

Advancing SDG 14 through Resilient Marine Governance in **Aqaba**

Policy Paper – 2026



Prepared by
Hala Ghazi Alaa Aldin, PhD,
University of Tübingen, Germany



Advancing SDG 14 through Resilient Marine Governance in Aqaba

Hala Ghazi Alaa Aldin, PhD,
University of Tübingen, Germany

Published by the United Nations Human Settlements Programme (UN-Habitat).
First published in Nairobi in September 2026 by UN-Habitat Copyright © United Nations Human Settlements Programme, 2026.

All rights reserved.

United Nations Human Settlements Programme (UN-Habitat) P.O. Box 30030,
00100 Nairobi GPO, Kenya Tel: 254-020-7623120 (Central Office)
www.unhabitat.org

Disclaimer

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the secretariat of the United Nations concerning the legal status of any county, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries regarding its economic system or degree of development. Excerpts may be reproduced without authorization, on condition that the source is indicated. Views expressed in this publication do not necessarily reflect those of the United Nations Human Settlements Programme, the United Nations and its member states

PREFACE

Achieving the 2030 Agenda requires more than translating global goals into national targets – it demands that sustainable development be rooted in the realities, needs, and capacities of local territories. Local and regional governments are indispensable actors in this process: they deliver essential services, address inequalities on the ground, and turn policy commitments into concrete actions. Yet this critical role is only fully effective when backed by strong evidence, meaningful knowledge exchange, and coherent governance across levels.

The Local2030 Knowledge and Scientific Network (KSN) was established within the UN Local2030 Coalition precisely to respond to this need. As a dynamic global platform, KSN connects young researchers, policymakers, community leaders, and practitioners around a shared mission: to harness science for sustainable development with local impact. It does so by aligning academic inquiry with the specific priorities of local development stakeholders, while amplifying research findings as inputs to SDG-related global processes.

Central to this approach is the understanding that research must not only be produced – it must be translated into policy and action. KSN promotes a more dynamic and responsive model of academia, one that co-creates scalable solutions rooted in scientific evidence and community priorities, and that empowers local actors with the skills, tools, and institutional support needed to engage in evidence-based decision-making and influence policy. Through its Country Pilots – sponsored by the Italian government and implemented by UN-Habitat and the Centro Studi di Politica Internazionale (CeSPI ETS) – and Innovation Labs, the network operationalizes this vision by connecting universities and students with local policymakers, enabling interdisciplinary collaboration and capacity-building in territories across Africa, Asia, and Latin America and the Caribbean.

Action-research is the methodological backbone of this work. Territories are engaged not as passive subjects of study, but as spaces for experimentation and learning, where sustained interaction between researchers, local governments, civil society, and communities drives learning, adaptation, and co-creation. By combining quantitative and qualitative methods – data analysis, spatial assessments, stakeholder engagement, and participatory approaches – this process generates a comprehensive and grounded understanding of local dynamics, inequalities, and development opportunities.

This policy paper is the result of that process. It reflects the outcome of collaboration between academic research, territorial analysis, and multi-stakeholder dialogue, in

the spirit of the KSN's core objective: translating research into policy and action. Its aim is to offer context-sensitive analysis and practical policy recommendations that can inform SDG localization at the local level — bridging the gap between global agendas and the communities that will ultimately determine their success.

TABLE OF CONTENTS

EXECUTIVE SUMMARY 1

1. INTRODUCTION 2

2. POLICY ISSUE 3

 2.1 Problem definition and justification 3

 2.1.1 *Climate stress* 3

 2.1.2 *Institutional coordination and operational constraints* 4

 2.1.3 *Sustainable financing for long-term impact* 4

3. CURRENT CONTEXT: FROM FRAGMENTED GOVERNANCE TO MORE INTEGRATED DECISION-MAKING 6

4. KEY CHALLENGES 7

 4.1 Coral resilience is strong but limited 7

 4.2 Local human pressures continue to threaten reef systems 7

 4.3 Plastic pollution requires greater policy attention 8

 4.3.1 *Plastic pollution as a direct threat to coral systems* 8

 4.4 Short-term environmental funding limits long-term impact 9

 4.5 Environmental protection is still too often framed as a constraint 10

5. WHY THESE MATTERS FOR SUSTAINABLE COASTAL GOVERNANCE 11

6. POLICY OPPORTUNITIES 12

 6.1 The Aqaba Marine Reserve as a governance anchor 12

 6.1.1 *National policies in the identified sector* 12

 6.2 The Blue Economy Center as a bridging institution 13

6.3 Environmental protection as an economic opportunity 13

7. POLICY RECOMMENDATIONS 15

9. CONCLUSION 18

EXECUTIVE SUMMARY

The Gulf of Aqaba hosts coral reef ecosystems of exceptional ecological and economic importance. These reefs are internationally recognized for their relatively high thermal tolerance, which gives them particular value under accelerating climate change. However, resilience should not be mistaken for immunity. Coral reefs in Aqaba remain vulnerable to cumulative local pressures associated with coastal development, tourism, maritime activity, plastic pollution, and limited integration between conservation priorities and development planning.

This policy paper argues that coral protection in Aqaba should be treated not only as an environmental objective, but as a core pillar of sustainable coastal governance and long-term blue economy development. Aqaba has already made progress in transitioning from fragmented institutional roles toward more integrated environmental decision-making, with scientific evidence increasingly informing planning, regulation, and risk management. This creates an important opportunity to strengthen coral protection through governance reform rather than through isolated conservation efforts.

The paper identifies three major policy needs: first, embedding coral reef protection more directly within coastal planning and institutional coordination; second, reducing local pressures that undermine reef resilience; and third, shifting from short-term project funding toward sustainable blue financing mechanisms that connect environmental protection with economic return. In this context, the Aqaba Marine Reserve can serve as a governance anchor, while the Blue Economy Center can act as a bridging institution linking marine conservation with sustainable investment and community-based development.

Protecting coral reefs in Aqaba is therefore not a constraint on growth. It is a strategic investment in ecological resilience, economic stability, and the long-term sustainability of coastal development.



1. INTRODUCTION

The Gulf of Aqaba is one of the region's most important marine environments, both ecologically and economically. Its coral reef ecosystems support biodiversity, underpin tourism and recreation, and form part of the environmental foundation upon which Aqaba's coastal development depends. These reefs are not merely natural assets; they are also directly linked to the city's long-term sustainability, competitiveness, and resilience.

As pressures on marine ecosystems continue to grow globally and locally, coral protection can no longer be addressed as a narrow conservation issue. In Aqaba, it must be integrated into a broader framework of coastal governance that connects environmental management with planning, tourism, maritime use, investment, and community participation. This is particularly important in a rapidly developing coastal city where economic growth and ecological protection are closely interconnected.

This policy paper examines how coral protection can be incorporated more effectively into sustainable coastal governance in Aqaba. It builds on the understanding that strong environmental governance depends not only on scientific knowledge, but also on institutional coordination, sustainable financing, and practical policy mechanisms capable of aligning conservation with development.

2. POLICY ISSUE

The central policy issue is not the absence of environmental concern in Aqaba, but the need to strengthen the integration of coral reef protection within the city's broader coastal governance and development model. Although coral reefs are widely recognized as valuable natural assets, they are still at risk when environmental protection remains partially separated from economic planning, investment decisions, and long-term financing structures.

Aqaba has made notable progress in environmental governance. Scientific research, water quality monitoring, and ecological assessments are increasingly informing decision-making processes. However, coral protection still requires stronger institutional embedding so that it becomes a routine part of how coastal development is planned, regulated, and financed. Without such integration, coral conservation efforts may remain reactive, fragmented, or dependent on temporary funding cycles.

This policy issue is especially important because the Gulf of Aqaba's coral reefs hold both environmental and strategic value. Their relative thermal tolerance has made them globally significant in climate change discussions, yet that same value increases the urgency of ensuring that local stressors do not erode their resilience over time.

2.1 Problem definition and justification

Marine ecosystem pressures in the Gulf of Aqaba are shaped by a combination of environmental stressors and operational challenges associated with long-term marine management in a rapidly developing coastal zone. Despite strong institutional coordination and effective governance structures, sustaining marine resilience requires continuous adaptation to climate-related risks and evolving data and financing needs.

2.1.1 Climate stress

Rising sea temperatures and episodic bleaching events continue to pose risks to the Gulf of Aqaba's globally significant coral reef systems. Although these corals demonstrate exceptional thermal tolerance compared to other reef systems worldwide, their long-term resilience depends on reducing cumulative pressures, enhancing adaptive management, and maintaining effective protection measures.

Furthermore, Aqaba implements a strict Nutrients Zero-Discharge Policy, which prohibits the discharge of nutrient-rich effluents into the Gulf of Aqaba in order to safeguard coral reef ecosystems and preserve marine water quality.

2.1.2 Institutional coordination and operational constraints

Marine governance in Aqaba is characterized by a high level of coordination among ASEZA, the Ministry of Environment, the Marine Science Station, and development partners. This coordination has enabled effective enforcement, informed permitting processes, and meaningful engagement with local communities, particularly professional fishermen.

The main challenge identified through this research does not relate to governance effectiveness or inter-institutional collaboration, but rather to the accessibility and consolidation of project-level and ecological data. Differences in data formats, reporting timelines, and institutional mandates can limit the availability of comprehensive datasets needed for long-term assessment, comparative analysis, and research-based policy learning.

Previously, institutional multiplicity was often perceived as a governance challenge. However, in the current phase, we are witnessing a positive transformation in which this multiplicity has become a source of strength and integration. Today, there is clear consolidation among regulatory, research, and implementation bodies, and science has become a central element in guiding decision-making. Scientific data related to coral health, water quality, and anthropogenic pressures are actively utilized in planning, regulation, and risk management. This development reflects a maturation of environmental governance, where science is no longer separate from decision-making, but rather its foundation.

These constraints are common in multi-institutional environmental governance settings and represent an opportunity to strengthen data-sharing mechanisms, enhance transparency, and further support adaptive management.

2.1.3 Sustainable financing for long-term impact

While significant progress has been achieved through project-based funding, many restoration, monitoring, and capacity-building activities continue to rely on short-term external support. Ensuring long-term sustainability requires integrating marine management needs into institutional budgets and establishing complementary financing mechanisms that support continuity beyond individual project cycles. In recent years, Aqaba has transitioned from traditional funding approaches to more sustainable financing instruments, including green and blue bonds, supportive

national policies, the Environmental Protection Fund, and the allocation of fines and environmental fees to finance research and emerging startups.

3. CURRENT CONTEXT: FROM FRAGMENTED GOVERNANCE TO MORE INTEGRATED DECISION- MAKING

In previous years, the involvement of multiple institutions in Aqaba's environmental management was often viewed as a source of fragmentation. Regulatory agencies, scientific institutions, environmental initiatives, and project actors operated with different mandates and priorities, which sometimes created coordination gaps. Yet this institutional diversity is gradually becoming an asset rather than a weakness.

Environmental governance in Aqaba is increasingly moving toward a more integrated model in which research, monitoring, regulation, and implementation are more closely connected. Scientific evidence is becoming central to environmental planning and risk management, rather than remaining external to decision-making. This includes greater reliance on coral health indicators, environmental monitoring data, and assessments of human pressures in shaping responses to marine challenges.

This shift is significant because coral protection depends on exactly this kind of institutional integration. Reef governance requires a continuous relationship between knowledge generation, policy formulation, implementation, and evaluation. Aqaba now has the opportunity to consolidate this progress by placing coral reef protection at the center of coordinated coastal governance.

4. KEY CHALLENGES

4.1 Coral resilience is strong but limited

Coral reefs in the Gulf of Aqaba are often recognized for their relatively high tolerance to heat stress compared with reef systems in many other regions. This characteristic gives them exceptional value in the context of climate change. However, resilience must not be misunderstood as complete resistance. Even thermally tolerant reef systems can be weakened by repeated local stressors that accumulate over time and reduce their capacity to cope with environmental change.

This means that coral protection in Aqaba should be based on precaution. The existence of natural resilience provides an opportunity for protection, not a justification for inaction.

4.2 Local human pressures continue to threaten reef systems

Despite the ecological importance of the reefs, local pressures remain a concern. Despite their ecological importance Aqaba's Reefs remain exposed to a range of local pressures. Coastal development, maritime activity, sedimentation, increased turbidity, hydrocarbon leakage, marine litter, and plastic pollution can all contribute to reef stress. While these pressures may not always result in immediate large-scale damage, but their cumulative effects can gradually erode coral health and undermine ecological stability.

The interaction between climate-related stress and local environmental pressures is especially important. Even relatively resilient coral systems can become more vulnerable when exposed to avoidable human disturbances. For this reason, effective local environmental management remains one of the most important determinants of long-term reef condition in Aqaba.

4.2.1 Local community evidence: insights from professional fishermen

Field surveys and interviews conducted with professional fishermen in Aqaba revealed clear positive ecological outcomes following the enforcement of a ban on fishing in shallow zones and a seasonal fishing closure from January to April/May,

implemented for two consecutive years. Fishermen reported a noticeable return of multiple species in higher quantities, the appearance of fish in areas where they had not been observed for years, and strong community support for maintaining the annual four-month closure. They emphasized that the seasonal closure enhances marine biodiversity, improves fish stock recovery, and strengthens their long-term livelihoods through more sustainable catch levels.

Based on this, the fishing community strongly recommends institutionalizing the seasonal closure as a fixed annual policy to protect Aqaba's marine ecosystems. This demonstrates the importance of local ecological knowledge and highlights the value of community-based co-management.

4.3 Plastic pollution requires greater policy attention

Plastic pollution is not only a general marine waste issue; it is a direct ecological threat to coral reef systems. Plastic debris can physically damage coral tissues, contribute to stress, and create conditions that increase disease vulnerability. Over time, plastics can break down into microplastics that move through water, sediments, and marine organisms, making the problem more persistent and less visible.

Because of these risks, plastic pollution should be treated as a coral governance issue rather than only as a waste management issue. Monitoring for plastics and microplastics in the marine environment should become part of routine environmental assessment and long-term reef protection strategies.

4.3.1 Plastic pollution as a direct threat to coral systems

Scientific evidence indicates that plastic pollution poses multi-dimensional risks to coral ecosystems.

Physical impacts: blockage of coral skeletal pores; tissue abrasion and mechanical injury; increased susceptibility to disease.

Chemical impacts: release of plastic additives (e.g., BPA, phthalates); transfer of adsorbed pollutants (heavy metals, hydrocarbons).

Biological impacts: plastics act as vectors for pathogenic microorganisms; potential

interference with photosynthesis of symbiotic algae; increased likelihood of coral stress and bleaching.

Monitoring for microplastics in water, sediments, and associated biota should therefore become part of routine environmental assessment frameworks.

Based on the latest study on microplastics in the Gulf of Aqaba, the results showed the presence of microplastics in all collected samples from surface water, middle water, bottom water, and deep-sea sediments. The study also found that microplastic concentrations were much higher in sediments than in the water column, indicating that the seafloor acts as a long-term sink for this type of pollution. In addition, the results showed differences in the shapes of microplastics, with fibres dominating in the water column and fragments being more common in sediments, reflecting differences in pollution sources as well as transport and deposition processes within the marine ecosystem.

Based on these findings, it is recommended that microplastic pollution be incorporated into environmental and marine policy priorities in the Gulf of Aqaba, and that regular monitoring programmed be strengthened across water, sediments, and marine organisms. It is also recommended to improve solid waste and wastewater management in order to reduce plastic leakage into the marine environment. Further recommendations include strengthening regulatory measures to reduce single-use plastics and enhancing public and sectoral awareness of the risks of plastic pollution, especially in sectors linked to tourism, fisheries, and marine transport. In addition, future studies should be expanded to cover a wider spatial and temporal scale in order to support evidence-based decision-making and contribute to the protection of marine ecosystems and the achievement of Sustainable Development Goal 14 on life below water.

4.4 Short-term environmental funding limits long-term impact

Many environmental activities in Aqaba have benefited from grants, projects, and external support. These resources have been valuable, but they often operate within limited timeframes and are not always designed to guarantee continuity after project closure. As a result, important environmental work may remain vulnerable to interruption, reduced institutional memory, or dependence on the priorities of donors rather than the long-term needs of the ecosystem.

This creates a structural challenge: coral reef protection requires continuous monitoring, management, and investment, yet current funding approaches may not always support that continuity.

4.5 Environmental protection is still too often framed as a constraint

One of the underlying policy challenges is conceptual. Environmental protection is still sometimes viewed as a limitation on growth, tourism, or marine use, rather than as a foundation for long-term economic sustainability. This framing weakens support for preventive environmental measures and can lead to short-term choices that increase future ecological and economic costs.

5. WHY THESE MATTERS FOR SUSTAINABLE COASTAL GOVERNANCE

Coral reefs in Aqaba should not be addressed as isolated ecosystems disconnected from broader governance systems. Their protection is directly linked to how the coast is managed, how institutions coordinate, how investments are designed, and how economic activities interact with environmental limits. In that sense, coral protection is a governance issue as much as it is an ecological one.

Sustainable coastal governance requires balancing environmental integrity with economic activity and social benefit. In Aqaba, this balance cannot be achieved without stronger integration of coral conservation into mainstream policy and planning. If coral reefs degrade, the consequences will extend beyond biodiversity loss to tourism quality, local livelihoods, coastal resilience, and the city's overall environmental reputation.

6. POLICY OPPORTUNITIES

6.1 The Aqaba Marine Reserve as a governance anchor

The Aqaba Marine Reserve (AMR) can serve as more than a protected area. It can function as a practical governance anchor through which coral protection is institutionalized within coastal management. The AMR provides a spatial and regulatory framework that can support monitoring, compliance, zoning, ecosystem management, and coordination among relevant actors.

Its value lies in making coral protection operational. Rather than treating reef conservation as an abstract goal, the reserve can translate it into concrete management mechanisms that connect research, regulation, and field implementation. To fulfil this role fully, however, the reserve must remain closely integrated with broader coastal planning and development processes in Aqaba.

6.1.1 National policies in the identified sector

The Aqaba Marine Reserve contributes directly to the objectives of Jordan's National Biodiversity Strategy, the National Tourism Strategy, the National Climate Adaptation Plan (2025), and ASEZA's Blue Economy priorities.

Institutional coordination among ASEZA, the Ministry of Environment, the Marine Science Station, and UNDP provides a strong governance foundation for marine protection in Aqaba. This coordination supports policy alignment, effective enforcement, scientific monitoring, and community engagement.

Building on this solid institutional framework, further strengthening of documentation practices and data-sharing protocols would enhance continuity, support evidence-based scaling of successful initiatives, and facilitate the translation of scientific findings into long-term planning and investment decisions.

Institution	Mandate	Coordination mechanism
ASEZA	Marine reserve management, enforcement, budgeting	Regular meetings, joint monitoring
Ministry of Environment	Policy integration, national coordination	Strategic planning sessions
Marine Science Station	Scientific monitoring	Data-sharing agreements, advisory councils
UNDP	Technical support, capacity building, funding	Project partnerships, workshops

6.2 The Blue Economy Center as a bridging institution

The Blue Economy Center can play an equally important role by linking environmental priorities with economic planning and sustainable investment models. It has the potential to translate marine conservation goals into economic frameworks that reward low-impact activities, strengthen local participation, and promote innovation in sustainable coastal enterprises.

By bridging conservation and economic development, the Center can help shift policy thinking away from the idea that reef protection is a cost. Instead, it can support a model in which ecological integrity becomes part of long-term economic value creation.

6.3 Environmental protection as an economic opportunity

Aqaba has strong potential to position marine environmental protection as a source of sustainable economic opportunity. High-value, low-impact eco-tourism, responsible diving systems, environmental service fees, and community-based environmental jobs all offer practical ways to connect reef protection with tangible economic benefit.

This approach is consistent with blue economy principles because it focuses on generating income without degrading the ecological base that supports it. It also provides a way to strengthen social support for conservation by showing that environmental protection can create real opportunities for local communities rather than only imposing restrictions.

7. POLICY RECOMMENDATIONS

- Coral reef protection should be formally integrated into coastal planning and environmental decision-making across institutions in Aqaba. Scientific evidence should continue to guide planning, regulation, and risk management, while coral-related concerns should be embedded in broader coastal development policies rather than addressed separately.
- Local environmental pressures affecting reef systems should be reduced through preventive action. This includes stronger management of pollution risks, improved control of coastal activities that contribute to sedimentation or turbidity, closer monitoring of maritime impacts, and the incorporation of plastic and microplastic monitoring into routine environmental assessment.
- The Aqaba Marine Reserve should be strengthened as a governance mechanism, not only as a conservation site. Its management role should be linked more explicitly to monitoring systems, policy implementation, and broader coastal governance arrangements.
- Aqaba should move gradually from short-term project-based environmental funding toward more sustainable blue financing models. A portion of revenues linked to marine tourism and related activities should be designed to support reef protection, protected area management, and community-based environmental initiatives.
- Institutions should promote a development narrative that positions environmental protection as an investment rather than a constraint. This requires better alignment between conservation policy, tourism strategy, local livelihoods, and long-term economic planning.
- Marine and coastal waste management: strengthen waste collection, recycling, and separation processes in coastal and marine areas to reduce pollution impacting marine biodiversity. Promote public awareness campaigns and stakeholder engagement to encourage responsible disposal practices and reduce plastic leakage into the marine environment.
- Sustainable fisheries: replace conventional plastic fishing lines with biodegradable alternatives; support eco-friendly boats and operations to reduce marine pollution.

- Gender empowerment: conduct targeted capacity-building and marine environment training for women; promote women's participation in marine conservation and blue economy activities.
- Climate adaptation planning: enhance collaboration between the Royal Society for the Conservation of Nature (RSCN) and the Ministry of Environment to integrate local coastal climate adaptation plans into national strategies.
- The Blue Economy Center should be supported as a bridging platform that connects conservation goals with sustainable enterprise development, economic valuation, and local participation. Its role could be especially valuable in designing practical financing and investment pathways that support both coral protection and community benefit.
- National Water Carrier Project (Environmental Considerations): In light of planned large-scale desalination and water transfer initiatives, such as the National Water Carrier project, potential marine environmental implications should be rigorously assessed and continuously monitored.
- Particular attention should be given to changes in seawater salinity and temperature associated with desalination processes and brine discharge. Although the Gulf of Aqaba is characterized by deep and dynamic waters, its semi-enclosed nature and ecological sensitivity call for a precautionary approach. Integrating rigorous environmental impact assessments, long-term monitoring systems, and adaptive management measures into project planning will help ensure that such strategic infrastructure developments remain aligned with marine conservation objectives and the long-term resilience of coral reef ecosystems.

8. PATHWAY FROM ANALYSIS TO FUTURE PROJECT

The evidence and recommendations converge into a coherent future AMR expansion and resilience project, linking:

Ecological monitoring, seasonal closures and reef restoration

Community engagement, sustainable livelihoods and waste and fisheries improvements

Governance coordination, territorial planning and climate adaptation

This ensures that all elements from analysis to implementation are connected without duplicating a full Concept Note.

9. CONCLUSION

Coral reefs in the Gulf of Aqaba are among the city's most valuable ecological assets, yet their long-term future depends on how effectively they are integrated into coastal governance. While Aqaba has made meaningful progress toward more coordinated and science-based environmental management, critically, the next step is to ensure that coral protection is embedded within the broader systems that shape development, investment, and marine use.

This policy paper has argued that coral reef protection should be understood not only as an environmental responsibility, but as a strategic pillar of sustainable coastal governance and blue economy development. Stronger institutional integration, reduced local pressures, more effective use of the Aqaba Marine Reserve, and more sustainable financing models can together create a governance framework capable of protecting reefs while supporting long-term economic resilience.

In Aqaba, protecting coral is not separate from development. It is part of securing the environmental foundation on which sustainable development itself depends.

LOCAL 2030

KNOWLEDGE AND SCIENTIFIC NETWORK

Connect with Hala!



h.maroof1992@yahoo.com



[halaghazi](#)



Learn more
about the Local2030
Knowledge and
Scientific Network!