**Chapter one**

**Introduction**

**1.0 Overview**

This chapter relates to the overall introduction to the study as a whole. It consists of the background of the study, problem statement, objectives of the study, research questions, scope of the study, significance of the study, operational definitions of key terms and conceptual framework of the study.

* 1. **background of the study**

Mangroves dominate the intertidal zone of sheltered (muddy) coastlines of tropical, sub-tropical and warm temperate oceans. The word ‘mangrove’ is used to refer to both a specific vegetation type and the unique habitat (also called tidal forest, swamp, wetland, or mangal) in which it exists (United Nations, 2016)

In comparison with the tropical rainforest biome which contains thousands of tree species, mangrove forests are less in diversity. But the ecosystem these trees create provides a home for a great variety of other organisms. Mangrove forests form an interface between marine and terrestrial environment.

Mangroves fall into two groups according to their habitats in nature: true mangroves and mangrove associates. True mangroves refer to species that specifically grow in intertidal zones, while mangrove associates are capable of occurring in either littoral or terrestrial habitats. (Central Marine Fisheries Research Institute | R.C. Mangalore, n.d).

A coastal ecosystem is a collection of habitats often located along the continental margins of the world. They include; coastal forests, coral reefs, estuaries, lagoons, marine-water, salt marshes, sandy beaches, rocky shores, and mangrove forests amongst others   
Feka, Z. N., & Morrison, I. (2017).

Coastal ecosystems are regions of remarkable biological productivity and high accessibility. This has made them centers of human activity for millennia. Coastal ecosystems provide a wide array of goods and services: they host the world’s primary ports of commerce; they are the primary producers of fish, shellfish, and seaweed for both human and animal consumption; and they are also a considerable source of fertilizer, pharmaceuticals, cosmetics, household products, and construction materials (World Resources Institute, 2001)

Globally, Mainland India has a vast coastline of about 5423 km length spanning 13 maritime mainland states and union territories, with diverse coastal and marine ecosystems, supporting nationally and globally significant biodiversity. The coastline also supports almost 30% of its human population who are dependent on the rich exploitable coastal and marine resources (REF, n.d)

Regionally, Tanzania has a coastline of over 800km stretching from latitude 4º49’S at the border with Kenya to the border with Mozambique at latitude 10º28’S. Tanzania is renowned for the attractiveness of its coastal and marine environments, high marine biodiversity and rich marine and coastal resources. The coastal and marine environments include amongst others: Major estuaries, mangrove forests, coral reefs, sandy beaches, cliffs, seagrass beds and muddy tidal flats. These coastal ecosystems interact with each other and together sustain a tremendous diversity of marine life, which is an important source of sustenance for coastal communities (Institute of Marine Sciences, University of Dar es Salaam, Zanzibar, Tanzania, n.d)

Locally Somalia has the longest coastline in Africa (3,025 Km), and is split ecologically into two distinct zones – the Gulf of Aden which encompasses the Somaliland and northern Puntland coastline, and the Indian Ocean coastline of northern Puntland, and central and south Somalia. Its marine resources are rich and varied, and the Somali maritime zone has one of the most important large marine ecosystems, the Somali Current Marine Ecosystem of the Indian Ocean (Fielding & Mann 1999). A prominent feature is a seasonal upwelling which gives rise to high levels of biological productivity that sustain rich fishing grounds, most notable in the northern area between Ras Asir and Ras Mabber (IUCN 2006).

Although coastal ecosystem is significantly important for Somalia, however, there are no sufficient studies related to the problem under investigation. Therefore, this study is aimed to determine the role of mangrove in coastal ecosystem in Abaay dhaxan, Mogadishu, Somalia.

* 1. **Problem statement**

Oceans cover 71% of the earth’s surface and are home to up to 2.2 million species.2 They regulate global climate, mediating temperature, driving weather systems and determining rainfall, droughts and floods: 83% of the world’s carbon cycle is circulated through the ocean, which absorbs around 30% of the annual anthropogenic carbon emissions released to the atmosphere. Oceans provide huge benefit to society. Most of the world’s megacities are in coastal zones and coastal communities often have deep-rooted cultural, social and physical interconnections with the ocean. Around three billion people source nearly 20% of their mean daily animal protein intake from the oceans,3 providing nutritional and health benefits. Oceans support millions of jobs through a variety of sectors, including fisheries, transport, tourism and energy, adding US$1.5 trillion to the global economy every year (IIED, 2019)

However, Climate change and human activities will definitely have significant impacts in Somalia. Some of the impacts include reduction in coastal fisheries production, degradation of coral reefs due to bleaching, salt water intrusion, increased flooding of low-lying areas, displacement of coastal populations and loss of coastal infrastructure. Unfortunately, studies are yet to be undertaken to determine the magnitude of the impacts of climate change (GEF et al, 2012)

Although many studies related to the problem under investigation have been conducted in many parts of the world, however studies related to this problem are missing in the study area. Therefore, this study is aimed to bridge this gap and find out the role of mangrove in coastal ecosystem in Abaay-dhaxan, Mogadishu, Somalia.

**1.3 Objectives of the study**

**1.3.1 General objective / main objective / purpose of the study**

To determine the role of mangrove in coastal ecosystem in Abaay-dhaxan, Mogadishu, Somalia.

**1.3.2 Specific objectives**

* To describe the role of mangrove on livelihood in Abaay-dhaxan, Mogadishu, Somalia.
* To identify the role of mangrove on coastal erosion in Abaay-dhaxan, Mogadishu, Somalia.
* To assess the role of mangrove on sandy beaches in Abaay-dhaxan, Mogadishu, Somalia.

**1.4 Research questions**

* What is the role of mangrove on livelihood in Abaay-dhaxan, Mogadishu, Somalia.?
* What is the role of mangrove on coastal erosion in Abaay-dhaxan, Mogadishu, Somalia.?
* What is the role of mangrove on sandy beaches in Abaay-dhaxan, Mogadishu, Somalia.?

**1.5 Significance / justification / rationale / motivation of the study**

This study will be useful for future researchers because it will act as a source of information and also a guideline for them to follow in the subsequent studies related to same problem under investigation.

The study will also be useful for institutions both public and private because it makes them aware of the existing issues and also proper ways to come up with a long-lasting solution for the researched problems.

The study will also be benefited by the local community because it creates conscious awareness of the severity of a particular problem and also the urgency of the need for a solution.

**1.6 Scope of the study**

**1.6.1 Time scope**

The study will be conducted between April to July, 2021.

**1.6.2 Geographical scope**

The study will be conducted in Abaay-dhaxan, Mogadishu, Somalia.

**1.6.3 Content scope**

The study will focus on the role of mangrove in coastal ecosystem. The study will specifically focus on the role of mangrove on livelihood, coastal erosion, and sandy beaches in coastal ecosystem.

**1.7 Conceptual framework**

IV DV

Mangrove

Coastal ecosystem

Mangrove

Livelihood

Coastal Erosion

Sandy beaches

**CHAPTER TWO**

**LITERATURE REVIEW**

1. **Introduction**

this chapter presents different literatures related to the role of mangrove in coastal ecosystem. The literature will specifically focus on the role of mangrove on livelihood, coastal erosion, and sandy beaches in coastal ecosystem. These literatures have been retrieved from various books, journals, articles and studies related to the same problem under investigation.

**2.1the role of mangrove on livelihood**

**2.2 the role of mangrove on coastal erosion**

Throughout human history, coastal plains and lowland river valleys have usually been the most populated areas throughout the world. This is due to the use of the rivers and estuaries as transport routes and to their very high biological productivity, sustaining a high level of food production (Wolanski et al., 2004). Coastal waters, including those covering continental shelves, supply about 90 percent of the global fish catch. Worldwide, there is an increasing migration towards the coasts; this has resulted in a doubling of the population along many coasts over the last 20 years. At present, about 60 percent of the world’s population lives near estuaries and the coast (Lindeboom, 2002). This rapid population growth near the coast is posing new and increasing challenges for humanity, through pollution, eutrophication, increased turbidity, overfishing and habitat destruction. Pollutants number not only nutrients, but also mud from eroded soil, heavy metals, radionuclides, hydrocarbons and a number of chemicals, including new synthetic products (Australian Institute of Marine Science, Australia ,n.d)

Coastal erosion and accretion are natural processes; however, they have become anomalous and widespread in the coastal zone of Asia and other countries in the Indian Ocean owing to combinations of various natural forces, population growth and unmanaged economic development along the coast, within river catchments and offshore. This type of erosion has been reported in China, Japan, India, Indonesia, Viet Nam, Sri Lanka, Thailand, Bangladesh and Malaysia (FOA,,n.d)

Based on studies and scientific results, the presence of vegetation in coastal areas improves slope stability, consolidates sediment and reduces wave energy moving onshore; therefore, it protects the shoreline from erosion. However, its site-specificity means that it may be successful in estuarine conditions (low energy environment), but not on the open coast (high energy environment). In some cases, revegetation fails because environmental conditions do not favour the growth of species at the particular site or there is ignorance as to how to plant properly given the same conditions. It is also possible that anthropogenic influences have completely altered the natural processes in the area. The most obvious indicator of site suitability is the presence of vegetation already growing. This can be extended by other factors such as the slope, elevation, tidal range, salinity, substrate and hydrology (Clark, 1995; French, 2001).

**2.3 the role of mangrove on sandy beach**

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