



OGS National Institute
of Oceanography
and Applied
Geophysics



BLUE ECONOMY WORKSHOP: DEVELOP A SUSTAINABLE AND EQUITABLE OCEAN ECONOMY.

May 2022

Challenges of Climate Change in Egypt

Ahmed Elshazly, PhD

PhD, Marine Geology

Director, Office of Sponsored Projects, Heliopolis University, Cairo



Do we use the coastal environment appropriately in Egypt?

22 % of the total Population live in coastal areas.

60 % of the industrial, economic, commercial and maritime activities are being practiced on coastal areas.

Nile Delta covers **60 %** of agriculture production in Egypt.

Coastal areas produce **85 %** of the total crude oil production.



Coastal Environment: Coastal and marine areas in Egypt have a strategic significance due to the availability of food resources and raw materials, which are the fundamentals of economic development. In addition, the coastal area is considered as a vital source for maritime transport and trade. These areas include a number of significant environmental resources that are the main resource for entrainment and tourist attraction. Coastal areas in Egypt include about **22%** of the total population and they are where more than **60%** of the industrial, economic, commercial, and maritime developmental activities are being practiced on coastal areas, in addition to the Nile Delta, which covers about **60%** of the agricultural production in Egypt. Moreover, coastal areas in Egypt, especially the Red Sea, produce about **85%** of the total crude oil production.⁵



SUSTAINABLE DEVELOPMENT GOALS

17 GOALS TO TRANSFORM OUR WORLD

1 NO POVERTY

2 ZERO HUNGER

3 GOOD HEALTH AND WELL-BEING

4 QUALITY EDUCATION

5 GENDER EQUALITY

6 CLEAN WATER AND SANITATION

7 AFFORDABLE AND CLEAN ENERGY

8 DECENT WORK AND ECONOMIC GROWTH

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

10 REDUCED INEQUALITIES

11 SUSTAINABLE CITIES AND COMMUNITIES

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

14 LIFE BELOW WATER

15 LIFE ON LAND

16 PEACE, JUSTICE AND STRONG INSTITUTIONS

17 PARTNERSHIPS FOR THE GOALS

SUSTAINABLE DEVELOPMENT GOALS



SUSTAINABLE DEVELOPMENT GOALS



Conserve and sustainably use the oceans, seas and marine resources for sustainable development

The Science We Need for the Ocean We Want



2021
2030 United Nations Decade
of Ocean Science
for Sustainable Development



Sustainable Development Strategy
EGYPT VISION 2030
استراتيجية التنمية المستدامة

رؤية مصر ٢٠٣٠



The Sustainable Development Strategy (SDS): Egypt Vision 2030 Main Pillars



Resources



Challenges in Egypt





Marine Pollution from Land-based sources



Ocean Acidification



Coastal erosion



Overfishing



Biodiversity



Marine Litter



Sea level rise

Coastal planning



Decision making and Information

KMS – Knowledge Management System

- **Decision-making** is an integral part of climate change management processes.
- Most supportive resources for decisions related to climate change assume that decision making is limited to the **quantity and quality of available information**, hence, providing the decision-makers with good and reliable information will more likely lead to the desired outcomes.
- One of the most important and pressing challenges in climate change management is, not only the lack of sufficient information, but also the absence or inefficiency of an integrated **knowledge Management System** that links the different key players of the management process.
- Effective **KMS** properly integrating academia, business sector, civil society, media, and decision/policymakers is a must in the current era of climate change.

A Knowledge Management System as a Tool for Better Climate Change Management

Aly A. Ahmed and Ahmed Elshazly



Lecture Notes in Civil Engineering

Daniele La Rosa
Riccardo Privitera *Editors*

Innovation in Urban and Regional Planning (INPUT)

Integrating Nature-Based Solutions in
Planning Science and Practice

 Springer

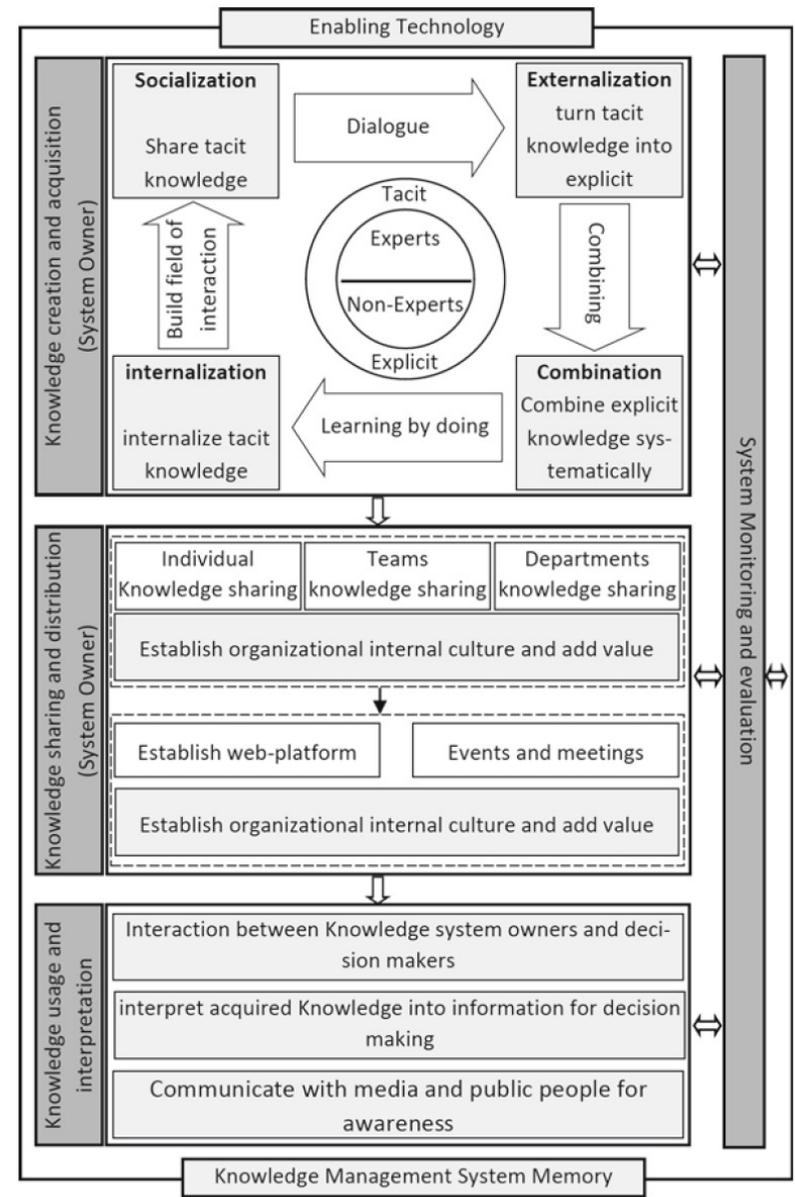
Table 1 A summary of the main systems analyzed to prepare the proposed system

	Strategy title	Issued by	Year	Description
1	Climate Change Knowledge Management Strategy	Republic of Kenya	2012	National climate change action plan: knowledge management and capacity Development strategy
2	UNPD Knowledge Management Strategy Framework	UN	2014	United Nations development programme. A knowledge management strategy framework
3	Information and Knowledge Management for Climate Change (IKM4CC) Strategic Framework	Griffith University and Secretariat of the Pacific Regional Environment Programme (SPREP)	2016	Knowledge management system guidelines for the Pacific Region
4	ISO30401 Knowledge Management Standard	The International Organization for Standardization (ISO)	2018	International standard to build and manage knowledge systems through organizations

Challenges in the systems

- Inability to recognize or articulate knowledge; turning tacit knowledge into explicit.
- Geographical distance and/or language barrier in international companies.
- Limitations of information and communication technologies.
- Loosely defined areas of expertise.
- Constantly changing business.
- Internal conflicts Lack of incentives or performance management goals.
- Poor training or mentoring programs.
- Cultural barriers

- Step 1: Knowledge creation and acquisition**
- Step 2: Knowledge sharing and distribution**
- Step 3: Knowledge usage and interpretation**



Public Awareness

Public Awareness of Climate Change Impacts

- Mitigating CC impacts requires public awareness of climate change and its impacts on the marine environment.
- Assessment of public awareness of climate change impacts on marine environment is important for climate change management.
- This can be done through the identification of any gaps in knowledge; analysis of information sources on climate change and marine environment; and investigation of the pro-environmental behaviors individuals undertake to minimize their negative impact on the marine environment.

Assessment of Public Awareness of Climate Change Impacts on Marine Environment in Egypt

Ahmed Elshazly and Mohamed A. Hamza



Lecture Notes in Civil Engineering

Daniele La Rosa
Riccardo Privitera *Editors*

Innovation in Urban and Regional Planning (INPUT)

Integrating Nature-Based Solutions in
Planning Science and Practice

 Springer

Questionnaire Structure

1- General climate change awareness

to assess the public awareness of climate change and to evaluate the perception of participants about its causes and threats.

2- The Global and local efforts

public knowledge about the global and local strategies and policies to reduce climate change impacts.

3- Daily routines and organizational behavior

to evaluate and analyze people routines to support climate change management and to recognize what organizational behavior exist in the organizations they belong to.

Questionnaire Structure

4- Awareness of climate change and marine environment

to assess respondents awareness on the relation between climate change and marine environment including the role of marine environment in reducing climate change, threats and consequences of climate change on marine and coastal environments.

5- Information source

to identify the sources from which people receive their information about marine environment and climate change issues.

Questionnaire Results

1- General climate change awareness

91% agreed that climate change causes a serious threat to people around the world,

90% were aware that global temperatures have changed compared to the previous decade and

84% of participants stated that they understand what climate change means well.

75% agreed that Egypt faces a serious risk from climate change.

Questionnaire Results

2- The Global and local efforts

64% are not aware.

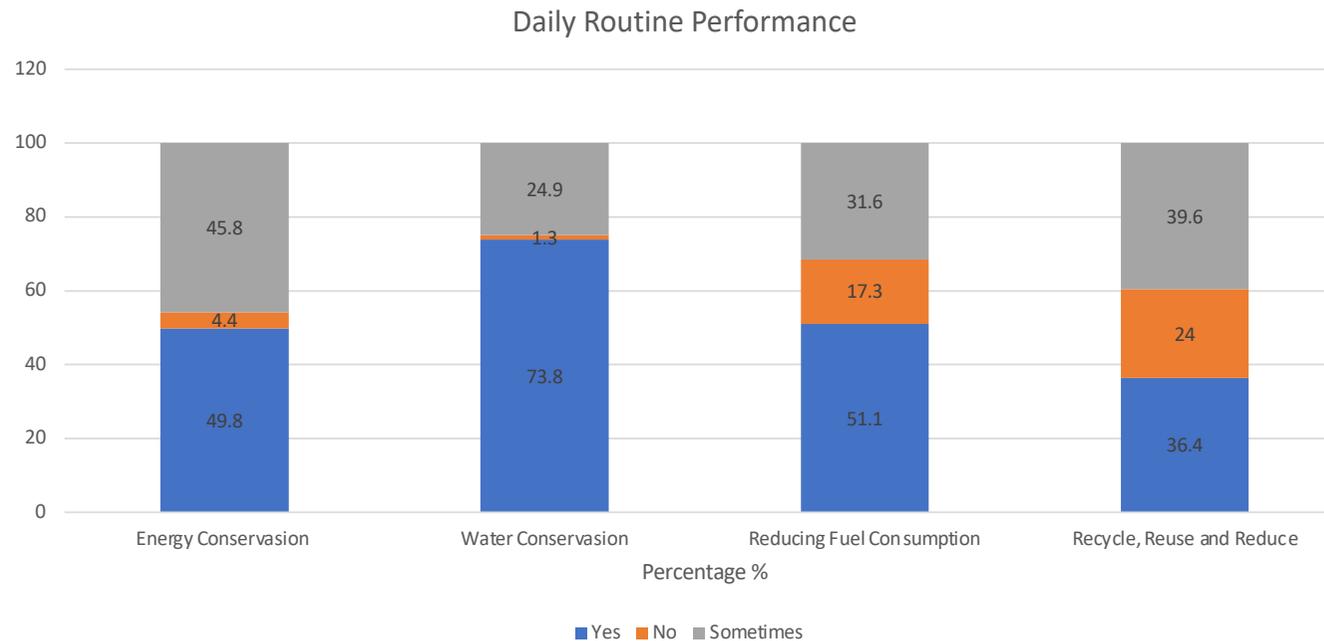
36% (n=80) stated that they are aware of the global initiatives and policies, where 24 of the 80 gave clear answers about the policies and initiatives they recognize.

78% declared that they are not aware of the local policies and efforts to reduce climate change in Egypt, while

22% (n=50) stated that they aware, where 20 of the 50 defines the policies and strategies they recognize.

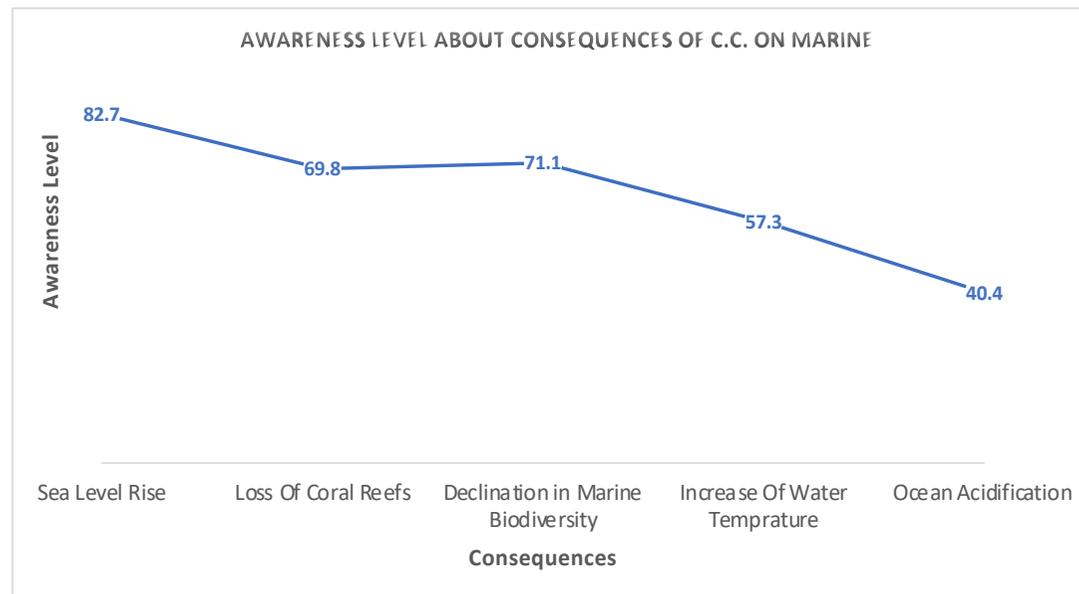
Questionnaire Results

3- Daily routines and organizational behavior



Questionnaire Results

4- Awareness of climate change and marine environment



Questionnaire Results

5- Information source

50% count on the social media as the main source of information, **35%** obtain their information from official news reports and environmental documentaries. On the other hand, **12%** from respondents count on scientific research journals as the climate change information source.

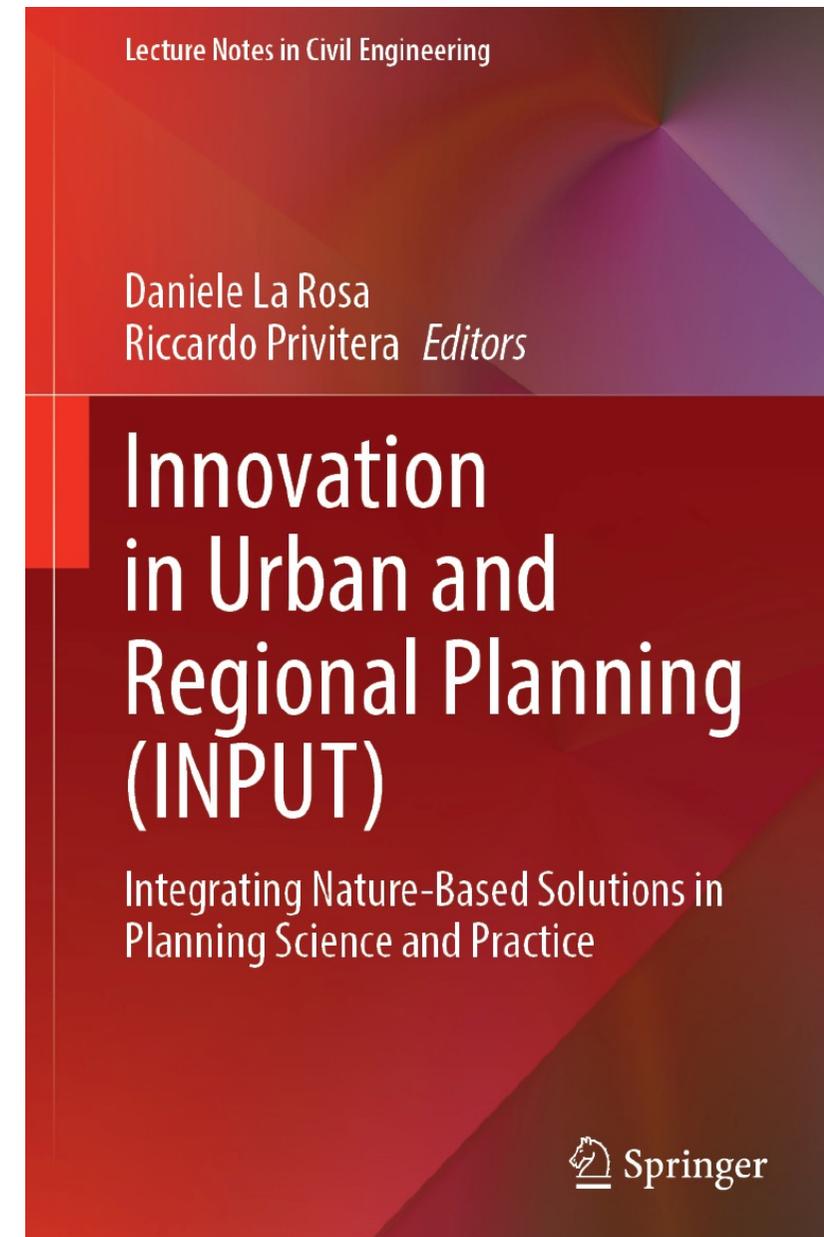
Public awareness is a must

- **Raising public awareness** about climate change is one of the key factors to transform society and, therefore, promote mitigation and adaptation to climate change.
- It's crucial to **minimize the knowledge gaps** highlighted by this research, **minimize the value-action gap**, **overcoming the barrier of habit** and routine is vital to making a pro-environmental behavior viable.
- It's important to communicate the conservation strategies to the public through interdisciplinary **science communication**.

Natural Vs. Man-Made Solutions

Nature Based Solutions for Coastal Adaptation to the SLR: A Case Study from the Northwest Mediterranean Coast of Egypt

Ahmed Elshazly



Nature-based Solutions

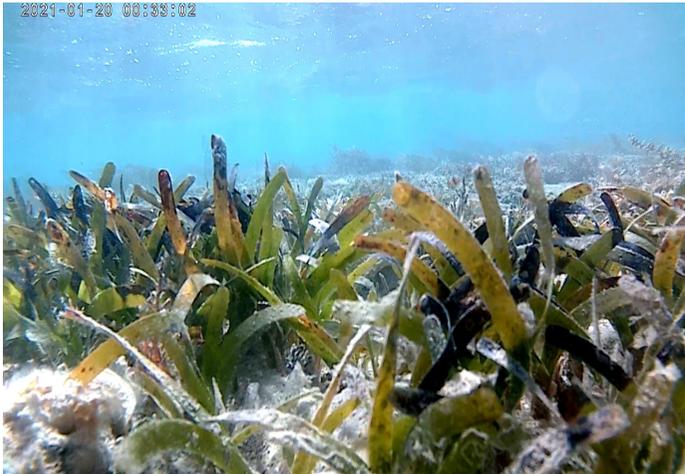
- At present, the northwest Mediterranean coast of Egypt, from Alexandria to Mersa Matruh, is subjected to **man-made coastal engineering hard structures** for the coastal protection from erosion and the SLR as well.
- The reliance on the **traditional** engineered hard structures seems to be **unsustainable** due to the **high construction and maintenance costs**, the need to be upgraded to be adaptive to future changes in climate and the substantial ecological costs.
- Accordingly, there is international direction for the development of **nature-based solutions** (morphology and living shoreline) as a **cost-effective and sustainable** approach to shoreline protection.

- The study examined the morphology, texture, cementation and diagenesis of the emerged and **submerged coastal ridges** and the **beachrocks** from Alexandria to Mersa Matrouh to assess their reliability as an effective tool for the coastal protection.
- This study highlights the importance of employing nature based **non-conventional and cost-effective** means as effective natural defense system to adapt to sea level rise.
- The **integration** between natural (morphology and living shoreline) and the commonly used man-made protection engineering structures will prove to be cost-effective and will accelerate filling in gaps in the existing coastal protection system.



Blue Carbon in Mangrove and sea grasses Sediments as Climate Change Mitigation Tool: A Case Study from Red Sea, Egypt.

Blue Carbon (BC) refers to *organic carbon that is captured and stored by the oceans and coastal ecosystems, particularly by vegetated coastal ecosystems: seagrass meadows, tidal marshes, and mangrove forests.*



Objectives

1-Estimating Carbon Sequestration Potential (CSP) in the sediments of selected mangrove area.

2-Evaluating the state and trend of mangroves distribution using of RS and GIS techniques.

3-Assessing the role of BC in mitigating the Climate Changes Impacts and proposing management actions.

