

Original Research Article

Investigating the Mutual Relationship Between Ecosystem Services and Environmental-Social Justice in Explaining the Strategic Framework of Sustainable Development of Qeshm Island, Bandar Abbas, Iran*

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Abstract | The demand for change from an undesirable situation, especially when natural resources, cultural assets, and social capacities are available to drive transformation, necessitates careful selection of a path not only for advancement but also for the durability and balance of a favorable developmental state. Qeshm Island and its adjacent areas, as some of the richest settlements within Iran - boasting a unique ecosystem, access to open waters, and a deep-rooted cultural and civilizational heritage - find themselves in less-than-ideal conditions and are in demand of comprehensive development. The unique value of this natural-historical ecosystem highlights the importance of designing a strategic development framework. This framework should aim to ensure economic growth, preserve the environment, and provide equitable access to resources, information, and decision-making processes. Consequently, the development process should provide a platform for growth and progress for all social, age, gender, and racial groups. This research aims to elucidate the relationship between the concept of ecosystem services on Qeshm Island and the achievement of environmental justice in various dimensions to determine the necessary boundaries for crafting a desirable and sustainable development framework for Qeshm Island and its satellite areas as an integrated socio-ecological system.

The research employed a qualitative and mixed-method approach, using a case study to analyze and expand the global literature on the topic as applied to the study area. Through the examination of sustainable development literature, it became evident that recognizing the human-environment relationship as an inseparable natural and systemic network (ecosystem services) and establishing environmental justice are prerequisites for the sustainability of this process in the Qeshm Island climate. The balanced pursuit of economic growth, environmental conservation, and social development defines the preferred approach. Thus, in designing a comprehensive and unique sustainable development model for Qeshm and its satellites, it is crucial to address distributive, cognitive, and procedural justice by recognizing the roles, capacities, and values of various stakeholders and acknowledging the role of intermediaries - such as governance - in the process. Additionally, efforts should be made to create learning opportunities aimed at reducing inequalities and shifting focus from mere idealism to altering "unjust conditions" in the region.

Keywords | Sustainable Development, Ecosystem Services, Environmental Justice, Qeshm Island, Socio-Ecological System.

Introduction | Coastal areas, islands, and environmental zones with rich ecological access to water, land, and climate have been primary locations for human settlement, food provision, and trade since the dawn of civilization. However, with humanity's dominance over nature, industrial production, the construction of settlements on flatlands, and the ability to transfer resources to these populated centers,

the importance of such areas diminished in the development priorities of developing and less developed countries. In the past 50 years, this issue has resurfaced in importance for all nations with access to these natural phenomena and resources, driven by population growth, the dominance of consumer culture, the renewed significance of maritime trade, climate changes (often nonlinear), and the guidance of international institutions and organizations.

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Before the emergence of sustainable development as a concept in 1987 and its formal framework in 2015 as a comprehensive structure for environmental governance and a substitute for the dominant economic development paradigm, the right to development was advocated by Global South countries as an emblem of their “right to self-determination” (Atapattu et al, 2021). Sustainable development, defined as “meeting the needs of the present without compromising the ability of future generations to meet their own needs,” is based on two core principles: economic development and environmental protection (World Commission on Environment and Development, 1987). Later, in the “World Summit for Social Development” statement of 2015, this concept was redefined to include a third core principle, “social development,” creating an integrated framework of three interdependent pillars (United Nations, 1996).

The crucial aspect of establishing a functional link between the discourse of sustainable development and the development of islands, ports, and coastal cities is defining a unique, tailored model of sustainable development for these areas. This model should focus on economic development while simultaneously emphasizing the unique elements of social development and environmental protection specific to these regions.

Problem Statement

In the evolving development literature worldwide, marine-based development for coastal cities and islands has taken on a significant role as a form of ecosystem service, understood as “shared benefits and the utilization of nature’s resources” (Loos et al., 2023). However, in Iran, prevailing urban and economic development models have often reduced this concept to profit-centered, imbalanced, and superficial projects. These approaches have been hindered by cognitive, institutional-legal, and social barriers (Malekmohammadi & Kamali, 2013, 161) or compartmentalized perspectives, ultimately leading to serious, irreversible environmental damage, widening social inequalities, and exacerbating class disparities. Sustainable development faces significant challenges in regions like the southern islands of Iran, where development has been either absent or narrowly focused on economic growth. This is due both to the potential for diverse and rich ecosystem services and the risk of irreversible environmental damage and deepening social inequality. A pertinent example is Qeshm Island and its surrounding areas - the largest non-sovereign island globally. Here, a lack of social and ecological perspectives in most development plans and projects has led to a condition where, despite numerous opportunities to attract productive, non-local investments and utilize

ecosystem services for sustainable development in this unique climate, local communities and ecosystems have yet to fully benefit socially and economically from these resources.

In many current development models, “if development is pursued solely through economic means, with the involvement of investors and tourists, it is highly likely that due to factors such as better profit margins for investors elsewhere or different attractions for tourists, the development might lose momentum, leading to the degradation of the island” (Abolhassan Tanhaei et al., 2017, 233).

In response to this situation, applying a distributive justice framework to redistribute the wealth and benefits derived from Qeshm Island’s unique ecosystem can address some of these inequalities on a temporary and ad hoc basis. However, without addressing the underlying social values, conditions, and forces, it fails to recognize this region as a socio-ecological system, which is essential for creating self-sustaining conditions in adaptive development.

Therefore, redefining concepts around environmental justice is necessary to map a desirable path toward sustainable development in these areas. This research aims to establish an environmental justice framework to highlight the potential synergy between environmental justice assessments and goals. Specifically, this study focuses on the under-explored potential to facilitate pluralism by integrating environmental justice into the assessment, management, and research of ecosystem services in case studies.

Research Question

What is the interrelationship between ecosystem services and environmental justice in sustainable development planning for Qeshm Island and its surrounding areas? How can a strategic framework be designed to create a localized development model for this region, considering the three core pillars of sustainable development - economic development, environmental protection, and social development - and the unique characteristics of Qeshm Island and its neighboring areas?

Hypothesis

The ideal sustainable development model for Qeshm Island is a form of strategic planning that replaces idealism with a realistic perspective. By integrating the global concept of ecosystem services with the values of environmental and social justice, it frames human-environment relationships based on locally inseparable values. This approach enables the formulation and realization of a sustainable development model that is both place-specific and value-driven.

Research Methodology

In this research, a case study approach was employed as a qualitative research methodology. The case study method allows the researcher to conduct an in-depth, comprehensive examination of a specific example, applying established environmental science theories to this particular context. This method emphasizes detailed analysis and aligns collected data with theoretical concepts, fostering a deeper and more practical understanding of the subject. In this context, the research, through the selection of a specific case, aims to analyze and assess the environmental effects and impacts using existing theoretical frameworks. This method is especially useful for investigating social phenomena, such as community attitudes and perspectives on sustainability and environmental justice.

According to this general definition, the case study approach has two essential characteristics. First, case study research is holistic, meaning that a case can only be understood within its context. The meanings of different features of a case depend on their relationships with other features and the context in which they are displayed. Therefore, case study research views the world as an integrated system, preventing the study of its parts in isolation. Second, case study research focuses on specificity, emphasizing precise, detailed descriptions of specific cases in all their unique characteristics (Willing, 2008, 87).

Research Background

The studies relevant to this research are categorized into two main areas: 1- research within the discussed literature, and 2- studies on the development trajectory of Qeshm Island.

In the first category, based on the concept of ecosystem services and its relationship to environmental justice:

a) The primary body of research on ecosystem services, such as “The Maturation of Ecosystem Service: Social and Policy Research Expands” by K.M.A Chan and Satterfield (2020), predominantly focuses on the ecological and physical aspects of ecosystem services, paying limited attention to the socio-economic dimensions in relation to communities and contexts.

b) The second subset of studies, such as the study by Palomo et al. (2016) titled “Disentangling the Pathway and Effect of Ecosystem Service and Co-production,” despite addressing justice and equity, centers primarily on distributive justice.

c) other studies focus on procedural justice by identifying and comparing active approaches in this field. A comprehensive example is the collection of papers in The Cambridge Handbook of Environmental Justice and Sustainable Development, including “An Environmental Justice Perspective on Ecosystem Service” by Jacqueline Loos et al. (2023), which thoroughly explores the literature on this topic.

In the second category, which specifically addresses

Qeshm’s development, causes, and impacts, three major approaches are identifiable:

a) The first approach prioritizes economic development, as seen in “Investigation of the Position of Free Zone in the Qeshm Island in Sustained Development and Social Security” by Rostam Gourani et al. (2013). This study examines the economic and trade capacities of Qeshm’s Free Zone and the territorial effects of economic development, though with limited consideration for the ecological capacities of land, sea, and climate.

b) The second approach, like the study “The Role of Qeshm City in the Regional Economy Development” by Sarvar and Khaliji Oskouei (2014), explains the economic development potential for Iran and how Qeshm leverages these capabilities. While this group of studies links Qeshm’s development to Iran’s regional and territorial development, it continues to emphasize economic growth over other pillars of sustainable development.

c) The third approach includes studies that consider sustainable development models - albeit partially - focusing on natural, social, cultural, and anthropological capacities. Examples include “Dimensions of Social Development in Qeshm (Based on “Parsons’ Theory”)” by Abolhassan Tanhaei et al. (2017) and “Strategic Development Planning of Qeshm Using the SWOT Model” by Safavi et al. (2011).

Theoretical Foundations

• Concepts and definitions

Development is understood as the social state of a nation in which the needs of a population are met through the logical and sustainable use of resources and natural systems. Todaro and Smith (2006) also define development as a multidimensional process involving substantial changes in social structures, attitudes, and institutions, as well as economic growth, the reduction of inequality, and the eradication of absolute poverty. The concept of development has evolved over the years, expanding from a focus on economic growth in the 1950s and 1960s to poverty alleviation in the 1970s, sustainable development in the 1980s, human development in the 1990s, Millennium Development Goals (MDGs) in the 2000s, and Sustainable Development Goals (SDGs) in the 2010s (Adam et al., 2019). Sustainable development is a value-based goal aimed at creating harmony among interconnected social, environmental, and economic systems, in ways that preserve opportunities for future generations (World Commission on Environment and Development, 1987). **Sustainable development** encompasses three core elements: economic growth, social development/human rights, and environmental conservation and restoration principles. This type of development also contributes to the promotion of peace and security (Dernbach et al., 2012).

Economic development is seen as the structural transformation of an economy through the introduction of mechanized and modern technologies to enhance labor productivity, employment, income, and the standard of living. Economic development must be accompanied by improvements in infrastructure as well as social, political, and institutional factors to facilitate economic transformation (Myint & Krueger, 2016). The economic goal of sustainable development is to ensure high standards of living and meet people's needs for a better quality of life (Zhang et al., 2024)

Regarding **social development**, although the concept has been explained since the 1990s, there remains a lack of consensus among researchers. Social development is commonly defined by attributes such as inclusive development, overall community welfare, social transformation, and quality-of-life improvements (Adam et al., 2019). These definitions have gradually incorporated intangible aspects of social development. Mohan (2010) views social development as a post-material process of human-society transformation aimed at constructing identities for individuals, communities, and nations (Mohan, 2010). Therefore, new characteristics like equitable distribution of resources, reduction of inequalities, and structural changes have been integrated alongside fundamental elements in the concept of social development.

Environmental conservation refers to the efforts of individuals, organizations, and governments to protect the environment. Its objectives include preserving natural resources, restoring damage, and reversing environmental trends where possible (Sur, 2022).

Ecosystem services (ES), defined as the benefits humans derive from nature, have evolved into the broader concept of "Nature's Contributions to People (NCP)", which encompasses multiple links between the environment and society that underpin human well-being (Díaz et al., 2018). These services are often categorized into four groups: provisioning, regulating, cultural, and supporting services for people and communities. They directly affect individuals and require support to maintain other services (Reid et al., 2005, 39).

Environmental justice aims to achieve environmental equality for all groups within society through fair treatment and meaningful involvement of individuals, regardless of racial or socio-economic backgrounds, in the development, implementation, and enforcement of environmental laws, regulations, and policies (Newton, 2009). Assessing environmental justice in an area is a qualitative topic requiring the definition of impact assessment tools, such as Social Impact Assessment (SIA)¹. SIA is typically achieved firstly through processes that allow broad stakeholder participation and secondly through systematic analysis

of the social patterns of project impacts and benefits (Walker, 2010). Environmental justice is often interpreted as equal distribution of natural resources, while other facets, such as procedural justice, education, recognition, and participation, are frequently overlooked in evaluations. On the other hand, compelling arguments suggest that concerns for distributive or environmental justice should be explicit parts of impact assessment processes. Perhaps the most convincing of these arguments is based on values that protect the most vulnerable individuals, ensuring that marginalized and politically disadvantaged groups are not systematically excluded from environmental benefits (Connelly & Richardson, 2005). This underscores that environmental decision-making is not solely a technocratic process but also inherently involves normative policy considerations (Walker, 2010).

The social-ecological system (SES) consists of interrelated social, economic, ecological, cultural, political, technological, and other components that interact intensively across multiple layers. Social-ecological systems emphasize an integrated view of "humans in nature" as fully interconnected systems that continuously evolve across time and spatial scales (Petrosillo et al., 2015). This framework posits that the system is influenced by two categories of conditions: 1) social conditions, including values, governance, and subsystems derived from human relationships (e.g., community, economy, culture, and politics), and 2) ecosystem conditions, including physical processes (climate, radiation, temperature, humidity, etc.) and environmental processes (drought, wet periods, ecological changes, etc.). This dual interaction between social and ecological subsystems, affected by social pressures on the ecosystem and the flow of ecosystem services to social conditions, forms an integrated social-ecological system (Saberri Nahreforouzani et al., 2021).

Findings and Discussions

Economic growth constitutes a fundamental premise of sustainable development, but its importance should not surpass the designated weights for social welfare and environmental quality. Various simulations on different economic growth approaches indicate that merely pursuing rapid economic growth, while disregarding people's needs in areas such as education, healthcare, and ecosystem environment, cannot guarantee healthy and sustainable economic development (Zhang et al., 2024). On the other hand, much of the research conducted on environmental justice within ecosystem services assessments focuses primarily on distributive justice values rather than extending the discussion beyond instrumental, relational, and intrinsic values (Pascual et al., 2017a & 2017b). As a result, there is often an indirect emphasis on the reciprocal and processual interaction between humans and nature in achieving equity and reducing inequalities.

The ecosystem services theory, despite critiques regarding ambiguities in defining equity components, aligns with the intrinsic objectives of sustainable development, such as embodying concepts of intergenerational and intragenerational justice within the Earth's biophysical limits across time and space (Schröter et al., 2017). For example, Chile's experience in incorporating the ecosystem services concept into socio-political interventions - such as designing a Payment for Ecosystem Services (PES) system to regulate water use - demonstrates that understanding local conditions can enhance social justice and environmental preservation (Loos et al., 2023; Benra et al., 2022). Influenced by these conditions and concepts, environmental justice emerges not solely from biological conditions but from the synergy between nature and people.

Sustainable development emphasizes a “participatory” process in economic growth and “sharing” the benefits of growth, creating job and entrepreneurship opportunities through sustainable economic growth methods, particularly providing the poor with more opportunities for maximum participation (Zhang et al., 2024).

In discussing the various aspects of environmental justice and its relationship with ecosystem services, three primary forms are considered in various studies:

- **Distributional justice:** Often viewed as the primary form of achieving environmental justice through governance interventions, it focuses on equal access to ecosystem services. Distributional justice is predominantly concerned with the equitable redistribution of natural resources and the benefits derived from them at different scales, both intergenerational and intragenerational.

- **Procedural justice:** This form of environmental justice depends on deep stakeholder interaction and power dynamics, emphasizing institutional, collective, and individual participation with consideration of their heterogeneous capabilities.

- **Recognitional justice:** Connected to ecosystem services through the concept of “Nature's Contributions to People,” recognitional justice emphasizes understanding and acknowledging diverse perspectives (values, democracy, knowledge, and abilities of different groups) for achieving environmental justice (Loos et al., 2023).

A detailed examination of research and interventions in ecosystem services through the lens of environmental justice proposes ways to engage with biophysical structures, processes, and functions that contribute to human well-being, including feedback loops and intermediary factors. Recognitional justice offers a feasible entry point toward expanding governance and management of ecosystem services to include a diversity of powers, capabilities, knowledge, and values (Fig. 1) (Pascual & Howe, 2018).

It appears that achieving equitable and sustainable

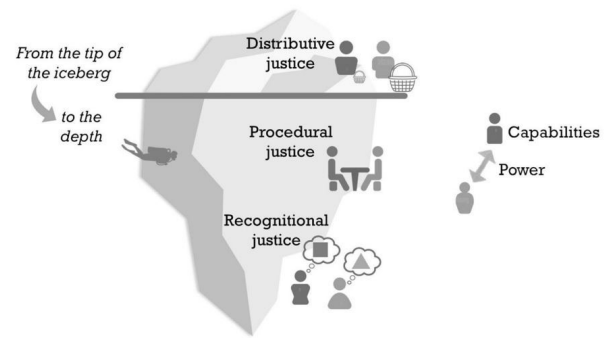


Fig. 1. Dimensions of justice intersecting with the assessment and management of ecosystem services are depicted as an iceberg. Rather than measuring only the visible, distributive dimension, recent research in this field emphasizes the need to “dive deeper” into the socio-ecological system to understand and acknowledge the value and diversity of knowledge, as well as the capabilities and power structures underpinning decision-making processes based on ecosystem services. Source: Pascual & Howe, 2018.

benefits from ecosystem services - as a form of inseparable relationship between humans and the environment - requires a holistic perspective encompassing all three dimensions of justice. Such an approach is key within the complex socio-ecological systems underlying ecosystem governance and management.

Discussion on the Studied Cases

The cases examined in this research aim to analyze the nature of ecosystem services on the island and assess the environmental equity or inequity derived from it through: a) document reviews and field observations of the general living conditions of local communities (economic, cultural, and social) in the cities of Laft, Souza, Tabl, Qeshm, Hormuz Island, and the villages of Gooran, Chahkooh, Soheili, and the ports of Khamir and Kong (due to thematic relevance), and an analysis of their access to or deprivation of the benefits arising from ecosystem services-based development; b) an exploration of the different forms of environmental and social justice (distributive, recognitional, and procedural) in the historical, cultural-social, and economic contexts of these cities, focusing on the experiences of Laft, the village of Gooran, Chahkooh, and the port of Khamir, and their relationship to sustainable development; and c) an evaluation of current development-oriented programs, ranging from capital-attracting economic development to activating local tourism economies and protecting Qeshm's ecosystem heritage. These form the three main groups of samples and levels studied in this research.

In aligning the concept of ecosystem services, social justice, and sustainable development with the cases on Qeshm Island and its surrounding areas, this study examines the relationship between development programs, access to ecosystem services, and the existing and potential dimensions of environmental justice on the island. The field findings from this study, based on

observations from the research team's travels, can be categorized into four general groups:

- Living and Environmental Conditions of Local Communities: Particularly in the areas around Qeshm (Souza, Tabl, Laft, Hormuz) and in some coastal cities in Hormozgan Province (Khamir and Kong), the findings reveal a lack of access to ecosystem services and exclusion from the economic, social, and cultural benefits of development. This is evident in the infrastructural deficiencies within cities and villages that lie outside the visible zones of tourism and development, affecting the underprivileged local communities. Despite the relative richness of marine and coastal ecosystem services, even the basic facets of distributive justice are unmet.

- Partial, Monolithic Economic Development Based on External Ecosystem Services Investment: This form of development, primarily visible in Qeshm and some villages, focuses on the tourism, commercial, and service sectors, yet fails to create sustainable gains beyond the limited distribution of economic returns to the local population (with minimal distributive justice). Moreover, much of these marginal economic profits are reabsorbed through rising living costs in redeveloped areas, gradually relegating locals to low-wage service, trade, and downstream economic work. Consequently, this form of development not only diverts revenue from ecosystem services out of the region but also fails to achieve sustainable regional development or increase local per capita income. As a result, it leaves procedural and recognitional justice largely unaddressed.

- Recent Localized Efforts to Engage Social Participation in Ecosystem-Based Economic-Tourism Activities: Efforts can be seen that lead to localized environmental justice. In these initiatives, in addition to distributive justice, aspects of environmental, local capacities, and recognitional and procedural justice are observed. Activities such as promoting local tourism and wetland tours in Khamir port, active conservation of natural heritage in Chahkooch with UNESCO support, focusing on tourism economy and community participation - though limited in economic scale - have the potential to evolve into sustainable development hubs, given their focus on recognitional and procedural justice.

- Examples of Historical-Natural Sustainable Ecosystem Service Use: Historical examples of sustainable access to ecosystem services that naturally led to environmental justice provide valuable models for extraction, analysis, and application in the current environment. Examples include the water cisterns and underground reservoirs in Laft, a traditional solution for preserving freshwater (Figs. 2 & 3); the dhow-building workshops in Gooran, a traditional industry emerging from the coastal ecosystem's capacities, which, under UNESCO and JICA's

guidance, have been revived and made environmentally and economically viable through local participation (Fig. 4); and the Chahkooch geo-site, a preserved ancient water harvesting technology site (Fig. 5). These are among Qeshm's significant historical examples of local ecosystem service use, where distributive, recognitional, and procedural justice can still be discerned.



Fig. 2. "Telo"; Rainwater storage cisterns as manifestations of ecosystem service technology, Qeshm Island, Laft Port. Source: Author archive.



Fig. 3. Historical water reservoir in Laft Port, exemplifying freshwater storage technology, Qeshm Island, Laft Port. Source: Author archive.

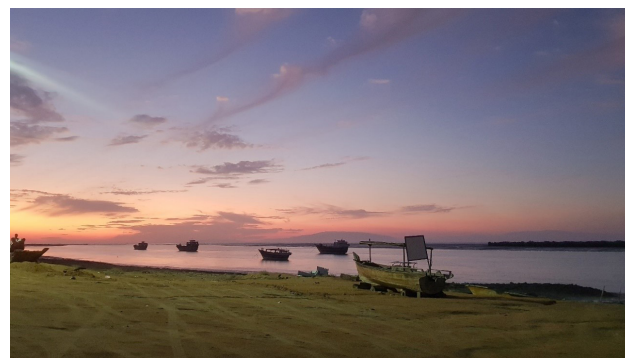


Fig. 4. Gooran Dhow-Building Museum, Qeshm Island, Gooran Village. Photo: Seyedeh Hosna Hosseini Nasab, 2023.



Fig. 5. Chahkooh Geo-site as an example of indigenous water harvesting and storage technology, utilizing ecosystem services, Qeshm Island, Chahkooh. Photo: Seyedeh Hosna Hosseini Nasab, 2023.

Conclusion

By elucidating and aligning global sustainable development literature influenced by ecosystem services with the natural, social, and economic conditions of Qeshm, its satellite islands, and surrounding areas, it is essential first to understand development as a recognized process. At both local and governance levels, this process's sustainability is contingent upon environmental and social justice. Within this framework, environmental justice should be seen not as an obstacle to development but as a catalyst for addressing deficiencies in the socio-ecological system. It facilitates a democratic process that aligns global standards with local conditions. In this process, instead of deviating toward absolute distributive justice and charity or one-dimensional development (tourism), the values of the local community and their participation are recognized within a pluralistic process.

Ultimately, by adopting three strategies: 1. Identifying stakeholders, their values, and capabilities (Reed et al., 2009), 2. Attributing values and the impact of governance in decision-making (as mediators) (Primmer et al., 2015; Isaac et al., 2022; Loos et al., 2023), and 3. Distributing needs and assets related to ecosystem services while creating learning opportunities (Loos et al., 2023, 483), the ultimate goal shifts from achieving an ideal state of access or absolute equality (unlikely) to reducing inequalities, permanently altering unjust situations from policy formulation to the redistribution of benefits, thereby moving toward pluralism.

It is noteworthy that by integrating perspectives derived from the ideas of “ecosystem services” and “environmental justice,” the development process will neither adopt a top-down approach nor be universally applicable through coercion to all nations and peoples. Instead, it will be realized with respect for local values and diversity; “every

nation has its unique intellectual and legal traditions that should underpin its sustainable development” (McGregor et al., 2020, 58).

Finally, a development program arising from this perspective will be strategic, based on establishing an interconnected chain of environmental protection and social participation derived from equitable processes that leverage the region's ecosystem capacities for economic development. This interconnected three-factor system's supremacy will depend on ensuring environmental justice across all its dimensions and achieving balance in the region's valuable natural ecosystem. It is anticipated that with the implementation of the first complete chain of this program, injustices will emerge as potential consequences of the unrestrained development process, and their mitigation and reduction will be possible through strengthening learning processes, cognitive recognition, and the genuine distribution of natural assets.

Recommendations

• Establishing a strategic framework for sustainable development

Based on the analyses conducted and the examination of various components, a strategic framework has been proposed to improve natural resource management and strengthen environmental justice in the studied region. This framework includes recommendations for policymakers and local managers aimed at enhancing access to ecosystem services and ensuring equitable distribution of resources. It is derived from the results of scientific analyses and field observations, and can also serve as a guide for other regions with similar conditions. The Framework for Strategic Sustainable Development (FSSD)² is a method that assists decision-makers, institutions, and society at large in achieving long-term objectives grounded in strict sustainability principles for the entire biosphere. The unique characteristics of this framework enable users to manage systems, logically assess exchanges, and calculate sustainable resource potentials (Anderson, 2016).

Accordingly, and with the establishment of the significance of considering the interconnections between ecosystem services and environmental justice in planning for sustainable development in Qeshm Island, it is essential to not only pay attention to the historical, environmental, and cultural roots of the development axes but also to incorporate all three dimensions of environmental justice (distributive, cognitive, and procedural) as fundamental values in the modeling of development. Furthermore, it is crucial to understand the role of governance (local and territorial) as a mediator for achieving development and to address “cognitive, institutional-legal, policy, and social factors as the

main barriers to development policymaking in Iran” (Malekmohammadi & Kamali, 2013, 173).

In this framework, by recognizing the unbreakable links between the utilization of ecosystem services and environmental justice in political-social interventions, a unique opportunity for governance and economy will be created for sustainable development (Loos et al., 2023). In this context, the use of ecosystem services will always be contingent upon avoiding natural hazards and achieving environmental justice - not as an ultimate goal but as a process of continuous refinement and improvement.

In fact, the sustainable development of Qeshm Island and its satellite islands will transform into a process - not a project - where environmental justice serves as a fundamental principle in striving for universal access to the natural benefits of ecosystems, fostering learning opportunities alongside development, and changing unjust conditions based on participation and respect for the local traditions of the Qeshm ecosystem (Fig. 6).

• **Key elements of the proposed strategic development program**

Based on the proposed model for integrating environmental justice with local ecosystem services (Fig. 6) and its alignment with the concept of an integrated social-ecological system for Qeshm Island and its surrounding areas, the strategic framework for this region’s development and its main program components can be proposed as follows:

- **Mission and vision statement**

Mission: Develop a sustainable local model that emphasizes

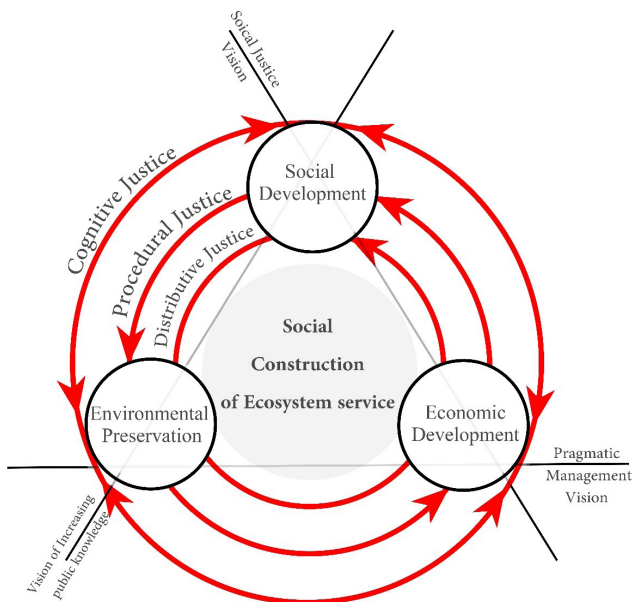


Fig. 6. Proposed model for defining the relationship between environmental justice and ecosystem services in the sustainable development of Qeshm Island’s integrated social-ecological system. Based on: 1) The justice dimensions model intersecting with ecosystem service management, represented as an iceberg (Loos et al., 2023), and 2) The social construction of the ecosystem services model (Ernstson, 2013). Source: Author.

preserving and utilizing the ecosystem services of Qeshm Island, with social and environmental justice as fundamental pillars of development, aimed at enhancing the quality of life for local residents and conserving the environment.

Vision: Transform Qeshm Island and its surrounding areas into a leading model of sustainable development where the local economy, environment, and social justice operate in full harmony, serving as an example for similar regions nationally and internationally.

- **Situation Analysis**

Strengths: 1. Rich and unique biodiversity on the island and its surrounding ecosystems, 2. Strong, sustainable cultural traditions within local communities, and 3. Qeshm Island’s strategic geographic location.

Weaknesses: 1. Limited freshwater resources and environmental threats due to unsustainable development, 2. Social and economic disparities among local residents, and 3. Increasing tourism pressures on environmental and social infrastructure.

Opportunities: 1. Potential for sustainable tourism and ecotourism, 2. Possibility of attracting sustainable and environmentally friendly investments, and 3. National and international support for sustainable development projects.

Threats: 1. Climate change and rising sea levels, 2. Depletion of natural resources due to unsustainable economic activities, and 3. Demographic shifts and migration driven by industrial development.

• **Strategic goals**

Goal 1: Preserve and enhance the island’s ecosystem services through natural resource management and habitat conservation programs.

Goal 2: Promote social and economic justice within local communities by ensuring equitable distribution of resources and opportunities, creating sustainable jobs, and strengthening social participation.

• **Strategy development**

Strategy 1: Implement an integrated natural resource management system to conserve biodiversity and manage resources sustainably.

Strategy 2: Establish local community networks and strengthen inter-institutional cooperation to oversee development-driven projects.

Strategy 3: Develop sustainable tourism infrastructure based on ecotourism principles and local culture and environment.

Strategy 4: Increase awareness and education on environmental conservation and sustainable development for local residents and visitors.

Strategy 5: Leverage new technologies to manage resources and deliver public services efficiently, enhancing productivity and reducing environmental impact.

• **Key Policies**

Policy 1: Define the “Local Sustainable Development Capacity Discovery Program” within the “Qeshm and

Surrounding Islands Sustainable Development Program,” focused on identifying exploitable ecosystem services, local values, and investment attraction points.

Policy 2: Define an “Action Chain” for development-stimulating activities, from local micro-units to investor engagement, prioritizing the establishment and approval of environmental protection, local participation, education, and economic empowerment guidelines.

Policy 3: Create a portfolio of strategic projects related to the “Local Development Systemic Program” and “Action Chain” across micro, mid, and macro scales, with environmental, cultural, educational, and community empowerment components.

Policy 4: Develop and implement applications, a database, and an open, transparent public monitoring and evaluation system for projects.

Policy 5: Establish the strategic institution “Qeshm and Surrounding Islands Sustainable Development Program” as the program’s lead and supervisory body.

• **Program implementation and performance evaluation Execution Plan:** Prepare and implement operational plans for each strategy with specific timelines, resource allocations, and clear roles and responsibilities for each stakeholder.

Evaluation Metrics: Define key performance indicators (KPIs) to assess progress in each goal and strategy, including environmental, economic, and social metrics.

Review and Adjustment: Establish a continuous feedback and evaluation system to review plans and strategies based on results and changes in environmental and social conditions.

Endnotes

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Research Center in Hormozgan province in January 2023.

1. Social Impact Assessment
2. Framework of Strategic Sustainable Development

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