

Environmental Governance in Morocco: A Critical Geographic Analysis of the Normative-Implementation Gap in the Rabat-Salé-Kénitra Region

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Abstract

Environmental governance has become a structural challenge across the Mediterranean basin and the MENA region, as IPCC (2022) projections signal accelerating aridification, mounting water stress, and deepening ecosystem degradation. Morocco's sustained international engagement, from COP22 hosting to the adoption of the Stratégie Nationale de Développement Durable 2017-2030, illustrates a paradox characteristic of middle-income states: a well-constructed normative framework coexisting with persistent and well-documented implementation difficulties. This article analyses how the gap between Morocco's national environmental normative framework and its effective territorial implementation manifests in the Rabat-Salé-Kénitra (RSK) region, the country's institutional core.

The research adopts an exploratory three-pillar mixed-method approach based on secondary sources: systematic documentary analysis of the national environmental legal corpus and its regional articulation through IAD coding (Ostrom, 1990); territorial analysis of RSK's multi-sectoral environmental pressures using secondary GIS-based indicators disaggregated across seven prefectures and provinces; and institutional analysis mapping governance actors, competences, and structural constraints.

Available evidence indicates a normatively coherent national framework that undergoes systematic attenuation at regional and sub-territorial scales. RSK simultaneously faces concurrent pressures in water management, sanitation, solid waste, air quality, and biodiversity, distributed unequally across its sub-territories. Structural governance constraints, namely coordination deficits, fiscal asymmetries, human capital shortfalls, and low enforcement frequency, appear to account for the observed implementation gap, which follows the spatial logic of intra-regional social inequality.

The study contributes a replicable three-pillar analytical framework for diagnosing environmental governance challenges at regional scale, designed for application to other Moroccan regions and comparable MENA governance contexts.

Keywords: environmental governance · Morocco · Rabat-Salé-Kénitra · normative-implementation gap · multi-level governance · environmental justice

1. Introduction

The IPCC Sixth Assessment Report (2022) projects severe climate risks for North Africa, including accelerating aridification, water stress, and ecosystem degradation, that have made environmental governance a defining challenge of the century, particularly in the MENA region (Sowers et al.,

2011). A structural paradox motivates this article: elaborately constructed legal frameworks coexist with persistent implementation difficulties, suggesting a systemic disconnect between normative design and governance practice.

Morocco illustrates this paradox with particular clarity. Despite assembling one of Africa's most comprehensive environmental legal arsenals, spanning water law, environmental impact assessment, waste regulation, and a sustainable development framework charter, implementation indicators remain concerning (World Bank, 2021; Zair, 2011). The Rabat-Salé-Kénitra (RSK) region constitutes a privileged observation terrain for five reasons: its status as the capital region, concentrating national institutions and specialised agencies; rapid metropolisation producing peri-urban sprawl and coastal pressure; an internal diversity spanning urban poles, agricultural plains, forests, and an Atlantic coastline; concurrent multi-sectoral environmental pressures; and an institutional paradox whereby proximity to central power coexists with persistent local governance deficits (HCP, 2023; Conseil Régional RSK, 2022).

The literature on Moroccan environmental governance has addressed the national normative framework and sectoral policies with some depth (Haddad, 2016; Zair, 2011), but it has not adequately engaged with how national frameworks are territorially applied at regional scale. Integrated regional case studies examining the full chain from normative design to local implementation remain rare, particularly for capital regions where the institutional stakes are highest. This article addresses that gap by applying a geographic lens capable of reading spatial disparities in governance outcomes and distinguishing between urban, peri-urban, agricultural, and coastal sub-territories within RSK (Offner, 2006; Faure, 2019).

The central question this article addresses is: how does the gap between Morocco's national environmental normative framework and its effective territorial implementation manifest in RSK, and what institutional, human, and financial factors appear to explain the observed constraints? The general objective is an exploratory integrated analysis of the normative-to-implementation chain at regional scale. Five specific objectives structure the inquiry: mapping the national legal framework and its regional articulation; analysing territorial implementation across RSK's seven sub-units; identifying the principal environmental sectors at stake; evaluating implementation constraints along four dimensions, namely coordination, budget, technical capacity, and enforcement; and developing a critical geographic reading of the national-to-local governance gap over 2015-2023.

The article unfolds across five sections. Section 2 establishes the theoretical framework, integrating multi-level governance theory, political ecology, and policy cycle analysis. Section 3 presents the three-pillar methodology. Section 4 reports empirical results across normative, territorial, and institutional dimensions. Section 5 discusses the findings and situates the study's methodological contribution. Throughout, the analytical logic progresses from the national normative architecture through regional territorialisation to the local constraints that generate the observed governance gap.

RSK's environmental salience derives from both demographic scale and pressure intensity. With a population exceeding 4.5 million and urbanisation rates above the national average, the region experiences rapid peri-urban expansion that consumes agricultural and forest land at a pace that outstrips regulatory enforcement capacity (HCP, 2022a; AURS, 2014). Available monitoring data suggest PM_{2.5} and PM₁₀ concentrations in the urban agglomeration have frequently exceeded WHO

recommended thresholds, though systematic monitoring remains limited to the urban core (ONEM, 2022). Sanitation and solid waste management deficits persist across peri-urban and rural communes (Ministry of Interior, 2021). Water stress compounds this picture: available indicators point to declining water availability in both the Bouregreg-Chaouia and Sebou hydraulic basins relative to growing urban and agricultural demand (ABH Bouregreg, 2019; ABH Sebou, 2021).

2. Theoretical Framework and Literature Review

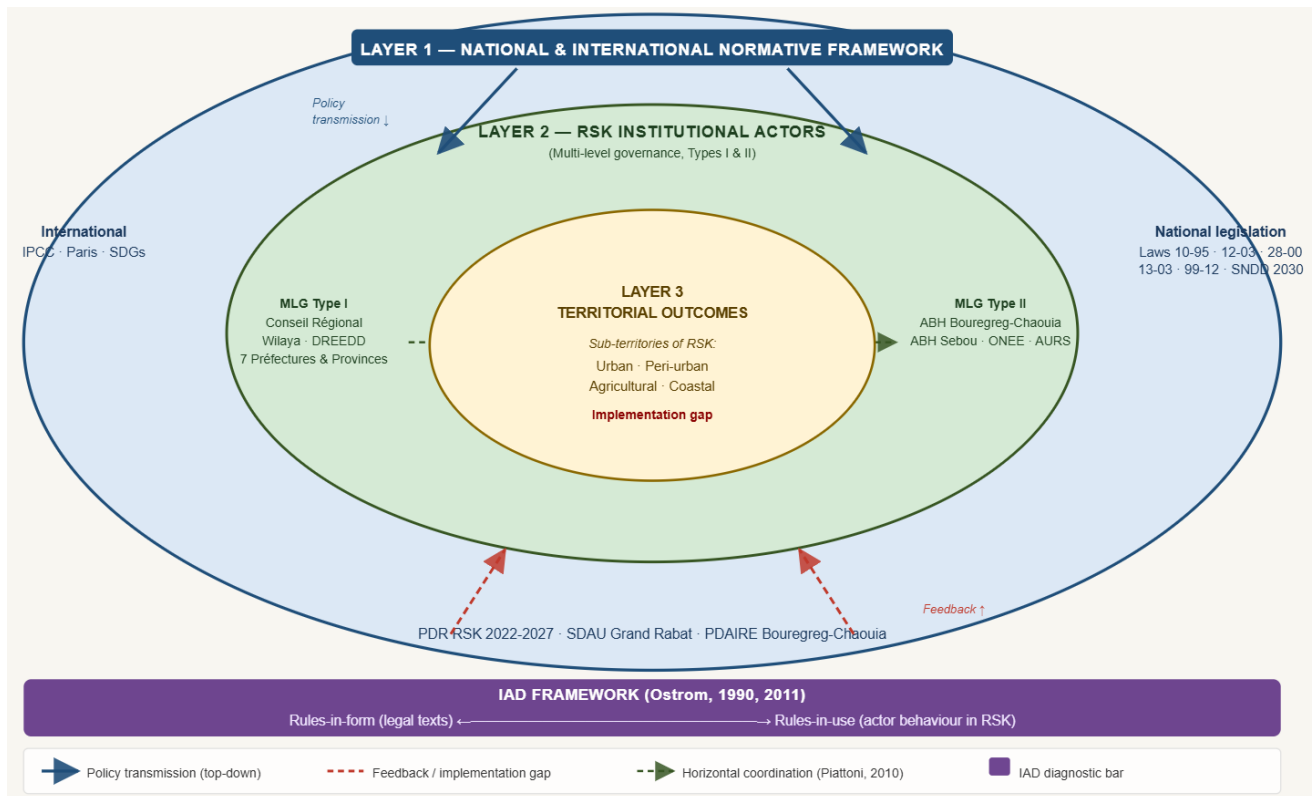
2.1 *Environmental Governance and Multi-Level Governance Theory*

Environmental governance encompasses the regulatory processes, mechanisms, and organisations through which political actors influence environmental actions and outcomes (Lemos & Agrawal, 2006). Applying this framework to Morocco requires attending to the multi-scalar architecture within which governance operates, from international commitments through to communal enforcement capacities. Multi-level governance (MLG) theory provides the conceptual vocabulary. Hooghe and Marks (2003) distinguish Type I MLG, general-purpose jurisdictions arranged hierarchically, from Type II MLG, task-specific agencies addressing particular policy domains. RSK displays both configurations simultaneously. The Conseil Régional, the wilaya, seven prefectures and provinces, and communal governments constitute the Type I hierarchy, while ABH Bouregreg-Chaouia, ABH Sebou, ONEE, and the Agence Urbaine Rabat-Salé (AURS) operate as Type II actors, cutting across territorial jurisdictions and generating the mandate overlaps documented throughout this study.

Piattoni (2010) highlights the coordination challenges inherent in such systems, drawing a useful distinction between vertical coordination, the transmission of mandates and resources from the national state to regional and local actors, and horizontal coordination across agencies and ministries operating at similar scales. Both dimensions appear structurally strained in RSK, where inter-agency mandates overlap and inter-ministerial articulation on environmental matters remains fragmentary. Ostrom's Institutional Analysis and Development (IAD) framework supplies a further diagnostic instrument, distinguishing rules-in-form, the texts of laws, decrees, and strategic plans, from rules-in-use, the actual behaviours structuring collective action arenas in practice (Ostrom, 1990, 2011). Applied to RSK, this distinction reveals a potentially systematic divergence: the formal legal corpus prescribes comprehensive regulatory obligations, but the operational rules that actors appear to follow diverge at every tier. The concept of institutional fit extends this insight by emphasising the alignment between governance arrangements and the socio-ecological specificities of the governed territory, a particularly salient concern for RSK, where coastal, urban, agricultural, and forest sub-territories impose heterogeneous governance demands simultaneously (Paavola, 2007).

As illustrated in Figure 1, the governance architecture of RSK operates across three nested analytical layers, with the IAD framework applied as a transversal diagnostic bar connecting formal rules to their sub-territorial implementation outcomes.

Figure 1. Integrated conceptual analytical framework of the study (adapted to the Rabat-Salé-Kénitra regional scale).



2.2 Political Ecology, Environmental Justice, and Territorialisation of Public Action

Political ecology asks not merely how governance systems are structured, but who bears the cost of their failures. Applied to RSK, this question points to a structured pattern of environmental burden: peri-urban and rural communes in the region's periphery absorb disproportionate exposure to solid waste mismanagement, water scarcity, and uncontrolled urbanisation, while institutional capacity to address these pressures remains concentrated in the urban core (Robbins, 2020). Environmental justice theory provides a tripartite framework for reading this pattern. Schlosberg (2007) identifies three dimensions: distributive justice, the unequal geographic distribution of environmental harms; procedural justice, unequal access to consultation and decision-making; and recognition justice, the unequal political voice of marginalised communities. In RSK, all three dimensions appear to intersect. Rural communes in Sidi Kacem or Khémisset provinces face greater environmental exposure while participating minimally in EIA consultations and regional planning processes.

The concept of territorialisation of public action, the process by which national policies are locally reinterpreted, adapted, negotiated, or deflected by subnational actors, anchors the spatial dimension of this analysis (Offner, 2006; Faure, 2019). RSK's sub-territories do not passively receive national environmental mandates; they filter them through local institutional capacities, political economies, and socio-ecological conditions. Citizen participation is central to this dynamic. As both a procedural justice requirement and a governance performance condition, participation has been structurally weak across RSK, particularly in peri-urban zones where EIA consultation records suggest chronically low engagement (Fung, 2006; Bergh, 2012).

2.3 Policy Cycle Analysis as a Diagnostic Thread

The policy cycle provides a diagnostic thread for locating governance failures. The canonical sequence, formulation, adoption, implementation, evaluation, suggests that environmental governance in RSK does not break down at the design stage; the national framework appears normatively coherent. Difficulties arise downstream, at the implementation and monitoring stages (Sabatier & Jenkins-Smith, 1993). The compliance deficit concept is analytically useful here: actors in RSK may rationally discount enforcement probability given the documented weakness of sanctions, producing a self-reinforcing pattern in which low enforcement confidence depresses compliance (Tosun, 2012). Rather than ideal-type institutional performance, 'good enough governance' constitutes a more realistic analytical benchmark for resource-constrained governance environments such as RSK's rural provinces (Grindle, 2004). A further structural dimension concerns horizontal policy integration: environmental governance in RSK intersects with urban planning instruments (SDAU Grand Rabat), water management plans (PDAIRE Bouregreg-Chaouia), waste programmes (PNDM), and agricultural policy, yet effective inter-ministerial coordination across these domains appears absent (Jordan, 2008).

3. Methodology

3.1 Research Design and Epistemological Positioning

The study adopts an exploratory critical-interpretive regional case study design, combining qualitative documentary analysis with secondary quantitative territorial indicators in a mixed-method approach. The primary unit of analysis is the Rabat-Salé-Kénitra region, disaggregated into seven internal sub-units: the Prefectures of Rabat, Salé, and Skhirate-Temara, and the Provinces of Kénitra, Sidi Kacem, Sidi Slimane, and Khémisset. The temporal horizon spans 2015 to 2023. Critical geography constitutes the epistemological stance: rather than mapping institutions descriptively, the study reads governance outcomes spatially, asking where normative prescriptions appear to fail and why these difficulties are distributed unevenly across sub-territories. It is important to note that the empirical analysis relies exclusively on secondary institutional sources and published indicators; no primary fieldwork, field surveys, or institutional interviews were conducted for this study. Findings are therefore presented as diagnostic insights based on available documentary evidence, not as definitively measured outcomes.

3.2 Pillar 1 — Documentary and Normative Analysis

The first analytical pillar rests on a systematic inventory of the national legal corpus applicable to the RSK territorial context. The corpus encompasses the principal environmental legislation enacted between 1995 and 2023, including Water Law 10-95, Environmental Impact Assessment Law 12-03, Solid Waste Law 28-00, Air Quality Law 13-03, and Framework Law 99-12, along with their implementing decrees, the Stratégie Nationale de Développement Durable (SNDD 2017-2030), the Programme National des Déchets Ménagers (PNDM), the PDR RSK 2022-2027, the Schéma Directeur d'Aménagement Urbain (SDAU Grand Rabat), and the PDAIRE Bouregreg-Chaouia. Each instrument is analysed through the IAD coding protocol, which systematically identifies rules-in-form against rules-in-use as documented through institutional reports and official evaluations (Ostrom,

1990, 2011). International environmental law provides the normative benchmark against which the national corpus is assessed (Kiss & Shelton, 2007).

3.3 Pillar 2 — Territorial Analysis of RSK

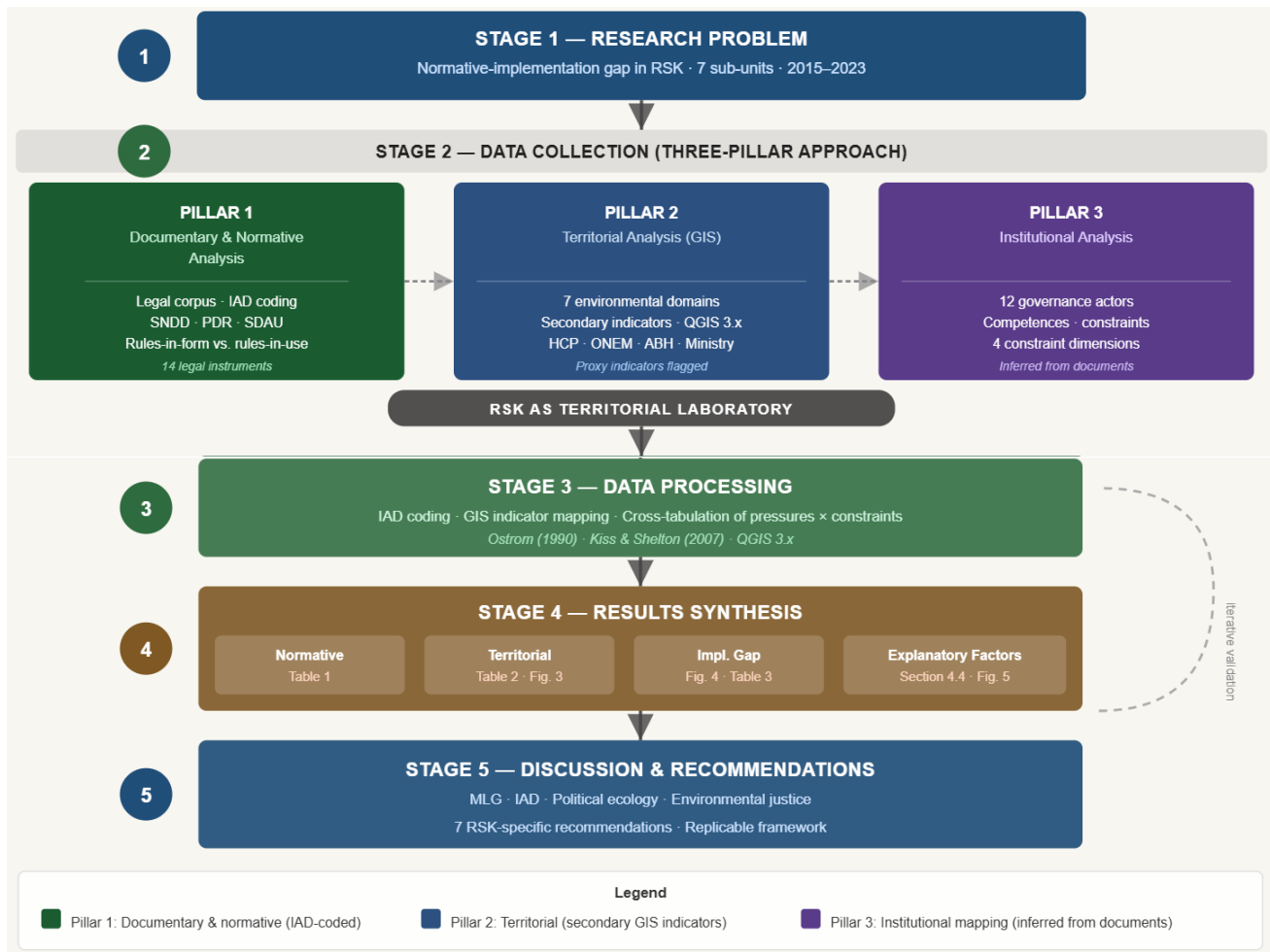
The second pillar consists of an internal territorial analysis of RSK across seven environmental domains, producing a spatially differentiated diagnostic of governance outcomes at sub-regional scale. The domains examined are: urbanisation dynamics and land-use change; hydrographic resources and water management across the Bouregreg, Sebou, and coastal groundwater systems; sanitation infrastructure coverage; solid waste management; air quality in the urban agglomeration; agricultural and forest cover under anthropogenic pressure; and coastal and lagoon ecosystems. Primary data sources are HCP (2022a), ONEM (2022), ABH Bouregreg (2019), ABH Sebou (2021), and the Ministry of Interior (2021). Environmental indicators are mapped using QGIS 3.x and disaggregated by prefecture and province where data availability permits. Where sub-regional data are unavailable, proxy indicators derived from national datasets are used and clearly flagged as approximations (see Appendix A). This territorial grid is presented as Table 2 in the Results section.

3.4 Pillar 3 — Institutional Analysis of Implementation Actors

The third pillar maps the actors responsible for environmental policy implementation in RSK and evaluates their governance constraints. At the regional level, the principal actors are the Conseil Régional RSK, the wilaya, and the regional ministerial directorates (DREDD, DREF, DRE). At provincial and prefectural level, the study covers the seven sub-units with their respective environmental delegations. Cross-cutting specialised agencies, including ABH Bouregreg-Chaouia, ABH Sebou, ONEE, and AURS, operate across multiple tiers. At the communal level, elected councils, civil society associations, and private operators complete the governance landscape. For each actor category, the study evaluates four constraint dimensions: coordination capacity, budget endowment, technical and human capital, and enforcement frequency (Agrawal & Ribot, 1999; Bergh, 2012).

The institutional mapping produced by this pillar feeds directly into the actor-competence matrix presented as Table 3 in the Results section. The methodological flowchart below (Figure 2) synthesises the three-pillar research design as an integrated whole, from problem definition through to the discussion of recommendations.

Figure 2. Methodological flowchart of the research (RSK as territorial laboratory)



4. Results

4.1 The National Normative Framework and Its Regional Application

4.1.1 National Legal Corpus: Structure and Enforcement Gaps

Morocco's environmental legal framework has evolved through four legislative phases since 1995. Water Law 10-95 established integrated hydraulic resource management and created the Agences de Bassin Hydraulique. Environmental Impact Assessment Law 12-03 mandated pre-project environmental screening for activities with significant effects, an instrument directly applicable to RSK's urban development and infrastructure pipelines. Solid Waste Law 28-00 and Air Quality Law 13-03 addressed the pollution dimensions of industrial and urban growth, while Framework Law 99-12 constituted the overarching normative architecture, enshrining the right to a healthy environment and anchoring the Stratégie Nationale de Développement Durable 2017-2030. The corpus shows progressive alignment with Rio 1992, Paris 2015, and the 2030 Agenda. A structural enforcement gap nonetheless appears to pervade the system: the delayed publication of implementing decrees for several laws creates what Haddad (2016) and Zair (2011) identify as an executory vacuum, with regulatory obligations preceding operational instruments. This difficulty is particularly noted in EIA enforcement, waste valorisation, and air quality monitoring across RSK.

Table 1. National environmental legal and institutional framework and territorial implications for the Rabat-Salé-Kénitra region (1995–2023).

Instrument / Strategy	Environmental domain	Main implementation mechanism	RSK territorial relevance	Observed / documented implementation issues in RSK	Status
Water Law 10-95 (Loi 10-95)	Water resources management	ABH creation; PDAIRE; water use fees; water police authority	Two ABH (Bouregreg-Chaouia and Sebou) cover RSK; cross-basin coordination required in Kénitra Province	Cross-basin coordination appears limited at ABH boundary; PDAIRE targets not systematically enforced for agricultural withdrawals according to reviewed sources	Partially operational
EIA Law 12-03 (Loi 12-03)	Environmental impact assessment	Pre-project EIA procedure; public consultation; post-project monitoring by decree	Applicable to major projects in all RSK sub-territories; formally required across urban and peri-urban development	EIA procedures appear more consistently applied to major projects; smaller peri-urban developments appear less systematically monitored in reviewed sources	Partially operational
Solid Waste Law 28-00 (Loi 28-00)	Solid waste management	PNDM; communal collection responsibility; CET construction targets; valorisation hierarchy	Communal-level responsibility across RSK; PNDM targets applicable at provincial scale	Waste valorisation remains weakly documented and appears limited in rural provinces; uncontrolled sites documented by Ministry of Interior (2021)	Limited operationalisation
Air Quality Law 13-03 (Loi 13-03)	Air quality and atmospheric emissions	Emission norms; ONEM monitoring network; industrial emission permits	ONEM monitoring infrastructure concentrated in urban agglomeration; rural RSK provinces have limited monitoring coverage	No clearly identified monitoring infrastructure in inland provinces in reviewed sources; industrial emission compliance weakly documented	Partially operational
Framework Law 99-12 (Loi-cadre 99-12)	Integrated sustainable development framework	National Environmental Charter; SD Council; cross-sectoral ministerial obligations	Applies across all RSK sectors; PDR RSK 2022-2027 explicitly references this framework	No clearly identified regional monitoring mechanism in available sources; several implementing decrees pending publication	Limited operationalisation
National SD Strategy (SNDD 2017-2030)	Integrated sustainable development	Sectoral action plans; national performance indicators; 6-year review cycles	National targets applicable to RSK; no regional adaptation identified in reviewed documentary sources	RSK-level operationalisation absent in reviewed documents; inter-ministerial horizontal coordination appears weak	Partially operational
Regional Development Plan (PDR RSK 2022-2027)	Regional strategic planning and investment	5-year development programme; environmental chapter; monitoring obligations for Conseil Régional	Primary RSK-level strategic planning instrument; environmental objectives formally articulated	Environmental monitoring indicators not operationalised in reviewed sources; no dedicated environmental observatory identified	Partially operational
PDAIRE Bouregreg-Chaouia	Integrated water management at basin scale	Basin water allocation plan; quality monitoring; discharge permits; groundwater surveillance	Covers Bouregreg-Chaouia basin; ABH Sebou covers Sebou basin (Kénitra, Sidi Kacem Provinces)	Cross-basin coordination gap documented at Kénitra boundary; PDAIRE targets for agricultural withdrawals appear partially enforced	Partially operational

Table note: Implementation status is indicative and based on secondary documentary evidence, not on primary field verification. Status categories (Relatively operational / Partially operational / Limited operationalisation) reflect available documentary evidence and should be read as a diagnostic mapping rather than a measured assessment.

Source: Authors' construction based on Zair (2011), Haddad (2016), Ostrom (1990, 2011), Kiss & Shelton (2007).

As summarised in Table 1, the normative framework governing RSK's environmental management operates across fourteen instruments with variable territorial reach and implementation effectiveness.

4.1.2 Institutional Architecture and Coordination Gaps in RSK

The institutional landscape responsible for environmental governance in RSK is simultaneously dense and fragmented. At the regional level, the Conseil Régional holds strategic planning competences through the PDR 2022-2027, while the wilaya coordinates deconcentrated state services, including the Direction Régionale de l'Environnement et du Développement Durable (DREDD). At provincial and prefectural scale, seven territorial units manage environmental delegation tasks with markedly heterogeneous technical capacity. Three coordination difficulties are particularly notable. First, the Conseil Régional and the wilaya occupy overlapping strategic terrain, with environmental planning responsibilities claimed by both, producing duplication without clear accountability. Second, the boundary between ABH Bouregreg-Chaouia and ABH Sebou runs through Kénitra Province, creating a fragmented water governance zone where cross-basin coordination appears structurally absent. Third, AURS exercises urban planning authority across the Grand Rabat perimeter, but its environmental prescriptions frequently encounter limited communal implementation capacity, generating a design-execution gap in land-use and coastal management. Read through the IAD framework, these configurations reveal collective action arenas in which rules-in-use may systematically diverge from rules-in-form (Ostrom, 1990, 2011).

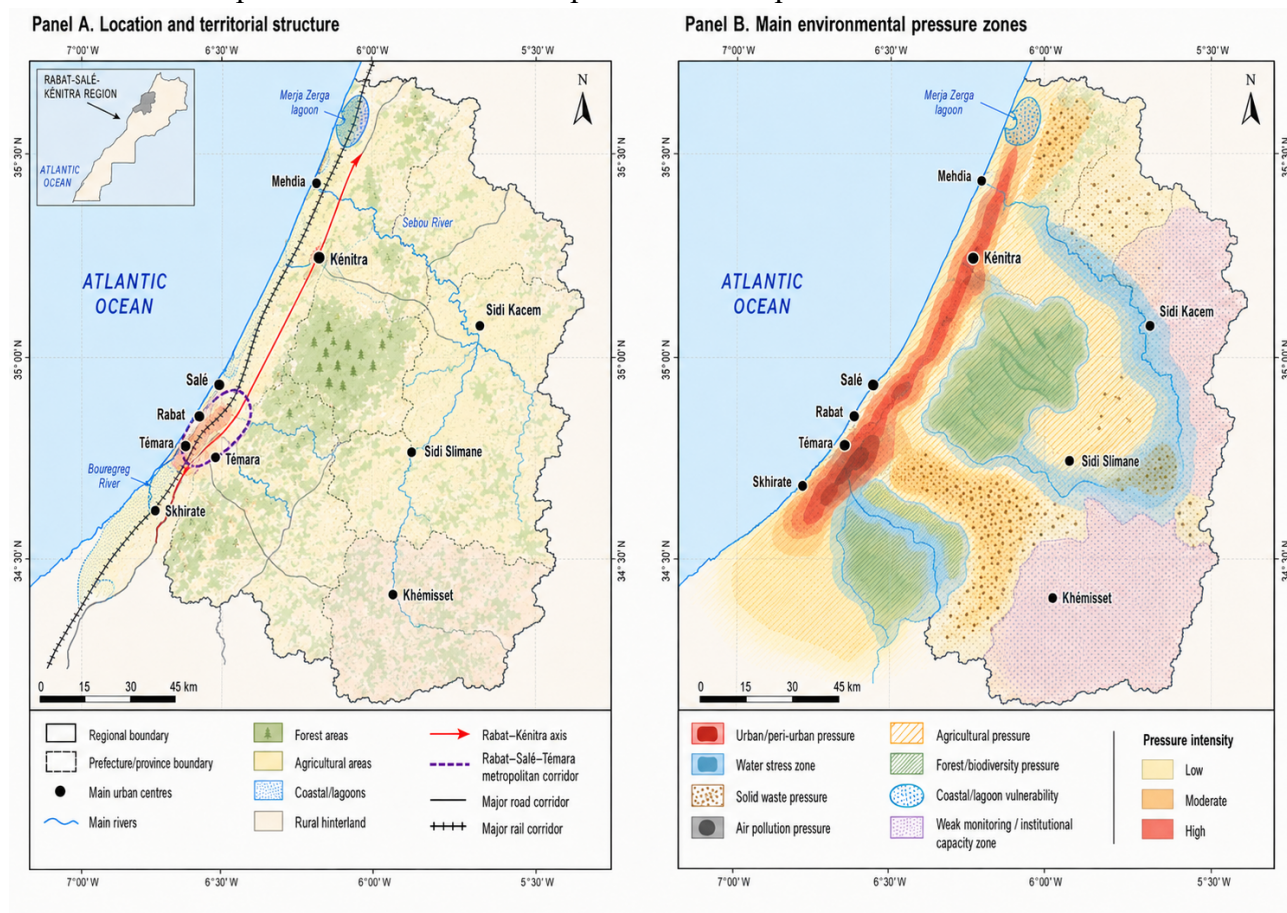
4.2 RSK: A Regional Territory Under Multiple Environmental Pressures

4.2.1 Urban Dynamics and Land-Use Change

RSK's urbanisation trajectory presents one of the most analytically relevant dimensions of the governance gap. Between 2004 and 2022, the region's urbanisation rate exceeded the national average at each census interval, driven by metropolisation in Rabat-Salé-Skhirate-Temara and secondary urban growth in Kénitra (HCP, 2022a). Peri-urban sprawl has progressively consumed the coastal strip between Salé and Kénitra, encroaching on agricultural land and fragmented remnants of the Maâmora forest, while informal settlements proliferate in zones where communal planning documents are absent or unenforced. The Atlantic façade south of Rabat has experienced coastal artificialisation through tourist and residential development, while smaller-scale projects appear to be subject to weaker or less systematic environmental screening. This spatial dynamic reveals a structural mismatch: urban growth generates administrative complexity at a pace that outstrips the regulatory and enforcement capacity of communal authorities (AURS, 2014).

Figure 3 illustrates the territorial structure and spatial distribution of environmental pressures across RSK's seven prefectures and provinces, providing the cartographic foundation for the analysis that follows.

Figure 3. Location and territorial structure of the Rabat-Salé-Kénitra region, with spatial distribution of environmental pressures across its seven prefectures and provinces.



4.2.2 Water, Sanitation, Waste, and Air Quality

Water availability constitutes the region's most acute and multi-dimensional environmental constraint. Available indicators suggest declining renewable water in both the Bouregreg-Chaouia and Sebou basins relative to demand, driven by urban consumption growth, intensive irrigation withdrawals in the Gharb plain, and successive droughts between 2018 and 2023 (ABH Bouregreg, 2019; ABH Sebou, 2021). Access remains unequal: urban agglomeration connection rates contrast with documented deficits in rural communes of Sidi Kacem and Khémisset provinces. Sanitation mirrors this divide: while ONEE manages wastewater treatment in the urban core, rural communes lack functioning treatment systems, with reported groundwater contamination in zones of intensive agriculture (ONEE, 2021).

Solid waste management presents analogous spatial disparities. Collection rates in Rabat, Salé, and Kénitra city remain relatively adequate, but peri-urban communes and the rural inland register significantly lower formal collection rates and near-absent valorisation, with uncontrolled dumping sites documented across provincial hinterlands (Ministry of Interior, 2021). Air quality compounds the picture: available monitoring data from the urban agglomeration document concentrations of PM_{2.5} and PM₁₀ that have on multiple occasions exceeded WHO (2021) recommended thresholds, attributable to road traffic, industrial activity in the Kénitra zone, and construction. Rural provinces

lack equivalent monitoring infrastructure, and their pollution loads remain poorly characterised (ONEM, 2022).

4.2.3 Natural Spaces and Biodiversity Under Pressure

RSK's natural heritage faces documented pressure despite formal protective designations. The Maâmora forest, one of the world's largest cork oak formations, is reportedly subject to accelerating degradation through overgrazing, illegal logging, and peri-urban encroachment from the Salé and Kénitra directions. Merja Zerga, a Ramsar-listed coastal lagoon in Kénitra Province, shows signs of eutrophication and agricultural runoff affecting avifauna habitats. The Atlantic coastal strip and the Bouregreg estuary face competing pressures from marina development, port extension, and tourism infrastructure, with EIA screening reportedly ineffective for smaller-scale interventions (HCEFLCD, 2020). Across these cases, formal designation as protected or regulated space does not appear to translate into effective protection on the ground, reflecting HCEFLCD's limited surveillance capacity within RSK.

Table 2. Grid of environmental issues in the Rabat-Salé-Kénitra region: territorial manifestations, institutional actors, indicators, constraints, and observed effects.

Environmental domain	Main territorial manifestation in RSK	Main actors	Available / mobilisable indicators	Implementation constraints	Documented / potential territorial effects
Water resources	Basin water stress; rural access gaps; coastal aquifer vulnerability (Bouregreg-Chaouia, Sebou)	ABH Bouregreg-Chaouia, ABH Sebou (Ministère de l'Agriculture), ONEE	Renewable water/capita (m ³ /hab); connection rate (%); groundwater levels (partial data)	Split basin governance; competing agricultural-urban demand; communal-scale data gaps	Rural water access deficits; potential groundwater salinisation; documented basin availability decline
Sanitation	Urban core served by ONEE; rural communes without treatment; peri-urban gaps documented	ONEE, communes (Conseil Régional RSK), Ministry of Interior / DGCL	Sanitation access rate (%); wastewater treatment capacity (partial, urban agglomeration)	ONEE contractual coverage limited to urban zones; rural investment capacity insufficient	Possible groundwater contamination in agricultural zones; health risks in peri-urban informal settlements
Solid waste	Urban collection relatively adequate; rural and peri-urban areas with documented uncontrolled sites	Ministry of Interior / DGCL, communes, private operators (PNDM framework)	Formal collection rate (%); valorisation rate (%); uncontrolled dumping sites count (indicative)	Insufficient infrastructure in rural communes; valorisation capacity absent outside urban core	Environmental and health risks from uncontrolled sites; soil contamination (documented and potential)
Air quality	PM2.5/PM10 concentrations above WHO thresholds documented in urban agglomeration; inland provinces unmonitored	ONEM (Ministère de la Transition Énergétique), industrial operators, DREEDD	PM2.5/PM10 concentrations µg/m ³ (urban agglomeration only); monitoring station spatial density	Monitoring infrastructure limited to urban core; no stations identified in inland provinces; enforcement weakly documented	Respiratory health risks documented in urban agglomeration; rural exposure remains undocumented
Biodiversity and natural spaces	Maâmora degradation reported; Merja Zerga eutrophication documented; Bouregreg estuary under development pressure	HCEFLCD, communes, Ministry of Agriculture, Ministry of Environment	Forest cover change (sub-regional); lagoon trophic index (partial); EIA compliance near protected areas	HCEFLCD surveillance capacity limited in RSK; EIA enforcement near protected areas weakly documented	Reported cork oak cover loss in Maâmora; documented lagoon habitat degradation; coastal ecosystem fragmentation
Agricultural land	Peri-urban land conversion; Gharb Plain intensification; soil degradation reported in several zones	Ministry of Agriculture, ORMVA du Gharb (Agence de Bassin), communes, AURS	Agricultural land conversion rate (estimated); soil quality (limited data); irrigation water intensity	AURS coverage excludes Kénitra Province; land protection criteria not systematically applied	Documented peri-urban farmland loss; potential groundwater depletion in Gharb; soil quality decline in irrigated zones
Coastal and lagoon ecosystems	Atlantic coastline artificialisation between Rabat and Kénitra; Merja Zerga eutrophication;	DREEDD, HCEFLCD, communes, private	Coastline artificialisation rate (estimated); lagoon trophic status	No integrated coastal zone management plan identified for RSK; EIA compliance	Documented habitat loss on Atlantic strip; potential erosion of unprotected shoreline; loss of fishery ecosystem services

Environmental domain	Main territorial manifestation in RSK	Main actors	Available / mobilisable indicators	Implementation constraints	Documented / potential territorial effects
	Bouregreg estuary morphology modified	developers, Ministry of Housing	(partial); coastal erosion rate (partial)	weak for smaller coastal projects	
Urbanisation and land use	Rapid peri-urban sprawl (Salé-Kénitra); informal settlements in planning vacuums; coastal artificialisation south of Rabat	AURS (Grand Rabat perimeter), communes, Ministry of Housing, DREDD	Urban land cover change (%/5 years, estimated); informal settlement count (partial); SDAU compliance rate (partial)	AURS coverage limited to Grand Rabat; communal planning capacity absent in rural communes; post-hoc land regularisation	Agricultural and forest land conversion; infrastructure deficits in informal settlements; increased flood and environmental risk exposure

Table note: Indicators are derived from available secondary sources. Some variables are available only at basin, urban-agglomeration or provincial level and should be read as indicative rather than directly measured at communal scale. The term 'documented / potential territorial effects' reflects varying levels of evidence: some effects are reported in institutional sources, while others are analytically plausible given the documented pressures.

The multidimensional character of RSK's environmental challenges is captured in Table 2, which provides a cross-sectoral territorial reading of the seven key environmental domains, mapping territorial manifestations, institutional actors, mobilisable indicators, implementation constraints, and observed territorial effects.

4.3 Implementation Gaps in the Region

4.3.1 Normative Ambitions vs. Communal Capacities

The gap between legal prescription and local implementation capacity is most visible in RSK's interior provinces. Sidi Kacem, Sidi Slimane, and Khémisset operate under the same formal normative obligations as Rabat, yet face a fundamentally different resource environment. The 2015 Organic Law on Regions transferred significant environmental competences to the communal level without commensurate financial or technical resources, generating what Agrawal and Ribot (1999) characterise as decentralisation without accountability. Three critical lacunae are recurrently noted: limited availability of trained environmental technical staff within communal administrations; weak or absent operational GIS capacity for territorial monitoring; and insufficiently identifiable or weakly prioritised environmental budget allocations beyond baseline service delivery. The contrast with the Rabat and Salé prefectures is instructive: even within the urban core, enforcement appears uneven, with larger operators seemingly subject to less visible or less frequent sanctions than smaller-scale violations. This pattern reflects the political economy of enforcement rather than any rational application of regulatory priorities.

4.3.2 Budget Gaps and Financial Dependencies

Financial asymmetries within RSK compound the governance gap in structurally predictable ways. Available fiscal data suggest that per-capita environmental expenditure in the urban prefectures of Rabat and Salé exceeds that of the rural inland provinces, driven by the fiscal base differential between densely urbanised communes and rural communes dependent on central government fiscal transfers (Ministry of Interior, 2021). This intra-regional fiscal geography produces a problematic alignment: the territories bearing the highest environmental pressures, expanding peri-urban

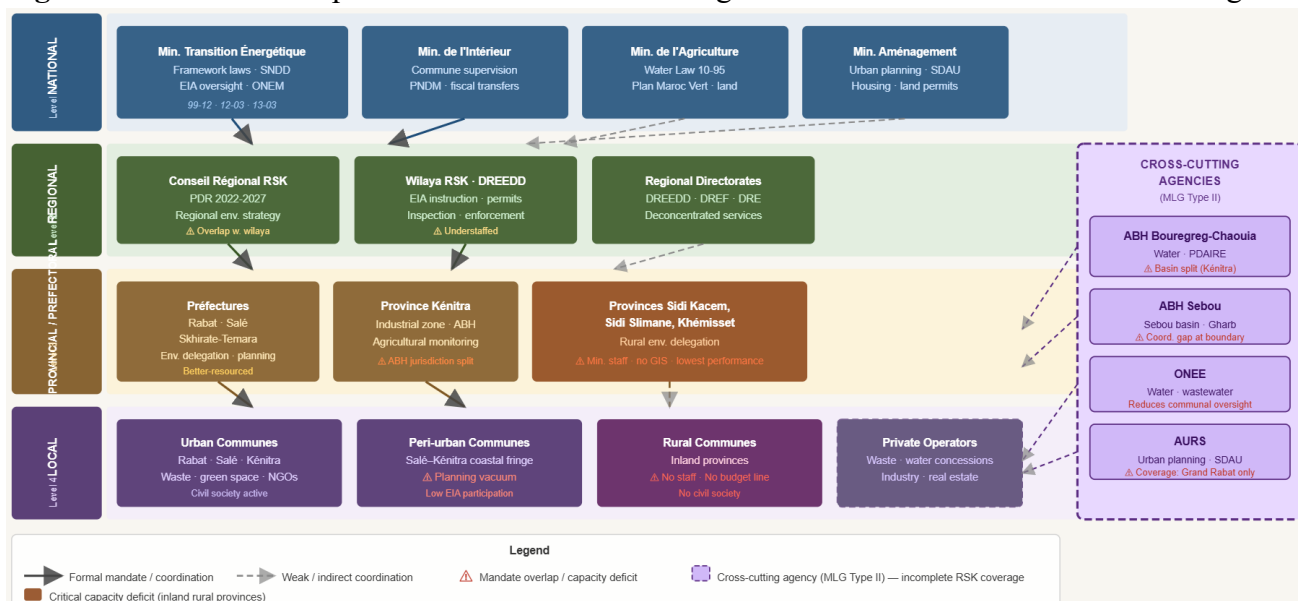
communes and agricultural provinces under water stress, are precisely those with the least financial capacity to address them. International financing from AFD, the Green Climate Fund, and the European Union has supplemented domestic resources for specific projects, but this external dependency introduces institutional sustainability risks: project cycles do not align with governance cycles, and capacity built around specific programmes may dissipate when funding expires (World Bank, 2023). Grindle's (2004) 'good enough governance' provides a pragmatic benchmark here, acknowledging that resource-constrained governance environments cannot be evaluated against ideal-type institutional performance standards.

4.3.3 Coordination and Participation Deficits

RSK lacks an integrated environmental action plan aligning the mandates of the Conseil Régional, wilaya, ABH Bouregreg-Chaouia, ABH Sebou, ONEE, AURS, and communal governments into a coherent operational framework. The PDR RSK 2022-2027 articulates strategic environmental objectives, but their translation into coordinated sectoral action is impeded by agency frictions: AURS and ABH Bouregreg-Chaouia reportedly operate parallel spatial data systems without interoperability; ONEE service delegations in peri-urban communes may reduce communal environmental oversight capacity. Citizen participation presents a parallel structural deficit. EIA consultation procedures exist formally but appear to register low engagement rates in peri-urban and rural zones, where notification mechanisms are inadequate (Fung, 2006). Civil society activity is geographically concentrated in the Rabat-Salé agglomeration, while associative presence in inland rural provinces is minimal (Bergh, 2012). This spatial polarisation of civic capacity reinforces the institutional and financial asymmetries documented above.

The complexity of RSK's institutional landscape, including identified coordination gaps and overlapping mandates, is represented in Figure 4.

Figure 4. Actors and competences in the environmental governance of the Rabat-Salé-Kénitra region.



4.4 Explanatory Factors of the Implementation Gap

4.4.1 Institutional and Financial Factors

The explanatory structure of RSK's implementation gap is rooted, first, in institutional architecture. Mandate overlap between the Conseil Régional, the wilaya, DREDD, the ABH agencies, and ONEE generates accountability gaps: when environmental standards are breached, no single actor carries unambiguous enforcement responsibility. The absence of a unified regional environmental observatory means that no institution currently holds the mandate or capacity to produce integrated, sub-territory-disaggregated performance data for RSK. Filtered through the IAD framework, this configuration creates collective action arenas in which enforcement probability is low, rational non-compliance is predictable, and the compliance deficit identified by Tosun (2012) may reproduce itself across governance cycles (Ostrom, 1990, 2011). Financially, the structurally poor communes of the inland provinces, where environmental budget lines are routinely subordinated to service delivery spending, appear to exhibit a self-reinforcing degraded performance cycle: insufficient revenue generates insufficient technical staff, which generates degraded environmental quality.

4.4.2 Human and Technical Factors

Technical capacity constraints compound these institutional difficulties. Available institutional data suggest the ratio of environmental inspection personnel to population presents a marked urban-rural gradient across RSK: inspection functions appear concentrated in Rabat and, to a lesser extent, Kénitra, leaving interior provinces with minimal monitoring presence. Three structural causes are plausibly at work: centralised recruitment processes that favour the capital region; salary and career differentials that drive migration from provincial environmental services toward private sector consultancy; and the apparent absence of GIS capacity at provincial level, which limits evidence-based environmental monitoring (Agrawal & Ribot, 1999). Intercommunal cooperation mechanisms, which could theoretically pool technical resources across small communes, remain underdeveloped despite the enabling framework of the 2015 Organic Law.

Table 3 maps these competence and capacity dimensions across RSK's principal environmental governance actors, offering a diagnostic reading of mandate overlaps and accountability gaps.

Table 3. Actors and competences in the environmental governance of the Rabat-Salé-Kénitra region.

Actor category	Governance level	Main environmental responsibilities	Main means of action	Documented constraints and coordination issues
National ministries (Ministry of Environment and Energy Transition; Ministry of Interior / DGCL)	National	Framework legislation (laws 99-12, 13-03, 12-03); SNDD; EIA national oversight; ONEM; commune environmental supervision; PNDM coordination	Regulatory authority; DREEDD delegation; ONEM monitoring network; prefectural authority; fiscal transfers to communes	DREEDD capacity appears limited relative to RSK project volume; limited environmental specialisation within DGCL; limited deconcentration to sub-regional level
Regional Council (Conseil Régional RSK)	Regional	PDR RSK 2022-2027; regional environmental strategy; budget allocation for environmental priorities	Own fiscal revenues; state transfers; international development partnerships; regional investment authority	Overlapping strategic mandate with wilaya on environmental planning; no dedicated environmental observatory identified in available sources; limited environmental technical staff
Wilaya RSK / DREEDD	Regional	Deconcentrated state authority; EIA instruction and approval; industrial facility permits; enforcement coordination	Prefectoral authority; DREEDD inspection services; inter-ministerial coordination role in RSK	Possible administrative and political constraints on enforcement; inspection capacity appears limited relative to project volume in RSK; limited GIS infrastructure identified
Urban prefectures (Préfectures de Rabat, Salé, Skhirate-Temara)	Provincial / Prefectoral	Environmental delegation management; urban planning coordination with AURS; communal waste oversight; EIA local liaison	Prefectoral environmental services; commune liaison; access to state technical resources	Enforcement appears uneven for high-impact economic actors; better resourced than inland provinces but selective application documented in secondary sources
Province de Kénitra	Provincial / Prefectoral	Environmental delegation; industrial zone oversight; liaison with ABH Bouregreg-Chaouia and ABH Sebou; agricultural monitoring	Provincial environmental service; liaison with ORMVA du Gharb; ABH coordination role	Jurisdictional split between ABH Bouregreg-Chaouia and ABH Sebou creates documented coordination gap across province territory
Inland rural provinces (Provinces de Sidi Kacem, Sidi Slimane, Khémisset)	Provincial / Prefectoral	Environmental delegation; rural waste coordination; agricultural and forest monitoring; water access oversight	Provincial environmental service (limited according to available sources); liaison with HCEFLCD and ABH Sebou	Limited staff and weak GIS capacity according to available documentary sources; weaker documented capacity across several indicators relative to urban prefectures
Basin agencies (Agence du Bassin Hydraulique Bouregreg-Chaouia / ABH Sebou)	Cross-cutting	PDAIRE implementation; water quality monitoring; discharge permits; water police authority across respective basins	Water police authority; technical expertise; water use fee revenues; basin monitoring infrastructure	Documented coordination gap at Kénitra administrative boundary; agricultural withdrawal enforcement appears partial according to reviewed sources
ONEE (Office National de l'Electricité et de l'Eau Potable)	Cross-cutting	Drinking water supply and distribution; urban wastewater treatment in contracted zones; service delegation agreements	National technical infrastructure and investment capacity; delegation contracts with communes; operational expertise	Rural and peri-urban coverage gaps; service delegation contracts may reduce effective communal environmental oversight capacity
AURS (Agence Urbaine Rabat-Salé)	Cross-cutting	Urban master plan (SDAU Grand Rabat); land-use permit review; EIA integration in urban planning; urbanisation perimeter management	Regulatory authority over Grand Rabat perimeter; spatial data and urban planning expertise	Coverage limited to Rabat-Salé-Skhirate-Temara; Kénitra Province and inland provinces excluded; no spatial data interoperability with ABH agencies identified
Local actors (communes; civil society / NGOs)	Local	Local environmental service delivery (waste, green space, local permits); civil society environmental monitoring and advocacy	Communal fiscal revenues (limited in rural areas); delegated service contracts; NGO grant funding; community mobilisation	Sharp capacity gradient between urban communes and rural communes; civil society concentrated in Rabat-Salé agglomeration; minimal associative presence in inland provinces

Table note: Actor constraints are identified from documentary sources and should be read as a diagnostic mapping rather than an institutional audit. The term 'documented' refers to evidence found in secondary institutional reports; where evidence is limited, formulations such as 'appears' or 'according to available sources' are used. For detailed competences and mandate overlaps, see Figure 4.

Source: Authors' construction based on Conseil Régional RSK (2022), Agrawal & Ribot (1999), Bergh (2012), Ostrom (1990, 2011).

4.4.3 Socio-Territorial Factors

A third explanatory layer operates at the socio-territorial scale. Peri-urban and rural communes in RSK face compounded vulnerability: they bear higher relative environmental burdens while possessing weaker institutional voice in regional planning processes, more limited access to legal recourse, and less civil society capacity to advocate for environmental accountability. Schlosberg's (2007) three dimensions of environmental justice, distributive, procedural, and recognition, appear simultaneously unmet across these sub-territories. Robbins (2020) directs analytical attention to the political economy dimension: in RSK, as in comparable governance contexts, the enforcement of environmental norms may vary according to the economic weight and territorial visibility of actors, contributing to an unequal distribution of environmental burdens across communities with uneven institutional capacity.

5. Discussion

5.1 What the RSK Case Reveals About Moroccan Environmental Governance

The RSK case amplifies an argument that national-scale analyses cannot fully develop: Morocco's normative-implementation gap in environmental governance is not an anomaly attributable to resource scarcity in lagging regions, but a structural feature of the governance architecture itself, discernible even at the institutional core. A capital region concentrating national ministries, specialised agencies, and international development financing exhibits similar compliance difficulties, coordination failures, and civic participation gaps as less-resourced territories, though with different intensities and distributional consequences across its sub-territories. Through the IAD lens, this finding is analytically coherent: the construction of Morocco's rules-in-form is not fundamentally in question; the legal corpus is well-structured and progressively aligned with international standards (Ostrom, 1990). The difficulties arise at the rules-in-use level, in the arenas where actors make enforcement decisions, resource allocation choices, and institutional cooperation agreements. The system's institutional fit, the alignment between governance arrangements and the socio-ecological characteristics of governed territories, appears structurally insufficient at regional and sub-regional scales (Paavola, 2007; Tosun, 2012).

5.2 A Capital Region Between Institutional Centrality and Territorial Vulnerabilities

RSK occupies a paradoxical position in Morocco's governance landscape. Its institutional centrality, the concentration of national decision-makers, specialised agencies, and international partnerships, generates reasonable expectations of governance performance. Yet the analysis indicates that this centrality does not straightforwardly translate into environmental implementation effectiveness across the region's territory. Proximity to national power does not resolve the coordination difficulties between the Conseil Régional and the wilaya, does not close the fiscal gap between urban prefectures and inland provinces, and does not extend civil society advocacy capacity beyond the Rabat-Salé

agglomeration. The resource flows associated with institutional centrality appear captured by urban governance actors and international project cycles, while peri-urban communes and rural provinces remain structurally peripheral within the regional governance architecture (Robbins, 2020). Environmental justice adds further analytical precision: the distributional consequences of these governance difficulties follow the same spatial logic as social inequality within RSK, with environmental burdens accumulating where institutional voice is weakest (Schlosberg, 2007). RSK can thus be read as a critical case in the theoretical sense: a territory where the conditions for governance success are maximally present, yet the implementation gap persists.

5.3 From Inter-Regional Comparison to Intra-Regional Analysis

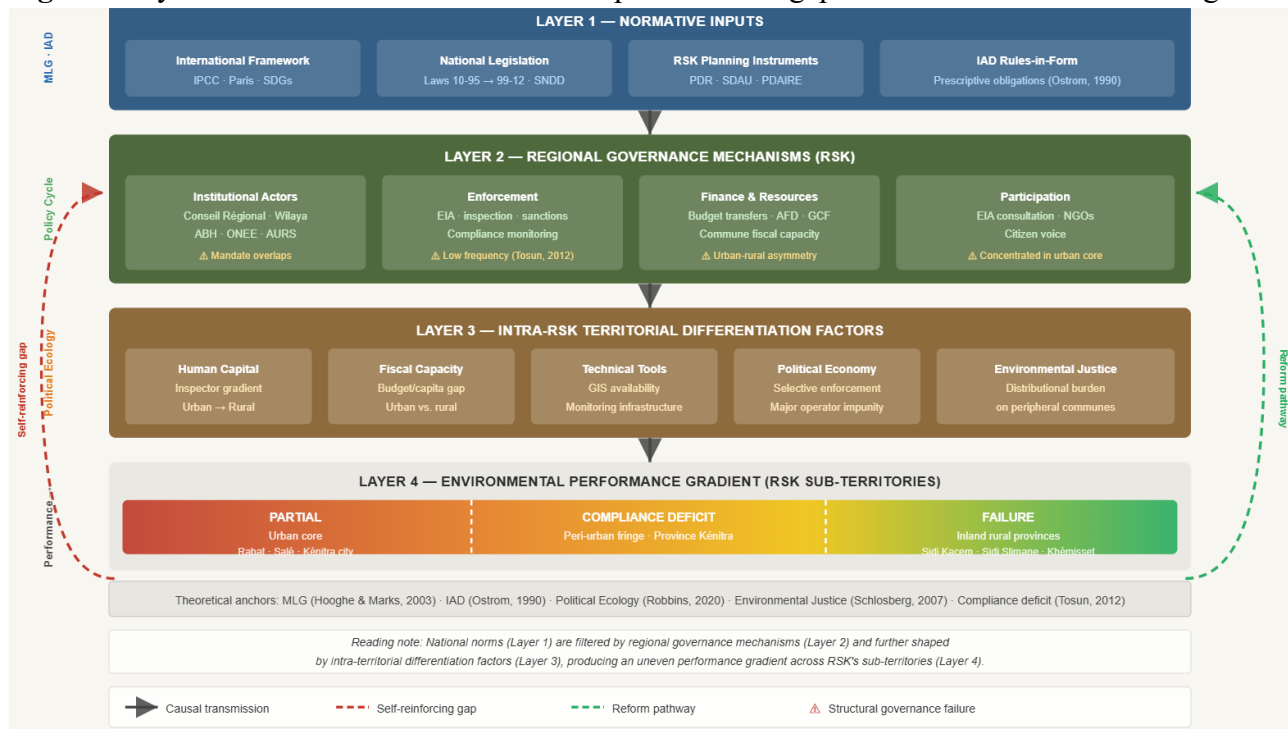
A methodological contribution of this study lies in its analytical scale choice. The dominant tradition in Moroccan environmental governance research operates at national scale, comparing sectoral policy performance or benchmarking Morocco against regional averages. This article proposes a different register: the intra-regional scale, which surfaces governance dynamics that national-level analysis cannot capture. The disparities between Rabat and Khémisset, between a Ramsar-listed lagoon and an unmonitored dumping site a few kilometres away, between EIA compliance in major urban developments and apparent non-enforcement in peri-urban subdivisions, carry governance-analytical significance that national averages structurally obscure. Intra-regional disparities are also more policy-actionable than inter-regional comparisons: they point to specific actor constellations, specific budget allocation mechanisms, and specific institutional reforms whose effects could be observed within a single governance cycle. The three-pillar analytical framework is designed as a replicable instrument for other Moroccan regions and comparable MENA governance contexts where multi-level institutional complexity intersects with territorial inequality (Biermann et al., 2012).

5.4 Scientific Contribution and Implications

This article makes three distinct contributions. Empirically, it constitutes, to the authors' knowledge, an early integrated regional case study of environmental governance challenges in RSK, disaggregated to the sub-territorial level across seven environmental domains simultaneously, an analytical scope absent from the existing literature on Moroccan environmental governance. Methodologically, the three-pillar framework, combining IAD-coded normative analysis, secondary GIS-supported territorial diagnosis, and multi-actor institutional mapping, represents a replicable instrument applicable to other Moroccan regions and comparable governance contexts (Biermann et al., 2012; Grindle, 2004). Prescriptively, the geographically differentiated results generate policy recommendations calibrated to the specific governance profile of RSK's sub-territories, acknowledging the urban core/peri-urban/rural gradient and targeting the distinct constraint constellations at each level.

Figure 5 synthesises the causal structure of the normative-implementation gap as it appears to operate in RSK, integrating the multi-level governance dynamics, territorial differentiation factors, and reinforcing feedback loops identified across Sections 4.1 to 4.4.

Figure 5. Synthesis model of the normative-implementation gap in the Rabat-Salé-Kénitra region.



5.5 Methodological Limitations

This study operates within several methodological boundaries that require explicit acknowledgement. The empirical analysis rests exclusively on secondary institutional sources, published indicators, and documentary evidence; no primary fieldwork, institutional interviews, or field surveys were conducted. Communal-level environmental data within RSK remain substantially incomplete, particularly for Sidi Kacem, Sidi Slimane, and Khémisset, where official sub-provincial records are either unavailable or insufficiently granular. In several domains, proxy indicators derived from proportional disaggregation of national datasets substitute for unavailable sub-regional data, as detailed in Appendix A. The cartographic representation of RSK in Figure 3 is schematic and based on administrative boundary approximations. Environmental staff ratio data in Appendix D should be treated as indicative orders of magnitude. Informal governance practices, including negotiated enforcement exceptions and unwritten inter-institutional arrangements, are underestimated by documentary analysis alone. These constraints reinforce the study's positioning as an exploratory diagnostic framework based on available secondary evidence, and they define the data collection agenda for future primary research grounded in institutional interviews and field observation.

6. Conclusion

Four diagnostic conclusions emerge from this analysis. Morocco's environmental normative framework is structurally coherent and internationally aligned, but available evidence suggests systematic attenuation between the national legal tier and the communal implementation level, most acutely in RSK's interior provinces. Environmental pressures in RSK are multi-sectoral and simultaneously active across water, waste, air quality, urbanisation, and biodiversity domains, distributed unequally in ways that compound rather than compensate for existing social inequalities.

Implementation difficulties appear explained by four intersecting factors: institutional coordination deficits, financial asymmetries between urban prefectures and rural provinces, human capital shortfalls in environmental inspection, and chronically low enforcement frequency. The cumulative pattern is consistent with what environmental justice frameworks identify as a structural burden on peripheral communities with limited institutional voice.

The study contributes to three scientific fields. It extends environmental geography's empirical base by providing a sub-territorially disaggregated regional case study from a North African governance context. It tests the analytical utility of MLG theory in a hybrid Type I/Type II governance system, using RSK as empirical terrain. It applies political ecology's critical apparatus, particularly Robbins (2020) and Schlosberg (2007), to a Moroccan case, extending both frameworks' geographic reach. The three-pillar methodology is designed for cross-regional replication.

Seven targeted recommendations follow from the analysis. An integrated regional environmental observatory should be established with a mandate to produce disaggregated sub-territorial performance data. Provincial GIS capacity must be developed through dedicated staffing and interoperable data architecture. Inter-agency coordination between the Conseil Régional, ABH agencies, ONEE, and AURS requires institutional formalisation through binding cooperation agreements. A publicly accessible regional environmental performance dashboard should be institutionalised. EIA citizen participation procedures must be restructured in peri-urban and rural zones. Environmental investment must be explicitly prioritised toward the most vulnerable sub-territories. International financing should be conditionally linked to measurable governance improvement targets rather than infrastructure outputs alone.

Three research trajectories extend this work. A comparative regional study applying the same three-pillar methodology to Casablanca-Settat and Tanger-Tétouan-Al Hoceïma would test the generalisability of RSK findings. Longitudinal monitoring of RSK governance outcomes against PDR 2022-2027 objectives, beginning in 2025, would provide dynamic evidence of reform trajectories. Primary institutional interviews with regional, provincial, and communal environmental actors would substantially enrich the implementation analysis beyond what documentary sources alone can capture.

Appendices

Appendix A — Territorial Indicator Grid Methodology

The territorial analysis of RSK draws on a set of quantitative indicators selected for each of the seven environmental domains examined in Section 3.3. Indicators were chosen on the basis of three criteria: availability at prefecture or province level within RSK, official institutional provenance, and comparability across sub-territories. Where official sub-regional data are unavailable, proxy indicators derived from national surveys are used and flagged accordingly in the table below.

Important methodological note: Several indicators are not available at the prefecture or province level and have been estimated through proportional allocation weighted by population or surface area. This disaggregation method introduces approximation errors whose magnitude cannot be precisely quantified. Data gaps are most acute at the communal scale for the three inland provinces (Sidi Kacem, Sidi Slimane, Khémisset), where official sub-provincial environmental records are largely absent. Results derived from these indicators should be read as indicative orders of magnitude rather than precisely measured values.

Environmental domain	Indicator	Unit	Primary source	Reference year	Spatial resolution	Status
Water resources	Renewable availability	water m ³ /inhab/year	ABH Bouregreg-Chaouia; ABH Sebou	2019-2021	Basin level	Official

Environmental domain	Indicator	Unit	Primary source	Reference year	Spatial resolution	Status
Water resources	Drinking water network connection rate	% households	ONEE	2021	Prefecture / Province	Official
Sanitation	Sanitation infrastructure coverage	% population	Ministry of Interior; ONEE	2021	Prefecture / Province	Official (partial)
Solid waste	Formal collection rate	% communes served	PNDM; Ministry of Interior	2021	Commune (aggregated)	Estimated
Solid waste	Uncontrolled dumping sites	Count	Ministry of Interior	2021	Province	Official (partial)
Air quality	Annual mean PM2.5 concentration	µg/m3	ONEM	2022	Urban agglomeration only	Official
Air quality	Annual mean PM10 concentration	µg/m3	ONEM	2022	Urban agglomeration only	Official
Biodiversity	Forest cover change (Maâmora)	ha/year	HCEFLCD	2020	Sub-regional	Official
Urbanisation and land use	Urban land cover change	% per 5-year interval	HCP; AURS	2004-2022	Prefecture / Province	Estimated
Urbanisation and land use	Informal settlement count	Count	AURS; communes	2022	Prefecture (Grand Rabat perimeter only)	Partial
Institutional capacity	Environmental technical staff	Staff per 10,000 inhab.	Institutional reports (proxy)	2022	Prefecture / Province	Proxy estimate

Indicators are processed using QGIS 3.x. Where data are reported at the national or basin scale, disaggregation is performed through proportional allocation and flagged as an approximation. Air quality data are available only for the Rabat-Salé urban agglomeration; rural provinces of RSK lack equivalent monitoring infrastructure, which constitutes a significant data gap for the territorial analysis. Environmental staff ratios are derived from institutional service reports and secondary administrative sources; they are particularly uncertain for the three inland rural provinces, where staff counts could not be independently verified.

Appendix B — IAD Coding Grid: Sample for the RSK Institutional Context

The IAD coding protocol (Ostrom, 1990, 2011) is applied to each legal instrument in the national corpus by systematically distinguishing rules-in-form, what the text prescribes, from rules-in-use, what actors in RSK's collective action arenas appear to do in practice. Rules-in-use are not directly observed through fieldwork in this study; they are inferred from institutional reports, PDR 2022-2027 evaluations, DREEDD activity reports, ABH annual publications, and the secondary governance literature. This inferential character introduces uncertainty, and the characterisations below should be read as analytical hypotheses grounded in documentary evidence rather than as verified empirical facts.

Legal text	Rules-in-form (as prescribed)	Rules-in-use in RSK (as inferred from documentary sources)
EIA Law 12-03	EIA mandatory for all projects with significant environmental effects; public consultation required prior to approval; post-project environmental monitoring prescribed by decree	EIA appears applied to major industrial and urban projects; peri-urban subdivisions and smaller coastal developments reportedly bypass the procedure; consultations held but participation reportedly minimal in rural communes; post-project monitoring largely undocumented
Water Law 10-95	Integrated management of water resources through ABH; PDAIRE as binding planning instrument; water use fees applied to all withdrawals; discharge standards enforced by water police	ABH Bouregreg-Chaouia and ABH Sebou operate without effective coordination at the Kénitra boundary; PDAIRE targets reportedly unenforced for agricultural withdrawals in the Gharb; water police under-resourced according to institutional reports; fee recovery appears partial
Framework Law 99-12	Right to a healthy environment enshrined; precautionary and polluter-pays principles mandatory across all sectoral ministries; National SD Council established; ministerial reporting obligations prescribed	Implementing decrees for several provisions remain unpublished; SD Council created but operationally limited; cross-ministerial coordination absent in RSK; no regional SD performance monitoring mechanism identified in the documentary record

Appendix C — RSK Institutional Sources Consulted

The following sources constitute the primary institutional documentation base for this study. They are distinguished between national-level sources and RSK-specific regional or provincial sources. All documents are publicly available through the relevant institutional portals or were accessed through official institutional repositories.

National-level sources

- Ministère de la Transition Énergétique et du Développement Durable. (2022). *Rapport annuel de la Direction Régionale de l'Environnement et du Développement Durable (DREEDD)*. Rabat.
- Ministère de l'Intérieur / DGCL. (2021). *Bilan du Programme National des Déchets Ménagers (PNDM)*. Rabat.
- Haut-Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification (HCEFLCD). (2020). *Rapport national sur la biodiversité*. Rabat.
- Observatoire National de l'Environnement et du Développement Durable (ONEM). (2022). *Rapport sur la qualité de l'air au Maroc*. Rabat.
- Office National de l'Electricité et de l'Eau Potable (ONEE). (2021). *Rapport annuel*. Rabat.
- Haut-Commissariat au Plan (HCP). (2022). *Monographie de la région Rabat-Salé-Kénitra*. Rabat.
- Haut-Commissariat au Plan (HCP). (2022). *Indicateurs démographiques et sociaux du Maroc*. Rabat.
- Haut-Commissariat au Plan (HCP). (2023). *Annuaire statistique du Maroc*. Rabat.

RSK-specific regional and provincial sources

- Conseil Régional Rabat-Salé-Kénitra. (2022). *Programme de Développement Régional (PDR) RSK 2022-2027*. Rabat.
- Agence Urbaine de Rabat-Salé (AURS). (2014). *Schéma Directeur d'Aménagement Urbain du Grand Rabat (SDAU)*. Rabat.
- Agence du Bassin Hydraulique Bouregreg et Chaouia (ABH). (2019). *Plan Directeur d'Aménagement Intégré des Ressources en Eau (PDAIRE) — Bouregreg-Chaouia*. Rabat.
- Agence du Bassin Hydraulique du Sebou (ABH Sebou). (2021). *Rapport annuel*. Fès.
- Wilaya de la Région Rabat-Salé-Kénitra / DREEDD. (2022). *Rapports d'activité de la Direction Régionale de l'Environnement et du Développement Durable*. Rabat.
- Préfecture de Rabat; Préfecture de Salé; Préfecture de Skhirate-Temara. (2021-2022). *Rapports des services déconcentrés de l'environnement*. Rabat.
- Province de Kénitra; Province de Sidi Kacem; Province de Sidi Slimane; Province de Khémisset. (2021-2022). *Rapports des délégations provinciales de l'environnement*. Various.

Appendix D — RSK Sub-territory Raw Indicator Data

The table below presents available raw indicator data per prefecture and province within RSK, prior to any analysis. Data are drawn from the sources listed in Appendices A and C. **All figures are approximations derived from secondary sources and should be treated as indicative orders of magnitude.** Sub-provincial disaggregation involves proxy estimation for rural communes in the three inland provinces; the uncertainty attached to these estimates is highest for Sidi Kacem, Sidi Slimane, and Khémisset. Cells marked *n.a.* indicate unavailability of sub-regional official data; no proxy estimate was considered sufficiently reliable to substitute. This table supports the analysis in Figure 3, Table 2, Figure 4, and Table 3.

Sub-territory	Pop. density (inhab/km2)	Urbanisation rate (%)	Waste collection rate (%)	Sanitation coverage (%)	Drinking water access (%)	Env. staff per 10,000 inhab. (indicative)
Préfecture de Rabat	~4,500	~99	~95	~98	~99	~0.8
Préfecture de Salé	~2,800	~92	~88	~92	~97	~0.5
Préfecture de Skhirate-Temara	~850	~78	~72	~75	~91	~0.4
Province de Kénitra	~280	~65	~80	~82	~90	~0.3
Province de Sidi Kacem	~85	~32	~35	~28	~68	~0.1
Province de Sidi Slimane	~95	~28	~30	~25	~65	~0.08
Province de Khémisset	~75	~35	~38	~32	~70	~0.1

Sources: HCP (2022a, 2022b), Ministry of Interior (2021), ONEE (2021), PNDM progress reports, institutional provincial service reports. Environmental staff data are derived from institutional reports and administrative sources and are indicative only; independent verification at sub-provincial level was not possible within the scope of this study.

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