

Lack of Resilience in the Integrated Coastal Zone Management and the Regional Strategic Plans in Egypt's Northwest Coast Region

Ebtehal Ahmed Abd-Almoity, M. H. Refaat, H. S. Amin, M. R. Abdel- Rahman*

Department of Regional Development, Faculty of Regional and Urban Planning, Cairo University, Egypt

Received April 12, 2022; Revised June 16, 2022; Accepted June 26, 2022

Cite This Paper in the Following Citation Styles

(a): [1] Ebtehal Ahmed Abd-Almoity, M. H. Refaat, H. S. Amin, M. R. Abdel- Rahman , "Lack of Resilience in the Integrated Coastal Zone Management and the Regional Strategic Plans in Egypt's Northwest Coast Region," *Civil Engineering and Architecture*, Vol. 10, No. 5A, pp. 33 - 46, 2022. DOI: 10.13189/cea.2022.101402.

(b): Ebtehal Ahmed Abd-Almoity, M. H. Refaat, H. S. Amin, M. R. Abdel- Rahman (2022). *Lack of Resilience in the Integrated Coastal Zone Management and the Regional Strategic Plans in Egypt's Northwest Coast Region*. *Civil Engineering and Architecture*, 10(5A), 33 - 46. DOI: 10.13189/cea.2022.101402.

Copyright©2022 by authors, all rights reserved. Authors agree that this article remains permanently open access under the terms of the Creative Commons Attribution License 4.0 International License

Abstract This paper discusses the missing resilience issues between the activities of both the integrated coastal zone management (ICZM) and the regional strategic planning (RSP) approaches when dealing with the coastal region's issues through an applied study on the Northwest Coast region of Egypt overlooking the Mediterranean Sea. The resilience between these two approaches aims to save the effort, time, and money needed for preparing both ICZM initiatives and RSP projects by literature reviews, analyzing the current situation, evaluating the national institutions' tasks, and the comparative study between the methodological frameworks of both approaches in the study area, it was discovered that there were no effective mechanisms among institutions. Moreover, there were some conflicts between the current regulations and laws. In addition, the difference between the coastal units and regional levels caused the differences in the methodological frameworks, although, there are some similarities and variations in their activities. This resilience concept may be helpful for decision-makers, ICZM teamwork, but it has special importance for urban planners to develop the methodological phases and activities of the regional planning approach in a balanced manner, to deal with the devolving requirements and the coastal issues achieving resilience between the activities of the Integrated Coastal Zone Management, Regional Strategic Plans (RSP) and sustainable development in the application of Egypt's North West Coast Region overlooking the Mediterranean Sea.

Keywords Integrated Coastal Zone Management, Regional Strategic Plan, Egypt's Northwestern Coast, Sustainable Development, Coastal Zones

1. Introduction

Over the past two decades, the concept of resilience has changed dramatically from a trait-oriented approach to an outcome- or process-oriented approach [1], where resilience is the amount of change [2] that a system can undergo and still maintain the same functionality and structure while maintaining development options. It serves as a more helpful alternative philosophy and methodology to analyze complex adaptive systems and systemic risks [3].

According to the resilience concept, many countries developed ICZM initiatives to find suitable solutions to the issues resulting from coastal urban development. However, the ICZM approach is no longer limited to finding solutions to urban and environmental issues and setting up programs for managing, protecting, and preserving the components of the natural environment in coastal regions, rather it has evolved to include the preparation and development of spatial plans and various development policies.

The problems resulting from development of the coastal

urban settlements and the emerging climate change issues imposed new facts, which required the reorientation of ICZM to provide strategic solutions and development policies. Although the ICZM approach is not considered to be an up statute for sectorial plans, it supports links between activities and the various development sectors [4], following this principle several ICZM initiatives introduced spatial planning and development strategies which made the ICZM approach seems closer to the RSP approach.

With the growth in environmental sustainability approach, the urgent need to minimize the risks and negative impacts of unplanned urban extensions, and sea-level rise issues especially in river delta coasts [5], the coastal regions became the focus of urban planners and ICZM experts. While the ICZM approach addresses environmental and ecological issues from specialized perspectives, it still needs to be resilient with the economic development objectives especially at the national and regional levels to establish an economic base, which the RSP approach provides for. On the other hand, we find that the RSP approach deals with all regions in one recurring method to find solutions to the regional gaps that hinder development and adding value to the region - despite the different characteristics of the spatial content of regions, especially coastal regions with their unique components, natural and urban characteristics, and multiple issues, which is offered by the ICZM approach. It's within this context of intellectual balances, there is a need to find a methodological framework to resilient for both approaches ICZM&RSP when dealing with coastal regions, which is founded by two pillars (the methodological framework, and the legal and Institutional framework) as follow:

1.1. The Methodological Framework

The resilient can be defined between two approaches- the first approach is a developmental approach that is RSP, and the second is a protection and preservation approach [6] aiming to address the implications of the development processes, which is ICZM- The methodological framework uses ICZM principles in developing the methodology for preparing regional strategic plans in coastal regions, organizing administrative and institutional relations, increasing opportunities for community participant at ion in taking the decision and raising public awareness of coastal issues. Also, the resilience between ICZM&RSP at the regional level can be viewed as one of the most important issues facing the effectiveness of ICZM, because of the importance of this point, it was addressed through several ICZM initiatives. In the Shandong region in China [7], the central and regional government institutions use the sectoral planning approach to prepare the development plans- as a result of centralization - many conflicts emerged of overlapping land uses, thus, the government developed ICZM plans in the region aims to find resilient between multiple uses in the marine and coastal areas. Through RSP

plans and ICZM Initiatives, also, in the Black Sea, the ICZM Strategy (TACIS) [8] included two pilot projects, the first project in the Malaya Yalta region in Ukraine, on the Azov Sea coast, the second project in the Gelendzhik region in Russia on the Black Sea coast, in order to find the resilience aspects between ICZM&RSP approaches, the activities of these projects included the development of proposals for the preparation of RSP in the countries of the region based on an assessment of the importance and sensitivity of the natural components (water, soil, vegetation, fauna, and marine environment).

1.2. The Legal and Institutional Framework

The resilience is not only a product of intellectual and methodological advancements, but it considers legal and protocol frameworks. For example, the Mediterranean ICZM protocol in 2008 [9] made it a must for the signatory states to set up when preparing ICZM initiatives, urban development strategies that include "programs for land use and economic and social activities in the coastal zone, promote the activities of strategic plans, reduce urbanization expanding in the coastal regions, and ensure the participation of the local community and institutions concerned with the coastal region in the implementation of strategic development plans "Although the protocol doesn't provide clearance for the resilient between both approaches, it makes strategic planning the foundation on which the ICZM is based on and increases the role of urban planners in the methodological phases of the preparation of ICZM initiatives.

Recently, the ICZM laws turned from coastal protection concept to coastal management, J. Rochette, emphasizes that these laws are intended to implement the schemes through a legal and institutional framework [10], For example, Tunisia established the Environmental Observatory Agency (APAL) to prepare the development plans and protection programs of Coastal Zones [11], both Comoros, Kenya, Madagascar, Mauritius, Seychelles and Tanzania established the National Coastal Management Commissions [12], South Africa has prepared the act of Coastal Management, which includes an entire chapter on institutional arrangements and the creation of a national coastal commission [13].

The European Parliament - through ICZM Protocol - defined the institutional principles to be considered on preparing ICZM initiatives, which included considering the strategic plans for coastal zones, and the general framework for preparing policies and programs for coastal management [14]. Therefore, many European countries have resilient ICZM approaches contributing to setting up developmental policies with the institutional systems responsible for the preparation of the two approaches ICZM&RSP.

This research presents proposals for institutional arrangements and methodological phases to achieve the resilience between the two approaches when dealing with

coastal regions to activate the RSP implementation plans in a manner that preserves the natural resources of coastal regions.

2. Materials and Methods

The research is divided into three main phases. The first step includes an inductive study to identify the characteristics of both ICZM&RSP approaches, then use the comparative approach to identify the similarities and differences to deduce the importance of resilience between both approaches that can prepare and implement in a manner appropriate to the spatial characteristics of the coastal regions.

The second step is the practical section of the research-which contains a comparative study between the activities of the methodological phases involved in preparing initiatives and projects of both approaches in the North West Coast region of Egypt overlooking the Mediterranean. This section begins with an inductive approach to provide an overview of the region, then, the research moved to identify the initiatives and projects of both approaches in region to reach the challenges facing application of both approaches in the region, the second step also discusses the responsible bodies tasks for preparing ICZM&RSP projects in the region and uses the comparative approach to elicit points of convergence and differences between the methodological phases and these activities followed in preparing projects and initiatives in the region.

The third step contains a proposed methodological framework required to apply the resilience methodology between both ICZM&RSP approaches also, concludes the recommendations for the required institutional arrangement must follow to achieve resilience between the responsible bodies.

Step 1:

2.1. The Characteristics of ICZM&RSP Approaches

Regional Strategic Planning, RSP, setting as an alternative approach to the "comprehensive and sectoral planning" [15] in the setting up of development and regional plans in a manner that ensures the participation of government authorities, private sector, non-governmental organizations, and the local community, in devising a strategic development plan that achieves harmony between sectoral and institutional goals, to identify the development pathways and coordination of regional growth patterns. The RSP should also reflect the functional importance of the region and identify the different resources that will direct the development plan, The ICZM approach was introduced to provide solutions to environmental issues, the Town and Country Planning Association (TCPA), has identified the issues addressed by the strategic planning approach in land-use, economic, social, environmental,

and other issues that go beyond the local level, and therefore it deals with the study of the broader forces affecting the region, allowing more appropriate and resilience practical solutions that can be applied, (TCPA) also, show the characteristics of the RSP approach in the following points, (aims for long-term sustainable development that based on assumptions, a combination between top-down and bottom-up approach. has a specific location, Includes.. specific sectorial activities which have verification of resources and implementation processes, deals with medium and long terms, dealing with the participation of the local community and the stakeholders) [16]. Nathan Garber explained that the RSP approach goes through three main phases, each stage includes a series of phases, which are (development plan, implementation, monitoring) [17].

2.2. The Similarities Difference between ICZM and the RSP Approaches

According to the characteristics of ICZM&RSP approaches, we can deduce the points of similarity and difference as follows:

2.2.1. The similarities between ICZM&RSP approaches.

- 1- Both approaches are planning and administrative approaches and dealing with multiple spatial levels "international - national - regional - local."
- 2- Both approaches have administrative and institutional arrangements, which are one of the tools of decision-making.
- 3- Both approaches are concerned with the relationship between coastal, urban and social ecosystems.
- 4- Both approaches have coastal and marine spatial boundaries.
- 5- Both approaches are aimed at the conservation of natural resources and sustainability.
- 6- Both approaches are concerned with the local community and stakeholder's participation
- 7- Both approaches provide guidance and tools for decision-makers.
- 8- Both approaches aim to achieve interaction and balance between the urban system in the region elements "natural resources - urban activities - the local community".

2.2.2. The difference between ICZM&RSP approaches.

- 1- The RSP approach is concerned with the development and management of natural resources, while the ICZM approach aims to achieve protection and preservation.
- 2- The difference between the vision and goals is not clear in the ICZM approach, while the RSP approach is concerned mainly with including them within the outputs.
- 3- The ICZM approach is concerned with determining the alternatives and sources of funding used in the phases of preparation, implementation, and

development. While the RSP determined them through implementation plans.

- 4- The RSP approach has not included governance frameworks within the activities, which is considered one of the main activities in the ICZM approach

2.2.3. The importance of the resilience between both approaches.

Through the points of similarity and difference, the research presents a new methodology to activate the resilience between ICZM&RSP approaches for the activities of methodological phases and institutional arrangements when dealing with coastal regions aims to:

- 1- Reducing the degradation costs of coastal resources that result from overdevelopment in the coastal regions.

- 2- Implying the international regional dimension to the local regions in RSP projects to take advantage of the technical international cooperation which is used in the ICZM scopes.
- 3- Developing the institutional frameworks responsible for preparing and implementing RSP plans. Through propose new institutional regulating for coastal management operations and adopt these regulations as one of the RSP tools.

Step 2:

2.4. The Mediterranean Northwest coast of Egypt Overview

Egypt coasts extend more than 3,000 kilometers along the Mediterranean and the Red Sea [18] (Figure 1).

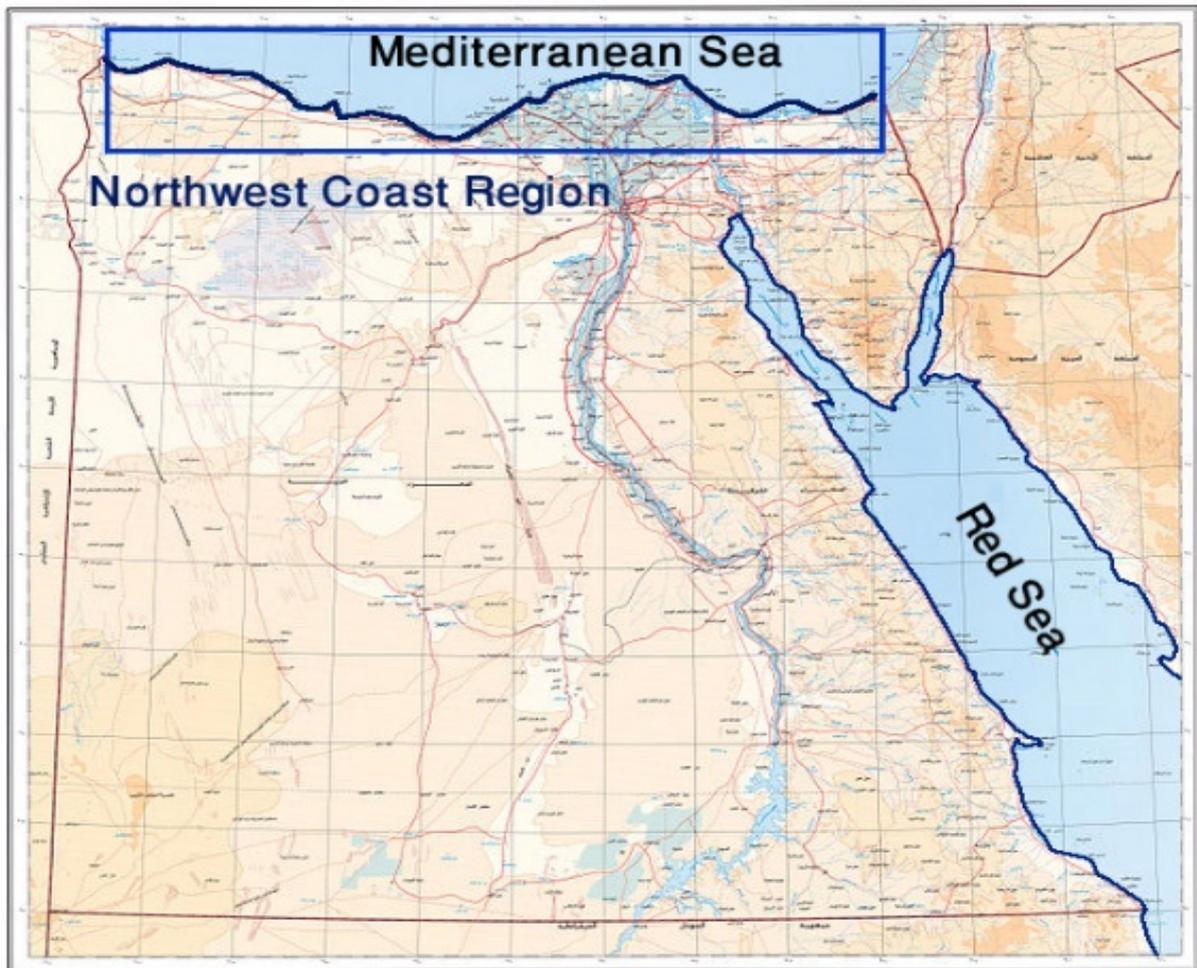
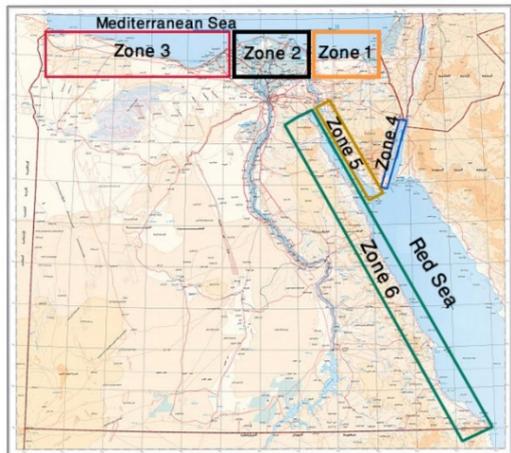
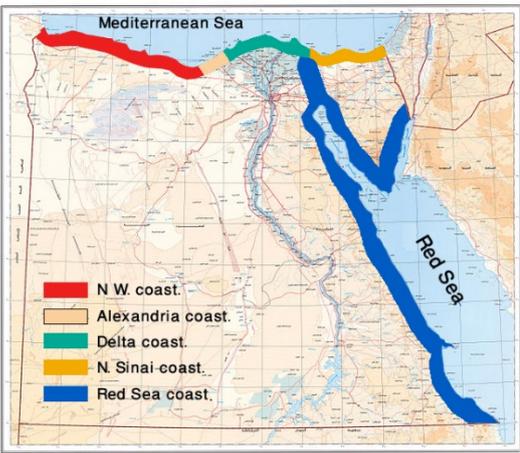


Figure 1. Northwest Coast location

Table 1. National Strategic development plan (NSDP) and National Strategy for ICZM (NSICZM), (source: researchers)

		National Strategy Development Plan (NSDP).	National Strategy for Integrated Coastal Zone Management (NSICZM).			
Coastal regions		 <p>Figure 2. The main regions in (NSDP).</p>	 <p>Figure 3. The main regions in (NSICZM).</p>			
		<table border="1"> <tr> <td>Sub regions</td> <td> <ul style="list-style-type: none"> N W. Coast. Med. N. coast. NE coast. </td> </tr> </table>	Sub regions	<ul style="list-style-type: none"> N W. Coast. Med. N. coast. NE coast. 	<table border="1"> <tr> <td>Sub. regions</td> <td> <ul style="list-style-type: none"> N W. coast. Alexandria coast. Delta coast. N. Sinai coast. </td> </tr> </table>	Sub. regions
Sub regions	<ul style="list-style-type: none"> N W. Coast. Med. N. coast. NE coast. 					
Sub. regions	<ul style="list-style-type: none"> N W. coast. Alexandria coast. Delta coast. N. Sinai coast. 					
Med.Sea.	3	<ul style="list-style-type: none"> Gulf of Aqaba coast. Gulf of Suez coast Red Sea coast. 	1			
Red Sea	3	<ul style="list-style-type: none"> Gulf of Aqaba coast. Gulf of Suez coast Red Sea coast. 	1			

The coastal regions suffer severe and increasing pressures, and as a result of those pressures, the Egyptian government is aiming to apply the ICZM approach to manage the coastal areas and sustainably preserve the economic resources. In 1996, the Egyptian Environmental Affairs Agency (EEAA) begins to develop Integrated Coastal Zone Management initiatives to guide coastal management in a manner that identifies appropriate solutions to coastal problems and their challenges. [19] These ICZM initiatives identified key issues in coastal areas including "the presence of unplanned land use in coastal areas, lack of strategic planning, deterioration of water quality, and increases in coastal erosion rates, seasonal floods, and deterioration of the natural state [20]. Recently, in 2019, Egypt has prepared The National Strategy for Integrated Coastal Zone Management (NSICZM), which included developing coastal management strategies at the "national and regional" levels.

The General Organization for Physical Planning (GOPP) - is the authorized institution for preparing the strategic development plans- used the Strategic planning approach for developing integrated future vision for the developing of Egyptian urban communities and has prepared the National Strategy Development Plan (NSDP) until 2025.

The General Organization for Physical Planning (GOPP)

-that is the authorized institution for preparing the strategic development plans- used the Strategic planning approach for formulating the integrated future vision for developing Egyptian urban communities and has prepared the National Strategy Development Plan (NSDP) until 2025 [21] to attract urban development outside the Nile Valley and Delta and to absorb the expected population increase during the next years by increasing the number of coastal urban communities. According to the plan, the northwestern region is intended to accommodate about 30 million people during the next thirty years as the regions till maintains large areas that are not yet developed. As a result, it is expected that the increase in urban capacity and the level of economic activities will lead to increase demand for natural resources in the region, thus an increase in the extent of inserted pressures on the coastal environment. The Egyptian coasts in NSDP and NSICZM are divided into many coastal regions each one containing sub-regions corresponding to the used approach (Table 1).

2.5. ICZM Initiatives in the Region

According to NSICZM, the Mediterranean coast of Egypt is divided into four main regions (Figure 3), the northwestern coastal region, which extends from Sallum to Alexandria takes two regions (Alexandria and Matrouh)

[22]. At present time, tourism activities constitute the most important economic activities in the region concentrated mainly in the shore areas, although tourism activities are regarded as the main factor in raising the economic level of the region in general, the accelerated development has isolated the public from the shore areas, also, the unplanned activities of coastal and marine areas led to increasing the coastal erosion rates, which affected many coastal economic activities, [19]. Because of the lack of sustainable development concepts, the pressures on the coastal environmental systems and natural resources increased [23], the Egyptian government implemented four ICZM initiatives in the northern coast of Egypt. Three of

which on the northwest coast are: (1) Coastal zone Management Program “Fuka-Matrouh” Project [24], (2) Alexandria/lake Maryut Integrated Management, (3) the Integrated Coastal Management for Marsa Matrouh/Salloum coastal area [25]. With the evolving of the of climate change issues and sea-level rise, the Egyptian Ministry of Water Resources and Irrigation (MWRI), represented by the Shore Protection Authority (SPA) launched in the year 2017 the first phase of "adaptation to climate change in the Nile delta through integrated coastal zone management” project, and the preparation of the second phase of the project is underway, figure 4 shows the ICZM Initiatives in the region.

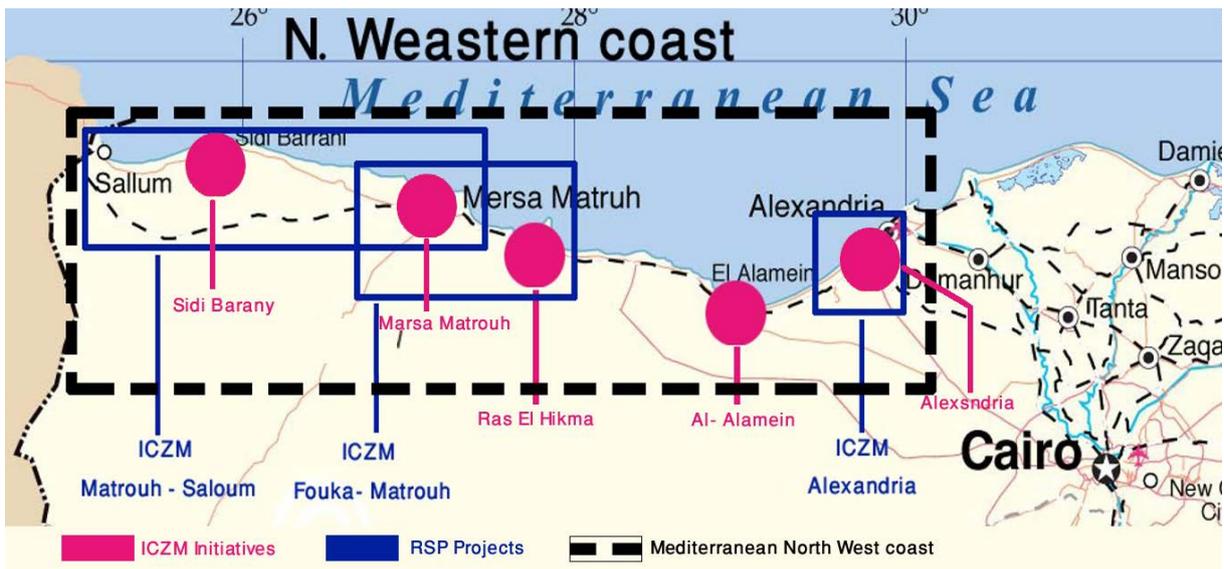


Figure 4. ICZM Initiatives and RSP projects locations (source: researchers)

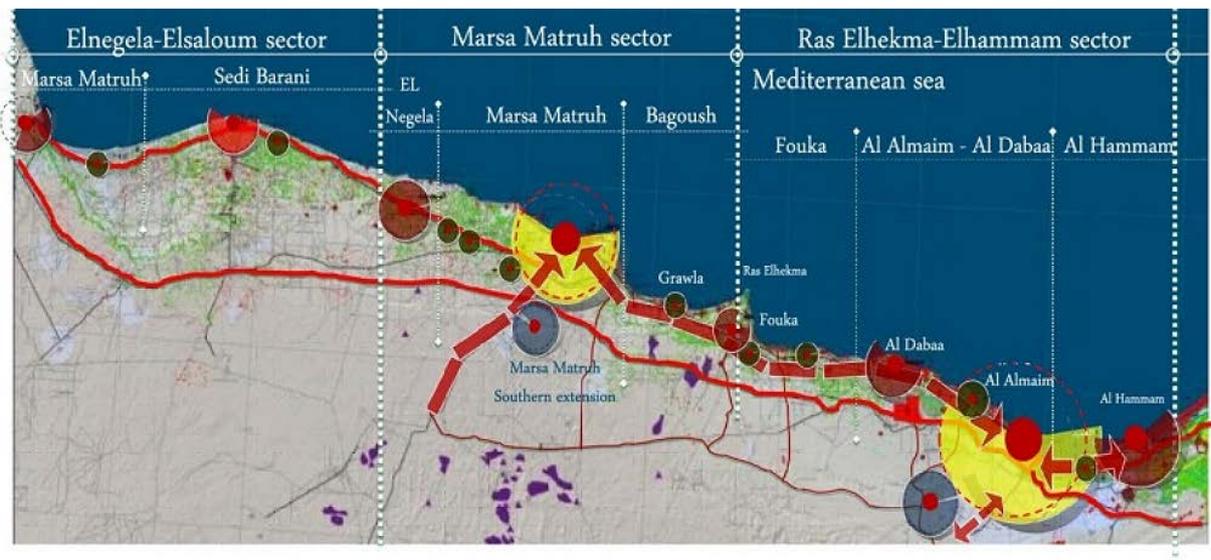


Figure 5. The northwestern coast development plan (NSDP) (source: GOPP).

2.6. RSP Projects in the Region

According to NSDP, the Mediterranean coast of Egypt is divided into three main regions (Figure 2). During decade, several projects have been prepared for the region that includes: "The strategic development plan of Matrouh Governorate Until the year 2032 (in 2016)" (Figure 5), "Northwest Coast and Qattara Depression Development plan (in 2014)", "Environmental perspective for urban development of Alexandria region (in 2011)", "Strategic plan for Alexandria governorate Until the year 2032 (in 2018)", "Future Vision of the Alexandria governorate Until 2050 (in 2010)", "Regional vision and the General plan for tourism development in the northwest coast (in 2010)", and "Strategic development plan for the Northwest Coast and the hinterland (in 2007)", In addition to Al-Alamein new city, Ras El Hikma new city, Matrouh city, Sidi Barany city.

2.7. Responsible Bodies for Preparing ICZM & RSP Projects in the Region

According to Law No.4 of 1994 (the first integral law on the environment in Egypt) a new governmental agency was established, with a body for environmental protection and development under the name "Environmental Affairs Agency" (EEAA). This agency has branches in various Governorates grants the authority of preparing and implementing ICZM projects in Egypt [23]. The (EEAA) sets a national committee that includes the General Authority of Urban Planning (GOPP) from the Ministry of Housing, and the Shore Protection Authority (SPA) from

the Ministry of Water Resources, the local administration's government, the land authorities, and the local social organizations. The Egyptian institutions can be divided according to their level of interaction and involvement into three levels: Responsible bodies, Participating bodies, and adjunct bodies - according to the nature of the work-. (Table 2).

2.8. The Bodies' Responsibility Analysis

By reviewing the bodies' responsibility in the ICZM&RSP preparation, it becomes clear that:

The bodies differ in their Objectives when dealing with the coastal region despite the geographical unity of the region that entails common issues and challenges.

No one body has overall responsibility for ICZM and RSP.

General Organization for Physical Planning, which is expected to play a pivotal role in management and planning procedures is in a regressive position in ICZM.

Most organizations operating independently cooperate through committees as a stakeholder.

The effectiveness of the resilience methodology depends on finding an administrative and institutional system capable of dealing with both approaches when addressing coastal regions' issues. Through the analysis results of the administrative system and the responsibilities of preparing and implementing both approaches bodies, the research presents a development proposal of administrative and institutional systems to meet the needs of the proposed administrative and institutional arrangements.

Table 2. Depicts the levels of the national body's involvement in preparing ICZM& RSP (source: researchers).

Bodies	ICZM	RSP	responsibility	Objectives
EEAA	●	◐	Responsible for setting up ICZM initiatives	Preserving the natural environment and protecting its various components from urban development impacts
GOPP	◐	●	Responsible for setting up RSP projects	Preparing urban development plans at the national, regional, and local levels.
SPA	◐	◑	Sometimes acts as a responsible authority for setting up ICZM initiatives	Protect the coastal area components "with a depth not exceeding 200 meters."
Lands Authorities	◐	◐	Responsibility according to the geographical boundaries-s of the project	Sectorial development and increase the economic return.
Sovereign and security authorities	◐	◐	Common institutions in all initiatives and projects	Securing the coastal area
Ministries	◐	◐	According to the project properties	Implement the national plans.

● Responsible bodies ◐ Participating bodies ◑ Assisting bodies

2.9. Phases and Activities of RSP&ICZM Approach in Egypt

2.9.1. Phases and activities of the RSP approach in Egypt

According to law No. 119 of 2008, the regional strategic plan is “the plan that defines the objectives, policies, and programs of urban development for each economic region and regional projects to be implemented, the phases of implementation, and the role of each public and private agency in this implementation within the framework of the national strategic plan”. Based on this definition, the GOPP divided the preparation phases of RSP into three unified

phases, each stage includes sub-activities for all regions in the country each includes many activities , as shown in. (Figure 6).

2.9.2. Phases and activities of ICZM approach in Egypt

The preparation phases and activities of ICZM projects differ according to the region characterization. Through the Egyptian experience with the preparation of ICZM projects, the activities could be clustered and analyzed. These projects are composed of 6 main phases, each stage includes sub-phases including several activities as shown in (Figure 7).

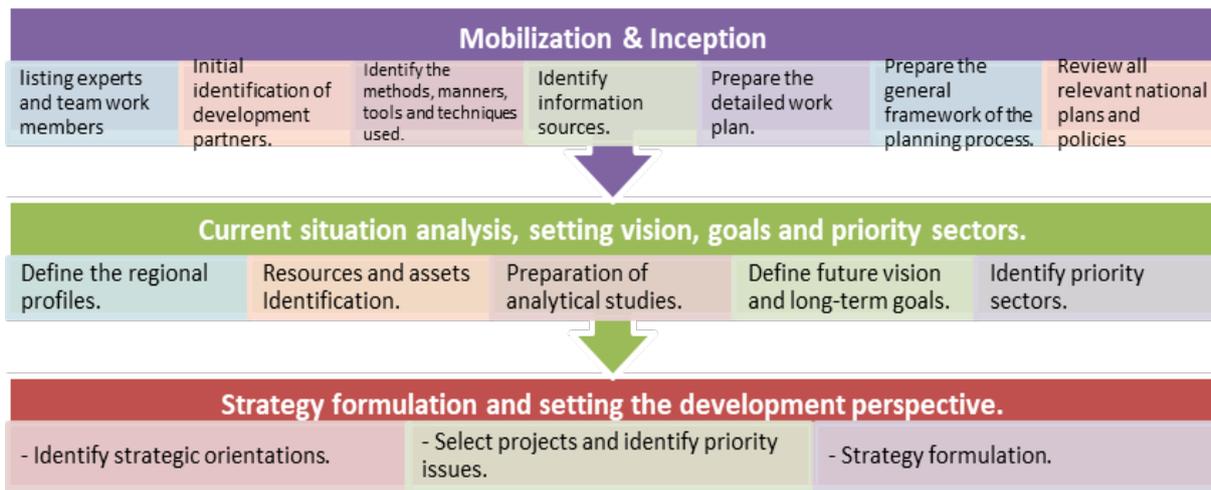


Figure 6. The RSP methodology in Egypt, (source: researchers)

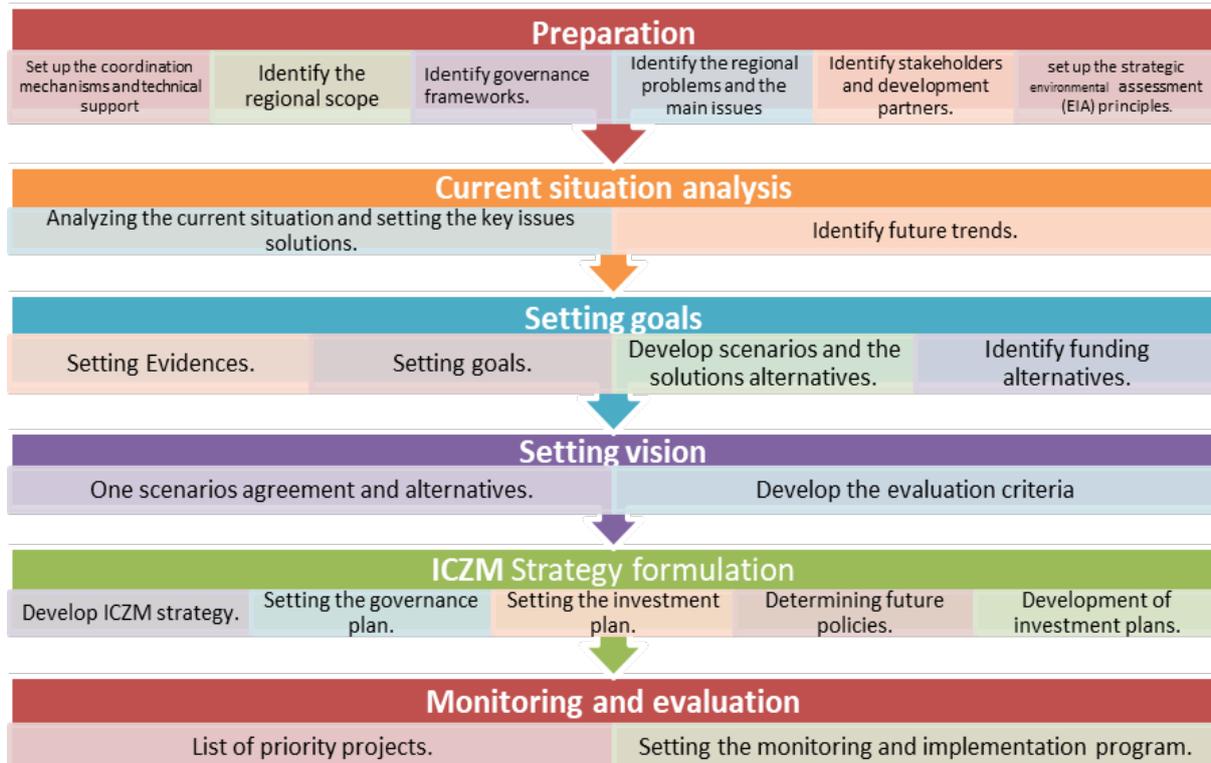


Figure 7. The ICZM methodology in Egypt, (source: researchers).

		The methodological phases of ICZM approach														Total									
		First						2 nd		3 rd				4 th			5 th				6 th				
		Preparation						Current situation analysis		Setting goals				Setting vision			Setting the strategy				Monitoring and evaluation				
		1-1	1-2	1-3	1-4	1-5	1-6	2-1	2-2	3-1	3-2	3-3	3-4	4-1	4-2	5-1	5-2	5-3	5-4	5-6	6-1	6-2	22 activities		
The methodological phases approach of ICZM - (GOPP) Model	First	Preparation	1-1																						
			1-2																						
			1-3																						
			1-4																						
			1-5																						
			1-6																						
			1-7																						
	2 nd	Current situation Analysis and formulating the vision and objectives	2-1																						
			2-2																						
			2-3																						
			2-4																						
			2-5																						
	3 rd	Formulating strategy and development framework	3-1																						
			3-2																						
			3-3																						
Total		15	-						-	1 unique activity				1 unique activity	3 unique activities				-						



Unique activities with different phases



Sharing activities at different phases



Shared activities at the same phases

Figure 8. The phases & activities analysis of the (ICZM & RSP) approaches in Egypt, (source: researchers).

Step 3:

2.10. The Analysis of ICZM&RSP Methodologies in Egypt

The comparative study (figure 8.) depends on giving a numerical code for each activity of the main phases of each of the six methodological phases of the ICZM approach, and the three methodological phases of the RSP approach, then deducing the compatible activities between the two approaches with the same stage and the same activity at different phases, as well as deducing the unique activities of each approach.

By comparing the activities for ICZM and RSP in the Northwest Coast region in Egypt shown in (Figure 8), in which the rows represent the main phases and sub-phases for ICZM, and the Columns represent main phases and sub-phases of RSP, Codes are given for the sub-activities of both approaches to be used in the analyzes, By analyzing these activities, it is obvious that:

Some similar activities between ICZM and RSP amounted to 20 items, which were divided into 11 common activities at the same phase and 9 common activities with other phases.

Similar activities concentrated on the first three phases of the two approaches by 55%, while the common activities but in different phases were concentrated in the phases "6,5,4,3", by the first stage, with 7 activities, followed by the third stage with 3 similar activities .

In general, we find that the ICZM approach deals with the region as a specific environmental case that needs to be specified targets. It also seeks to prepare and launch many development projects in the region commensurate with the characteristics of different resources, This highlights the importance of the resilience between the specific activities of ICZM and RSP approaches to reach a regional strategic plan that is more sustainable and compatible with the spatial characteristics of the coastal region, taking into account its resources and environmental sensitivity. 2.11. Proposed Resilience Framework for ICZM&RSP Approach

A new model was drawn up in this study that set the principle of resilience between the two approaches into effect, aiming to develop RSP activities through the use of sustainability principles and maintaining the ecological and natural systems used in ICZM projects. (Table 3) shows the proposed methodological framework.

Table 3. The proposed methodological framework, (source: researchers)

phases	activities
Phase one Preparation and Setup	<ul style="list-style-type: none"> - Define the working group and list of experts - Identify development partners and stakeholders -Preparing the work plan and institutional coordination mechanisms - Identify sources of information -Review all approved plans and strategies and all published literature on regional issues
Phase two Analyze the status quo and set the vision and goals	<ul style="list-style-type: none"> -Determine the general characteristics of the region and study the resources and assets - Preparation of analytical studies - Identify key and secondary issue - Determine the regional scope of study - Setting the vision and goals
Phase three Formulating development strategy and solutions scenarios	<ul style="list-style-type: none"> - Define directing factors and build evidence -Developing strategy and solution scenarios. - Planning strategy and strategic plan - Putting different frameworks - Identify financing alternatives - Identify priority sectors - Setting investment plans
Phase four Implementation, monitoring and evaluation	<ul style="list-style-type: none"> - Establishing evaluation standards and programs -Development of the non-operational plan - Determine future policies - Establish a program of periodic follow-up and evaluation

Table 4. The Sectorial Coastal Units (SCU), (source: researchers).

Sectorial Coastal Units (SCU)	
planning levels	tasks
Regional level	<ul style="list-style-type: none"> -Preparing development plans for coastal regions. -Preparing regional and local coastal management plans.
Local level	<ul style="list-style-type: none"> -Follow-up of the executive steps, periodic monitoring, controlling variables, and setting up the development plans.

2.12. The Proposed Coastal Management Form

The resilience between (ICZM&RSP) approaches requires an administrative and institutional pattern, capable of implement the proposed methodology, in line with the region's economic, political, and societal characteristics, as well as development goals and the national vision for the development of the region, which can be achieved through Sectorial Coastal Units (SCU) form which aims to divide the coastal area into main administrative sectors, each coastal sector is considered an independent administrative unit that includes representatives of central government institutions (local administration, urban development, and infrastructure management). (SCU) does not have complete independence and working under supervision of the central government, by (SCU) we can transfer parts of the responsibilities from the central government. Each (SCU) includes sub-regional departments to monitor and implement policies. Table 4 shows the Sectorial Coastal Units (SCU) tasks at regional and local levels.

2.13. The Proposed Administrative and Institutional Arrangements at (SCU) Form

According to the proposed form "Sectorial Coastal Units (SCU), Table 5 shows the body's tasks in resilience methodology which can apply in the northeastern coastal region.

According to the current state of institutional arrangements, we find that the institutional system depends on administrative and technical centralization at the national and regional levels. Therefore, a direct shift towards decentralization requires long periods of time to prepare concepts capable of making decisions individually. As a result of this centralization, researchers suggest at the national level the use of a top-down approach based on National Plans Guidelines (NSDP & NICZM) in guiding institutions, while at a regional level, it is possible to redistribute tasks between branches of institutions in the region (ROBs - RPCs - SPA - L.A - Min.s - Sec.) through mutual coordination carried out by The Sectorial Coastal Units (SCU) as shown in Figure 9.

Table 5. The distribution of institutional tasks in the proposed phases at (SCU) model, (Source: Researchers).

Bodies	phases			
	Phase one	Phase two	Phase three	Phase four
EEAA	Preparation of specialized teams work, Coordinate with funding bodies	Developing the environmental and coastal analysis, setup goals.	Developing ICZM strategy, reservation & protection programs according to NSDP.	Setup monitoring programs, and evaluation criteria.
GOPP	Setting up regional strategies. Developing the work plans. Coordination between stakeholders.	Developing the urban, social analysis. Setting up vision.	Developing RSP. Setting up solutions and scenarios.	Developing Implementation plans. Setting up priority projects.
SPA	Identifying the coastal issues.	setup the vision and goals with teams work	Reviewing solutions & scenarios.	Implementing the monitoring plan.
Lands Authorities	Provide the team's work with their sectorial planning. Coordinate between ministries & teams work.	Coordinate with teams work to analyze the current status.	Reviewing the solutions scenarios with their goals.	Implementing the priority projects.
Security authorities	Providing the security criteria.	Providing the security issues.	Reviewing the solutions scenarios with the security criteria.	Reviewing the Implementation plans, priority projects with the security criteria.
Ministries	Identifying the national & regional issues. Provide the team's work with their goals.	Reviewing the vision and goals with Min's. plans	Reviewing the solutions scenarios with min. plans	Reviewing the Implementation plans, priority projects with min. plans

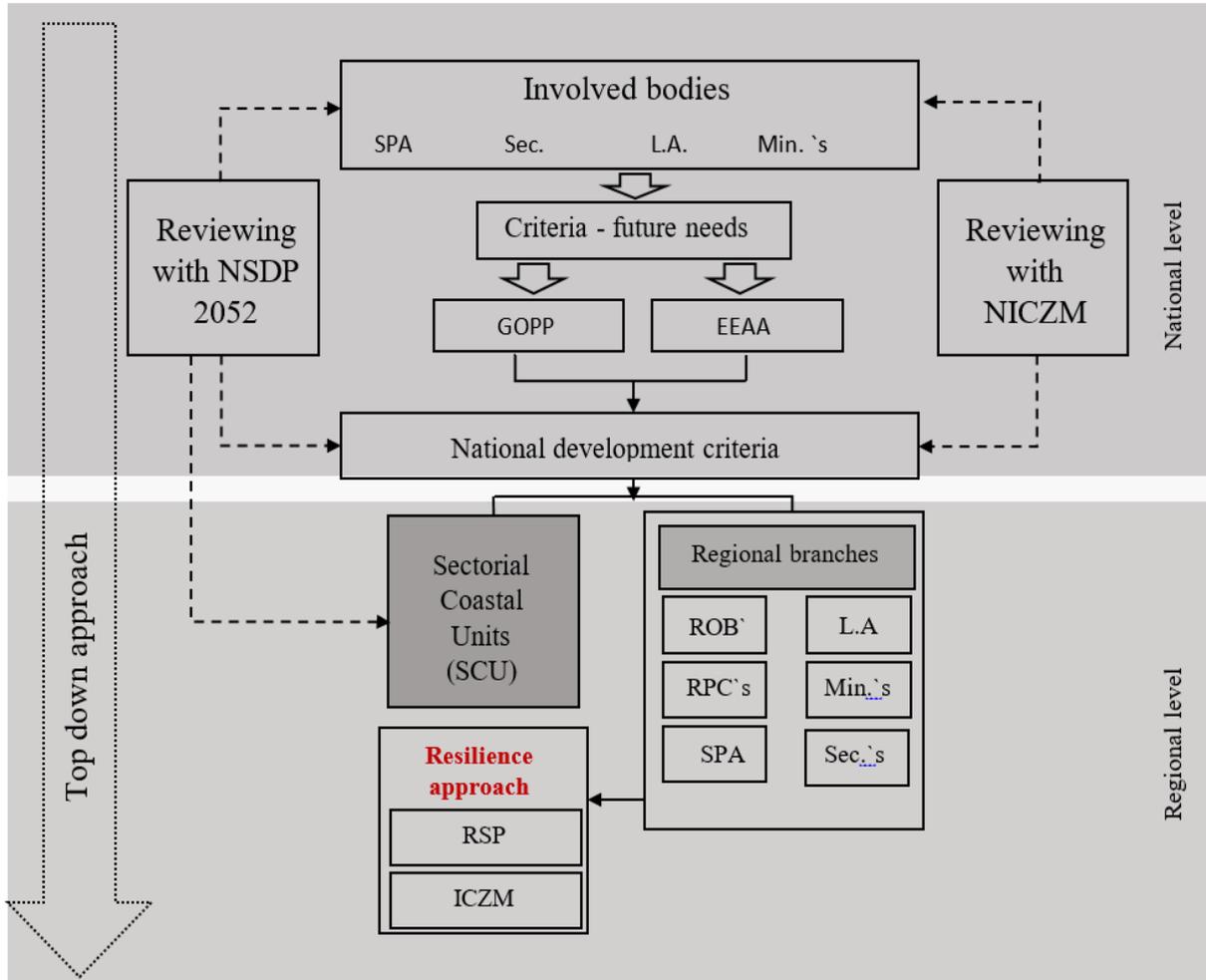


Figure 9. The proposed administrative and institutional arrangements in the region (source: researchers).

2.14. Advantages and Disadvantages of the Proposed Methodology

The proposed model (SCU) has the possibility of application to the current institutional situation in the region, despite the administrative centralization at the regional and national level; it can be considered as one of the transitions toward decentralization. Also, the proposed methodology takes advantage of merging the characteristics of the ICZM approach which aimed at protecting and preserving the natural and social characteristics and the characteristics of the RSP approach that support regional development processes and increase competitiveness at the national and regional levels.

On the other hand, the proposed methodological resilience and the regional management model (SCU) need the availability of technical support in various methodological phases, human capabilities, experts, a conscious local community, and local community elements able to deal with the accelerating economic and environmental changes.

3. Recommendations

Through the previous presentation and the comparative analysis study, the research may offer the following recommendations:

The need for integrated coastal zone management is compatible with the regional development strategy for the same region.

It is necessary for the leading party in ICZM projects to include a group of experts in regional strategic planning, including projects related to coastal preservation, preservation of marine and coastal natural resources, strategies for protection from natural hazards, programs/policies for coastal line management and marine policies, and environmental monitoring programs within the strategic regional development projects activities.

Paying attention to developing governance plans as one of the activities of the regional strategic plans with the investment plan.

Establishing follow-up and evaluation programs during the phases of regional strategic plans and developing the needed advanced systems, such as the use of geographic information systems (GIS) as a tool for monitoring and

evaluation.

4. Conclusions

There are many factors affecting coastal areas that must be considered while preparing for RSP, the most important of which are coastal urban expansion and the issues arising from it, the growth of thinking about environmental sustainability, climate change issues, and the sea level rising (SLR) the ICZM approach dealing with the coastal issues but at the same time, it does not provide acceptable solutions to development issues.

The most important challenges facing the ICZM&RSP approaches in the Northwest Coast region of Egypt are the conflicting vision between both approaches toward the coastal issues, administrative centralization, lack of funding, lack of qualified experts, and weakness of local community participation, conflicting policies, and laws, and conflicting institutional arrangements. As a result, there are multiple strategic regional plans and ICZM plans. In the region, there is a need to reach a resilience approach between ICZM&RSP approaches must contain methodological, legal, and institutional aspects in order to avoid administrative and institutional defects and increase the overlap between the responsible bodies to avoid those challenges

Both ICZM&RSP approaches deal with the region issues directly and at the same time individually. The individual concept found crossover administrative and methodological problems that led to a lack of resilience in preparing and implementing phases of both ICZM&RSP methodology, the research defines the administrative and methodological issues in the region, and the most critical administrative issues were the centralization and crossover between responsibilities of involved bodies. The research suggested a regional management model "Sectoral Coastal Units (SCU)" as an applicable resilience approach in the region. In order to find solutions to the regional issues, the research also suggested merging the two approaches ICZM&RSP into one approach has the resilience characteristics in preparing and implementing phases, also, directing experts in the two approaches to work the joint. This leads to reducing the time and effort required to prepare both ICZM&RSP approaches.

These proposals may need to be developed to suit other coastal regions' issues that have different natural and management characteristics. Governance systems also can play an effective role in finding the resilience that can affect the turning from centralization to decentralization.

Acknowledgements

We are very grateful to experts for their appropriate and constructive suggestions to improve this template.

REFERENCES

- [1] Chmitorz, A., Kunzler, A., Helmreich, I., Tüscher, O., Kalisch, R., Kubiak, T., ... & Lieb, K. (2018). Intervention studies to foster resilience—A systematic review and proposal for a resilience framework in future intervention studies. *Clinical psychology review*, 59, 78-100.
- [2] Nelson, D. R., Adger, W. N., & Brown, K. (2007). Adaptation to environmental change: contributions of a resilience framework. *Annual review of Environment and Resources*, 32, 395-419.
- [3] Linkov, I., Trump, B. D., & Hynes, W. (2019). Resilience strategies and approaches to contain systemic threats. In Conference paper.
- [4] Rochette, J., & Billé, R. (2010). Analysis of the Mediterranean ICZM Protocol: At the crossroads between the rationality of provisions and the logic of negotiations. Institute for Sustainable Development and International Relations (IDDRI), SciencePo. Available at: <http://www.cirspe.it/gizc/Pubblicazioni/Pubblicazioni>, 20(2).
- [5] El-Raey, M. (1997). Vulnerability assessment of the coastal zone of the Nile delta of Egypt, to the impacts of sea level rise. *Ocean & coastal management*, 37(1), 29-40.
- [6] Gallagher, A. (2010). The coastal sustainability standard: A management systems approach to ICZM. *Ocean & Coastal Management*, 53(7), 336-349.
- [7] Wu, X. Q., GAO, M., Wang, D., Wang, Y., Lu, Q. S., & Zhang, Z. D. (2012). Framework and practice of integrated coastal zone management in Shandong Province, China. *Ocean & coastal management*, 69, 58-67.
- [8] Antonidze, E. (2010). ICZM in the Black Sea region: experience and perspectives. *Journal of Coastal Conservation*, 14(4), 265-272.
- [9] <https://web.unep.org/unepmap/8-iczm-protocol>.
- [10] Rochette, J. (2007). Le traitement juridique d'une singularité territoriale: la zone côtière. Étude en droit international ET droit comparé franco italien (Doctoral dissertation).
- [11] Snoussi, M. (2000). Integrated coastal zone management programme northwest African region case. *Ocean & Coastal Management*, 43(12), 1033-1045.
- [12] Momanyi, A. (2015). Governance: legal and institutional frameworks. *Regional state of the coast report Western Indian Ocean*, 445-457.
- [13] Maccarrone, V., Filiciotto, F., Buffa, G., Mazzola, S., & Buscaino, G. (2014). The ICZM Balanced Scorecard: A tool for putting integrated coastal zone management into action. *Marine Policy*, 44, 321-334.
- [14] Shipman, B., & Stojanovic, T. (2007). Facts, fictions, and failures of integrated coastal zone management in Europe. *Coastal management*, 35(2-3), 375-398.
- [15] Khalifa, M. A. (2012). A critical review on current practices of the monitoring and evaluation in the preparation of strategic urban plans within the Egyptian context. *Habitat*

- international, 36(1), 57-67.
- [16] TCPA Regional Planning Task Team London, Strategic and Regional Planning, TCPA Regional Planning Task Team London, 2003.
- [17] Nathan Garber , Strategic Planning Model & Terminology , London : training Consulting for the Nonprofit Sector , 2006 , P2.
- [18] AbdeL-Latif, T., Ramadan, S. T., & Galal, A. M. (2012).Egyptian coastal regions development through economic diversity for its coastal cities. HBRC Journal, 8(3), 252-262.
- [19] Borhan, M. A., Farouk, M. A., & Hamdy, T. A. (2003). Country report on Egyptian ICZM experiences with special reference to Sharm El-Sheikh-Southern Sinai. Egyptian Environmental Affairs Agency
- [20] Masria, A., Negm, A., Iskander, M., & Saavedra, O. (2014). Coastal zone issues: a case study (Egypt). Procedia Engineering, 70, 1102-1111.
- [21] General Organization for Physical Planning (GOPP) - Ministry of Housing, Geographic Information Systems Database 2017.
- [22] Frihy, O.E., El-Sayed, M.K., 2012. Vulnerability risk assessment and adaptation to climate change induced sea level rise along the Mediterranean coast of Egypt. Mitigation and Adaptation Strategies for Global Change 1–23.
- [23] Researchers adapted from Parpairis, A., Parpairi, K., El-Raey, M., Abdrabo, M. A. E. K. A., Nasr, S., El-Bastawissi, E. & Mohamed, M. W. E. D. PAP team.
- [24] Ibrahim, H. S., & Hegazy, I. (2013).Decentralization in the Egyptian coastal management. Journal of Coastal Development, 16(2), 1-12.
- [25] Researchers adapted from Helmy, S. (2007). Legal and Institutional Analysis Report. Alexandria Lake Maryut Integrated Management: ALAMIM Project. Alexandria: The Center for Environment and Development for the Arab Region and Europe (CEDARE).