

Coastal Security in Mumbai: Applicable Solutions Using GPS

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Abstract

The coastal security of Mumbai was never a great matter of concern until the terror attacks of 26/11. This is because the terrorists found their way through the waters around Mumbai. After realizing this fact, the Indian Navy established the Maharashtra Coastguard Security Exercise to safeguard the coast by installing radars and patrolling boats. This has enabled the coastline of Mumbai to stay protected. However, the existing coastal security system can be enhanced to reduce pressure on resources. The present paper tries to understand the gaps in the existing coastal security system and propose a new coastal security system.

KEYWORDS: coastal security, Mumbai, terrorist attacks, protection, geographical positioning system

Introduction

The terror attacks of 26/11, shook Mumbai and the entire world with a great shock. A large number of innocent men lost their lives, property and homes. The aftermath led to few important discussions among the concerned authorities viz. identification of the objective of the terrorists, demarcating their way to the city and ensuring that the city is in safe hands so that its people live with peace. During the investigation, it was found that the terrorists found their way to the city through its waters; this made coastal security of Mumbai an alarming issue. It then found its place in the limelight and was moved from the edge to the fore of every discussion, action and policy formulation. The present paper intends to recommend certain new measures to improve the coastal security of a global city-Mumbai.

(HT, 2016) “After Union home minister Rajnath Singh emphasised the need to safeguard India’s coastline, the focus is back on Mumbai’s coastal security — which faced its worst-ever terror attack from the sea” **(Indian Navy, 2015)** Coastal patrolling by the Navy, Coast Guard and Marine Police has increased sharply over the last few years. At any given time, our entire coastline is under continuous surveillance by ships and aircraft of the Navy and Coast Guard. As a result, potential threats have been detected and actions have been taken to mitigate them in good time. **(The Indian Express, 2016)** Highlighting ‘severe security lapses’ in the coastal areas of the city, the fishermen community has claimed that the “negligence” of the fisheries department and the Marine Police could lead to another incident like the 26/11 terror attacks. Tandel claimed that despite pointing out the security lapses to the authorities, the coastal areas are left unguarded, leaving them open to exploitation by terrorists. “More than 700 unlicensed boats have come in from Gujarat with smuggled goods and they travel in the water unsupervised. Terrorists can come in on any of them,” he said.

The research objectives of the present study are as follows:

- To analyse the existing coastal security system of Mumbai
- To understand the gaps in the system
- To recommend applicable solutions using GPS

The area of study chosen is the city of Mumbai **(Fig: 01)**. The city constitutes of seven islands having fishing and trading as its indigenous commercial activities. The city is surrounded by Arabian Sea on its West, Ulhas River in North, Thane Creek in

the East and Arabian Sea in the South. It is the state capital of Maharashtra and financial capital of India. It is a major industrial hub for the entire nation. Its latitudinal extension is from 18⁰ East to 19⁰ East and longitudinal extension is from 72.82⁰ North to 73.00⁰ North approximately. The development of the city is credited to its potential for marine trade along its 149 kilometres long coastline which has sustained till date. The coast of Mumbai has been serving as excellent harbours which have been then converted to ports. However, due to anthropogenic activities, a lot has been changed along the coastlines and caused both negative and positive effects. The case studies are from Gorai and Mira-Bhayander areas of Mumbai.

Materials and Methods

The research methodology adopted for the present paper is systematic in nature. The present study is based primarily on secondary data collected from various online and offline sources. The major source of information has been news articles and government websites which have highlighted the need of costal security and coastal security system in Mumbai. The researcher has attempted to present her idea of existing coastal security and proposed coastal security of Mumbai spatially using QGIS v. 2.14.0 mapping software.

Results and Discussion

After the terrorist attacks of 26/11, Mumbai's coastal security has been considered as a serious issue. After several meetings, expert advices and mapping at various levels, a planned security system has been introduced along the coastline of Mumbai and rest of Maharashtra.

Figure 02 represents the existing coastal security system with the help of a map created by the researcher with the help of conclusions drawn from secondary texts and data. It can be observed that at 12 nautical miles (nmi) from the coast of Mumbai, several radars have been set up with overlapping ranges. These radars aim at covering each and every parcel of water so that even a single ship tries to cross the borders, it can be tracked and checked for. To fulfil the gaps between radar ranges, small radars are also installed to avoid any intrusion. Similarly, the Indian Coastguard ships continuously patrol between 12nmi and 22nmi so that intrusions can be avoided and changes in sea conditions can be notified in advance. This also helps the lost ships and pirates to find their way in the sea. Besides these practices, the local fishermen community is heavily relied upon for their observations of possible threats, if any.

With the existing coastal security system, it is possible to safeguard the coast of Mumbai in an efficient way, however, this system requires huge maintenance cost, manpower and fuel to operate the machinery. It may be based on advanced mechanisms; the system lacks modern technology and is prone to human errors.

The fishermen on whom the system depends for information, are not paid for their job. They do not have any technological equipment to help them, rather their experiences and observations are counted for the threats on the city. this may be a case of serious concern as it is prone to human errors.

Here, with the help of this study, several technological and policy suggestions are attempted to be made.

It is advisable to use GPS- Global Positioning System for improving coastal security along Mumbai. GPS is a tool which helps in identifying location and helps improve navigation skills of the user. Therefore, GPS can be used to improve efficiency of information given to the base office.

Using GPS has several advantages viz. it works on battery, hence minimizes use of fuel. GPS is based on satellite data, the constellation of which is already operating in

space in an efficient manner. This would not pose higher installation charges and would also be safer.

GPS can be used in two ways as follows:

1. The GPS receiver can be installed on fishermen's boats so that they do not get lost in the sea and cross the border as in the case of Gujarati fishermen. This will help them track their location by beeping a light followed by a loud siren as soon as they cross the marine borders.
2. The Indian ships and boats can be given a registration number like a digital code or a unique identification number which will be highly confidential. These numbers can be registered with the software and uploaded in the GPS receivers. These known GPS receivers can be installed on fixed structures like rods. As soon as a ship or a boat which is not registered with the software crosses the limit of 22nmi, the apparent fence formed by GPS receivers shall flash lights followed by a loud alarm to intimate the threat.

This system would not require manpower to be present all the time in the sea. It would reduce the effort of supplying resources and salary dissemination to a large group of employees with the Indian Coastguard Agency. However, the base of the system or the monitoring station could be situated just at the coast so that the taskforce can be sent immediately in case of threat identified by the GPS receivers. This would require a highly skilled and trained team of navy to combat the threat. Also, the required weaponry, machinery and resources can be kept in ready position to face the threat at all times.

The fishermen can be offered small incentives in exchange of valuable and true information disseminated by them. However, their information would just be a cross verification in case of extreme threats identified by the GPS fence.

To conclude, it can be said that the existing coastal security system of Mumbai is stringent but is not economically feasible. It poses great pressure on resources like money, food, machinery and fuel. The proposed security system helps minimise the pressure on resources and dependence of manpower. This further can help improving the efficiency of the security system and reducing maintenance cost too.

Following are some of the recommendations of the study:

- The proposed coastal security system can be tried as an experiment in Mumbai and then be implemented in other areas.
- Help of GIS and GPS experts with the support of programming professionals is crucial in this project.
- The security base needs to be developed before the installation of GPS fence so that the security is not breached at any point of time.
- Also, only after the new system is installed, should the old system be eradicated to avoid security breach.
- The unique identification number assigned to ships and boats must be kept confidential with the ministry of defense

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References

- Express News service (2016) Coastal security still poor: Mumbai Fishermen. Available online at
- <http://indianexpress.com/article/india/india-news-india/coastal-security-still-poor-mumbai-fishermen-4395530>

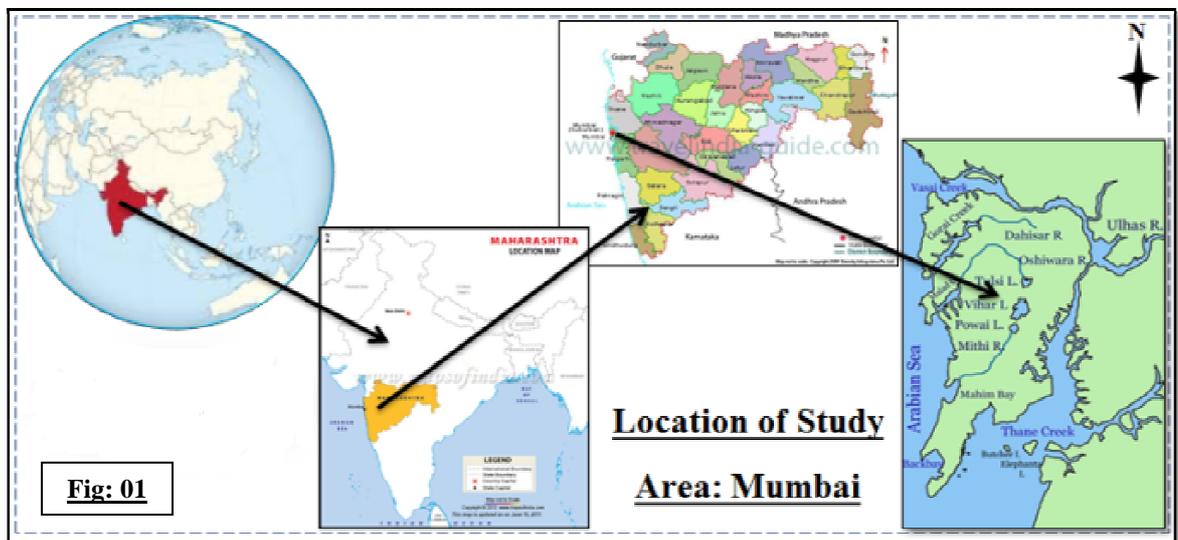
- Hindustan Times (2016)Coastal security: Mumbai better prepared after 2008 attacks, but not fully. Available online at <http://www.hindustantimes.com/india-news/coastal-security-mumbai-better-prepared-after-2008-attacks-but-not-fully/story-2z7jbKWVSd9AI8IZREH4qI.html>
- Indian Navy (2017)Maharashtra Coastal Security Exercise. Available online at <https://www.indiannavy.nic.in/content/maharashtra-coastal-security-exercise>

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Figure 1: Location of the Study Area

Figure 2:Researcher’s Interpretation of the Existing Coastal Security around Mumbai

Figure 3: Proposed Coastal Security System by Researcher for Mumbai



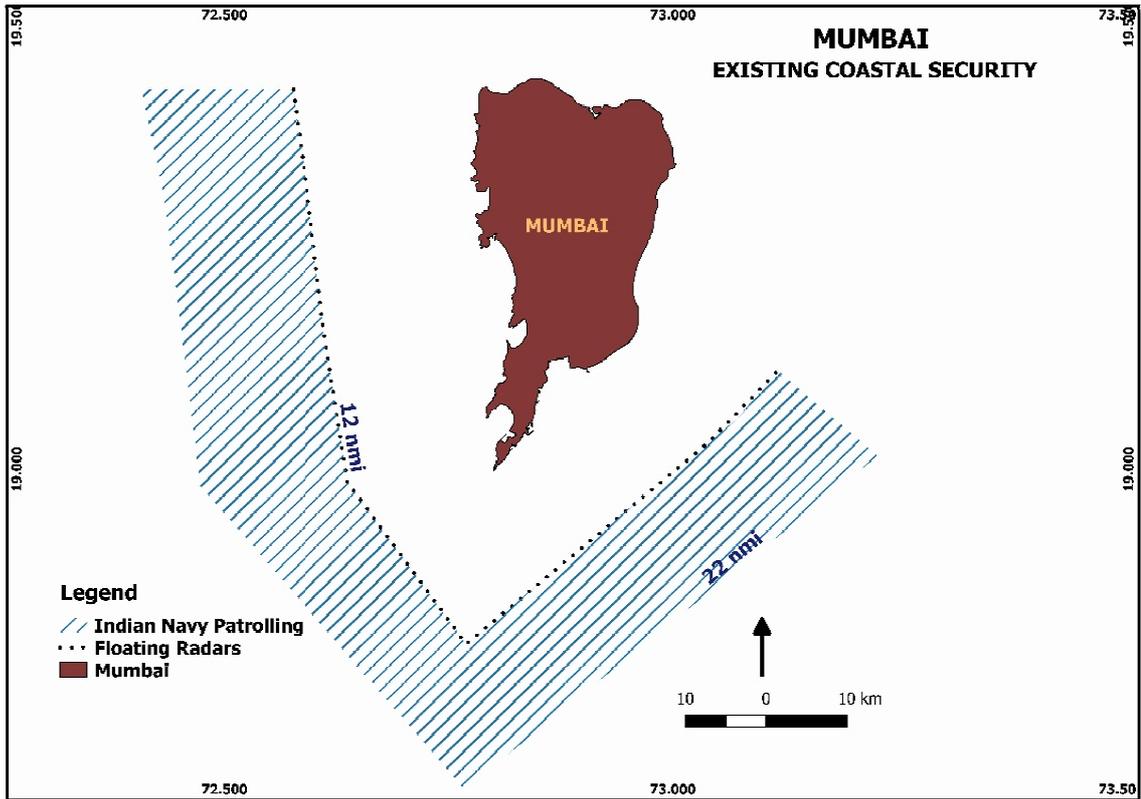


Fig: 02: Researcher's Interpretation of the Existing Coastal Security around Mumbai

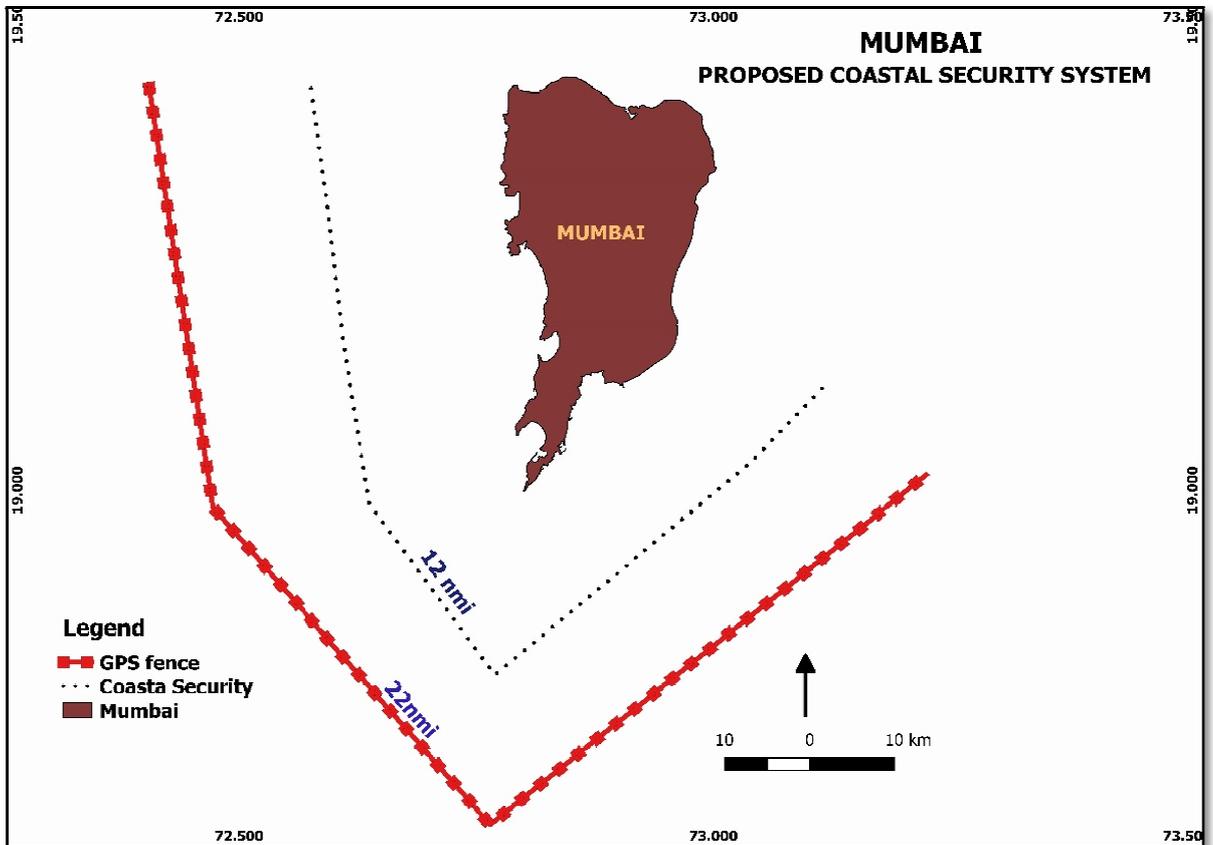


Fig: 03: Proposed Coastal Security Systemby Researcher for Mumbai