

Environmental Discourse and Cultural Narratives in Algeria: A Linguistic Analysis of Competing Representations in Nature and Development

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Article information	Abstract
DOI : 10.25077/jds.3.1.18-37.2026 Correspondence : khansaa.mohammedcherif@phd.uni-pannon.hu	Algeria faces increasing environmental pressures associated with desertification, water scarcity, climate change, and hydrocarbon dependent development. At the same time, environmental debates in the country are shaped by competing discourses concerning nature, development, and sovereignty. This study examines how environmental meanings are constructed and contested within Algerian environmental discourse through the interaction between traditional ecological knowledge, state developmental narratives, and contemporary environmental activism. The study adopts a qualitative discourse analytical approach grounded in the post structural discourse theory of Laclau and Mouffe. The analysis is based on a purposively selected corpus consisting of policy documents, academic studies, environmental reports, and media and activist texts related to anti-fracking mobilizations in southern Algeria. The findings reveal that traditional ecological systems such as foggaras and ghout oasis agriculture articulate environmental stewardship through communal governance, ecological adaptation, and sustainable resource management. In contrast, post-independence developmental discourse frames natural resources primarily as instruments of industrial modernization and national sovereignty. The study further demonstrates that contemporary environmental activism challenges this extractivist model by linking environmental protection with democratic participation, social justice, and cultural identity. Environmental discourse in Algeria, therefore, emerges as a field of political and ideological contestation in which competing actors attempt to define legitimate models of development and sustainability. The study contributes to environmental discourse scholarship by demonstrating how ecological debates in North Africa are deeply connected to historical memory, political authority, and struggles over resource governance. The findings further suggest that sustainable environmental governance in Algeria requires greater recognition of local ecological knowledge and more participatory approaches to environmental decision-making.
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INTRODUCTION

Algeria possesses the largest territorial area in Africa, with approximately 85 percent of its landmass situated within the Sahara Desert (Central Intelligence Agency, 2024; Encyclopaedia Britannica, 2025). Human settlement and economic activity in these arid conditions have historically depended on carefully adapted relationships between local communities, fragile desert ecosystems, and scarce freshwater resources. In recent decades, however, these environmental systems have come under increasing pressure due to accelerating climate change, expanding desertification processes, groundwater depletion, and the continued growth of extractive industries. These interconnected challenges have intensified ecological vulnerability and raised significant concerns regarding long-term environmental sustainability and resource security in Algeria (United Nations Environment Programme, 2023). The Intergovernmental Panel on Climate Change warns that climate change is “intensifying water scarcity and ecosystem vulnerability across arid and semi-arid regions of the Mediterranean basin” (Intergovernmental Panel on

Climate Change (IPCC, 2022, p. 1688). Regional assessments similarly identify North Africa as one of the regions' most vulnerable to desertification and ecological degradation (Cherlet et al., 2018). In Algeria, declining rainfall, prolonged droughts, rising temperatures, and recurrent wildfires increasingly threaten both urban and Saharan environments (International Energy Agency [IEA], 2025). Environmental questions have consequently become closely tied to broader debates concerning governance, development, and social stability.

Long before contemporary climate debates emerged, Algerian communities developed environmental practices adapted to arid ecological conditions. Traditional irrigation systems such as the *foggara* in the Algerian Sahara and the *ghout* system in El Oued demonstrate forms of collective ecological management grounded in local knowledge and communal organization. *Foggaras* transport groundwater through underground galleries using gravity rather than mechanical extraction, thereby limiting evaporation and preserving aquifer sustainability. Idda et al. (2021) describe the *foggara* as “a living irrigation system” shaped through collective institutions and adaptive social organization (p. 431). Environmental sustainability in these systems is therefore embedded within social relations and cultural practices rather than industrial management. Recent studies in ecolinguistics and cultural discourse analysis similarly show that environmental values are often encoded through language, symbolism, and collective cultural memory. Handoko et al. (2024) argue that environmental expressions in traditional societies function as “cultural guidance for maintaining harmony between humans and nature” (p. 79). Moreover, they demonstrate that environmental discourse in traditional communities is deeply embedded in cultural beliefs, shared knowledge, and symbolic representations of nature (Handoko et al., 2024). Pratiwy et al. (2024) likewise observe that ritual discourse reflects ecological ideologies rooted in indigenous understandings of environmental balance. Ogungbemi (2024) further demonstrates how cultural narratives may represent nature as an active ecological presence rather than a passive resource available for exploitation.

Following independence in 1962, Algeria adopted a developmental model centered on industrialization and hydrocarbon extraction as foundations of economic modernization and national sovereignty. This orientation became institutionalized after the nationalization of hydrocarbons in 1971 and was reinforced through state discourse presenting natural resources as strategic assets necessary for postcolonial development. Environmental protection consequently remained secondary to industrial growth and energy production. Dryzek (2013) observes that developmental discourse frequently frames nature through economic and technocratic logics prioritizing modernization over ecological sustainability. Martínez Alier (2002) similarly argues that extractive economies often generate ecological conflict because environmental costs become marginalized within dominant development narratives. In Algeria, hydrocarbon extraction gradually became linked not only to economic policy but also to political legitimacy and state authority. More recent environmental governance scholarship further emphasizes that sustainability transitions are deeply shaped by political and institutional power relations rather than ecological concerns alone (Scoones et al., 2015; Turnhout et al., 2020).

Resistance to this developmental model became increasingly visible during the anti-fracking protests that emerged in southern Algeria between 2014 and 2015, particularly in In Salah and Ouargla. Local communities opposed shale gas exploration because of fears concerning groundwater contamination, ecological degradation, and unequal distribution of environmental risk. Belakhdar (2020) notes that protest slogans such as “Algeria is not for sale” connected environmental concerns with broader anxieties surrounding sovereignty, political exclusion, and economic injustice. Environmental mobilization was later intersected with the *Hirak* movement beginning in 2019, revealing how ecological grievances could become integrated into wider democratic demands. Ogungbemi (2024) similarly demonstrates how ecological discourse may function as symbolic resistance against environmental exploitation and political marginalization. Rather than treating environmental degradation as an isolated technical issue, protest discourse increasingly framed ecological protection as inseparable from citizenship, justice, and

public participation. Contemporary environmental discourse studies likewise emphasize that ecological conflicts often involve struggles over meaning, legitimacy, and political authority rather than disputes about science alone (Leipold et al., 2019).

Understanding environmental debate in Algeria therefore requires examining how environmental meanings are constructed through discourse, representation, and political narrative. Environmental discourse analysis investigates how societies define environmental problems, assign responsibility, and legitimize particular forms of action. Leipold et al. (2019) explain that discourse analysis enables researchers to examine “how environmental problems and their solutions are constructed, communicated and contested through language” (p. 447). In Algeria, state institutions, local communities, and environmental activists frequently construct nature through competing ideological frameworks. Traditional ecological discourse emphasizes coexistence, stewardship, and collective responsibility. Developmentalist discourse frames natural resources primarily as instruments of industrial modernization and national sovereignty. Environmental activism, by contrast, increasingly redefines ecological protection as a question of justice, democratic participation, and cultural survival. Isti’anah et al. (2024) further show that environmental representation in public discourse is closely connected to ideological framing and persuasive communication strategies that shape how nature is politically understood.

This study draws on the post-structural discourse theory developed by Laclau and Mouffe (2001), which conceptualizes discourse as a field of hegemonic struggle in which social meanings remain unstable and politically contested. According to Laclau (2005), political actors attempt to stabilize “floating signifiers” such as development, sovereignty, or justice in ways that reinforce particular ideological projects. Environmental politics therefore involves struggles not only over resources, but also over the meanings attached to nature, sustainability, and national development. The study also engages with ecolinguistic and cultural linguistic research examining how environmental identities and ecological values are constructed through language and symbolic representation (Handoko et al., 2024; Ogungbemi, 2024). Combining discourse theory with ecolinguistic perspectives makes it possible to examine environmental debate in Algeria as both a material and symbolic struggle shaped by historical memory, political authority, and competing visions of development.

Although environmental governance and climate vulnerability in North Africa have received increasing scholarly attention, relatively little research has examined Algerian environmental debates through a discourse theoretical and ecolinguistic perspective. Existing studies largely focus on technical water management, energy policy, or climate adaptation (Idda et al., 2021), while giving less attention to the linguistic and ideological construction of environmental meaning. Research rarely examines how traditional ecological knowledge, state developmental discourse, and environmental activism interact within broader struggles over sovereignty, identity, and political legitimacy. This gap remains significant because environmental discourse increasingly shapes public debates concerning governance, resource extraction, environmental justice, and democratic participation in Algeria.

The present study investigates how environmental meanings are constructed and contested across three major discursive formations in Algeria: traditional ecological discourse rooted in indigenous environmental practices, developmental discourse centered on industrialization and hydrocarbon extraction, and emergent environmental activism associated with anti-fracking mobilizations and wider social movements. Specifically, the study examines how traditional systems such as foggara irrigation and ghout oasis agriculture articulate cultural understandings of nature and stewardship; how developmental discourse frames environmental resources in relation to modernization and sovereignty; and how environmental activism redefines ecological protection within broader political struggles. Martínez Alier (2023) argues that environmental conflicts frequently evolve into wider movements for justice because affected communities experience ecological degradation as inseparable from inequality and political exclusion. To this end, the study pursues three interrelated objectives. First, it analyses how traditional

ecological practices such as foggara irrigation systems and ghout oasis agriculture articulate cultural understandings of nature and environmental stewardship in Algeria. Second, it investigates how state developmental discourse frames environmental resources in relation to industrial growth, hydrocarbon extraction, and national sovereignty. Third, it examines how environmental protest movements rearticulate ecological concerns and cultural heritage as elements of political resistance and democratic claims. The study therefore addresses the following research questions:

1. How is nature represented across traditional ecological discourse, developmental discourse, and environmental activism in Algeria?
2. How does developmental discourse construct the relationship between environmental resources, modernization, and sovereignty?
3. How do environmental movements mobilize ecological narratives within broader struggles over justice and democratic participation?

To address these questions, the study employs qualitative discourse analysis based on a purposively selected corpus consisting of policy documents, academic studies of traditional irrigation systems, environmental reports, media coverage of anti-fracking protests, and activist statements related to environmental mobilization in Algeria. Through this approach, the research examines how competing environmental narratives evolve across historical and political contexts and how different actors attempt to legitimize understandings of nature, development, and environmental responsibility. By combining discourse theory, ecolinguistics, and political ecology, the study contributes to broader discussions concerning ecological conflict, environmental justice, and the cultural politics of sustainability in postcolonial societies.

METHODS

Study Design

This study employs a qualitative single-case study design grounded in post-structural discourse analysis. Qualitative research is appropriate for examining environmental narratives because it investigates how meanings are socially and politically constructed through language and representation. Denzin and Lincoln (2018) explain that qualitative research seeks to interpret phenomena “in terms of the meanings people bring to them” (p. 43). Recent qualitative research further emphasizes that interpretive approaches are particularly suitable for examining socially constructed meanings embedded within political, cultural, and environmental texts (Aspers & Corte, 2019). Algeria was selected as the case study because environmental debates in the country intersect with hydrocarbon dependency, postcolonial development strategies, and emerging ecological activism. The study examines how environmental meanings are articulated and contested across traditional ecological discourse, developmental state narratives, and environmental activism. Using a post-structural approach, the research treats discourse as a space where competing representations of nature, development, and sustainability are produced through language.

Data Collection

The subjects of the study consisted of twenty-three publicly accessible texts related to environmental discourse in Algeria. The corpus was collected between January and March 2026 through purposive sampling, which prioritizes analytically relevant materials rather than statistical representativeness. Flick (2018) states that purposive sampling identifies materials that are “especially informative for the phenomenon under study” (p. 63). The selected texts included academic articles, environmental reports, governmental and policy documents, activist statements, and media coverage addressing environmental issues in Algeria. To ensure discursive diversity, the corpus was distributed across four categories: traditional ecological discourse, developmentalist state discourse, environmental protest discourse, and scientific or environmental governance discourse. Recent discourse studies also emphasize that heterogeneous textual corporation allows researchers to capture how meanings circulate across institutional, media, and activist

contexts (Wodak & Meyer, 2023). The corpus size was considered sufficient after thematic saturation was reached and no substantially new discursive patterns emerged.

The principal materials and analytical instruments used in this study were textual documents and qualitative coding procedures. Key materials included studies on foggara irrigation systems, governmental narratives concerning hydrocarbon development, reports on anti-fracking mobilizations, and environmental governance publications. Isti'anah et al. (2024) show that discourse strategically constructs environmental value through linguistic representation and evaluation, while Ogungbemi (2024) demonstrates how language constructs nature as an active ecological presence. Recent cultural discourse studies similarly demonstrate that linguistic representations frequently function as carriers of ecological and social values embedded within collective identity formations. All documents were archived digitally in PDF format to ensure consistency during the analytical process.

Data Analysis

The data were analyzed using a qualitative discourse-analytical approach informed by the discourse theory of Laclau and Mouffe (2001). The analysis began with repeated close readings of the entire corpus to identify recurring environmental themes, key signifiers, and dominant patterns of meaning across the texts, with particular attention to how concepts such as nature, development, sovereignty, sustainability, and environmental justice were articulated in different contexts. Following this familiarization stage, the texts were systematically coded to capture recurring signifiers, thematic formations, and patterns of articulation. Leipold et al. (2019) note that discourse analysis examines how environmental problems and their solutions are constructed, communicated, and contested through language (p. 447), and in line with this understanding, coding was used not only to categorize content but also to trace relational meaning-making across competing environmental narratives. Additionally, coding procedures in qualitative discourse research allow the systematic organization of discursive patterns, thematic categories, and ideological articulations within texts (Kuckartz & Rädiker, 2025). The analysis then proceeded in an iterative manner, moving between the coded data and the full corpus to compare and refine emerging patterns across traditional ecological discourse, state-centered developmental narratives, and environmental activism, thereby allowing shifts in environmental meaning to be examined across political and institutional contexts. Analytical rigour was ensured through repeated readings, iterative refinement of codes, and continuous comparison between textual extracts and broader discursive structures.

RESULTS

The discourse analysis of the corpus reveals the coexistence of three interconnected discursive formations that shape environmental debate in Algeria: traditional ecological discourse, developmentalist state discourse, and an emergent environmental counter discourse. These discourses compete to define the meanings of key signifiers such as nature, development, sustainability, and sovereignty, while simultaneously attempting to legitimize particular environmental and political agendas. Recent scholarship in environmental discourse analysis emphasizes that competing environmental narratives play a central role in shaping governance frameworks, public perception, and policy legitimacy by influencing how ecological problems and development priorities are interpreted within society (Leipold et al., 2019). Moreover, they argue that environmental discourse is not merely descriptive but also political because it structures which actors, forms of knowledge, and policy solutions are considered legitimate within environmental governance processes (Leipold et al., 2019).

In the Algerian context, these discursive formations correspond to distinct historical, political, and socio ecological conditions while remaining deeply interconnected within contemporary environmental debates. Traditional ecological discourse constructs nature through communal stewardship, ecological adaptation, and sustainable resource management rooted in indigenous practices. Developmentalist discourse, by contrast, frames natural resources primarily as strategic assets for industrial modernization,

economic growth, and national sovereignty. Emerging environmental counter discourse increasingly challenges this extractivist logic by linking ecological protection with democratic participation, environmental justice, and cultural identity. The analysis further demonstrates that environmental discourse in Algeria functions as a contested ideological field in which competing actors struggle to define legitimate relationships between society, nature, and development.

Traditional Ecological Discourse

Within the corpus, nature functions as a nodal point organized around ideas of ecological balance, communal stewardship, and adaptive sustainability. Traditional irrigation systems such as foggaras illustrate this discourse particularly clearly. As shown in Figure 1, foggara systems operate through underground galleries, vertical shafts, and gravity driven water distribution channels designed to transport groundwater efficiently across arid environments. These systems capture groundwater through underground galleries and distribute it through gravity driven channels without the use of mechanical pumps. As Idda and colleagues explain: “The groundwater is transported through the gallery to the surface.

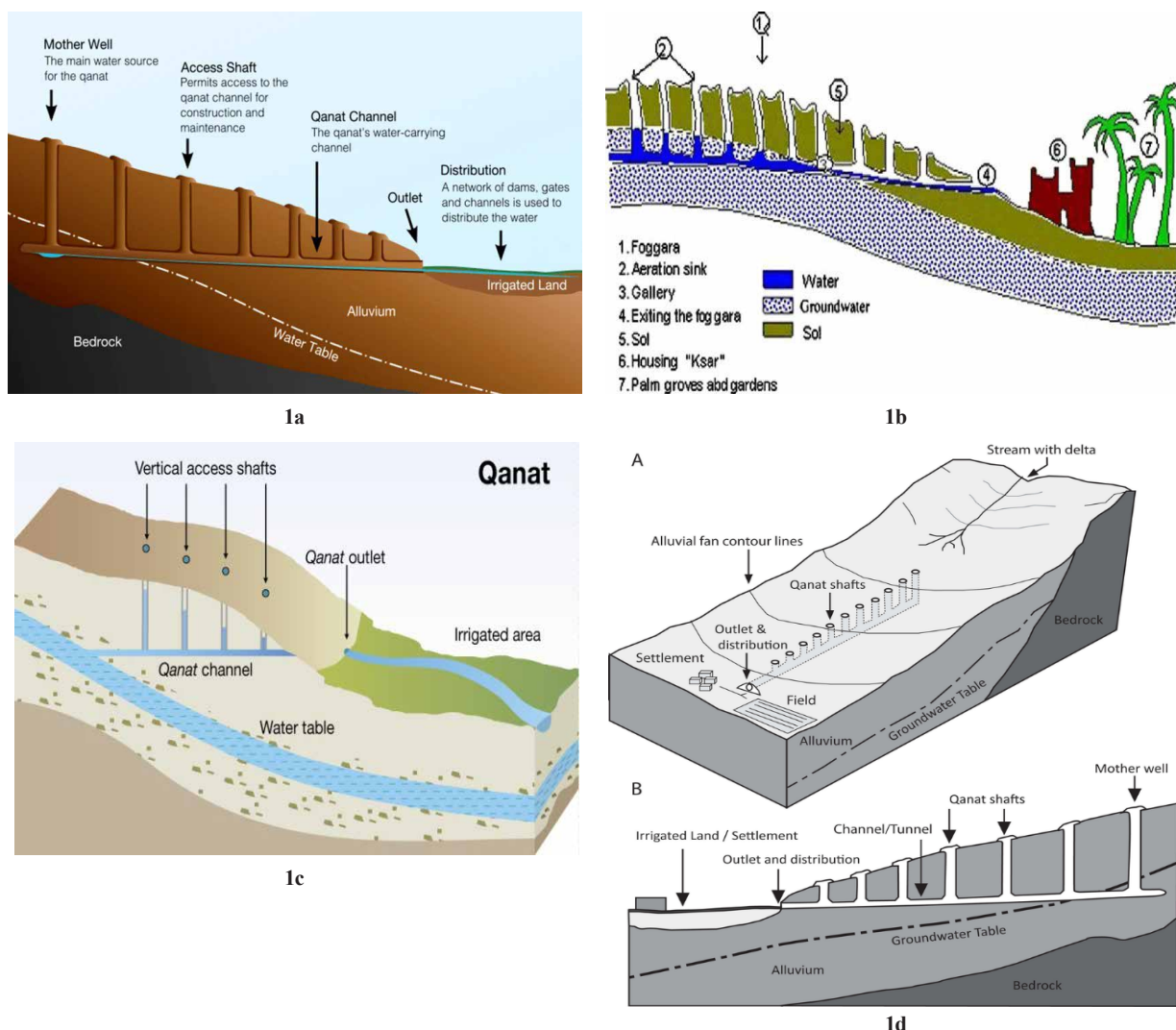


Fig 5. Conceptual diagrams illustrating the structure and hydrological functioning of foggara (qanat) irrigation systems in arid environments.

Source. (a) Cross-sectional schematic of a qanat system showing the mother well, access shafts, underground gallery, and water distribution toward irrigated land. Adapted from Remini, B. (2015), *Applied Water Science*. (b) Conceptual diagram of a Saharan foggara system illustrating aeration shafts, underground gallery, groundwater layers, ksar settlement, and palm groves typical of oasis agriculture. Adapted from Remini, B. (2015), *Applied Water Science*. (c) Simplified hydrological cross-section showing vertical shafts, groundwater table, and gravity-fed irrigation outlet typical of qanat systems. Adapted from Cressey, G. B. (1958), “Qanats, Karez, and Foggaras,” *Geographical Review*. (d) Three-dimensional conceptual model of a qanat irrigation system located on an alluvial fan, illustrating the relationship between mother wells, shafts, groundwater table, and irrigated settlements. Adapted from Cressey, G. B. (1958), *Geographical Review*, and later reproductions in hydrological studies of qanat systems.

A similar ecological logic can be observed in the ghout oasis system of the El Oued region. As illustrated in Figure 2, the ghout system consists of cultivated depressions excavated within Saharan dunes to allow date palms direct access to shallow groundwater while simultaneously generating localized microclimatic conditions that reduce evaporation and stabilize surrounding soils. Recent studies of oasis agriculture emphasize that ghout systems represent highly adaptive forms of indigenous environmental engineering specifically designed for arid ecosystems (Khebizi et al., 2023; Hamamouche et al., 2024). In this system, farmers excavate shallow depressions that allow date palms to access groundwater directly while simultaneously creating microclimatic conditions that reduce evaporation. As Khebizi et al. (2023) explain: “The excavation creates a favorable microclimate in which evaporation is reduced, soils are stabilized, and humidity is maintained locally” (Khebizi et al., p.15, 2023). The Food and Agriculture Organization of the United Nations [FAO] (2023) describes the ghout system as a multilayered agricultural structure that supports biodiversity and sustainable cultivation without the use of chemical inputs. These systems therefore, represent what contemporary sustainability research describes as “nature-based”.

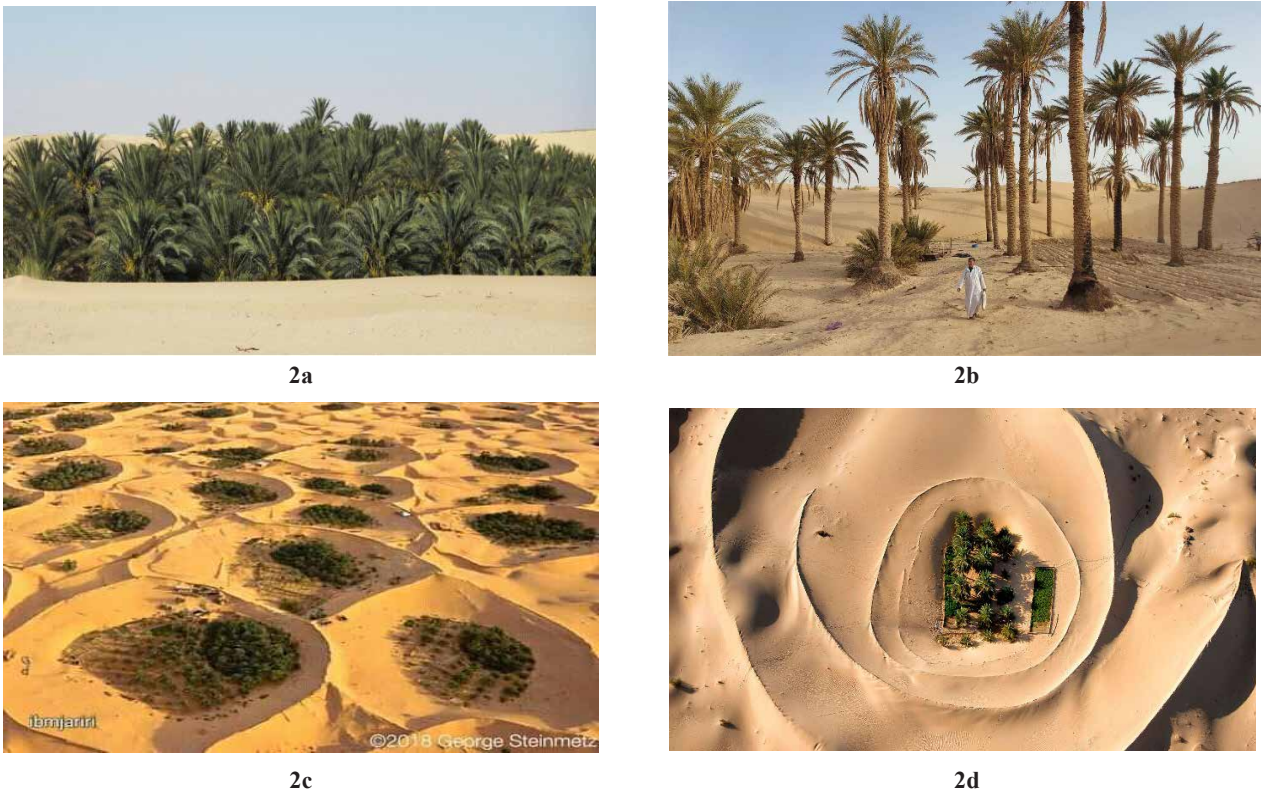


Fig. 2. Ghout oasis agricultural landscapes in the El Oued region of the Algerian Sahara

Source. a) Dense date palm oasis vegetation forming a linear green belt against surrounding Saharan sand dunes. Source: iStockphoto stock photography archive, “Date palm oasis in the Sahara Desert, Algeria.” (b) Date palms dispersed across sand dunes with a local inhabitant walking among the trees, illustrating human presence within Saharan oasis environments. Source: Shutterstock stock photography archive, “Man walking among palm trees in the Sahara Desert.” (c) Aerial view of a single ghout depression excavated in sand dunes to allow date palms to access shallow groundwater and create a localized microclimate. Source: FAO Globally Important Agricultural Heritage Systems (GIAHS), *Ghout Oasis System, El Oued, Algeria*. (d) Aerial photograph showing multiple ghout depressions forming a patterned oasis landscape across Saharan dune fields. Source: Steinmetz, G. (2018). *Aerial photography of Saharan oasis systems*, © George Steinmetz.

Figure 2 further demonstrates how oasis agriculture in El Oued integrates environmental adaptation, groundwater management, and settlement organization within an arid Saharan ecosystem. The aerial and landscape representations visually reinforce recent environmental research arguing that traditional oasis systems in North Africa function as resilient socio ecological infrastructures capable of sustaining agricultural production under conditions of climatic stress and desertification (Ben Hassen et al., 2025). The spatial organization of ghout depressions visible in Figure 2 also reflects forms of ecological planning based on long term environmental adaptation and communal resource management characteristic of Saharan agricultural societies (Hamamouche et al., 2024).

Together, these examples illustrate a discourse in which environmental stewardship is framed as a

communal responsibility rooted in cultural heritage and ecological knowledge. In this discourse, nature is not merely an economic resource but a living system requiring careful management and collective governance.

Development-First Discourse

In contrast to traditional ecological narratives, the developmentalist discourse that emerged after Algerian independence frames natural resources primarily as engines of economic growth, industrial modernization, and national sovereignty. Within this discourse, the signifier *development* functions as the principal nodal point organizing environmental meaning and legitimizing state-centered extractive policies. The nationalization of hydrocarbons in 1971 and the ideological orientation of the 1976 National Charter consolidated a development model centered on industrialization, centralized planning, and state-controlled resource extraction. Environmental politics scholars frequently observe that postcolonial developmental discourse tends to construct natural resources as strategic instruments for modernization and economic autonomy rather than ecological systems requiring protection (Dryzek, 2013).

Within this narrative, hydrocarbon reserves are repeatedly represented as symbols of national progress, economic independence, and political sovereignty. Environmental concerns are therefore often subordinated to industrial and economic priorities. Similar discursive patterns have been identified in many resource dependent economies where extractive industries are framed as necessary foundations for modernization and national development (Leipold et al., 2019). Contemporary sustainability scholarship further argues that dominant development narratives frequently minimize ecological risks by emphasizing economic growth, technological control, and national competitiveness while marginalizing environmental vulnerability and social inequality (Blythe et al., 2018). In the Algerian context, this developmental logic remains visible within official discourse surrounding unconventional hydrocarbon extraction and long term energy policy planning (IEA, 2025).

Political narratives surrounding shale gas extraction particularly illustrate how developmental discourse constructs environmental resources through economic and technocratic frameworks. Belakhdar (2020) documents how governmental discourse represented shale gas reserves as a “divine gift” capable of securing Algeria’s economic future and preserving national energy sovereignty. Through this framing, hydrocarbon extraction becomes associated with patriotic obligation, economic security, and state stability rather than ecological risk. Environmental discourse analysis similarly demonstrates that state and institutional narratives frequently employ technocratic language to normalize extractive development and legitimize environmentally controversial projects (Turnhout et al., 2020). Studies in cultural discourse analysis further indicate that political and institutional language often commodifies nature by transforming environmental resources into measurable economic assets and development indicators (Isti’annah et al., 2024).

As a result, environmental risks such as groundwater contamination, desertification, and ecological degradation are frequently minimized or represented as manageable through technological expertise and administrative regulation. This discourse constructs environmental protection as secondary to economic necessity and energy security. Martínez Alier (2023) argues that such extractivist narratives often generate ecological conflicts because local environmental concerns become subordinated to national economic priorities and state-centered development agendas. Within the Algerian case, developmental discourse therefore operates not only as an economic framework but also as an ideological system that defines legitimate relationships between nature, sovereignty, and modernization.

Emergency Environmental Counter-Discourse

The third discursive formation identified in the corpus is an emergent environmental counter discourse that challenges the dominance of extractivist development narratives. This discourse became particularly visible during the anti-fracking protests that occurred in southern Algeria between 2014 and 2015. As

illustrated in Figure 3, demonstrations in cities such as In Salah and Ouargla articulated environmental concerns together with broader political claims regarding sovereignty, democratic participation, and regional justice. The protest imagery presented in Figure 3 visually demonstrates how environmental activism in Algeria combined ecological resistance with nationalist symbolism, collective mobilization, and public opposition to shale gas extraction.

Protest slogans frequently framed shale gas extraction as a threat to both environmental sustainability and national autonomy. During demonstrations in Ouargla, protesters declared: “They sold the Sahara for dollars!” (Belakhdar, 2020, p. 36). Other slogans emphasized sovereignty and collective ownership of natural resources: “National sovereignty is the red line” and “We are all In Salah” (Belakhdar, 2020). One protester articulated the perceived injustice of environmental risk distribution in the following terms: “If fracking is not harmful... then they should drill near the Presidential Palace! We are not laboratory animals!” (Belakhdar, 2020, p. 37). Figure 3 further illustrates how protest discourse transformed environmental concerns into visible forms of political resistance through banners, slogans, and national symbols associated with collective identity and democratic mobilization.



3a



3b



3c



3d

Fig. 3. Anti-fracking mobilizations in Ouargla and In Salah, Algeria, during the 2014–2015 protests

Source. (a) Demonstration in Ouargla showing protesters carrying Algerian flags and a banner reading “NO to SHALE GAS.” Photograph by Naoual Belakhdar, March 14, 2015. Source: Belakhdar (2020), *Middle East Report*. (b) Protesters waving Algerian flags during anti-fracking demonstrations in southern Algeria following the government’s announcement of shale gas exploration in 2015. Source: international press photography coverage of the Ouargla and In Salah protests (Reuters / AFP–Getty Images). (c) Crowd holding a banner reading “Say No to Shale Gas” during the Ouargla rally organized by the anti-fracking coalition and unemployed movement, March 13–14, 2015. Photograph by Naoual Belakhdar. Source: Belakhdar (2020), *Middle East Report*. (d) Protester holding a sign reading “لا للغاز الصخري” (“No to shale gas”) during anti-fracking demonstrations in southern Algeria in 2015. Source: photographic documentation of the Ouargla protests reported in Belakhdar (2020) and Amnesty International reports on the anti-fracking mobilizations.

These discursive articulations connect environmental concerns with broader critiques of political authority and economic governance. Protest discourse therefore constructs chains of equivalence linking environmental protection, democratic accountability, and national sovereignty. Environmental discourse scholars note that such mobilizations often challenge dominant development narratives by

reframing environmental protection as an issue of political justice and social rights (Leipold et al., 2019). Recent studies of environmental activism similarly argue that ecological protest movements frequently emerge when local communities perceive environmental degradation as inseparable from political exclusion, unequal resource distribution, and failures of democratic governance (Martínez Alier, 2023). Contemporary ecolinguistic scholarship further demonstrates that protest language functions not only as political communication but also as symbolic resistance against extractivist ideologies and environmental exploitation (Ogungbemi, 2024).

Comparative Discursive Structure

The interaction between these three discourses can be summarized through the comparative articulation of key signifiers across the corpus. As shown in Table 1, each discursive formation constructs fundamentally different meanings around concepts such as nature, development, sovereignty, and water. The comparative structure presented in Table 1 illustrates how traditional ecological discourse frames nature as a living ecological system grounded in communal stewardship, while developmental discourse represents natural resources primarily as strategic economic assets linked to industrial modernization and state sovereignty. In contrast, the emergent environmental counter discourse reconstructs nature as a threatened commons connected to democratic participation, environmental justice, and sustainable transformation. Recent scholarship in environmental discourse analysis emphasizes that competing environmental discourses frequently organize political conflicts by assigning different ideological meanings to shared environmental signifiers (Leipold et al., 2019). Similarly, Laclau and Mouffe (2001) argue that political struggle often emerges through attempts to stabilize contested meanings around central social signifiers.

Table 1. Comparative articulation of key environmental signifiers across the three discourses identified in the corpus.

Signifier	Traditional discourse	Development discourse	Counter discourse
Nature	Living ecological system	Economic resource	Threatened commons
Development	Ecological adaptation	Industrial modernization	Sustainable transformation
Sovereignty	Communal governance	State control	Popular democracy
Water	Shared collective resource	Strategic national asset	Cultural and human right

Table 1 further demonstrates that environmental discourse in Algeria operates as a contested ideological field in which competing actors seek to define legitimate relationships between society, nature, governance, and development. From a discourse theoretical perspective, these competing articulations reflect struggles over the stabilization of key signifiers such as sovereignty, development, and sustainability within broader hegemonic projects (Laclau & Mouffe, 2001). The comparative patterns identified in Table 1 also illustrate how environmental meanings shift according to political and historical context, revealing tensions between extractivist modernization models and emerging ecological justice narratives. Recent environmental discourse scholarship similarly argues that environmental conflicts frequently emerge through competing attempts to legitimize different models of governance, resource management, and socio ecological futures (Leipold et al., 2019). In the Algerian case, the interaction between these discourses demonstrates how environmental debates increasingly function as broader negotiations over political legitimacy, democratic participation, and cultural identity within contemporary environmental governance (Martínez Alier, 2023).

Temporal Evolution of Environmental Discourse

The historical evolution of these discourses reveals a gradual shift from traditional ecological knowledge systems toward industrial developmentalism during the post independence period, followed by the emergence of environmental counter narratives in response to contemporary ecological conflicts and extractive policies. These discursive transformations reflect broader political and economic changes

in Algeria's resource governance model, particularly the transition from locally embedded environmental stewardship to centralized state led development strategies centered on hydrocarbon extraction and territorial modernization (Dryzek, 2013). As illustrated in Figure 4, environmental governance during the post independence era increasingly relied on large scale technocratic interventions such as the Green Dam (*Barrage Vert*) reforestation project, which was designed to combat desertification across northern Algeria through state directed environmental planning.



Fig. 4. The Green Dam (Barrage Vert) project and its geographic extent across northern Algeria.

Source. Map illustrating the location and spatial extent of the Green Dam (Barrage Vert), a large-scale reforestation program initiated in the 1970s to combat desertification and soil degradation along Algeria's northern fringe of the Sahara. Adapted from Saifi, M., Boulghobra, N., and Fattoum, L. (2015), *The Green Dam in Algeria as a tool to combat desertification*, *Planet@Risk*, 3(1), 68–71.

Figure 4 demonstrates the extensive territorial scope of the Green Dam initiative stretching across the Saharan frontier, reflecting how environmental protection became integrated into broader state modernization and land management policies. Recent environmental governance research emphasizes that large scale anti desertification projects in North Africa frequently combine ecological objectives with political, territorial, and developmental agendas (Cherlet et al., 2018). Although the Green Dam project was officially framed as an environmental protection strategy, scholars have also noted that such initiatives often operate within centralized developmental frameworks that prioritize state control over local ecological participation (Turnhout et al., 2020). The historical evolution of environmental discourse in Algeria therefore illustrates an ongoing tension among traditional ecological adaptation, state-centered developmentalism, and emerging environmental justice narratives within contemporary debates on sustainability and governance.

The historical evolution of environmental discourse in Algeria therefore, reflects a gradual transformation in the relationship between environmental governance, political authority, and development priorities. While traditional ecological discourse emphasized communal adaptation and sustainable resource management, post-independence developmentalism increasingly institutionalized technocratic and extractivist approaches to environmental governance. Over time, however, ecological conflicts associated with desertification, water scarcity, and shale gas extraction contributed to the emergence of environmental counter discourses that challenged dominant state narratives. As illustrated in Figure 5, these historical shifts correspond to major political and economic turning points including hydrocarbon nationalization, industrial modernization policies, anti-fracking mobilizations, and the

Hirak movement. The figure demonstrates how environmental discourse progressively evolved from localized ecological stewardship toward broader political struggles concerning sovereignty, democratic participation, and environmental justice (Belakhdar, 2020). Recent environmental governance research similarly emphasizes that environmental conflicts frequently reshape dominant development narratives by transforming ecological concerns into wider debates over legitimacy, citizenship, and sustainable futures (Martínez Alier, 2023; Turnhout et al., 2020).

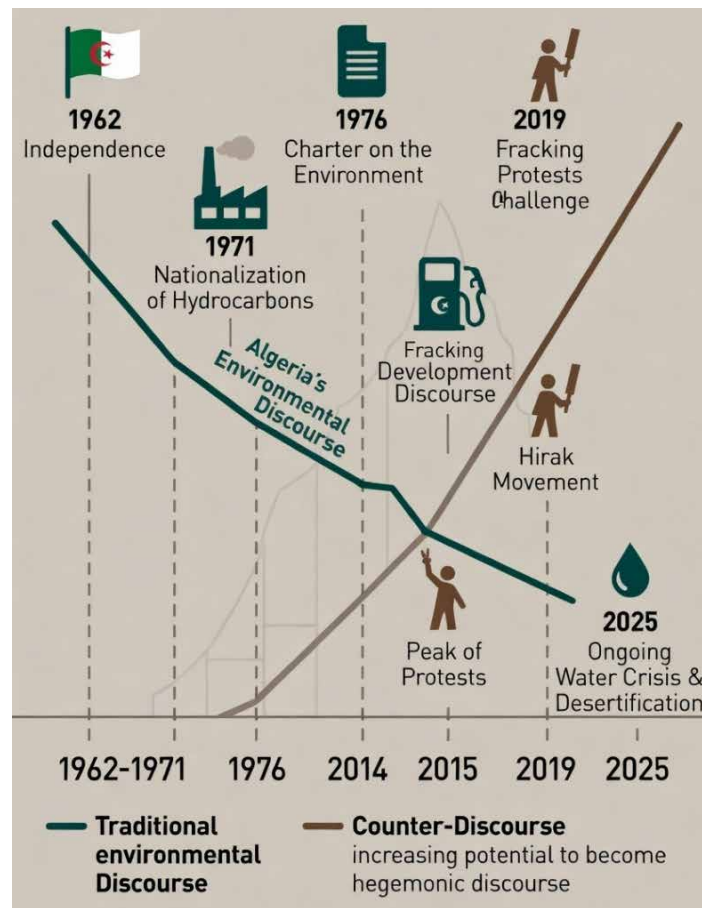


Fig. 5. Evolution of environmental discourse in Algeria from independence to contemporary environmental mobilization

Source. Conceptual timeline constructed by the author to illustrate the transformation of environmental discourse in Algeria from post-independence developmentalism to contemporary environmental counter-discourses. The timeline integrates key historical and political events including Algerian independence (1962), hydrocarbon nationalization (1971), the National Charter and state-led industrial development policies (1976), the announcement of shale gas exploration and subsequent anti-fracking protests in In Salah and Ouargla (2014–2015), the Hirak protest movement (2019), and ongoing environmental challenges related to water scarcity and desertification. The conceptual interpretation is based on historical and analytical sources including Belakhdar (2020) on anti-fracking mobilizations and environmental activism in the Sahara, as well as recent climate and energy assessments of Algeria reported by the International Energy Agency (IEA, 2025).

Recent climate assessments suggest that desertification, groundwater depletion, and water scarcity are intensifying across North Africa, thereby increasing the political significance of environmental governance and resource conflicts (IEA, 2025; IPCC, 2022). Within this context, the findings indicate that environmental counter discourse increasingly challenges the developmentalist paradigm that has historically structured Algerian resource governance. Environmental discourse in Algeria is therefore no longer confined to technocratic debates concerning energy production or resource management but has evolved into a broader ideological field in which competing actors negotiate questions of sovereignty, ecological justice, democratic participation, and sustainable futures. Contemporary environmental mobilizations consequently reflect not only resistance to extractive policies, but also wider struggles over political legitimacy and the social organization of environmental responsibility within postcolonial Algeria (Martínez Alier, 2023).

DISCUSSION

The findings of this study demonstrate that environmental discourse in Algeria emerges through the interaction between cultural heritage, political economy, and contemporary ecological conflict. The analysis reveals that environmental meanings are not fixed or purely technical but are continuously constructed and contested through competing political and cultural narratives. Traditional ecological systems such as *foggaras* and *ghouts* function not only as irrigation infrastructures but also as symbolic representations of communal stewardship, ecological adaptation, and sustainable coexistence with arid environments. In this respect, the Algerian case supports broader environmental discourse scholarship emphasizing that environmental governance is shaped not only by material conditions but also by the ways ecological relationships are interpreted and represented within society (Leipold et al., 2019).

The findings further indicate that traditional ecological practices in Algeria embody locally embedded environmental knowledge developed through centuries of adaptation to Saharan climatic conditions. Systems such as *foggaras* and *ghouts* demonstrate forms of water governance based on collective management, ecological limitation, and intergenerational responsibility rather than intensive extraction. Similar conclusions have been reached in recent sustainability research highlighting the importance of indigenous ecological knowledge for climate adaptation and long-term environmental resilience (Ben Hassen et al., 2025). The present study extends this literature by demonstrating that these systems also operate discursively as cultural symbols mobilized within contemporary debates concerning sustainability and development. Recent studies in ecolinguistics and cultural discourse analysis similarly emphasize that environmental meanings are frequently embedded within symbolic language, ritual discourse, and collective cultural narratives that regulate relationships between communities and nature (Handoko et al., 2024; Pratiwy et al., 2024). In the Algerian context, traditional ecological infrastructures therefore acquire significance not only as historical technologies but also as counter symbolic models challenging extractivist development narratives.

The analysis also demonstrates that developmentalist discourse continues to frame environmental resources primarily through the language of modernization, economic growth, and national sovereignty. Following independence, hydrocarbon extraction became closely associated with state legitimacy and postcolonial economic autonomy. Environmental concerns were consequently subordinated to industrial priorities and centralized resource governance. This finding corresponds with broader environmental governance research demonstrating that resource dependent states frequently construct extractive industries as strategic foundations of modernization and national stability (Dryzek, 2013). Contemporary policy discourse surrounding shale gas extraction similarly illustrates how technocratic narratives attempt to normalize environmentally controversial projects through economic and developmental rhetoric. As Belakhdar (2020) demonstrates, official discourse frequently represented shale gas as a strategic opportunity capable of securing Algeria's economic future despite widespread ecological concerns in affected regions.

At the same time, the findings reveal that environmental counter discourse increasingly challenges this developmentalist paradigm by linking ecological concerns with broader demands for democratic participation, regional justice, and political accountability. The anti-fracking mobilizations in In Salah and Ouargla transformed environmental protest into a wider critique of extractive governance and uneven risk distribution. Rather than framing environmental degradation solely as a technical issue, protest discourse articulated ecological protection as inseparable from citizenship, sovereignty, and social justice. These findings support recent political ecology research emphasizing that environmental conflicts frequently emerge through struggles over legitimacy, participation, and resource control rather than purely ecological disagreement (Martínez Alier, 2023). Contemporary ecolinguistic studies similarly demonstrate that protest language frequently functions as symbolic resistance against systems of environmental exploitation and political marginalization (Ogungbemi, 2024). The Algerian case therefore, illustrates how environmental

discourse can become integrated within broader postcolonial struggles concerning authority, governance, and national identity. The study additionally demonstrates that competing environmental discourses in Algeria correspond to different governance paradigms concerning the relationship between society and nature. Traditional ecological discourse frames water and land as shared collective resources governed through communal stewardship and environmental limitation. Developmentalist discourse, by contrast, represents environmental resources as strategic national assets requiring centralized state management and technological intervention. Environmental counter discourse rearticulates these same resources as threatened commons connected to democratic participation and ecological justice. Similar patterns have been identified within environmental governance scholarship, which emphasizes that environmental conflicts frequently reflect competing normative frameworks concerning sustainability, legitimacy, and policy authority (Turnhout et al., 2020). The findings therefore reinforce discourse theoretical perspectives arguing that political struggles often emerge through attempts to stabilize contested meanings around central signifiers such as development, sovereignty, and sustainability (Laclau & Mouffe, 2001).

Recent climate and sustainability assessments further increase the significance of these discursive tensions. Intensifying desertification, groundwater depletion, and water scarcity across North Africa are likely to increase pressure on existing governance models and resource management strategies (IPCC, 2022). Contemporary environmental policy in Algeria continues to prioritize technocratic interventions such as desalination infrastructure, renewable energy expansion, and rehabilitation of the Green Dam project (IEA, 2025). Although these initiatives are officially framed as sustainability strategies, the findings suggest that they frequently remain embedded within centralized developmental frameworks prioritizing technological management over participatory ecological governance. Similar critiques have been raised in recent sustainability scholarship arguing that environmental policies centered exclusively on technological solutions risk marginalizing local ecological knowledge and reproducing existing political inequalities (Blythe et al., 2018). Recent Algerian water governance research similarly argues that water management remains shaped by “the logics of a rentier state centred on oil and natural gas” (Benyovszky, 2025, p. 619). Kherbache (2020) further observes that “water management continues to focus on upstream water mobilization without downstream valorization” (p. 141), illustrating the persistence of supply side governance approaches despite intensifying environmental pressures. In contrast, the findings of this study suggest that traditional irrigation systems such as foggaras and ghouts may provide important models for locally adapted climate resilience and sustainable water governance within arid ecosystems.

The findings also carry broader theoretical implications for environmental discourse studies and political ecology research. The Algerian case demonstrates that environmental discourse in postcolonial contexts cannot be reduced to technical debates concerning climate adaptation or resource management alone. Instead, environmental narratives become deeply connected to questions of sovereignty, historical memory, democratic participation, and cultural identity. Similar conclusions have been reached in recent environmental justice scholarship emphasizing that ecological conflicts frequently function as broader struggles over political legitimacy and social power (Martínez Alier, 2023). The study therefore contributes to discourse analytical scholarship by illustrating how ecological conflict functions simultaneously as an environmental, political, and symbolic struggle. This finding supports Leipold et al.’s argument that environmental discourse analysis examines “how environmental problems and their solutions are constructed, communicated and contested through language” (2019, p. 447). The integration of discourse theory with ecolinguistic perspectives additionally demonstrates the importance of language, metaphor, and cultural representation in shaping environmental governance debates and sustainability narratives (Ogungbemi, 2024; Handoko et al., 2024).

Several limitations should nevertheless be acknowledged. The study relies on qualitative discourse analysis based on a purposively selected textual corpus rather than ethnographic observation or quantitative environmental data. Consequently, the research examines how environmental meanings are constructed and contested within public discourse rather than evaluating the material effectiveness of

specific environmental policies or irrigation systems. As Wodak and Meyer (2023) emphasize, discourse analytical research primarily investigates the production and circulation of meaning within social and political contexts rather than causal measurement of policy outcomes. Furthermore, the study focuses primarily on nationally visible environmental debates and may not fully capture localized variations in environmental discourse across different Algerian regions and communities. Kherbache (2020) similarly argues that Algerian environmental governance remains characterized by “a lack of institutional coordination and many multi level governance gaps” (p. 141), suggesting the need for more localized and interdisciplinary environmental research.

Future research may further investigate how environmental discourse in Algeria evolves in response to intensifying climate pressures, renewable energy transitions, and changing regional geopolitics. Comparative studies examining environmental discourse across other North African and Maghreb countries could provide deeper insight into how postcolonial societies negotiate tensions between extractive development, ecological sustainability, and democratic participation. Recent political ecology scholarship increasingly emphasizes the importance of comparative approaches for understanding how environmental governance models circulate across regions shaped by shared colonial and extractive histories (Malik, 2024). Additional ecolinguistic research may also explore how environmental narratives circulate through digital activism, local media, literature, and youth environmental movements in contemporary Algeria. Studies in cultural discourse analysis further suggest that digital communication increasingly shapes public understandings of ecological crisis, environmental justice, and sustainability (Isti'anah et al., 2024).

CONCLUSION

This study has demonstrated that environmental discourse in Algeria operates as a contested ideological field shaped by the interaction between traditional ecological knowledge, developmentalist state narratives, and emergent environmental activism. The findings reveal that traditional irrigation systems such as *foggaras* and *ghouts* function not only as adaptive environmental infrastructures but also as symbolic representations of communal stewardship and ecological sustainability. Recent research on Saharan water governance similarly emphasizes that traditional irrigation systems remain important forms of locally adapted ecological resilience under intensifying climate pressures (Ben Hassen et al., 2025). In the *ghout* system of El Oued, agricultural depressions create “a favorable microclimate in which evaporation is reduced, soils are stabilized and humidity is maintained locally” (Khebizi et al., 2023). These findings support ecolinguistic scholarship demonstrating that environmental meanings are embedded within cultural narratives and collective ecological identities (Handoko et al., 2024).

In contrast, post-independence developmental discourse has historically framed natural resources through the language of modernization, industrial growth, and national sovereignty. Environmental counter discourse, particularly during the anti-fracking mobilizations in southern Algeria, increasingly challenged this extractivist paradigm by linking ecological protection with democratic participation and environmental justice. As Belakhdar (2020) demonstrates, environmental protest in Algeria evolved into a broader critique of political legitimacy and resource governance. The findings therefore reinforce environmental discourse scholarship emphasizing that environmental governance is shaped not only by ecological conditions but also by competing narratives that define legitimate forms of development and sustainability (Leipold et al., 2019).

Nevertheless, the study remains limited by its qualitative focus on textual discourse rather than ethnographic observation or quantitative environmental assessment. Future research may therefore combine discourse analysis with fieldwork and comparative North African case studies to examine how environmental narratives evolve across different social and political contexts. Ultimately, the study demonstrates that the future of environmental governance in Algeria will depend not only on technological and economic capacity, but also on how competing actors negotiate the meanings of sovereignty,

sustainability, and ecological responsibility within an increasingly climate-vulnerable region.

ETHICS STATEMENT

The author has read and followed the ethical requirements for publication in *Jurnal Digital Sociohumanities*. The present study does not involve human participants, animal experimentation, clinical data, or personal data collected from social media platforms. The research is based exclusively on publicly accessible academic publications, policy documents, environmental reports, and media materials used for qualitative discourse analysis.

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DECLARATION OF COMPETING INTERESTS

The author declares that there are no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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APPENDIX A

Corpus of Texts Used in the Discourse Analysis

ID	Discursive Formation	Source	Year	Link
1	Traditional ecological discourse	Idda, S., Bonté, B., Kuper, M., & Mansour, H. (2021). <i>Revealing the foggara as a living irrigation system through an institutional analysis: Evidence from oases in the Algerian Sahara. International Journal of the Commons</i> , 15(1), 431–448.	2021	https://doi.org/10.5334/ije.1128
2	Traditional ecological discourse	Food and Agriculture Organization of the United Nations. (2023). <i>Ghout oasis system, El Oued, Algeria. Globally Important Agricultural Heritage Systems</i> .	2023	https://www.fao.org/giahs/giahs-around-the-world/algeria-ghout-oasis-system/en
3	Traditional ecological discourse	Remini, B., Achour, B., & Albergel, J. (2015). <i>The foggara of Moghrar (Algeria): An irrigation system millennium old. Applied Water Science</i> , 5(4), 361–373.	2015	https://doi.org/10.1007/s13201-014-0195-5
4	Developmentalist discourse	People's Democratic Republic of Algeria. <i>Charte nationale (National Charter)</i> . Official state ideological and development policy document establishing post-independence socialist and industrial modernization objectives.	1976	Journal officiel de la République algérienne démocratique et populaire (JORADP)
5	Developmentalist discourse	Ministry of Energy of Algeria. <i>Hydrocarbon Law Reform and Energy Sector Development Policy Documents</i> . Official governmental discourse concerning hydrocarbon investment, energy modernization, and national resource governance.	2019	https://www.energy.gov.dz
6	Developmentalist discourse	Organization of the Petroleum Exporting Countries (OPEC). <i>Algeria facts and figures: Energy profile and hydrocarbon sector overview</i> . Institutional discourse emphasizing hydrocarbons, national production, and energy development strategies.	2022	https://www.opec.org
7	Developmentalist discourse	World Bank. <i>Algeria economic update: Energy sector and growth model</i> . Institutional economic discourse concerning hydrocarbon dependency, growth policy, and energy sector modernization in Algeria.	2023	https://www.worldbank.org
8	Developmentalist discourse	International Energy Agency. <i>Energy policy review: Algeria</i> . Institutional policy discourse concerning energy security, hydrocarbon governance, and national development strategies.	2022	https://www.iea.org
9	Environmental protest discourse	Belakhdar, N. "Algeria is not for sale!" <i>Mobilizing against fracking in the Sahara. Middle East Report</i> , 296. Analysis of anti-fracking protest discourse, environmental mobilization, and resource sovereignty in southern Algeria.	2020	https://merip.org/2020/10/algeria-is-not-for-sale
10	Environmental protest discourse	Al Jazeera. <i>Algeria protests over shale gas fracking</i> . News coverage documenting anti-fracking demonstrations, protest discourse, and environmental opposition movements in southern Algeria.	2015	https://www.aljazeera.com
11	Environmental protest discourse	<i>The New York Times</i> . <i>Protests in Algeria over shale gas exploration</i> . International media coverage of anti-fracking mobilizations and environmental contestation in southern Algeria.	2015	https://www.nytimes.com
12	Environmental protest discourse	Amnesty International. <i>Algeria: Protesters arrested during anti-fracking demonstrations</i> . Human rights reporting on protest repression, environmental activism, and political contestation surrounding shale gas extraction in Algeria.	2015	https://www.amnesty.org

13	Environmental protest discourse	Qantara.de. <i>Anti-fracking protests in Algeria: Revolution rising from the desert</i> . Transnational media discourse concerning environmental protest, regional marginalization, and political resistance in southern Algeria.	2015	https://www.qantara.de
14	Environmental protest discourse	Middle East Eye. <i>Algeria shale gas protests spread across Sahara</i> . Media coverage of anti-fracking mobilizations, environmental resistance, and regional protest dynamics in southern Algeria.	2015	https://www.middleeasteye.net
15	Environmental protest discourse	Reuters. <i>Algerians protest against shale gas exploration</i> . International news coverage documenting environmental demonstrations and opposition to shale gas extraction in southern Algeria.	2015	https://www.reuters.com
16	Environmental protest discourse	University of Chicago, Institute for Middle East Studies. <i>Environmental exploitation triggers protests across Algeria</i> . Institutional commentary discussing environmental mobilization, extractive politics, and protest movements in Algeria.	2016	https://imes.uchicago.edu
17	Environmental protest discourse	BBC News. <i>Algeria shale gas protests continue in the Sahara</i> . International media coverage of environmental protest movements and anti-fracking mobilizations in southern Algeria.	2015	https://www.bbc.com
18	Environmental protest discourse	France24. <i>Algerian protesters oppose shale gas development</i> . International media coverage of anti-fracking demonstrations and environmental resistance movements in Algeria.	2015	https://www.france24.com
19	Scientific/environmental governance discourse	International Energy Agency. <i>The future of electricity in the Middle East and North Africa</i> . Institutional environmental and energy governance discourse concerning climate resilience, energy transition, and sustainability policy in the MENA region.	2025	https://www.iea.org/reports
20	Scientific/environmental governance discourse	Food and Agriculture Organization of the United Nations. <i>Desertification and land degradation in North Africa</i> . Institutional environmental governance discourse concerning land degradation, climate vulnerability, and sustainable resource management in the MENA region.	2023	https://www.fao.org
21	Scientific/environmental governance discourse	United Nations Environment Programme. <i>Climate change adaptation in North Africa</i> . Institutional environmental governance discourse concerning regional climate vulnerability, adaptation policy, and sustainability strategies.	2022	United Nations Environment Programme
22	Scientific/environmental governance discourse	World Resources Institute. <i>Water stress and climate risks in North Africa</i> . Institutional environmental governance discourse concerning regional water scarcity, climate vulnerability, and sustainability challenges.	2023	https://www.wri.org
23	Scientific/environmental governance discourse	Intergovernmental Panel on Climate Change. <i>Climate change 2022: Impacts, adaptation and vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change</i> . Scientific and environmental governance discourse concerning climate vulnerability, adaptation, and regional environmental risks in North Africa.	2022	https://www.ipcc.ch
