

The Paradox of Trust: How Belief in CPEC's Mega-Dams Reshapes Pakistan Water Crisis Perceptions

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Abstract

Amidst Pakistan's severe water crisis, public trust in China-Pakistan hydro-projects presents a governance paradox. Using nationwide survey data and mediation analysis, this study finds that trust in CPEC is the strongest predictor of heightened catastrophic water risk perception, acting as a psychological amplifier rather than a palliative. While trust buffers geopolitical anxieties, it fails to address deep-seated structural and gendered hydraulic inequalities. The results advocate for a hybrid water governance model that leverages CPEC's political capital for efficiency reforms while mandating equity-focused interventions to address distributive justice, a critical pathway for sustainable water resource management in a transboundary crisis context.

Keywords: China-Pakistan Economic Corridor, Water governance, Public trust, Risk perceptions, Hydraulic inequality, Pakistan, hydro-diplomacy

Introduction

Pakistan faces an existential water crisis, marked not by simple physical scarcity but by a lethal convergence of geopolitical conflict, climate shocks, and profound socio-economic inequity (Mustafa et al., 2013; Sultana, 2020; Khan et al., 2025). Where per capita water availability has plummeted by 77% since 1962 (FAO, 2021), the state's response has been defined by institutional failure and governance gaps, eroding public confidence in domestic solutions (IMF, 2025; Khan et al., 2024).

Into this vacuum of trust has steeped the China-Pakistan Economic Corridor (CPEC), with its suite of large-scale hydroelectric projects promoted as strategic solutions to energy and water shortages (Adnan, 2022; Hakim et al., 2025). This intervention presents a stark empirical paradox that challenges conventional theoretical expectations. Globally, foreign-funded mega-dams under China's Belt and Road Initiative (BRI) are routinely met with public scepticism and protest, critiqued as instruments of debt-trap diplomacy, environmental degradation, and neo-colonial overreach (Renzio et al., 2025). Yet, emerging evidence suggests that within Pakistan, CPEC's hydro-power projects garner substantial and consequential public trust (Naz et al., 2025).

This paradox creates a critical gap in our understanding of the political psychology of crisis. Existing literature excels in siloed analyses: hydro-hegemony theory explains upstream geopolitical aggression (Zeitoun and Warner, 2006); feminist political ecology reveals the gendered burdens of scarcity (Sultana, 2020); climate justice frameworks highlight adaptive

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inequities (Schlosberg, 2013); and behavioural economics diagnoses policy inertia (Banerjee and Duflo, 2019). However, these perspectives remain largely disconnected. We lack an integrated understanding of how public trust in a specific, external infrastructural solution forged at the nexus of these multiple crises actively mediates how citizens perceive the high risks these theories describe.

Consequently, this study asks: How does public trust in CPEC hydro-projects mediate the relationship between the key drivers of Pakistan's water crisis and public perceptions of catastrophic water risk? We conceptualise trust not as a passive outcome, but as an active psychological mediator, a cognitive filter through which geopolitical threats, climate vulnerabilities, and social inequalities are interpreted and translated into a sense of personal and national risk (Mayer et al., 1995; Daraz, Khan, et al., 2024).

This central inquiry is operationalised through two subsidiary questions that bridge distinct theoretical domains:

1. The Geopolitical-Policy Nexus: Does trust in CPEC buffer perceptions of external hydrological threats and, in doing so, increase receptiveness to modernising, market-based policy solutions that address domestic inefficiency?
2. The Structural Inequality Limit: To what extent does this infrastructural trust alleviate, or conversely fail to alleviate, concerns regarding deeply rooted structural and gendered hydraulic inequalities?

By empirically testing questions with nationwide survey data, this study makes two primary contributions. First, it theoretically integrates disparate lenses of hydro-politics, feminist ecology, climate justice, and behavioural economics to model how trust functions in a poly-crisis environment. Second, it provides novel empirical evidence on the conditional nature of this trust, showing where it acts as a potent psychological buffer and where it reaches its limits, offering critical insights for crisis governance.

The remainder of the paper is structured as follows. Section 2 develops our interdisciplinary theoretical framework and synthesises the literature to establish our hypotheses. Section 3 details the methodology. Section 4 presents the results. Section 5 discusses the implications, policy recommendations, limitations, and avenues for future research.

Literature Review: Trust at the Nexus of Crisis

A Crisis of Geopolitics, Climate, and Structural Failure

Pakistan's water crisis is not merely one of physical scarcity but a poly-crisis where geopolitical, climatic, and socio-structural drivers intersect to create a state of hydrological precariousness (Barusa et al., 2018; Daraz, Bojnec, et al., 2024). Externally, hydro-hegemony dynamics (Zeitoun and Warner, 2006) manifest through upstream "legal warfare," in which treaty-compliant infrastructure such as India's Ratle Dam strategically reduces flows during critical periods, weaponising scarcity (Mirza et al., 2023; Blair, 2023).

This geopolitical anxiety is matched by climate threats. Himalayan glaciers, the Indus Basin's source, are retreating 23% faster than the global average (ICIMOD, 2023). The state remains unprepared for the resulting floods and droughts (Abbasi & Ullah, 2022).

Internally, this scarcity is profoundly engineered. Stark urban-rural divides (TNS, 2020) and entrenched distribution systems favour powerful agrarian elites, leaving regions such as Baluchistan parched (Magazine, 2024). Feminist political ecology (Sultana, 2020) illuminates how this crisis is gendered, with women bearing the disproportionate daily burden, spending hours fetching water, sacrificing education, and facing health risks (UNDP, 2025). Compounding these injustices is a pervasive governance vacuum: catastrophic irrigation losses exceeding 60% (Ejaz & Ashraf, 2023), minimal storage capacity, and decades of policy paralysis have systematically eroded public trust in domestic institutions (IMF, 2025). This confluence of external threats, climatic vulnerability, structural inequity, and institutional

failure establishes the context of profound insecurity within which public perceptions are formed, and solutions are evaluated.

The CPEC Paradox: Anomalous Trust in a Sceptical Era

In this landscape of multi-dimensional failure, the hydro-infrastructure projects of the CPEC are promoted as a strategic panacea (Adnan, 2022). This presents a central paradox for understanding the political psychology of crisis. Globally, large-scale, foreign-funded dams under China's BRI are typically met with intense public scepticism and socio-political resistance, critiqued as instruments of debt-trap diplomacy, environmental harm, and neo-colonial overreach (Renzio et al., 2025). Yet, emerging evidence suggests that within Pakistan, CPEC projects garner substantial and consequential public trust (Naz et al., 2025; Shahzad & Sunawar, 2024).

We conceptualise this public trust in CPEC hydro-projects through the integrative model of Mayer et al. (1995), defining it as a psychological willingness to be vulnerable based on perceived competence (technical ability to deliver), benevolence (intentions towards Pakistan's security), and integrity (reliable operation). This trust is not incidental; it is a direct cognitive response to the poly crisis. It represents a potential psychological shield against geopolitical aggression, a techno-managerial proxy for failed domestic climate adaptation, and a litmus test against lived experiences of inequality. This paradox, divergent local trust against a backdrop of global scepticism, reveals a critical gap: how does this specific trust mediate the public's perception of the very risks outlined in Section 2.1?

An Integrated Framework: Trust as a Conditional Mediator

To address this gap, we move beyond siloed theoretical analyses and propose an integrated framework in which trust in CPEC serves as a conditional psychological mediator, filtering the relationship between objective crisis drivers and subjective risk perceptions. This framework deliberately bridges disciplinary lenses to generate testable hypotheses.

First, drawing on hydro-hegemony and behavioural economics, we posit that trust in a powerful external ally's infrastructure can buffer the anxiety generated by geopolitical threats (H1a). Furthermore, by mitigating this sense of external vulnerability, such as trust, one may reduce policy fatalism and increase receptiveness to modernising, market-based solutions aimed at parallel domestic issues like catastrophic wastage (H1b).

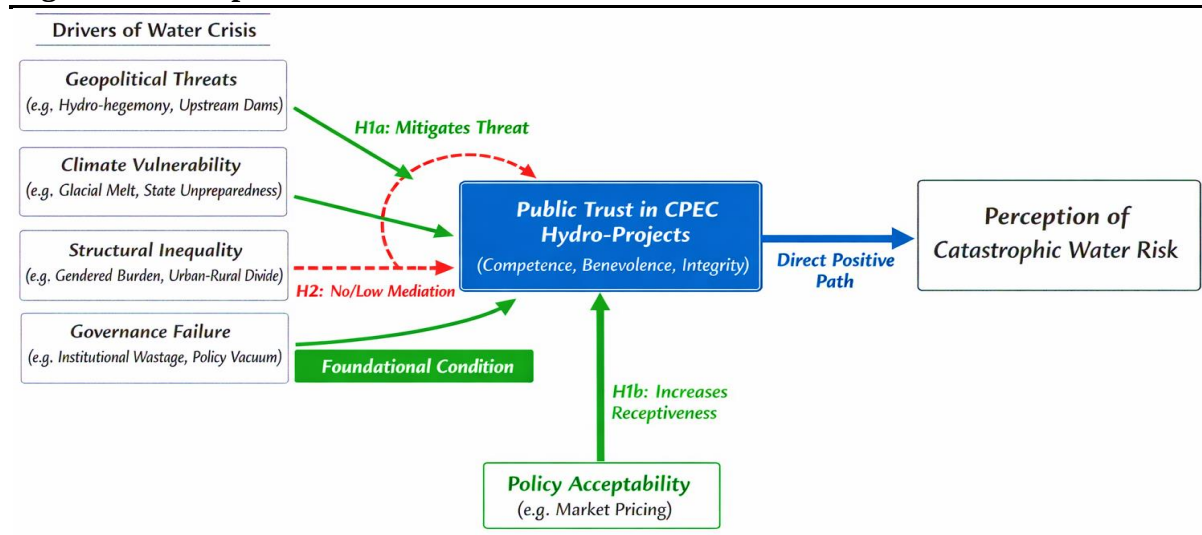
Second, and critically, integrating feminist political ecology and climate justice theory, we hypothesise a limit to technical trust. Perceptions of risk rooted in deep-seated structural and gendered inequalities are tied to power relations and social justice, domains that are largely unaddressed by infrastructural solutions. Therefore, we expect trust in CPEC will fail to mediate the relationship between these equity concerns and overall water risk perceptions (H2). In essence, our framework posits that trust functions as a potent mediator for externally focused, techno-managerial problems (geopolitics, inefficiency) but reaches its theoretical limits when confronting internally rooted, socio-structural injustices. This conditional model offers a more nuanced understanding of how political psychology operates in poly-crisis states.

Synthesising the Gap and Presenting the Conceptual Model

The literature ably documents the discrete drivers of Pakistan's water crisis but underexplores their interactive psychological impact. Anomalous trust in CPEC infrastructure provides a unique empirical lens for examining this interaction. Our integrated framework, summarised in Figure 1, addresses this gap by positioning trust as the key mechanism through which the geopolitical, climatic, and socio-economic dimensions of the crisis converge to shape public risk perceptions. This study tests this framework to explain not only what Pakistani's fear about water, but also the implications for crisis governance and policy legitimacy.

Conceptual framework illustrating the hypothesised mediating role of public trust in CPEC hydro-projects. Trust is posited to mitigate the impact of geopolitical threats (H1a) and increase policy acceptability (H1b), but not to mediate the effect of structural inequalities (H2). Governance failure is shown (Figure 1) as the foundational driver of trust. Solid lines represent hypothesised positive/mediating paths; the dashed line represents a hypothesised weak or non-significant path.

Figure 1: Conceptual Framework



Methodology

Research Context and Design

To empirically test the conditional mediation framework developed in section 2 (Figure 1), this study employs a cross-sectional, perception-based survey design within Pakistan's acute water crisis context. Pakistan's existential water challenge driven by geopolitical strife, climate vulnerability, structural inequity, and profound governance failure (Saddiqa et al., 2022; Sultana, 2020; Khan et al., 2024) provides the critical backdrop of "hydrological precariousness." This context makes the public's trust in large-scale external interventions, such as CPEC hydro-projects, not merely an academic variable but a pivotal psychosocial factor with direct implications for risk perception and policy legitimacy. Our methodological approach is explicitly designed to move from correlation to mechanism, testing how CPEC mediates the public's cognitive processing of multidimensional threats.

Data Collection, sampling, and Variable Operationalization

Survey Design and Construct Measurement

A structured online survey was developed to systematically assess public perceptions of water scarcity drivers, solutions, and the role of CPEC. The section of key domains and their operationalization into latent variables was theoretically anchored in the interdisciplinary literature synthesized in section 2. All constructs were measured using 5-point Likert scales (1= strongly disagree to 5= strongly agree), which provide interval-like data suitable for advanced parametric analysis (Norman, 2010).

The operationalization of our core construct, Trust in CPEC Hydro-Projects, is foundational. Grounded in Mayer et al. (1995) integrative model of organizational trust, we define it as the public's psychological willingness to be vulnerable based on perceptions of:

- *Competence*: Belief in Chinese engineering's ability to deliver effective water solutions.
- *Benevolence*: Belief in China's intentions to support Pakistan's water security.

- *Integrity*: Belief in the reliable and transparent operation of CPEC projects.

This multi-dimensional trust as the central mediating mechanism (M) in testing our hypotheses. The dependent variable, Perception of Catastrophic Water Risk (Y), captures the perceived likelihood of a severe, nationwide water shortage by 2050. The independent variables correspond precisely to the crisis drivers in our conceptual framework (see table 1), allowing us to test their distinct and mediated pathways to risk perception.

Table 1: Variable Operationalization, Theoretical Foundations, and Hypothesized Role

Latent Variable	Survey Item	Theoretical Foundation & Citation	Justification for Inclusion
Risk Perceptions (Y)	Likelihood of catastrophic water shortage by 2050.	Outcome variable	Dependent Variable
Geo political Threats (X ₁)	Upstream dam construction by neighbors is an act of hydrological warfare.	Hydro-hegemony framework (Zeitoun & Warner, 2006).	Tests H1a: Indirect effect via trust expected (buffering).
Socioeconomic (Urban-Rural) (X ₂)	Urban elites have better access to clean water than rural population.	Political ecology of water (Mustafa et al., 2013).	Control variables; tests general inequality effects.
Climate Vulnerability (X ₃)	The govt. is unprepared for climate-induced water disasters (GLOFs, droughts).	Climate justice theory; governance preparedness (Schlosberg, 2013).	Tests for mediation via trust as an adaptive response.
Socioeconomic (Equity) (X ₄)	Water mismanagement disproportionately harms poor communities and women.	Feminist political ecology (Sultana, 2020).	Tests H2: indirect effect via trust expected to be non-significant.
Population Pressure (X ₅)	Rapid population growth is the #1 driver of water scarcity in Pakistan.	Malthusian pressures vs. governance narratives (Haq et al., 2024).	Control variable; test attribution.
Governance Failure/Wastage (X ₆)	Inefficiencies in irrigation systems cause significant losses.	Crisis mismanagement literature (Qureshi & Ashraf, 2019).	Foundational driver; tests link to trust and policy.
Policy: Market Pricing (X ₇)	Water should be priced according to scarcity to reduce waste.	Behavioral economics (Grafton & Wheeler, 2018).	Tests H1b: Trust expected to positively predict acceptability.
Trust in CPEC (M)	China's CPEC water projects (dams) will improve Pakistan's water scarcity.	Public trust in foreign infrastructure (Mayer et al., 1995).	Core Mediator for H1a, H2; Predictor for H1b.

Source: Compiled by authors.

Sampling and Data Collection

The survey was administered online via Google Forms and disseminated through social media networks (WhatsApp) and professional contacts to achieve wide geographic coverage across Pakistan between May 2025 to July 2025. We employed a stratified convenience sampling strategy to ensure representation from all four provinces (Punjab, Sindh, Khyber Pakhtunkhwa, and Baluchistan), capturing diverse hydrological and socio-economic contexts pertinent to the water crisis.

The final sample consists of N=418 respondents. While this method does not yield a statistically random sample, the size meets and exceeds established thresholds for the robustness of multivariate and mediation analyses (Sekaran, 2003). We explicitly acknowledge the potential for self-selection bias, as respondents require internet access and may have a prior interest in water issues. This limitation is addressed in the discussion (Section 5). However, for testing the relationships and pathways between perceptions the core aim of this study a purposive, informed sample is analytically suitable and offers significant insights into the cognitive landscape of the crisis.

Analytical Strategy: A Three-Stage Hypothesis Test

Our analysis was conducted in Jamovi and progressed through three sequential stages, each designed to test specific components of our conceptual framework and its hypotheses.

Stage 1: Baseline Model Identifying Dominant Predictors

We first estimated a standard multiple linear regression with all predictors and the trust mediator entered simultaneously:

$$Y = \beta_0 + \beta_1 X_{Geo} + \beta_2 X_{SE1} + \beta_3 X_{SE2} + \beta_4 X_{Climate} + \beta_5 X_{Pop} + \beta_6 X_{Waste} + \beta_7 X_{Market} + \beta_8 X_{ChinaTrust} + \epsilon$$

This model provided a holistic view of the relative strength of each driver and established the baseline direct relationships, contextualizing the subsequent mediation tests.

Stage 2: Core Test Mediation Analysis for H1a and H2

To test the central proposition that trust mediates the effect of specific drivers on risk perception, we conducted mediation analysis using a General Linear Model (GLM) approach with bias-corrected bootstrapping (5,000 samples). Bootstrapping is a non-parametric technique ideal for mediation as it does not rely on normality assumptions and provides robust confidence intervals for indirect effects.

- *For H1a (Geopolitical Buffering):* We tested the significance of the indirect effect of geopolitical threats (X_1) on risk perception (Y) via trust (M). a significant negative indirect effect (where the path through trust reduces the total effect) would support the hypothesis that trust acts as a psychological buffer.
- *For H2 (Limit of Trust):* We tested the indirect effect of structural inequality (X_4) on risk perception (Y) via trust (M). A non-significant indirect effect would confirm our hypothesis that trust cannot mediate concerns rooted in deep-seated socio-structural injustice.

Stage 3: Supplementary Test Policy Receptiveness (H1b) and Exploratory Moderation

- To test H1b, we examined the direct relationship between Trust (M) and support market pricing (X_7) within the regression model. A significant positive relationship would indicate that higher trust correlates with greater openness to this modernizing policy.
- Exploratory, we examined whether trust acted as a moderator (versus a mediator) for any relationships, testing interaction terms (e.g., geopolitics * Trust) in separate GLM models to see if trust levels strengthened or weakened certain direct pathways to risk.

Reliability and Validity

Psychometric Robustness: Prior to hypothesis testing, we assessed the measurement model. The scales demonstrated excellent internal consistency (Cronbach's $\alpha=0.88$) for independent variables, $\alpha=0.98$ for the dependent variable). To assess the threat of common method bias (CMB), we conducted Harman's single-factor test. The largest factor explained only 38.2% of the total variance, well below the 50% threshold, indicating that CMB is not a critical confounder in this dataset.

Causal Inference and Limitations: A paramount caveat concerns causality. The cross-sectional design allows us to test theoretically derived mediation pathways and identify robust associations, but it cannot definitively establish temporal or causal precedence. While our model is grounded in theory (crisis drivers → trust formation → risk perception) reverse causality (e.g., pre-existing high risk perception influencing trust levels) is plausible. Therefore, we interpret our results as revealing systemic mediational relationships that are consistent with our theoretical framework, providing compelling evidence for the hypothesized psychological mechanism and a solid foundation for future longitudinal or experimental research.

Results

Stage 1: Baseline Regression Model – Dominant Predictors of Water Risk

The combined linear regression model significantly predicted catastrophic water shortage risk in Pakistan ($F(8, 409) = 22.568$, $p < 0.001$), explaining 30.6% of the variance ($R^2 = 0.306$). This establishes the collective explanatory power of the geopolitical, socio-economic, and infrastructural drivers identified in our framework. Analysis of the standardized coefficients (β) reveals three dominant positive predictors shaping public risk perceptions (Table 2). First, and most powerfully, trust in CPEC-hydro-projects ($\beta = 0.408$, $p < 0.001$) was the strongest predictor. This indicates that higher faith in Chinese-led water infrastructure is associated with a heightened, not diminished, sense of catastrophic water risk, positioning CPEC as a psychological amplifier of crisis salience. Second, awareness of water mismanagement disproportionately harming marginalized groups ($\beta = 0.256$, $p < 0.001$) underscores that perceived structural and gendered inequity remains a core direct driver of public concern. Third, the perception of upstream dam construction as hydrological warfare ($\beta = 0.130$, $p = 0.002$) confirms the independent role of geopolitical anxieties in elevating risk perceptions. Paradoxically, other significant predictors exerted negative effects. Higher recognition of urban-rural inequality ($\beta = -0.267$, $p < 0.001$) and support for drip irrigation mandates ($\beta = -0.294$, $p < 0.001$) were linked to lower perceived risk. It could reflect a normalization of chronic disparities or policy fatalism, where familiar inequities or prescribed technical fixes are not seen as altering the trajectory towards catastrophe. Support for market-based water pricing showed no significant direct effect ($\beta = -0.073$, $p = 0.111$), indicating initial public skepticism towards economic instruments. All variance inflation factor ($VIF < 2$) confirmed the absence of problematic multicollinearity, supporting the robustness of these relationships.

Table 2: Linear Regression Model

Predictor	β Un-Stand.	Std. error	β Stand.	t-value	p-value	VIF
Constant	3.519	0.269	-	13.062	0.000	-
Upstream dam construction by neighboring countries is an act of hydrological warfare	0.140	0.045	0.130	3.135	0.002	1.00
Urban elites have better access to clean water than rural population	-0.273	0.052	-0.267	-5.302	0.007	1.49
Pakistan government is unprepared for climate-induced water disasters (GLOFs, droughts)	0.130	0.048	0.127	2.705	0.000	1.29
Water mismanagement disproportionately harms poor communities and women	0.267	0.056	0.256	4.778	0.000	1.69
Rapid population is the #1 driver of water scarcity in Pakistan	-0.201	0.054	-0.201	-3.702	0.000	1.74

Farmer should be legally required to adopt drip irrigation	-0.305	0.054	-0.294	-5.618	0.000	1.61
Water should be priced according to scarcity level to reduce waste (e.g., higher rates for inefficient agriculture)	-0.076	0.047	-0.073	-1.595	0.111	1.23
China's water infrastructure projects in Pakistan (e.g., CPEC dams, hydro-projects) will improve the country's water scarcity	0.402	0.045	0.428	8.925	0.000	1.35

Stage 2: Core Mediation Analysis Testing the Conditional Role of Trust

The mediation analysis provides the crucial test of our framework's central proposition: that trust in CPEC acts as a conditional psychological mediator between crisis drivers and risk perception. Contrary to Hypothesis 1a (H1a), the indirect effect of geopolitical threats on threats on risk through trust was non-significant ($\beta = -0.012$, $p=0.511$). This suggests that, in the specified mediation pathway, trust does not act as a straightforward psychological buffer for geopolitical fears. However, the significant positive effect of geopolitics on risk ($\beta = 0.130$, $p = 0.002$) remains potent, disclosing these anxieties operate alongside, rather than through, trust in CPEC (Table 3). The complete decomposition of direct, indirect, and total effects for all predictors is provided in Appendix tables A1 and A2.

In strong support of Hypothesis 2 (H2), the indirect effect of structural inequality on risk through trust was virtually zero and non-significant ($\beta=0.003$, $p=0.903$). This result confirms a critical theoretical boundary: trust in large-scale foreign infrastructure fails to mediate concerns rooted in deep-seated social and gendered inequities. These concerns retain a strong, unmediated direct path to heightened risk perception ($\beta = 0.256$, $p < 0.001$), underscoring the limits of technical solutions in addressing justice-based anxieties.

While not central to our primary hypotheses, the analysis revealed that trust act as a significant positive mediator for other drivers. Population pressures ($\beta = 0.139$, $p < 0.001$) and perceptions of water wastage ($\beta = 0.071$, $p = 0.003$) exerted substantial indirect effects via trust. This indicates that concerns about demographic growth and systemic inefficiency are cognitively channeled into, and amplified by, reliance on CPEC as an external solution. Furthermore, trust significantly mediated the path to policy acceptability, supporting Hypothesis 1b (H1b). The indirect effect on support for market-based pricing was positive and significant ($\beta = 0.056$, $p=0.006$), suggesting that trust in external infrastructure can increase receptiveness to modernizing, and often contentious, domestic policy reforms.

Table 3: Indirect Effects of Predictors on Water Risk Perceptions through China-Trust (Mediation Pathway)

Effect	Estimate	SE	Beta	z	P
Market $\Rightarrow$ China – Trust $\Rightarrow$ Water. Risk	0.05862	0.0215	0.05643	2.724	0.006
Water Waste $\Rightarrow$ China – Trust $\Rightarrow$ Water. Risk	0.07362	0.0248	0.07103	2.970	0.003
Population $\Rightarrow$ China – Trust $\Rightarrow$ Water. Risk	0.13886	0.0274	0.13919	5.067	<0.001
Socioeconomic 2 $\Rightarrow$ China – Trust $\Rightarrow$ Water. Risk	0.00274	0.00225	0.00267	0.122	0.903
Socioeconomic 1 $\Rightarrow$ China – Trust $\Rightarrow$ Water. Risk	0.03984	0.0248	0.03816	1.609	0.108
Climate Change $\Rightarrow$ China – Trust $\Rightarrow$ Water. Risk	0.02185	0.0211	-0.02130	-1.034	0.301
Geopolitics $\Rightarrow$ China – Trust $\Rightarrow$ Water. Risk	-0.01285	0.0195	-0.01190	-0.658	0.511

Stage 3: Exploratory Moderation Analysis The Conditioning Effect of Trust

An exploratory analysis tested whether trust moderates (strengthens or weakens) the direct relationships between drivers and risk, offering a supplementary perspective to the mediation findings. The results reveal a nuanced role of trust. For several key drivers – geopolitical threats ($\beta = -0.139$, $p < 0.001$), climate vulnerability ($\beta = -0.074$, $p = 0.017$), and urban-rural inequality ($\beta = -0.095$, $p = 0.002$) – higher levels of trust in CPEC significantly weakened their positive relationship with perceived risk (table 4). This indicates that while trust did not mediate the geopolitical pathway (H1a), it does act as a conditional buffer, reducing the strength of this link for those who hold high trust. Similarly, trust diminished the negative relationship between support for market pricing and risk perception ($\beta = -0.101$, $p = 0.002$), further supporting the H1b finding that trust creates space for policy consideration.

Critically, and consistent with H2, trust did not moderate the relationship between structural inequality (Socioeconomic-2) and risk perception ($\beta = -0.050$, $p = 0.167$). This reinforces the finding that the powerful connection between lived inequity and fear catastrophe operates independently of one's faith in CPEC infrastructure, highlighting a fundamental disconnect between technical and justice-based perceptions of the water crisis.

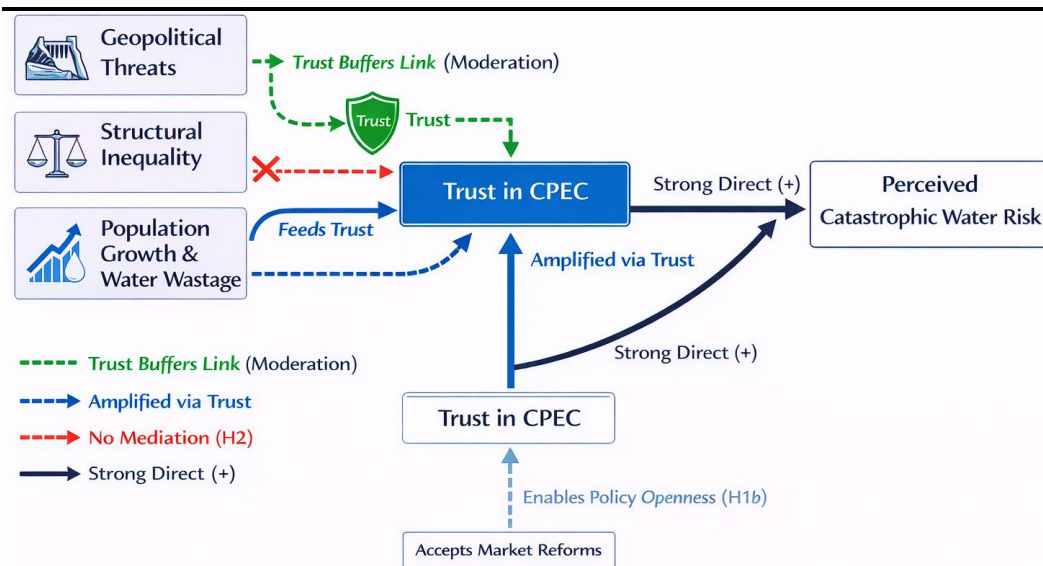
Table 4: Moderation effect of CPEC on Predictor Risk Perception Relationship

Predictor	Main Effect	Interaction (β)	SE	P	95%	Interpretation
Geo-Politics	0.149*	-0.139***	0.0333	<0.001	[-0.204, -0.074]	High trust weakens geopolitics $\Rightarrow$ Risk Link
Climate Change	0.104*	-0.074*	0.0311	0.017	[-0.134, -0.011]	Trust reduced climate change's impact
Socioeconomic 1	0.136**	-0.095**	0.0307	0.002	[-0.158, -0.032]	Trust mitigates urban-rural disparity effects
Market	-0.138**	-0.101**	0.0319	0.002	[-0.161, -0.031]	Trust diminishes market-policy skepticism
Socioeconomic 2	-0.163**	-0.050(ns)	0.0361	0.167	[-0.124, 0.018]	No moderation by trust
Population	-0.332***	0.025 (ns)	0.0318	0.426	[-0.039, 0.086]	No moderation by trust
Water. Waste	-0.402***	0.047 (ns)	0.0348	0.175	[-0.017, 0.115]	No moderation by trust

Note: Significance Levels: * $p < .05$, ** $p < .01$, *** $p < .001$. Main Effects represents predictors $\rightarrow$ risk relationships at mean trust levels. Interaction terms test how China-Trust modifies this relationship.

Integrative Summary of Key Pathways

Synthesizing the direct, indirect, and total effects, the results illustrate a complex, conditional psychology of trust in polyresins context. Urban inequalities and geopolitical tensions exert strong, largely unmediated positive effects on risk perception. Concerns about population growth and systemic wastage, however, are significantly filtered and amplified through trust in CPEC. Most notably, the pathway from structural and gendered inequity to risk perception remains entirely outside the mediating or moderating influence of trust, validating the proposed limit to infrastructural legitimacy. Trust, therefore, operates not as a universal palliative but as a selective cognitive filter: it is potent in reshaping perceptions related to volumetric and technical problems but impotent against those rooted in social justice. These integrated pathways are summarized visually in Figure 2.

Figure 2: Synthesis of Key Pathways: The Conditional Mediating and Moderating Role of Trust in CPEC

Caption: Synthesized pathways from the regression, mediation, and moderation analyses. Trust in CPEC acts as potent direct amplifier of risk and a channel for technical/demographic concerns, but fails to mediate justice-based inequities (H2). It also conditionally buffers geopolitical anxieties and enables policy receptiveness (h1b).

Discussion

Reinterpreting the CPEC Paradox: Trust as Amplifier, Not Palliative

Globally, BRI hydro-projects frequently met with public skepticism over debt, environment, and neo-colonialism (Renzio et al., 2025). Pakistan's substantial public trust in CPEC dams presents a striking paradox. Our findings clarify this paradox by revealing trust's dual role: it is both the strongest predictor of heightened catastrophic risk perception ($\beta = 0.428$, $p < 0.001$) and a psychological buffer against geopolitical anxiety (moderation $\beta = -0.139$, $p < 0.001$). This suggests a reframing of the trust-risk nexus.

In Pakistan's unique context, trust in CPEC is not merely faith in engineering solutions. It is, more fundamentally, trust in a geopolitical security guarantee. As recent analyses underscore, CPEC is perceived as a strategic asset directly tied to national security and the China-Pakistan partnership (Khan, 2025; Khan et al., 2025). The public's elevated risk perception reflects a realistic assessment of the water crisis's severity from retreating glaciers (ICIMOD, 2023) to upstream hydrological aggression. However, the concurrent trust in CPEC represents a belief that this existential threat is being actively countered by a powerful ally. Thus, high trust correlates with high risk because both are driven by the same underlying reality: a state of perceived conflict and vulnerability, where CPEC is seen as a vital shield. This aligns with observed public sentiments where national defense successes are directly linked to renewed confidence in CPEC's visibility (Khan, 2025; Daraz, Bojnec, et al., 2025).

This interpretation resolves the apparent contradiction. The public does not trust CPEC despite the risk: they trust it because of the risk. CPEC infrastructure is cognitively framed as a critical, high-stakes response within an ongoing struggle for hydrological and national security, explaining why it amplifies risk salience while simultaneously buffering specific geopolitical fears.

Validating the Integrated Framework: Boundaries and Buffers of Trust

The results provide robust validation for the integrated theoretical framework, revealing both the potency and the precise limits of public trust in CPEC as a psychological mediator.

The analysis offers strong confirmation of the central limit posited by Hypothesis 2. Trust in CPEC infrastructure completely failed to mediate the powerful pathway from perception ($\beta = 0.003$, $p = 0.903$). This finding is critical, as it demonstrates that infrastructural trust operates in a separate cognitive and political domain from justice-based concerns. Anxieties rooted in lived experiences of inequity where women are systematically excluded from water governance and bear the unequally daily burden of scarcity (Sultana, 2020; UNDP, 2025) remain untouched by faith in mega-dams. This creates a significant governance blind spot, indicating that a policy focus on CPEC's volumetric solutions does not address, and may inadvertently ignore, the parallel social crisis of water distribution by reinforcing top-down, technocratic approaches that marginalize community-led, gender-inclusive management models (Aijaz and Akhter, 2020).

The relationship between trust and geopolitical threats revealed a more nuanced pattern. While trust did not mediate the pathway from geopolitical threats to risk the tested model (h1a not supported), it functioned as a significant conditional buffer. The moderation analysis shows that for individuals with higher trust, the positive link between geopolitical threats and perceived risk is substantially weakened (interaction $\beta = -0.139$, $p < 0.001$). This can be understood as trust acting as a psychological substitute for strategic assurance (Daraz, ul Hakim, et al., 2025). In a context where data warfare and hydrological aggression erode treaty-based security (Frada, 2023), public confidence in CPEC may provide a cognitive counterweight to geopolitical anxiety, mitigating the sense of helplessness without altering the objective threat.

Finally, the findings support hypothesis 1b, highlighting trust's role as an enabler for policy reforms. Trust significantly mediated the path to greater acceptability of market-based pricing solution ($\beta = 0.056$, $p = 0.006$). It also acted as a conduit, challenging concerns about population growth and systemic wastage into the overall risk perception. This links the realm of behavioral economics with the politics of infrastructure, indicating that the legitimacy conferred by CPEC bolstered by its perceived association with improved governance and project delivery, as noted in studies on CPEC's institutional performance (Khattak et al., 2023) could create a vital political opening for implementing otherwise contentious efficiency and governance reforms risk further disadvantaging women and poor households who lack the capital to participate in water market.

Policy Implications: From Conditional Trust to Hybrid Governance Models

The conditional nature of public trust potent for technical and security issues, impotent for equity demands a governance response that is equally sophisticated and hybrid. Fortunately, the strategic direction of CPEC Phase II, as outlined in the 2025-2029 Action Plan, explicitly aligns with this need, moving beyond hardware to "high-quality, inclusive, and people-centered development" (CPEC, 2025).

1. *Leveraging Trust for Systemic Market and Efficiency Reforms:* The link between CPEC trust and acceptance of market-based pricing (H1b) reveals a critical political opening. Pakistan should establish Integrated Water Governance Pilots within CPEC's designated Agricultural and Special Economic Zones. These pilots would blend Chinese engineering with adapted institutional models. Such as tradable water rights inspired by the Australian Murry-Darling basin (Grafton & Wheeler, 2018). CPEC's legitimacy can be used to overcome resistance from vested interests to efficiency and allocation reforms. This aligns directly with the Phase II goal of making "exports the engine of growth" through modernized agro-logistics and value chains (CPEC, 2025).
2. *Mandating Equity and Inclusion by Design to Address the Trust Gap:* Since trust does not alleviate equity concerns (H2), justice must be explicitly engineered into projects. The new CPEC "livelihood Corridor" and proposals to pilot China's poverty alleviation models in

poor districts (CPEC, 2025; Khan et al., 2025) provide the perfect framework. This must include formal mandates for gender-inclusive governance, such as reserved seats for women and marginalized community representativeness on water councils, and social impact assessment focused on distributional outcomes. The military's role in security must be balanced by formalized civilian and community oversight for these "soft" governance components to avoid purely technocratic outcomes.

3. *Integrating Energy-water Nexus Solutions for Climate Resilience:* The trust-mediated concerns over wastage and climate vulnerability highlight the need for integrated solutions. CPEC's new "Green Corridor" and "Innovation Corridor" (CPEC, 2025) should prioritize investments in renewable energy-driven smart water systems. Research confirms the vast potential for hybrid renewable energy systems (hydro, solar, wind) in regions like western Kashmir under CPEC, which can power climate-smart agriculture and efficient irrigation, directly addressing the water-energy-climate nexus (Rehman et al., 2025). This transforms CPEC infrastructure from a volumetric solution into a resilient, decarbonized water-energy system.

Limitation and a Future Research Agenda Aligned with CPEC Phase II

While this study's cross-sectional design limits causal claims, it sets a clear agenda for future work aligned with CPEC's new phase. Research must now employ longitudinal designs to track how trust evolves as Phase II's "people-centered" projects materialize. It should use mixed-methods, combining surveys with in-depth interviews to unpack the narrative behind the trust paradox. Crucially, the implementation of the five new corridors (Growth, Innovation, Green, Livelihood, regional Connectivity) offers a natural laboratory for policy-focused research.

A critical future avenue is the quantitative analysis of water-energy-food (WEF) nexus within CPEC. Studies like Rehman et al. (2025), which model renewable energy integration for sustainable water and energy management, provide a methodological template. Future research should employ similar system-dynamics or nexus-benefit quantification modeling to analyze trade-offs and synergies between CPEC's hydro-projects, agricultural zones, and renewable energy investments, offering actionable intelligence for the Joint working Group on Water and Climate Resilience proposed in the 2025 JCC (CPEC, 2025).

Conclusion

Pakistan stands at a rare moment of strategic alignment. Public trust in CPEC provides the political capital. CPEC Phase II's stated goals inclusivity, sustainability, people-centered growth provide the policy blueprint. Our findings provide the empirical guide: harness trust to build efficient markets and resilient infrastructure, but deliberately inject equity and inclusion to bridge the gap that trust alone cannot span.

The path forward is not to choose between Chinese infrastructure, Australian markets, or local justice, but to orchestrate them into a resilient, hybrid governance framework. This means using the Green Corridor to fund solar-powered drip irrigation. The Livelihood Corridor to empower women-run water councils, and the Innovation Corridor to deploy AI for leakage detection. With climate change intensifying, the time for siloed solutions is over. Pakistan must act decisively to ensure CPEC becomes more than concrete and cables it must become the institutional catalyst for a hydro-just future.

References

- Abbasi, R., & Ullah, S. (2022). Rising strategic instability and declining prospects for nuclear disarmament in South Asia: A Pakistani perspective. *Asian Journal of Peacebuilding*, 10(1), 215–241.

- Adnan, M. (2022). Pakistan's ability to mitigate water shortage by making Diamer-Bhasha Dam. *Journal of the Research Society of Pakistan*, 59(1), 81–90.
- Banerjee, A. V., & Duflo, E. (2019). *Good economics for hard times*. PublicAffairs.
- Barua, A., Vij, S., & Zulfiquir Rahman, M. (2018). Powering or sharing water in the Brahmaputra River basin. *International Journal of Water Resources Development*, 34(5), 829–843. <https://doi.org/10.1080/07900627.2017.1403892>
- Blair, H. (2023). Saving India's rivers: Ecology, civil society, religion, and legal personhood. *World Development Sustainability*, 3, 100068. <https://doi.org/10.1016/j.wds.2023.100068>
- China-Pakistan Economic Corridor (CPEC). (2025). *Pakistan and China enter new era of economic cooperation as Minister Ahsan Iqbal inaugurates 14th JCC meeting in Beijing*. <https://cpec.gov.pk/news/318>
- Daraz, U., Bojnec, Š., & Khan, Y. (2024). The impact of climate change on migration patterns in coastal communities. *Climate*, 12(11), 180. <https://doi.org/10.3390/cli12110180>
- Daraz, U., Bojnec, Š., & Khan, Y. (2025). Gender role reversal in gig economy households: A sociological insight from Southeast Asia with evidence from Pakistan. *Societies*, 15(10), 276. <https://doi.org/10.3390/soc15100276>
- Daraz, U., Khan, Y., Alsawalqa, R. O., Alrawashdeh, M. N., & Alnajdawi, A. M. (2024). Impact of climate change on women mental health in rural hinterland of Pakistan. *Frontiers in Psychiatry*, 15, 1450943. <https://doi.org/10.3389/fpsy.2024.1450943>
- Daraz, U., ul Hakim, A., Hussain, Z., & Hussain, M. (2025). Empowering Pakistani women through education: A mixed-method exploration of psychological strength and resilience. *Pakistan Journal of Law, Analysis and Wisdom*, 4(9), 147–171.
- de Renzio, P., Siame, N., Kaulule,., & Chelwa, G. (2025). *Accountability failures: Investigating the roots of Zambia's 2020 debt default*. WFD & AFRODAD.
- Ejaz, K., & Ashraf, M. (2023). Water productivity and economic feasibility of growing rice and wheat on beds in central Punjab, Pakistan. *Pakistan Council of Research in Water Resources (PCRWR)*.
- Food and Agriculture Organization (FAO). (2021). *The state of the world's land and water resources for food and agriculture*. <https://openknowledge.fao.org/>
- Frada, R. (2023). *Beyond the Belt and Road Initiative: Navigating gender dynamics in China's global development projects*. <https://igg-geo.org/en/2023/11/30/beyond-the-belt-and-road-initiative-navigating-gender-dynamics-in-chinas-global-development-projects/>
- Grafton, R. Q., & Wheeler, S. A. (2018). Economics of water recovery in the Murray–Darling Basin, Australia. *Annual Review of Resource Economics*, 10, 487–510. <https://doi.org/10.1146/annurev-resource-100517-023038>
- Grafton, R. Q., Horne, J., & Wheeler, S. A. (2016). On the marketisation of water: Evidence from the Murray–Darling Basin, Australia. *Water Resources Management*, 30(3), 913–926. <https://doi.org/10.1007/s11269-015-1199-0>
- Hakim, A. U., Daraz, U., Hussain, Z., & Hussain, M. (2025). Perception-based analysis of local investors' response to CPEC development in Khyber Pakhtunkhwa. *Research Consortium Archive*, 3(4), 568–579. <https://doi.org/10.5281/zenodo.17513435>
- Haq, F. U., Ahmad, I., & Khan, N. M. (2024). Climate change, water variability, and cooperation along transboundary river basins in perspective of Indus Water Treaty. In *The water, climate, and food nexus: Linkages, challenges and emerging solutions* (pp. 457–473). Springer. <https://doi.org/10.1007/978-3-031-XXXX-X>
- International Centre for Integrated Mountain Development (ICIMOD). (2023). *Water, ice, society, and ecosystems in the Hindu Kush Himalaya*. <https://doi.org/10.53055/ICIMOD.1028>
- International Monetary Fund (IMF). (2025). *IMF flags Pakistan's corruption, eroding public trust, system favoring elite*. <https://indianexpress.com/article/india/imf-flags-pakistans-corruption-eroding-public-trust-system-favouring-elite-10380935/>
- Khan, A. M. (2025). *Strategic shift in South Asia & CPEC*. <https://thestrategicbrief.com/2025/05/30/strategic-shift-in-south-asia-cpec/>

- Khan, Y., Bojnec, Š., & Daraz, U. (2025). Infrastructure, knowledge and climate resilience technologies enhancing food security: Evidence from Northern Pakistan. *Sustainable Futures*, 10, 100769. <https://doi.org/10.1016/j.sfr.2025.100769>
- Khan, Y., Bojnec, Š., Daraz, U., & Zulpiqar, F. (2024). Exploring the nexus between poor governance and household food security. *Economic Change and Restructuring*, 57(2), 92. <https://doi.org/10.1007/s10644-023-09492-0>
- Khan, Y., Bojnec, Š., Lou, G., & Daraz, U. (2025). When poverty meets hunger: Household vulnerability and coping responses to food insecurity in Torghar, Pakistan. *Agriculture & Food Security*. <https://doi.org/10.1186/s40066-025-004XX-X>
- Khattak, G. S. (2025). *Geo-economics and the rocky road of gender equality*. <https://asia.fes.de/news/geo-economics-and-the-rocky-road-of-gender-equality.html>
- Kumar, S. Y. (2023). China–Pakistan Economic Corridor (CPEC): India’s conundrum and policy options. In *The Palgrave handbook of globalization with Chinese characteristics* (pp. 647–665). Palgrave Macmillan.
- Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of Management Review*, 20(3), 709–734. <https://doi.org/10.5465/amr.1995.9508080335>
- Mirza, M. N., & Mahmood, N. (2023). Securitising and de-securitising water scarcity in Pakistan: A case study of the Diamer Basha Dam. *Water Policy*, 25(1), 1–14. <https://doi.org/10.2166/wp.2023.XXX>
- Mustafa, D., Akhter, M., & Nasrallah, N. (2013). *Understanding Pakistan’s water-security nexus*. United States Institute of Peace.
- Naz, L., Khalid, Z., Ali, A., Haleem, K., & Shafaqat, S. (2025). Mapping the climate risk landscape of the Diamer–Basha Dam in Pakistan: A storyline approach. *Natural Resources Forum*. <https://doi.org/10.1111/1477-8947.12XXX>
- Norman, G. (2010). Likert scales, levels of measurement and the “laws” of statistics. *Advances in Health Sciences Education*, 15(5), 625–632. <https://doi.org/10.1007/s10459-010-9222-y>
- Qureshi, R., & Ashraf, M. (2019). Water security issues of agriculture in Pakistan. *Pakistan Academy of Sciences*, 1, 41–50.
- Rehman, A. U., Alblushi, I. G. M., Khalid, H. M., Said, Z., Ismail, A., Muyeen, S. M., & Abdelaziz, A. Y. (2025). Analysis of renewable energy resources under the China-Pakistan Economic Corridor initiative. *Sustainable Futures*, 10, 100826. <https://doi.org/10.1016/j.sfr.2025.100826>
- Saddiqa, A., Batool, S., Gill, S. A., & Khan, A. J. (2022). Water governance and management in the 21st century: A case study of Pakistan. *Pakistan Journal of Humanities and Social Sciences*, 10(1), 29–42.
- Schlosberg, D. (2013). Political challenges of the climate-changed society. *PS: Political Science & Politics*, 46(1), 13–17. <https://doi.org/10.1017/S1049096512001376>
- Sekaran, U. (2003). *Research methods for business: A skill-building approach* (4th ed.). John Wiley & Sons.
- Shahzad, A., & Sunawar, L. (2024). Unpacking the paradox: Exploring the knowledge-attitude-perception (KAP) and trust of the local community towards CPEC. *Qlantic Journal of Social Sciences*, 5(4), 150–167.
- Sultana, F. (2020). Embodied intersectionalities of urban citizenship: Water, infrastructure, and gender in the Global South. *Annals of the American Association of Geographers*, 110(5), 1407–1424. <https://doi.org/10.1080/24694452.2020.1715193>
- The Express Tribune. (2024). *Karez to the rescue*. <https://tribune.com.pk/story/2465246/karez-to-the-rescue>
- The News International. (2020). *PSLM and the rural–urban divide*. <https://www.thenews.com.pk/>
- United Nations Development Programme (UNDP). (2025). *Water access is transforming the lives of women and girls in Pakistan*. <https://www.undp.org/>
- Zeitoun, M., & Warner, J. (2006). Hydro-hegemony: A framework for analysis of trans-boundary water conflicts. *Water Policy*, 8(5), 435–460. <https://doi.org/10.2166/wp.2006.054>