

Management of Populated Islands of Yemen (Case Study of Kamaran Island)

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Abstract:

Kamaran Island is the largest Yemeni island in the Red Sea and the second largest amongst all Yemeni islands after Socotra Island. It is one of the populated islands with a population of about 3,524. It has a variety of environmental sensitive marine habitats including the northern mangrove natural reserve. A socioeconomic survey of Kamaran Island population was conducted between years of 2014 and 2015. The study investigated the infrastructure services presented to Kamaran Island's people. Those services are including water, electricity, waste disposal, transportation, telecommunications, education, and health Services. The present investigation found that services provided by the successive governments to Kamaran Island do not meet the needs of the people. More attention should be paid to improve the socioeconomic situation of Kamaran's communities and increase their welfare and way of life.

Keywords: Kamaran Island, Red Sea, Management, Yemen.

Introduction

The Republic of Yemen is located in Southwestern corner of the Arabian Peninsula in the Middle East. It is bordered in west by the Red Sea, and south by the Gulf of Aden and Arabian Sea. The Red Sea is a semi-enclosed basin (Sofianos and Johns, 2015) that contains more than a thousand of islands (Rasul, *et al.*, 2015). Out of the 186 islands that controlled by Yemen, there are about more than 121 islands located in the Yemeni Red Sea waters (NPA 2003; EPA 2004).

Among those Yemeni islands located in the Red Sea, Kamaran Island is the largest with a total area of about 110 km² (Al Khirbash *et al.*, 2019). It is one of the populated islands of Yemen with a population of about 3,524 (CSO, 2016).

The island has a variety of environmental sensitive marine habitats including the northern approximate 3.61 Km² mangrove area, which has been declared as a natural reserve by decree No. 310 of the year 2009 (Nagi *et al.*, 2012).

Moreover, Mud and algal flats, seaweeds, sea grass habitats, coral reefs, wetlands, sand dunes vegetation, freshwater plants, saline plants are the most important habitats in Kamaran Island (Abu-Alfotouh and Al-Nusairi, 2008). However, Wood cutting of mangrove trees in the protected area is common among the local community due to poverty (Nagi and Abubakr, 2013; Taher, 2018).

Kamaran Island is considered as an essential hub for fisheries sector and it has rich marine environments as it was mentioned above. A study by Taher (2018) showed that 77.5 % of the boats owned by Kamaran's community are used for fishing activities. Moreover, it has a military importance as it forms the security belt for Al-Saleef Port at the mainland of Yemen (Abdel Rahman, 2019). It is separated from the mainland by a 2.5 km wide channel (PERSGA, 2004)

Historically, Kamaran Island is known as its importance for maritime navigation, and it was used as a quarantine for Muslim pilgrims who headed for Saudi Arabia in the season of Hajj. Its archeological, military, civil, and religious monuments are adding significant values to its importance (Abdel Rahman, 2019).

The aim of this research study is to investigate the socioeconomic situation of Kamaran's population. It will look at the services provided to them by the government and the needs by its community for improving their quality of life.

Methodology

Study Area

Kamaran Island is the second biggest Yemeni Island after Socotra. It is one of the populated islands of Yemen, and the largest Yemen island in the Red Sea. Kamaran Island has a strategic location in the Red Sea, as it is situated about 200 miles from its southern extremity. It is located in approximately 60 km to the north-west of Al-Hodeidah city (HoodOil, 2004). It is located between 15° 15' 41" and 15° 28' 48" N latitudes, and 42° 31' 32", and 42° 39' 90" E longitudes, in the southern end of the Red Sea (Fig. 1).

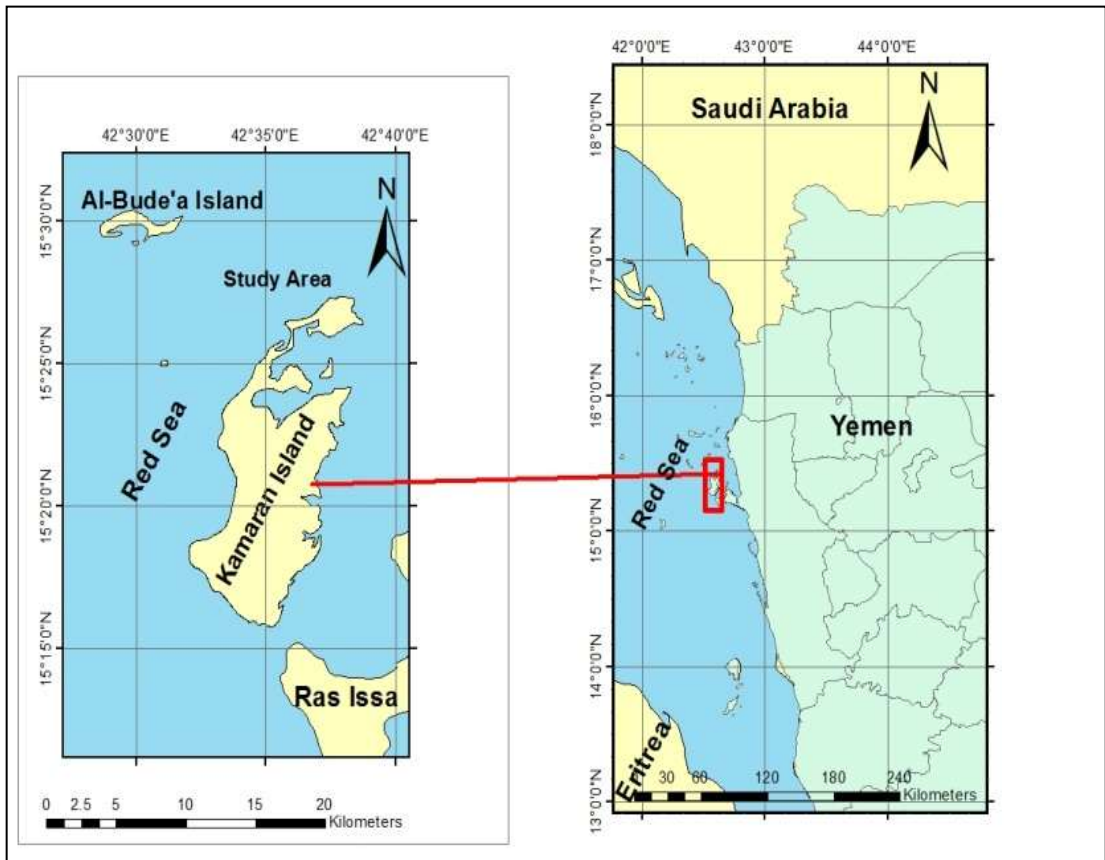


Figure 1. Location of Kamaran Island

There are three main villages in the island, viz. Kamaran village in the northeastern side of the island, Makrm village in the west (about 7.5 km far from the village of Kamaran), and Ras Al-Yemen village in the southeast of the island (about 8 km far from Kamaran village) (Fig. 2).

Materials and methods

This study was carried out from April 2014 to January 2015. During this period, four field visits were paid to the island every 3 months. Socioeconomic survey of Kamaran Island population was conducted using a questionnaire. The questionnaire was prepared and reviewed with supervisors and then arbitrated by five professors at Sana'a University. The data collected through house visits,

interviews with communities, and meetings with local authorities and NGOs. Results were analyzed using a Statistical Package for Social Sciences program (SPSS).

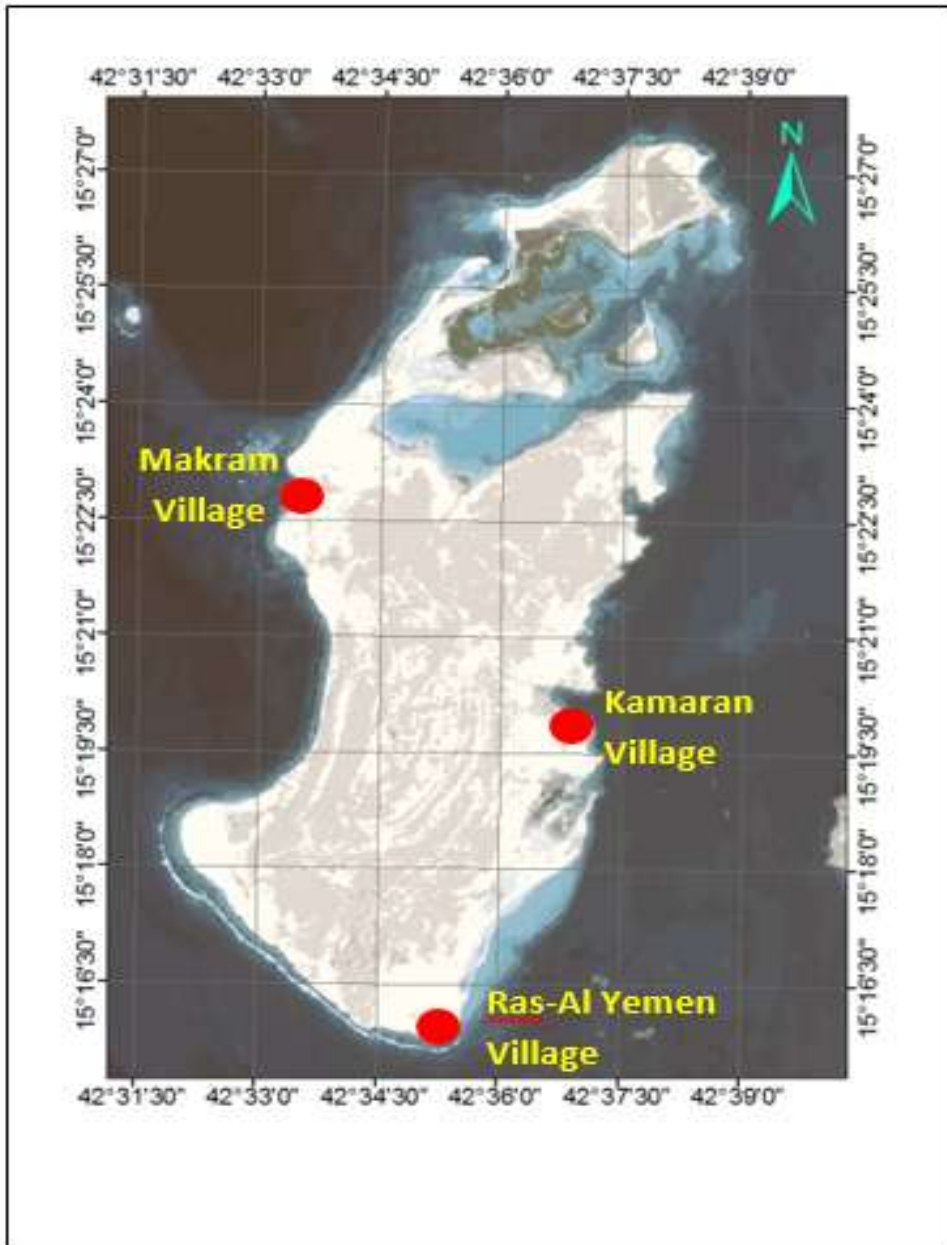


Figure 2. Location of Kamaran's Main Villages.

Results and Discussion

The present study investigated the infrastructure services presented to Kamaran Island's people. Those services are including water, electricity, waste disposal, transportation, telecommunications, education, and health Services.

Successive governments of Yemen have showed more or less interest in populated islands. For example, Socotra Island has been declared as the 22nd governorate of Yemen in the year 2013, whereas Kamaran Island is one of Al-Hodeidah Governorate's districts. Yemeni governments have provided those islands with some needed and necessary facilities.

In Kamaran Island, several governmental offices have been established to serve the local community, such as education, health care, water supply, finance, civil services, *etc* (Figure 3a). The infrastructure and services provided to Kamaran island and results found during the present survey are discussed below:

Water Supply Sector

Water is being transported to Kamaran Island from the opposite Al-Saleef village located at the mainland coast. Earlier, water used to be transported by a small tanker called "*Kendassa*" (Figure 3b). Once it reached the island, it distributed to its villages by using tanker trucks or by donkey carts. Depending on the people economic status in Kamaran, the way that they transfer water from the *kendassa*, or any other water source, to their homes differ from one family to another. The present study showed that about 75.8% of the families are using truck tankers whereas 24.2% are using donkey carts.

At Present, the *Kendassa* has stopped working and docked near Kamaran Island in a bad shape. Nowadays, water is brought from wells that are distributed in the island. About 92.3% of Kamaran families use donkey carts for transferring water from those wells to their homes. The remainder used to transfer water by foot

carrying water tanks over their heads. It is common among villagers in Yemen that women and girls are used to takeover this task.

However, the services provided to the island is at its minimal, which could be attributed to the low density of population in the island and the policy of Yemen's governorate to give more attention to highly populated areas at the mainland. Therefore, more are needed to be done in the island with regards to improve water service and conduct maintenance to the already exist ones.

The government as well as donors' organizations used to finance drilling water wells in Kamaran Island. However, the government did not establish a water supply network in the island, which could have helped people to facilitate transporting water from collecting tanks to their homes through pipelines. During the present study, people complained of the high costs of water transportation by the above mentioned ways. The present investigation also showed that all people are not satisfied with water quality. They complained of water hardness and its increased salinity that make it unsuitable for neither drinking nor washing.

In 2016, because of water supply shortage and deterioration of the water tank "*Kendassa*", a small water desalination unit was established in the island. However, the island community do not prefer to take water from this unit. They complained about its high chlorine content, which is probably due to the unexperienced staff operating this unit who might do not have enough processing techniques in the field of desalination (Figure 3c).

Power Supply

The government has provided Kamaran Island with generators that supply electricity power to each and every main village of the island through a simple electricity network. The island Local Council and Al Hodiedah governmental authorities used to secure diesel which is used as a source of power. The electricity used to be supplied to the island houses for 8 hours per day. Unfortunately, at present, diesel generators have stopped working due to the political unrest and war

situation in the country. This situation has led to reducing the financial support to the island. In addition, the increasing costs of diesel has made it unaffordable to buy by the local authority.

The present study showed that more than half of the island villagers possess electrical appliances in their homes. Therefore, they had to figure out any source of electricity to meet their daily needs. About 6.3% of Kamaran families bought their personal small gasoline generators for power supply. But the majority of the island families (35.7%) preferred the solar panels as it is the best and cheapest way to get electricity power. However, it is noticed during the present investigation that about 20.3% of the houses are still not provided by any kind of power supply. This could be attributed to the poverty and low economic situation of many families in the island.

Sewage and Solid Waste

Wastes endangers human health and environment as well (Chandrappa & Das, 2012) Safe disposal of liquid domestic and urban sewage is the environmental problem that worries the local authorities of islands. There are no sewer networks neither a sewage treatment plant. As it is common in all Yemeni villages, each house has its own underground hall that receives its discharged sewage. During the present investigation, it was found that about 71% of houses discharged their sewage into those underground halls, whereas the remaining 29% of houses are not provided with such halls and sewage are discharged from those houses directly towards the surrounding areas. This would result in increasing pollution in the island, as well as increasing the possibilities of spreading diseases among people, and put human health at risk. Such primitive ways could also deteriorate the surrounding environment, create a bad odor, and disturb the beautiful landscape.

With respect to the domestic solid wastes, they are collected from Kamaran houses and then transported by municipal workers to a specified garbage dumping site. The dumping site is located between Kamaran and Ras-Al Yemen villages. It has an

area of about 1250 m², and provided with a wall in order to avoid intrusion of animals to it. However, the dumping site is not provided with a gate to achieve this objective and it is wide open to any intruders (Figure 3d).

During the present study, it is found that about 71% of the houses' solid wastes are collected and transported to the dumping sites, whereas 29% do not follow this system and family members, particularly young children, used to carry the garbage bags and threw them anywhere outside the house. This also could increase pollution, diseases, and deteriorate the environment.

Communication Services

The present investigation showed that 37.7% of Kamaran people possess a telephone landline. Telecommunication network is only available in Kamaran village, whereas this service is not available in other areas of the island including the villages of Makram and Ras Al-Yemen. Therefore, cell phones are the most common communication devices which are used all around the island. It is the only and faster way to bring communication to those areas where landlines are not available. Mobile phone network almost covering all parts of the island, therefore, about 61.4% of Kamaran people uses cell phones for communication.

Roads and Transportation

Al-Saleef Village at the main land is considered the gate which receives people coming from Kamaran or people going to it. Fiberglass rented boats are used for transporting local people or visitors going in or out of the island. Those small boats also used for transporting domestic goods and gas cylinders to the villagers. In the island, there are not asphaltic or paved roads, only a network of single track dirt roads used by locals to link between Kamaran villages and different important areas in the island.

The present investigation showed that about 62.3% of Kamaran people do not have their own vehicles. The remaining uses their own vehicles which are mostly motorcycles and only three cars exist in the island. The vehicles are used for private purposes, or could be given for rent to help other people to reach their destinations. 2.4% reported that they do not use any of the vehicles for transportation, and move from place to another on foot, while 1% of people use animals for transportation. Cars could also be used to help students to reach their faraway schools. There was a single van provided by the Local Council meant to transport students to their schools, but, unfortunately, this van is malfunctioning at present due to lack of maintenance.

Education

There are five schools distributed in Kamaran Island, one primary school at Ras Al-Yemen Village, and one at Makram Village, while there are three schools at Kamaran Village. One primary school for boys, one for girls, and the third one is a secondary school intended for boys and girls).

There is a high ratio of illiteracy among females, particularly, the old ones, while young generation have received a good education. However, the number of schools in Kamaran Island becomes not inadequate for accommodate all student of the island. The existence of only one secondary school in Kamaran Village makes it difficult for students in Makram Village to travel all the way to it, which makes it difficult for them to complete their secondary education. Moreover, one of the primary schools in the island has been destroyed by an air strike (Figure 3e) in the existing war in Yemen that worsen the present educational situation. All the schools at the island lack of necessary equipment for education. High percent of students who completed their secondary education could not pursue their college studies at the mainland due to economic difficulties.

Health Care

Although the Government of Yemen prioritized national health care programs to serve wider segment of the public, limited resources in addition to management problems have hindered the effectiveness and accessibility of such programs. Access to adequate health care services is one of the major concerns of the residents in Kamaran Island.

There are three Health Care Units (HCU) distributed in Kamaran Island. The main health center is located in Kamaran village (Figure 3f), in addition to two small Health Care Units are located in Makrm and Ras Al-Yemen villages.

Kamaran health center is provided with an assistant doctor, few nurses, small laboratory, and minimal medical equipment. This has resulted in providing limited health care and first aid services. As a result, the quality and level of healthcare service is extremely poor. In addition to the nurses, there are several midwives who give assistance to the majority of women in Kamaran during delivery operations and provide pre- and post-natal care. Given the fact that the midwives are traditional birth attendants with limited training, women who are about to give birth are taken to the hospitals of Al-Saleef or Al-Hodiedah in case of critical situations that need professional doctors.

The present socioeconomic investigation showed that there are some endemic diseases spread in the island. The largest disease distributed among Kamaran people is malaria with a percentage of 48.3%. Other diseases found, although in lower rates are diarrhea and dysentery. Clean water, nutrition, and regulation of infectious diseases are related to the health of island people (Corvalan *et al.* 2005). About 91.7% of affected people visit one of the available health care units for treatment, while the remaining take medication on their own.

It is clear from the present investigation that health services provided to Kamaran Island do not meet the needs of the people. The number of medical staff (doctors, nurses, pharmacists, technical assistance, *etc.*) are not enough to give

adequate medical assistant to island's people. Lack of financial support allocated by the government to the health services has increased suffering of Kamaran's people.



Figure 3: (a) The governmental Offices complex in Kamaran Island, (b) Abandoned deteriorated water tanker "*Kendassa*" that used to bring water to the island from the mainland, (c) Small sea water desalination unit, (d) Solid waste dumping site of the island, (e) Destroyed school by an air strike during the current war in Yemen, (f) A health care unit in Kamaran Village.

Recommendation

Obviously, applying of integrated coastal zone management (ICZM) program is necessary in case of managing Yemeni islands. Integrated coastal zone management is aimed to manage development of coastal zones, including islands, without harming the resources (Clark, 1996). From the above study, it is necessary that the local authorities should start taking actions in order to improve the services provided to Kamaran local communities.

Starting with health care, and in order to overcome the negative health situation in Kamaran Island, many medical facilities should be provided to the island in order to meet their medical needs. Many improvement steps should be taken by the government and the Local Council such as developing a minor operations room, an integrated laboratory, labor room, and X-ray unit. The health care units should be provided with enough specialist doctors, qualified nurses, pharmacist, and necessary medicines. A standby ambulance car should be provided and put at standby at Al-Saleef village in the mainland in case of critical and emergency health situation comes from the island.

Schools in the island should be improved by increasing the number of classrooms as well as rebuild the school that have destroyed during the current war in order to accommodate more students. Transportation facilities should be provided to students in order to get them from their villages to schools. For those who completed their secondary schools, hostels for both males and females should be prepared in the nearby Hodeidah University to encourage the island's students to complete their graduation studies.

It is important that the local authorities should begin to pay a serious attention to collect and treat domestic solid wastes in a proper way that protect the environment and human health. Also, sewer networks should be established and a small sewage treatment plant suitable for the island is necessary. Due to the poverty and present drastic economic situation of Kamaran's communities, and because of

high coast and the deficit in providing the conventional energy sources to island's people, a cheap source of electricity should be made available to the poor community. Both international and local organizations should support them with funding projects addressing water and electricity supply. Improving water quality is also necessary by improving the performance of the desalination plant. All actions and plans seeking the welfare of Kamaran's community should be considered for other Yemeni populated islands.

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