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Vessel Monitoring System-An Overview

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SUMMARY

A Vessel Monitoring System (VMS) is a satellite-based monitoring system which provides data on the location, course and speed of vessels to the fisheries authorities at regular intervals. A VMS is essential for the country like India having over 2 million km2 of the sea space. In the initial stage a VMS can bring in its ambit the larger deep-sea fishing vessels (>20 m OAL) and all the foreign fishing vessels permitted under the deep-sea fishing schemes to fish within its EEZ. The Ministry of Agriculture has seized the issue and is expected to implement a VMS, which could help in knowing the fishing activities and their operational details on regular basis.

INTRODUCTION

The FAO maintains that fisheries Monitoring, Control and Surveillance are key components of the fisheries management process. Monitoring includes collection, measurement and analysis of data pertaining to fishing. The Monitoring data includes information Catch Species composition fishing effort, by catch, Discard, Area of operations, etc. These primary data can be used Illegal fishing has been recognized as one of the greatest threats to marine ecosystems and the communities, which depend on them. Controlling involves the specification of the terms and conditions under which resources can be harvested. These specifications are normally contained in National fisheries legislation and other sources that might be national or sub regional. Surveillance involves the regulation and supervision of fishing activity through National legislation, Term, Conditions of access, and Management measures. To implement MCS, increased cooperation among nations has been stressed during the past decade. VMS is an effective tool for the successful MCS of fisheries activities. VMS provides a fishery management agency with accurate and timely information about the location and activity of fishing vessels (FAO 2013). Before the introduction of VMS, traditional monitoring methods are Surface and aerial patrols, On-board observation, Dockside interviews, Logbook source followed. They are time consuming and cost effective.

Importance of VMS

Management purposes - The analysis of VMS data can provide spatial and temporal grids about fishing effort, which is necessary information for management purposes.

Scientific purposes - "Good quality" estimates of fishing effort are required in order to design management plans for the operation of different fishing gears and for modelling purposes

Maritime Spatial Planning Directive - The VMS is a key part of the Monitoring Control and Surveillance (MCS) programmes at national, European and international levels and can be used to improve the management and sustainability of the marine environment.

Modelling purposes - The analysis of VMS data can be a significant input for several modelling approaches combining VMS data with bathymetry, environmental and oceanographic data, fisheries data (catches, landings, discards), sea bottom types and habitats.

Components of VMS

Shipboard Equipment- Antenna, Transceiver, External Power source and Cable- VMS unit (Automatic location communicator). The antenna is installed in a place where it has continuous, unobstructed view of the satellite. The antenna site must be suitably distant from antennas of other communications systems, navigation antennas or magnetic compass

Space segment- It has communication system which gets reports related to position and other messages from the Shipboard equipment .It communicates with the Fisheries Monitoring Centre (FMC). The satellite used for the space segment in most fisheries VMS programs are Argos (California), Inmarsat-C and D+ (London), Iridium (US), Orbcomm and Qualcomm (EutelTRACS in Europe and Boatracs in North America).

Fishery Monitoring Centre (FMC)- It receives the data from satellite and transmitted to the end users through commercial data networks. MS data can be accessed from FMC only by authorized persons. The FMC collects the data, validates and stores them, and makes the information available for analysis.

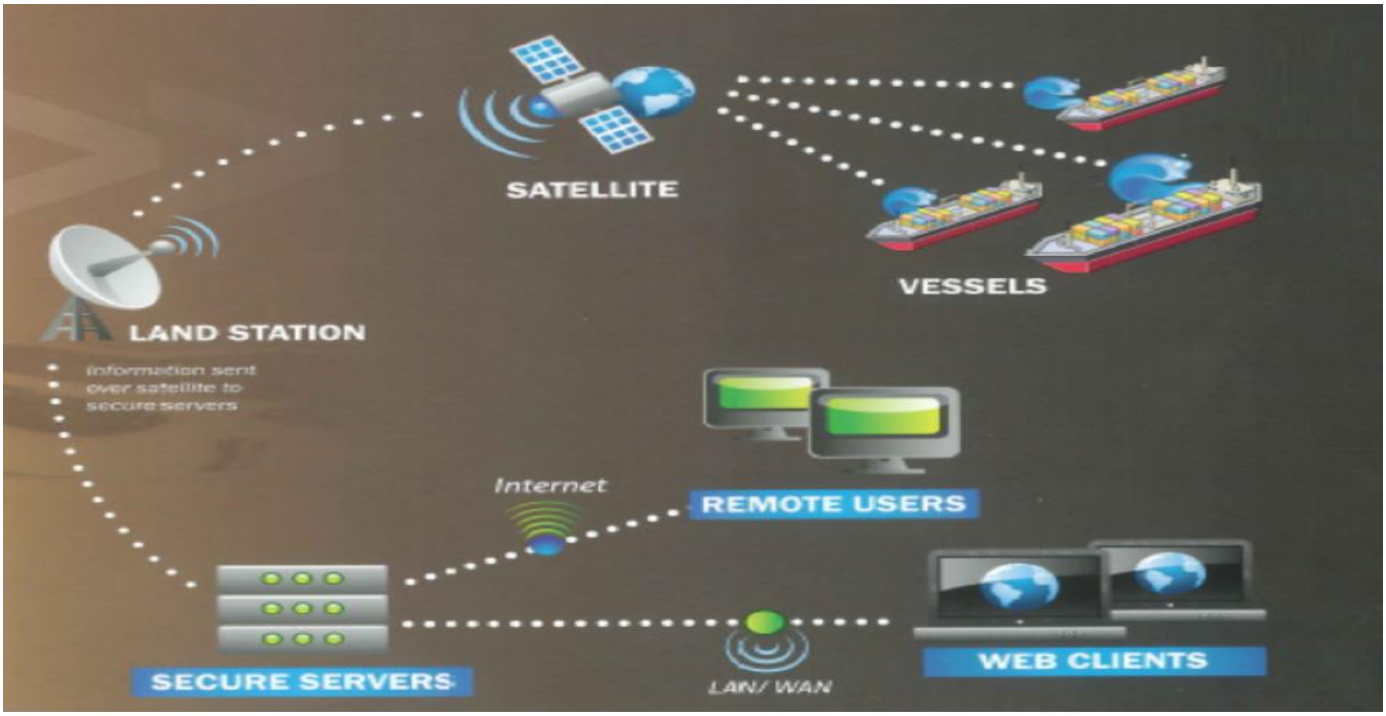

Fig 1. Working principles of Vessel monitoring system

Current Status of VMS in the world

- Indonesia -- All the vessels of a gross tonnage higher than 30 tons have to install a VMS transmitter before starting fishing activities on Indonesia Water Region and the high seas.
- European Union (EU) -- length exceeding 15 meters are required to install a satellite-based Vessel Monitoring System (VMS) on board to prevent the illegal activities
- The United Kingdom – on board of fishing vessels of 12 meters and greater (OAL) have to install VMS.

Status of VMS in Indian vessels

Satellite-based Vessel Monitoring system for small fishing vessels (less than 20m) across the country's coastline was initiated the aftermath of 26/11 Mumbai attacks. The action is still pending primarily due to two reasons: (i) Non –compliance of fisherman and (ii) Union –State conflicts

(i) Non –compliance of fisherman

a) Fishermen don't want to get tagged as they do not want any of their illegal activities recorded

b) They are also doubtful that others will get to know of where there is good catch.

(ii) Union –State conflicts

As fishing is a State subject, there are local politics involved between the Union and State Governments

Initiatives taken in India

Trials have been conducted with VMS fitted in the vessels in states such as Maharashtra**,** Gujarat and Tamil Nadu**.** Central government provides Tracking Devices for traditional and motorised vessels with the subsidy assistance 40% for general category and 60% for SC/ST women category under PMMSY (central government scheme, May 2020).

Application and its use

- Tracking the fishing vessel locations will be possible for inspection.
- Deterrent – illegal activity can be assessed

- Probable cause of an event at sea and targeted investigations would be possible
- Targeting landing and at sea inspections
- Under declaration of catch can be revealed out.
- Activities of fishing vessel can be monitored.
- E-logbook system on catch information would be possible.
- Data generated can be used for Fisheries research and analysis
- Safety can be ensured through communication if vms is available with the vessel.

Limitations of VMS

It is mostly used for monitoring vessels in compliance with their area and time. However, these areas may be restricted for monitoring, navigation, etc. such area may include EEZ, treaty zones, respected fishing areas, etc. VMS is also not very useful it comes to other types of regulation then just location or time. Vms can monitor operational aspects of fishing activities, but it is not possible to monitor measures like target species, gear and vessel configurations, discards, illegal tampering, etc. Thus, traditional inspection method needs to be used.

CONCLUSION

Rapid technical progress of VMS has no doubt opened a new era in fisheries management and research. While the technology has traditionally been used for vessel monitoring, taking advantage of its various functions increases the utility of VMS. These have demonstrated the potential of VMS for Advance sustainable fisheries management and are encouraging managers to further apply VMS to management in a practical manner.

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