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REVIEW ARTICLE

Section: *Literature, Linguistics & Criticism***Water words: Cultural memory, conservation, and environmental discourse in Saudi school texts**Rami A. Sa'di¹ & Neelofar Hussain Wani²¹College of Humanities and Sciences, Prince Sattam bin Abdulaziz University, Saudi Arabia²Department of English, College of Languages and Translation, King Khalid University Abha, Kingdom of Saudi Arabia* Correspondence: r.alsadi@psau.edu.sa**ABSTRACT**

Water enters school knowledge as more than a chemical substance or a finite utility. It also carries inherited narratives, moral obligations, memories of place, and expectations about the relation between citizens and the state. This article examines how these meanings are assembled in a contrastive micro-corpus of three water-focused units from Saudi national primary textbooks issued for the 1446/2024 school year: Grade 4 Islamic Studies, Grade 4 Science, and Grade 5 Social Studies. The corpus comprises 15 textbook pages, including expository prose, scriptural citations, photographs, diagrams, activities, and assessment prompts. A memory-sensitive critical ecolinguistic analysis combines cultural-memory theory with categories of framing, evaluation, salience, erasure, legitimation, and agency. The analysis finds a layered civic ecology. Islamic Studies presents water as divine blessing, purifying substance, and object of restraint modelled through a remembered Prophetic measure. Science translates scarcity into observation, calculation, domestic repair, and persuasive communication. Social Studies frames aridity through national territory, depleted springs, and state-led desalination and wastewater treatment. Across subjects, Qur'anic language links cosmological value to practical conservation, while named landscapes and infrastructures place water within a national story. The resulting discourse is ethically resonant and unusually actionable at the household scale. Yet it allocates responsibility unevenly: the child and family receive detailed duties, the state appears chiefly as provider and problem-solver, and agricultural demand, desalination externalities, distributional questions, and climate change remain largely absent. Cultural memory therefore works as both bridge and boundary. It can connect faith, place, and sustainable conduct, but it requires systemic inquiry if conservation education is to develop action competence rather than compliant thrift alone.

KEYWORDS: cultural memory, ecolinguistics, environmental education, Saudi Arabia, school textbooks, water conservation

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1. Introduction

Water words do social work. Terms such as *ni'mah* (blessing), *mā'* (water), *shuḥḥ* (scarcity), *tharwah mā'iyyah* (water wealth), and *tarshīd* (conservation or rationalised use) do not merely identify a material substance and its management. They place water within moral, historical, scientific, and political relations. A lesson that calls water a divine blessing invites gratitude and restraint; a diagram that divides supply into surface, groundwater, and desalinated water orders it as a national resource; a calculation of leakage turns a household tap into a site of civic responsibility. When these framings appear across school subjects, they form an environmental discourse through which young readers are invited to remember, value, and act.

This issue is particularly consequential in Saudi Arabia. The country's water policy operates under low rainfall, limited renewable freshwater, pressure on non-renewable groundwater, and a substantial dependence on desalination. The Saudi National Water Strategy 2030 identifies demand management, resource protection, service quality, and the use of treated wastewater as linked priorities; official environmental reporting also identifies accelerated groundwater depletion as a national challenge (Ministry of Environment, Water and Agriculture [MEWA], n.d.-a, n.d.-b). Water education is therefore not peripheral environmental content. It participates in the long formation of public expectations about consumption, infrastructure, stewardship, and authority.

School textbooks are important in this formation because they stabilise selected explanations and values as teachable knowledge. They establish what counts as a problem, who is authorised to define it, which actions are imaginable, and which scales of responsibility receive attention. Research in environmental education has repeatedly shown that knowledge alone does not guarantee environmental action (Hungerford & Volk, 1990; Kollmuss & Agyeman, 2002). The more demanding educational question is how curricula connect knowledge to judgement, participation, and a learner's capacity to act (Jensen & Schnack, 1997; UNESCO, 2017, 2020). Textbook discourse matters here because it can either open environmental problems to inquiry or settle them in advance as matters of prescribed conduct.

Textbook studies have examined environmental content, evaluation, task design, and the framing of contested issues (Andersen, 2018; Liu et al., 2024; Ma & Chang, 2025; Román & Busch, 2016). In the Arab region, a broad curriculum survey found that natural resources, pollution, ecosystems, and sustainable development were widely present, but that coverage and pedagogical depth varied considerably. Its Saudi profile located resource conservation across science, social, family, and language education while noting weak incorporation of climate change (Arab Forum for Environment and Development [AFED], 2019). Water-specific scholarship offers a sharper warning. Hussein's (2018) analysis of Jordanian educational texts showed that scarcity can be naturalised through geography and external causes while management choices escape scrutiny. Amahmid et al. (2019), by contrast, demonstrated that curricular water education can improve children's knowledge, attitudes, and reported practices when concepts and activities are sustained across instruction. Together, these studies suggest that the presence of water is less revealing than the story told about it.

Saudi water discourse cannot be understood adequately through resource language alone. Qur'anic verses, Prophetic practice, inherited measures, named springs, dry valleys, and modern plants coexist on the textbook page. These elements bring different pasts into the learner's present. Cultural-memory theory helps explain how canonical texts and repeated practices preserve socially consequential meanings beyond individual recollection (Assmann & Czaplicka, 1995). Ecolinguistics, meanwhile, asks how linguistic patterns support or undermine the conditions of life by foregrounding certain actors, relationships, and values while backgrounding others (Stibbe, 2021). Their combination makes it possible to analyse conservation not simply as an environmental topic but as a moral and mnemonic project.

This article asks three questions:

1. How do water-focused units in Islamic Studies, Science, and Social Studies frame water's value, scarcity, and proper use?
2. How are scriptural and territorial memories mobilised to legitimise conservation and national water governance?
3. What forms of learner, family, and state agency are made salient or erased, and what do those patterns imply for action-oriented environmental education?

The study makes a deliberately bounded contribution. It does not claim to represent the whole Saudi curriculum or measure the prevalence of themes across all grades. Instead, it conducts an intensive comparison of three explicitly water-titled units. This design reveals how subject traditions redistribute the same environmental object: Islamic Studies remembers water through revelation and exemplary conduct; Science renders it observable and calculable; Social Studies territorialises it through scarcity and public infrastructure. Read together, the units construct what this article calls a layered civic ecology: an account of human–water relations in which sacred value, practical competence, and national provision are mutually reinforcing but not equally open to criticism.

2. Water, memory, and curriculum discourse

2.1 From environmental content to environmental agency

Environmental education research has moved beyond asking whether a topic appears in a curriculum. The decisive questions concern the quality of the encounter: whether learners investigate causes, recognise competing interests, evaluate evidence, imagine alternatives, and participate in change. Early behavioural models sometimes treated knowledge, attitude, and action as a simple progression. Later research showed that environmental conduct is shaped by values, habits, infrastructure, social norms, perceived efficacy, and the opportunities available for action (Hungerford & Volk, 1990; Kollmuss & Agyeman, 2002). A child may understand leakage and still inhabit a household or city where repair, pricing, landscaping, or supply arrangements encourage waste. The action-competence tradition responds to this complexity by distinguishing purposeful participation from behaviour prescribed by an authority. For Jensen and Schnack (1997), environmental education should help learners understand problems, form judgements, develop visions, and act with reasons. This does not make everyday conservation irrelevant. Closing a tap or reporting a leak can be meaningful. The distinction lies in whether the learner is merely instructed to perform a correct behaviour or is enabled to ask why the problem exists, who can change it, what consequences different responses carry, and how individual and collective action connect.

Contemporary Education for Sustainable Development similarly joins cognitive, socio-emotional, and behavioural learning. UNESCO's guidance for Sustainable Development Goal 6 includes knowledge of the water cycle, scarcity, access, management, and responsible use, but also encourages systems thinking, collaboration, critical reflection, and participation (UNESCO, 2017). Its later roadmap places individual learning within the societal transformation required by interconnected sustainability challenges (UNESCO, 2020). Such formulations make a curriculum's distribution of agency analytically central. A textbook may recognise the state, industry, agriculture, household, and child, yet assign them very different kinds of visibility and obligation.

Water education studies confirm the value of connecting knowledge with situated activity. Amahmid et al. (2019) found that structured school instruction in Morocco improved pupils' water-related knowledge, attitudes, and reported behaviour. Their work supports the pedagogical importance of concrete examples and practices, especially where scarcity is lived rather than abstract. At the same time, discursive research warns that action can be narrowed by the explanation of scarcity itself. Hussein (2018) found that Jordanian policy and textbook discourse foregrounded natural aridity and external pressures while giving less attention to political and managerial causes. When scarcity is represented chiefly as a condition imposed by climate and geography, supply expansion and compliant conservation appear inevitable, while choices about allocation and governance become harder to see.

These findings are relevant to Saudi Arabia, but direct transfer would be unwise. Saudi textbooks draw on a distinctive relation between Islamic ethics, national development, and public provision. Environmental ethics in Islamic scholarship commonly emphasise divine creation, human accountability, balance, and the prohibition of excess (Hamed, 1993; Saniotis, 2012). Whether those principles become ecologically searching in school discourse depends on their pedagogical use. A scriptural verse may broaden the learner's sense of relation and responsibility, or it may serve chiefly as an authoritative closure. The difference cannot be decided from the presence of religious language alone.

2.2 Textbooks as sites of framing and legitimation

Textbooks are designed, selective artefacts rather than neutral containers. Their prose, images, captions, exercises, and page architecture cooperate to define salient knowledge. Critical discourse analysis in education has shown

how institutional texts establish identities, normalise relations, and make particular social arrangements appear commonsensical (Rogers et al., 2016). Multimodal analysis adds that placement, scale, colour, contrast, and image–text relations affect what receives attention and how viewers are positioned (Kress & van Leeuwen, 2021). A large image of cracked soil, a coloured conservation banner, or a diagram flowing toward a desalination plant can carry an argument without making it explicit in continuous prose.

Ecolinguistics supplies categories suited to environmental consequences. Stibbe (2021) describes the “stories we live by” as recurrent linguistic patterns that organise identity, evaluation, salience, erasure, and conviction. In textbook analysis, a frame identifies what kind of thing water is: blessing, resource, wealth, habitat, commodity, or public service. Evaluation marks what is desirable or wrong. Identity positions the learner as believer, investigator, consumer, family member, or citizen. Salience makes actors or processes vivid; erasure excludes, backgrounds, or distorts them. These categories do not prove a learner’s response. They show the invitations and limits built into the text.

Legitimation analysis clarifies how such invitations acquire authority. Van Leeuwen (2007) identifies authorisation, moral evaluation, rationalisation, and mythopoesis as recurring ways of answering the implicit question “Why should this be done?” Saudi water lessons may authorise conservation through revelation, Prophetic example, parental instruction, scientific evidence, or state institutions. They may morally evaluate extravagance, rationalise repair through calculated savings, or narrate dry and green landscapes as consequences of water’s presence. Different forms can accumulate. Conservation becomes compelling not through a single command but through a convergence of sacred authority, practical reason, and civic loyalty.

Textbook scholarship has shown the usefulness of attending to these linguistic details. Román and Busch (2016) demonstrated that grammar and framing influence how certainty and responsibility are distributed in science accounts of climate change. Andersen (2018) found that the design of science tasks affects whether sustainability problems invite reproduction of knowledge or evaluative inquiry. Studies of Chinese language and English textbooks show that environmental attitudes may be conveyed through evaluative language even outside science classes, while corpus breadth alone does not guarantee attention to the full range of sustainability relations (Liu et al., 2024; Ma & Chang, 2025). BouJaoude and Nouredine (2020) further argue that Arab science textbooks need to be read as cultural tools, since scientific content is always mediated by choices about local identity and relevance.

2.3 Cultural memory and the environmental present

Cultural memory is not simply information about the past. Assmann and Czaplicka (1995) use the term for socially maintained knowledge that shapes collective identity across generations through texts, rituals, symbols, and institutions. Canonical language can be reactivated in new circumstances, allowing present obligations to appear continuous with inherited norms. In the water lessons examined here, a Qur’anic verse about rain or life does not function only as historical citation. It brings a sacred account of water into a contemporary page on purification, groundwater, or conservation.

The concept is especially useful when memory is materially specified. A Prophetic report about the small quantity of water used for ablution is accompanied in the Islamic Studies unit by modern metric equivalents. The remembered practice is not left in a remote measure; it is translated into millilitres and litres. Similarly, Social Studies names regions once known for springs and narrates their decline through heavy use. In one case, memory travels through canonical conduct; in the other, it travels through landscape loss. Both create an environmental past against which present behaviour can be judged.

Memory can legitimate care, but it can also regulate the terms of debate. Canonical authority may intensify a conservation ethic while reducing room to question how a policy distributes burdens. National memory may cultivate attachment to place while presenting technological development as the settled answer to scarcity. The present analysis therefore treats memory neither as ornament nor as an inherently beneficial resource. It asks what memory connects, whose agency it authorises, and which ecological relations remain outside its frame.

3. Materials and method

3.1 Corpus construction

The study uses a criterion-selected, contrastive micro-corpus of water-focused units in Saudi national primary textbooks issued for the 1446/2024 school year. Three criteria governed selection: the unit or lesson had to name water explicitly in its title; it had to belong to a different subject tradition; and it had to address value, scarcity, use, or conservation rather than mention water incidentally. The resulting corpus contains 15 textbook pages across three books (Table 1). The textbooks are publicly accessible curriculum documents. Files were retrieved from public educational mirrors and checked against page-based viewers on 8 August 2026.

Table 1. Composition of the micro-corpus

Subject and level	Water-focused unit	Textbook pages	Pages analysed	Principal discourse domain
Grade 4 Islamic Studies, semester 1	<i>Aqsām al-miyāh</i> (Categories of Water), especially <i>Niʿmat al-māʾ</i> (The Blessing of Water)	64–66	3	Blessing, purification, exemplary restraint
Grade 4 Science, semester 2	<i>Al-māʾ</i> (Water), in <i>Mawārid al-arḍ</i> (Earth's Resources)	74–82	9	Hydrology, treatment, household conservation
Grade 5 Social Studies, semester 3	<i>Al-miyāh</i> (Water), in <i>Al-mawārid al-iqtisādiyyah</i> (Economic Resources)	146–148	3	Aridity, sources, public infrastructure

The unit, rather than the isolated sentence, was the unit of contextual interpretation. All verbal matter on the selected pages was included: expository prose, Qurʾanic and Prophetic citations, headings, captions, activity instructions, questions, and assessment prompts. Photographs, diagrams, colour panels, and logos were analysed where they affected salience, sequence, or agency. Website navigation, user comments, answer overlays, and video transcripts were excluded because they are not part of the printed textbook. The study does not reproduce textbook page images, both to respect copyright and to maintain the manuscript's Romanisation-only presentation.

This corpus is intentionally small. Its value lies in controlled contrast, not statistical representation. The pages make three subject-specific treatments of the same material object directly comparable. Claims are therefore limited to these units. The article does not infer how teachers enact them, how pupils interpret them, or how frequently a theme occurs elsewhere in the curriculum.

3.2 Analytical framework and procedure

The analysis combines cultural-memory theory (Assmann & Czaplicka, 1995), critical ecolinguistic categories (Stibbe, 2021), and legitimation analysis (van Leeuwen, 2007). Multimodal observations follow Kress and van Leeuwen's (2021) attention to composition and salience but remain subordinate to the study's discourse questions. Five coding dimensions guided close reading:

Table 2. Analytical dimensions

Dimension	Guiding question	Typical evidence
Valuation and frame	What kind of entity is water, and what qualities are attached to it?	Blessing, life, wealth, scarce resource, purifying substance
Memory and temporality	Which pasts are brought into the environmental present?	Scripture, Prophetic measure, named springs, remembered depletion
Legitimation	Why is a practice presented as necessary or right?	Sacred authority, moral evaluation, calculation, scientific explanation, state authority
Agency and scale	Who acts, can act, or must act, and at what scale?	First-person pledges, family repair, public treatment, desalination
Salience and erasure	What is made vivid, backgrounded, or absent?	Contrasting landscapes, infrastructure images, omitted sectors or externalities

Reading proceeded in three passes. The first identified explicit water frames, evaluative expressions, social actors, and action verbs. The second traced memory cues and forms of legitimation across prose, quotations, images,

and tasks. The third compared the subjects and searched for negative cases: places where a unit interrupted its dominant pattern, such as a scientific lesson using scripture or an Islamic lesson using metric calculation. Analytic memos recorded page references, provisional interpretations, alternative readings, and cross-subject contrasts. Because this is a single-researcher interpretive study, no intercoder statistic is claimed. Transparency rests instead on the bounded corpus, the disclosed coding questions, page-specific evidence, translated excerpts, and explicit limits on inference.

Arabic is represented through a modified IJMES-style Romanisation. Long vowels and emphatic consonants are marked where they assist recognition; *‘ayn* and *hamzah* are represented by ‘ and ’. Initial definite articles are retained without assimilating the following consonant. Names widely conventional in English, including Qur’an and Saudi Arabia, keep their familiar forms. Translations are the author’s and favour semantic clarity over reproducing the rhythm of the source. No Arabic script is used.

4. Findings

4.1 Blessing, purification, and the remembered measure

The Islamic Studies unit begins by making the difference water makes visible. A photograph of green date palms and cultivated land is paired with cracked, dry ground. Pupils are asked to describe the images and explain their difference (Ministry of Education, 2024a, p. 64). Before water is categorised for ritual use, it is encountered as the condition of flourishing. The contrast works as a compact causal story: where water is present, the land lives; where it is absent, the surface fractures. The learner is positioned first as witness and interpreter rather than recipient of a definition.

Scriptural language then names the source and purposes of water. Qur’an 2:22 is presented in the excerpt *wa-anzala mina al-samā’i mā’an fa-akhraja bihi mina al-thamarāti rizqan lakum* (He sent down water from the sky and thereby brought forth fruits as provision for you). Qur’an 8:11 adds *wa-yunazzilu ‘alaykum mina al-samā’i mā’an li-yutahhirakum bihi* (He sends down water from the sky to purify you with it). These verses join production and purification. Water sustains bodies and landscapes, but it also enables ritual readiness. The frame exceeds the category of “resource”: water is provision whose value is received before it is managed.

The next page turns reception into obligation under the heading *wājibunā tujāha ni‘mati al-mā’* (our duty towards the blessing of water). The pupil is instructed to recognise the greatness of the blessing, thank its giver, and remember divine favour throughout life (Ministry of Education, 2024a, p. 65). Gratitude is therefore not a private feeling detached from conduct. It is the evaluative ground from which non-extravagance follows. Hamed’s (1993) account of Islamic environmental ethics is useful here: natural entities are not ownerless material but parts of a morally ordered creation for which use entails accountability.

The most distinctive mnemonic device is a Prophetic report attributed to Anas: *kāna Rasūlu Allāhi yatawaḍḍa’u bi-l-muddi wa-yaghtasilu bi-l-ṣā’i ilā khamsati amdād* (the Messenger of God performed ablution with one *mudd* and bathed with one *ṣā’*, up to five *mudds*). The page supplies metric equivalents: one *mudd* as 687 millilitres and one *ṣā’* as 2.748 litres. This is more than pious recollection. A remembered bodily practice is made measurable in a contemporary domestic world. The pupil can compare a sacred precedent with the flow of a modern tap.

The expected inference is strongly cued: legitimate cleansing requires little water, so abundance at the tap does not authorise excess. Prophetic practice provides authorisation, non-extravagance supplies moral evaluation, and metric conversion offers practical rationalisation (van Leeuwen, 2007). Memory becomes a technique of present-day conservation.

A coloured national campaign panel intensifies that convergence. Beside a water-efficiency logo, the unit states: *al-tarshīdu ṭā’atu Allāhi ‘azza wa-jalla wa-ittibā’u hadyi nabiyyihi wa-istijābatun li-waliyyi al-amr* (conservation is obedience to God, following the guidance of His Prophet, and responding to the ruler). The sentence aligns three authorities—divine, Prophetic, and governmental—within one account of correct conduct. Its force lies in continuity: the modern campaign is not introduced as a merely administrative response to demand; it is placed within an inherited moral order.

This alignment produces an ecologically supportive story insofar as it resists the idea that paid or piped water may be used without limit. It also narrows the learner’s political role. The citizen appears as a conscientious respondent to authorised guidance, not as a participant who might examine allocation, infrastructure, or policy

trade-offs. The closing activity—asking what would happen if people stopped conserving—invites consequential reasoning, but “people” are undifferentiated consumers. The unit makes restraint memorable and morally dense; it does not differentiate between the capacities or water footprints of households, farms, businesses, and public institutions.

4.2 Scarcity, lost springs, and the memory of territory

Social Studies begins from a national geographical proposition: Saudi Arabia lacks freshwater bodies such as permanent rivers and lakes, and rainfall is low across much of the country. The lesson explains that the homeland lies within an arid zone, where a semi-arid climate contributes to *shuḥḥi mawāridi al-miyāh* (scarcity of water resources) (Ministry of Education, 2024c, p. 146). The possessive phrase “my homeland” gives climate an affective territory. Scarcity is not encountered as a global abstraction; it is a condition of a place to which the pupil belongs.

A diagram answers scarcity by classifying supply into surface water, groundwater, and desalinated seawater. Examples attach these categories to recognisable locations: springs and valleys in Al-Ahsa and Najran, wells in Medina and Asir, and desalination plants on the eastern and western coasts. Unlike the Islamic Studies sequence from gift to gratitude, Social Studies moves from climatic limit to spatial inventory. Water is *tharwah mā'iyyah*—water wealth—whose sources must be known, developed, and protected.

The unit's strongest memory cue is a sidebar about Al-Ahsa, Al-Aflaj, and Al-Kharj. These places, it explains, once had many springs, but intensive withdrawal and consumption in recent years caused most to dry up; remaining flows are pumped (Ministry of Education, 2024c, p. 146). The passage disrupts a purely naturalised scarcity story. Climate explains the baseline, but human extraction explains loss. “Once” and “in recent years” create a before-and-after narrative in which depletion is historically produced.

The account makes absence memorable: named places keep depletion from becoming a generic warning and complicate the nearby language of state provision, since new supply does not erase exhausted sources. Nevertheless, the lesson does not ask which sectors withdrew the water, how development patterns shaped extraction, or whose uses were protected. Human causation is acknowledged, but responsibility remains socially indistinct. The pattern resembles the naturalisation Hussein (2018) identified in Jordanian educational discourse, although the Saudi unit contains a counter-current in its recognition of overuse.

The lesson next introduces treated wastewater as “a new resource” that supports other sources and can irrigate parks and gardens or serve industry. Desalination receives still greater visual and verbal prominence. Plant photographs and declarative statements cast it as evidence of national capacity; a textbook claim that desalination supplies 70% of drinking-water needs appears within this celebratory frame (Ministry of Education, 2024c, p. 147). The statistic is analysed here as a curricular claim, not treated as an independently current measure. Its discursive role is clear: technology converts geographic lack into governable supply.

Government has “worked to provide alternatives,” treatment creates a new resource, and desalination secures drinking water. This acknowledges purposive public action, yet the technology is nearly frictionless. Energy demand, emissions, brine, cost, and marine effects do not enter the page, although the National Water Strategy recognises desalination's energy and environmental footprint (MEWA, n.d.-a). Technological capacity is salient; its dependencies are erased.

The final page returns to moral conduct. Pupils should avoid throwing waste into springs, valleys, and wells; use only the water they need; and raise others' awareness. Qur'an 21:30—*wa-ja' alnā mina al-mā'i kulla shay' in ḥayyin afalā yu' minūn* (We made every living thing from water; will they not believe?)—anchors these actions in a universal proposition of life (Ministry of Education, 2024c, p. 148). The sequence closes the distance between territorial management and sacred value. Water is simultaneously national wealth and the basis of all living things, though the map of valleys and the public works remain organised principally around human supply.

4.3 Scientific inquiry and the domestic citizen

The Science unit is longer and more procedurally varied. It begins with movement: rain falls, runs through channels and valleys, and gathers in streams. Pupils are asked whether water is always moving, then compare how it infiltrates soil and gravel (Ministry of Education, 2024b, pp. 74–75). This structure positions the learner

as an investigator. Water is not only received or classified; its behaviour can be observed through a small experiment.

The unit builds a hydrological account of saltwater, freshwater, groundwater, wells, treatment, irrigation, and wastewater. Its statement that humans live in a watery world while regions still experience scarcity creates a productive paradox. Visible planetary abundance does not equal usable local supply. Qur'an 23:18 is inserted into this scientific sequence: *wa-anzalnā mina al-samā'i mā'an bi-qadarin fa-askannāhu fī al-arḍi wa-innā 'alā dhabābin bihi la-qādirūn* (We sent down water from the sky in due measure and lodged it in the earth, and We are capable of taking it away). The phrase *bi-qadarin* (in due measure) resonates with hydrological limit, while “lodged it in the earth” accompanies the explanation of groundwater.

This scriptural presence differs from the Islamic Studies unit. It does not primarily establish ritual duty; it gives cosmological depth to an empirical account. Scientific process and revelation are presented as compatible ways of reading water. BouJaoude and Nouredine's (2020) description of science textbooks as cultural tools is visible in this arrangement: scientific knowledge is localised through a familiar source of meaning rather than stripped of cultural context.

The second half of the unit shifts from systems to conduct. Under a first-person question—*kayfa yumkinunī al-musāhamatu fī al-muḥāfaẓati 'alā al-mā'*? (How can I contribute to conserving water?)—the model answer states: *ughliq al-ṣunbūra ba'da al-isti'māli, wa-aṭlubu ilā wālidayya iṣlāḥa a'tāli al-magāsili wa-ṣanābiri al-miyāh* (I close the tap after use and ask my parents to repair faulty basins and water taps) (Ministry of Education, 2024b, p. 80). The grammar is significant. The first-person singular gives the pupil direct agency, while the request to parents recognises the child's limited authority over repairs. Agency is nested within the family rather than imagined as autonomous.

The lesson expands this repertoire through ordinary technologies and routines: repair a leaking tap, choose locally appropriate plants that need little water, use drip irrigation, operate washing machines and dishwashers only when full, and install conservation fittings. A review problem asks pupils to calculate annual leakage and the saving achieved by distributed efficiency devices. Calculation makes waste perceptible across time. A drip too small to appear consequential becomes a yearly quantity; a fitting becomes an intervention with measurable effect.

A final writing activity asks pupils to compose a persuasive letter to a national platform, state a view, present evidence, and propose feasible actions (Ministry of Education, 2024b, p. 81). The unit thus connects observation, arithmetic, household practice, and a thin but meaningful line from learner to public institution. The scope of persuasion, however, remains bounded by the solution set already supplied. The pupil is encouraged to advocate conservation, not to compare competing allocations or question why some demands are treated as fixed. The scientific unit explains treatment infrastructure but does not examine energy–water relations, agricultural demand, virtual water, pricing, unequal access, or climate projections. The child's sphere is richly specified; larger systems are stable scenery.

This scalar asymmetry is reinforced by the unit's closing conservation text: *ḥayātunā kulluhā ta'tamidu 'alā al-mā'* (our entire life depends on water), while population grows year after year and water does not increase at the same rate; therefore resources must be conserved as far as possible (Ministry of Education, 2024b, p. 82). The collective “our” establishes shared dependence and common obligation. Yet a population-to-supply ratio simplifies demand into the number of people rather than the organisation of production and consumption. The statement is not false as elementary pedagogy, but it favours demographic pressure over political economy.

4.4 A cross-subject architecture of authority and action

Across the corpus, the three subjects do not compete to define water. They layer their accounts. Islamic Studies supplies ultimate value and exemplary restraint; Science supplies causal process, domestic technique, and calculation; Social Studies supplies territory, infrastructure, and the state. The same key term, *tarshīd*, can therefore mean obedience, efficient practice, and national necessity. This semantic portability helps conservation travel across the timetable as a coherent civic norm.

Qur'anic language links water to provision, purification, measure, and life, while national logos and platforms connect inherited obligation to present administration. Authority accumulates: gratitude, Prophetic restraint, calculated leakage, family repair, and public guidance make conservation appeal to identity, reason,

affection, and efficacy. The result is neither a wholly secular management story nor a purely devotional ethic. The cumulative pattern has a paternal edge. Government appears as an active provider of alternatives and an issuer of guidance; the pupil appears as grateful beneficiary, careful user, family advocate, and occasional correspondent. State action is described more than evaluated. Even the persuasive letter is oriented toward supporting conservation rather than deliberating among policies. Van Leeuwen's (2007) authorisation and rationalisation coexist, but authorisation sets the horizon within which reasoning occurs.

Erasure is similarly patterned. Nonhuman life receives universal acknowledgement in the verse that all living things are made from water, and green landscapes visibly signify flourishing. Yet no organism, habitat, wetland, or marine ecosystem is followed as a water claimant in its own right. Agriculture is present mainly as irrigation technique and vegetation choice, not as a major allocation sector. Desalination is present without brine or energy. Groundwater depletion is remembered without an institutional history of extraction. Climate change is absent from all 15 pages, consistent with the gap identified in AFED's (2019) earlier Saudi curriculum profile.

Primary textbooks must simplify, and a 15-page corpus cannot contain every dimension of water governance. The analytical point is relational: the precise volume of a *mudd*, the mechanics of a leak, and supply categories receive concrete attention, while sectoral demand, environmental externalities, and distributive questions do not. What is measurable and morally assignable to a child becomes especially visible.

5. Discussion

5.1 Cultural memory as bridge and boundary

The central finding is that cultural memory is constitutive of conservation discourse, not an ornamental addition to scientific content. Scriptural quotations establish water as provision, purification, measured gift, and basis of life. Prophetic practice supplies a remembered bodily standard that is translated into metric units. Place names preserve a national memory of springs diminished by extraction. Together, these forms locate present water conduct within inherited relations rather than treating conservation as a recent technocratic demand.

This memory functions as a bridge in three senses. First, it connects cosmology to routine. Closing a tap can be understood not only as saving a utility but as gratitude for a gift. Second, it connects past practice to contemporary measurement. The conversion of *mudd* and *ṣāʿ* into litres allows an old measure to enter present comparison. Third, it connects local landscapes to national responsibility. The memory of lost springs gives depletion a place and a history.

Such bridging responds to a problem in environmental education: abstract information often fails to become personally meaningful. Cultural memory supplies identity, narrative continuity, and moral vocabulary, all of which can strengthen motivation (Assmann & Czaplicka, 1995; Saniotis, 2012). It also counters an economic story in which price or ownership exhausts water's value. A blessing cannot be reduced to a commodity without remainder; a source of all life exceeds its service to an individual consumer.

Memory is also a boundary when it closes rather than opens interpretation. In the Islamic Studies campaign statement, conservation simultaneously obeys God, follows the Prophet, and responds to the ruler. The three authorities are presented as continuous, leaving little discursive space to distinguish enduring ethical principles from revisable policy instruments. The ethical case for avoiding waste is strong, but a water tariff, an allocation rule, or a desalination strategy still requires public evaluation. Sacred legitimacy should not make administrative choices appear beyond inquiry.

The pedagogical opportunity is therefore not to secularise the units or remove cultural memory. It is to extend the questions memory can support. A teacher might ask how the principle of avoiding excess applies differently to a dripping tap, a water-intensive crop, an urban landscape, and an industrial process. Pupils might compare the small Prophetic measure with actual tap flow, then investigate how fixture design and public standards enable restraint. They might map remembered springs and examine what forms of governance could protect remaining aquifers. In this way, memory becomes a starting point for systems thinking rather than a substitute for it.

5.2 From household conservation to water action competence

The corpus contains substantial strengths for action-oriented education. Science pupils observe infiltration,

calculate leakage, identify feasible household changes, and write persuasively. Islamic Studies pupils interpret contrasting landscapes and infer conservation from an exemplary practice. Social Studies pupils classify sources, consider why treatment and desalination arose, and propose solutions. The activities are more active than a simple list of rules.

The distinction between responsible behaviour and action competence nevertheless remains important (Jensen & Schnack, 1997). Most actions are predetermined, private, and low-conflict: close, repair, reuse, install, inform. These are worthwhile practices, and Ouda et al. (2013) show that domestic conservation has a legitimate place in Saudi demand management. But a curriculum centred on household thrift can imply that scarcity is chiefly the sum of individual habits. Official Saudi strategy itself is broader, encompassing sectoral demand, groundwater protection, wastewater reuse, service performance, and the environmental footprint of supply (MEWA, n.d.-a).

The textbooks could preserve age-appropriate action while widening its scale. A Grade 4 class could audit taps at school and present findings to administrators, joining calculation to collective decision-making. Pupils could compare two garden designs under a fixed water budget, weighing shade, biodiversity, cultural preference, and maintenance. A Grade 5 class could interpret simplified sectoral-demand data, debate alternative allocations during drought, or examine why groundwater is difficult to renew. A desalination activity could ask where energy comes from and what happens to concentrated brine. None of these tasks requires turning children into water engineers. They make visible the relations behind the tap.

Such extensions would also improve the role assigned to the state. The existing units rightly show that public infrastructure matters; scarcity cannot be solved by households alone. Yet provision is represented mainly as completed achievement. Inquiry into policy choices would position government not as an adversary but as a domain of collective reasoning in which citizens can understand evidence, recognise constraints, and evaluate alternatives. The persuasive-letter task already contains the seed of this relation. It could be strengthened by asking pupils to address a specific local problem, use evidence from more than one source, anticipate a counterargument, and propose action by both residents and institutions.

5.3 Reframing scarcity without denying aridity

Critical discourse analysis of water sometimes risks appearing to deny material scarcity. That is not the argument here. Saudi aridity is real, groundwater limits are consequential, and supply systems are technically demanding. The issue is whether environmental limits are represented as the whole explanation. In the Social Studies unit, climate provides the opening cause, but the lost-springs passage recognises that intensive extraction also changes availability. This is a valuable fracture in a naturalised account.

The fracture could support a fuller causal story. Scarcity can be simultaneously meteorological, hydrological, infrastructural, economic, and political. Distinguishing these forms helps pupils see why different remedies follow. Low rainfall may justify storage or desalination; groundwater overdraw may require monitoring and allocation; leakage may require maintenance; demand created by landscaping or agriculture may require design and policy change. Hussein's (2018) Jordanian findings show the danger of explanations that externalise responsibility. The Saudi units partly avoid that danger through conservation and depletion language, but they stop before naming institutional and sectoral actors.

Technological optimism creates a related tension. Desalination and wastewater treatment deserve inclusion because they are central to Saudi water provision. Their absence would be a serious distortion. The problem is the rescue narrative in which plants convert scarcity into supply without ecological or energy consequences. An ecolinguistic reading does not require a negative portrayal of technology. It requires that dependence and trade-off become speakable. A balanced textbook could present desalination as both a major national capability and a process whose energy use and marine impacts demand continuing innovation. This formulation would align more closely with the National Water Strategy's own recognition of environmental cost (MEWA, n.d.-a).

5.4 Contribution, limitations, and research agenda

The article contributes the concept of layered civic ecology to research on environmental discourse in textbooks. The concept names the cross-curricular accumulation of sacred value, scientific explanation, domestic practice,

territorial identity, and public infrastructure around an environmental object. It directs attention away from whether religion, science, or nationalism “dominates” and toward how they divide labour. In this corpus, religion supplies moral depth, science supplies practical efficacy, and social studies supplies national scale. Their coherence is a curricular achievement; their shared silences are a curricular limit.

The study also extends cultural-memory analysis into routine pedagogy. Here memory is carried by a unit of ablution water, a Qur’anic phrase beside groundwater, and the remembered disappearance of springs. These small textual acts organise ecological conduct in everyday school knowledge.

Several limitations delimit the claims. The corpus contains only three units and two grade levels. It cannot establish frequency, progression across schooling, change over editions, or differences among subjects beyond the selected pages. Textbook discourse does not predict classroom interaction or learner reception. Translated excerpts inevitably lose some semantic and rhythmic texture, although Romanisation preserves key lexical choices. Finally, the single-researcher design benefits from a transparent coding frame but lacks the interpretive challenge that a multilingual research team could provide.

Future work should build a diachronic corpus across editions and grades, quantify recurring water frames, and compare Arabic and translated policy language. Classroom observation and pupil interviews could test whether sacred authority encourages reflection, compliance, or both. Comparative work across Gulf curricula could examine how shared Islamic references interact with different water infrastructures and national narratives. Researchers should also investigate images more extensively, particularly how gender, labour, nonhuman life, and technological landscapes are represented. Such work would move from the curricular availability of meanings to their lived educational consequences.

6. Conclusion

The Saudi primary-school units examined here teach water through a distinctive convergence of memory, science, and citizenship. Water is a blessing received from God, a purifying substance, a measured practice inherited from the Prophet, a moving element investigated through experiment, a scarce national wealth, and a service secured through public infrastructure. Conservation gains force because these meanings reinforce one another. It is at once grateful, rational, practical, and civic.

The same convergence distributes agency unevenly. Children and families receive precise, feasible duties; the state receives the role of provider and guide; larger systems of demand and ecological cost remain faint. The curriculum therefore forms capable household conservers more clearly than critical participants in water governance. Its most promising elements—the metric translation of remembered restraint, the account of depleted springs, the leakage calculation, and the persuasive letter—could support a more systemic pedagogy without abandoning their cultural ground.

Cultural memory is most educationally powerful when it does more than certify an answer. When scriptural ethics and memories of place invite investigation of present causes, trade-offs, and collective choices, they can deepen both attachment and judgement. Saudi water education already possesses a rich moral vocabulary and several practical routes to action. Bringing the erased relations of energy, ecology, sectoral demand, and shared decision-making into that vocabulary would turn conservation from compliant thrift into informed stewardship.

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Ethics and data statement

This study analyses publicly accessible curriculum documents and involved no human participants or personal data. The corpus is fully identified by book, unit, and page in Table 1. Source-viewer links are supplied in the references; copyrighted textbooks are not redistributed with the article.

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