مشروع " تعزيز التكيف مع تغير المناخ في منطقتي الساحل الشمالي ودلتا النيل في مصر"

Enhancing Climate Change Adaptation in the North Coast and Nile Delta Regions in Egypt Project (ECCADP)

Enhancing Climate Change Adaptation in the North Coast and Nile Delta Regions in Egypt

Socioeconomic Component

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Executive Summary

Adaptation to climate change is a highly context specific and complex topic, that involves a range of different issues from being able to generate an awareness of the importance and relevance of the issue, to planning, implementation, and monitoring and reviewing adaptation strategies and actions[1]. This means that climate change adaptation measures usually involve undertaking a wide range of activities that may have a number of direct and indirect implications on socioeconomic conditions of local communities.

The project entitled "Enhancing Climate Change Adaptation in the North Coast and Nile Delta Regions in Egypt", in five selected study sites (hotspots) is intended to reduce coastal flooding risks in Egypt's North Coast due to the combination of projected sea level rise and more frequent and intense extreme storm events. For this purpose, the project focuses on constructing 69 km of sand dune dikes along five vulnerable hotspots within the Nile Delta coastal areas that were identified during an engineering scoping assessment and technical feasibility study. In this context, socioeconomic assessment can play an essential role in characterizing baseline conditions of the community and potential socioeconomic impacts of such measures in general and on different specific socioeconomic groups, in particular.

Such an assessment, which is the subject of this report, is intended to characterize socioeconomic context of the five study sites, assess impacts of proposed protection actions; develop a grievance mechanism and proposing guidelines for community development. Additionally, this assignment involves the development capacity buildings plan, focusing on socioeconomic studies and tools, to support capacity of the technical staff of Shore Protection Authority (SPA). Attaining these objectives, the work begins by socioeconomic characterization of the study sites including site delineation and collecting spatial data and information collection and processing. This was followed by assessing impacts, which involved the identification and review of two reference coastal localities, through the identification of affected parties in both the five study sites as well as the two reference localities. The identified potential physical impacts are then utilized in economic valuation of such impacts.

Thereafter, guidelines for projects that would compensate for such impacts as well as support community development were developing through community consultation exercises in order to identify and prioritize community needs. This was followed by identifying alternative actions, from which best possible actions that could be undertaken. Additionally, needs for socioeconomic capacities of SPA technical were identified through assessment of existing capacities and capacity development actions are planned.

Concerning socioeconomic conditions of these hotspot were characterized and main similarities as well as differences among these hotspots were highlighted. For instance,

[1] *Bowyer, P., S. Rechid and D. Schaller, 2014, Adapting to climate change: methods and tools for climate risk management, Climate Service Center, Germany, 124 pages.*

various hotspots showed no significant differences in terms of their prevailing socioeconomic conditions. The communities of different hotspots have a relatively similar age structure. Also, different hotspots were found to have a variety of stakeholder and target groups in each hotspot, which implies the need for involving them in the consultation when planning for community development guidelines. Meanwhile, among other differences, different hotspots showed varied levels of sensitivity and thus physical vulnerability to coastal flooding risks due to their varied geographical as well as socioeconomic contexts. Therefore, the magnitude and spatial extent of coastal flooding impacts would be expected to vary among different hotspots. Moreover, each hotspot has a particular set of potential target groups that should be carefully identified and motivated to be engaged during the field work phase. Such differences suggest that there should non-uniform methodology and/or approach for field work in different hotspots.

It should be noted that vulnerability of the five hotspots to coastal flooding is expected to increase in the future under different SLR scenarios. This is, especially true in two sites; namely West New Ashtom El Gamil outlet and West New Gamasa city, where considerable proportions of the two sites are expected to be highly vulnerable to coastal flooding by the year 2065 under RCP8.5 scenario. In all cases, it was found that the coastal flooding may have significant impacts either on permitting development activities and/or prevent loss of assets. Thus, the proposed protection work can provide large positive impacts with possible future development. The positive impacts of the suggested protection work can be valued by the damage that can be avoided as a result of such work and consequent preserved assets. The economic value of impacts of the suggested protection work was estimated to be EGP 275 and 1,031 million in the case of West New Ashtom El Gamil and West Burullushotspots, respectively. This brings the total economic value of the positive impacts, only in these two sites to about EGP 1,306 million. Additional significant positive economic impacts are expected at the remaining 3 sites, where large-scale development is taking place or planned. However, estimating their values is hindered by the lack of information on the specific contribution and role of the protection work in these sites and how this protection work would be integrated with the side-walks planned for the three sites.

Concerning development needs of communities at West Burullus Outlet and West New Ashtom El Gamil Outlet Hotspot included absence of sanitary sewage systems, lack of job opportunities for women in the area, limited opportunities for women to enhance their capabilities, lack of educational and health care services, frequent power and water provision cuts during the winter season and high level of groundwater table. Meanwhile, in other hotspots, concerns about potential impacts of suggested protection work on the market value of real estates were expressed, during consultation meetings, by residents of these areas.

Despite the limited anticipated adverse impacts of the suggested protection work that are planned to be undertaken within the project in the hinterland of the selected five hotspots, development of a grievance mechanism for these intended protection works was

considered to be a must. for this purpose, a grievance mechanism was proposed consisting of four main steps: receipt and recording complaints, screening for eligibility, identifying appropriate solution and monitoring and evaluation.

The project proposed protection work would reduce the exposure to the risks of coastal flooding and sea level rise, contributing towards improved resilience of these communities. in this respect, a number of proposals were suggested to improve resilience of the local communities focusing more on marginalized groups including women. Therefore, two of the four proposals are intended to empower women in the community and enhance both their financial independence as well as their support to the livelihood of their families. These include increasing market access for women's local products (mats) and enhancing women's capacities in terms of sewing, animal farming and other local activities. Meanwhile, the third proposal could be seen as a contribution to community development and sustainability as it can provide direct and indirect benefits both at community as well as household levels. These benefits include, for instance, improved health status and therefore productivity of community members.

For building capacities of SPA technical staff in the field of socioeconomic assessment and forming a core team for socioeconomic assessment, the main topics of training were identified and a priority list for capacity building activities targeting SPA technical staff was developed.

Section (1):

Background

1. Background

1.1 Introduction

The Project entitled: "Enhancing Climate Change Adaptation in the North Coast and Nile Delta Regions in Egypt", which is sponsoring this socioeconomic assessment work intends to support adaptation efforts of Egypt in the Nile Delta. The Delta is identified by the IPCC in its Fourth Assessment Report as one of the world's three "extreme" vulnerable hotspots. The objective of the project is to reduce coastal flooding risks in Egypt's North Coast due to the combination of projected sea level rise and more frequent and intense extreme storm events. For this purpose, the project focuses on constructing 69 km of sand dune dikes along five vulnerable hotspots within the Nile Delta that were identified during an engineering scoping assessment and technical feasibility study.

The scope of the work, which intends to assess the social and economic feasibility of planned protection works, includes:

- Review GCF Funding Proposal, UNDP Project Document, Environment and Social Management Framework (ESMF) Document as well as other relevant project reports
- Review grievance mechanism in the ESMF
- Meet with the key stakeholders including MWRI, SPA, UNDP, GEF Small Grants Programme and IFAD
- Compile available demographic information segregated by gender in the five project areas in the lands that benefit from the protection works
- Hold consultation meetings in the five project areas with the local communities in coordination with MWRI, SPA and municipalities to discuss community development needs and priorities
- Identify active and well-respected registered NGOs in the project
- Present the findings of the study in a workshop to SPA and Governorate officials and explain tools used to conduct the study
- Assess training needs for Shore Protection Authority Staff (SPA) in the fields of environment and socio-economic and develop a training program to fulfill those needs.

1.2 Objectives

There is a need for assessing socioeconomic conditions and identify the impacts of coastal protection actions being carried out by the Project entitled: "Enhancing Climate Change Adaptation in the North Coast and Nile Delta Regions in Egypt", in five selected study sites (hotspots) highlighting the main areas of concern. Such an assessment specifically aims to:

- Characterizing socioeconomic context of study sites;

- Assessing impacts of protection actions by the project;
- Developing a grievance mechanism;
- Proposing guidelines for community development; and
- Developing capacity buildings plans.

1.3 Socioeconomic Assessment: Methodology

Socioeconomic environment refers to a wide range of interrelated and diverse aspects and variables relating to or involving a combination of social and economic factors. These variables could, in general, be categorized into; economic, demographic, socio-culture as well as infrastructure and service aspects. The economic aspects may, for instance, include general characteristics and structures various economic activities and employment. Demographic aspects may include population growth structures, distribution and density. The social aspects may involve community life as well as social and cultural attitude and values. Public or community services may meanwhile be concerned with housing and requirements for infrastructure such as water, sanitation, communications, police and fire protection facilities and services such as solid waste disposal as well as health and educational services (Murdock et al 1986).

Socioeconomic conditions are related to human beings and their characteristics, which are usually dynamic variables that differ widely within the same community and from one community to another. A socioeconomic assessment is thus a way to learn about the social, cultural, economic and political conditions of stakeholders including individuals, groups, communities and organizations and identify those that may be affected by a development project or plan

Nevertheless, no comprehensive list of areas of concern could be developed to fit socioeconomic assessment in all cases. Therefore, the potential socioeconomic impacts should be screened to identify the most probable ones and exclude the not applicable impacts (**Table 1-1**). This means that each of above-mentioned groups of indicators should be tailored to suit the situation(s) being examined.

The framework of the assignment is envisaged to involve four main stages (**Figure 1-1**) namely study site characterization, assessing impacts of protection actions to be undertaken by the project, developing community development plans and finally developing capacity building plans for main stakeholders.

Table 1-1: Aspects of socioeconomic environment

Aspect	Indicators
Economic conditions	· Economic structure
	· Income levels
	· Job opportunities
Community structure, institution and infrastructure	· Health and social services in study area, including health, workforce, law enforcement, fire protection, water supply, wastewater treatment facilities, solid waste collection and disposal, and utilities.
	· Transportation systems in study area, including highway, rail, air, and motorway
	· Tourism and recreational opportunities in the study site
	· Tax levels and patterns in the study area, including land, sales, and income taxes
	· Institutional structure
	· Community cohesion, including organized community groups
	· Gender issues
	· Social orders including community attitudes, lifestyle and history of the community
	· Distinct settlements of ethnic groups
Demographic conditions	· General trends in population size for study site
	· Migration trends in the study area
	· Population characteristics in the study area including distribution by age, gender, ethnic groups, educational level and family size
	· poverty and wealth distribution
Employment	· Employment composition
	· Unemployment rate
	· Availability of job opportunities and their nature
Community resources	· Land use patterns and controls for study site
	· Land values in the study area
	· Housing characteristics in the study area, including types of housing and occupancy levels and age and condition of housing
	· Areas of unique significance

Source: (Abdrabo and Hassaan, 2003)

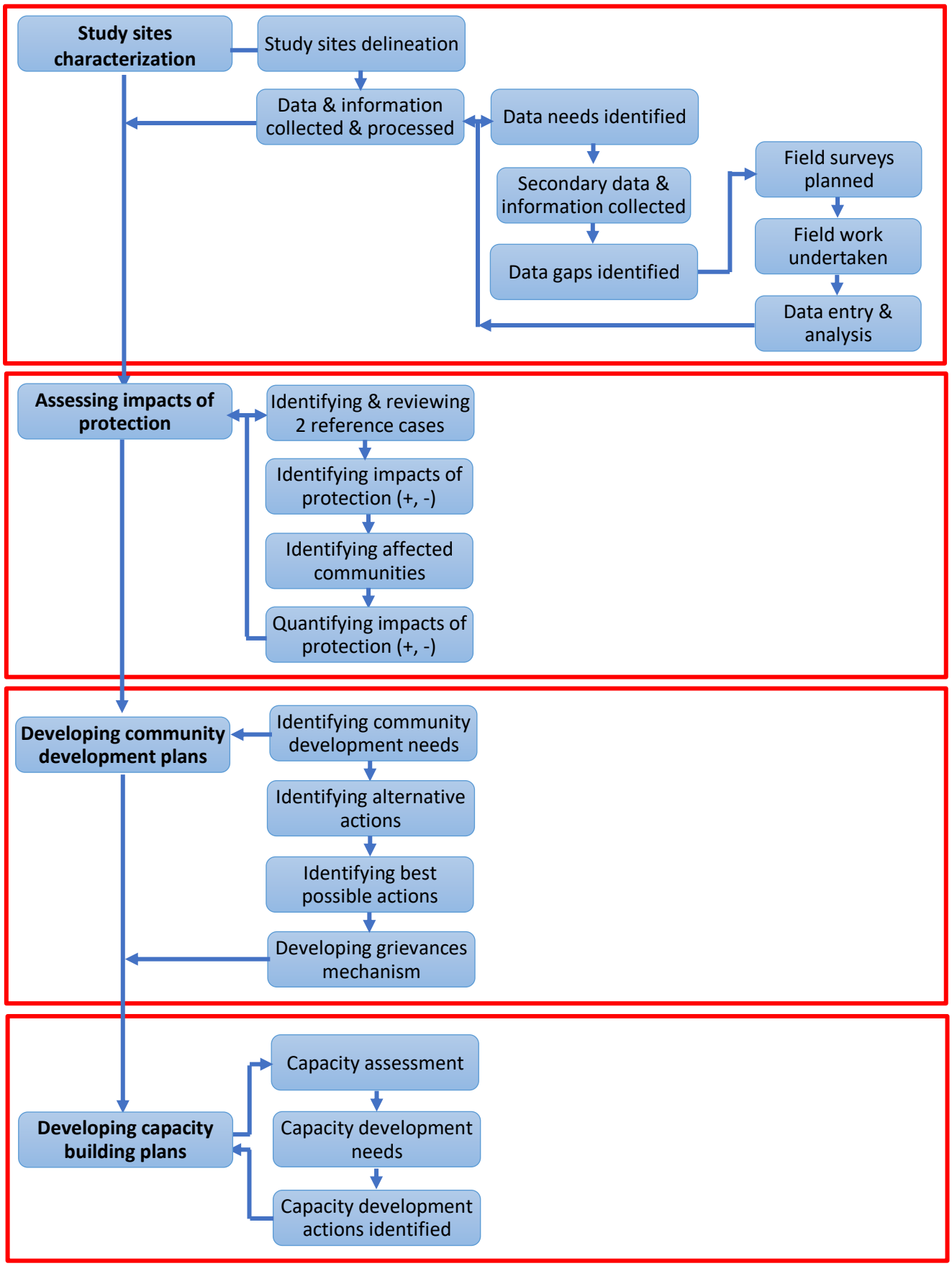


Figure 1-1: Framework of the socioeconomic assessment study

- **Stage I:** Study site characterization: at this stage, as a prerequisite, the study sites are to be delineated. This involves collecting spatial data and information collection and processing. This stage also comprises the identification of data needs, to be followed by secondary data and information collected, then identification of data gaps. Based upon such data gaps, field surveys are to be planned and field work identified and then conduct data entry and analysis. A preliminary identification of key stakeholders in each hotspot are to be identified.
- **Stage II:** Assessing impacts of protection: This involves the identification and review of **two** reference coastal localities that are experiencing similar flooding but has no protection work undertaken (used as with and without cases). This is intended to assist in the assessment of the impacts of the protection works. Thereafter, affected parties in both the five study sites as well as the two reference localities are to be identified as well as positive and negative impacts of protection. This is to be followed by attempting to quantify and value such impacts.
- **Stage III:** proposing guidelines for community development: This includes identifying and prioritizing community needs. This is followed by identifying alternative actions, from which the best possible actions that could be undertaken to remedy actions.

  It is worth mentioning that significant consultation is to be undertaken with the key stakeholders' groups during the 2nd and 3rd stages.
- **Stage IV:** Developing capacity building plans: This stage involves conducting assessment of existing capacities and then capacity development needs are to be identified. Accordingly, capacity development actions are identified.

1.4 Updating Mechanism of the Socioeconomic Study

It should be noted that, due the dynamic nature of socioeconomic environment, there would be a need for continuous updating some sections of the socioeconomic component of the project. Such updating is also highlighted for the purpose of monitoring and evaluation purposes. As per request of project management the following updating plan is suggested:

Section	Regular updating
Socioeconomic analysis (Section 2.2)	Bi-annually
In-depth assessment (Section 3.5)	Bi-annually
Grievance mechanism (Section 4)	Annually
Community Development Activity (Section 5.3)	Bi-annually
Socioeconomic capacity building (Section 6)	Annually

Section (2):
Baseline Socioeconomic Conditions

2. Baseline Socioeconomic Conditions

2.1 Objective

The main objective of this section is to characterize the five selected hotspots alongside the Nile Delta coastal zone and provide a comprehensive and detailed socioeconomic as well as demographic profile for each of these sites. Such characterization and consequent socioeconomic profiles will represent the base for assessing the social and economic feasibility of planned protection works.

2.2 Socioeconomic Analysis

The socioeconomic context, characterization, of the various sites covered by this assessment can be adequately depicted through their geophysical setting, demographic conditions and prevailing Land Cover/Land Use (LCLU) pattern. The geophysical setting delineates each hotspot and highlights its location and main local features. This delineation is determined based on the protection work hinterland, which on one hand neighboring the protection work and thus believed to be most affected by such work and represents the lowest administrative units (locality – Sheiakha) for which Census data is available, on the other hand. Meanwhile, demographic conditions of each hotspot give insight into the population characteristics in terms of size, age-sex structure, educational level and economic structure.

It should be stated that the data for economic activities and household characteristics description are available for the local administrative unit (Locality – Sheiakha), except for the labor force data that is only available at governorate levelin the most recent Census. Moreover, LCLU pattern in an area can support socioeconomic characterization with adequate information on socio-culture conditions as well as the economic structure of this area. Therefore, mapping and understanding LCLU pattern in coastal areas can also support decision-making process and consequently ensure sustainable management of their natural resources.

2.2.1 West Burullus Outlet Hotspot

a) Geophysical Setting

The hinterland of the west Burullus outlet hotspot extends from 30° 34` 00" to 30° 50` 00" E and from 31° 25` 14" to 31° 32` 38" N covering a total area of 108.3 km^2. The area has a shoreline extending for about 27 km. The topography of the area reveals that the area is generally low-lying land, where about 13% and 25.3% of the total area lie below Mean Sea Level (MSL) or have an elevation ranging between 0 and 0.5 m above MSL, respectively (ARCA, 2017). The downscaled scenarios of sea level rise indicated that the sea level is expected to rise alongside the coastline of the 20 and 23 cm under IPCC RCP 2.6 and RCP 8.5 scenarios by

the year 2065, respectively. Meanwhile, such sea level rise is expected to reach 30 and 35 cm by the year 2100 under the two scenarios, respectively (ARCA, 2018).

Such low-lying land has generally been experiencing varied subsidence rate ranging between 0 and 1.2 mm/year (Stanley, 1997; Stanley and Warne, 1993). These low-lying areas are, however, located in the southern parts and thus naturally protected by a relatively high land alongside coastal façade. This doesn't mean that they are not exposed to flooding associated with extreme weather events, especially in terms of high tides along the coast during winter. Administratively, the hinterland of west Burullus outlet hotspot is a part of Barr Bahary locality, which is one of El Burrulus District, Kafr EL Sheikh Governorate (**Figure 2-1**).

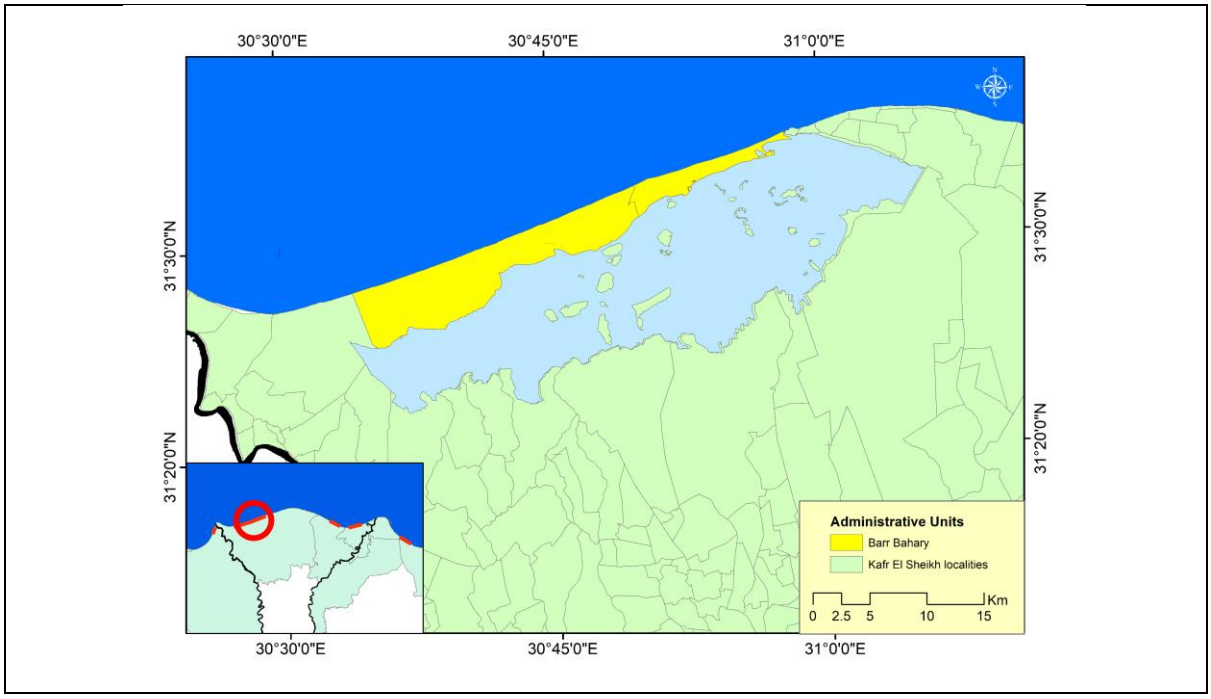


Figure 2-1: Administrative boundaries of Kagr EL Sheikh governorate localities including west Burullus hotspot

b) Demographic Conditions

According to the 2017 Population Census, the area has a population of 15,718 (CAPMAS, 2017). The population of the area has increased by about 34% during the period 2006-2017 (CAPMAS, 2008) with annual change rate of 3%, which is relatively higher the national rate (Worldmeter, 2019). This is expected to influence the age structure and economic dependency rate in the area. It was found accordingly, that the age structure of a society's population, reflecting the rapid rate of population increase, has significant implications for current and future development of that society. Generally, male/female ratio in the area recorded 101, which means 101 males to 100 females that is relatively lower than that of Egypt as a whole which accounted for 106 (CAPMAS, 2017).

The age group less than 15 years old represents about 37.8% of the total population. While the group of population in the working age (15-64 years old) represents 59.7% of the

total area population, whereas elder population group (more than 64 years old) represents 2.5% of the total population of the city (**Figure 2-2**).

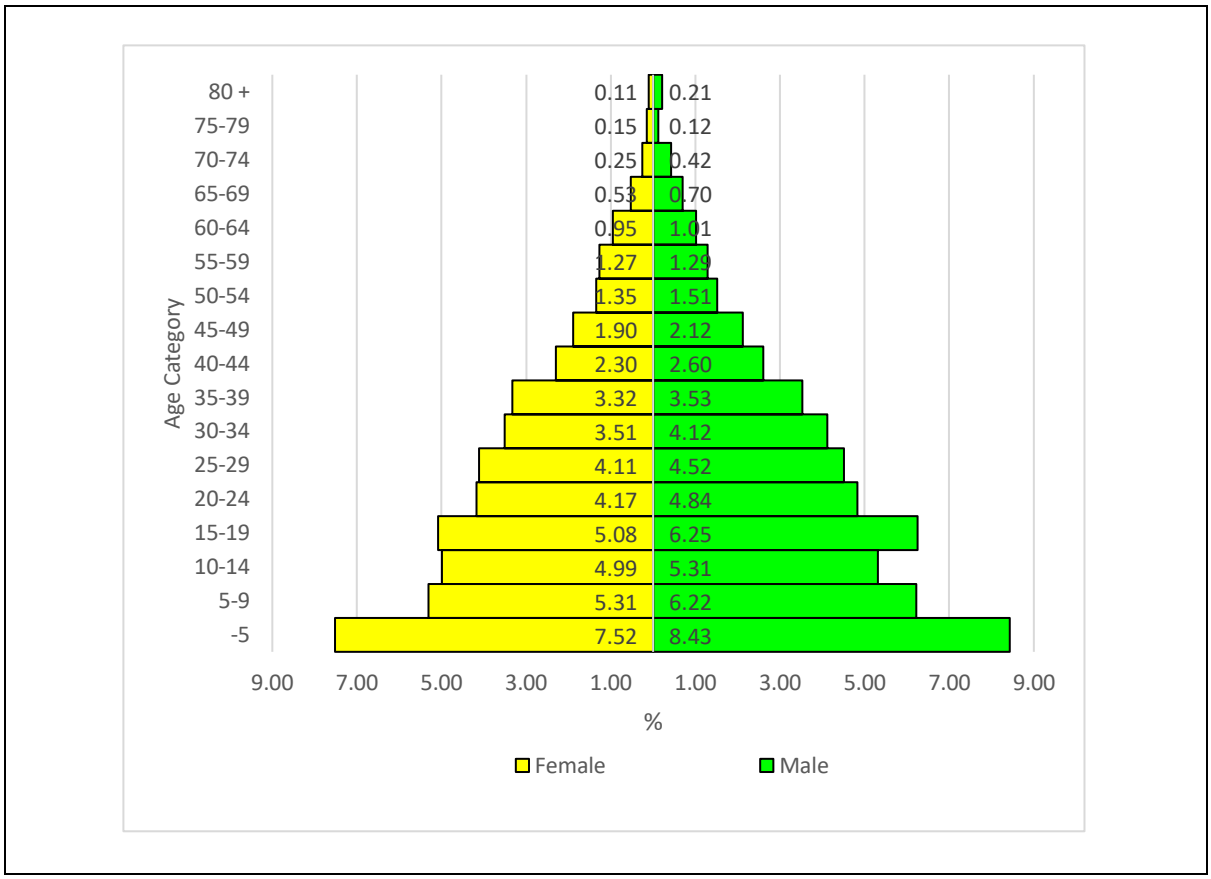


Figure 2-2: Age-sex population structure of West Burullus outlet hotspot

This means a demographic dependency ratio, which usually employed as an indicator to community productivity as it refers to the burden that should be shouldered by those who are economically active; population in working age (15-64) is 67.4%. This, in turn means the need for creating more jobs relevant to education and skills available among working age group. Additionally, there would be a need for providing services and infrastructure to serve the less than 15 years age group.

Generally, it can be argued that the broad base of the age structure pyramid reflects the above discussion, showing generally the relative majority of the population lying in the less than 15 age group, which means that the fertility rate of the community is high. This shape of population pyramid with ideal big base and skinny top (**Figure 2-2**) indicates, also, a community at the first stage of demographic transition model that is characterized by high fertility levels and shorter life expectancy, leading to decreasing proportions of elder population.

In terms of educational status, it was found that the area suffers from a high illiteracy rate of 41.3% for the population above 10 years old, which is considerably high compared to the average illiteracy rate in Egypt, which is 25.8% (CAPMAS, 2017). Also, the illiteracy rate was found to be higher among women (50.2%) compared to 33.2% for men. This is also reflected in women having a relatively lower percentages compared to men at all educational levels (**Figure 2-3**). This may reflect a gender issue in access to education in the area and could also affect other aspects such as employment.

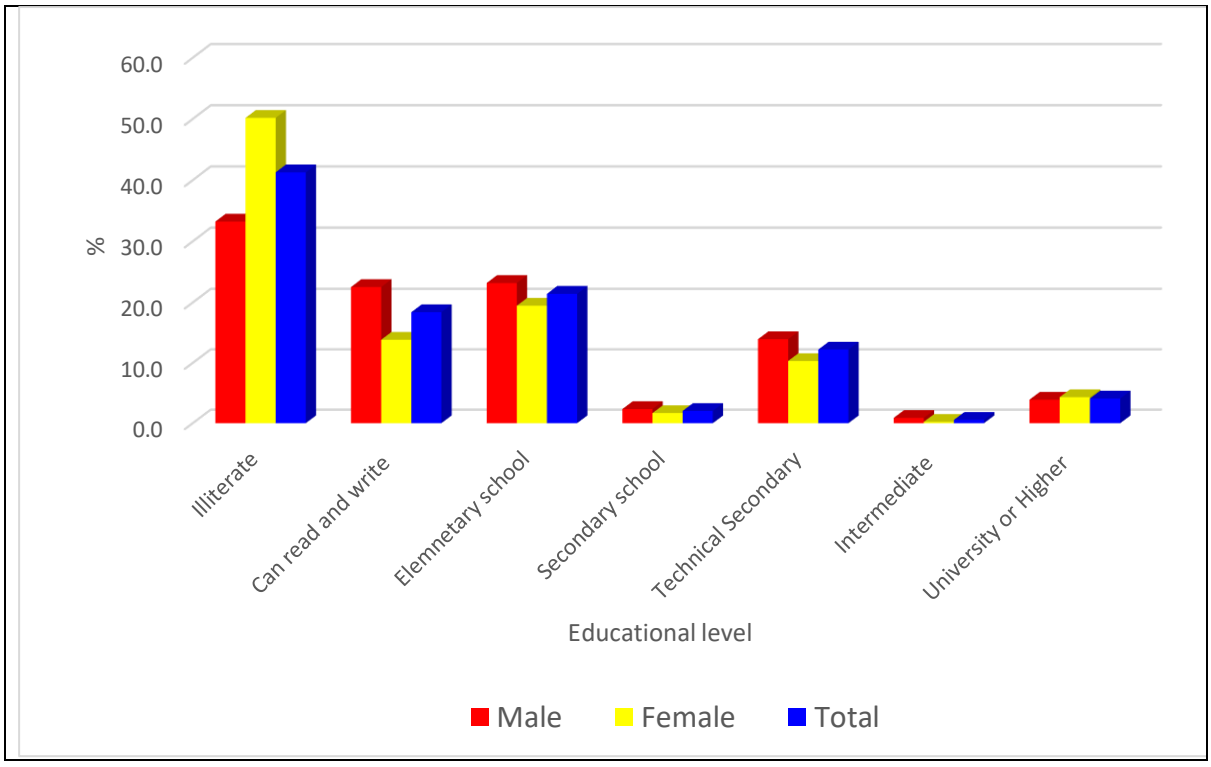


Figure 2-3: Educational levels in West Burullus outlet hotspot

Moreover, it was noted that 18.4% and 21.4% of total population above 10 years old were found to be able to read and write or at elementary school level, respectively. This means that about 81.1% of the total population above 10 years are either illiterate or have limited educational levels, which, in turn, highlights the low educational levels in the area in general. Meanwhile, the percentage of those enrolled in technical education represent about 12.2% of the total population above 10 years old. This may suggest the availability of skilled technical labor force that provide the base for possible small and medium size (SMEs) projects.

Unemployment rate in the area is about 1.4% on average, with the unemployment rate being noticeably higher among women (9.7%) compared to men (1.0 %) (CAPMAS, 2008).This may highlight the limited access of women to job opportunities. According to the

economic structure, 49.1% of the total labor force in the area are employed in tertiary activities including services, transportation, construction...etc. This is followed by primary activities particularly agriculture and fishing that involve on average 45.1% of the total labor force at the governorate level. Meanwhile, manufacturing industries employ only 5.8% of the total labor force (CAPMAS, 2017). The high percentage of those employed in primary activities in general and in fishing in particular could be adversely affected by the protection measures proposed by the project. As the percentages of women employed in agriculture and services sectors represent the majority of women in the labor force (61.1%). This may indicate that the contribution of women in agricultural activities is limited, which is more of hidden income for the households in the area.

Concerning access to basic services and infrastructure, it was found that 97.4% and 95.3% of total residential buildings in the area have access to electricity and potable water, respectively. Meanwhile, only less than 1% of these buildings have access to sanitation and none of the buildings in the area has access to natural gas services (CAPMAS, 2017) (**Figure 2-4**). Limited access to sanitation in the area may magnify the impacts of flooding and thus enhance the benefits of potential protection measure to be undertaken by the project.

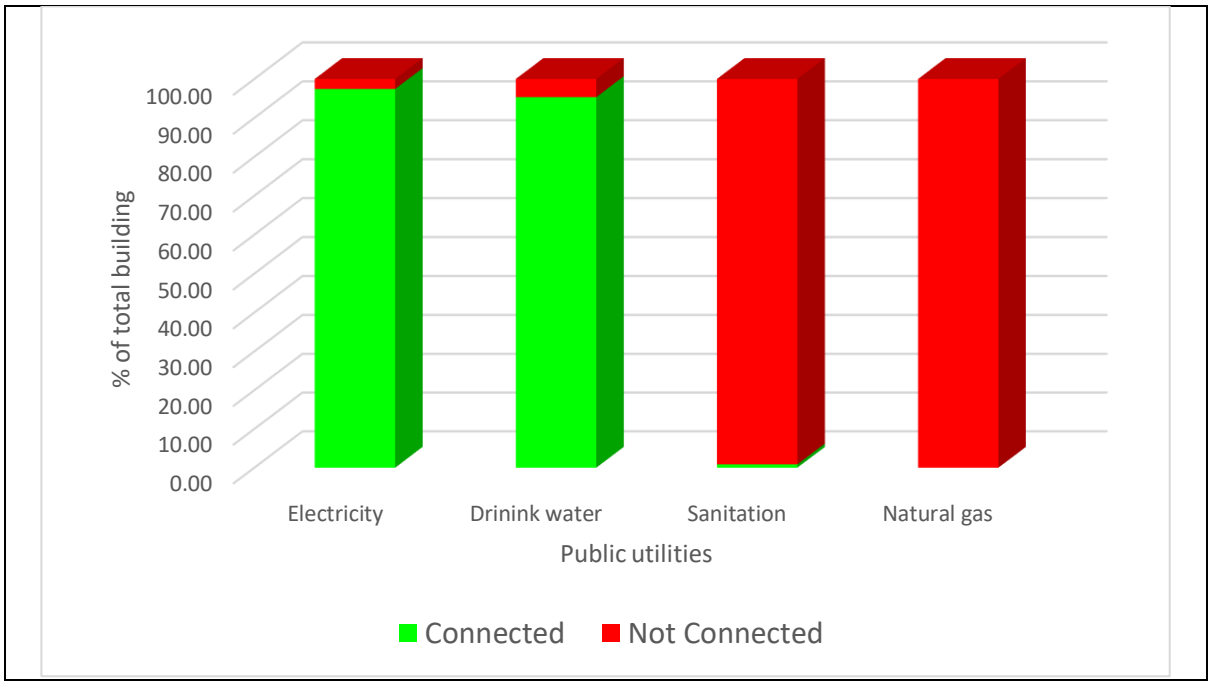


Figure 2-4: Access to basic services and public utilities in West Burullus outlet hotspot

According to 2017 Population Census, 85.3% of rural population in Kafr EL Sheikh governorate use mobile, while 41.7% use computers and 21.9% have access to the internet. Generally, despite these proportions are relatively low compared to national level (CAPMAS, 2017). This could suggest that the mobiles may provide an appropriate framework for communicating with local residents.

c) Land Cover/Land Use (LCLU) Pattern

LCLU pattern in the hinterland of west Burullus outlet hotspot reveals a considerable proportion of the area, 44.6%, is cultivated land. Meanwhile the built-up areas represent only 2% of the total area (**Table 2-1** and **Figure 2-5**). The built-up areas involve a number of villages such as Izbet El Maqmasa and Mastrwa village in addition to three new villages for graduates. Also, the built-up areas comprise some infrastructure; namely, New Burullus electricity generation plant with productive capacity of 4800 megawatt in the northeastern part of the area the investment cost of this power plant is € 22 billion (KFG, 2018).

Undeveloped land is located mainly in the northern parts of the area alongside the Mediterranean coast (**Figure 2-6**) covering about 46.2% of the total area. The development of these undeveloped lands in the area should carefully consider future risks associated with coastal flooding and sea level rise.

Table 2-1: Areas of various types of LCLU in West Burullus outlet hotspot

LCLU	Area Km^2	%
Undeveloped land	82.9	46.2
Cultivated Land	80.1	44.6
Infrastructure	1.1	0.6
Residential areas	2.4	1.4
Total Built-up area	3.6	2.0
Wetlands	8.1	4.5
Aquaculture	4.9	2.7
Total Wetlands	13.0	7.2
Overall area	197.6	100%

Wetlands cover about 13 km^2 of the total hinterland of west Burullus outlet hotspot representing 7.2% of the total area. A considerable proportion of these wetlands (about 5 km^2) are utilized in aquaculture activities. The wetlands in the area is a part of Burullus lake, which extends to the south of the area and represent one the prominent geographical features in West Burullus Outlet hotspot (**Figure 2-6**). The lake extends for about 70 km from west to the east and its width from north to south ranges between 6 and 17 km covering a total area of about 410 km^2 and is connected to the Mediterranean Sea by Burullus outlet. The depth of water in the lake ranges between 40-130 Cm on average and the eastern parts of the lake are the shallowest ones and the depth increase westward. The lake has a variety of fish stock including marine species such as *Engraulis encrasicholus* in addition to some fresh water fish such as *Barabus bynni*. Generally, *Tilapia zillii* is widely distributed in the lake as it is highly tolerant to saline water (Shaltout and Khalil, 2005).

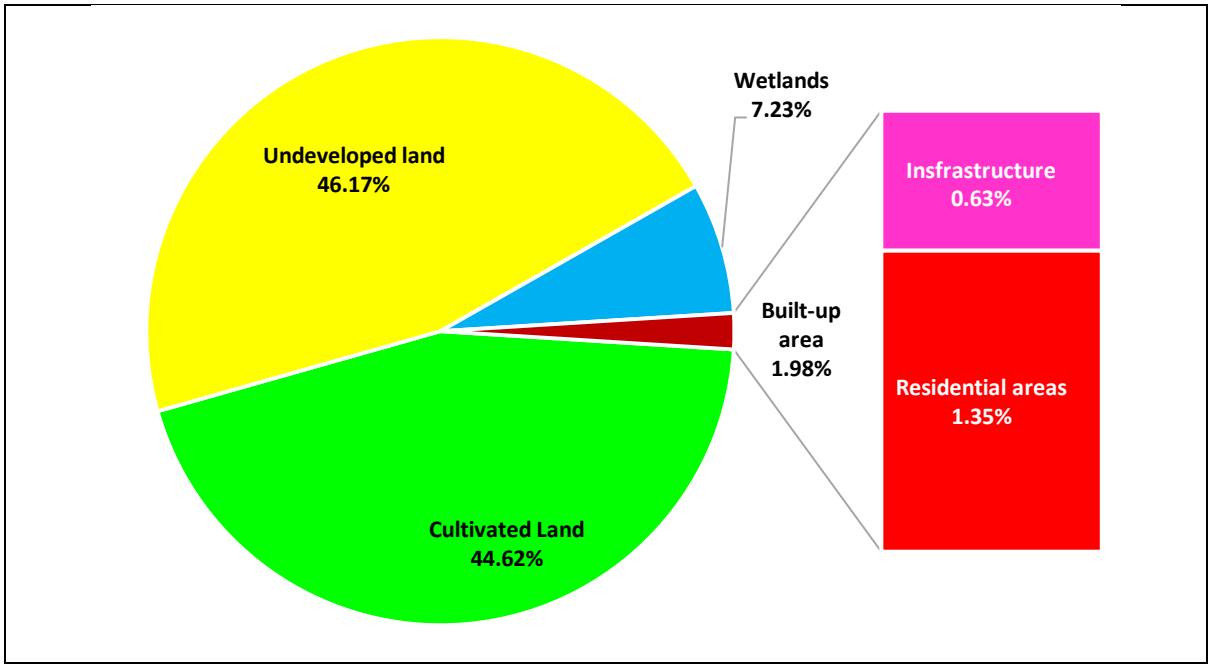


Figure 2-5: Relative distribution of various LCLU types in West Burullus Outlet hotspot

The total fish production of the fisheries in Burullus lake was estimated to be 67577 ton in 2016 (CAPMAS, 2018). Meanwhile, wide areas of the lake (more than 400 km^2) were used in Aquaculture activities (GAFRD, 2014) that produced about 670551 ton in 2016 (CAPMAS, 2018), which represent about 49.4% of the total fish production of aquaculture in Egypt. This suggests that marine fishermen in the area who could be adversely affected by the coastal protection measures, due to reduced access to the sea, to be developed by the project, could have an alternative working in the lake. This, however, may require some action form the project to enhance the potential of such an opportunity.

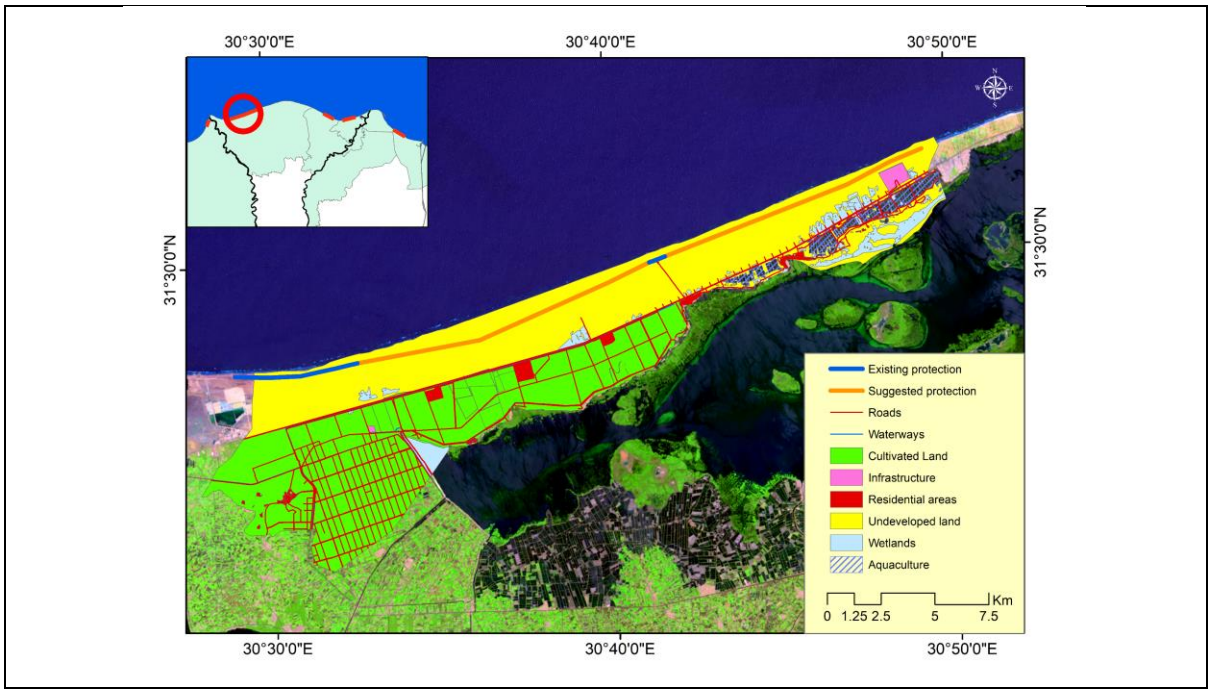


Figure 2-6: LCLU pattern in West Burullus outlet hotspot

2.2.2 West New Ashtom El Gamil Outlet Hotspot

a) Geophysical Setting

The hinterland of West New Ashtom El Gamil Outlet Hotspot extends from 32° 03` 21" to 32° 14` 15" E and from 31° 11` 10" to 31° 21` 54" N covering a total area of 248.7 km^2 with a shoreline extending for about 18 km. The area is generally low-lying land that has been experiencing the highest subsidence rate in the Nile Delta ranging between 2.3 to 4.3 mm/year (Stanley, 1997; Stanley and Warne, 1993). This makes the area one of the most vulnerable areas in the Nile Delta to coastal flooding and SLR impacts, which expected to be, alongside the coastline of the area, about 22 and 24 cm under downscaled IPCC RCP 2.6 and RCP 8.5 scenarios by the year 2065, respectively. Meanwhile, such a sea level rise is projected to reach 31 and 36 cm by the year 2100 under the two scenarios, respectively (ARCA, 2018). Administratively, the area is one of Port Said governorate districts; Elmnasra section (**Figure 2-7**).

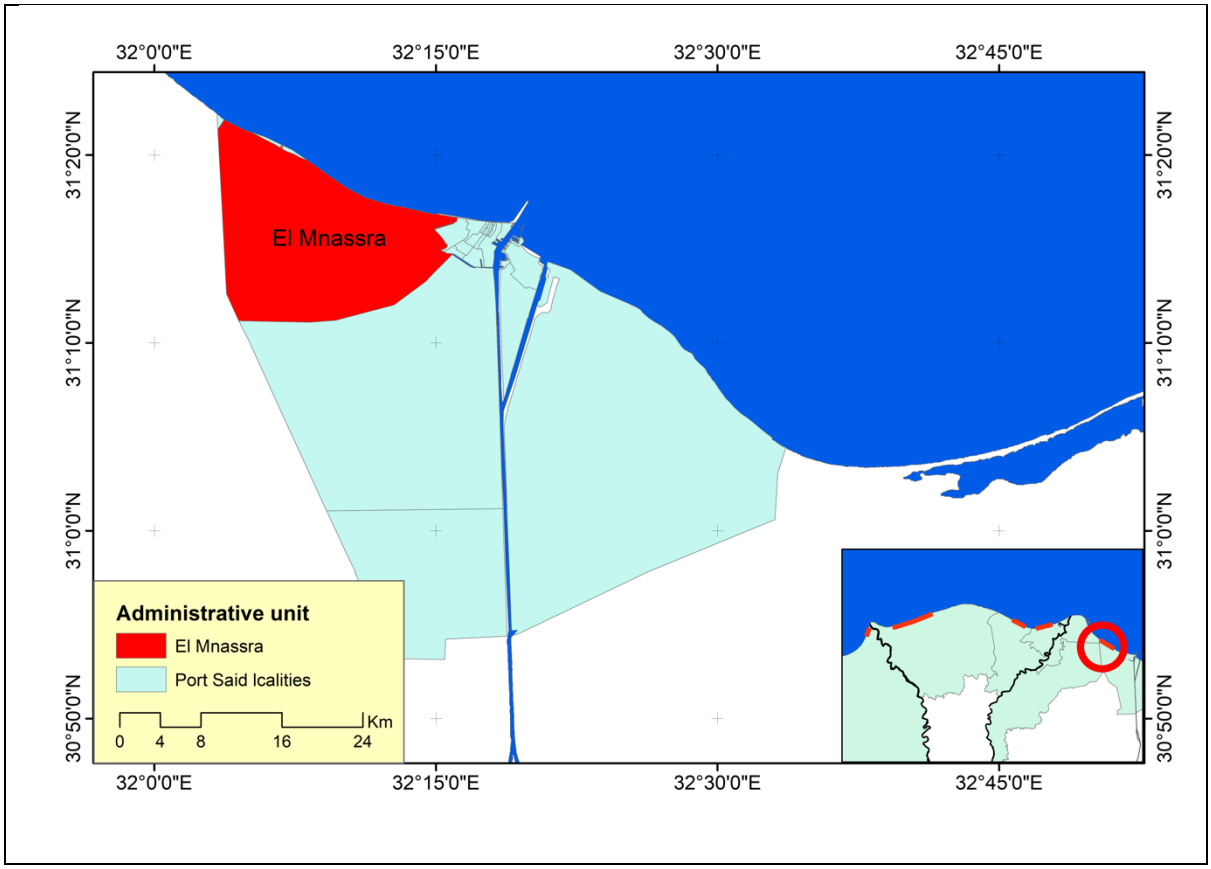


Figure 2-7: Administrative boundaries of Port Said governorate localities including Mnassra study site

b) Demographic Conditions

According to the 2017 Population Census, Elmnasra section has a total population of 5304 (CAPMAS, 2017) [2]. The population of the area rapidly increased over the period 2006-2017 from 2679 to 5304 in 2017 with an annual increase rate of 8.9% (CAPMAS, 2008; CAPMAS, 2017). Male/female ratio in the area recorded 120, meaning 120 males to 100 females on average, which is considerably higher than the average national one, which accounted for 106 (CAPMAS, 2017). This, in turn, refelects gender imbalance in the area that can be motivated by selective population local migartion movement into the area by males into the working age group.

Age-sex structure of area population is characterized by broad pyramid base as the population below 5 years old represents about 20% of the total population, while population group (5-15 years old) represents about 13.2% of the total area population. While the population in the working age group (15-64 years old) represents 62.3% of the total area population, the elder population group (more than 64 years old) represents about 3% of the total population of the city (**Figure 2-8**).

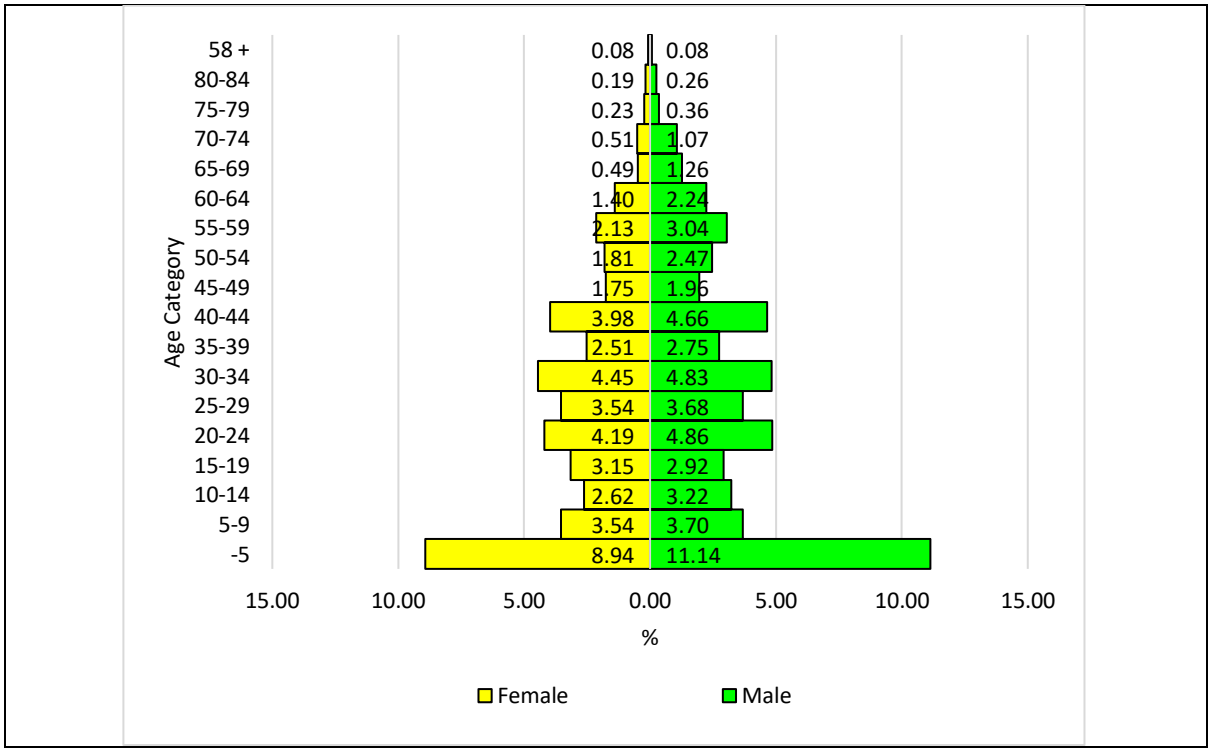


Figure 2-8: Age-sex population structure of West New Ashtom El Gamil Outlet hotspot

[2] This number was confirmed also by Eng. El Arabi El Kashawy, SPA Local representative in Port Said, on 31st of March 2020.

This means demographic dependency ratio of 60.5%. Generally, it can be argued that the broad base of the pyramid and noticeable high proportions of children below 5 indicates high fertility rate of the community (**Figure 2-8**). Additionally, it could be argued that the age-sex structure of the area reflects imbalance especially concerning the high dependency. This can have magnifying effects on the vulnerability of such community to external risks, particularly, sudden risks such as coastal flooding.

High illiteracy rate was reported to be 38.7% in the area, which exceeds the illiteracy rate in Egypt (25.8%) (CAPMAS, 2017). Despite that the illiteracy rate was found to be a relatively higher among men than women, it was found that women have improved educational levels compared to men in the area (**Figure 2-9**).

Moreover, it was noted that 16.1% and 11.7% of total population above 10 years were found to be able to read and write or enrolled in elementary schools, respectively. This means that about 66.5% of the total population above 10 years are either illiterate or have limited educational levels, which, in turn, highlights the low educational levels in the area in general. Meanwhile, those enrolled in technical education represent about 29.4% of the total population above 10 years old. This may indicate to availability skilled technical labor force that could provide the base for small and medium projects or a labor base for newly-developed industrial zone in the area.

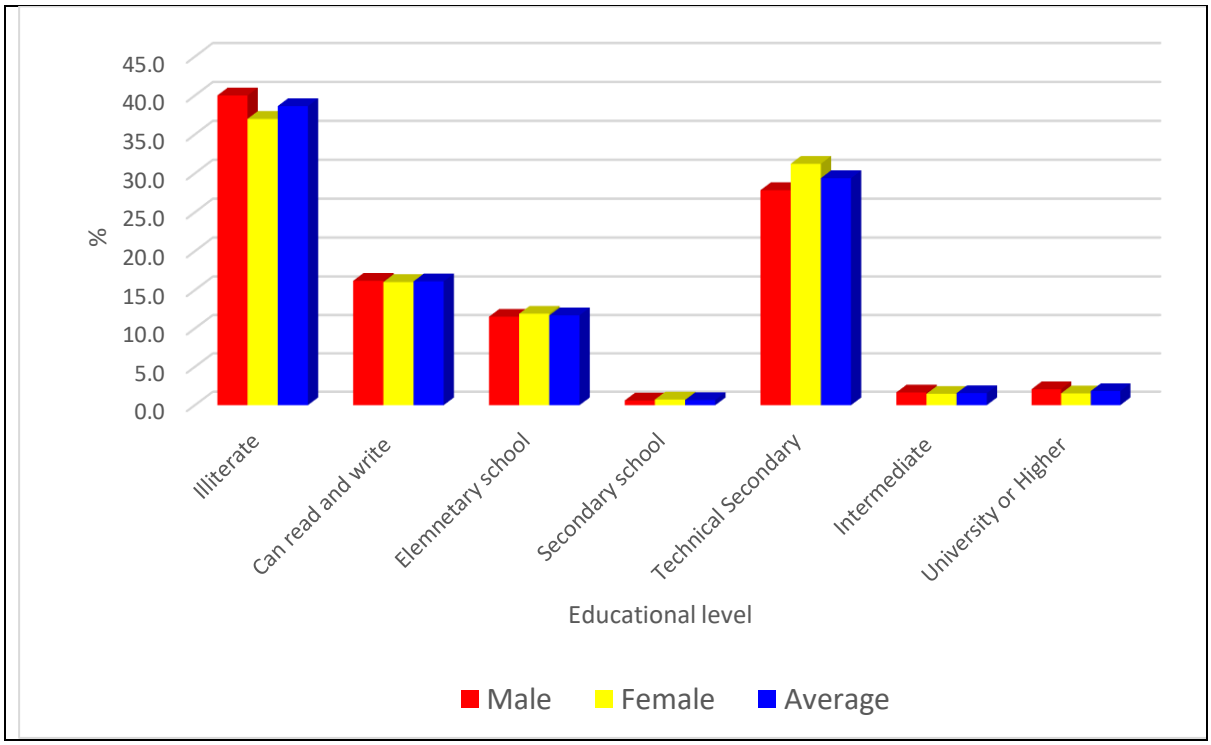


Figure 2-9: Educational levels in West New Ashtom El Gamil Outlet hotspot

Unemployment rate in the area is about 3.5% and unemployment rate was found to be slightly higher among men (4.4%) compared to women (2.7%) (CAPMAS, 2008). According

to the economic structure, 73.7% of the total labor force in the area works in services, transportation, construction...etc. This is followed by manufacturing activities that host about 16.6% of the total labor force at the governorate level. Meanwhile, primary economic activities employ only 9.7% of the total labor force (CAPMAS, 2017). Such economic structure may mean low level of sensitivity to coastal flooding risks.

Concerning access to basic services and infrastructure, it was found that 99.9% of total residential buildings in the area have access to electricity, 99.8% of the buildings have access to potable water. Meanwhile, 72.2% of the total buildings have access to sanitation (CAPMAS, 2017) (**Figure 2-10**).

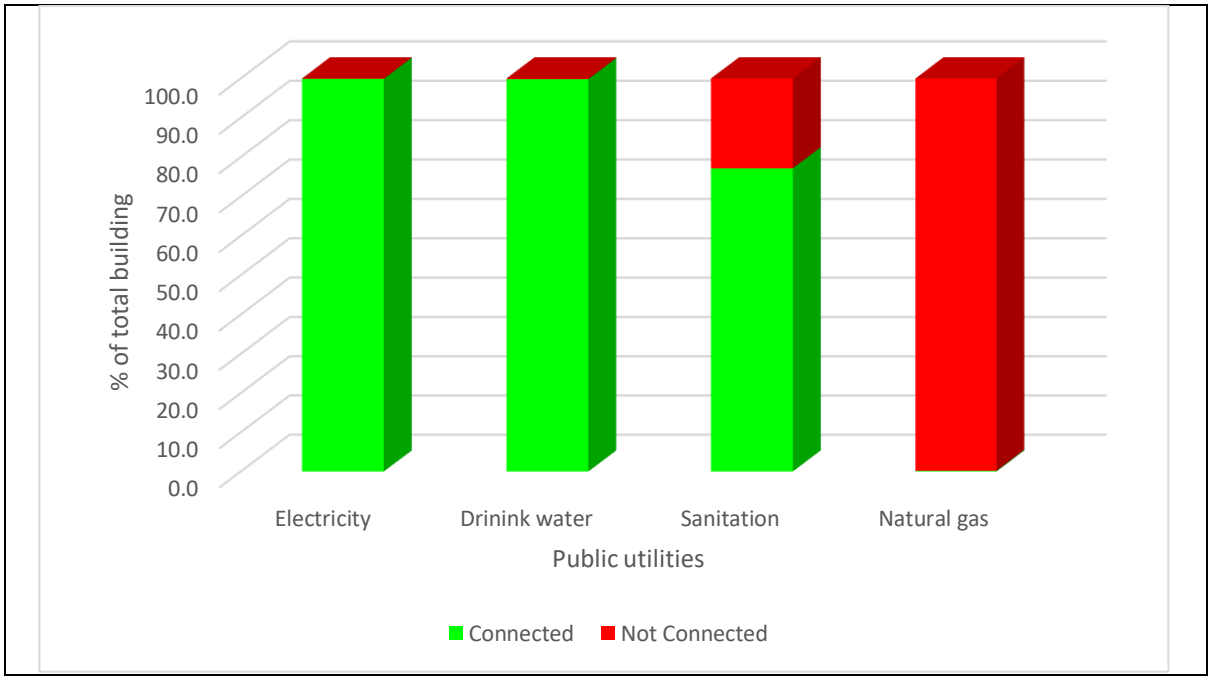


Figure 2-10: Access to basic services and public utilities in West New Ashtom El Gamil Outlet hotspot

According to the 2017 Population Census, 80.8% of population in Port Said governorate use mobile, while 48.6.% use computers and 51.1% have access to the internet. Generally, these proportions are relatively high compared to national averages and indicate improved levels of information technology usage in the area (CAPMAS, 2017). Again, this represents an opportunity for the utilization of high access mobile and the internet that could support the project proposed grievances mechanisms.

c) Land Cover/Land Use (LCLU) Pattern

The LCLU in the area is dominated by wetlands as Manzala lake occupies about 94.8% of the total area (**Figure 2-11**). The lake extends for about 35 km from northwest to southeast with an average width of 30 km. Similar to other Nile Delta northern lakes, Manzala lake is shallow, where the depth of water ranges between 70-150 cm. The lake is connected to the Mediterranean Sea in the area by two outlets: El-Gamil and Ashtom Al Gamil. The lake has a

variety of fish stock including marine and fresh water species (Rashad and Abdel-Azeem, 2010). The total fish production of the fisheries in Manzala lake was estimated to be 42305 ton in 2016 (CAPMAS, 2018).

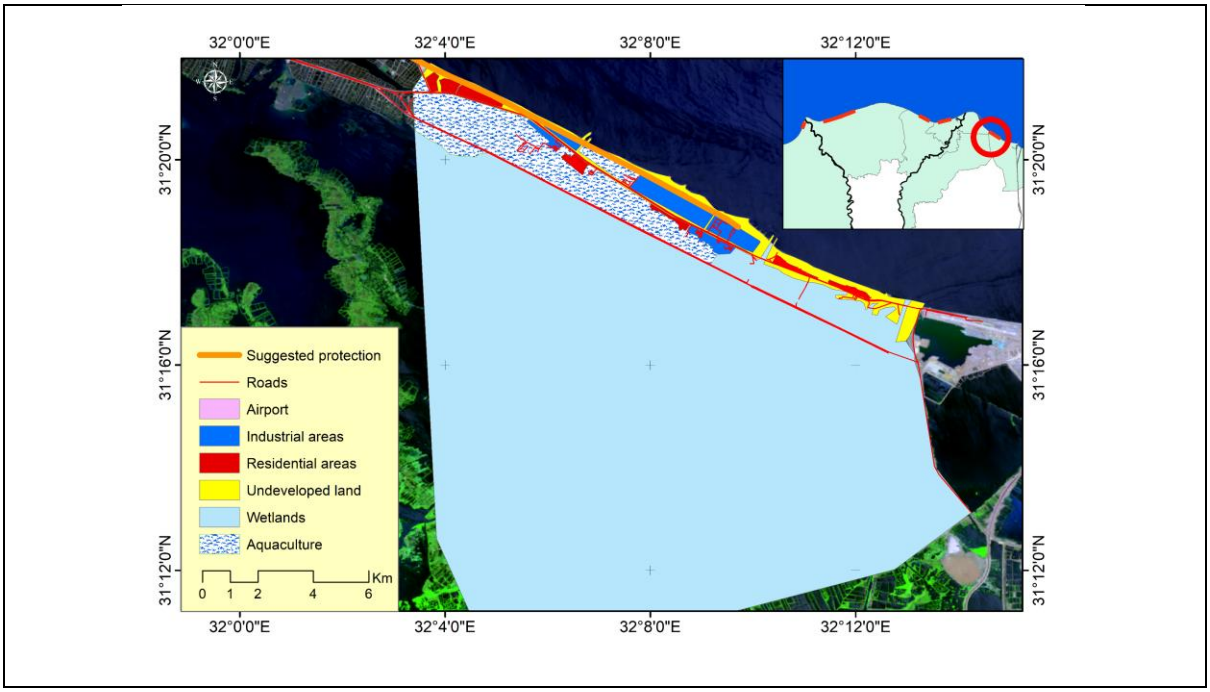


Figure 2-11: LCLU pattern in West New Ashtom El Gamil Outlet hotspot

Meanwhile, wide areas of the lake (more than 500 km^2) were used in aquaculture activities (GAFRD, 2014) that produced about 363497 ton in 2016 (CAPMAS, 2018), which represent about 26.8% of the total fish production of aquaculture in Egypt. In this respect, it is worth mentioning that 14.4 Km^2 of wetlands located in western parts of the area are used in aquaculture activities (**Table 2-2** and **Figure 2-12**). Existence of the two outlets can provide good access to the sea, which can mitigate potential adverse effects of the proposed protection on marine fishing activities.

Table 2-2: Areas of various types of LCLU in West New Ashtom El Gamil Outlet hotspot

LULC	Area Km2	%
Industrial areas	4.1	1.6
Residential areas	1.9	0.8
Total Built-up area	6.0	2.4
Wetlands	221.4	89.0
Aquaculture	14.4	5.8
Total Wetlands	235.8	94.8
Undeveloped Land	6.9	2.8
Overall area	248.7	100

The built-up areas that are located mainly in the coastal strip covers a total area of 6 km^2, which represent about 2.4% of the total area including touristic resort, petroleum industries in addition to three villages, namely El Diba, El Manasra and El Graba'a villages (**Figure 2-11**). Coastal resorts in the area are expected to be highly affected by the suggested protection measure as their access to the shoreline, which is their main local tourist attraction, will be reduced and/or restricted.

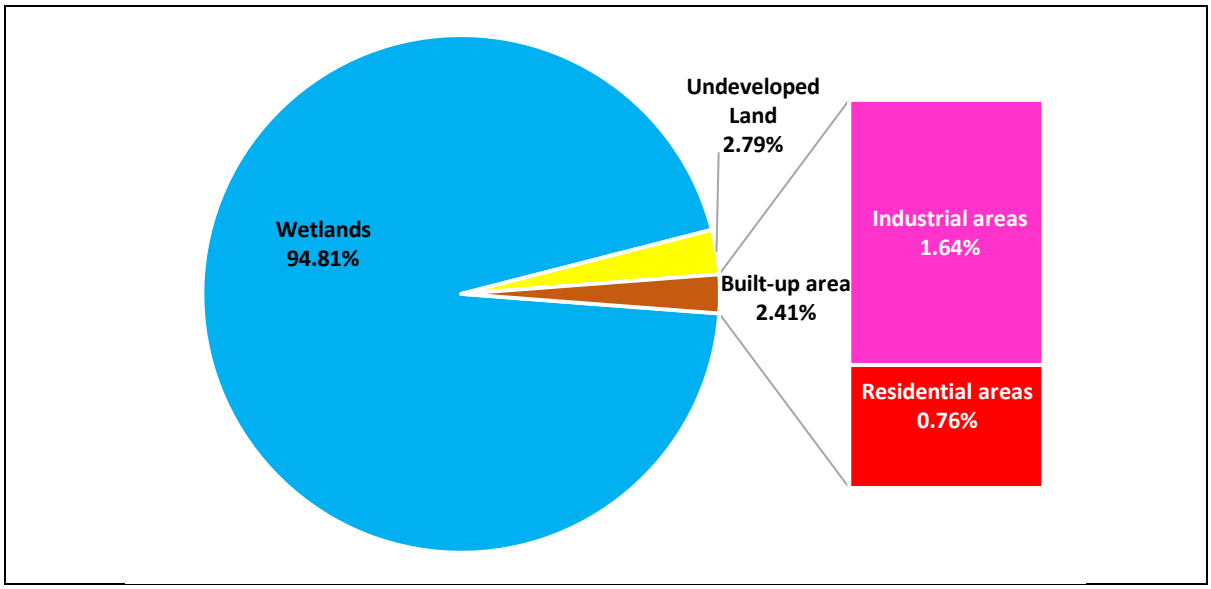


Figure 2-12: Relative distribution of various LCLU types in West New Ashtom El Gamil Outlet hotspot

2.2.3 West Rosetta Estuary Hotspot

a) Geophysical Setting

The hinterland of West Rosetta estuary hotspot extends from 30° 19` 34" to 30° 25` 35" E and from 31° 22` 35" to 31° 28` 07" N covering a total area of 54.5 km^2 with a shoreline extending for about 10 km. The area is generally low-lying land that has been experiencing the highest subsidence rate in the Nile Delta ranging between 0.7 to 3.4 mm/year (Stanley, 1997; Stanley and Warne, 1993). This makes the area one of the most vulnerable in the Nile Delta to SLR impacts, which expected to be about 21 and 24 cm under downscaled IPCC RCP 2.6 and RCP 8.5 scenarios by the year 2065, respectively. Meanwhile, such a sea level rise is expected to reach 31 and 36 cm by the year 2100 under the two scenarios, respectively (ARCA, 2018). Administratively, the area consists of two localities belonging to Behaira governorate namely; Rosetta town and Burg Rashid (**Figure 2-13**).

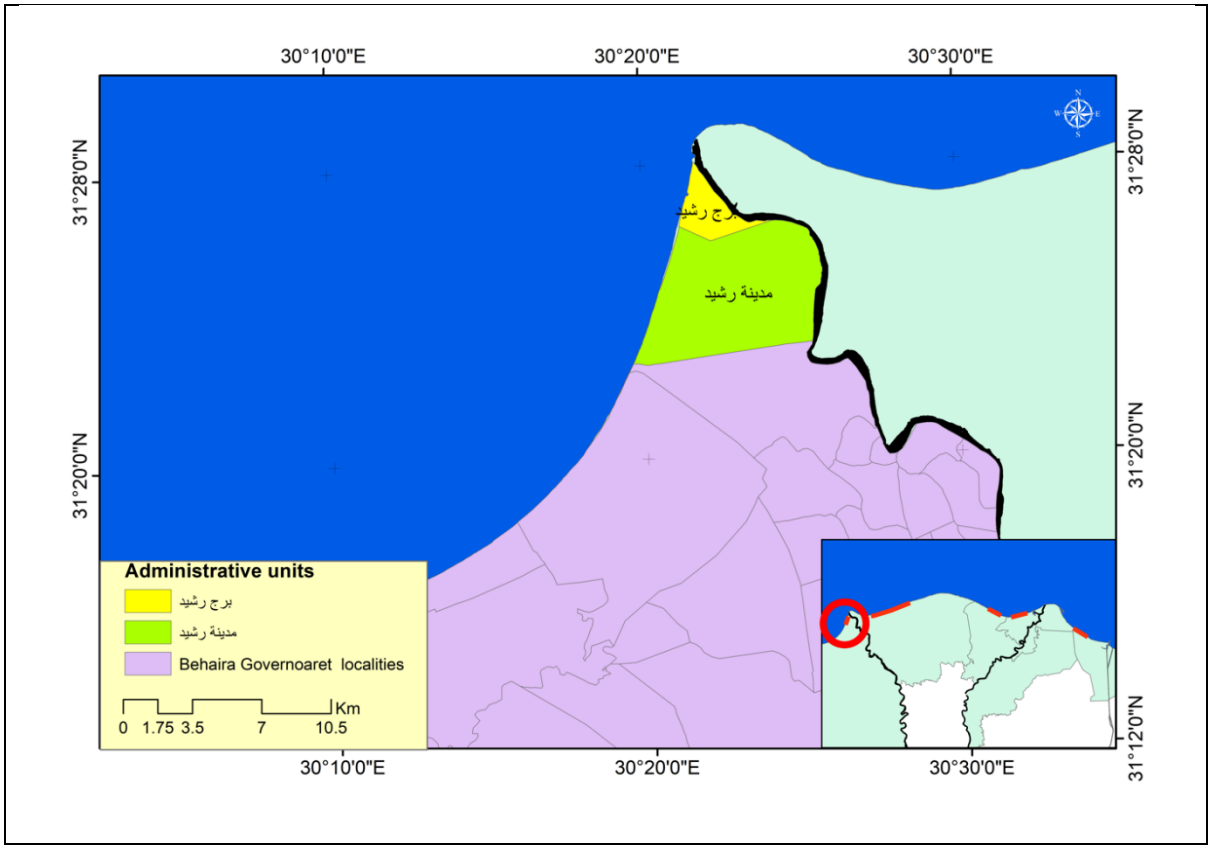


Figure 2-13: Administrative boundaries of Beheira governorate localities including Burg Rashid and Rosetta City study sites

b) Demographic Conditions

According to the 2017 Population Census, the two localities of west Rosetta estuary hotspot have a population of 126875 (CAPMAS, 2017). The population of the area rapidly increased during the period 2006-2017 as they increased from 89304 to 126875 with an annual increase rate of about 3.8% (CAPMAS, 2008; CAPMAS, 2017). Male/female ratio in the area recorded 104, which means 104 males to 100 females that is relatively lower the national one, which accounted for 106 (CAPMAS, 2017).

Age-sex structure of the area is characterized by the population (below 5 years old) representing about 15.1% of the total population, which is relatively smaller compared to the hotspots covered by this assessment. The population group (5-15 years old) represents about 20.3% of the total area population. While the group of population in the working age (15-64 years old) represents 60.7% of the total area population, the elder population group (more than 64 years old) represents about 3.9% of the total population of the area. This means demographic dependency ratio of 64.7%. Despite imbalanced age structure in the area, such imbalance is not as extreme as in the other hotspots, which may suggest a relatively more resilient community (**Figure 2-14**).

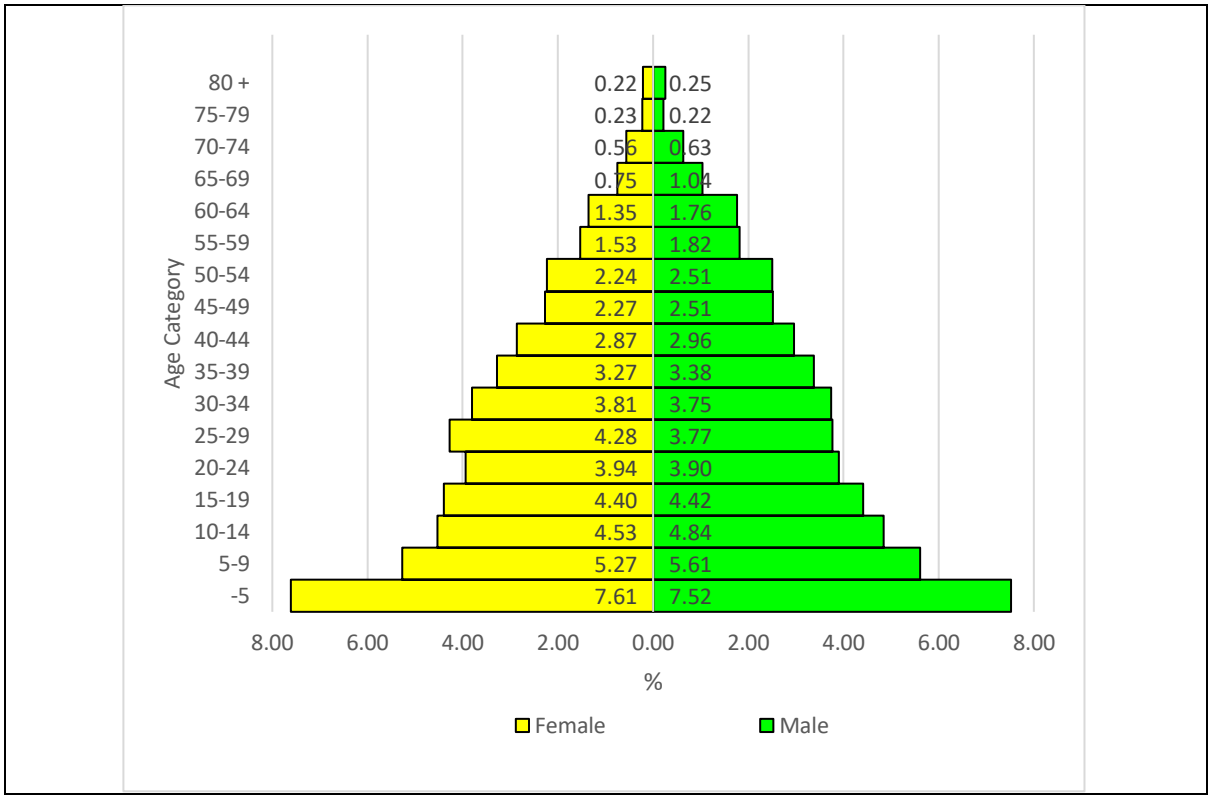


Figure 2-14: Age-sex population structure of West Rosetta Estuary hotspot

High illiteracy rate was reported to be 34.6% of population above 10 years old, which exceeds the illiteracy rate in Egypt (25.8%) (CAPMAS, 2017). Generally, there is no significant difference in educational levels between women and men in the area (**Figure 2-15**). It was recorded that 11.4% and 19.6% of total population above 10 years were found to be able to read and write or enrolled in elementary schools, respectively. This means that about 65.7% of the total population above 10 years are either illiterate or have limited educational levels, which, in turn, highlights the low educational levels in the area in general. Meanwhile, those enrolled in technical education schools represents about 18.6% of the total population above 10 years.

Unemployment rate in the area is about 4.6% with no considerable difference between women and men in the area (CAPMAS, 2008). According to the economic structure, 55.0% of the total labor force in Behaira governorate works in tertiary activities including services, transportation, construction...etc. This is followed by primary activities including agriculture and fishing that employ about 37.3% of the total labor force at governorate level. It was found that marine fishermen have access to the sea through Rosetta promontory, thus they are not expected to be highly affected by the suggested protection actions. Farmers are, meanwhile, expected to benefit from such actions as their cultivated land may be less exposed to coastal flooding. Manufacturing activities, localized mainly in Rosetta town, employ only 7.7% of the total labor force (CAPMAS, 2017).

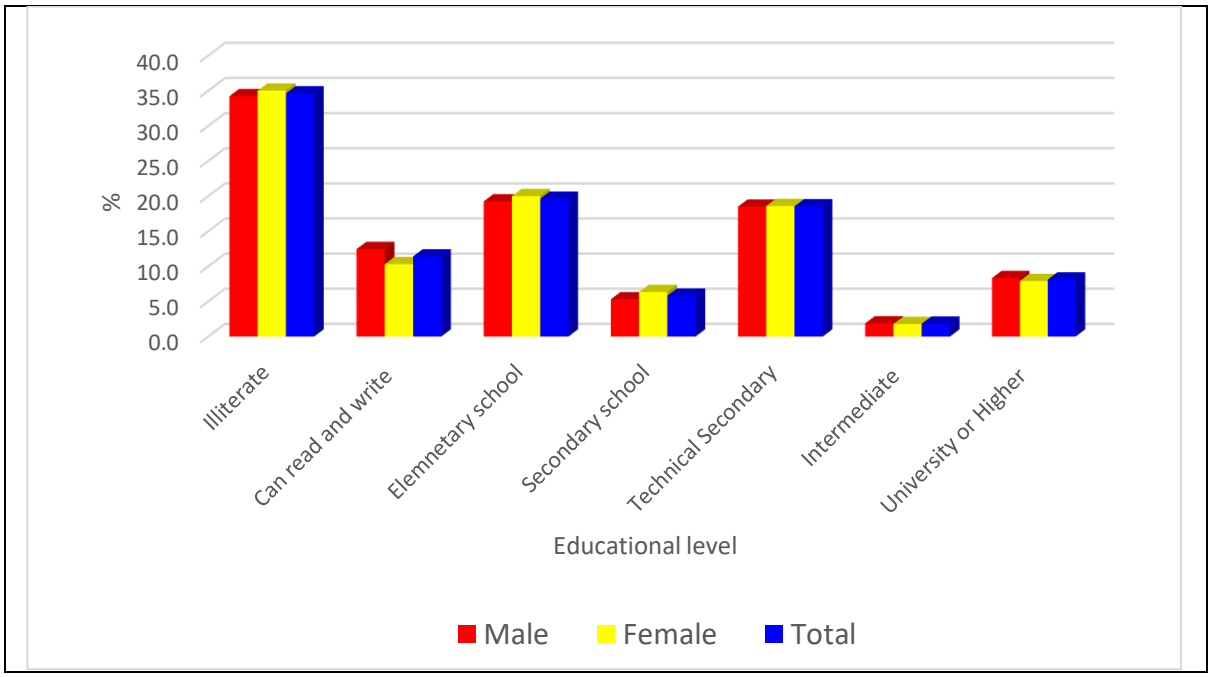


Figure 2-15: Educational levels in West Rosetta Estuary hotspot

Concerning access to basic services and infrastructure, it was found that 98.4% of the total residential buildings in the area have access to electricity, 97.3% of the buildings have access to potable water. Meanwhile, 68.1% of the total buildings have access to sanitation and 54.8% of the building in the area has access to natural gas services (CAPMAS, 2017) (***Figure 2-16***). This means that the basic infrastructure is sufficiently provided in the area reflecting relatively higher quality of life in the area.

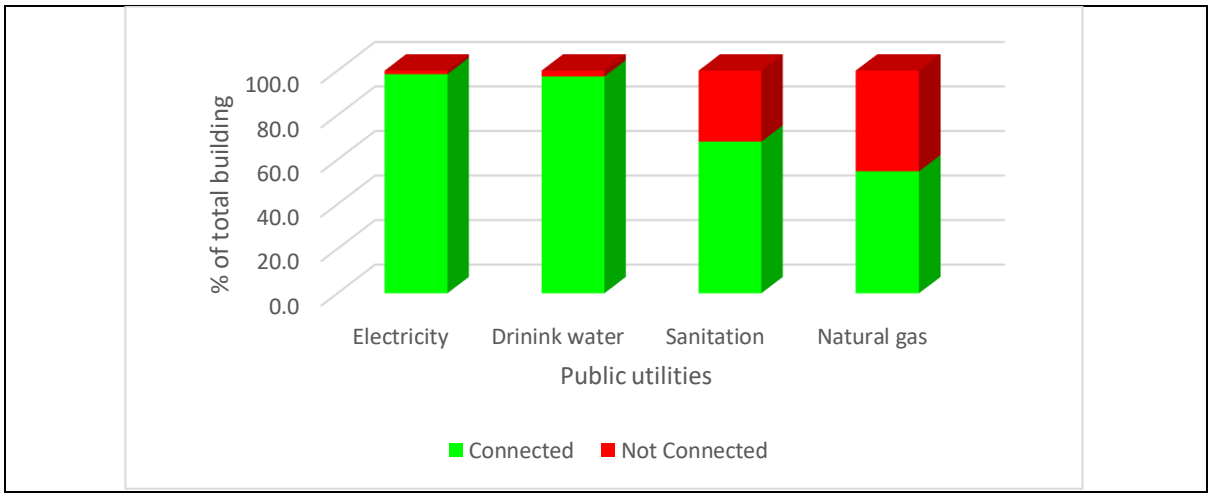


Figure 2-16: Access to basic services and public utilities in West Rosetta Estuary hotspot

According to the 2017 Population Census, 57.3% of population in Behaira governorate use mobiles, while 42.7% use computers and 18.6% have access to internet. Generally, the proportion of population using computers was found to relatively higher compared to national average, while mobile use and access to the internet are less than the national

average (CAPMAS, 2017). This may reduce the potential for the use of mobiles and the internet as means for the grievances system.

c) Land Cover/Land Use (LCLU) Pattern

The LCLU in the area is dominated by cultivated lands that represent about 54.4% of the total area (**Table 2-3** and **Figure 2-17**). This is followed by undeveloped lands occupying the western parts of the area alongside the Mediterranean coast (**Figure 2-18**). The development of these undeveloped lands should carefully consider potential adverse effects of coastal flooding and SLR. However, the protection actions suggested by the project may assist in reducing these impacts. Moreover, wetlands scattered in the western part of the area covering a total area of 3.2 km^2 that represent about 5.8% of the total area.

Table 2-3: Areas of various types of LCLU in West Rosetta Estuary hotspot

LCLU	Area Km^2	%
Infrastructure	0.3	0.5
Residential areas	4.6	8.5
Total Built-up area	4.9	8.9
Cultivated Land	29.6	54.4
Undeveloped Land	16.8	30.8
Wetlands	3.2	5.8
Overall area	54.5	100.0

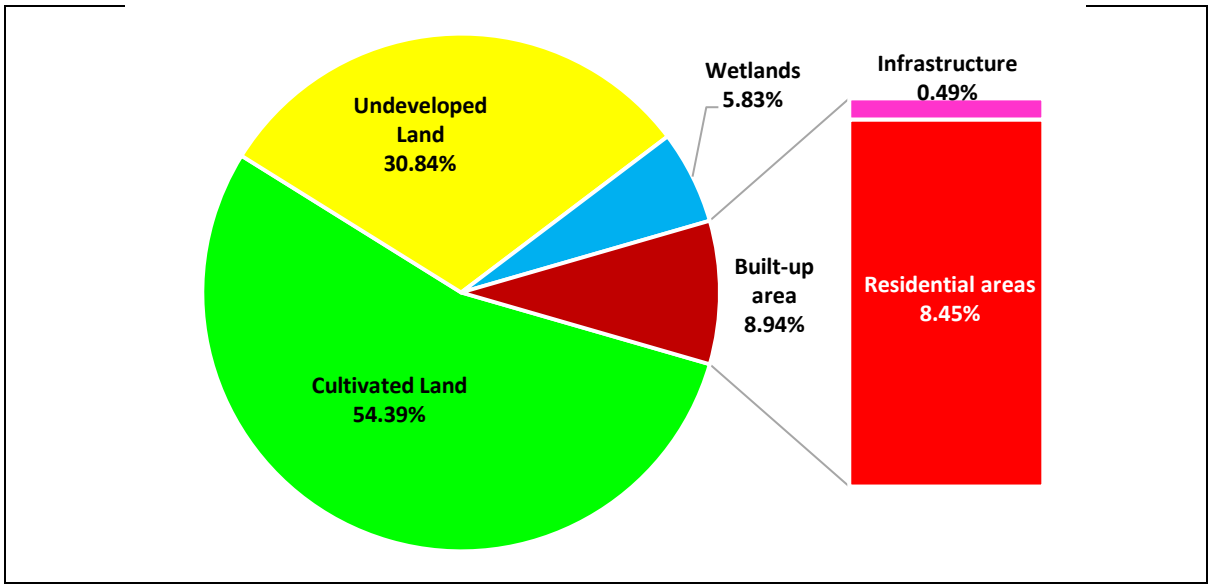


Figure 2-17: Relative distribution of various LCLU types in West Rosetta Estuary hotspot

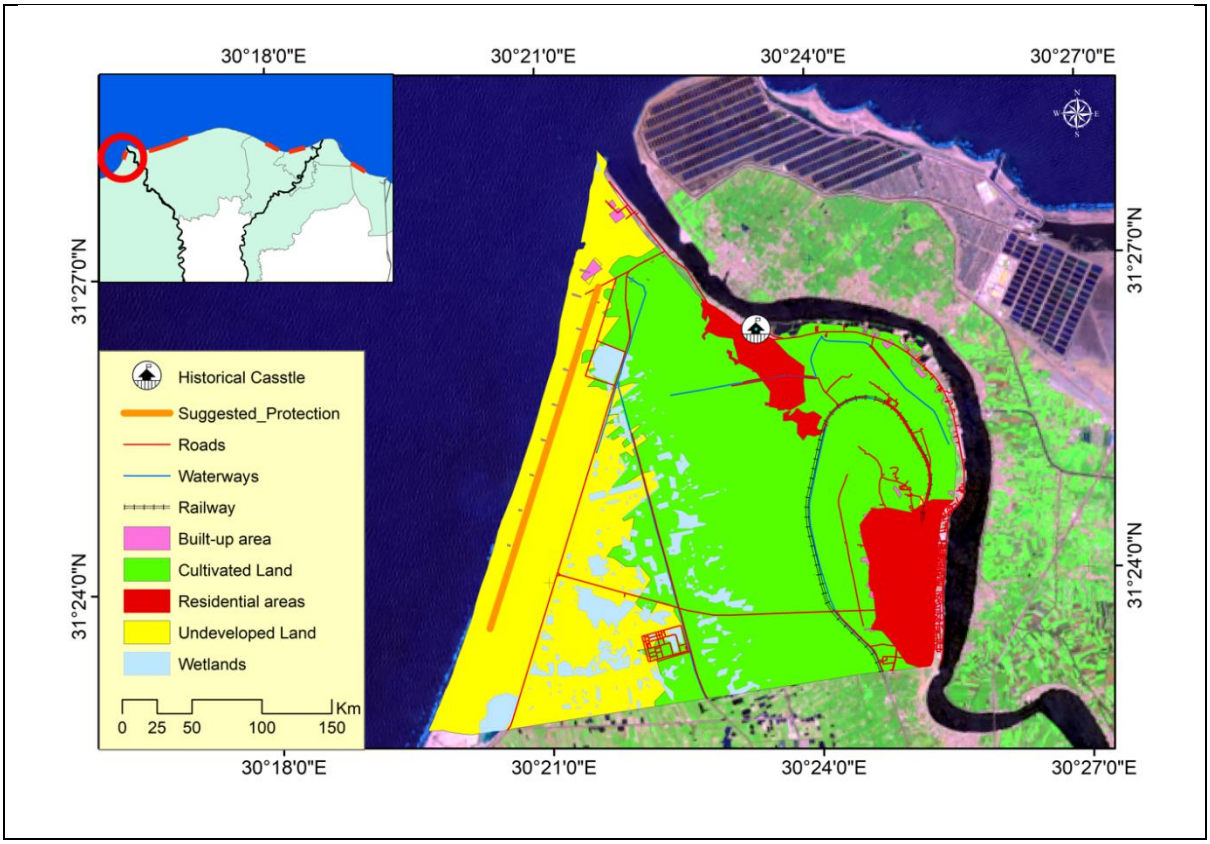
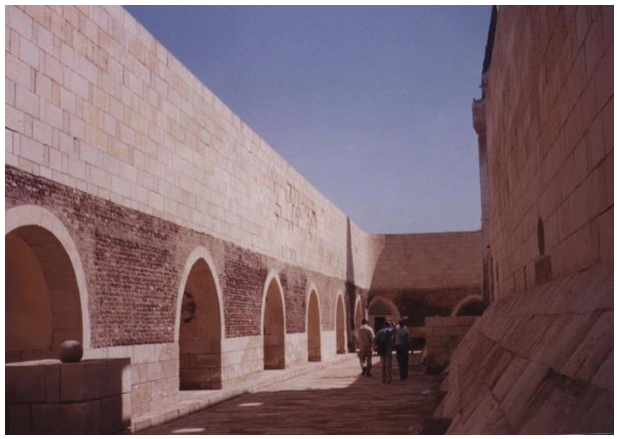


Figure 2-18: LCLU pattern in West Rosetta Estuary hotspot

Meanwhile, the built-up area that mainly consists of residential areas represent about 8.9% of the total area. In this respect, it is worth mentioning that Rosetta town has 38 monuments and historical sites that represent valuable cultural heritage. These sites include 22 historic houses some of which were built in the 18th century, 14 mosques some of which built in the 14th century, one castle built in 15th century (**Figure 2-19**), and one mill built in 19th century. These historical sites are generally suffering from deteriorating conditions (**Figure 2-20**). However, as they are located within the vicinity of Rosetta town, they are not expected to be affected whether, directly or indirectly, by coastal flooding or suggested protection actions.

One of the historical houses in Rosetta



Qaitbay Citadel (Built in 15th Century)

Figure 2-19: Historical sites in West Rosetta Estuary hotspot

The preservation of historical sites should be one of the top priorities as they represent valuable cultural heritage, which could be lost forever as a result of the haphazard development and higher levels of groundwater table accelerate the decay and destruction of these historical assets. As a result of such damage to historical sites, the already limited tourism activities may be adversely affected.

Figure 2-20: Deteriorating conditions of Historical sites

2.2.4 West of New Damietta City Hotspot

a) Geophysical Setting

The hinterland of West of New Damietta City hotspot extends from 31° 31` 30" to 31° 43` 49" E and from 31° 23` 45" to 31° 28` 12" N covering a total area of 83.5 km^2 with a shoreline extending for about 15 km. Land elevation in the area ranges between 0.1 m below Mean Sea Level (MSL) and 4.4 m above MSL (ARCA, 2017). The area has been experiencing a relatively moderate subsidence rate, compared to other sites in the Nile Delta coastal zone, ranging between 1.0 to 1.9 mm/year (Stanley, 1997; Stanley and Warne, 1993). According to downscaled scenarios of SLR, sea level is expected to rise, alongside the coastline of the area, about 23 and 26 cm under downscaled IPCC RCP 2.6 and RCP 8.5 scenarios by the year 2065, respectively. Meanwhile, such a sea level rise is expected to reach 32 and 37 cm by the year 2100 under the two scenarios, respectively (ARCA, 2018). Administratively, the area is subdivided into three administrative units of Damietta governorate: new Damietta city, Om El-Reda and El Rekabyia villages (**Figure 2-21**).

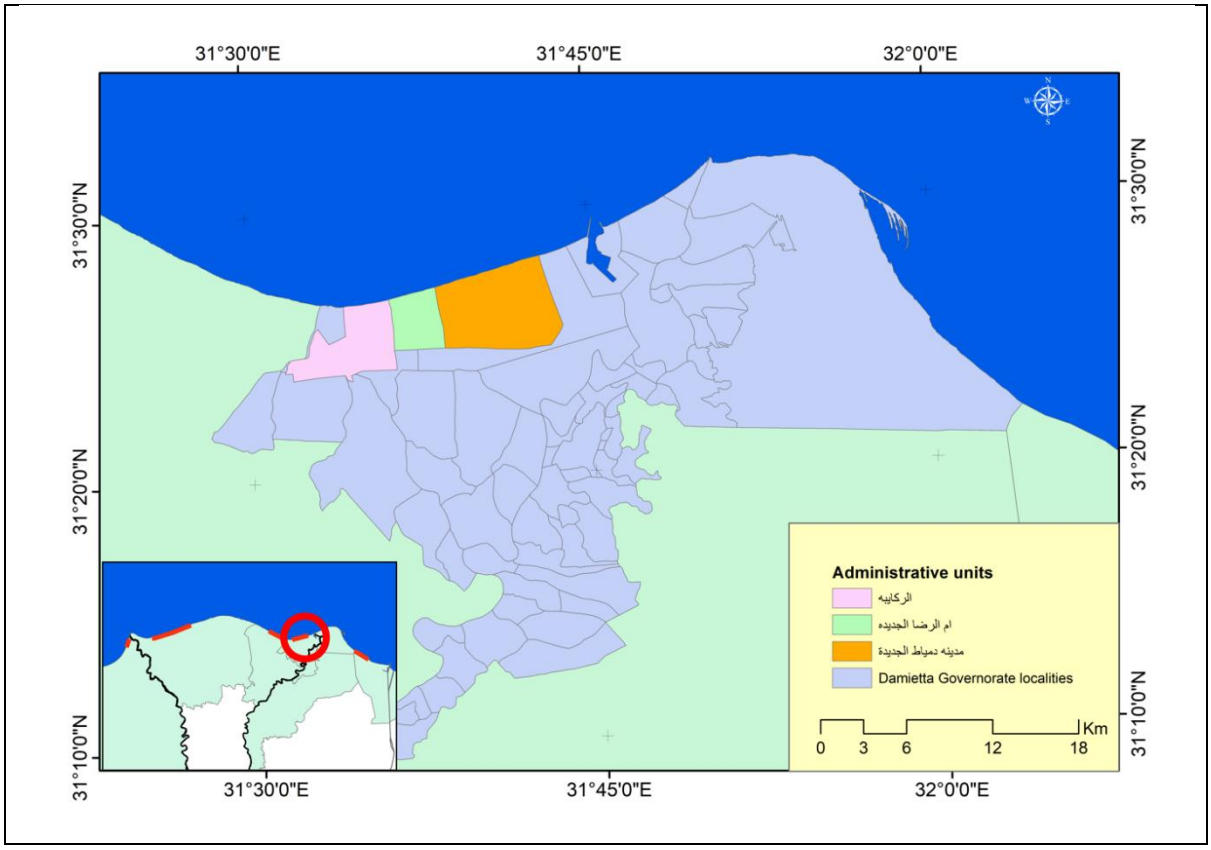


Figure 2-21: Administrative boundaries of Damietta governorate localities including new Damietta city, Om El-Reda and El Rekabyia villages study sites

b) Demographic Conditions

According to the 2017 Population Census, West of New Damietta City hotspot has a population size of 72552, of which 69.1% are urban population (CAPMAS, 2017). The population of the area rapidly increased during the period 2006-2017 as they increased from 43449 to 72552 with an annual increase rate of 6.1% (CAPMAS, 2008; CAPMAS, 2017). Male/female ratio in the area recorded 103, which means 103 males to 100 females that is relatively lower the national one, which accounted for 106 (CAPMAS, 2017).

Age-sex structure of the area is characterized by a relatively typical form as young population group (less than 15 years old) represents about 33.4% of the total area population. While the group of population in the working age (15-64 years old) represents 63.9% of the total area population, the elder population group (more than 64 years old) represents about 2.7% of the total population of the area. This means demographic dependency ratio of 56.6%, which relatively lower than prevailing ratios in other hotspots (**Figure 2-22**).

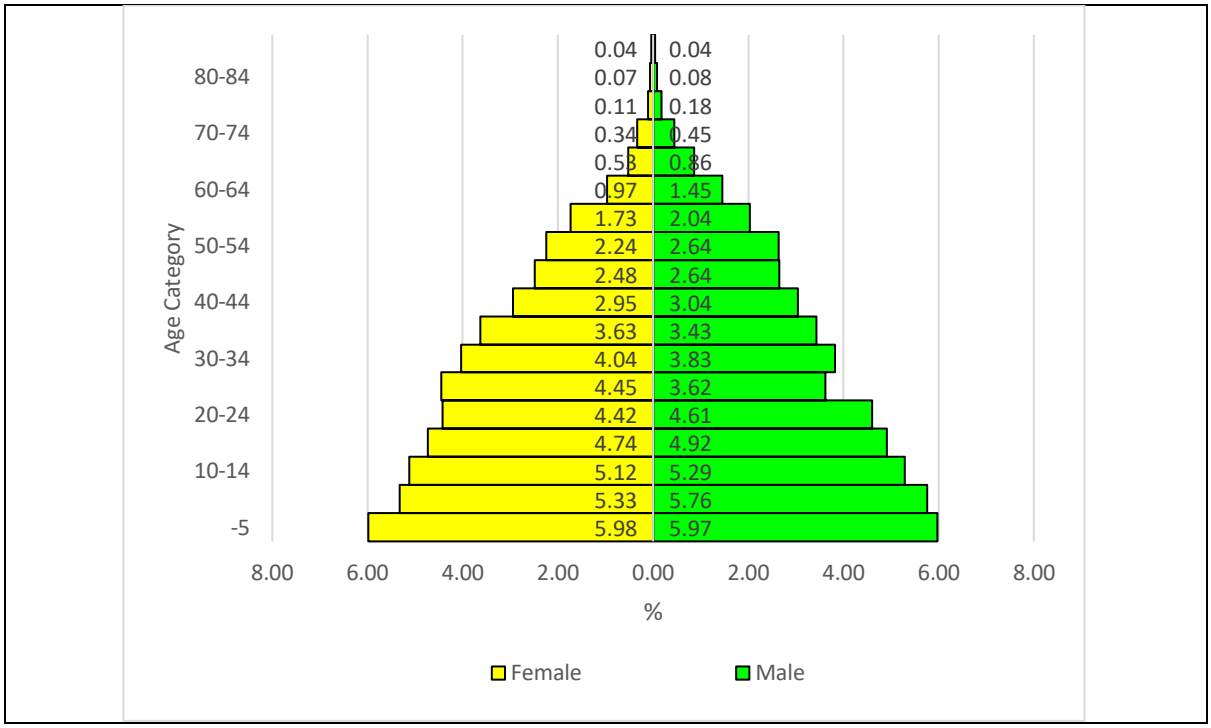


Figure 2-22: Age-sex population structure of West New Damietta City hotspot

The area is reported to have relatively improved educational levels, compared to other hotspots, this is emphasized by a low illiteracy rate (12.9%), which is half the national average (25.8%) (CAPMAS, 2017). Also, the proportion of university graduates is 26.6% of total population above 10. Generally, there is no significant difference in educational level between women and men in the area (**Figure 2-23**). The relatively high educational status of the population in the area could have positive impacts on awareness levels of the population in the area.

Unemployment rate in the area is about 4.6% and the unemployment rate was found to be relatively higher among women (5.7%) compared to men (3.4%) (CAPMAS, 2008). According to the economic structure, 59.7% of the total labor force on average in Damietta governorate works in tertiary activities including services, transportation, construction...etc., which is similar to that of the other hotspots. However, the proportion of labor force employed by manufacturing activities, at 28.1% of the total labor force, is significantly higher compared to the other hotspots. Meanwhile, primary activities, particularly agriculture, employ only 12.2% of the total labor force (CAPMAS, 2017).

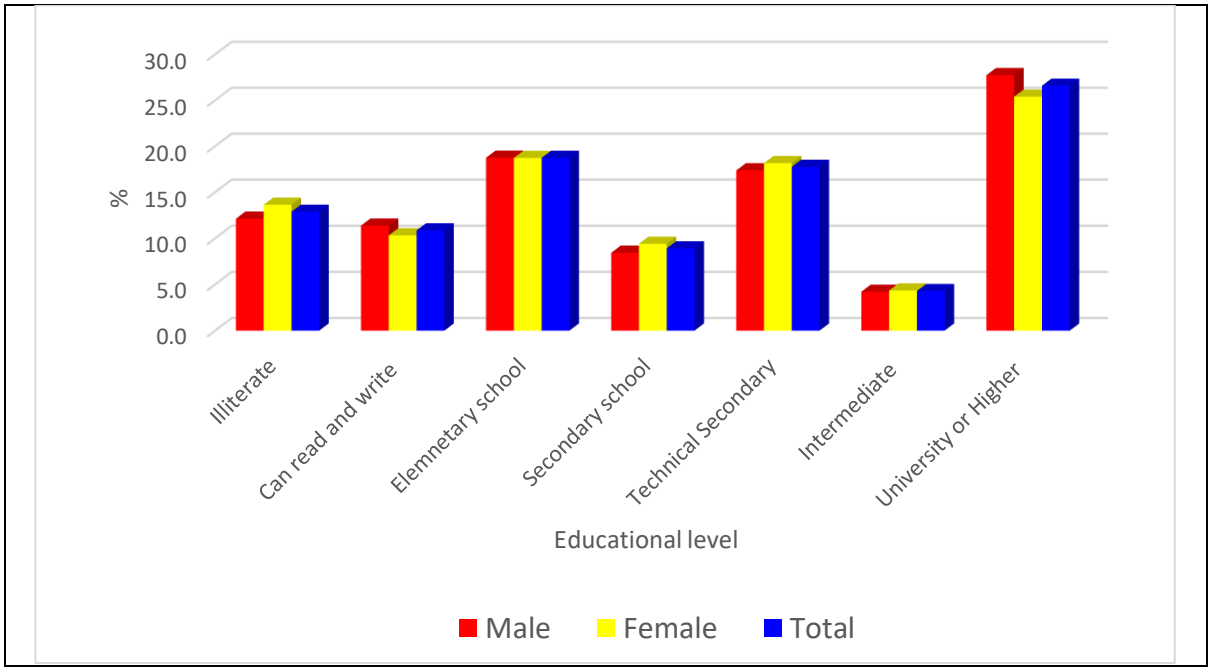


Figure 2-23: Educational levels in West New Damietta City hotspot

Concerning access to basic services and infrastructure, it was found that 98.8% of the total residential buildings in the area have access to electricity, 98.7% of the buildings have access to potable water. Meanwhile, 68.6% of the total buildings have access to sanitation and 57.5% of the building in the area has access to natural gas services (CAPMAS, 2017) (**Figure 2-24**).

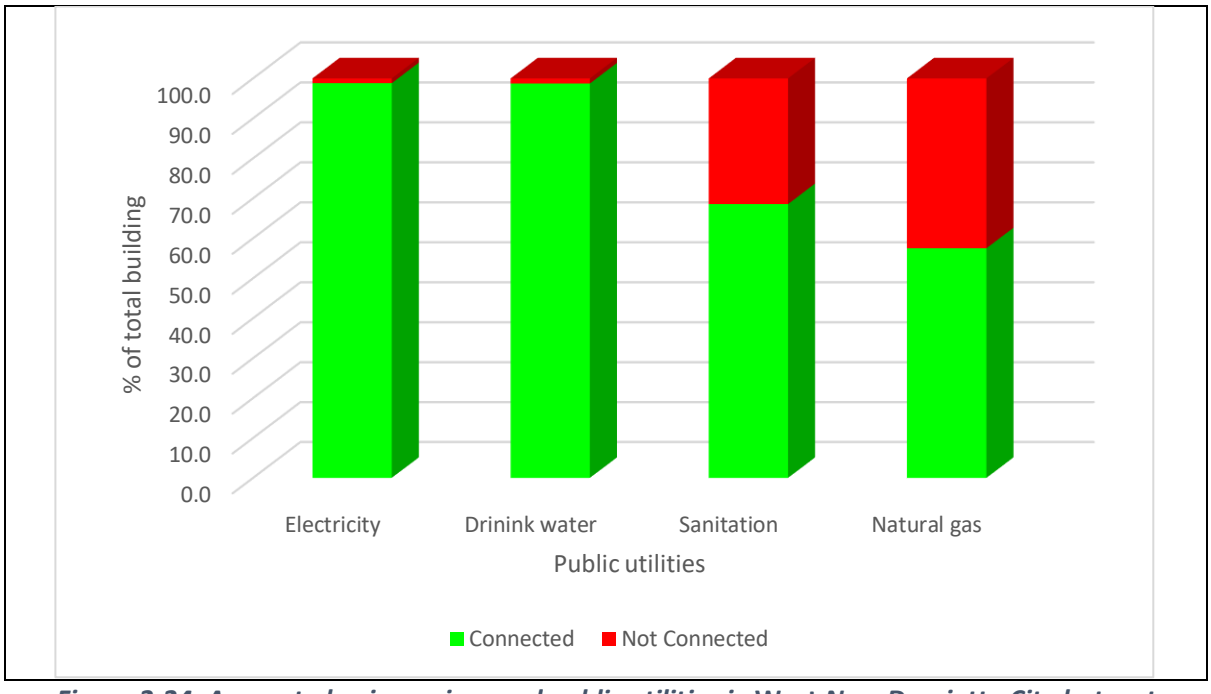


Figure 2-24: Access to basic services and public utilities in **West** *New Damietta City hotspot*

According to the 2017 population Census, 71.3% of rural population in Damietta governorate use mobiles, while 28.7% use computers and 38.6% have access to internet. Generally, these proportions of population who use information technologies were found to relatively high compared to national average (CAPMAS, 2017) and thus can support the grievances system to be developed by the project.

c) Land Cover/Land Use (LCLU) Pattern

The LCLU in the area is dominated by cultivated lands that represent about 47.4% of the total area (**Figure 2-25**). This is followed by Built-up areas that comprise residential areas, industrial zones and infrastructure such as West Damietta Power Plant that is located in the western part of the area with total investment costs US$ 231.5 million (EDEPCO, 2019) (**Table 2-4**). Moreover, undeveloped lands cover about 18.9 km^2 that represent about 22.7% of the total area (**Figure 2-26**). Again, these areas of undeveloped lands can be considered as a venue for possible development actions that could be proposed by the project.

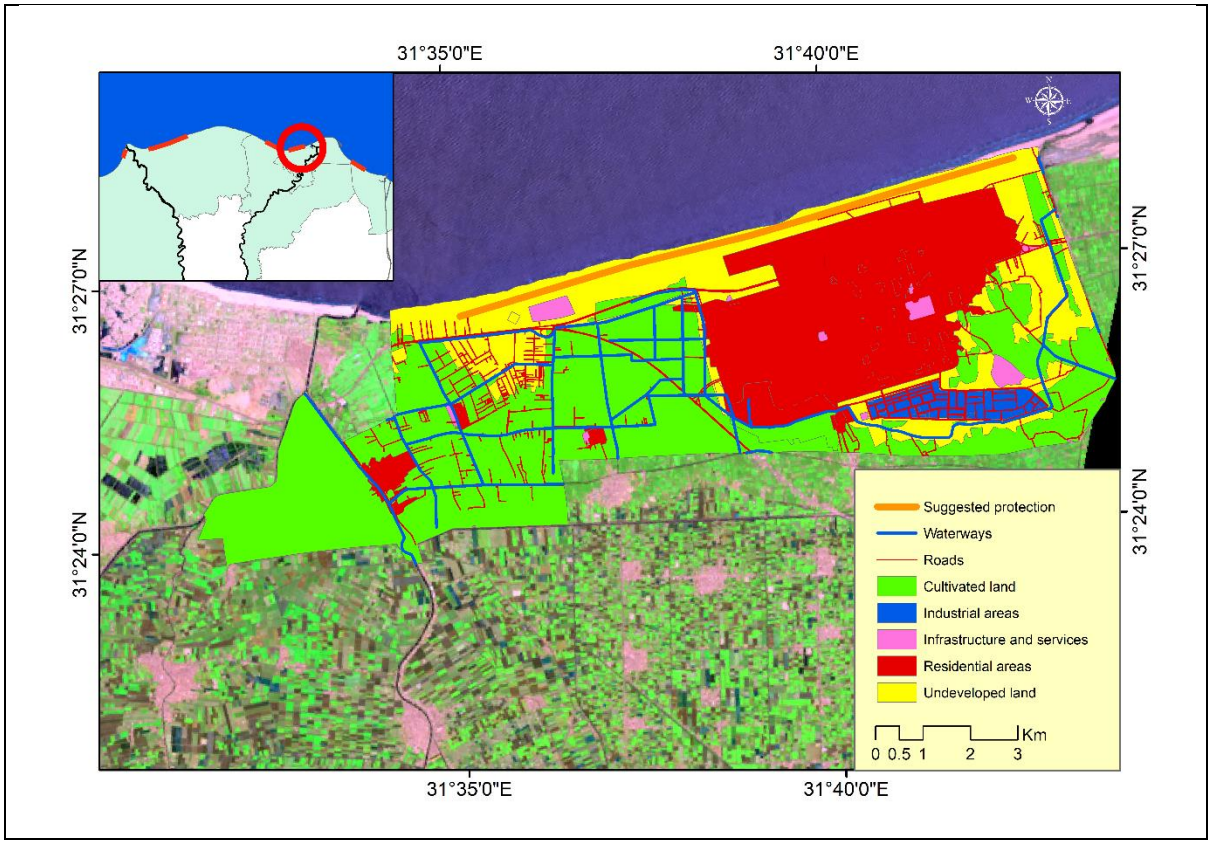


Figure 2-25: LCLU pattern in West New Damietta City hotspot

Table 2-4: Areas of various types of LCLU in West New Damietta City hotspot

LULC	Area Km2	%
Infrastructure and services	1.1	1.3
Industrial areas	2.0	2.4
Residential areas	21.9	26.2
Total Built-up area	25.0	30.0
Cultivated land	39.6	47.4
Undeveloped land	18.9	22.7
Overall area	83.5	100.0

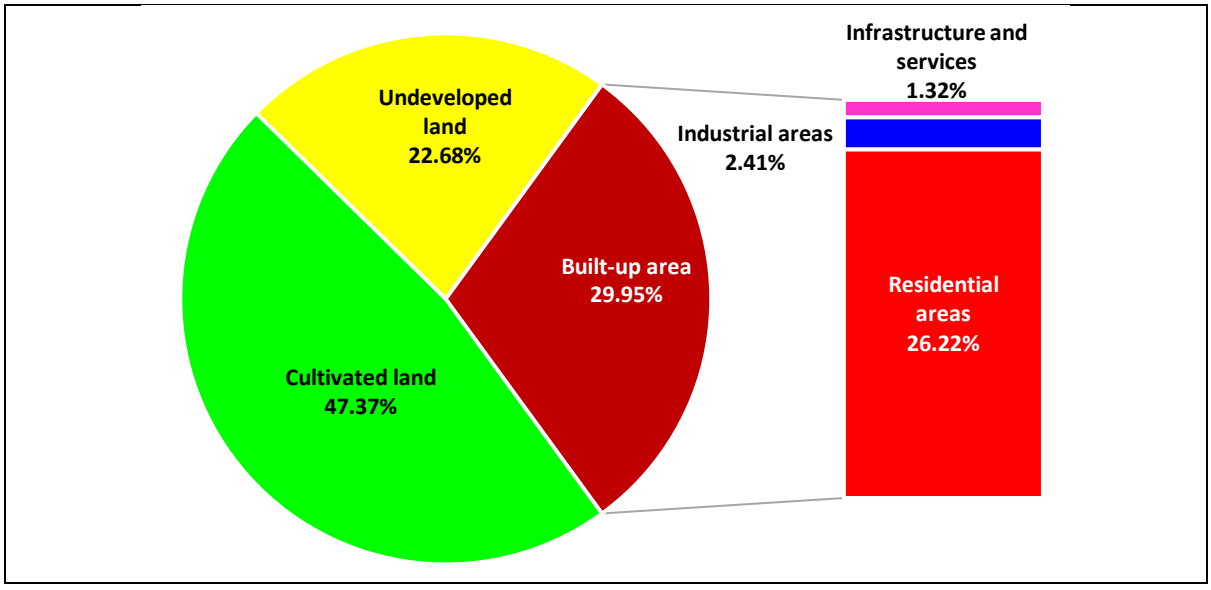


Figure 2-26: Relative distribution of various LCLU types in West New Damietta City hotspot

2.2.5 West of New Gamasa City Hotspot

a) Geophysical Setting

The hinterland of West of New Gamasa City hotspot extends from 31° 21` 50" to 31° 31` 13" E and from 31° 21` 59" to 31° 30` 23" N covering a total area of 143.6 km^2 with a shoreline extending for about 13 km. Land elevation in the area ranges between 0.1 m below Mean Sea Level (MSL) and 13 m above MSL (ARCA, 2017). The area has been experiencing a relatively low subsidence rate, compared to other sites in the Nile Delta coastal zone, ranging between 0.2 to 1.2 mm/year (Stanley, 1997; Stanley and Warne, 1993). According to downscaled scenarios of SLR, sea level is expected to rise, alongside the coastline of the area, by about 22 and 26 cm under downscaled IPCC RCP 2.6 and RCP 8.5 scenarios by the year 2065, respectively. Meanwhile, such a sea level rise is expected to reach 33 and 37 cm by the

year 2100 under the two scenarios, respectively (ARCA, 2018). Administratively, the area is one of the localities of Belkas District, Dakahlyia governorate (**Figure 2-27**).

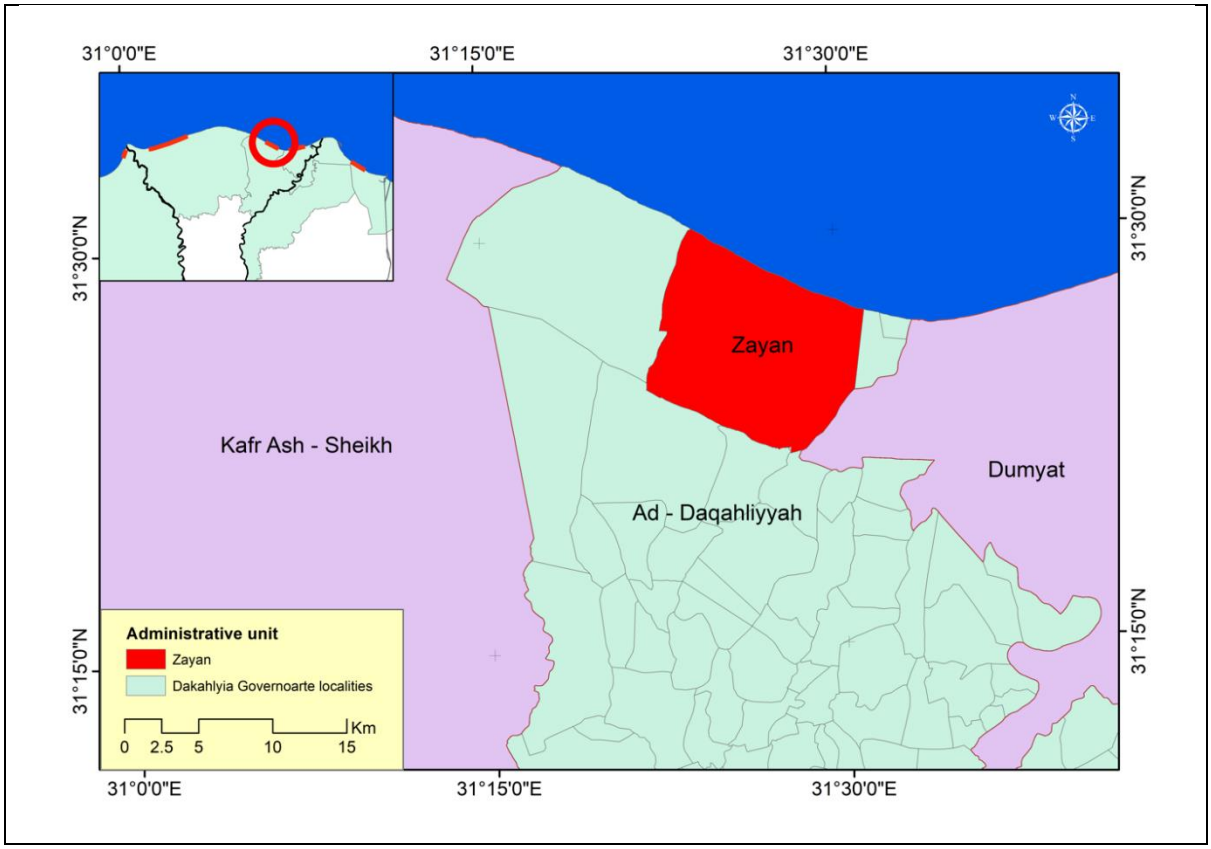


Figure 2-27: Administrative boundaries of Dakahlyia governorate localities including Zayan study site

b) Demographic Conditions

According to the 2017 population Census, West of New Gamasa City hotspot has a population of 14246 (CAPMAS, 2017). The population of the area rapidly increased during the period 2006-2017 as they increased from 8846 to 14246 with an annual increase rate of 5.5% (CAPMAS, 2008; CAPMAS, 2017).

Age-sex structure of the area represents a typical developing countries case with a young population group (less than 15 years old) accounting for 33.4% of the total area population. While the group of population in the working age (15-64 years old) represents 63.9% of the total area population, the elder population group (more than 64 years old) represents about 2.7% of the total population of the area, which means demographic dependency ratio of 56.6% (**Figure 2-28**).

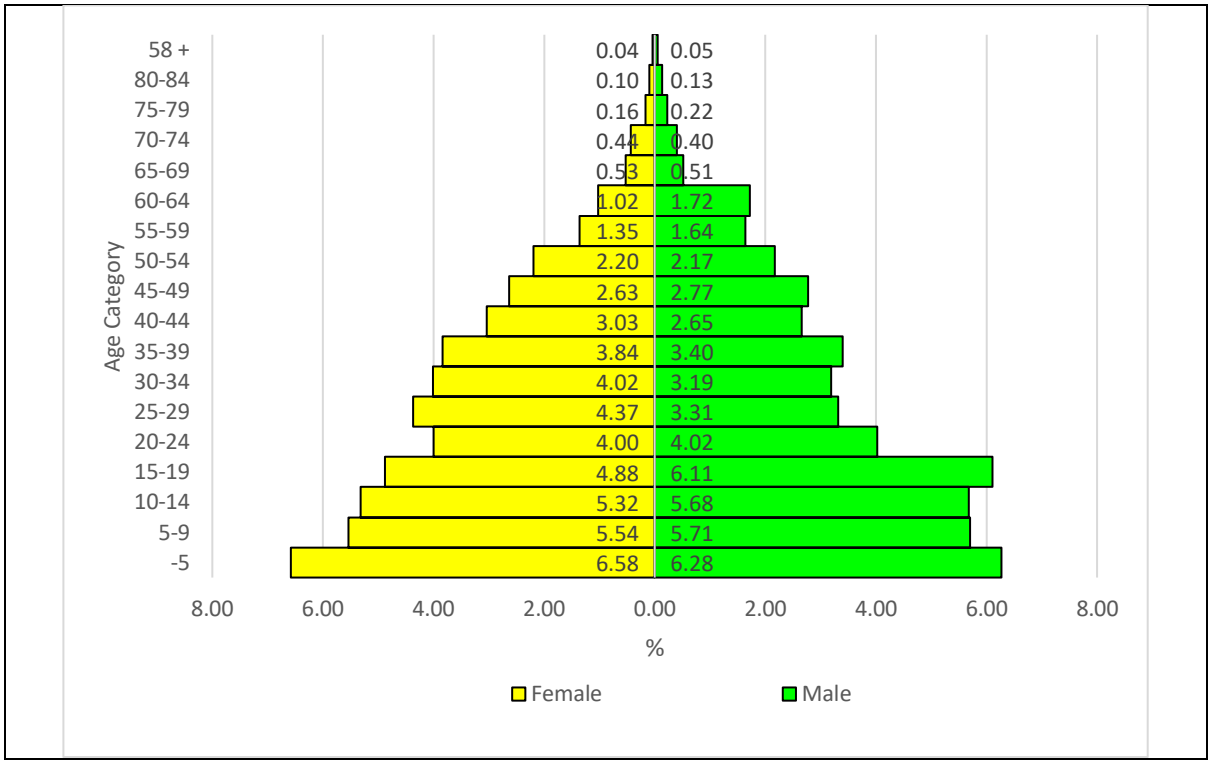


Figure 2-28: Age-sex population structure in West of New Gamasa City hotspot

It was found that 54.5% of the total population above 10 are illiterate, meanwhile, 9.7% are able to read and write. This means that 64.2% of the total population are either illiterate or have limited educational level. This refers to low educational level of the area population. This is highlighted by the very limited proportions of university graduates (2.2%) (CAPMAS, 2017) (**Figure 2-29**). Low educational status in the area may reflect limited awareness and thus need for more efforts by the project team to engage and consult with the local population and simpler messages to be conveyed and more traditional means of communication to be used.

Unemployment rate in the area is about 3.3% and the unemployment rate was found to be higher among men (5.2%) compared to women (1.5%) (CAPMAS, 2008). According to the economic structure, 67% of the total labor force in Dakahlyia governorate works in tertiary activities including services, transportation, construction...etc. This is followed by Primary activities mainly agriculture and fishing activities that host about 22.6% of the total labor force in the governorate. Meanwhile, manufacturing activities host only 10.4% of the total labor force (CAPMAS, 2017).

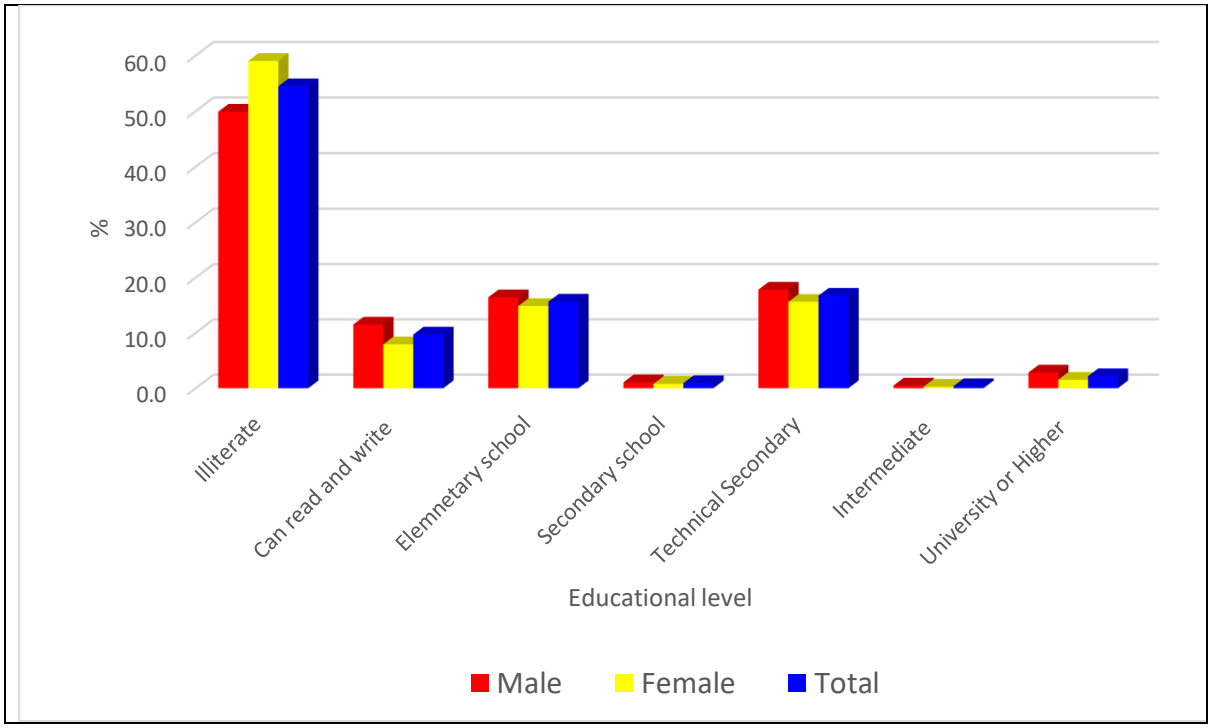


Figure 2-29: Educational levels in West of New Gamasa City hotspot

Concerning access to basic services and infrastructure, it was found that 94.1% of the total residential buildings in the area have access to electricity, 81.7% of the buildings have access to potable water. Meanwhile, only 16.4% of the total buildings have access to sanitation and no natural gas services are provided in the area (CAPMAS, 2017) (***Figure 2-30***). Limited access to sanitation in the area could exaggerate impacts of coastal flooding and sea level rise.

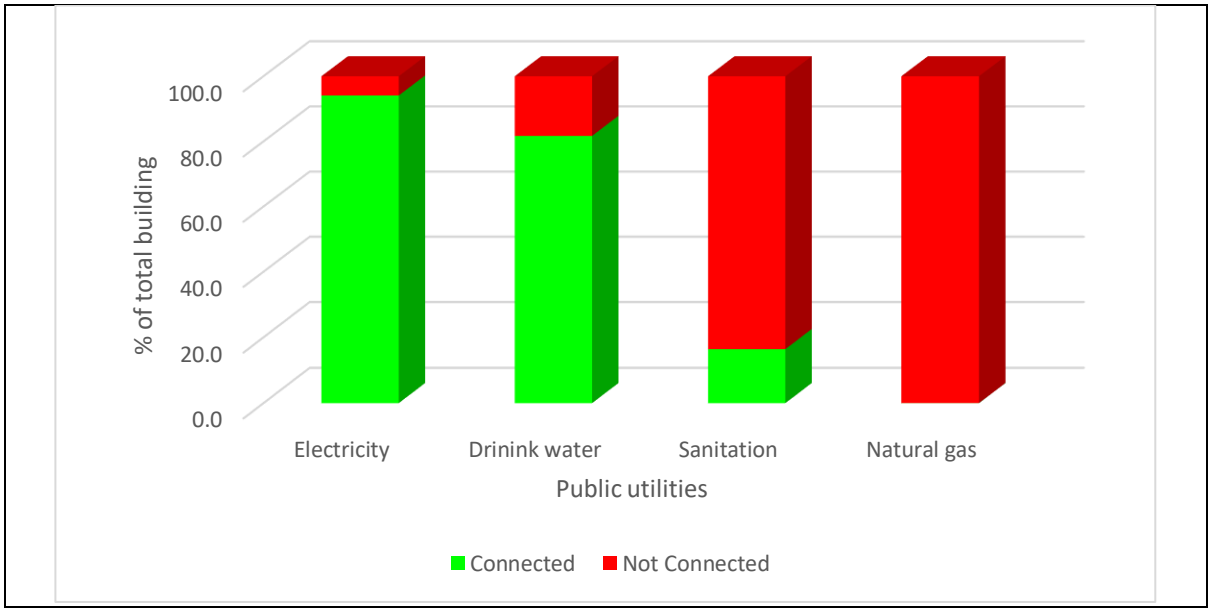


Figure 2-30: Access to basic services and public utilities in West of New Gamasa City hotspot

According to 2017 Population Census, 65.9% of rural population in Dakahlyia governorate use mobile, while 34.1.7% use computers and 30.6% have access to internet. Generally, these proportions of population who use information technologies were found to relatively high compared to national average (CAPMAS, 2017).

c) Land Cover/Land Use (LCLU) Pattern

The LCLU in the area is dominated by cultivated lands that represent about 62.8% of the total area (Figure **2-31**). Also, about 18.5 Km^2 are wetlands representing about 12.9% of the total area. The Built-up areas cover about 7.4% of the total area including residential areas, infrastructure and industrial zones in addition to New Mansoura city in the western part of the area (Table **2-5**). The city is one of The New Urban Communities Authority projects, which was commenced in 2017, up till now a large number of residential units have been constructed and booked. The New Mansoura City is planned to stretch 14 km along the coastal road, extending from Gamasa city all the way to the borders of Kafr El-Sheikh Governorate. According to its master plan, the city will cover an area of 4,000 acres with an investment valued at over L. E. 60 billion. The city is intended to host over a million and a half residents. The first phase of the city will be 40% of the total are (25,000 residential unit). The city will have different housing types: tourism residences, villas, middle-income housing, and social housing (Property Finder, 2019). Moreover, undeveloped lands cover about 24.2 km^2 that represent about 16.9% of the total area (Figure **2-32**).

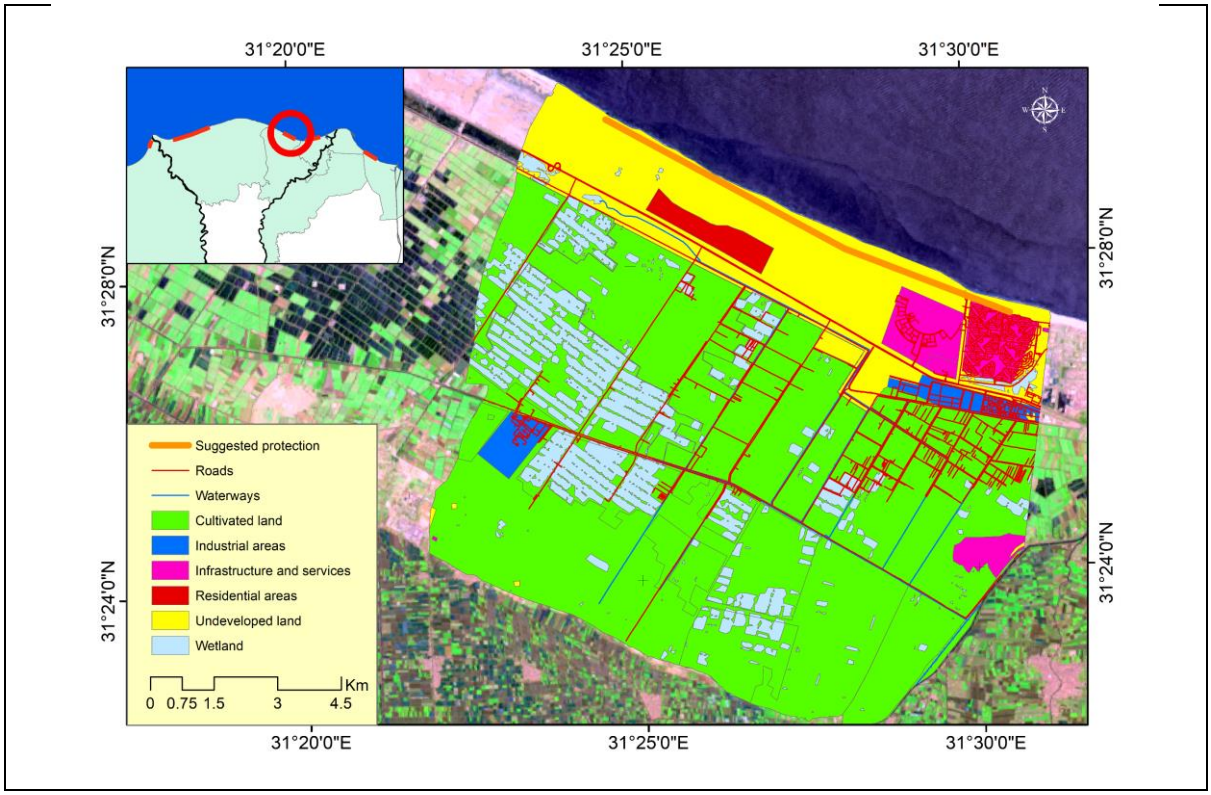


Figure 2-31: LCLU pattern in West of New Gamasa City hotspot

Table 2-5: Areas of various types of LCLU in West of New Gamasa City hotspot

LULC	Area Km^2	%
Infrastructure and services	6.1	4.3
Industrial areas	2.9	2.0
Residential areas	1.7	1.2
Total Built-up area	10.7	7.5
Cultivated land	90.2	62.8
Undeveloped land	24.2	16.9
Wetland	18.5	12.9
Overall area	143.6	100

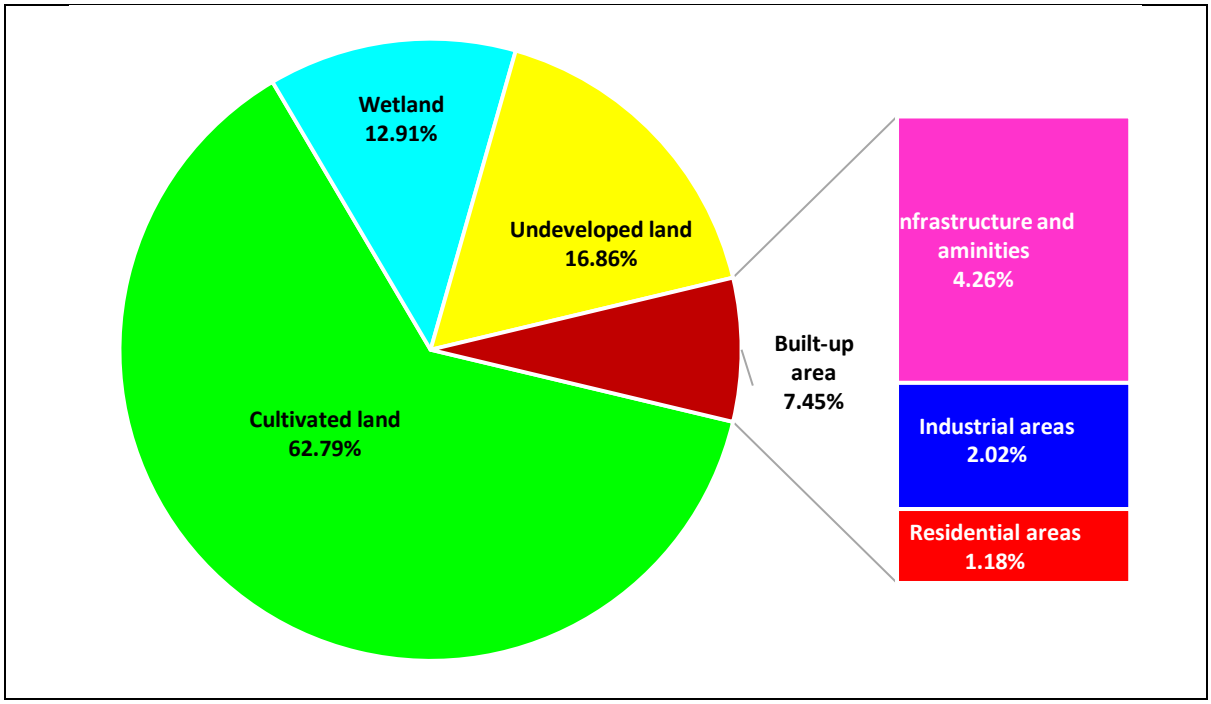


Figure 2-32: Relative distribution of various LCLU types in West of New Gamasa City hotspot

2.3 Comparative Analysis

2.3.1 Similarities and Differences

Upon the Above-mentioned discussion various hotspots have some similarities including, for example:

- Despite some hotspots contain urban and rural communities, it was found that there are no significant differences in terms of their prevailing socioeconomic conditions and thus they will be treated as homogeneous units.
- There is a variety of stakeholder and target groups in each hotspot, which implies the need for involving them in the consultation when planning for community development guidelines.
- Areas of undeveloped land existing in each hotspot should carefully be developed considering future risks associated with coastal flooding and sea level rise. Such areas could as well represent an opportunity whenever the need arises for land for siting possible development actions.
- There is a pool of potentially skilled technical labor force that provide the base for possible small and medium size (SMEs) projects associated with community development plans.
- The communities of different hotspots have a relatively similar age structure that is characterized generally by high percentages of young population (less than 15 years old). This, means there would be a need for providing more services and infrastructure to serve this age group. Accordingly, providing services targeting this age group will be an essential part of any development plans for these hotspots.

The five hotspots having different socioeconomic context, suggest that there should non-uniform methodology and/or approach for field work in different hotspots. Such differences may be highlighted by:

- Hotspots showed different levels of sensitivity and thus physical vulnerability to coastal flooding risks due to their varied geographical as well as socioeconomic contexts. Therefore, the magnitude and spatial extent of coastal flooding impacts would be expected to vary among different hotspots.
- Each hotspot has a particular set of potential target groups that should be carefully identified and motivated to be engaged during the field work phase.
- Having the same target group in different hotspots doesn't mean adopting similar approaches in the field work as there is expected to have varied levels of vulnerability to coastal flooding impacts in different hotspots for the same groups.
- Different educational levels and usage of information technologies by hotspots population necessitate the need for different communication channels, messages' content and mechanisms for grievances of the project.

2.3.2 Main Target Groups

It is worth noting we should differentiate between stakeholders in general and the target groups. The former represents different parties that may have some influences on the development and later the implementation of the development actions. Meanwhile, the later consists of different groups that may be affected by the proposed actions and thus would be the focus of the impact assessment and priority settings for action in different hotspots.

Table 2-6: Preliminary list of potential target groups and stakeholder groups in each hotspot

Hotspot	Target groups								
	Farmers	Fishermen	Aquaculture operators and workers	Resort operators and guests	NGOs*				
West Burullus Outlet	✪	✪	✪		✪				
West New Ashtom El-Gamil Outlet		✪	✪	✪	✪				
West Rosetta Estuary	✪	✪			✪				
West of New Damietta City	✪				✪				
West of New Gamasa City	✪		✪	✪	✪				
Hotspot	**Stakeholder groups**								
	Local Government	Local residents	EEAA	Ministry of irrigation	Industrial communities	New Towns Authorities	GAFRD	Agriculture Directorates	Environment Directorates
West Burullus Outlet	✪	✪	✪	✪			✪	✪	✪
West New Ashtom El-Gamil Outlet	✪	✪	✪	✪	✪		✪	✪	✪
West Rosetta Estuary	✪	✪						✪	✪
West of New Damietta City	✪	✪			✪	✪		✪	✪
West of New Gamasa City	✪	✪			✪	✪		✪	✪

*This would depend on the presence of active NGO in Each hotspot

It should be noted that there is a variety of target groups in each hotspot, which implies the need for involving them in the consultation when planning for community development guidelines. Additionally, concerning the stakeholders, their involvement in the consultation process may differ depending their power and role in each hotspot.

Section (3):

Impact of Proposed Protection Works in the Selected Hotspots

3. Impact of Proposed Protection Works in the Selected Hotspots

3.1 Objectives

The main objective of this section is to identify and assess potential positive and/or negative impacts of proposed protection works in the five selected hotspots, which may be expected to affect directly and/or indirectly livelihood of local communities.

3.2 Methodology for Impacts Identification

Impact assessment of proposed protection work in the five hotspots was undertaken according a methodology of three main stages including:

- Characterizing proposed protection work: This step involves defining various models of proposed protection works based on Annex VI (b) of the project document.
- Developing an inventory (checklist) of potential impacts: This comprises listing various impacts that may result due to proposed protection work. the full inventory of various impacts was identified on the bases models of the proposed protection work and main findings of the first report on hotspot socioeconomic characterization.
- Screening impacts: This involves revising the preliminary list of impacts developed earlier. Such a revision was carried out in the shadow of the type of protection work model and local conditions of each hotspot. To get insight into the different models of the proposed protection work two field visits to West Burullus Outlet hotspot and West New Ashtom El Gamil Outlet hotspot were carried out on 17 and 18 December 2019, respectively. Other hotspot sites were also visited, yet briefly. As a result of this step, a final list of potential impacts was developed.

Moreover, a number of group meetings were organized with various key players, target groups and stakeholders in the five hotspots (**Table 3-1**). All group meetings in the five hotspots started by providing a brief on the project highlighting its objectives and main components as well as all potential impacts of coastal flooding and the suggested protection work. This is followed by a consultation of the participants on the following four aspects:

- The most likely impacts
- The economic structure
- The main livelihood issues and challenges
- Development needs

Table 3-1: List of group meetings undertaken in the five study sites

S	Site	Date	Participants	
			No.	Stakeholders, target groups
1	West Burullus outlet	28/01/2020	9	Fishermen, farmers and officials in Mastrwa village
		28/01/2020	8	Female members of local community in Mastrwa village
		28/01/2020	5	Fishermen and farmers in Mohamed Sharhsir village
2	West Rosetta estuary	29/01/2020	45	Fishermen, local residents and officials in Rosetta town and Burj Rasheed village
3	West New Gamasa city	03/02/2020	45	Farmers, local residents of Zayan village
4	West New Ashtom Al Gamil outlet	05/02/2020	7	Fishermen and local residents of EL Diba village and officials
5	West New Damietta city	11/02/2020	35	Officials and local residents of New Damietta city
6	Reference site	05/01/2020	22	Local residents of El Hanafy village as a reference case study

These group meetings provide detailed information that assisted in getting an insight into study sites and utilized later in conducting an in-depth assessment of the impacts of coastal flooding and suggested protection work.

Mastrwa village 28/01/2020

Zayan village 03/02/2020

Rosetta 29/01/2020

Port Said 05/02/2020

New Damietta 11/02/2020

Figure 3-1: Group meetings in different study sites

3.3 Proposed Protection Work

In order to reduce vulnerability of properties and community livelihood in the hinterland of five selected hotspots in the Nile Delta coastal area, a number of soft engineering protective works were introduced through A UNDP-GEF- SCCF Climate Change Adaptation in the Nile Delta Project. Generally, soft engineering protective works are most favorable compared to hard ones due to the limited damage and adverse impacts on the natural environment and ecosystems (Sapkota, 2017). The importance of soft engineering

protective works is emphasized in the case of those areas where the livelihood of the coastal communities is based upon natural environment and ecosystems.

The proposed protective works, which aim to sustain proper functioning of coastal ecosystems and their productivity, include four models. The four models were designed to comply with local conditions of various hotspots in terms of elevation of the low-lying areas to be protected, projected (Sea Level Rise) SLR, anticipated height of storm surge above mean high tide during extreme events, geomorphological characteristics of the hotspot and nearby bathymetry, etc. Such an approach can ensure minimum negative impacts of the proposed protection works on the community livelihood of the five hotspots.

In the following section, brief description of the five types of proposed protection are presented in order to enable the identification of potential impacts of such protection.

a) **Model 1** is planned to be constructed in areas where adjacent land elevations are up to 1.5m above MSL. Model 1 design contains three different sub-designs, A, B, and C. Each of these designs are planned to use sand from site excavation activities as filling materials. No large stone face coverings are to be used in any of the Model 1 sub-designs. The sub-designs are distinguished by the quantities of filling materials being extracted from existing activities at Lake Burullus. It should be noted that sub-design A, in terms of the amount of filling materials, will require the least quantities of filling materials, while sub-design B requires the largest quantities. Additionally, all three sub-designs will require the use of geotextiles as a barrier between sand fill and the substratum.

b) **Model 2:** is planned to use filling materials to be extracted totally from the nearest lake and will be constructed in areas where adjacent land elevations are higher than 1.5m above MSL. This model is planned for areas in the front of beach cities and villages in order to minimize beach accessibility issues. Model 2 will be constructed for a length of about 10 km, using no excavation or de-watering activities involved in the works.

c) **Model 3** design will be constructed in areas where the adjacent land elevations are less than 1.0m above MSL, using sand from site excavation activities as filling materials as well as large dolomite stone (up to 100 kg stones) covering the slope on the seaside of the structure. It is worth mentioning that this model is the only one that involves the utilization of stone face covering. This model is planned for construction for about 6 km of Burullus as the shoreline is North-South oriented and thus dunes are not expected to naturally form compared to the other hotspots. Therefore, a more solid structure is needed for this specific location.

d) **Model 4** design is planned for construction in areas where the adjacent land elevations are higher than 1.5ms above MSL, for about 20 km. The design involves the construction of interlocking wooden fence that will serve to capture shifting sand in the coastal areas. Based on past experience, it takes about (1-2 years) for enough sand to accumulate within

the interlocking fence that it will resemble natural sand dune. By that time, the structure will be stabilized with local vegetative species to thwart future shifting of the sand.

There is a number of key activities (stages) associated with the establishment of the soft coastal protection including:

- Site preparation including clearing, grubbing, stripping, dewatering;
- Constructing location-specific coastal soft protection structures; and
- Implementing an operations and maintenance program for the installed soft protection structures.

Identifying potential impacts of the establishment of the soft coastal protection would involve considering these key activities (stages), some of these impacts are expected to be temporary (short-term), while others long-term.

3.4 Possible Impacts of Proposed Protection Work: A preliminary assessment

Coastal flooding usually occurs as a result of extreme tidal conditions caused by severe weather and subsequent inundation of low-lying land, which may lead to loss of property and sometimes loss of life. Coastal flooding can be classified according to the magnitude of their impacts into three levels of severity: minor, moderate and major floods. Minor floods imply occurrence of a slight amount of beach erosion with limited damage. Moderate floods involve occurrence of beach erosion with damage to property. Meanwhile, major floods cause serious threats to life and property, where large-scale beach erosion will occur, numerous infrastructure such as roads may be flooded, and many properties damaged. The severity of coastal flooding is determined by several factors, including the strength, size, speed, and direction of the storm. In this respect, it should be noted that the topography of onshore and offshore plays a crucial role in determining coastal floods severity (Maddox, 2014).

The five selected hotspots alongside the Nile delta coastal zones are highly exposed to coastal flooding, particularly in winter. These hotspots accommodate a wide range of assets, properties and economic activities that have varied levels of sensitivity, meaning diverse impacts magnitude and spatial extent and levels of vulnerability.

The main socioeconomic potential impacts of coastal flooding on the selected hotspots can be summarized as follows:

- Loss of property and assets and their market value (e.g. loss of cultivated land, housing units and economic activities units)
- Reduced accessibility due to road damage.
- Disturbance to ecosystems functionality due to saltwater incursion
- Decline in income for some groups (e.g. fishermen, farmers and investors) and thus the livelihood of local community can be adversely affected

Accordingly, the impacts of proposed protection work, in the five hotspots, can contribute directly to:

- Preserving property and assets as well as their market values.
- Ensuring higher accessibility.
- Conserving ecosystems
- Supporting livelihood of local communities.
- Creating opportunities for raising awareness about climate change and SLR risks.

Meanwhile, proposed protection work may have negative impacts including:

- Land acquisition for erection of proposed protection works.
- Reduced accessibility to the shoreline
- Interference with existing businesses (Table 3-2).

An attempt is made in the later section of this report to anticipate potential positive and/or negative impacts of current situation and those associated with the proposed protection work in each hotspot. It should be mentioned that the lists are developed based on the characterization of each site as well as observations made during the field visits carried out by the assignment team.

Table 3-2: Preliminary list of potential impacts

Coastal flooding	
- ve	**+ ve**
• Loss of property and assets • Reduced accessibility due to road damage. • Disturbance to ecosystems functionality due to saltwater incursion • Decline in income for some groups (e.g. fishermen) and thus the livelihood of local community can be adversely affected	-
Suggested protection work	
- ve	**+ ve**
• Land acquisition for erection proposed protection works • Reduced accessibility to the shoreline due to protection work • Interference with existing businesses	• Preserving property and assets • Securing accessibility • Conserving natural ecosystems • Supporting livelihood of local community • Raising awareness about SLR risks

3.4.1 West Burullus Outlet Hotspot

The preliminary assessment revealed the following observations in the case of West Burullus outlet hotspot:

- During extreme weather events, only those parts that are located to the north of the International Coastal Highway, are highly exposed to coastal flooding.
- Area located to the north of the International Coastal Highway, except for Kafr EL Sheikh power plan, is generally dominated by derelict undeveloped land.
- All areas to the south of the International Coastal Highway are not vulnerable to coastal flooding during extreme weather events.
- There is a group of villages to the south of the International Coastal Highway, the most important of which is El Maksama village, Mastrwa village in addition to the Graduates villages.
- Mostly, the built-up areas of these villages are located to the south of the International Costal highway, so that they are less vulnerable to coastal flooding.
- The village of Izbat al-Hanafi, which is located to the east of the power station, is outside the hinterland of this hotspot, so that is it was decided to be a reference case.
- The proposed protection work extends for 1.25 km to the east of Kafr El Sheikh power plant in addition to about 6 km extending to the west of the plant.
- The proposed protection work has no impact on their activities as accessibility to the shoreline is ensured.

Accordingly, the potential negative impacts in the case of West Burullus Outlet hotspot were evaluated in terms of their significance and likelihood (Figure 3-2). It should be noted that there would be **no issue** with the proposed protection work in terms of land acquisition as land in the area is owned by the government. The field work should include a number of target groups including local residents of farmers and fishermen in addition to some stakeholders including Environment Directorate and Agriculture Directorate – Kafr El Sheikh governorate, EEAA and representatives of Kafr El Sheikh Power plant.

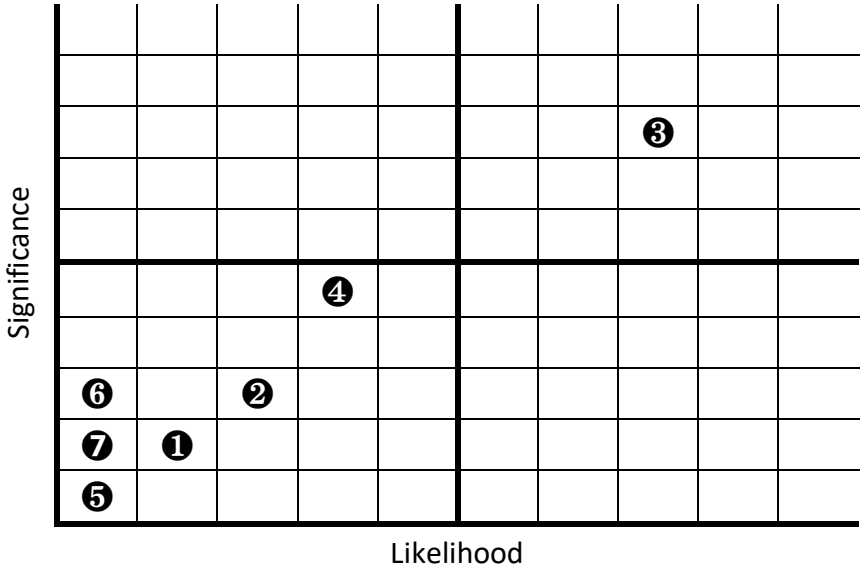


Figure 3-2: Potential impacts matrix in case of West Burullus Outlet hotspot

1. Loss of property and assets
2. Reduced accessibility due to road damage.
3. Disturbance to ecosystems functionality due to saltwater intrusion
4. Decline in income for some groups and their livelihood can be affected
5. Land acquisition for erection proposed protection works
6. Reduced accessibility to the shoreline due to proposed protection works
7. Interference with existing businesses

3.4.2 West New Ashtom El Gamil Outlet Hotspot

The following observations were recorded during the field visit to Wet New Ashtom El Gamil Outlet hotspot:

- The western part of the hinterland of West New Ashtom Elhgamil hotspot has a number of urban development projects, such as (Tower Bay) and (Porto Said).
- There are also a number of large industrial projects, such as:
  - United Gas Derivatives Company
  - Aquaculture company
  - Onshore Zohr project
  - United Gas Derivatives Company
  - Petrojet Pipeline Factory
  - Petroleum industry

While the first four projects are located to the north of the International Coastal Highway, the last two projects are located to the south of the highway. There are also three residential areas in the region including Al-Diba village, Al Manasra village and Al-Jaraba village. While the first village is located to the north of the coastal road, the last two villages are located to the south of the road.

- All areas that are located to the south of the International Coastal Highway are not vulnerable to coastal flood
- Main issues in Al Diba village should be investigated during the field work to be the basis for the intended community developments guidelines.
- The proposed protection work extends from onshore Zohr project in the east to the Tower Bay project in the west, passing through the existing industrial projects.
- The question is "what are the interests and attitude of the existing projects to the proposed protection work?"
- There is a protection work in front of the Al-Dibba village, which is represented in a stone dyke.
- The question is "What the relationship between proposed protection works and existing one?

Accordingly, the potential negative impacts in the case of West Ashtom El Gamil Outlet hotspot were evaluated in terms of their significance and likelihood (Figure 3-3). Local residents of El Diba village is the main target group that should be involved in the field work in addition to a number of stakeholders such as representatives of industrial enterprises, real-estate developer in the area, EEAA and Environment Governorate – Port Said governorate.

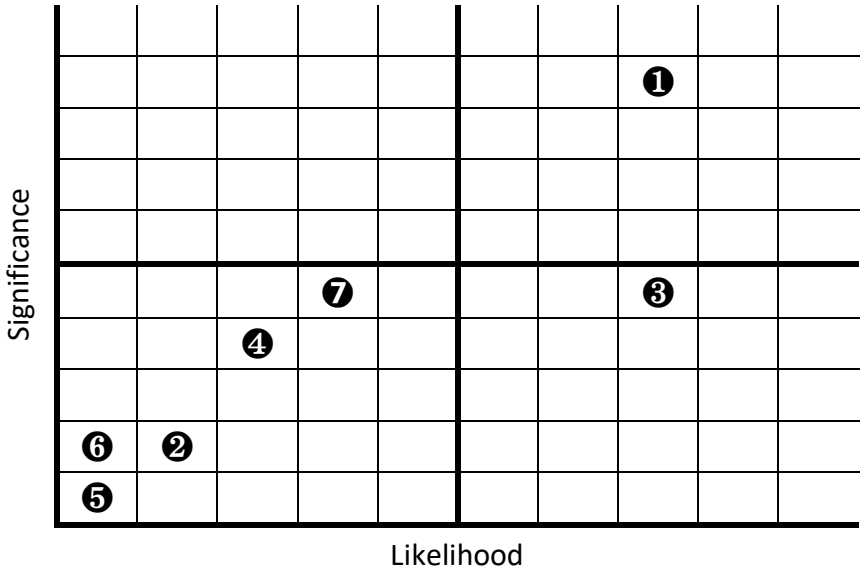


Figure 3-3: Potential impacts' matrix in case of West Ashtom El Gamil Outlet hotspot

1. Loss of property and assets
2. Reduced accessibility due to road damage.
3. Disturbance to ecosystems functionality due to saltwater intrusion
4. Decline in income for some groups and their livelihood can be affected
5. Land acquisition for erection proposed protection works
6. Reduced accessibility to the shoreline due to proposed protection works
7. Interference with existing businesses

3.4.3 West Rosetta Estuary Hotspot

The impacts of coastal flooding as well as proposed protection works seem to be low in the area, while the positive impacts of the protective works are expected be very high. The positive impacts of the proposed protection works are emphasized by the fact that the area will accommodate one of the newly developed town; New Rosetta City. The city is established according to Presidential Decree 117 of 2019. The city, which is planned to cover a total area of 3100 acres, extend between the Rosetta promontory in the west and the site of natural gas projects that are located to the north of the Edku city (**Figure 3-4**) (Ministry of Housing, 2019).

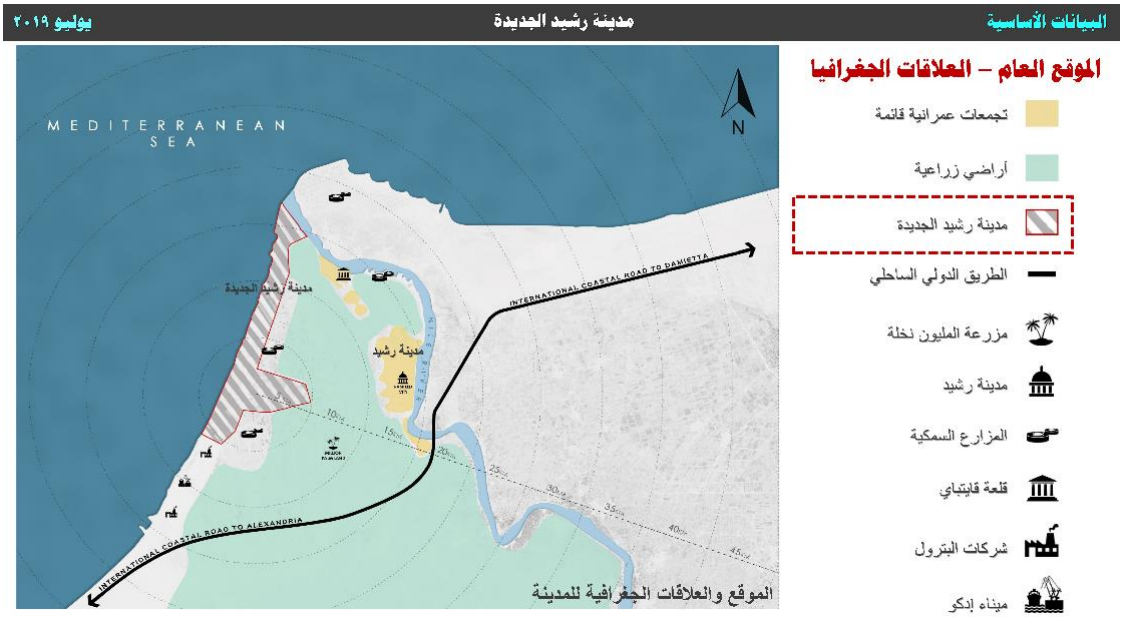


Figure 3-4: Situation of New Rosetta city
Source: (Ministry of Housing, 2019)

The potential negative impacts in the case of West Rosetta Estuary hotspot were evaluated in terms of their significance and likelihood (Figure 3-5). The field work in West Rosetta Estuary should focus upon stakeholders particularly; New Urban Communities Authority, Ministry of Housing in addition to some target groups such as fishermen and local residents in the nearby settlements.

The field works should involve both target groups and stakeholders including, farmers, fishermen and local residents in addition to representatives of New Damietta city, Environment Directorate and agriculture Directorate – Damietta Governorate.

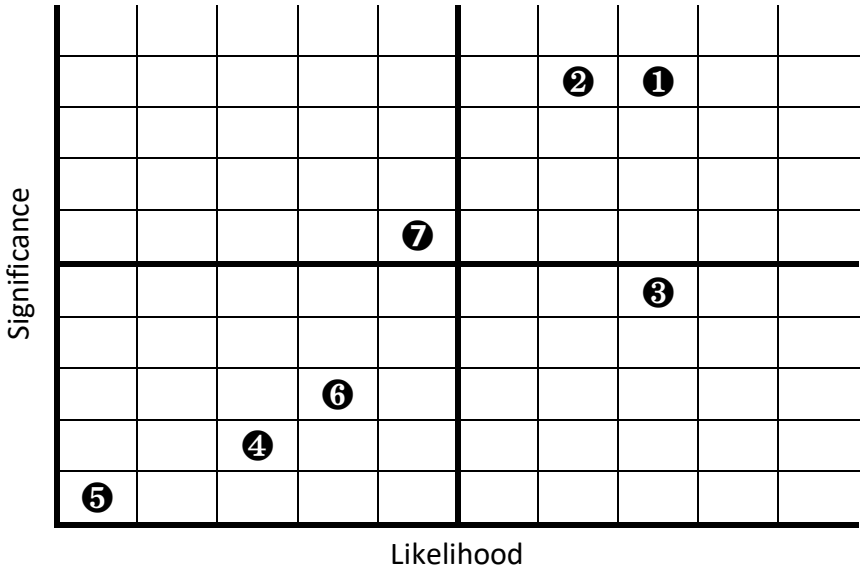


Figure 3-5: Potential impacts' matrix in case of West Rosetta Estuary hotspot

1. Loss of property and assets
2. Reduced accessibility due to road damage.
3. Disturbance to ecosystems functionality due to saltwater intrusion
4. Decline in income for some groups and their livelihood can be affected
5. Land acquisition for erection proposed protection works
6. Reduced accessibility to the shoreline due to proposed protection works
7. Interference with existing businesses

3.4.4 West of New Damietta City Hotspot

Coastal flooding is expected to have significant impacts on the local communities in the case of West of New Damietta City hotspot. Theses impacts, in the case of coastal flooding, may include loss of property and assets, reduced accessibility due to road damage, and consequently, adversely affecting income of some groups. Also, the proposed protection works are expected to have adverse impacts on the area including for example, reduced accessibility to the shoreline and issues related to land acquisition. These impacts were evaluated according to their significance and likelihood (Figure 3-6).

The field works should involve both target groups and stakeholders including, farmers, fishermen and local residents in addition to representatives of New Damietta city, Environment Directorate and agriculture Directorate – Damietta Governorate.

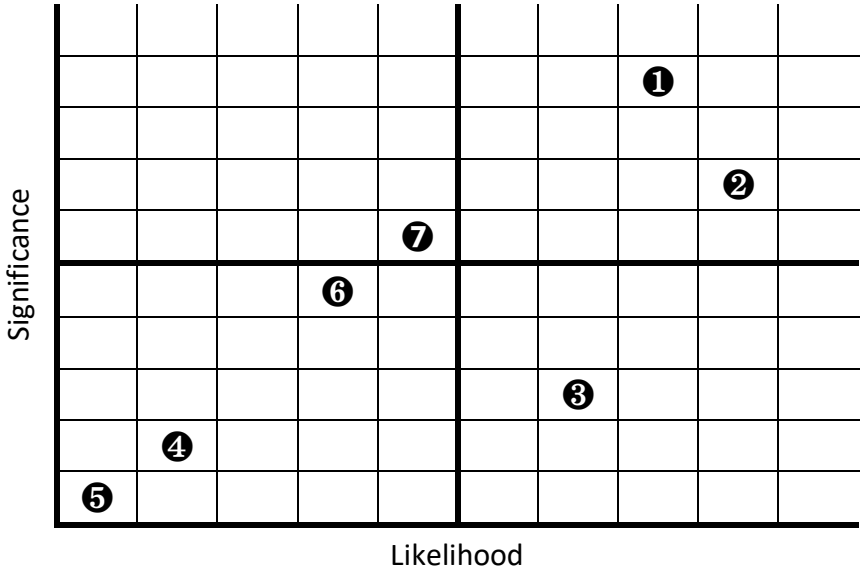


Figure 3-6: Potential impacts' matrix in case of West of New Damietta City hotspot

1. Loss of property and assets
2. Reduced accessibility due to road damage.
3. Disturbance to ecosystems functionality due to saltwater intrusion
4. Decline in income for some groups and their livelihood can be affected
5. Land acquisition for erection proposed protection works
6. Reduced accessibility to the shoreline due to protection works
7. Interference with existing businesses

3.4.5 West of New Gamasa City Hotspot

The hinterland of West of New Gamasa city accommodate a variety of activities and the International Coastal Highway crosses the area from southeast to northwest. Generally, those parts that are located to the north of Coastal International Highway are expected to be more vulnerable to coastal flooding. Therefore, despite the of existence of a variety of activities in the southern part of the area such as cultivated land and an industrial zone, these activities are expected be less vulnerable to coastal flooding. Meanwhile, those parts located to the north of the International Coastal Highway accommodate New Mansoura city and Delta University are expected to be more affected by coastal flooding. This, on one hand, indicates to the significant impact of coastal flooding on these assets and highlights the importance of proposed protection works in protecting these assets, on the other hand. The potential impacts were assessed in terms of their significance and likelihood (Figure 3-7). The field works should involve stakeholders including representatives of New Urban Community Authority, Environment Directorate and agriculture Directorate – Dakahlyia Governorate.

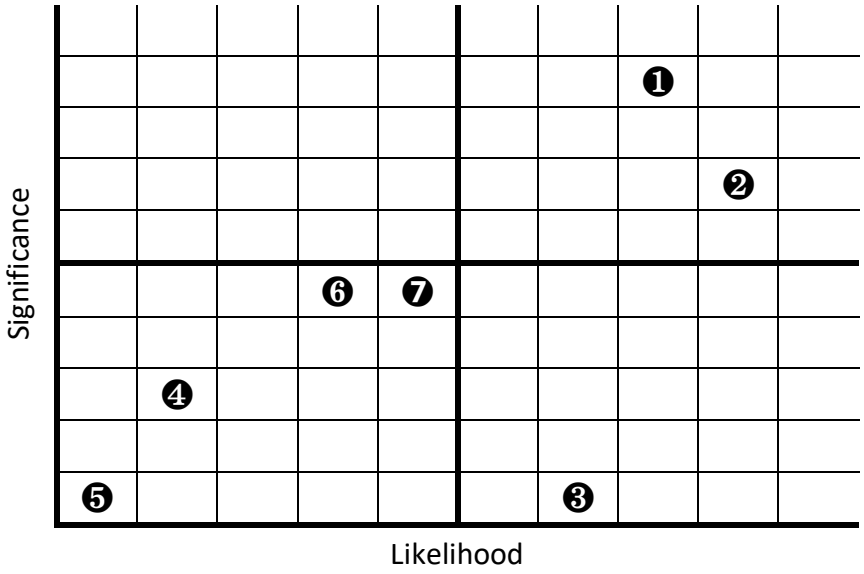


Figure 3-7: Potential impacts' matrix in case of West of New Gamasa City hotspot

1. Loss of property and assets
2. Reduced accessibility due to road damage.
3. Disturbance to ecosystems functionality due to saltwater intrusion
4. Decline in income for some groups and their livelihood can be affected
5. Land acquisition for erection proposed protection works
6. Reduced accessibility to the shoreline due to protection works
7. Interference with existing businesses

3.5 In-depth Assessment

Based upon the data and information collected during the group meetings, the preliminary assessment was revised and in-depth assessment was undertaken. In the following sections, each of the hotspots is considered in terms of existing socioeconomic conditions and potential impacts of sea flooding.

3.5.1 West Burullus Outlet Hotspot

- All areas located to the north of the International Coastal Highway are state-owned lands, which means on one hand that land acquisition is **not challenge** for the project activities and that there is some flexibility when consider potential future development activities, on the other.
- A large part of the area to the north of the International Coastal Highway has high voltage electricity lines, which limits to great extent certain types of development in the area, as it excludes urban, residential and industrial activities.

- The economic activities of the area residents include fishing, aquaculture and agriculture activities.
- There were talks of a plan for developing a 18,000 acres fish farms in the area to the north of the International Coastal Highway, but has not yet been implemented.
- Although the international coastal highway protects areas located to the south of the road from coastal flooding during extreme weather events, it was argued that water flooding may adversely affect the road itself in terms of both shorter lifespan of the road and higher maintenance work and cost.
- It was suggested that the price of land in similar areas ranges between EGP 60 - 70 thousand. The cost of developing an acre of land to establish a fish farm is about EGP 15,000
- Women were found to contribute considerable to the livelihood of the local community through diverse economic activities, such as animal and bird husbandry as well as agricultural activities. They are also involved in handicrafts products of mat woven from papyrus (reed, maples) naturally growing in the lake.
- The role of civil society is limited in the area, with a few NGOs supporting mainly charity work for needy local residents.
- Protection works already erected in the adjacent areas in front of Mohamed Sharshir village showed great effectiveness in reducing vulnerability to coastal flooding.

- The main issues of concern in the area include:
  - Lack of a sanitary sewage system
  - Lack of job opportunities in the area for women.
  - The area has no secondary schools.
  - There is a need to support local economy as well as income levels and livelihood of the local population particularly in terms of fishing and aquaculture activities.
  - Water provision is interrupted regularly, with water cuts expanding for days.
  - Frequent power cuts during the winter season, despite the presence of electricity towers nearby.

3.5.2 West New Ashtom El Gamil Outlet Hotspot

- The western part of the hinterland of West New Ashtom Elhgamil hotspot has a number of real estate projects, such as (Tower Bay) and (Porto Said).
- the area has also a number of large industrial projects, such as:
  - United Gas Derivatives Company
  - Aquaculture company
  - Onshore Zohr project
  - United Gas Derivatives Company
  - Petrojet Pipeline Factory
  - Petroleum industry

While the first four projects are located to the north of the International Coastal Highway, the last two projects are located to the south of the road.

- There are also a number of residential areas in the region, such as:
  - Al-Diba village to the north of the International Coastal Highway.
  - Al-Jaraba village to the south of the International Coastal Highway
  - Al Mansra village to the south of the International Coastal Highway
- All areas that are located to the south of the International Coastal Highway are not vulnerable to coastal flooding.
- Livelihood of almost all the local community in Al Diba village relies mainly on fishing activities.
- El Diba village is repeatedly flooded by seawater and high level of groundwater during extreme weather events in winter season.
- Main issues in Al Diba village, as the most vulnerable village to seawater flooding in the area, include:
  - Absence of sanitary sewage system
  - High level of groundwater table.
  - Poverty prevalence
  - There is a need to support local economy as well as income levels and livelihood of the local population particularly in terms of fishing and aquaculture activities.
- Women were found to have limited role in community livelihood, with very limited direct contribution to livelihood.
- Also, the civil society, represented by only one NGO, has limited role with minimum activities, focusing mainly on charity work.
- The only negative impact of the coastal flood in the area was found to be loss of assets. This highlights the potential positive impact of the suggested protection work with no negative impacts were identified, particularly with increasing vulnerability of the study site to inundation by coastal flooding under different scenarios of SLR. in this respect, it was estimated that the study site is completely vulnerable to inundation by SLR under RCP 8.5 scenario by the year 2065.

It should be noted that representatives of industrial enterprises, real-estate developers in the area should be consulted on the form and design of the protection work to ensure best efficiency possible of the suggested protection work.

3.5.3 West Rosetta Estuary Hotspot

At present, the physical and socioeconomic impacts of coastal flooding as well as proposed protection works seem to be low in the area, as the hinterland of the suggested protection work is undeveloped area allocated for the development of New Rosetta city.

The livelihood of two nearest communities (Burj Rashid village and Rosetta city) relies mainly on agriculture and fishing activities with no relationship with the hinterland of the suggested protection work. The intended protection work was found to have no negative impacts on the nearby communities and their livelihood.

While the positive impacts of the protective works are expected to be very high as the area will accommodate one of the newly developed town; New Rosetta city. in such a case, the suggested protection work can be valued by the total investments that can be protected from coastal flooding.

However, as shown in the structure the new city plan (**Figure 3-8**), the city is designed to have a sidewalk alongside the coastline. This emphasize the need to integrate the suggested protection into the development plan of the city. Accordingly, there will a need for more consultation with the Ministry of Housing represented by the General Authority of New Cities and Urban Communities Development. Also, it should be noted that the area will accommodate a new community with specific socioeconomic conditions that could not be projected at present.

Figure 3-8: Plan of New Rosetta city
Source: (Ministry of Housing, 2019)

3.5.4 West of New Damietta City Hotspot

Despite coastal flooding is expected to have significant impacts on the local communities in the case of West of New Damietta City hotspot, the suggested protection work may contradict with existing urban structure of the city. In this respect, during the group meeting organized on 11/02/2020, it was clear that most of participants have expressed their concerns about the potential impacts of the proposed protection work on the aesthetic aspects of the area, which would be expected to adversely affect the market value of

properties in the area. This may indicate to the need for devoting more efforts on raising awareness on the project and suggested protection work in the area. Again, the need for more consultation with the Ministry of housing represented in the General Authority of New Cities and Urban Communities Development is highly needed.

3.5.5 West of New Gamasa City Hotspot

Generally, those parts that are located to the north of Coastal International Highway are frequently vulnerable to coastal flooding during extreme weather events in the winter. During the group meeting organized in Zayan village; the nearest community to the suggested protection work, it was found that the livelihood of the community relies on agriculture and is not related to the suggested work as it is located in the peripherals of the hinterland.

However, the vulnerability assessment showed that about 11 km^2 of the study site are expected be highly vulnerable to coastal flooding due to SLR by the year 2065 under RCP8.5 scenario. Also, it was noted that the site of New Mansoura City is among parts that are vulnerable to coastal flooding due to SLR. This highlights the importance of the suggested protection work to protect those parts New Mansoura city with total capital investment of EGP 60 billion.

According to the city plan, it was designed to establish sidewalk alongside the beach of the city (**Figure 3-9**). This once again, require more consultation with the Ministry of housing represented in the General Authority of New Cities and Urban Communities Development.

Figure 3-9: Sidewalks in New Mansura city
Source: (Ministry of Housing, 2019)

In conclusion, the main issues prevailing in the study sites can be summarized in two broad categories, contextual issues in addition to physical and socioeconomic issues (Figure 3-10).

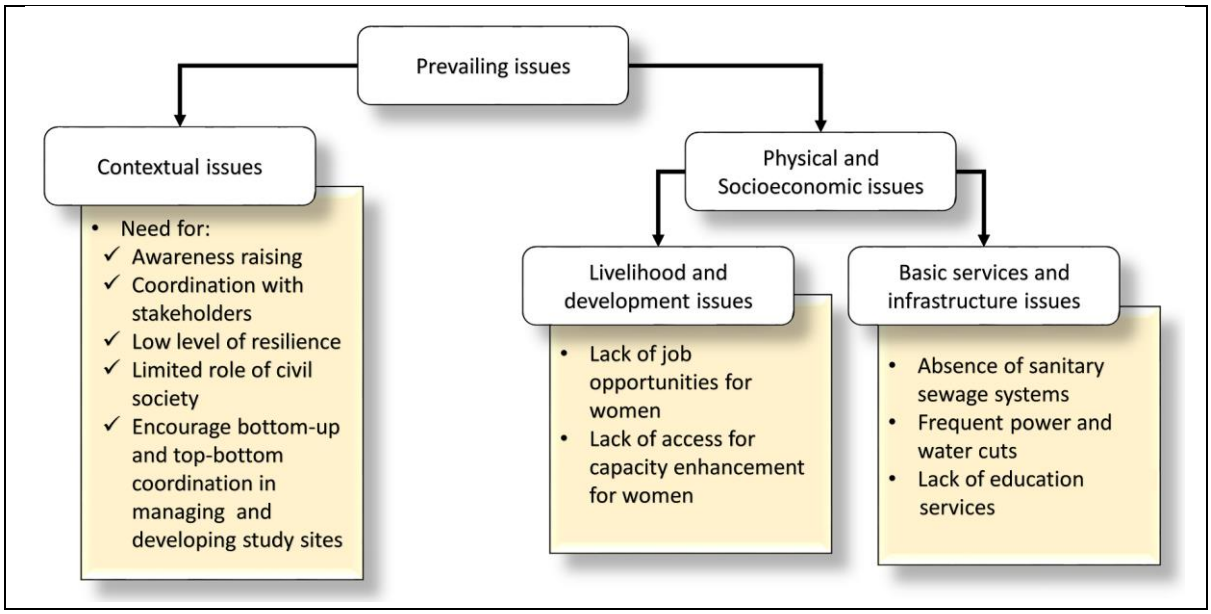


Figure 3-10: Main categories of prevailing issues in the study sites

3.6 Economic Value of the Impacts and Suggested Protection Work

Making decisions for adaptation measure disregarding the values of such measures and their impacts on livelihood of the local communities may lead to maladaptation with high opportunity cost compared to current benefits. Moreover, such maladaptation may affect adversely the adaptive capacities of the local communities and increase their vulnerability.

This highlights the need for deriving the economic value for adaptation measures. i.e. diverse benefits and costs associated with intended adaptation measures- typically a monetary unit (WB, 2004). Economic valuation means simply eliciting measures of human preferences for non-marketed goods (environmental changes). It also refers to the assignment of money values to non-marketed assets, goods and services, (Pearce et.al. 2002).

For this purpose, a number of valuation techniques can be employed to capture the economic value of intended adaptation measures. these techniques are grouped into three categories including market-based, revealed preferences and expressed preferences techniques. Each of these valuation techniques has not only its own advantages and disadvantages and but also it cannot be employed generally to deal with every possible case.

it should be noted that estimating economic value of adaptation measures can contribute in a number of ways to:

- Demonstrating the value of money: in the context of policy and/or decisions making, there is always a need to demonstrate the value of adaptation along with other values.
- Economic appraisal of alternatives: Economic appraisal of alternatives, whether using Benefit-cost analysis or cost effectiveness analysis, in order to generate well-informed decisions, need to incorporate estimates of adaptation.
- Generating funds: Generating funds for adaptation, whether self-raised or through donors would require demonstrating the value of adaptation (Tinch et al., 2010).

3.6.1 West Burullus Outlet Hotspot

The area to the north of the International Coastal Highway in general is susceptible to coastal flooding, which disrupt any potential development. it should be noted that, high-voltage towers and electricity lines cross this area, excluding potential residential, industrial and services development, meaning that the main potential development could be aquaculture, especially as there were talks of a plan for developing a 18,000 feddan fish farms in the area to the north of the International Coastal Highway, but none has so far been implemented.

This means, in economic terms, proposed protection work could create an opportunity for the aquaculture development. It was suggested, in this respect, that the price of land for aquaculture activities in similar areas ranges between EGP 60,000 – 70,000 per feddan, while the cost of land preparation for such activities is about EGP 15,000 per feddan. This means a net added value of EGP 50,000 per feddan. The economic value to be generated by such protection, in terms of potential economic activities would be:

$$\text{Potential economic value} = A * N$$

Where:

A = Total area

N = Net added value per unit of area

Potential economic value= 18,000 feddan* EGP 50,000 value per feddan = EGP 900 million

Additionally, there is the economic value of the, direct and indirect, job opportunities to be generated, the rate of which per 100 tons of fish is shown in table (3-3). Assuming that annual yield per feddan of aquaculture is 3.5 tons (GAFRD, 2013), the total annual yield for the whole area is expected to be 63,000 tons.

Table 3-3: Potential direct & indirect job opportunities to be created by aquaculture activities

Type	Per 100 tons of production (*)			Total no of jobs in aquaculture
	Full time equivalent jobs per 100 tons	Part-time or seasonal jobs per 100 tons	Total no of jobs	
Aquaculture workers	12.59	4.65	17.24	10,860
Trader/wholesaler	0.92	0.0	0.92	580
Retailer	7.79	0.0	7.79	4,900
Total	21.29	4.65	25.94	16,340

(*) The number of jobs in aquaculture in the area is estimated based on the numbers provided by (Macfadyen et al., 2011).

The total number of jobs provided by aquaculture activities in the area is estimated to be as much as 6,560 jobs (Macfadyen et al., 2011) (**Table 3-3**). The cost of job creation in the aquaculture sector is estimated to range between L.E. 18,000 and 30,000. This means that the total cost of job opportunities created by aquaculture in the area, assuming cost of job creation at the lower bound EGP 18,000, can be valued at about **EGP 294 million**. This represents the economic benefits of the jobs to be created by the aquaculture development, bringing the total overall benefits to **EGP 1,194 million** [3].

3.6.2 West New Ashtom El Gamil Outlet Hotspot

The value of the protection work can be valued by the existing and currently developed assets that can be protected due to such protection work. El Menasra district, which include Three villages, namely El Diba, El Garabaa and El Menasra villages, has a total number of about 3300 housing units. Assuming that El Diba village has about one-third of these housing units, which equivalent to 1100 units that can be protected by the intended protection works. The value of these housing units can be estimated according to the following formula:

Economic value = H * P

Where:

H = Number of housing units

P = Price of a housing unit

Economic value = 1100 * 250,000 = 275 million

Accordingly, the proposed protection works in the case of New Ashtom El Gamil hotspot is estimated to be about **EGP 275 million** (Assuming EGP 250,000 for a housing unit).

[3] We were told, during personal communication with Eng. Abdel Razek Mohamed Abdel Nabi on 31st of March 2020, that there are plans being prepared for the development of a new city (New Kafr El Sheikh city) in the area. However, nothing concrete or details are available about this project.

3.6.3 West Rosetta Estuary, West of New Damietta City and West of New Gamasa City Hotspots

These three sites are being considered for the development of new cities and communities along the coastal stretches, with significant investment and assets that could be exposed to the adverse impacts of coastal flooding and SLR assuming that the proposed protection work will be completely integrated with the side-walk planned. **For instance**, New Mansoura and New Gamasa cities involve together a total investment of about **EGP 100 billion** (Egypt Today, 2017). Similarly, the total investment of New Damietta city was estimated to be **EGP 91 billion** (SIS, 2019). This indicates that the intended protection works suggested by the project can contribute to the protection of a total investment of about **EGP 191 billion.**

Meanwhile, **the first phase** of New Rosetta city involving establishment a residential district will cost about **EGP 1.5 billion** (Al-Boursa, 2019). It should be noted that estimating the economic value of the benefits associated with the suggested protection work in the case of New Rosetta city cannot be undertaken without knowing the specific contribution and role of the protection work in these sites. This in turn cannot be known precisely without knowing how this protection work would be integrated with the side-walk planned for new Rosetta city.

3.7 Conclusion

- Most areas located to the south of the International Coastal Highway are currently not expected to be directly vulnerable to coastal flooding. However, frequent coastal flooding may adversely affect the highway itself and shorten its lifetime, which may lead to the need for additional maintenance work and expenditures.
- The vulnerability of the five hotspots to coastal flooding is expected to increase in the future under different SLR scenarios. This is, especially true in two sites; namely West New Ashtom El Gamil outlet and West New Gamasa city, where considerable proportions of the two sites are expected to be highly vulnerable to coastal flooding by the year 2065 under RCP8.5 scenario.
- it was clear, during the field work that local communities, local authorities and General Authority of New Cities and Urban Communities Development were, due to time preference for the present, concerned with current issues particularly shoreline erosion and coastal flooding due to extreme weather events. Vulnerability to sea level rise and potential adaptation measures were not on their agenda.
- In all cases, it was found that the coastal flooding may have significant impacts either on permitting development activities and/or prevent loss of assets.
- Thus, the proposed protection work can provide large positive impacts with possible future development.
- The positive impacts of the suggested protection work can be valued by the damage that can be avoided as a result of such work and consequent preserved

assets. The economic value of the suggested protection work was estimated to be **EGP 275 million** in the case of West New Ashtom El Gamil Outlet Hotspot

- Also, the positive impacts can be valued by the opportunity cost of those areas that are vulnerable to coastal flooding and with the protection work would be available for development in This respect, it was estimated that the positive impacts of the suggested protection work in the case of West Burullus outlet will have value of **EGP 1,194 million**.
- This brings the total economic value of the positive impacts, in only two of the five sites, namely West Ashtom El Gamil New Outlet and West Burullus outlet, to be about **EGP 1,469 million**.
- Additional significant positive economic impacts are expected at two of the remaining sites, namely West New Gamasa city hotspot and west New Damietta city, where large-scale development is taking place or planned, the total investment in which is about **EGP 191 billion**.
- However, estimating the precise economic value of the contribution of the proposed protection work in the a case of west Rosetta estuary hotspot is hindered by the lack of information on the role of the protection work in these sites, assuming that this protection work would be integrated with the side-walks planned for the three sites.
- It is clear that the positive impacts of the proposed protection work significantly exceed negative ones. This is particularly the case where massive development projects are being undertaken or planned.
- It was found during the consultative meetings that most of the local communities have very limited knowledge about the project except for the areas adjacent to already established previous protection work. Accordingly, there is need for concerted efforts to raise awareness to reduce residents' concerns and resistance to project activities and associated protection work.
- More consultation is highly needed with the Ministry of housing represented in the General Authority of New Cities and Urban Communities Development to coordinate implementing the suggested protection work in the case of three sites: West Rosetta Estuary hotspot, West New Damietta city and West New Gamasa city. Similarly, more consultation is needed with industrial enterprises and real-estate developers in the case of Wet New Ashtom El Gamil outlet hotspot.
- The main issues of concern for the communities at West Burullus Outlet and West New Ashtom El Gamil Outlet Hotspot
    - Absence of sanitary sewage systems
    - Lack of job opportunities for women in the area
    - Limited opportunities for women to enhance their capabilities
    - The area has no secondary schools
    - Frequent power and water provision cuts during the winter season
    - High level of groundwater table

- These issues were clear in those sites that have communities that are directly associated with the suggested protection works such as Wet Burllus outlet, West new Ashtom El Gamil outlet. In other hotspots, the hinterland of the suggested protection work has communities that are neither related to nor interested in the protection works.
- However, these issues need to be carefully considered in preparing community development plan in the study sites.

Section (4):

Grievance Mechanism

4. Grievance Mechanism

4.1 Principles of Grievance Mechanism

Usually, large-scale projects have a wide range of, adverse and positive impacts on different groups of local communities in the regions where these projects are undertaken. Despite the limited anticipated adverse impacts of the suggested protection work that are planned to be undertaken within the project in the hinterland of the selected five hotspots alongside the Nile Delta coastal zone, there is a need to develop a grievance mechanism for these intended protection works. This section is intended to develop a grievance mechanism for the project highlighting the main principals of grievance mechanism and operation procedures for such a mechanism.

A grievance can be defined as a complaint raised by an individual or a group within communities vulnerable to real or perceived impacts of certain project (Nord Stream 2, 2019). Grievance mechanisms simply refers to a set of procedures for addressing complaints and resolving disputes (Cahn, 2010). at project level, grievance mechanism represents a platform for receiving, evaluating, and addressing project-related grievances from affected communities at the level of project (IFC, 2009).

Grievance mechanisms can generally contribute largely in:

- Providing a communication channel with local communities for expressing their concerns and achieving remedies for them.
- Preventing and address community concerns;
- Builds trust as an integral component of broader community relations activities
- Enables more systematic identification of emerging issues and trends, facilitating corrective action and preemptive engagement.
- Supporting development plan for local communities and creating positive socioeconomic changes (CAO, 2008).

When submitting a grievance, community members expect to receive an acknowledgment of their problem and a prompt response to issues questions about protection work activities and their impacts. such a response may range from a clarification, modification of the conduct that caused the grievance to a compensation in case of damage incurred by protection works (CAO, 2008).

Absence of a clear, well-defined and announced grievance mechanism or applying ad hoc approach means dealing with grievance individually, case by case. despite of flexibility of such an approach it is lacked to consistency, transparency and proactivity. Also, potential success of the provided resolution is so limited as the efficiency of these resolutions will depend upon the skills of the personnel in charge of receiving the grievance. Moreover, so limited number of grievances can be handled and may give negative image for the project activities (CAO, 2008). It should be noted that applying such ad hoc approach assumes

availability of efficient and effective communication channels with local communities for expressing their concerns, which is not a concrete assumption.

This. in turn, highlights the need for developed formal grievance mechanism that represents a trusted way to voice and resolve local communities' concerns on the intended protection works. Among other advantages, such a mechanism offers a proactive approach to address concerns, promotes the image of the project in the local community and provides proper climate for reducing the adverse impacts of the protection work and maximizing their benefits.

Usually, effectiveness of any grievance mechanisms can be constrained by low accessibility, socio-cultural barriers and low level of response (Cahn, 2010). Therefore, it was recommended that any efficient grievance mechanism should be transparent, accessible and equitable with an independent structure. Moreover, effective grievance mechanism should have a clear and well-known publicized procedure with timeframes for each stage (CAO, 2008). Similarly, IFC suggested proportionality, cultural appropriateness, accessibility, transparency and accountability and appropriate protection as main five principles of good grievance mechanism (IFC, 2009).

More recently, IUCN suggested six main principles of good grievance mechanism including: accessibility, practicality, effectiveness, transparency, independence and documentation (IUCN, 2016). The effectiveness of grievance mechanisms can be summarized simply in satisfaction levels of complainants of key stakeholders and target groups (Cahn, 2010).

4.2 Methodologies for Developing a Grievance Mechanism

To develop a grievance mechanism, a methodology of four main steps (Figure 4-1) was recommended including: identifying scope and goals, designing the grievance mechanism, implementing the mechanism and monitoring implementation (CAO, 2008).

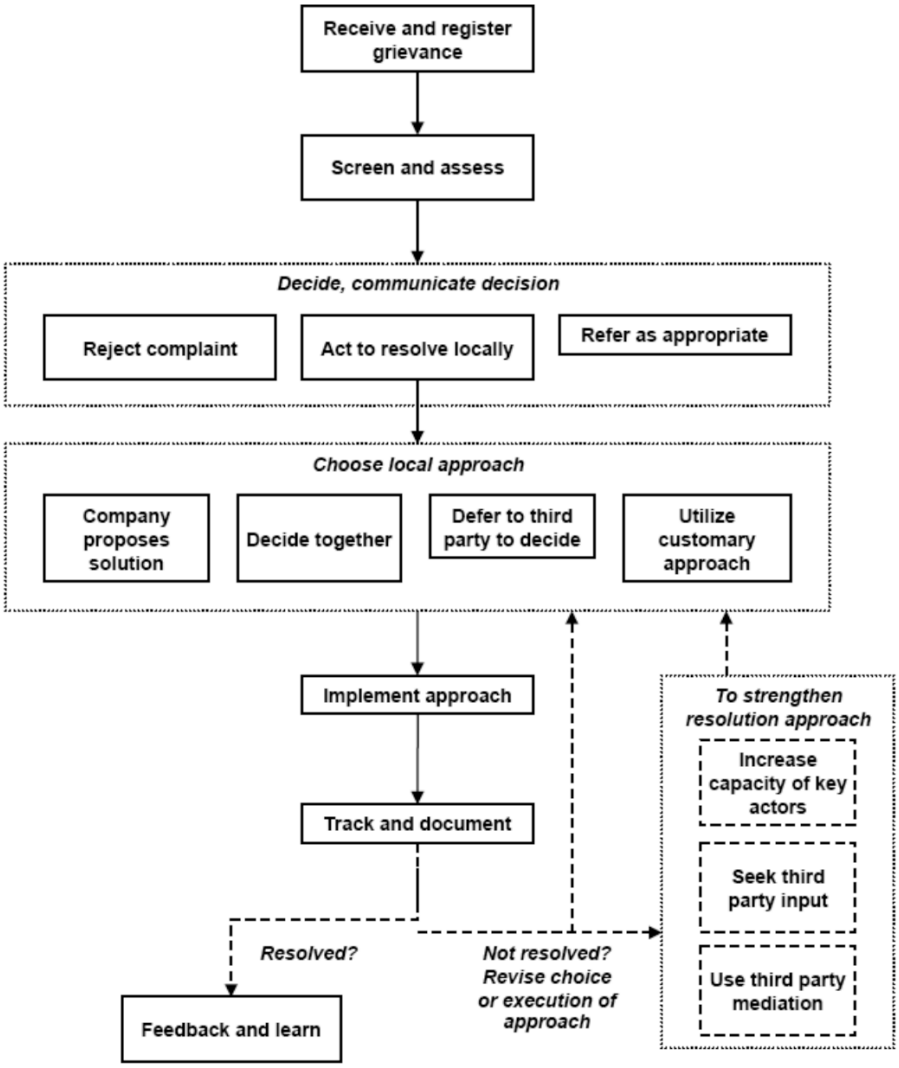


Figure 4-1: Grievance mechanism suggested by CAO

Source: (CAO, 2008)

Another five-step methodology proposed by IFC in 2009 to develop a good grievance mechanism. The methodology included: publicizing grievance management procedures, receiving and keeping track of grievances, reviewing and investigating grievances, developing resolution options and preparing a response and monitoring, reporting, and evaluating a grievance mechanism (Figure 4-2) (IFC, 2009).

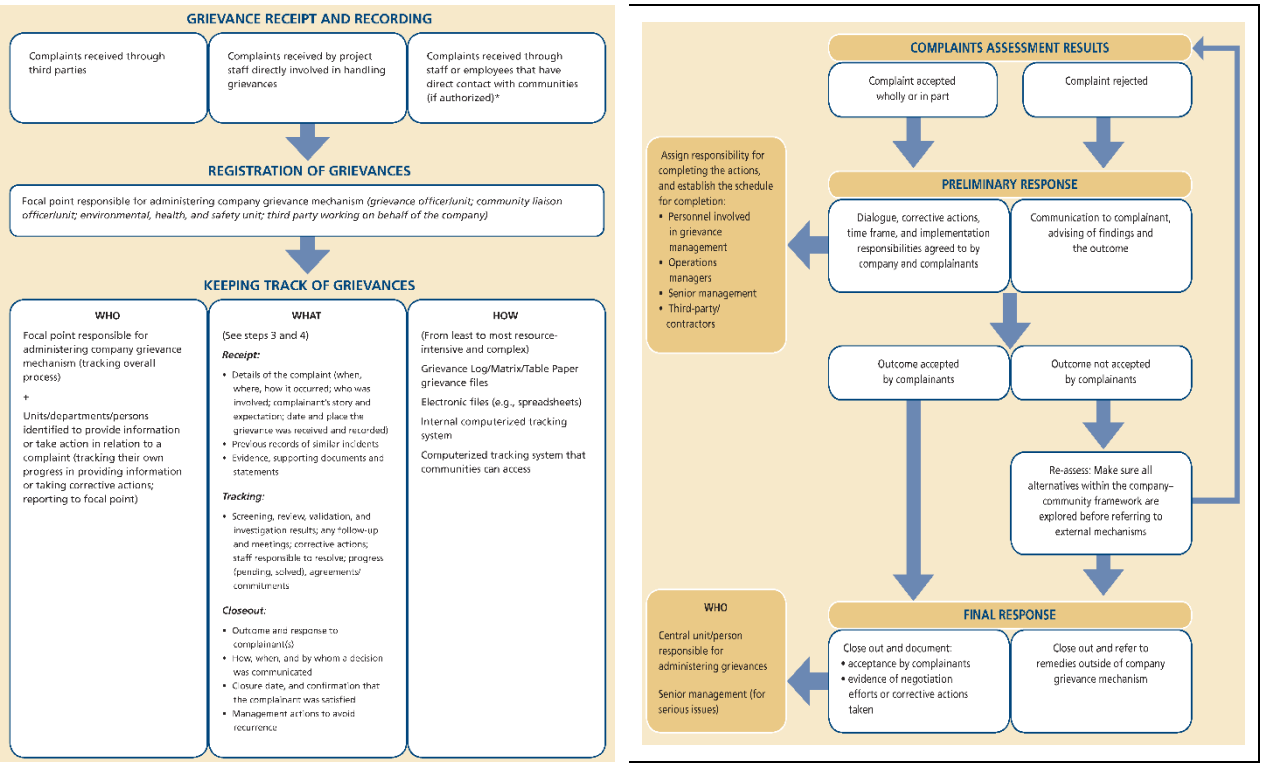


Figure 4-2: Grievance Mechanism suggested by IFC

Source: (IFC, 2009)

Practically, the grievance mechanism of Nord Stream 2, developed in 2019, represent one of the examples of grievance mechanism in the domain of mega project, which consists of six main steps: grievance communication and logging, Acceptance of grievance for investigation, notification, investigation, resolution and monitoring and evaluation (Nord Stream 2, 2019).

At project level, when designing grievance mechanism, local communities affected by the project should be carefully considered. This, in turn, entails analyzing and understanding socioeconomic conditions of these communities and who will be vulnerable to the project activities. Moreover, the strategies for developing grievance mechanism, also, differ widely according to the cultural attributes of the local community (IFC, 2009).

4.3 Suggested Grievance Mechanism

As a prerequisite for the intended grievance mechanism, an institutional framework should be firstly developed to ensure certain level of independence of the mechanism and its sustainability. for this purpose, five grievance committees should be designed, one for each hotspot. Also, the mandate of these grievance committees should be represented highlighting its scope and objectives.

The grievance committee in each hotspot should involve two parties: delegates of local community in each hotspot and representatives of different sectors of the project. while the members of the first party will vary from one grievance team to another, the second party

members will remain the same for all hotspots (**Table 4-1**). Concerning the members of the first part, most local communities in the hinterland of the five selected hotspots are hierarchical societies with established leadership and representation roles, that may inhibit full and active participation of all affected individuals. Thus, it is recommended to involve key community leaders as representatives of target groups and stakeholders and seek their support and input upfront.

Table 4-1: The structure of grievance committee in different hotspots

S		Hotspots				
		West Burullus Outlet	West New Ashtom El-Gamil Outlet	West Rosetta Estuary	West of New Damietta City	West of New Gamasa City
1	Project representative(s) (to be nominated)	√				
2	Grievance coordinator (to be nominated)	√	√	√	√	√
3	Local Government representative	√	√	√	√	√
4	Environment Directorate - Governorate level	√	√	√	√	√
5	Community leaders	√	√	√	√	√
6	NGO, if any	√	√	√	√	√
7	New Towns Authorities	X	X	√	√	√
8	Representatives of Industrial communities	X	√	X	√	√
9	Representative of real estate investors	X	√	X	X	X

The grievance committee in each hotspot, headed by local project representative, should meet regularly (e.g. bi-monthly) to discuss various complaints/issues raised by local community. It should be noted that the grievance mechanism can act as an efficient channel to communicate not only problems or complaints but also questions, requests for information, and suggestions from local communities.

The roles of grievance committee in each hotspot include:

- Develop scope and mandate of the committee's work.
- Organize regular meetings with members of the local community for awareness raising about the project as well as the grievance mechanism and update them on project activities.
- Investigate complaints and concerns associated with the project.
- Identify appropriate solutions for the issues related to grievances.

Meanwhile, the role of grievance coordinator, preferably local SPA representative, is to:

- Conduct preliminary investigations of grievance in order to make recommendations to the Committee.
- Attend Grievance Committee meetings and report on discussed issues and grievances.
- Develop a system for tracking and documenting grievance.
- Maintain traceable and confidential records for each grievance.
- Monitoring and evaluation reporting to the head of grievance committee, in terms of effectiveness and possible shortcomings of the mechanism, satisfaction of local communities and foreseen issues.

Moreover, the scope and objectives of grievance mechanism should be identified highlighting the area of complaints to be targeted by the mechanism. Also, the objectives of the mechanism should be clearly defined. To identify the objectives of the mechanism, the following questions need to be primarily addresses:

- Why is the grievance mechanism being established?
- Will the grievance mechanism be oriented primarily around concerns of the community or around joint concerns of the project and community?
- What should the grievance mechanism achieve in both the short and long term?

The proposed grievance mechanism consists of four main steps: receipt and recording complaints, screening for eligibility, identifying appropriate solution and monitoring and evaluation (***Figure 4-3***). Each of this step is discussed briefly in the next sub-section.

4.3.1 Step (1): Receiving and Recording Grievances

Grievance will be received, registered and documented by grievance coordinator through multiple channels including, for example:

- Regular Meetings of grievance committees that include community leaders, government officials, NGO…etc.
- Group meetings with local communitues with face to face interaction with local residents. During such a meeting local residents should be informed by grievance mechanism. Face-to-face, interactive and engaging informal meetings in local communities are recommended for this purpose.
- Complaints box located at Shoreline Protection Authority (SPA).
- Complaints emailed to the head of SPA.
- Complaints directed to the Cabinet of Ministers.

It should be noted that the last three channels are currently used by SPA to deal with complaints relevant to shoreline protection activities undertaken by the authority. Upon receiving, the grievances coordinator should register the complaint in details according to the

attached form (Annex 1). As soon as the grievance coordinator receives a complaint, she/he should enlist the complaint in the next committee meeting for discussion.

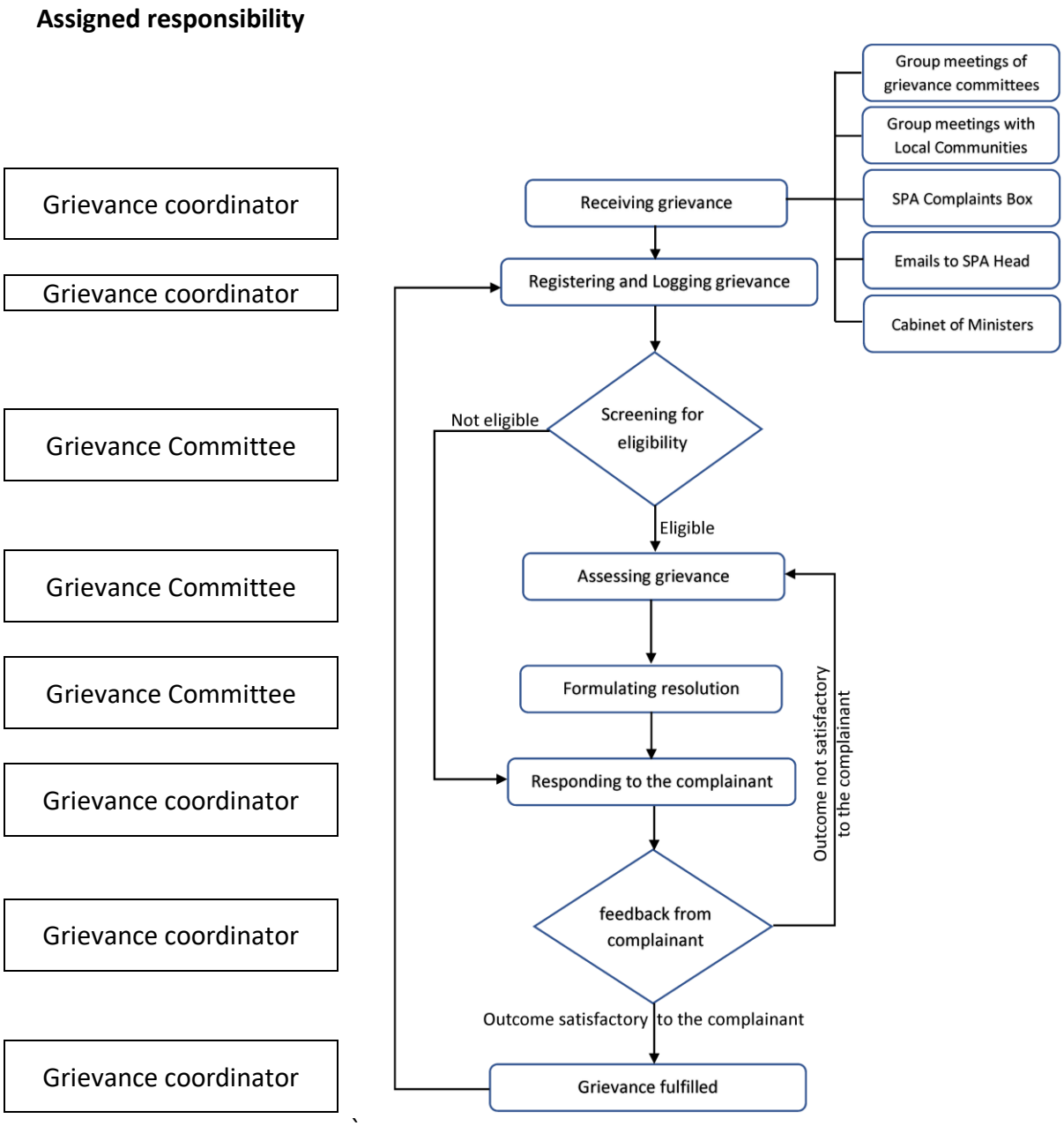


Figure 4-3: Suggested grievance mechanism

4.3.2 Step (2): Screening for Eligibility

During the grievance committee meeting, received grievance should be screened for eligibility, where the eligible complaints should have an issue that is relevant to the project and intended protection work and fall within the scope and mandate of grievance mechanism. This is followed by assessing the complaint and identifying its seriousness.

4.3.3 Step (3): Identifying Appropriate Solution

In case of the eligibility of complaint, the grievance committee should formulate an appropriate resolution for the grievance. the complainant should be informed by the outcome of the grievance assessment and recommended resolution within one week after grievance committee meeting and the complainant should be given one week for submitting her/his feedback. If the outcome not accepted by the complainant, the grievance reassessed once again during the following committee meeting. If the grievance is not eligible, the complainant should be replied with the outcome of the grievance assessment and detailed information and satisfactory clarifications.

4.3.4 Step (4): Monitoring and Evaluation

There is a need to monitor and evaluate the overall performance of the grievance mechanism throughout the project life cycle in terms of success of the mechanism in achieving the designed goals, satisfaction by the system's users, accessibility problems and procedural inefficiencies. For this to be attained, the process cycle should be closed by providing feedback for documentation and assessment of performance.

Table 4-2: Time frame for grievance mechanism

Task/Activity	Time frame (weeks)											
	1	2	3	4	5	6	7	8	9	10	11	12
Receiving and registering complaint												
Discussed during the following committee meeting												
Decision communicated to the complainant												
Receiving feedback, if any												
Re-assessing complaint												
Decision communicated to the complainant												
Receiving feedback, if any												

Section (5):

Concept Proposals for Local Community Development

5. Concept Proposals for Local Community Development

5.1 Local Community Development Principles

Community development is a multi-step process that is undertaken through participatory approach integrating local citizens and community leaders. Planning for a community development requires providing an enabling free and open environment to stimulate participation of the community members. Community development should be based on some basic principles such as:

- Participatory decision-making process: based on inclusive participation of local community
- Informed development: based on accurate information on the community livelihood and its actual needs and/or issues.
- Collective development: based on general agreement, which ensures high level of acceptance and sustainability (FRBSL, 2019; LCN).

Proposed activities of a community development plan need to focus on activities having immediate outcomes, are highly visible, consistent with the local community and support community sustainability (LCN). Moreover, these activities should target actual needs and prevailing issues in the community.

This section is intended to provide a concept proposal for local community development initiatives in the hinterland of the suggested protection works alongside the coastal zone of the Nile Delta.

5.2 Methodology for Preparing Community Development Proposals

Generally, to prepare community development proposals, a methodology of three main steps was applied as follows:

5.2.1 Inception Phase

This phase involved acquiring and analyzing necessary data and information about local communities in the five study sites. In this respect, the field work in the five hotspots and resulted reports on baseline socioeconomic conditions and impact assessment provided key insights about the five study sites and their local communities.

5.2.2 Consultation Phase

This phase included consultation with community members to identify current main issues, concerns about suggested protection work, if any, and development priorities. this consultation was undertaken in a number of group meetings with local community members in each study site during the period 05/01/2020 and 11/02/2020. These issues include:

- In the case of west Burullus outlet hotspot
    - Lack of a sanitary sewage system
    - Lack of job opportunities in the area for women:
    - The area has no secondary schools.

- There is a need to support local economy as well as income levels and livelihood of the local population particularly in terms of fishing and aquaculture activities.
- Water provision is interrupted regularly, with water cuts expanding for days.
- Frequent power cuts during the winter season, despite the presence of electricity towers nearby.

- In the case of west new Ashtom El Gamil outlet hotspot:
  - Absence of sanitary sewage system
  - High level of groundwater table.
  - Poverty prevalence
  - There is a need to support local economy as well as income levels and livelihood of the local population particularly in terms of fishing and aquaculture activities.

- In the case of the three remaining hotspots:
  As for these three hotspots are being planned and developed as new cities, there basic services and infrastructure will be provided. However, in case of New Damietta city, it was found that there is a concern about the visual impacts of such protection work on the properties market value in the area. Additionally, a number of opportunities were identified including for example, Integrated solid waste management (sorting and recycling) and sustainable modes of local mobility

Based on these issues and concerns, the following possible approaches and means to address them were identified as follows:

West Burullus outlet hotspot

- Marketing handicraft products made by women (mats).
- Establishment of a factory for fish processing and canning, which would enhance the value added of the fishing and aquaculture activities present in the area.
- Establishment of a solar water purification/filtration unit that would ensure clean fresh water provision.

West New Ashtom El Gamil outlet hotspot

- Establishment of capacity building center for training women on sewing, animal farming and other local activities that can lead to women empowerment as well as improving income levels and community livelihood.

The remaining three hotspots

The meetings at the remaining three study sites, where new cities do exist or in the process of being constructed, showed different issues and concerns. This involved concerns about the visual impacts of such protection work on the area and consequently on the properties market value in the area. The issue of development that need to be considered carefully by the project is identifying means for proper landscaping proposed protection work.

5.2.3 Planning Phase

During this phase, the proposed actions were formulated within the context of the study sites attempting to provide general description, objectives, spatial framework, beneficiaries, expected outcome, implementation plan and risks and uncertainty of each action. It is worth mentioning that the selection of the proposed actions was based on a number of principles including activities should:

- Have immediate outcomes, while ensuring sustainable development of the community;
- Be highly visible;
- Be consistent with the local community priorities;
- Be able to scale-up; and
- Target actual needs and prevailing issues in the community.

Based on these principles, fish processing plant was excluded as it represents a commercial activity though may provide opportunity for the community, would not contribute towards livelihood of the whole community. Also, it does not conform with the development support the project should be providing.

5.3 Proposals for Community Development Activities

The proposed activities should be seen in a wider framework, the vision of which is:

"To support coastal communities to become more resilient to coastal flooding and expected sea level rise"

This means that, on one hand, the project proposed protection work would reduce the exposure to the risks of coastal flooding and sea level rise, contributing towards improved resilience of these communities, on the other hand.

From this perspective, the proposed actions should focus more on marginalized groups including women. Therefore, two of the four proposals are intended to empower women in the community and enhance both their financial independence as well as their support to the livelihood of their families. These include increasing market access for women's local products (mats) and enhancing women's capacities in terms of sewing, animal farming and other local activities.

Meanwhile, the third proposal could be seen as a contribution to community development and sustainability as it can provide direct and indirect benefits both at community as well as household levels. These benefits include, for instance, improved health status and therefore productivity of community members.

One of the objectives of the development projects is to compensate communities that would be affected by the possible adverse impacts of the construction of the suggested protection work. This was found to be the case in the three remaining sites, where new towns are present or planned in the future. It is believed that this protection work would have an adverse impact on the real estate assets present in the area, which is a belief that was strongly expressed by community members in the case New Damietta city during the group meeting. Therefore, some action needs to be undertaken to reduce such impacts while supporting the communities with benefits that the protection work provides in terms of avoiding the risks of coastal flooding and sea level rise. The proposed action in this case may involve landscaping activities to ensure that the protection work is integrated in the scenery of the area and increase acceptability by these communities.

It should be noted that integration between some suggested proposals may augment the benefits to be derived from each proposal individually. For example, experience exchange and coordination between proposals No. (2) and (3) in El Diba village and Mastrwa village can enhance mutual benefits for the two communities.

It is worth stressing that within this context, the grievance mechanism should play an essential role as the link between the project management and local communities during initiation and running phases of these proposed actions. the role of the mechanism should be seen as a dissemination platform about the project actions including community development activities.

5.3.1 Proposal (1): Provision of Good Quality Drinking Water using Solar Powered Water Purification Units

General Background

It is generally agreed that drinking water quality is one of the main factors affecting human health, as poor drinking water quality can induce many waterborne diseases. Egypt, through health initiatives promoted by President Abdel Fattah El Sisi, has focused in recent years on improving health status of the people. In this context, efforts to be made by the project can support these communities by undertaking steps improve supply of good quality drinking water, which can result in tangible health benefits.

It is worth mentioning that the provision of improved drinking water quality can also contribute to improved productivity as well as reduce sickness time and treatment cost, which can have significant positive impacts on the livelihood of different households as well as the community as a whole.

Water quality is one of the common issues in local communities in the case of two of hotspots.

In order to address this issue, local solutions need to be considered including for instance, the construction of solar powered water purification/filtration units. The usage of renewable sources of energy is considered desirable taking into account environmental impacts of any actions to be proposed as well as climate change concerns, especially considering its abundance and sustainability. Theses solar powered water purification units can ensure sustainable supply of safe drinking water that can be accessible for all members of the local communities[4].

Objective

The project aims to improve quality of life and productivity and reduce sickness associated costs of the local communities in the hinterland of two study sites, and thus improve their resilience.

Spatial Framework

Mastrwa village (Kafr EL Sheilh governorate) and El Diba village (port Said governorate)

[4] An example of such units is available at the following site: http://providencetrade.com/water-purification/solar-powered-water-purification.html.

Beneficiaries	Local population in general and the elderly and young people in particular.
Expected Outcome	Improved health status, leading to improved livelihood and resilience of these communities.
Mode of Implementation	1. Assessing quality of existing drinking water provision 2. Community needs assessment 3. Identifying valid options and their feasibility 4. Identifying operational mechanism of most viable option 5. Coordination with community and local authority for implementation 6. Contracting and installation 7. Monitoring and evaluation
Risks and Uncertainty	Risk 1: Unenthusiastic perception by the communities, due to its novelty. Risk 2: The initiative is not sustainable To address risks: communities, as well as local authorities, need to be involved in the planning, implementation and operation of the units from the very beginning to generate sense of ownership.
Indicative Cost:	US$ 30,000 – 150,000 (Gallucci, 2018)[5]
Relevance to SDGs:	SDG No. 3: Good Health and well-being SDG No. 6: Clean Water and Sanitation SDG No. 7: Affordable and Clean Energy SDG No. 13: Climate Action
Potential partners:	Local community leaders Local authorities NGOs Water Provision Company

[5] For more details please visit https://spectrum.ieee.org/energywise/green-tech/solar/how-solar-powered-mobile-water-purifiers-can-help-cities-cope-with-bad-water

5.3.2 Proposal (2): Improving Market Access for Handicraft Products Made by Local Women (mats)

General Background

Women in rural areas make significant, though unrecognized contributions to local economies, yet they face multiple barriers to realizing their full potentials. Removing such barriers can enhance the economic and social roles played by women and girls in their households and communities. A major barrier to such role enhancement is improving market access for women's local handicraft products, as this may contribute towards income improvement through enhanced engagement with the market place. This can in turn enable them to secure a fairer price for their products and increase productivity in a sustainable way.

It was highlighted that women in one of the hotspots are engaged in the production of a number of handicraft products of mat woven from papyrus (reed, maples) naturally growing in the lake. Usually, women sell their handicraft van vary widely according to the final destination of the product and the affordability of buyers. Additionally, handicraft activities and products represent a community heritage and reflect living tradition that has usually been sustained for generations (Rane et al., 2016).

Objective

The project aims to support livelihood of households of the local community through improving market access for such traditional products.

Spatial framework

Mastrwa village (Kafr EL Sheilh governorate)

Beneficiaries

Women in the community

Expected outcome

Conservation of local culture and traditions
Improved income levels
Improved livelihood and resilience of households and communities

Mode of Implementation

1. Characterizing the products and production scale
2. Market access assessment to identify barriers and potentials
3. Developing non-conventional marketing strategy
4. Capacity building on market access improvement
5. Developing and implementing operational plan
6. Monitoring and evaluation

Risks and uncertainty

Risk 1: Limited real and practical information about market access.
Risk 2: The initiative is not sustainable

To address these risks:

communities, as well as local authorities, need to be involved in the planning, implementation and operation of the units from the very beginning to generate sense of ownership.

Additionally, the engagement of NGOs with past experience in these aspects can be a great boost to the initiative.

Indicative Cost: US$ 20,000

Relevance to SDGs:

SDG No. 5: Gender Equality
SDG No. 1: No Poverty

Potential partners:

Local community leaders
NGOs
Social Solidity Ministry

5.3.3 Proposal (3): Development of Women Capacity Building Program

General Background

Women, from an economic point of view, are major contributors in rural areas to livelihood of their households and communities, particularly in agriculture. However, such contribution is limited by restricted access to education beyond basic education owing to social and cultural norms of these communities.

Objectives

The proposed action, in this context, is intended to address such capacity deficit, without disrupting socio-cultural norms in the communities in the short and medium and long term.

Short-term (immediate) objective is to develop and undertake a capacity building program for women to enhance their contribution at household and community levels and provide an opportunity for them to be more active in their communities.

Medium-to-long term objective: if this program is properly developed and implemented at community level, there is an opportunity for scaling-up at district and governorate levels.

Spatial framework

El Diba village (Port Said governorate)

Beneficiaries

The proposed development project is expected to directly benefit women of local community.

The project can contribute, indirectly, to improved income generation capacities, enhance livelihood and improve resilience of households and community.

Expected outcome

Improved income levels

Improved livelihood and resilience of households and communities

Mode of Implementation

1. Needs assessment
2. Designing capacity building programs
3. Developing implementation plan
4. Assessment of capacity improvement
5. Up-take by women of gained capacities
6. Monitoring and evaluation

Risks and uncertainty

Risk 1: Limited women involvement.

To address risk:

The project needs to be properly planned and implemented to provide an incentive for women participation

Risk 2: Lack of venue

To address risk:

Contacts need to be initiated with the only NGO present in the area to assist in identifying make available a venue for such activities in the village.

Indicative Cost: US$ 15,000

Relevance to SDGs: SDG No. 5: Gender Equality

Potential partners: Local community leaders
Local authorities
NGOs
Social Solidity Ministry

5.3.4 Proposal (4): Landscaping of Proposed Protection Work

General Background

There were concerns expressed by local community in some sites, about possible negative impacts of proposed protection work on real estate values in these communities. This was clear in the three sites associated with new town development, which was quite feasible, for example, during the meeting held on 11/02/2020 in New Damietta. These concerns, as well as resistance to the proposed protection work could be address through landscaping of the proposed protection work.
Additionally, humans do usually have preference for pleasant surrounding landscape and environment because they can bring mental and physical benefits to people. Landscaping can, also, help the creation of sustainable living environment as well as increase the resale value of real estates, housing and/or land plots.

Objective

To enhance the derived benefits of proposed protection work and reduce concerns of local community

Spatial framework

West New Damietta city (Damietta governorate)
West New Gamasa City (Dakahliya Governorate)
West Rosetta Estuary (Behaira Governorate)

Beneficiaries

Local community members, housing units' owners as well as local new town development authorities

Expected outcome

Increased support for the proposed protection work from local communities
Improved, or at least no reduction in the market value of real estates in the sites

Mode of Implementation

1. Developing perspectives for landscaping proposed protection work (in cooperation with local communities and local New Town Development Authorities)
2. Subcontracting research institutions to identify proper plant species …etc.
3. Developing and implementing landscaping plans
4. Monitoring and evaluation

Risks and uncertainty

Risk 1: Type of plantation not compatible to the surrounding environment.

To address risk:

The project management is already involving a number of research institutions and universities in identifying potentially compatible plantations.

Risk 2: negative perception of the landscaping by community members and local new town development authorities.

To address risk:

These parties need to be involved from the very beginning in the identification and implementation of the landscaping work and be responsible about the sustainability of such landscaping work once completed by the project

Indicative Cost: US$ 35,000

Relevance to SDGs: SDG No. 11: Sustainable Cities and Communities

Potential partners: Agriculture Academic institutions
local new town development authorities
NGOs

5.3.5 Proposal (5): Developing Integrated Municipal Solid Waste Management System

General Background

Management of Municipal Solid Waste (MSW) is one of the crucial issues in urban areas with a variety of implications adversely affecting potential sustainability of these areas. This emphasizes the need for municipal solid waste management system for controlling, collecting, sorting, reusing, recycling, transporting and disposal of waste. Development of such a system should carefully take into account public health, economics, engineering, conservation, aesthetics, and other environmental considerations.

Three study sites of the project have/will have new communities attracting increasing number of population and their activities. This provides an opportunity for the initiation and development of an integrated municipal solid waste system that could grow along as the new cities grow.

Objective

To develop integrated municipal solid waste management systems, that include sorting and recycling, serving the new communities established in three study sites.

Spatial framework

West New Damietta city (Damietta governorate)
West New Gamasa City (Dakahliya Governorate)
West Rosetta Estuary (Behaira Governorate)

Beneficiaries

Residents of new community in the three study sites and local new town development authorities

Expected outcome

Improved quality of urban life
Supported sustainability of the new communities

Mode of Implementation

1. Baseline conditions assessment, including solid waste generation rate and composition
2. Designing integrated solid waste management system
3. Developing implementation plan
4. Monitoring and evaluation

Risks and uncertainty

Risk 1: Low awareness among local residents and local new town development authorities

To address risk:

Applying participatory approach in assessing baseline conditions and designing the intended system.

Raising awareness of local residents

Indicative Cost: US$ 70,000 ±20% for each city

Relevance to SDGs: SDG No. 11: Sustainable Cities and Communities

Potential partners: Local new town development authorities
NGOs
Local residents
EEAA

5.3.6 Proposal (6): Developing a Solid Waste Management System for Compositing

General Background

Local communities in two of the five study sites are dominated by primary economic activities (fishing and agriculture), which produce a relatively large quantity of organic solid wastes. These wastes are usually open-dumped, which lead to a wide range of environmental impacts. Alternatively, such wastes can be utilized in composting through which, organic wastes are degraded by micro-organisms, to create a stable matter similar to humus.

Objective

To support livelihood of the local community through utilizing organic wastes for composting and protect the environment for adverse effects of improper solid waste disposal.

Spatial framework

Mastrwa village (Kafr EL Sheilh governorate)
El Diba village (Port Said governorate)

Beneficiaries

Local residents and local administrative authorities

Expected outcome

- Give economic benefits for the maker and user through producing a marketable commodity
- Support social prosperity of the community in general
- Reduce environmental burden through:
  - Minimizing the quantity of solid wastes need to be disposed by diverting organic materials
  - Preventing pollutants from reaching nearby water bodies.
  - Absorbs odor and degrades volatile organic compounds.
- Provide job opportunities and improve income levels

Mode of Implementation

1. Baseline conditions assessment, including solid waste generation rate and composition
2. Designing approaches for collection and sorting organic wastes
3. Developing implementation plan
4. Monitoring and evaluation

Risks and uncertainty

Risk 1: Low awareness among local residents and local authority

To address risk:

Applying participatory approach in assessing baseline conditions and designing the intended system.

Raising awareness of local residents

Risk 2: limited marketing opportunities

To address risk:

Development of a marketing plan from the very beginning of the project

Indicative Cost: US$ 30,000 ±20% for each village

Relevance to SDGs: SDG No. 12: Responsible Consumption and Production

Potential partners:

Community leaders
Local authority
NGOs
EEAA
Local residents

5.3.7 Proposal (7): Provision of Sanitary Sewer Systems

General Background	Sanitary sewer systems are among the basic services and amenities that may support the quality of life and improve housing conditions. Lack of sanitary sewer systems is one of issues prevailed in two study sites of the project: Mastrwa village (Kafr El Sheikh) and El Diba village (Port Said). Due to local topographic conditions and higher level of groundwater table, accompanied by absence of sanitary sewer systems, the two study sites suffer, mainly in winter seasons, from waterlogging. This, in turn, has a wide range of implications on health, local mobility and lifetime of real estate, infrastructure and roads network.
Objective	To construct sanitary sewer systems for the two villages
Spatial framework	Mastrwa village (Kafr EL Sheilh governorate) El Diba village (Port Said governorate)
Beneficiaries	Local community members and local authorities
Expected outcome	Improved health status of the population Improved housing conditions Ensure high level of population mobility particularly in winter seasons.
Mode of Implementation	1. Community needs assessment 2. Identifying valid options and their feasibility 4. Identifying operational mechanism of most viable option 4. Coordination with community and local authority for implementation 5. Contracting and installation 6. Monitoring and evaluation
Risks and uncertainty	Risk 1: Difficulties associated with existing form of the built-up area of the two villages, which may hinder such a provision. To address risks: As part of needs assessment, a pre-technical feasibility needs to be undertaken in order to assess the potentials for the development of such a system.
Indicative Cost:	US$ 70,000 ±20% in Mastrwa village (Balaji et al., 2015) US$ 40,000 ±20% in El-Diba village (Balaji et al., 2015)

Relevance to SDGs:

SDG No. 3: Good Health and well-being
SDG No. 6: Clean Water and Sanitation

Potential partners:

Community leaders
Local Authority
NGOs

5.3.8 Proposal (8): Establishment of a Fish Processing Plant

General Background

The economic structure of the local communities in El Diba village (port Said) and Mastrwa village (Kafr El Seikh) relies largely on fishing and aquaculture activities with a considerable amount of fish production. Generally, fish is a very perishable products, thus fish processing (salting, drying, smoking and packaging) may contribute to the development of their flavor, improved storage characteristics, maintain their nutritional attributes and increase their prices. This, consequently, can contribute largely to improved income at local communities' levels.

Objective

To strengthen the economic structure of the local communities and maximize the added value of their products through establishment of a fist processing plant.

Spatial framework

Mastrwa village (Kafr EL Sheilh governorate)
El Diba village (Port Said governorate)

Beneficiaries

Local residents

Expected outcome

Provide job opportunities
Improve income levels

Mode of Implementation

1. Conducting a feasibility study
2. Developing operational plan for the plant
3. Coordination with community leaders and local authority for implementation
4. Contracting and implementation
5. Monitoring and evaluation

Risks and uncertainty

Risk 1: Inadequate quantities of fish catch needed for economic operation of the plant

To address risk:

The feasibility study should consider carefully the fish catch and minimum quantity that can support economic operation of the plant.

Risk 2: Lack of skilled technical laborfore needed for operating the plant

To address risk:

The developed operational plan for the plant will include capacity building activities for local residents to provide skilled laborforce.

Indicative Cost:	US$ 250,000 ± 20%
Relevance to SDGs:	SDG No. 1: No Poverty SDG No. 8: Descent Work and Economic Growth SDG No. 12: Responsible Consumption and Production
Potential partners:	Community leaders Aquaculture owners and operators

5.3.9 Proposal (9): Supporting Sustainable Mode of Local Mobility

General Background

Three of the project five study sites involve new communities to/are expected to accommodate considerable population size of high to medium-income groups and a variety of economic activities.
It is important to ensure high level of local mobility and good public transportation systems that would encourage less use of private cars and thus support local sustainability and improve quality of the environment.
The proposed system will ensure an efficient and more friendly-environment transport system, which offers sustainable patterns of mobility.

Objective

To support the sustainability of local communities through providing more sustainable mode of local mobility

Spatial framework

West New Damietta city (Damietta governorate)
West New Gamasa City (Dakahliya Governorate)
West Rosetta Estuary (Behaira Governorate)

Beneficiaries

Local community members
Local new town development authorities

Expected outcome

Maintain air quality
Improved quality of urban life
High level of mobility

Mode of Implementation

1. Baseline conditions and needs assessment
2. Conducting a feasibility study
3. Designing the transportation system
4. Coordination with community leaders and local authority and New Towns Development Authority for implementation
5. Contracting and installation
6. Monitoring and evaluation

Risks and uncertainty

Risk 1: low level of acceptance by local residents

To address risk:
Applying participatory approach in designing the intended system
Raising awareness of local residents.

Indicative Cost:

US$ 300,000 ±20% for each city

Relevance to SDGs: SDG No. 11: Sustainable Cities and Communities
SDG No. 13: Climate Action

Potential partners: Local new town development authorities
NGOs
EEAA

Section (6):

Socioeconomic Capacity Building for SPA Staff

6. Socioeconomic Capacity Building for SPA Staff

6.1 Objective

Climate change adaptation measures involve undertaking a wide range of activities that may have a number of direct and indirect implications on socioeconomic structure of local communities. in this context, socioeconomic assessment can play an essential role in characterizing baseline conditions of the community and evaluating those groups that may be affected by suggested adaptation measures.

This highlights the need for building capacities of SPA technical staff in the field of socioeconomic assessment. Also, it is of great importance to evaluate potential for forming a core team for socioeconomic assessment.

This section is intended mainly to developing a socioeconomic capacity building program for SPA staff. To attain such overall goal, the following specific objectives were identified:

- Listing main topics of training
- Assessing interests and perception of SPA staff concerning socioeconomic training
- Developing a priority list for capacity building activities targeting SPA technical staff

6.2 Methodology

The above-mentioned overall goal and specific objectives were attained through a methodology of three main steps. The first step involved developing a full list of various topics covering various aspects of and tools of socioeconomic studies in general and those of relevance to coastal management, protection and adaptation to climate change.

Thereafter, the second step was intended to gain insight on the perception of SPA staff about socioeconomic assessment and their actual needs that are relevant to undertaken tasks in various departments of SPA. For this purpose, an online questionnaire form was designed including three main sections:

- Section (1): dealt with personal data on age, gender, department and field of specialization.
- Section (2): considered the main topics of training that may assist in improving capacities of respondent. For this purpose, the participants were asked to select one or more of proposed topics including ten different topics of training.
- Section (3): was concerned with any additional topics that may be of importance and can be suggested by the respondent.

Upon designing, the online questionnaire form was published[6] and was available for SPA staff to participate during the period 23rd of February till 10th of March 2020.

Finally, the third step entailed utilizing outcome of the first two approaches in order to develop a priority list for the capacity building activities targeting technical SPA staff.

6.3 Main Findings

Firstly, a preliminary list of socioeconomic topics was developed including the following topics:

- Socioeconomic Impact Assessment
- Sustainable Development
- GIS Applications in Assessing Vulnerability to CC
- Designing and Conducting a Field Survey
- Environmental Economics
- Climate Change Mitigation
- Economic Valuation of CC Impacts
- Socioeconomic Impacts of CC
- Population Dynamics
- Environmental Impacts Assessment
- Strengthening Institutional Capacities for CC
- Life Cycle Analysis
- Environmental Management Systems
- Ecosystem Functions
- Spatial Modeling and Predicting LCLU Patterns
- Remotes Sensing Techniques
- Participatory Adaptation
- Critical Thinking
- Environmental Auditing
- Risk Analysis
- Stakeholders Analysis and Mapping

Thereafter, the preliminary list was revised to identify topics that are of relevance to coastal management, and thus shortlisted to include:

- Socioeconomic Impact Assessment
- Environmental Impacts Assessment
- GIS Applications in Assessing Vulnerability to CC
- Designing and Conducting a Field Survey
- Stakeholders Analysis and Mapping
- Participatory Adaptation
- Economic Valuation of CC Impacts
- Socioeconomic Impacts of CC
- Spatial Modeling and Predicting LCLU Patterns
- Critical Thinking

[6] https://docs.google.com/forms/d/e/1FAIpQLSc26tjc-0-I0Zk2oA_dzWSkM8cfg3yw1dTiN6GexB6fSX1Npg/viewform

Meanwhile, the online survey, intended to consult with SPA technical staff, involved 18 technical staff members representing those who participated in the online survey, which represent about 50% of total SPA technical staff. It was found that except for age group (45-50 years old), all age categories were mostly represented in the sample. Also, it was noted that women were reasonably represented in the survey, where 28% of those participated in the survey were women while the remaining proportions were from men (**Figure 6-1**). Moreover, different departments of SPA and its regional offices were represented in the survey, which means that it is a representative sample.

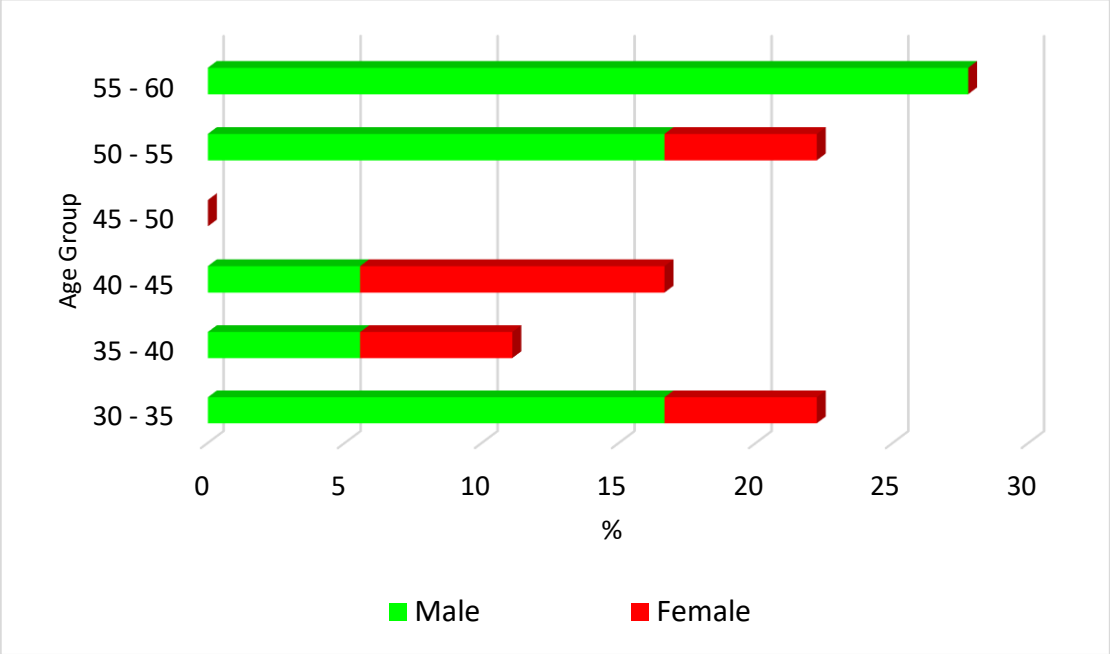


Figure 6-1: Relative distribution of the sample per age and gender

The main findings of the online survey will be discussed in the following sub-sections.

6.3.1 Interests of SPA Staff

All participants expressed their interest in participating in a number of capacity building activities in the field of socioeconomic assessment. For example, 28% selected seven topics, 22% selected four or five topics of the suggested ones. This means that about 72% of the participants selected four topics or more of the suggested list, while about 28% selected 3 topics or less (**Figure 6-2**).

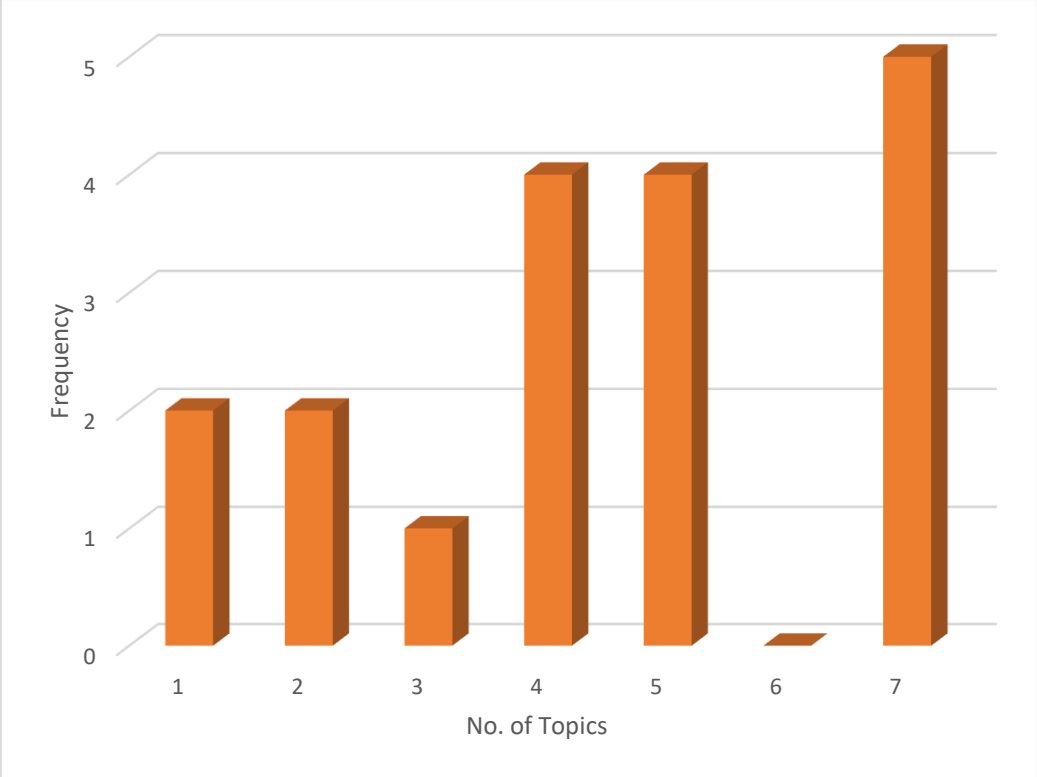


Figure 6-2: Frequency of suggested topics

This generally may indicate that SPA technical staff involved in the survey are interested in capacity building activities in the field of socioeconomic assessment. Furthermore, such high interest may emphasize that the suggested topics were of relevance to coastal management and adaptation to climate change and thus can support SPA technical staff.

6.3.2 Main Topics

among different suggested topics, socioeconomic impact of climate change was found to have the highest frequency as it was suggested by 67% of the total number of SPA staff involved in the survey. This is followed by spatial modeling and predicting LULC changes and GIS applications in assessing vulnerability to climate change. Meanwhile, both of critical thinking and designing field surveys came in the fourth order, while stakeholder's analysis came in the last order with least frequency (**Figure 6-3**)[7].

[7] It is worth mentioning that the total sum of recommended topics by SPA staff is more than the number of respondents, as people selected a range of topics and not only one.

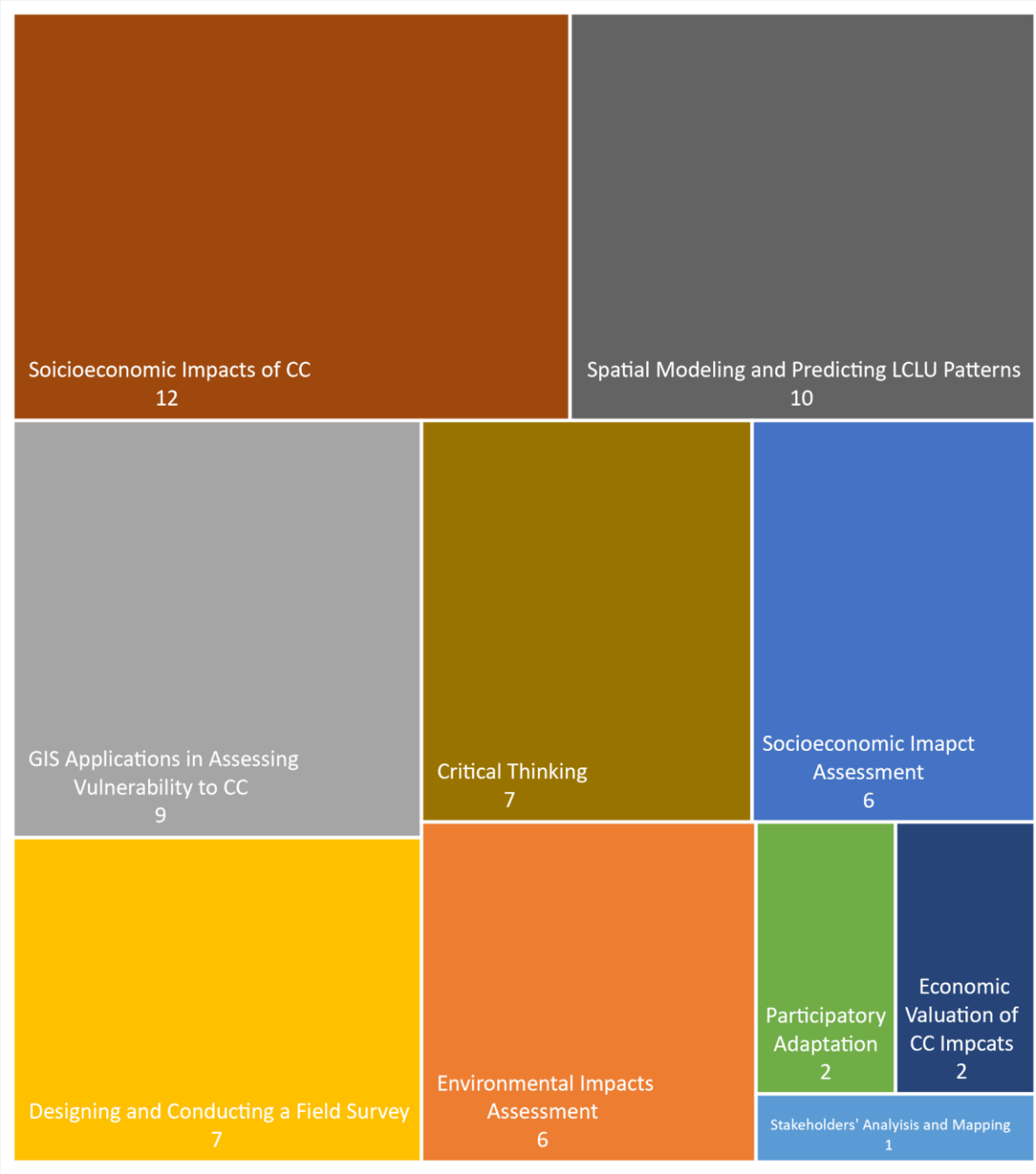


Figure 6-3: Proportional share of suggested topics

Moreover, the following five additional topics were suggested by 40% of the participants:

- How to develop a project proposal
- English language skills
- Management skills
- Surveying
- Remote sensing application in Climate change

It should be noted that, some of these additional suggested topics were found to be outside coastal management and adaptation to climate change, as they represent soft skills. Accordingly, they could be addressed by SPA management as ways of enhancing their staff's general skills.

6.4 Priority List of the Socioeconomic Capacity Building Activities

Based upon topics proposed by the consulting team and the preferences expressed by SPA technical staff involved in the survey, the priority list of the socioeconomic capacity building activities targeting SPA technical staff includes three categories of training topics as follows:

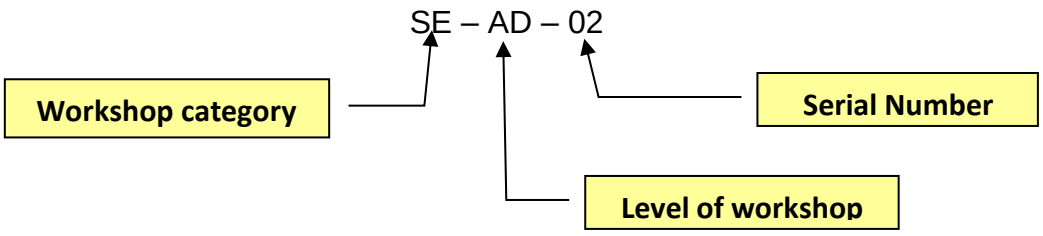
- Socioeconomic studies: This category involves mainly four workshops; two of which are introductory workshop introducing SPA staff to the domain of socioeconomic environment and socioeconomic impact assessment. Meanwhile, the advanced workshops focus upon socioeconomic impacts of climate change, economic valuation of climate change impacts and conducting a feasibility study.
- Stakeholders' engagement: This category considers mainly participatory adaptation.
- Soft skills: This category aims to support SPA staff through providing them with some advanced capabilities in terms of critical thinking.

The workshops should be organized at two levels, where the introductory workshops will target all SPA staff, the advanced workshops will involve only those who are interested in certain topics as these workshops will be based upon on-the-job training.

The workshops are coded on the basis of a three elements-coding system as follows:

- (AA) two variable characters refer to the workshop category, where:
  - SE refers to socioeconomic studies category;
  - PA refers to Stakeholders' engagement category; and
  - SK refers to soft skills category
- (BB) two variable characters refer to the level of workshop, where:
  - IN refer to introductory workshops; and
  - AD refer to advanced workshops.
- (XX) two digits-serial number

Example:



It should be noted that prerequisite for each training workshop was identified. For instance, workshop no. SE-IN-02. (Socioeconomic Impact Assessment) is a prerequisite for attending the workshop no. SE-AD-01 (Socioeconomic Impacts of Climate Change) (**Table 6-1**).

Table 6-1: Priority list of capacity building activities

S	Topic	Code	Prerequisite
1	Socioeconomic Environment	SE-IN-01	
2	Socioeconomic Impact Assessment	SE-IN-02	
3	Socioeconomic Impacts of CC	SE-AD-01	SE-IN-01
4	Economic Valuation of CC Impacts	SE-AD-02	SE-AD-01
5	Environmental Impact Assessment	SE-AD-03	SE-IN-01
6	Conducting a feasibility study	SE-AD-04	SE-AD-01
7	Participatory Adaptation	PA-IN-01	-
8	Critical Thinking	SK-IN-01	-

For each workshop to be implemented, the following steps should be followed:

- Call for offers: the offers should include technical and financial details.
- The technical offers should include:
  - Intended learning outcomes
  - Workshop syllabus
  - Detailed agenda
- Offer selection and contracting
- implementation
- Assessing training outcomes

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Annex

Annex (1): Suggested Form for Registering Grievance

مشروع " تعزيز التكيف مع تغير المناخ في منطقتي الساحل الشمالي ودلتا النيل في مصر "

Enhancing Climate Change Adaptation in the North Coast and Nile Delta Regions in Egypt Project (ECCADP)

Suggested Form for Registering Grievance

Grievance No.:	
Name:	*Name of complainant*
Address:	*Detailed address*
Area:	☐ West Burullus Outlet ☐ West Ashtom El-Gamil Outlet ☐ West Rosetta Estuary ☐ West of New Damietta City ☐ West of New Gamasa City
Source of grievance:	☐ Grievance Committee meeting ☐ Group meeting
Held on:	Click or tap to enter a date. Click or tap to enter a date.
	☐ Others (Please identify: .....)
Received on:	Click or tap to enter a date.
Issue(s):	*Description of the issue that is, or may be resulting from the protection work undertaken by the project*
Suggested action(s):	*Description of any suggested actions to deal with the issue*
Supporting documents:	*List of supporting documents, similar cases and attachments, as appropriate.*

Arabic Summary

Arabic Summary

الملخص العربي

يهدف مشروع تعزيز التكيف مع التغير المناخي في منطقتي الساحل الشمالي ودلتا النيل في مصر (ECCADP) إلى حماية تلك المناطق من مخاطر الفيضانات الساحلية الناجمة عن الارتفاع المتوقع في مستوى سطح البحر وأحداث العواصف الشديدة المتكررة، وذلك من خلال من خلال آليات وتدابير وإجراءات بسيطة تعتمد على البيئة ومواردها والتي تم دراستها من الناحية الفنية والهندسية بعناية ووضع التصميم الهندسي لها. تتمثل تلك الإجراءات في إنشاء كثبان رملية بطول 69 كم في خمس مناطق على امتداد الساحل الشمالي لدلتا النيل وهي المناطق الأكثر عرضة لخطر الفيضانات الساحلية والتي تم تحديدها من خلال العديد من الدراسات الفنية والهندسية.

وعادةً ما ينتج عن تنفيذ تدابير وإجراءات التأقلم مع الأخطار المتعلقة بتغير المناخ وارتفاع مستوى سطح البحر بالمناطق الساحلية عدد من الآثار الاجتماعية والاقتصادية – المباشرة وغير المباشرة - على المجتمعات المحلية بتلك المناطق. في هذا السياق، يمكن أن يلعب التقييم الاجتماعي والاقتصادي دورًا أساسيًا في دراسة التركيب الاجتماعي والاقتصادي للمجتمع، وتقدير أهم التداعيات الناجمة عن تدابير التأقلم المقترحة، مع تحديد أهم المجموعات الأكثر تأثراً بتلك التداعيات بالمجتمع.

وبشكل عام يهدف مكون الدراسة الاجتماعية والاقتصادية بالمشروع إلى:

- فهم وتحديد أهم الخصائص المميزة للظروف الاجتماعية والاقتصادية بمجتمعات مناطق الدراسة الخمس المختارة.
- تقييم الآثار الاجتماعية والاقتصادية المحتملة لأعمال الحماية المقترحة من قبل المشروع.
- تطوير آلية للتعامل مع الشكاوي التي قد يطرحها الأطراف المعنية نتيجة لأعمال الحماية المقترحة بمناطق الدراسة الخمس.
- صياغة عدد من المقترحات والخطوات الاسترشادية لتنمية المجتمعات المحلية بمناطق الدراسة الخمس.
- وضع وتصميم خطة لأنشطة بناء القدرات في مجال دراسة الجوانب الاجتماعية والاقتصادية تستهدف الموارد البشرية بهيئة جماية الشواطئ .

اتسمت الظروف الاجتماعية والاقتصادية للمجتمعات بمناطق الدراسة الخمس بعدد من أوجه التشابه الرئيسية. على سبيل المثال، لم تكن هناك اختلافات جوهرية بين تلك المناطق من حيث الخصائص الاجتماعية والاقتصادية للمجتمعات بتلك المناطق. حيث تشابه إلى حد ما التركيب العمري للسكان بالمناطق الخمس واتسم بارتفاع فئة السكان من صغار السن (أقل من 15 عامًا)، وهو ما يعني الحاجة إلى توفير المزيد من الخدمات والبنية التحتية بتلك المناطق لمواكبة التزايد المستمر في الطلب

على الخدمات والمرافق والمتوقع استمراره في المستقبل القريب. بناءًا على ذلك، يُعد توفير الخدمات التي تستهدف هذه الفئة العمرية جزءًا أساسيًا من أي خطط تطوير للمجتمعات بهذه المناطق. كذلك اتضح تنوع الأطراف المعنية والمجموعات المستهدفة في المناطق الخمسة، مما يعني الحاجة إلى مشاركتهم والتشاور معهم عند إعداد الخطوط الاسترشادية لتنمية تلك المجتمعات.

في المقابل اتسمت الظروف الاجتماعية والاقتصادية للمجتمعات بمناطق الدراسة الخمس بعدد من نقاط الاختلاف فيما بينها، تمثلت اهم تلك النقاط في تباينها من حيث درجة تعرضها لمخاطر الفيضانات الساحلية وبالتالي درجة تأثرها تبعاً لاختلاف خصائص الموضع الجغرافي لتلك المناطق تنوع بعض خصائصها الاجتماعية والاقتصادية. لذلك، فمن المتوقع أن يتفاوت حجم الآثار الناجمة عن الفيضانات الساحلية وإطارها المكاني من منطقة لأخرى من المناطق الدراسة الخمس. أيضًا، تحتوي كل منطقة على مجموعة معينة من الأطراف المعنية والمجموعات المستهدفة التي يجب تحديدها بعناية لضمان مشاركتها والتشاور معها خلال مرحلة العمل الميداني. تشير نقاط الاختلاف هذه إلى ضرورة تطبيق منهجيات مختلفة بمناطق الدراسة المختلفة – تتناسب مع ظروف كل منطقة - سواء عند تحديد وتقييم الآثار المتوقعة أو إعداد الخطوط الاسترشادية لتنمية المجتمعات المحلية بتلك المناطق.

أظهر التقييم الاجتماعي والاقتصادي للآثار المتوقعة لأعمال الحماية المقترحة من جانب المشروع بمناطق الدراسة الخمس أنه على الرغم من أن معظم الأجزاء الواقعة جنوب الطريق السريع الساحلي الدولي بتلك المناطق لا تتعرض للفيضانات الساحلية في الوقت الحالي، إلا أنه من المتوقع أن تزداد إمكانية تعرض تلك المناطق للفيضانات الساحلية في المستقبل في ظل السيناريوهات المختلفة لارتفاع سطح البحر في المستقبل. يتضح ذلك بشكل خاص في منطقتين؛ منطقة غرب اشتوم الجميل الجديد بمحافظة بورسعيد ومنطقة غرب مدينة جمصة الجديدة بمحافظة الدقهلية، حيث من المتوقع أن تتعرض مساحات كبيرة من المنطقتين بدرجة كبيرة للفيضانات الساحلية والغرق بحلول عام 2065 في ظل السيناريو (RCP8.5).

كما اتضح أن للفيضانات الساحلية آثار بالغة في مجال دعم جهود التنمية بتلك المناطق من خلال توفير حماية للأنشطة التنموية بها هذا بالإضافة إلى دورها في حماية الأصول والموارد الموجودة بتلك المناطق من التدمير. وهو ما يؤكد على أهمية أعمال الحماية المقترحة من جانب المشروع لما لها من الآثار الإيجابية المتعددة على تلك المناطق والتي من المتوقع أت تتزايد في ظل السيناريوهات المحتملة لارتفاع سطح البحر في المستقبل.

بناءً على ذلك، يمكن تقدير القيمة الاقتصادية لتلك الآثار الإيجابية لأعمال الحماية المقترحة من خلال قيمة الضرر الذي يمكن تجنبه نتيجة لهذه الأعمال وما يترتب عليه من حفظ للأصول الموارد بمناطق الدراسة الخمس. في هذا الإطار، تم تقدير القيمة الاقتصادية لأعمال الحماية المقترحة بنحو 275 مليون جنيه في حالة منطقة غرب أشتوم الجميل الجديد بمحافظة بورسعيد. كذلك يمكن تقدير القيمة الاقتصادية للآثار الإيجابية لأعمال الحماية من خلال تكلفة الفرصة البديلة للمناطق المعرضة للفيضانات الساحلية. في هذا الصدد، تم تقدير الآثار الإيجابية لأعمال الحماية المقترحة بحوالي 1194 مليون جنيه في حالة منطقة غرب البرلس بمحافظة كفر الشيخ. في حين تم تقدير هذه القيمة بحوالي

275 مليون جنيه في حالة غرب أشتوم الجميل بمحافظة بورسعيد، وبذلك يصل إجمالي القيمة الاقتصادية للتأثيرات الإيجابية، في موقعين فقط من المواقع الخمسة إلى حوالي 1469 مليون جنيه.

أمافي حالة الثلاث مناطق المتبقية من مناطق الدراسة للمشروع والتي تتوطن بها مدن جديدة كما هو الحال في حالة منطقة غرب مدينة دمياط الجديدة أو تم تخصيص أجزاء منها لتشييد مدن جديدة كما هو الحال في منطقة غرب مدينة جمصة الجديدة ومنطقة غرب مصب رشيد فقد تم تقدير هذه القيمة بقيمة الأصول والاستثمارات القائمة أو المخصصة التي يمكن أن تحميها أنشطة المشروع والتي بلغت حوالي 191 مليار جنيه في حالة منطقة غرب مدينة دمياط الجديدة ومنطقة غرب مدينة جمصة الجديدة، في حين بلغت هذه القيمة حوالي 1.5 مليار جنيه في حالة منطقة غرب مصب رشيد. تجدر الإشارة في هذا السياق إلى أنه على الرغم من حدوث تأثيرات اقتصادية إيجابية في منطقة غرب مصب رشيد، إلا أن نقص المعلومات حول دور أعمال الحماية في هذه المنطقة وكيفية دمج أعمال الحماية المقترحة مع الأعمال والمنشآت المخطط تنفيذها في تلك المناطق (مثل الممشى الساحلي) يحول دون الوصول إلى تقدير دقيق لتلك الآثار.

لذلك فإن هناك حاجة ماسة إلى مزيد من المشاورات مع هيئة المجتمعات العمرانية الجديدة لتنسيق تنفيذ أعمال الحماية المقترحة في حالة مناطق الدراسة الثلاث: منطقة غرب رشيد بمحافظة البحيرة والتي تخصيصها لإنشاء مدينة رشيد الجديدة، ومنطقى غرب دمياط الجديدة بمحافظة دمياط والتي توجد بها مدينة دمياط الجديدة، ومنطقة غرب مدينة جمصة الجديدة والتي يجري بها حالياً إنشاء مدينة المنصورة الجديدة. كذلك هناك حاجة ماسة أيضاً إلى مزيد من التشاور مع المؤسسات الصناعية ومطوري العقارات في حالة منطقة غرب أشتوم الجميل الجديد بمحافظة بورسعيد لتنسيق تنفيذ أعمال الحماية بالمنطقة.

وعلى الرغم من أن التقييم الاقتصادي قد أثبت أن التأثيرات الإيجابية لأعمال الحماية المقترحة من جانب المشروع تتجاوز التأثيرات السلبية – إن وجدت- إلا أن هناك حاجة - في بعض مناطق الدراسة الخمس - إلى بذل جهود متضافرة لرفع مستوى الوعي بالمشروع وأعمال الحماية المقترحة لدى الأطراف المعنية والفئات المستهدفة وأفراد المجتمعات المحلية للحد من مخاوف السكان من أنشطة المشروع وأعمال الحماية المرتبطة بها وزيادة درجة قبولهم للمشروع وأنشطته.

وقد أمكن، من خلال العمل الميداني والتشاور مع الأطراف المعنية والمجموعات المستهدفة في مناطق الدراسة، تحديد عدد من القضايا والمشاكل الرئيسية ذات الأولوية للمجتمع المحلي في حالة كل من منطقة غرب البرلس بمحافظة كفر الشيخ، ومنطقة غرب أشتوم الجميل الجديد بمحافظو بورسعيد. ويمكن تلخيص أهم تلك المشاكل فيما يلي:

- عدم وجود شبكات الصرف الصحي
- قلة فرص العمل للنساء في المنطقة
- محدودية فرص المرأة لتعزيز قدراتها
- عدم وجود مدارس ثانوية

- عدم وجود مراكز للرعاية الصحية
- انقطاع إمدادات الطاقة والمياه بشكل متكرر خلال فصل الشتاء
- ارتفاع مستوى المياه الجوفية

أما في مناطق الدراسة الثلاث الأخري، فقد تأكد من العمل الميداني والتشاور مع االأطراف المعنية والفئات المستهدفة بها أن المجتمعات الموجودة بتلك المناطق لا ترتبط بأعمال الحماية ولا تهتم بها.

على الرغم من الآثار السلبية المحدودة المتوقعة لأعمال الحماية المقترحة والمزمع تنفيذها ضمن المشروع في مناطق الدراسة الخمس المختارة على امتداد المنطقة الساحلية لدلتا النيل، هناك حاجة إلى تطوير آلية للشكاوى المتعلقة بأعمال الحماية المقترحة وما قد ينجم عنها من مشاكل محتملة. لهذا الغرض، تم تطوير آلية للشكاوى تتكون من أربع خطوات رئيسية: استلام الشكاوى وتسجيلها، وفحص مدى علاقتها بأعمال الحمية وأنشطة المشروع، وتحديد الحل المناسب والمتابعة والتقييم.

ومن الجدير بالذكر أن تفعيل الآلية المقترحة للتعامل مع الشكاوي يستلزم توفير إطار مؤسسي لضمان مستوى معين من استدامة هذه الآلية واستقلاليتها. لهذا الغرض، فقد تم اقتراح تشكيل خمس لجان لإدارة الشكاوى تختص كل واحدة منها بمنطقة من مناطق الدراسة الخمس وتضم ممثلين عن الأطراف المعنية والفئات المستهدفة بكل منطقة. بحيث تجتمع هذه اللجان بشكل دوري ومنتظم لدراسة الشكاوي التي قد يتم تقديمها من قبل افراد المجتمع المحلي بكل منطقة.

ونظراً لأن المشروع يهدف بشكل عام إلى تقليل تعرض مناطق الدراسة الخمس المختارة لمخاطر الفيضانات الساحلية وارتفاع مستوى سطح البحر، وفي هذا الإطار فقد تم صياغة أربعة مقترحات لتنمية المجتمع المحلي بمناطق الدراسة الخمس المختارة، حيث تمت صياغة تلك المقترحات وفق آلية اعتمدت في البداية على الدراسة الاجتماعية والاقتصادية لتلك المناطق وأهم ما توصلت إليه من نتائج فيما يتعلق بتوصيف تلك المناطق، تلى ذلك تحديد المشاكل التي تواجه المجتمعات المحلية بمناطق الدراسة الخمس من خلال التشاور مع الأطراف المجتمعية والفئات المستهدفة بكل منطقة من المناطق وذلك أثناء جلسات استماع وتشاور مع تلك الأطراف تمت خلال الفترة من 5 يناير وحتي 11 فبراير 2020. بعد ذلك تم وضع المقترحات والتي ركزت المقترحات المقدمة على الفئات المهمشة بما في ذلك النساء وذلك بهدف تحسين قدرة المجتمعات المحلية بمناطق الدراسة على التغلب على آثار تلك المخاطر. يهدف اثنان من المقترحات الأربعة إلى تمكين المرأة في المجتمع وتعزيز مواردها المالية المستقلة وكذلك دعمها لضمان سبل العيش لأسرتها. يتضمن ذلك زيادة فرص وصول المنتجات - التي تقوم النساء بتصنيعها والمتمثلة في الحصير - إلى الأسواق من خلال تطوير آلية لتسويق تلك المنتجات، وإنشاء مركز لتنمية قدرات النساء وتدريبهم في مجالات خياطة الملابس وتربية الحيوانات وغيرها من الأنشطة التي تعتمد على استغلال موارد البيئة المحلية.

في حين يدعم المقترح الثالث جهود تنمية المجتمعات المحلية بمناطق الدراسة واستدامتها من خلال إنشاء وحدة لتنقية مياه الشرب تعمل بالطاقة الشمسية، وهو ما من شأنه أن يعود بالعديد من الفوائد - المباشرة وغير المباشرة - على مستوى المجتمع والأسرة تتمثل في تحسين الحالة الصحية لأفراد المجتمع وبالتالي زيادة إنتاجيتهم.

أما المقترح الرابع فيتعلق بمناطق الدراسة التي تشهد إما وجود مدن جديدة أو جاري حالياً إنشاء مدن جديدة، حيث أن الاعتقاد السائد لدي الأطراف المعنية بتلك المناطق هو أن أعمال الحماية هذه سيكون لها تأثير سلبي على الأصول العقارية الموجودة بالمنطقة، وهو اعتقاد تم التعبير عنه بقوة من قبل الأطراف المعنية اثناء جلسات التشاور. لذلك، يهتم أحد المقترحات المقدمة باتخاذ بعض الإجراءات والتدابير تتمثل في مجموعة من الأنشطة لضمان دمج أعمال الحماية المقترحة مع المظهر الطبيعي والجمالي لسطح الأرض وبالتالي زيادة قبول هذه المجتمعات لأعمال الحماية المقترحة، وهو الأمر الذي يتطلب ذلك - كما أشرنا سابقاً - إلى ضرورة التنسيق مع هيئة المجتمعات العمرانية الجديدة.

وفي إطار بناء قدرات الكوادر الفنية بهيئة حماية الشواطئ في مجال تقييم الجوانب الاجتماعية والاقتصادية، تم تطوير برنامج لبناء القدرات في هذا المجال من خلال منهجية اعتمدت على ثلاث مراحل أساسية تمثلت في وضع تصور مبدئي للاحتياجات التدريبية لتلك الموادر، ثم القيام باستطلاع رأي الإدارات المختلفة بالهيئة، وأخيراً - وبناءًا على نتائج استطلاع الرأي – تم تحديد قائمة بأولويات أنشطة بناء القدرات التي تستهدف الكوادر الفنية لهيئة حماية الشواطئ، وهو ما تبلور في شكل مقترح لخطة تدريبية تم صياغتها بالتشاور مع إدارة المشروع.