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The Spring Listens: Water Ethics among Gujjars of the Western Himalaya

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Abstract

This paper examines the water ethics of the Gujjar pastoral communities of the Western Himalaya — an indigenous knowledge, practice, and belief system governing the relationship between mountain pastoralists and the springs, streams, rivers, and high-altitude lakes upon which their pastoral existence depends. Drawing on interpretive ethnographic fieldwork conducted across Jammu and Kashmir between 2021 and 2024, encompassing twelve communities, sixty-four semi-structured interviews, eleven focus group discussions, and multi-season participant observation, the study argues that Gujjar water ethics constitute a sophisticated moral framework rooted in Islamic theology, Sufi devotion, and an older animistic reverence for specific water sources. Springs (*nag*, *bowli*), lakes (*sar*), and several rivers (*nalah*) are addressed as moral entities, approached through protocols of respect, propitiated with offerings, and protected through spiritual prohibitions.

The paper's central analytical claim concerns mechanism. Cosmologies do not conserve water; institutions and repeated practices do. The study therefore traces a specific causal sequence — from theological stratum, to moral obligation, to norm-bearing institution, to repeated ritual, to observable environmental behaviour — and marks precisely where the evidence of an interpretive ethnography ends and inference begins. Behaviour is documented; ecological consequence is inferred and left explicitly unmeasured. This organisation allows the study to take indigenous water ethics seriously as ecological reasoning without collapsing description into advocacy, and it yields findings that a purely descriptive account would obscure: that reformist critique strips the stratum authorising *spatially specific* protection while affirming the one authorising general injunction; that spring groves persist through redundant motivation rather than sanctity alone; that the deepest knowledge of spring condition sits with people excluded from the institution adjudicating spring disputes; and that regional climatic forcing threatens the ethic less by disproving it than by rendering it unconfirmable.

The paper situates this material within four scholarly conversations — sacred ecology and Traditional Ecological Knowledge, Islamic environmental ethics, the political ecology of Himalayan water governance, and the comparative literature on ritualised water management — and positions the Gujjar case against Balinese, Andean, Māori, Oromo, and Aboriginal Australian analogues. It engages the literature cautioning against romanticisation of indigenous environmental practice, addressing internal variation, gendered stewardship, and the contemporary pressures reshaping this living ethical tradition.

1. Introduction

1.1 The Spring as a Moral Being

In the high-altitude meadows of the Pir Panjal range, above the treeline and below the permanent snowpack, there is a spring. It emerges from a fissure in a moss-encrusted rock, and it bears a name. Among the Gujjar and Bakarwal pastoral communities who have grazed these highlands for generations, a spring is not merely a water source: it listens. It responds to human conduct. It rewards reverence with

reliable flow and punishes disrespect with drying or bitterness. A woman elder of Sarthal (in Kathua district of Jammu), explaining the protocol of approaching a local spring, put it in simple Gojri as:

"Pani hamna sunae, dekhae, je ham changa te yo yo chango, te je ham maadha, yo maadho. Be adbi huyi taan suk je go."

[The spring listens and watches. If we are good to it, it will be good to us. If we behave badly, it too will turn bad. If we show disrespect, it will dry up.]

This statement is simultaneously a spiritual assertion and an ecological observation. Springs can and do fail when their catchment ecosystems are degraded — when surrounding forests are cleared, when soil compaction reduces infiltration, when contaminants enter the recharge zone. Whether or not the elder was making a conscious hydrological argument, the conduct her words prescribe — keeping spring surroundings shaded and undisturbed, preventing contamination, maintaining the integrity of the forest above — is consistent with what spring science recommends for sustaining reliable discharge. The spiritual frame and the ecological reality are not opposites; they are, at least in part, in conversation.

Gujjar pastoralists of the Western Himalaya have developed, through generations of intimate co-habitation with a demanding mountain environment, a body of water ethics that constitutes an indigenous framework of spring veneration, water-use discipline, and hydrological attentiveness. This system is not organised as a conservation protocol or a management plan. It is organised as a moral and spiritual relationship: a set of obligations, prohibitions, ritual practices, and narrative memories that govern engagement with every water source along the pastoral circuit, from the lowland seasonal camp to the high-altitude summer pasture.

1.2 The Problem of Mechanism

That a community reveres its springs and that its springs are well kept are two propositions frequently reported together and rarely connected. The gap between them is this paper's subject. Reverence is a disposition; a protected grove is a material fact; and nothing in the concept of reverence entails the fact. Belief does not act on a landscape. What acts on a landscape is a person doing something, repeatedly, under an obligation that has some means of being sustained across seasons and generations — which is to say that the pathway from cosmology to canopy runs through institutions, not through conviction alone.

This is not a pedantic point. It is what separates an account that can explain variation from one that cannot. If reverence conserved springs directly, the Gujjar water ethic would erode uniformly wherever belief weakened. It does not. It erodes differentially and predictably: the offering lapses while the grove stands; the shrine visit declines while the ethic of not fouling water strengthens; sedentarised households retain the belief entirely and abandon the practice. Only an account that specifies the institutional and practical middle can make sense of that pattern — and the pattern, rather than the reverence, is what the ethnographic record actually contains.

The paper therefore organises its material as a sequence rather than as a set of parallel domains. Figure 1 presents that sequence, which also supplies the paper's structure: cosmological strata (Section 4) generate moral obligations (Section 4.4), which are borne by institutions (Sections 5 and 8), which sustain repeated ritual practice (Section 6), which produces observable environmental behaviour (Section 6), from which ecological consequences may be inferred but are not here measured (Section 7).

1.3 Research Questions

The paper addresses four questions, each corresponding to a tier of Fig. 1 and to a distinct evidentiary standard.

(1) How is water morally conceptualised? What theological and cosmological resources do Gujjar communities draw on in constituting water as an object of obligation rather than a resource for use? (Section 4.)

(2) Through what institutions is this morality expressed? Which social forms — clan custodianship, shrine networks, gendered custodial authority, *jirga* adjudication, the naming of sources — carry the obligation and make it durable across seasons and generations? (Sections 5 and 8.)

(3) What behaviours emerge from these institutions? What, observably, do people do and refrain from doing at water sources, and how consistently? (Section 6.)

(4) What ecological implications can reasonably be inferred, and on what evidence? What hydrological or public-health consequences plausibly follow from those behaviours, what would be required to establish them, and what does this study *not* show? (Sections 7 and 10.4.)

The four questions are cumulative, and the evidentiary standard weakens as they descend. Questions 1 and 2 are answerable from interview and observation. Question 3 is answerable from observation alone, and constitutes the paper's empirical core. Question 4 is not answerable from an interpretive ethnography at all, and the paper's response to it is to specify the inference precisely enough that it becomes testable by other means. Marking that boundary is not a hedge. It is the condition under which the first three answers can be stated with confidence rather than buried under blanket disclaimers.

1.4 The Gujjars of the Western Himalaya

The Gujjar and Bakarwal community constitutes one of the largest transhumant pastoral populations in the Indian subcontinent and the third-largest ethnic group in Jammu and Kashmir (Government of India 2011). They range from settled (*muqaami* or *zimidar*) or semi-nomadic cattle-herding households in the lower hills, to more fully transhumant groups (*Banihara* or *Dodhi*) migrating with buffalo and cattle between the Jammu plains and the middle hills, to Bakarwals, a closely related sub-group specialised in goat and sheep herding. Their annual migrations cover formidable altitude gradients from lowland winter bases to high-altitude summer pastures in the Pir Panjal range, Kashmir, Gurez, and Kargil. They speak *Gojri* and practise Islam in forms shaped by centuries of Sufi influence across the Western Himalaya.

This internal differentiation is not incidental to the argument. Position along the sedentarisation gradient conditions the intensity and form of water-ethical practice, and because that gradient varies the frequency of institutional contact while holding cosmology roughly constant, it functions as something close to a natural experiment on the mechanism this paper proposes. Table 1 sets it out; Section 11.4 returns to its research value.

Table 1
The sedentarisation gradient and its relation to water-source engagement across the twelve study communities. Because cosmological commitment varies little across the gradient while institutional contact varies greatly, the gradient discriminates between belief-driven and institution-driven accounts of the ethic.

Group	Livestock specialisation	Mobility	Primary water sources	Observed intensity of ritual water practice
Muqaami / Zimidar (settled)	Cattle, some buffalo; mixed farming	Sedentary; local grazing only	Village bowli; increasingly piped supply	Attenuated — Thursday visits often confined to elder women; belief largely intact
Banihara / Dodhi (semi-nomadic)	Buffalo and cattle; milk economy	Seasonal, plains to middle hills	Forest-zone springs; streams along route	Intermediate — protocols maintained, shrine visits regular
Bakarwal (transhumant)	Goat and sheep	Long-range; passes above 3,500 m	Wayside springs; high-altitude lakes (sar); seasonal rivers	Strongest — full repertoire including lake and river propitiation

Source: Author’s fieldwork, 2021–2024. “Intensity” denotes observed frequency and completeness of the practice repertoire, not a measure of belief — a distinction on which the argument of § 1.2 depends.

1.5 The Crisis of Himalayan Springs

The Hindu Kush Himalayan region, the world's third-largest freshwater repository after the polar ice caps, is experiencing rapid deterioration in the condition and reliability of its natural spring systems. A synthesis report by the International Centre for Integrated Mountain Development found that approximately fifty per cent of springs in the Indian Himalayan Region have either dried up or experienced significant reductions in discharge in recent decades, threatening the water security of an estimated fifty million people (ICIMOD 2022). Research across the region confirms this picture: deforestation, land-use change, unsustainable extraction, road construction, and the compounding effects of climate change — including temperature increases of 0.2 to 0.5 degrees Celsius per decade across the Western Himalaya, accelerated glacial retreat, and shifting precipitation regimes — are collectively stressing the headwater ecosystems that sustain spring recharge (Panwar 2020; Sahu et al. 2024).

This crisis supplies the paper's stakes but also sharpens its methodological caution. Precisely because springs are failing, there is institutional appetite for accounts of indigenous practice that promise a

remedy — and an account that cannot specify its mechanism cannot be operationalised, only invoked. Vague endorsement of traditional knowledge is not merely epistemically loose; it is practically useless to a spring-restoration programme that must decide what, concretely, to protect and through which body to work. The mechanistic organisation of this paper is therefore its policy contribution as much as its analytical one.

1.6 A Note on Critical Reflexivity

This paper is written with full awareness of the substantial scholarly literature cautioning against the romanticisation of indigenous ecological practice. Agrawal's (1995) critique of the romantic construction of indigenous knowledge cautions against treating tradition as inherently wise, holistic, or conservation-oriented — an error that Brosius (1999), Li (2000), and Tsing (2005) extend by demonstrating how indigenous ecological identity can be strategically constructed, selectively deployed, or misread by outside observers.

The mechanistic organisation is this paper's substantive response to that critique, rather than merely its acknowledgement. Romanticisation operates by a specific and identifiable move: the silent promotion of a devotional claim into an ecological one — reporting that a community reveres its springs and allowing the reader to conclude that the springs are therefore well conserved. Insisting on the institutional and behavioural middle makes that move impossible to perform inadvertently, because it forces the question of *how*, and the answer is either available or it is not. The inference boundary in Fig. 1 marks where it stops being available. The paper accordingly holds two positions at once: that Gujjar water ethics constitute a genuine, historically grounded body of knowledge deserving serious analytical attention; and that this knowledge is neither uniformly held, consistently practised, nor intrinsically conservation-oriented by virtue of being indigenous. The ethical commitments of this study are to fidelity, not celebration.

2. Theoretical Framework

This study draws on four bodies of scholarship. Berkes's (1999) formulation of sacred ecology as a knowledge–practice–belief complex provides the principal frame for understanding how ecological attentiveness becomes embedded within moral obligation, ritual practice, and cosmological meaning rather than existing as technical environmental knowledge; Sponsel (2012) situates this within the broader field of spiritual ecology, whose ambition — to treat religious commitment as an environmental variable rather than as a cultural residue — this paper shares while resisting its more celebratory registers. Comparative scholarship on ritualised resource governance (Lansing 1991; Colding and Folke 2001) demonstrates that spiritual prohibitions, collective rituals, and sacred landscapes can function as informal systems of ecological regulation even where communities understand such practices in devotional rather than environmental terms. The literature on Islamic environmental ethics supplies the specific theological vocabulary — *khilafah* (stewardship), *amanat* (sacred trust), *mizan* (balance), *rahmah* (compassion toward creation) — through which water emerges not as a material resource but as a divinely entrusted basis of life (Nasr 1996; Haq 2001; Foltz 2003; Blankinship, Gillaspie, and Aboul-Enein

2025). Political ecology (Blaikie and Brookfield 1987; Robbins 2004; Saberwal 1999) situates all of this within the structures of power, policy, and dispossession that shape what pastoral communities are able to practise at all.

The paper's use of Berkes is qualified in one respect that bears emphasis, since it is the qualification that generates several of the findings below. The knowledge–practice–belief complex is frequently deployed as though its three components were mutually reinforcing by definition — belief motivating practice, practice generating knowledge, knowledge validating belief. The Gujjar material suggests a looser coupling. Belief and practice are tightly bound here; but the knowledge that practice generates (spring condition, seasonal behaviour, taste change) circulates in a substantially different social channel — women's daily custodianship, Section 8 — from the one in which belief is publicly authorised, which is male, ritual, and increasingly contested. Sacred ecology's components can come apart, and specifying where they do is one contribution of this study.

These four literatures are often treated as adjacent rather than joint, and the paper's framework is what results from forcing them into contact. Sacred ecology establishes that cosmology and ecological knowledge co-occur but is weakest precisely on mechanism. Colding and Folke supply a mechanism — taboo as compliance technology — but bracket the theological content that determines which taboos are available and which are contestable. Islamic environmental ethics analyses that theological content but as text rather than as practice, and therefore cannot see that scriptural and devotional Islam protect water in structurally different ways. Political ecology explains why practice is constrained but tends to treat cosmology as epiphenomenal to material interest. Each supplies what the adjacent one lacks.

Their convergence yields the analytical proposition this paper adopts: **religious cosmologies become environmentally significant not because beliefs themselves conserve nature, but because they generate institutions, norms, and repeated practices that structure everyday interactions with ecological systems.** Three corollaries follow, and they organise what comes after. First, the unit of analysis is the institution and the practice, not the belief — which is why Section 5 precedes Section 6 and why both precede any ecological claim. Second, the durability of an environmental effect depends on the durability of the institution bearing it, not on the sincerity of the conviction underwriting it, so the two can decouple and in this case do. Third, cosmological change matters ecologically only insofar as it withdraws authorisation from *specific* institutions — which is precisely what makes reformist critique consequential in a way that the general secularisation narrative cannot capture (Section 9).

3. Methodology

This study is grounded in interpretive ethnographic fieldwork conducted across four field seasons between 2021 and 2024, spanning both the winter (lowland) and summer (high-altitude) phases of the Gujjar and Bakarwal pastoral cycle. Fieldwork was conducted across twelve communities in the districts of Rajouri, Poonch, Reasi, Doda, Kishtwar, and Anantnag — chosen to represent the full range of internal variation across the sedentarisation gradient described in Table 1, from permanently settled Gujjar

villages to semi-nomadic *Banihara* camps in forested zones to fully transhumant Bakarwal migration camps at both lowland and high-altitude phases.

Data collection employed four primary methods, summarised in Table 2 alongside the tier of Fig. 1 each can and cannot support. Participant observation was central: the researcher resided with pastoral families, accompanied herd movements across altitudinal gradients, participated in daily routines including water collection, spring visits, and fodder management, and attended ritual events at sacred springs and river sites — including Thursday offering ceremonies at *bowlis*, pre-migration blessing visits at saint shrines, and propitiatory rituals at high passes and river crossings. Semi-structured interviews (n = 64) were conducted with elder herders, women water and herb collectors, community leaders, and *muqaddams* (headmen). Eleven focus group discussions explored community consensus and disagreement regarding water norms. Systematic oral narrative collection documented proverbs, songs, landscape legends, and ritual speech relating to water — the oral archive through which water ethics are transmitted across generations.

Table 2
Ethnographic dataset: methods, scope, the tier of Fig. 1 each supports, and its explicit limit.

Method	Scope	Tier supported (Fig. 1)	Explicit limit
Participant observation	Four field seasons, 2021–2024; both migration phases; twelve communities across six districts	Behaviour (direct); practice and institutions (contextual)	Researcher presence may itself elevate observed protocol compliance
Semi-structured interviews (n = 64)	Elder herders, women water and herb collectors, muqaddams, community leaders	Cosmology and ethics (primary); institutions	Reports normative ideals; cannot establish frequency of actual compliance
Focus group discussions (n = 11)	Consensus and disagreement on water norms across the gradient	Institutions; contestation and internal variation	Public setting may suppress dissenting or reformist positions
Oral narrative collection	Proverbs, songs, landscape legends, ritual speech	Cosmology; transmission mechanism	Narrative persistence is not evidence of current practice
(Not undertaken)	Spring discharge gauging, water-quality assay, vegetation survey	— Ecological tier unsupported	No instrumental measurement; all ecological claims remain inferential (§ 11.4)

The final row is stated as a positive feature of the design rather than as an omission: it locates the inference boundary of Fig. 1 in the evidence itself.

Analysis was guided by phenomenological ethnography (Ingold 2000; Jackson 1989) and political ecology (Blaikie and Brookfield 1987; Robbins 2004). Where the paper attributes ecological functions to

ritual practices — describing Thursday spring visits as monitoring events, or shrine-zone prohibitions as headwater protection — these attributions belong below the inference boundary and are the researcher's analytical interpretations of observed practice, not claims made by informants. No hydrological measurements, water-quality tests, or biodiversity surveys were conducted. The paper draws selectively on fieldwork observations and interview material to illustrate analytical patterns; it is not a comprehensive survey and makes no claims about statistical representativeness.

4. Cosmological Strata and the Constitution of Moral Obligation

This section answers the first research question: how is water morally conceptualised? The Himalayan Gujjars are predominantly Muslim, in contrast to their kin across the plains of India, who are largely Hindu. Gujjar religious life nonetheless retains strong elements of pre-Islamic indigenous belief, pastoral cosmology, and localised ritual practice, shaped alongside enduring Sufi influence. Their worldview may be understood as a layered and syncretic formation — three strata, distinguished in this paper not merely for descriptive tidiness but because, as Section 9 shows, they are differently exposed to contemporary theological challenge and authorise protections of differing spatial specificity. The top tier of Fig. 1 represents the stratification; the analysis of its consequences runs through the paper.

4.1 The Islamic Scriptural Stratum

The Gujjar relationship with water is theologically structured at its deepest level by the Qur'anic account of water as the divine origin and sustainer of all life. For many Gujjar informants, the Qur'anic declaration (Surah Al-Anbiya 21:30) that every living thing was made from water is not an abstract cosmological claim but an operative principle informing daily conduct at every water source along the pastoral circuit. If water is the substance from which God made all living things, then water carries a sanctity derived not from human designation but from its inherent status as the medium of divine creation. To contaminate a spring is, within this framework, an act of *fasad* (corruption) directed against one of God's primary signs.

This foundation is reinforced by the concept of *amanat* (sacred trust). The land, the water, the forest, the pasture belong to God and are entrusted to humans as temporary custodians obligated to care. A herder who pollutes a spring has violated a trust, committed an act of *zulm* (injustice) against the divine order, and made himself spiritually accountable to the community and to God. Several elder informants articulated this with directness:

"The water is not ours. We are borrowing it from Allah. We must give it back clean."

The concept of *rizq* (divine provision) reinforces the ethic of restraint: sufficiency is God's guarantee, and taking more than one's need is both spiritually presumptuous and ecologically harmful. Prophetic *hadith* prohibiting wasteful use even at a flowing river elevate water conservation to a spiritual discipline. Applied to daily practice, *rizq* generates a norm of minimal use: take what you need, return the first cup with gratitude, leave the source undisturbed for those who follow.

Two features of this stratum matter for what follows. It is scripturally grounded and therefore publicly defensible against any Islamic interlocutor; and its injunctions are *categorical* — they concern water as such, not this spring. Both features become consequential in Section 9.

4.2 The Sufi Devotional Stratum

The Sufi tradition that characterises Gujjar religious practice adds the doctrine of divine immanence in created things. In the tradition of Ibn Arabi's *wahdat al-wujud* (unity of being), the created world is an expression of divine being, a manifestation (*tajalli*) of the attributes of God in material form. A spring, within this framework, is not merely water emerging from rock: it is a site of divine manifestation, a place where the life-giving attribute of God (*al-Hayy*, the Living) is particularly concentrated and visible. Abdul Razzaq, an elder of the community and disciple of the Sufi tradition (from Rajouri), puts it:

"Bagto pani Allah go zikr kare." [Flowing water praises Allah.]

The Gujjar tradition of addressing springs by name (such as *La Wali Bowli* of Behrote) and approaching them with protocols reserved for persons of spiritual authority reflects this metaphysics in practice. Raudvere and Stenberg (2009) demonstrate that Sufi networks in South and Central Asia have historically generated cultural geographies of sacred sites — shrines, springs, groves, mountain passes — functioning simultaneously as spiritual centres and, in practice, as zones of protected land use. The Gujjar sacred landscape constitutes precisely such a geography, distributed along the pastoral migration corridor.

Note the shift in specificity. Where the scriptural stratum sanctifies water, the Sufi stratum sanctifies *this* water: a named source, at a located shrine, with a particular saint. That shift is what makes the stratum spatially generative — and what makes it vulnerable, since a claim about a particular place is contestable in ways that a claim about water in general is not.

4.3 The Animistic Substratum

Beneath the Sufi layer lies an older stratum of animistic reverence, not experienced by most Gujjars as a contradiction of Islamic faith but as its natural deepening. Specific springs, rivers, mountains, and trees harbour spiritual entities such as *jinn*, *dev*, or the ancestral presences of saints whose goodwill must be maintained through respectful conduct and periodic propitiation. These entities have moral agency: they respond to human behaviour, and their response is observable in the condition of the water source. A spring that dries has been angered; one that flows clear and cold has a guardian that is pleased. Abdul Razzaq of Rajouri maintains:

"Hazrat Khizar (peace be upon him) is the guardian of waters who resides at water sources, and disrespecting water is equivalent to disrespecting him."

This framework is integrated into Islamic practice through the Sufi vocabulary of *baraka* (divine blessing), *karamat* (saintly miracles), and the spiritual authority of the *wali* (saint). Whether the entity inhabiting a spring is named as a *jinn*, a serpent guardian, a living saint (as *Khizar*), or the spirit of a saint, it is

ultimately understood, in the Gujjar cosmological synthesis, as the divine presence manifest in that particular place. This integration is not mere rationalisation: it is a coherent local metaphysics that has provided the moral vocabulary of spring care across generations.

The specificity gradient completes itself here. This stratum does not merely sanctify a particular spring; it populates it with an agent who notices what individuals do at it. It is thus the stratum that generates the most fine-grained behavioural prescriptions — and, by the same token, the one most exposed to the charge of *shirk*. The inverse relation between spatial specificity and theological defensibility, visible in the top tier of Fig. 1, is the structural fact underlying Section 9's analysis.

4.4 From Cosmology to Obligation

The three strata converge on a small set of moral obligations that constitute the second tier of Fig. 1: *adab* (respect due to a superior presence), *amanat* (trust held on behalf of another), *shukr* (gratitude requiring return), and *baraka* (blessing that may be withdrawn). These are not environmental principles and were never formulated as such. They are relational obligations of a kind that would be equally intelligible if directed toward a person. That is precisely their significance: their effect on conduct at water sources follows from water having been placed inside the category of things one can wrong, rather than from any judgement about water's ecological function. The remainder of the paper follows these obligations downward — into the institutions that carry them (Section 5), the practices those institutions sustain (Section 6), and the behaviour that results.

5. The Institutional Tier: How Obligation Is Carried

This section answers the second research question. If moral obligation is to affect a landscape, something must carry it across seasons, across generations, and across the gap between the person who feels it and the person who does not. Four institutional forms do this work among Gujjar communities: the naming of sources, the shrine network, clan custodianship, and — treated separately in Section 8 because its implications are distinct — the gendered division of custodial authority. Each is an ordinary social institution that happens to have water inside it.

5.1 Naming as Institution: The Moral Cartography

The most fundamental institution of Gujjar water ethics is the practice of naming. Springs (*nag*, *bowli*), streams, rivers, and high-altitude lakes are individually named and individually known: each has its particular character, its seasonal rhythms, its guardian presence, its history of relationships with the pastoral community. Named springs along migration routes include *La Wali Bowli* of Behrote, associated with a local saint whose blessing is credited with sustaining its flow; various *nag* along the Pir Panjal corridor associated with specific clans and their ancestral obligations; and the high-altitude lakes *Nandan Sar*, *Chandan Sar*, and *Sukh Sar*, and rivers such as the *Ans*.

Naming is easily mistaken for a merely expressive practice — a picturesque overlay on a hydrological substrate. It is better understood as the institution on which all the others depend, for a structural reason. Obligation cannot attach to a category; it attaches to a particular. One cannot owe *adab* to water in general any more than one can owe respect to humanity in general in a way that constrains conduct toward the person in front of one. By individuating sources, naming converts a diffuse reverence into an addressable relationship, and only an addressable relationship can be assigned to a custodian, transmitted as knowledge of *that* spring's behaviour, or breached in a way that anyone could notice.

This has a consequence Section 9 develops: piped supply erodes the ethic not by displacing belief but by dissolving particularity. A tap is not a source one can be in relationship with, because it is interchangeable with every other tap, and interchangeability is exactly what naming exists to defeat. Table 3 sets out the resulting taxonomy, which is moral before it is hydrological; shows what organises it.

Table 3
The Gujjar moral taxonomy of water sources: category, exemplars, and governing protocol.

Category (Gojri)	Type	Exemplars documented	Governing protocol
Bowli	Community spring basin, often shrine-associated	La Wali Bowli (Behrote); village bowlis across all study districts	Thursday offering; basin cleaning; downstream watering; clan custodianship
Nag	Spring with resident guardian presence	Multiple sources along the Pir Panjal corridor	Approach protocol; night access restricted; no disturbance of basin
Sar	High-altitude lake	Nandan Sar; Chandan Sar; Sukh Sar	Arrival propitiation (coins, food, chicks); prayers for flock security
Nalah	Seasonal river / torrent	Ans; seasonal crossings along migration routes	Propitiatory offering before crossing in high flow
Shifa pani	Healing water (cold)	Larkutti spring (Bakori, Rajouri); ailment-specific sources	Pilgrimage visitation; ablution; women’s transmitted knowledge of indication
Tattapani	Geothermal hot spring	Kalakote (Rajouri); Hirpora (Shopian); Ramban site	Offering and prayer before bathing; shoes removed; voices lowered
Dua pani	Prayer water	Saint-associated sources across the corridor	Supplication; ritual purity of approach

Categories are not mutually exclusive: a single source may be simultaneously a bowli, a nag, and shifa pani. The taxonomy is organised by relational obligation and cross-cuts standard hydrogeological classification.

Two implications of the typology deserve statement. First, the ritual repertoire is calibrated to efficacy. Where maintenance is possible — at a *bowli*, at a *nag* — the protocol prescribes maintenance: cleaning,

trimming, inspection, custodial assignment. Where it is not — at a river in spate, at a lake one visits once a season — the protocol prescribes petition. Rivers receive offerings and no upkeep; springs receive upkeep and offerings both. A system of belief indifferent to consequence would have no reason to make this distinction.

Second, and following from this, the informational content of a named spring is a multi-generational qualitative time series indexed to place: reliability, seasonal behaviour, taste, catchment condition, the history of what happened when it was neglected. Formal monitoring has only recently begun to assemble the instrumental equivalent, and at far shallower depth in time.

Naming also distributes obligation unevenly, and it does so along a gradient worth stating explicitly: the nearer and the more frequently used a source, the denser the obligations attaching to it. The village *bowli* visited daily carries a fuller repertoire — approach protocol, weekly clearing, custodial assignment, first-cup return — than the wayside spring passed once a season, which carries the protocol alone. This is a scalar ethic rather than a uniform one, and its shape is informative. Obligation tracks contact. Where a community's relation to a source is thin, the moral demand is thin with it, which is what one would expect if the ethic were generated by the relationship rather than deduced from a doctrine about water. Agrawal (1999) observes a comparable pattern among migrant pastoralists elsewhere in the subcontinent, where the density of customary obligation follows the intensity of use rather than the intrinsic properties of the resource.

5.2 Shrines as Institution: Saints and Water Corridors

The sacred waterscape is structured by a network of Sufi shrines (*ziyarat*) and saints' resting places (*baithaks*) that punctuate every Gujjar migration route and that are, with considerable consistency, associated with hydrologically significant sites: spring headwaters, stream confluences, the margins of high-altitude lakes. This coincidence is not accidental in the Gujjar understanding: the saints who established these sites recognised the particular concentration of divine presence at water-rich locations.

The shrine's institutional work is to convert a diffuse prohibition into a bounded jurisdiction. "Do not damage the catchment" is not a rule anyone can follow, because a catchment has no visible edge and no one is charged with watching it. "Do not cut wood inside the shrine zone" is followable, enforceable by anyone present, and — this is the point — happens to describe a patch of ground selected for its water. The prohibitions on tree-cutting, intensive grazing, and loud noise in shrine zones thus fall on some of the most hydrologically sensitive locations in the pastoral landscape. What Gadgil et al. (1993) documented for Hindu sacred groves in peninsular India — that religiously protected patches often harbour greater biodiversity than formally managed areas — may have a counterpart here.

The causal direction is genuinely ambiguous and the paper does not resolve it: shrines may protect springs, springs may attract shrines, or both may reflect the intrinsic salience of reliable water in a mountain landscape. What the ethnography establishes is the co-location and the prohibition. But the

ambiguity matters less than it appears, because the institutional effect is the same under any of the three histories: whatever brought shrine and spring together, the shrine now supplies the boundary that makes catchment protection an operable rule.

5.3 Serpent Guardians as Institution: Sentinels and Sanction

Perhaps the most vivid element of Gujjar sacred hydrology is the belief in serpent guardians — *nag* — inhabiting and protecting primary water sources. Across all districts where fieldwork was conducted, belief in a guardian serpent residing within or immediately adjacent to major springs was documented.

Community members describe encounters with *nag* in terms that are specific and individually witnessed. Many report having seen a snake coiled inside the spring basin or at its margin; others describe a pair of glowing eyes in the depths of the water, especially in the evening or at night. Certain natural formations of rock, sediment, or root structure at the spring opening are understood to represent the serpent's resting place or to embody its form. The serpent is often understood not as a physical animal to be feared or repelled, but as a spiritual sentinel: a being whose presence marks the spring as sacred and whose displeasure can manifest in the souring or drying of the spring, or the illness of those responsible. At other springs, what is seen is not a snake but a leopard moving near the source at first light, or a venerable elder in white robes appearing at noon or dusk and vanishing before he can be clearly seen. Different springs have different presences, whose forms are as individual as the springs themselves.

Whatever the ontological status of these sightings — and the researcher maintains a principled agnosticism — their behavioural consequences are consistent and observable. Children and women are cautioned against visiting major springs alone in the dark, the times when the guardian presence is understood to be most powerful and least tolerant of disrespect. The temptation is to read the *nag* as an access-control mechanism in mythological dress. That reading should be resisted: it is unfalsifiable on the present evidence, and it misdescribes what informants report, since the restriction is not experienced as a rule with a rationale but as prudence in the presence of a powerful being.

What can be said belongs to the institutional tier and is narrower. The *nag* solves a monitoring problem that no human institution in a dispersed pastoral society could solve: it places a permanent, sleepless observer at every major source. Social sanction requires a witness, and the hours at which a spring is most vulnerable to careless use are precisely the hours at which no witness is present. A guardian who is always there closes that gap — not by deterring the calculating violator, but by making unobserved conduct at the source unthinkable in the first place. This is a considerably stronger institutional claim than access control, and it is compatible with the belief being sincere rather than instrumental.

The *nag* also serves as the transmission institution. Stories of springs that dried or turned bitter after a guardian was disturbed — by a child who threw stones into the basin, by a family that neglected Thursday offerings, by a visitor who approached in ritual impurity — are among the most commonly

narrated moral tales in Gujjar folklore. Its narrative durability is one reason the ethic outlives the practices that once accompanied it.

5.4 Clan Custodianship: Distributed Stewardship

A further institutional layer is the clan-based system through which specific water sources are associated with specific *gotras* (lineage clans) bearing custodial responsibility for their care. Just as certain tree species and wild animals are tied to specific clans through *batka* observation (totemic prohibitions), certain springs and stream sections belong to particular ancestral lineages — not as private property but as sites of obligation. The clan associated with a spring is responsible for its maintenance, for reporting deterioration in its condition, and for performing the ritual attentions that sustain its spiritual wellbeing.

In institutional terms this solves the classic problem of unassigned responsibility in common-pool resources: no named water source lacks a party with a stake in its health, and this is achieved without enclosure or central authority. Its precondition, however, is seasonal return — custodianship of a place one never reaches is a formality — which is why it is the layer most directly dissolved by disrupted mobility (Section 9).

5.5 Healing Waters: Visitation as Maintenance

Within the taxonomy of Table 3, a distinction is recognised between water that is simply named and water bearing special potency: water that answers prayer (*dua pani*) and water that heals (*shifa pani*). The distinction tracks something observable — certain springs produce water of unusual clarity, coldness, or mineralogical character — and something spiritual: association with saints, with answered prayers, with miraculous recoveries, with the blessing of particular lineages. Elder women, the primary knowledge holders for medicinal spring use (Section 8), maintain detailed oral knowledge of which springs serve which conditions: eye complaints, joint pain, skin disease, digestive ailment.

The institutional point is that *shifa* status generates a visitation schedule. A spring credited with healing is a spring people come to, repeatedly, for reasons independent of thirst — and a spring people come to is a spring whose condition is observed. The healing attribution and the maintenance are not connected by any belief the community holds; they are connected by the traffic the attribution produces.

A well-developed form of this is the veneration of geothermal hot springs. *Tattapani* (literally hot water in Gojri and Pahari) combine spiritual and physical potency in concentrated form: the heat of the earth and the flow of water, both expressions of divine creative power, joined at one site. Among those most regularly visited are the Tattapani of Kalakote in Rajouri district (a sulphur-rich spring some twenty-five kilometres from Rajouri town) and the Tattapani of Hirpora in Shopian district. A further site approximately forty kilometres from Ramban town draws visitors from across Jammu and Kashmir. The Larkutti spring in Bakori, Rajouri, is a locally celebrated healing source in the pastoral heartland.

For Gujjar visitors, a visit to a hot spring is not primarily a wellness practice in the contemporary therapeutic sense. It is a pilgrimage: an act of spiritual submission to a site of exceptional divine presence, motivated by the belief that the spring's spiritually charged water can treat ailments ranging from skin disease and joint pain to complaints understood to have spiritual as well as physical dimensions. Rituals of offering and prayer precede bathing; the visit is framed as supplication to the guardian presence rather than consumption of a mineral resource. Informants consistently emphasised the conduct the site demands — removing shoes, lowering voices, performing ablutions before entering.

The therapeutic claims are disputed: some medical studies find evidence for sulphur-rich bathing in dermatological and musculoskeletal conditions (balneotherapy); others question its strength. For Gujjar communities the debate is beside the point — the healing power is spiritual in origin and in mode of action, and the heat, minerals, and flow are all signs (*ayat*) of divine power, the scientific mechanism being merely the means through which grace operates. This is worth noting as an instance of a general pattern: the theological frame does not compete with the physical explanation but subsumes it. That subsumption is why the two orders of explanation can converge in practice without the community ever experiencing them as two.

5.6 Lakes and Rivers: The Limits of Care

At the culmination of the Bakarwal migration, the high-altitude lake sustains both community and herd through the summer. Lakes including *Nandan Sar*, *Chandan Sar*, and *Sukh Sar* are understood as powerful spiritual presences with agency over the safety of those who enter their domain. On arrival after the ascent, communities perform rituals of formal acknowledgement: offering coins, chicks, or food, with prayers of gratitude for safe arrival and requests for flock security. The behavioural consequence is that arrival is marked as entry into another's domain rather than occupation of an empty resource.

Similarly, when a seasonal river runs high and dangerous, custom calls for a propitiatory offering before the crossing: a chick, a lamb, or a gift of food offered to the current as a formal request for safe passage. The river, unlike the spring, cannot be cared for; it can only be addressed. Where the spring receives maintenance, the river receives petition.

This asymmetry divides the entire waterscape in two, and the division is the clearest available evidence that the ritual grammar is responsive to what human action can actually affect. On one side stand the sources that can be tended: springs, whose basin can be cleared, whose canopy can be left standing, whose catchment can be kept clean. Here the protocol prescribes maintenance, with offerings resting on top of it. On the other stand the sources that admit no maintenance: a river in spate, a lake reached once a season. Here the protocol prescribes petition alone. Offerings appear on both sides; upkeep appears on only one. A system of belief indifferent to consequence would have no reason to draw that line, and a system that drew it arbitrarily would not have drawn it exactly where human agency ends.

One qualification should be entered rather than assumed. The lake sits on the petition side because Bakarwals reach it once a season, not because a lake is intrinsically untendable. The division may

therefore track frequency of return as much as the nature of the source — which would make it a fact about the community's relation to the water rather than about the water itself. The present evidence does not settle this, and the distinction matters for how far the pattern would generalise beyond a transhumant system.

6. Ritual Practice and Environmental Behaviour

This section answers the third research question, and constitutes the paper's empirical core: what, observably, do people do? Everything reported here sits above the inference boundary of Fig. 1.

6.1 The Approach Protocol

Every interaction with a named spring or high-altitude lake — and sometimes a stream — begins with embodied protocols enacting the source's claim to respect. Shoes are removed before approach, the same gesture offered at a mosque, a shrine, or before a spiritual elder. Voices are lowered; children are cautioned against running or shouting; animals are held back.

The first cup drawn is, in some cases, offered back to the source — poured onto the ground beside the spring or into its basin — with a brief prayer of gratitude and a request for continued flow. This reciprocity is the most concise expression of the ethic: the relationship is exchange, not extraction. It also ensures that every act of water-taking is preceded by a moment of deliberate attention to the spring's condition.

Animals are watered downstream of the human drinking intake. Washing of utensils and clothing is performed below the intake point. Waste, dung, and food scraps are removed rather than allowed to accumulate. Polluting a source or its adjoining space is termed *be-adbi* and *napaki* (desecration and impurity). Informants describe these as spiritual obligations — as what one owes to the spring that is listening. Their convergence with practices reducing faecal contamination risk is, plausibly, a consequence of generations of experiential feedback: conduct associated with illness may, over time, have come to be experienced as disrespectful and prohibited accordingly. This is speculative, and offered as such; it is consistent with what comparative ethnoecological research documents elsewhere (Colding and Folke 2001).

6.2 The Thursday Ritual

Among the most consequential practices is the Thursday offering at community *bowlis*. On Thursdays, the day associated with Sufi saint veneration in the South Asian Islamic tradition, women and elder men visit primary sources to perform acts of ritual attention: clearing the basin of accumulated debris, trimming overhanging vegetation that might obstruct the intake, inspecting the condition of surrounding soil and vegetation, and offering milk, *kheer* (sweet rice), or *ghee* to the guardian presence, with prayers for continued flow and for the health of the community and its herds.

Whether or not designed as environmental monitoring, it functions as one at the behavioural tier: a regular, community-wide occasion for attentive inspection that ensures consistent awareness of

deterioration in quality or quantity. Debris accumulation, changes in flow rate, turbidity, or taste are noticed and discussed in ways that would not occur without the ritual occasion to gather at the spring.

The comparison with Lansing's (1991) Balinese case is instructive but requires qualification, and the qualification is more revealing than the parallel. Lansing's water temples coordinate irrigation scheduling across a hydrologically coupled system, where the ritual calendar performs a computational function with an identifiable optimum: the temples solve a problem that exists whether or not anyone perceives it. The Thursday ritual solves nothing of the kind. The springs are hydrologically independent; there is no scheduling problem, no coupling, no optimum. What the two cases share is only that ritual supplies the occasion and the social organisation through which ecological knowledge is mobilised regularly and collectively. This is a parallel of institutional form, not of ecological function — and preserving the difference matters, because the Balinese case is routinely invoked to license far stronger functional claims than most sacred-ecology material can bear.

6.3 Prohibitions and the Spiritual Policing of Water Use

The positive practices of care are complemented by prohibitions governing what must not be done at and near sources. These are enforced less by social sanction than by the threat of spiritual consequence: the drying of the spring, the sickening of livestock, the withdrawal of *barkat* (divine blessing) from the responsible family. Table 4 sets out the core prohibitions.

Table 4
Core prohibitions at Gujjar water sources: sanction, enforcement mechanism, and inferred relevance.

Prohibition	Stated sanction	Enforcement mechanism	Inferred relevance (below inference boundary)
Washing at the headwater intake	Spring turns bitter or dries	Spiritual conviction; guardian displeasure	Protects the drinking point from soap, sediment, organic load
Bathing animals at the main basin	Illness of livestock; be-adbi	Conviction; visible community disapproval	Reduces faecal-oral pathway at the intake
Defecation within the immediate catchment	Napaki; withdrawal of barkat	Ritual purity norms	Protects the recharge zone from pathogen entry
Cutting trees within the shrine zone	Offence against the saint; karamat	Shrine authority; collective memory	Retains canopy over hydrologically sensitive ground
Loud noise or quarrelling at the source	Angers the guardian	Conviction; instruction of children	Sustains the source as a low-disturbance site
Neglecting the Thursday offering	Spring closes; misfortune to the dera	Clan custodial obligation; women’s organisation	Preserves the monitoring interval itself

The final row is analytically distinctive: it is a second-order prohibition — one protecting the practice that sustains the other prohibitions. Its erosion (§ 9) is therefore consequential out of proportion to its apparent ritual weight.

Colding and Folke's (2001) cross-cultural analysis demonstrates that spiritual sanctions can be among the most effective compliance mechanisms available where the state lacks capacity to monitor and enforce formal law. The Gujjar system exemplifies this. One qualification deserves emphasis: taboo-based systems are effective precisely because they are internalised rather than policed, and the corollary is that they are brittle under theological challenge — a sanction operating through conviction fails completely the moment conviction is withdrawn, with no graduated decline. This asymmetry of high effectiveness and low resilience is central to Section 9.

The protocols separating livestock watering from human intake constitute, in public-health terms, practices that would tend to reduce faecal-oral transmission if consistently observed. Informants were not aware of germ theory or the faecal-oral pathway. They were aware, from experience and oral tradition, that drinking from a spring where animals have bathed makes people sick and that the spring does not like it. The spiritual framing encodes a public-health reality in the language of moral relationship — the two orders of explanation being empirically indistinguishable in behavioural output and entirely distinct in justification.

6.4 The Offering Economy: Reciprocity and the Ethics of Taking

The offering ritual is the institutional expression of the ethic's central moral logic: reciprocity. Every act of taking — every cup drawn, every bathing of animals, every crossing of a flooded river — is embedded in a reciprocal structure demanding acknowledgement, gratitude, and symbolic return. The offerings at springs (milk, *kheer*, *ghee*, the first cup poured back); the propitiatory gifts to rivers in flood; the coins and tokens offered to lakes on arrival at summer pasture: these are not presented by informants as superstitious payments to capricious powers, but as the formal enactment of a moral obligation of *shukr* (gratitude) that is, in Islamic ethics, both a spiritual virtue and a practical duty.

6.5 The Grove at the Spring

The most consistent material expression of Gujjar water ethics observed across the study area is also the most visible: virtually every named spring encountered during fieldwork was surrounded by a stand of trees or shrubs actively protected from cutting. This was not confined to shrine-associated sources. It held at community *bowlis*, at wayside springs along migration routes, and at seasonal sources visited only during the passage of a single *dera*. The trees at a spring are not cut. Their branches are not lopped for fodder — a significant restraint in a pastoral economy where fodder is a constant need. They are not collected for fuel.

Table 5 records the woody species observed at spring sites. Two features are analytically significant. First, the assemblage is dominated by naturally established rather than planted taxa, indicating that the

practice is protection rather than afforestation — the grove is a remnant of pre-existing catchment vegetation rather than a substitute for it. Second, the protected species include *Celtis australis* and *Quercus* spp., among the most heavily lopped fodder trees in the regional economy. Their exemption at spring sites is the strongest available behavioural evidence that the prohibition is real rather than nominal: it is observed precisely where it is costly.

Table 5
Woody species observed in protected stands at named spring sites, with establishment mode and altitudinal occurrence.

Species	Local name (Gojri)	Establishment	Zone observed	Note
Quercus spp.	Reen	Natural	Lower and middle altitudes	Major fodder tree regionally; not lopped at spring sites
Celtis australis	Khirk	Natural and planted	Middle hills, Rajouri to Doda	Prime fodder species; exemption at springs is costly and therefore diagnostic
Viburnum grandiflorum	Guchh	Natural	Moist cool habitats: Poonch, Kishtwar, Anantnag	Among the commonest woody shrubs of the moist zone
Populus spp.	Safeda	Planted	Settled and semi-settled sites	Planted at bowlis; indicates active site tending
Melia azedarach	Drek	Planted	Lower altitudes, settled sites	Associated with sedentary rather than transhumant sites
Salix spp.	Bisa	Planted	Basin margins, moist sites	Bank stabilisation function locally recognised

Source: Author's field observation, 2021–2024. Species presence was recorded qualitatively at visited sites; no systematic vegetation survey or quadrat sampling was undertaken, and the table should not be read as a floristic inventory.

Community members do not explain this protection in the language of hydrology. They explain it in the language of respect. "These trees belong to the water," one elder in Reasi said, gesturing to the oak canopy above a community *bowli*. "They are not ours to cut." Several informants noted a practical observation sitting comfortably alongside the spiritual one: springs with good tree cover flow more reliably and produce cooler, cleaner water than exposed sources. Whether offered as causal explanation or as correlation of long experience, it is consistent with what hydrology suggests about canopy cover in maintaining soil moisture, reducing basin evaporation, and sustaining infiltration.

The trees also serve functions beyond hydrology. On a hot afternoon crossing, the shade of a spring grove is where a family pauses to rest, to water animals in the downstream channel, to eat and sleep

before resuming migration. The grove is a waypoint as well as a water source, a social space as well as a sacred one. This convergence — shade for travellers, watering point, spiritual site, sensitive forest patch, gathering place — means the trees are protected by multiple, mutually reinforcing motivations at once.

That redundancy is itself the analytically important finding, and it directly tests the framework of Section 2. If sanctity alone protected the grove, grove protection would track sanctity, weakening wherever shrine observance weakens. It does not: the grove is the most robust element of the entire repertoire, standing in settings where offerings and shrine visits have lapsed entirely. What explains its robustness is not the strength of the belief but the number of independent institutions resting on it. A practice sustained by five overlapping reasons does not fail when one is withdrawn. The practical consequence is a network of small but ecologically significant tree patches distributed along the pastoral corridor — an unplanned but functionally coherent element of the region's informal green infrastructure, maintained without programme, budget, or enforcement.

6.6 Phenological Water Reading

Gujjar herders maintain extensive phenological knowledge of spring and stream behaviour: the ability to read, from biological and physical indicators, the current and future state of sources along the route. Experienced herders describe reading upstream snowpack condition from the clarity, temperature, and flow rate of meltwater streams; predicting lake filling from spring snow observed during the Pir Panjal crossing; and identifying early signs of spring failure — reduced flow, increased turbidity, changes in taste — that precede complete drying.

This knowledge has growing applied value as climate-related change makes fixed-calendar management less reliable. Fernandez-Gimenez and Estaque (2012) document comparable adaptive value of phenological TEK for North African pastoralists navigating climate-induced water variability; Fernandez-Gimenez (2000) establishes the same for Mongolian rangeland. Within the Gujjar cosmological frame, reading the spring's condition is a form of listening. The epistemological point is worth drawing out: this is inference from indicator to catchment state, structurally identical to what instrumental monitoring performs, differing in medium and in the vocabulary of its justification rather than in logical form.

7. From Cosmology to Conservation: An Interpretive Model

This section introduces no new data. It draws the preceding sections together into the model of Fig. 1 and states, as precisely as the evidence permits, what the model does and does not establish.

7.1 The Sequence Restated

The Gujjar case supports the analytical proposition of Section 2 in a specific and traceable form. A layered cosmology (Section 4) constitutes water as a moral subject, generating four relational obligations — *adab*, *amanat*, *shukr*, *baraka* — that are not environmental principles and were never formulated as such. Four institutions carry those obligations into social durability (Section 5): naming

individuates sources so that obligation has something to attach to; shrines convert diffuse prohibition into bounded jurisdiction; guardians place a permanent observer where no human witness can be; clan custodianship assigns every named source a responsible party. Those institutions sustain a repertoire of repeated practice (Section 6), and that practice produces observable behaviour: uncut groves, downstream watering, weekly basin clearing, restricted night access, catchment kept clean, sources read phenologically. Table 6 summarises the chain.

At each transition, something is added that the previous tier could not supply on its own. Cosmology cannot specify a place; naming does. Obligation cannot survive the person who feels it; custodianship does. Prohibition cannot be enforced without a witness; the guardian is one. This is what it means to say the mechanism runs through institutions: each institution solves a problem that would otherwise break the chain, and it is the solving, not the believing, that reaches the landscape.

Table 6
Components of Gujjar water ethics and their inferred socio-ecological functions: the full sequence from cultural element to possible ecological implication. The rightmost column falls below the inference boundary of Fig. 1 throughout.

Cultural element	Ethical principle	Institutional carrier	Observed practice	Behavioural outcome	Possible ecological implication
Amanat (Qur'anic trust)	Stewardship on another's behalf	Scriptural authority; jirga adjudication	Avoidance of pollution; prohibition of fasad	Catchment kept free of waste and defecation	Improved water quality at the intake
Shukr (gratitude)	Reciprocity; return before taking	Offering economy; first-cup protocol	Offerings of milk, kheer, ghee; first cup returned	Repeated visitation; pause and inspection before each use	Habitual observation embedded in routine use
Thursday observance	Devotion to the saint	Women's custodial organisation	Basin cleaning; vegetation trimming; inspection	Weekly clearing; flow and taste discussed collectively	Regular distributed condition monitoring
Nag belief	Adab before a powerful presence	The guardian as permanent witness	Approach protocol; restriction of night access	Unsupervised use at low-accountability hours forgone	Reduced disturbance at the source
Shrine sanctity	Baraka; offence against the wali	Shrine zone as bounded jurisdiction	Prohibition on felling, grazing, noise in the zone	Groves uncut and unlopped even where fodder is scarce	Recharge-zone canopy retained; targeted catchment protection
Clan custodianship (gotra)	Inherited responsibility	Lineage assignment to named sources	Maintenance; reporting of deterioration	No named source without a responsible party	Distributed governance without enclosure or state capacity
Phenological reading	Attentiveness as listening	Oral transmission along the route	Reading snowpack, turbidity, taste, flow	Early detection of failure; route decisions adjusted	Adaptive response under variable hydrological regimes

Read across, each row is a causal claim whose first five columns are evidenced by fieldwork and whose sixth is not. Read down, the sixth column is the research agenda of § 11.4 rather than a finding of this study.

7.2 What the Model Explains

A model earns its place by explaining variation that a simpler account cannot. This one explains three patterns that a direct belief-to-conservation account leaves opaque.

Differential erosion. Practices do not decline together. The grove outlasts the offering; the ethic of not fouling water outlasts the shrine visit; settled households retain the cosmology and abandon the practice (Table 1). On the direct account this is anomalous, since belief is roughly constant across the gradient. On the institutional account it is expected: what varies across the gradient is not conviction but the frequency of institutional contact, and where the carrier weakens the practice weakens with it regardless of what anyone believes.

Differential robustness. The grove is the most durable element of the repertoire not because it is the most sacred — it is not, the shrine is — but because it is the most institutionally redundant, resting on five independent supports (Section 6.5). Robustness tracks the number of carriers, not the intensity of sanctity.

Differential vulnerability. Reformist critique does not weaken the water ethic in general. It withdraws authorisation from two of three strata while affirming the third (Section 9), and the consequence is specific: what is lost is spatially targeted protection, what survives is categorical injunction. Only a model that distinguishes the strata by what each authorises can predict this, and it is not what a general secularisation narrative would predict.

7.3 What the Model Does Not Establish

The model is a chain of institutional and behavioural claims terminating at a boundary. Above it — through the behavioural tier — every link is evidenced by participant observation and can be stated without hedge. Below it, nothing is measured. The paper does not show that Gujjar springs discharge more reliably than comparable springs elsewhere, that shrine-associated groves have greater canopy cover than matched patches, or that Thursday observance detects deterioration earlier than its absence. No hydrological, water-quality, or vegetation data were collected, and no such claim is entered.

This limit is not a defect of execution but the boundary of a method: an interpretive ethnography can establish what people do and why, and cannot establish what the doing accomplishes hydrologically. The contribution the model makes at that boundary is to state the inference in a form precise enough to be tested — which practice, at which sites, with which expected signal, against which comparison. Section 11.4 sets out the three studies that follow. The claim of this paper is that the chain up to the boundary is real, and that the last link is worth someone's instruments.

8. Gendered Water Ethics and Customary Governance

8.1 The Gendered Division of Spring Knowledge

The ethnographic record reveals a consistent and analytically significant pattern: women are the primary daily custodians of water sources and carry correspondingly deeper practical knowledge of spring

condition, seasonal behaviour, and medicinal properties. Men conduct the more publicly visible ritual events — propitiatory offerings at river crossings, clan ceremonies at lakes on arrival — but it is women who visit springs daily, collect water for household use, first notice change in quality or flow, and maintain the knowledge constituting the core of *shifa pani* practice. Table 7 sets out the division.

Table 7
The gendered division of water-ethical labour and its consequences for knowledge and authority.

Dimension	Women	Men
Frequency of contact with named sources	Daily; multiple visits across seasons and household cycle	Seasonal and peripatetic; tied to herd movement
Character of knowledge	Deep and single-site: smell, temperature, taste, pre-rainfall sound, seasonal shift at particular springs	Broad and multi-site: route hydrology, snowpack reading, lake filling
Ritual role	Organises and leads Thursday bowli observance; gathers offerings; instructs juniors	Conducts public propitiation at rivers and lakes; represents clan
Medicinal knowledge	Primary holder of shifa pani indications and herb associations	Peripheral
Transmission role	Primary; instructs children in approach protocol and cautionary narrative	Secondary
Standing in jirga water disputes	Not represented	Adjudicates

The final row records the paper's central finding on gender: the deepest knowledge of spring condition is held by those with no formal standing in the institution that adjudicates water disputes.

Women's knowledge is relational and phenomenological: they know specific springs through hundreds of daily visits over years, in different seasons, at different hours, through different phases of the household cycle. They know the spring's smell in different seasons, the temperature of its output in different weeks, the sounds it makes before rainfall, the changes in taste preceding seasonal shifts in flow. This granular, embodied knowledge — what Ingold (2000) calls dwelling knowledge — is often more detailed than the spatially distributed knowledge of male herders, whose relationship with specific springs is seasonal rather than daily.

The asymmetry in the final row is a structural feature of the institutional tier, not a marginal observation. The system routes decisions about springs through a body that formally excludes the people holding the most detailed information about spring condition. Whatever its virtues as common-pool governance, this is an identifiable defect in its information architecture — with an immediate policy corollary developed in Section 11.3 and marked at step 2 of Fig. 2.

8.2 Intergenerational Transmission through Women

Women are also the primary transmitters of water ethics. It is mothers and grandmothers who instruct children in the protocol of approach — shoes off, voice lowered, first cup offered back — and who narrate the cautionary tales of springs that closed when disrespected. The Thursday offering is in most cases organised and led by senior women, who gather offering materials, instruct younger women and girls in the prayers, and conduct the cleaning and inspection of the basin. The ritual is thus simultaneously religious observance, maintenance event, and intergenerational transfer of knowledge, all organised around women's custodial authority.

This bundling has a consequence Section 9 develops. Because transmission, maintenance, and monitoring occupy a single occasion, the decline of that occasion does not degrade three functions gradually and separately. It removes all three at once. The efficiency of the bundle in operation is the source of its fragility under disruption — an instance of the general principle that an institution's robustness depends on how many independent supports it rests on, which is precisely what the grove has and the Thursday ritual does not.

8.3 The Jirga and Customary Water Governance

Water governance is managed through the customary institution of the *jirga*, the council of elders that mediates disputes and maintains the moral order of community life. Water disputes — over priority of access to a shared spring, over alleged violation of upstream and downstream protocols, over use of a shrine-associated *bowli* by an outsider group — are among the most common and serious conflicts before it. The *jirga*'s authority rests not on formal legal standing but on genealogical knowledge, customary law, and elder wisdom. Its decisions are framed in the language of *mizan* (balance) and *itfaq* (concord) rather than adversarial determination: the goal is not to declare a winner but to restore the balance disrupted, and to repair the relationship between the parties and between the community and the source whose guardian has been distressed.

Agrawal's (2005) comparative work on common-pool governance identifies precisely these features — clear rules, graduated sanctions, collective dispute resolution grounded in shared cosmological values — as associated with successful long-term management. The Gujjar *jirga* exemplifies this architecture, with two qualifications. The first is the exclusion documented in Table 7: an institution adjudicating spring disputes without the community's primary spring observers is well designed for legitimacy and poorly designed for information. The second is that its efficacy is contingent on the same conditions as the ritual repertoire — co-presence, seasonal return, shared cosmological premises — and is subject to the same erosion. Saberwal (1999) demonstrates for the Western Himalaya how exclusionary forest policy progressively displaced customary pastoral institutions of exactly this type, substituting a formal authority with neither the local knowledge nor the legitimacy to replace what it dismantled. The pattern persists into the present: implementation of the Forest Rights Act in Jammu and Kashmir has been slow and uneven for Gujjar and Bakarwal communities, leaving customary claims to pasture and the water sources along migration routes formally unrecognised (IDR 2020), so that the institutions this paper documents operate without the legal standing that would allow them to be defended. The governance

deficit in Himalayan spring management is not, on this reading, a vacuum awaiting an institution; it is the residue of one that was displaced.

9. Contemporary Transformations and the Erosion of Water Ethics

The model of Section 7 predicts that erosion will be differential and that it will track institutional carriers rather than belief. This section tests that prediction against the contemporary record, and the fit is close enough to constitute the model's principal evidence.

Across the study area, informants described contemporary life as marked by a weakening of older forms of attentiveness toward springs, forests, and pastoral landscapes. Elder respondents contrasted the present with what they described as the old ways, when collective obligations toward springs were more strictly observed. Such testimony requires careful handling. Nostalgia for a more observant past is a near-universal feature of elder recollection and is not, on its own, evidence of decline. What gives these accounts evidentiary weight is not their content but their differentiation: informants did not report uniform erosion but specified which practices had lapsed and which had not, and the pattern of that specification is consistent across communities and corresponds to identifiable structural pressures rather than to generalised regret. Table 8 sets out the pattern.

Table 8
Differential erosion of water-ethical practice: four pressures, the institutional tier each acts on, and their observed effects.

Pressure	Mechanism of effect	Practices most affected	Practices comparatively resilient
Disrupted mobility	Removes seasonal return, the precondition of custodianship; dissolves the carrier, not the belief	Clan custodianship; wayside spring maintenance; lake propitiation	Village bowli practice where residence persists
Sedentarisation and piped supply	Dissolves particularity: a tap is interchangeable, and naming exists to defeat interchangeability (§ 5.1)	Thursday visits (now often confined to elder women); transmission to the young	Spring groves — sustained by five redundant motivations, not by sanctity alone (§ 6.5)
Climate variability	Breaks the reverence–flow feedback from outside the moral economy	Credibility of the ethic's central relation — not any single practice	Phenological reading — appreciating in value as fixed calendars fail
Reformist Islamic currents	Withdraws authorisation from the Sufi and animistic strata while affirming the scriptural	Offerings; propitiation; guardian belief; shrine visitation — i.e. all spatially specific protection	Scriptural stratum (amanat, mizan, rizq) — affirmed, even strengthened

Source: Author's fieldwork, 2021–2024. "Resilience" denotes persistence reported and observed under the stated pressure, not immunity. Note that no pressure in this table operates by weakening belief.

9.1 Disrupted Mobility

The Gujjar water ethic emerged within a transhumant system in which communities returned repeatedly, season after season, to the same springs, *bowlis*, lakes, and streams along established corridors. Informants in Rajouri, Reasi, and Shopian described springs once associated with specific *deras* or clans that are now rarely visited because the migration route has changed or become inaccessible. Because custodianship is constituted by return, its disruption does not weaken the obligation; it removes the party to whom the obligation belonged. The belief that the spring has a custodian survives intact. The custodian does not arrive.

9.2 Sedentarisation and the Dissolution of Particularity

In several settled villages, piped water supplied through government schemes had reduced the frequency of direct interaction with traditional springs. Younger community members, especially those educated outside pastoral settings, were often less familiar with the names, stories, and protocols of older sources than their grandparents. In some communities, Thursday visits to *bowlis* now occur only among elderly women, while younger households rely almost entirely on tap water. The decline is not absolute — many settled families maintain strong ritual relationships with springs — but the shift from direct dependence to infrastructural mediation changes the experiential conditions through which water ethics are reproduced.

The mechanism follows from Section 5.1 and is more specific than convenience. Piped water does not merely supply water more easily; it dissolves the particularity on which the entire moral cartography rests. A tap is interchangeable with every other tap, and one cannot be in a relationship with an interchangeable source — not because the theology forbids it but because relational obligation has no purchase on a category. Naming exists precisely to defeat interchangeability; infrastructure restores it. This is why the erosion runs through practice rather than through belief, and why settled households can hold the cosmology entire while the repertoire lapses around them.

9.3 Climate Variability: From Practical to Epistemic Threat

Informants across the Pir Panjal and Chenab regions consistently described declining snowfall, irregular rainfall, warmer summers, and reduced spring discharge compared with earlier decades. Several elders associated the drying of springs not only with spiritual neglect but with visible ecological transformation: forest cutting, road blasting, erratic precipitation, shrinking snow cover. Springs remembered as perennial are described as seasonal; streams once reliable are increasingly unpredictable during late-summer migration. These observations resonate with the hydrological literature on Himalayan spring decline, though this study does not verify them instrumentally — and Pandit et al. (2024) caution specifically that perceived spring decline does not always correspond to measured decline, a caution this paper takes seriously precisely because its own evidence on spring condition is perceptual.

The difficulty climate change poses is distinct in kind from the other three pressures, and Table 8 marks it accordingly: it damages no institution. The Gujjar water ethic rests on a legible feedback relation — reverence sustains flow, neglect closes the spring — and regional climatic forcing breaks that relation from outside the moral economy entirely. A community that observes every protocol faithfully and watches its spring fail regardless is confronted not with a practical setback but with disconfirmation.

Two responses were observed, pulling in opposite directions. The first attributes failure to the community's own moral decline, preserving the framework at the cost of misdiagnosing the cause — and, worse, at the cost of intensifying observance where observance cannot help. The second attributes it to visible ecological damage: road blasting, forest cutting, the shrinking snow. This diagnoses accurately but relocates causation outside the moral economy the ethic governs, and an ethic that cannot reach the causes of what it cares about is on its way to becoming ceremonial. Neither response restores the feedback loop. This, rather than any single lapsed practice, may be the deepest threat climate change poses: not that the ethic will be abandoned, but that it will cease to be confirmable, and a moral order that can no longer be shown to work is sustained thereafter only by faith in it.

9.4 Reformist Islam and the Stripping of a Stratum

Across several field sites, younger men associated with reform-oriented movements criticised offerings at springs, propitiation of lakes, and reverence toward saint-associated sources as *bid'ah* (religious innovation) or *shirk* (associationism). In some villages, shrine visits have declined under scripturally oriented preaching that regards localised devotional practice with suspicion. Elder informants often defended such practices as inherited forms of *adab* (respect) rather than worship, while younger reformist voices framed them as incompatible with proper Islam.

The structure of this contestation follows directly from the strata of Section 4, and its consequences are far more specific than a general account of religious change would suggest. Reformist critique does not target the water ethic. It targets a stratum. The scriptural layer — *amanat*, *mizan*, *rizq*, the prohibition of *fasad* — is not merely untouched but actively affirmed by reformist preaching, which is if anything more insistent than local tradition on the religious duty of not wasting or fouling water. What is withdrawn is authorisation for the Sufi and animistic strata: the shrine zone, the guardian presence, the offering, the Thursday observance.

The ecological consequence follows from the specificity gradient established in Section 4. *Amanat* protects water; the shrine protects *this grove*; the *nag* watches *this basin*. A community can hold *amanat* with complete sincerity and have no reason whatever to leave a particular stand of oak uncut above a particular spring, because a categorical injunction cannot select a site. What reformism produces, then, is not a less environmental Islam but a differently extensive one: an ethic that retains its general injunctions and loses its spatially targeted protections. Since it is precisely the targeting that made the ethic hydrologically consequential — protection landing on the sensitive ground rather than on water in the abstract — this is the single most consequential transformation documented in this paper, and it is one that would be invisible to any account treating cosmology as a unitary variable.

The contestation reveals that Gujjar water ethics are not culturally frozen traditions but active terrains of theological negotiation, and that the outcome will be selective rather than wholesale. The challenge is therefore neither to preserve them as static relics nor to dismiss them as superstition, but to understand them as adaptive moral ecologies whose future depends on the changing relationships between mobility, religion, environment, and governance.

10. Discussion: The Gujjar Case in Comparative Perspective

The literature on ritualised water governance is dominated by a handful of well-worked cases, and the Gujjar material is best located by what it shares with each and what it does not. Table 9 sets out the comparison.

Table 9
The Gujjar water ethic in comparative perspective: five ritualised water systems and the dimensions on which they differ.

Case	Cosmological basis	Spatial logic	Institutional carrier	Coupling to hydrology
Balinese subak (Lansing 1991)	Hindu-Balinese water temple cosmology	Fixed; a single coupled irrigation system	Temple hierarchy; calendrical scheduling	Tight — ritual calendar solves a real optimisation problem
Sacred groves, peninsular India (Gadgil et al. 1993)	Hindu deity residence	Fixed patches; discrete and bounded	Village deity custodianship; taboo	Loose — protection is incidental to sanctity
Andean mountain cosmology	Apu / mountain-being reciprocity	Fixed; vertical archipelago of ecological tiers	Ayllu community; offering cycles	Moderate — tied to agropastoral verticality
Māori freshwater ethics	Mauri (life-force) of the water body; whakapapa	Fixed; catchment as ancestor	Iwi and hapū kaitiakitanga; now legally recognised	Moderate — increasingly formalised in statute
Oromo and Aboriginal Australian water knowledge	Ancestral and customary law	Semi-mobile to mobile; arid-zone waterpoint networks	Customary elders; seasonal law	Moderate — scarcity-driven waterpoint governance
Gujjar water ethic (this study)	Islamic scriptural + Sufi + animistic, syncretic	Mobile; a linear corridor of dispersed sources	Clan custodianship; shrine network; women's daily custody	Loose — sources hydrologically independent; no coupling

10.1 What the Comparison Shows

Three features distinguish the Gujjar case, and none is simply that it is Islamic.

Mobility. Every major case in the comparative literature is territorially fixed. Balinese *subak*, Indian sacred groves, Andean *ayllu* holdings, Māori catchment guardianship all attach a settled community to a bounded place. The Gujjar ethic attaches a moving community to a *linear corridor* of dispersed, hydrologically independent sources encountered in sequence. This changes what the institutions must do: not manage a commons under contested access, but sustain obligation to places one is absent from for most of the year. Clan custodianship and the guardian presence are intelligible as responses to that specific problem — the first assigns responsibility that survives absence, the second supplies a witness where the community is not. Mobility is not a variant of the sacred-ecology pattern; it is a different design problem.

Syncretic layering. The comparative cases rest on a single cosmological order. The Gujjar ethic is triple-stratified, and this is not merely a matter of historical texture. It means the ethic contains internal theological tension as a permanent condition, and it is what makes the reformist transformation of Section 9.4 possible at all: a unitary cosmology can be abandoned or retained, but only a stratified one can be *partially* delegitimated, losing its spatially specific protections while its categorical injunctions are affirmed. No other case in Table 9 could undergo that transformation, and it is the most consequential thing happening to Gujjar water ethics.

Loose hydrological coupling. This is where the Gujjar case is weakest as an argument for functional efficacy and most valuable as an analytical corrective. Lansing's Balinese material carries such weight in this literature because the coupling is tight: the temples solve a coordination problem with an identifiable optimum, and the ritual system can be shown to approximate it. Nothing in the Gujjar system is coupled in that way. The springs are independent; no scheduling problem exists; no optimum is being approached. The temptation in sacred-ecology scholarship is to invoke Bali as a licence for functional claims that the local material cannot support — and the Gujjar case is a useful check on precisely that move, because it demonstrates a rich, coherent, institutionally elaborated ritual water system that is doing something real and is *not* doing what the *subak* do.

10.2 The Contribution Restated

What is distinctive here is therefore not simply that Islamic environmental ethics, Sufi spirituality, and pastoral ecological knowledge combine in a transhumant mountain landscape, though they do. It is that this combination generates a *corridor* form of sacred hydrology: protection distributed as a network of small patches along a line of movement, sustained by institutions engineered for absence rather than for presence, and stratified in a way that makes it vulnerable to partial theological delegitimation rather than to wholesale secularisation. Neither the sacred-grove literature (fixed patches, settled custodians) nor the *subak* literature (tight coupling, calendrical computation) anticipates this configuration.

11. Conclusion

11.1 What the Spring Knows

This paper has argued that Gujjar water ethics constitute a morally structured relationship with water sources — rooted in Islamic theology, deepened by Sufi cosmology, layered over an animistic recognition of individual spiritual presence — and that this relationship reaches the landscape through a traceable sequence rather than through reverence alone. Cosmology constitutes water as a moral subject; obligation attaches to named particulars; institutions carry the obligation across absence and generations; practice follows; and behaviour results: uncut groves, downstream watering, weekly clearing, restricted access, catchments kept clean, sources read for what they disclose about the season ahead.

The paper's methodological claim is that this sequence, and not its ecological terminus, is what an interpretive ethnography can establish. Marking the boundary permits a strong claim on the near side of it and an honest one beyond — and the strong claim is not small: a functioning system of environmental governance operating across a mountain corridor without programme, budget, statute, or enforcement, at a moment when the formal alternatives are failing.

11.2 Theoretical Contributions

Four contributions stand out. First, the paper extends Berkes's (1999) sacred ecology into water governance with a specificity the literature has not achieved, while identifying a limit to the framework: the knowledge, practice, and belief components of the Gujjar complex are differently distributed across gender and differently exposed to theological challenge, and can come apart.

Second, it contributes to Islamic environmental ethics by showing that these principles are not merely textual resources but living practice — and, more pointedly, that the relationship between scriptural and devotional Islam is ecologically consequential in a way the textual literature has not registered. Scriptural environmental ethics protects water categorically; devotional practice protects particular waters. The reformist displacement of the second by the first is not, ecologically, a neutral substitution.

Third, it contributes to the political ecology of Himalayan water by demonstrating the institutional sophistication of a community-based system that exclusionary forest policy progressively dismantled (Saberwal 1999), while declining to idealise it: the *jirga*'s exclusion of women from water adjudication is a defect in its information architecture, not a nuance to be excused.

Fourth, and methodologically, the mechanistic organisation offers a portable device for TEK scholarship confronting the romanticisation critique. Agrawal's (1995) objection is usually answered by disclaimer. It is better answered by structure — by an apparatus that forces the question of *how*, and in which the promotion of a devotional claim into an ecological one becomes visible on the page rather than achievable by omission.

11.3 Policy Implications

Figure 2. Policy integration pathway. Each step carries a design caution derived from a specific finding of this study. The pathway is cumulative: participatory mapping that captures the wrong knowledge base compromises everything downstream of it, and a restoration programme that formalises protection while dissolving its redundancy may weaken what it intends to secure.

Design engagement around knowledge, not authority. Spring protection programmes should engage Gujjar knowledge as substantive input: participatory mapping of sacred spring networks, integration of indigenous phenological monitoring with formal spring-flow measurement, recognition of shrine-zone vegetation in land-use planning. But because the deepest knowledge of spring condition is held by women with no standing in the *jirga* (Table 7), participatory mapping routed through customary representative institutions will systematically capture the shallower knowledge base while appearing to have consulted the community — and will do so invisibly, since the consultation will have been genuine.

Add reasons; do not replace them. The finding on redundant motivation (Section 6.5) has a direct planning corollary. Spring groves persist because five overlapping reasons protect them. An intervention substituting a single institutional protection for that redundancy — a legal designation, a fenced enclosure — may weaken protection while formalising it, and will look like strengthening throughout.

Rebuild the carrier, not the belief. The differential erosion of Table 8 indicates that no pressure operates by weakening conviction, which is why appeals to cultural revival miss their target. Piped supply is not reversible and should not be opposed; but the monitoring function that Thursday observance incidentally performed can be institutionally re-created, and the phenological knowledge base is appreciating rather than depreciating in value precisely as fixed-calendar management fails.

11.4 A Research Agenda

This study's principal limitation is also its clearest bequest. The tier below the inference boundary remains empty, and three specific studies would begin to populate it.

A **paired-catchment comparison** of discharge, turbidity, and coliform load at shrine-associated and non-shrine-associated springs, matched for geology, aspect, and catchment area, would test the core inference of Section 5.2 and 6.5. A **canopy comparison** of spring groves against matched non-spring forest patches along the same corridor would establish whether the protection is measurable rather than merely reported. And a **longitudinal comparison across the sedentarisation gradient** of Table 1 — where ritual attendance varies naturally while cosmology does not — comes closest to isolating the effect of the practice itself, and is the design the model of Section 7 most directly implies. None was possible within an interpretive ethnographic design. All three are formulable only because the ethnography exists, and the third is formulable only because the ethnography identified the gradient as the variable it is.

11.5 Closing Reflection

The elder's statement — that the spring listens; that if we are good to it, it will be good to us — is not a hypothesis this paper can test, and it was never offered as one. Whether springs literally possess agency lies outside the scope of scientific inquiry, and the question is not improved by being asked more rigorously.

What this study demonstrates is something else, and it does not depend on the answer. Treating a spring as a moral being rather than as a resource generates named particulars, and named particulars can bear obligation; obligation borne by clan, shrine, and daily custody outlives the individuals who feel it; and institutions of that kind produce, season after season, an uncut grove above a spring in a landscape where fodder is scarce and enforcement is absent. That chain is not a matter of belief. It is a matter of record — and its terminus, fifty per cent of Himalayan springs now declining or failed (ICIMOD 2022), is a matter of urgency. The enduring institutions of care that a moral cosmology can cultivate, and the ecological consequences they may carry, merit serious scholarly and policy attention. The communities holding the longest continuous observational record of these springs are precisely those whose access to them is being curtailed. This paper maps the practices; it does not measure their effects; and it is honest about which of those two the springs can still afford to wait for.

Declarations

Ethics Statement

The study was conducted in accordance with accepted ethical guidelines for ethnographic research, and informed consent was obtained from all participants prior to interviews and field interactions.

Competing Interests:

The author declares no competing interests.

Clinical Trial Number

Not applicable.

AI Declaration

AI assistance was taken for polishing Figs. 1 and 2.

Funding Statement:

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Notes

1. The compound expression "Gujjar and Bakarwal" (or "Gujjar-Bakarwal"), though imprecise, is used here primarily in accordance with the official and administrative terminology adopted following the conferment of Scheduled Tribe status by the Government of India in 1991. In ethnographic and socio-cultural terms, however, the Bakarwals are a transhumant pastoral subgroup within the broader Gujjar community, traditionally distinguished by their specialisation in sheep and goat herding.

2. The Bakarwals are distinguished from Gujjars primarily by their near-exclusive specialisation in small ruminants (goats and sheep) and their considerably greater degree of seasonal mobility. Most Bakarwal families complete annual migrations of several hundred kilometres, crossing passes of 3,500 metres or higher.

3. All interviews were conducted in Gojri and Urdu with informed consent and audio-recorded where permitted. Transcription and back-translation were reviewed by bilingual community members. Quotations are presented in English translation; Gojri or Urdu originals are retained where the specific vocabulary is analytically significant. Gojri and Urdu terms are italicised throughout.

4. The majority of Gujjars associate their spiritual lineage with Babaji of Wangath, a family shrine and prominent spiritual centre in Ganderbal district of Kashmir.

5. The comparative cases in Table 9 are drawn from the published literature at differing levels of detail. The Balinese and Indian sacred-grove entries rest on the primary studies cited (Lansing 1991; Gadgil et al. 1993). The Andean, Māori, Oromo, and Aboriginal Australian entries are characterised at the level of general scholarly consensus rather than from primary sources consulted for this study, and are offered to locate the Gujjar case rather than as independent contributions to those literatures.

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Figures

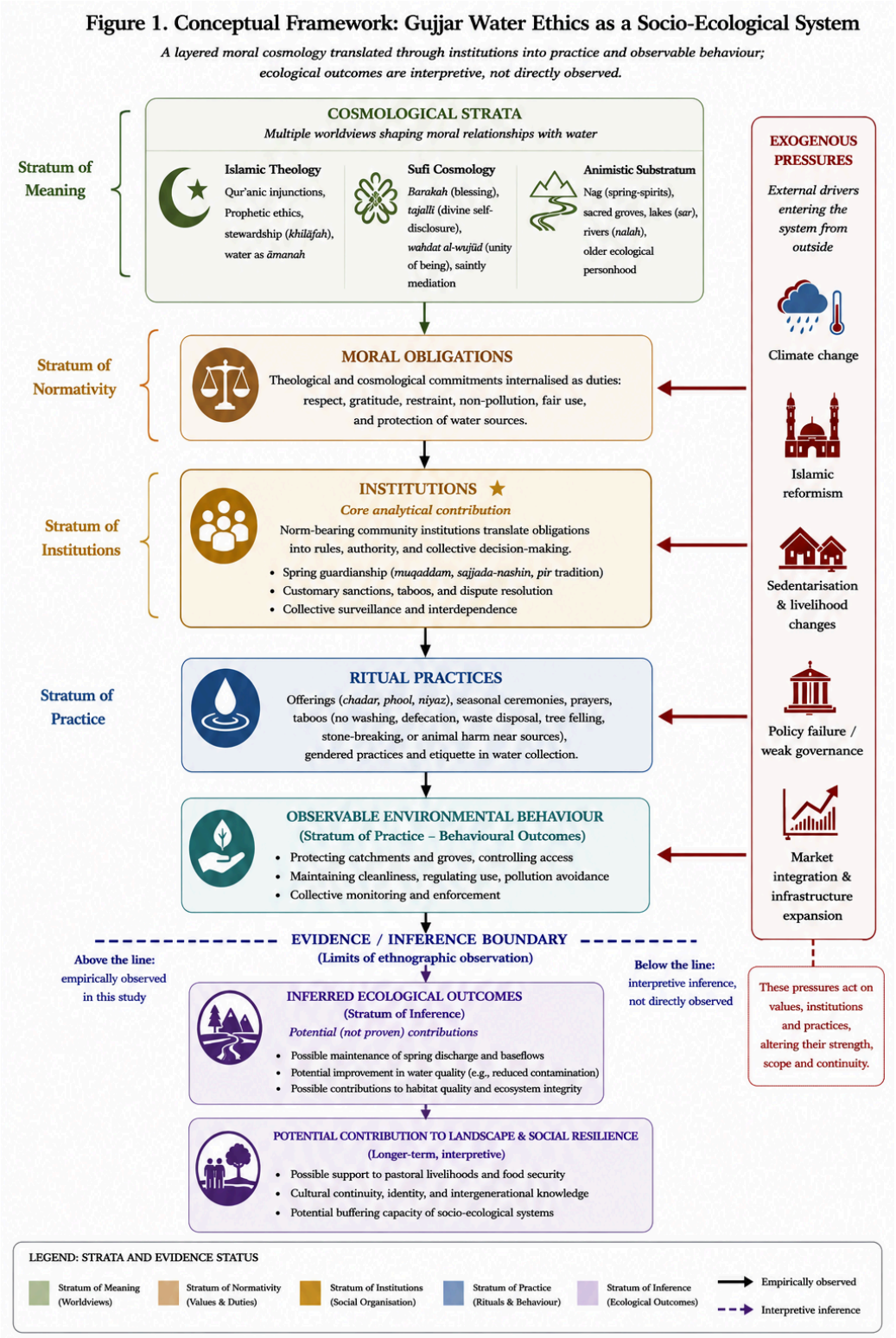


Figure 1

Conceptual framework: Gujjar water ethics as a socio-ecological system. The vertical sequence is the paper's argument and its structure. Two features are analytically load-bearing. First, the institutional tier: cosmologies do not act on landscapes, and the step most often omitted in sacred-ecology accounts is the one that carries the causal weight. Second, the inference boundary: everything above it is recorded by participant observation, everything below it is interpretive and unmeasured in this study. Solid arrows

denote relations evidenced by fieldwork; broken arrows denote inference. The feedback loop marks the pressures of Section 9, which act back on the ethical and institutional tiers rather than on belief itself.

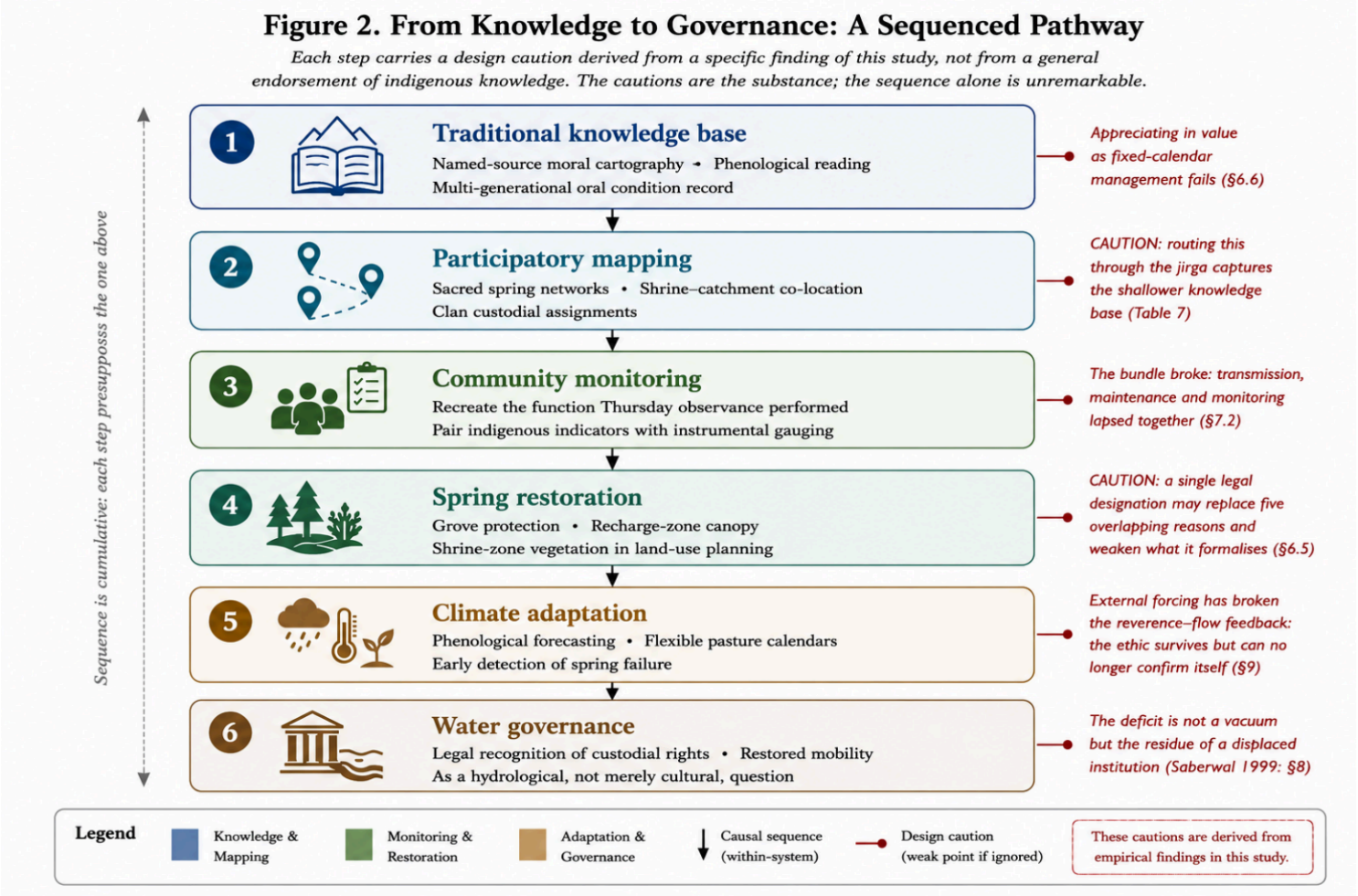


Figure 2

Policy integration pathway. Each step carries a design caution derived from a specific finding of this study. The pathway is cumulative: participatory mapping that captures the wrong knowledge base compromises everything downstream of it, and a restoration programme that formalises protection while dissolving its redundancy may weaken what it intends to secure.