BOBP/REP/143

Strategic Workshop on Communication Needs of Marine Fishermen

9-10 November 2013
Chennai, Tamil Nadu

Department of Fisheries
Government of Tamil Nadu

IFAD fishMARC

BAY OF BENGAL PROGRAMME
INTER-GOVERNMENTAL ORGANISATION

BOBP/REP/143

Report of the Strategic Workshop on Communication Needs of Marine Fishermen

09 - 10, November 2013
Chennai, Tamil Nadu

Bay of Bengal Programme
Inter-Governmental Organisation
91, Saint Mary's Road, Abhiramapuram
Chennai - 600 018
Tamil Nadu, India

This document records the proceedings of the '*Strategic Workshop on Communication Needs of Marine Fishermen*' jointly organized by the Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO); Department of Fisheries (DoF), Government of Tamil Nadu (GoTN); Post-tsunami Sustainable Livelihoods Project of the International Fund for Agricultural Development (PTSLP); and Fisheries Management Resource Centre (fishMARC). The Strategic Workshop was organized in Chennai, Tamil Nadu, India during 9 - 10 November 2013. The designation employed and the presentation of material in this Report do not imply the expression of any opinion whatsoever on part of the BOBP-IGO/DoF-GoTN/PTSLP/fishMARC concerning the legal status of any country, territory, state or its authorities or concerning the delimitation of its frontiers or boundaries. Opinion expressed in this publication are those of the authors/speakers and do not necessarily reflect the views of the Organizers of the Strategic Workshop.

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Report of the Strategic Workshop on Communication Needs of Marine Fishermen

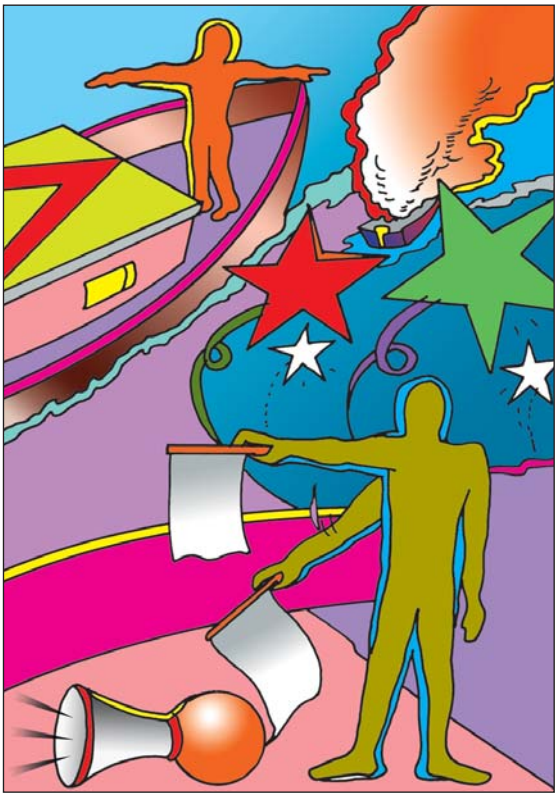
Executive Summary

A two day Strategic Workshop on 'Communication Needs of Marine Fishermen' was held on 09 - 10 November 2013 at Hotel Ambassador Pallava, Chennai. The Workshop was jointly organized by the Department of Fisheries (DoF), Government of Tamil Nadu (GoTN); the Post Tsunami Sustainable Livelihoods Project (PTSLP) of the International Fund for Agricultural Development (IFAD), Chennai; Fisheries Management Resource Centre (fishMARC), Thiruvananthapuram; and the Bay of Bengal Programme Inter Governmental Organisation (BOBP IGO), Chennai.

The objectives of the Strategic Workshop were to assess the communication needs of fishermen in terms of technology and equipment for improving safety at sea; evaluate available technologies and their financial requirements; and chart a roadmap for integrating communication needs into a larger fisheries management framework. The Strategic Workshop was attended by 146 participants representing the concerned Ministries/Departments of the Central Government, Government of Tamil Nadu, Research and Development Institutions from Chennai and elsewhere in the country, Experts, Inter- Governmental and Non-Governmental Organizations and Fishermen Associations.

The Strategic Workshop began with a welcome address by Mr C Munianathan, Director, DoF-GoTN. Referring to the genesis of the Workshop, Mr Muniananthan said that the Hon'ble Chief Minister of Tamil Nadu had made a statement on the floor of the State Assembly on 05 April 2013 regarding the need for seamless communication for marine fishermen and announced supply of communication equipment to the fishermen with a subsidy component of 75 percent. The welcome address was followed by an introduction to the Strategic Workshop by Dr Yugraj Singh Yadava, Director, BOBP-IGO. Dr Yadava said that fishing has been recognized as one of the most dangerous occupations in the world, along with mining and aviation. According to the statistics of the International Labour Organization (ILO), annually about 24,000 fishermen die at sea. Stressing the importance of safety at sea, he said that apart from personal flotation devices and good quality boats, aspect such as seamless communication network at sea was vital. Referring to the Fisheries Policy of the Tamil Nadu Government, Dr S Vijayakumar, Secretary, Department of Animal Husbandry, Dairying and Fisheries, GoTN, said that the Hon'ble Chief Minister had stated that fishers in Tamil Nadu would be provided with communication facilities for use, especially at times of distress. He said that in the pilot project implemented in Ramanathapuram District, a number of issues had come up including the issue of licence, multiplicity of regulatory authorities, types of fishing crafts being used by fishermen and the different technologies available. Mr L Shankar, Joint Commissioner (Fisheries), Department of Animal Husbandry, Dairying and Fisheries (DAHD&F), Ministry of Agriculture, Government of India (GoI) in his opening remarks spoke about the marine fisheries policies of the Central Government.

Mr N Ravi Shankar, Special Secretary, Department of Telecommunications, GoI, delivered the keynote address. Speaking on 'Telecom Policies for Marine Communications', he said that under the National Telecom Policy, 2012, telecommunication is seen as an infrastructure requirement that can have great impact on the socio-economic development in the country. Mr Ravi Shankar further informed that ambitious development targets were set up by the GoI for taking telecom infrastructure everywhere that would result in the increase in voice communication facilities from the current level of about 42 percent in rural areas to about 70 percent by 2017 and 100 percent by 2020. He also stressed on the need for coordination between the Department of Telecom (DoT) and the Ministry of Home Affairs as well as the Ministry of Shipping and the Ministry of Space (for satellite communication) and said that the Telecom Department would strive to address the communication related issues of the marine fisheries sector in a holistic manner.



Dr T S Sridhar, Additional Chief Secretary and Commissioner, Revenue Administration, GoTN and Chairman of the Opening Session gave the Inaugural Address. Appreciating that a number of organizations had come together in a coordinated manner for the benefit of the fisheries sector, he said that the State Disaster Management Plan, which was under preparation aims to move from reactive to preventive and various preventive and mitigation measures as well as infrastructure were being put in place. Dr Shridhar said that the World Bank's Coastal Disaster Risk Reduction Project (CDDRP) was also being finalized, which is likely to further improve the situation. Dr Shridhar wished the Workshop all success and hoped that sound recommendations would emerge from the deliberations.

Mr V Vivekanandan, Secretary, fishMARC proposed the vote of thanks.

In the Technical Session on 'Providing the Background' two presentations were made.
Dr S R Muthusamy, Consultant, World Bank Project made the first presentation on "Marine Fisheries of Tamil Nadu and their Communication Needs". Dr Muthusamy elaborated on the coastal districts, fishing crafts and gear, number of fishing days, distance from shore travelled by fishermen and the scope of communication devices for different segments of the fishing sector. He also correlated the fishing voyage days and the distance of the fishing grounds and emphasized on an efficient, cost-effective and economic communication technology, especially for the offshore and deep sea fishing sector. In the second presentation, Dr Y S Yadava said that safety at sea cannot be looked in isolation. It is an integral part of fisheries management. He said that while personal floatation devices and communication networks were the basic needs of sea-going fishermen, long-term measures to ensure safety and well-being of fishers required sound management of the sector as a whole.
Dr Yadava also emphasized on the integration of fisheries management and fisher's safety with a sound Monitoring, Control and Surveillance (MCS) system and said that rather than adopting a complete command and control mechanism, MCS regime in the Indian context could be community driven, especially keeping in mind the very high proportion of small-scale fisheries in the sector.

Following the two presentations, a Fishermen Panel comprising 07 fishermen/fisher association representatives spoke on the communication and safety equipment used by them and also explained the challenges they faced at sea and their immediate and long-term requirements for ensuring safety at sea. The panel members said that presently they used mobile phones and VHF sets for meeting their communication needs, but both equipment were useful only for near-shore communication, or in the case of VHF from boat to boat when communication with the shore was not possible. They detailed their problems with respect to lack of communication facilities when they were fishing in offshore waters, difficulties in communicating with the Indian Coast Guard (ICG) and the long response time in attending to the call of fishermen in distress. They suggested that the Government may consider providing communication equipment that would work when they are beyond the reach of VHF and a 24X7 service and also satellite phones that would allow them to undertake fishing at longer distances, at times even outside the Indian Exclusive Economic Zone (EEZ).

The panel also requested for software that could provide them information on bathymetry and fish location and also wanted to know if low-cost radar could be developed for fishermen to help them locate the position of their boats, especially at night. Further, the Government may consider providing Distress Alert Transmitter (DAT) to all the boats; the ICG may deploy a vessel with a helicopter on board to mount Search and Rescue (SAR) as and when required and such a vessel could be stationed in Nagapattinam in Southern Tamil Nadu; life floats should be provided to the boats as they would be more useful in protecting them from cold water as also from fish and sea snake bites. Finally, it was also suggested that the multi-day fishing vessels would need High Frequency (HF) sets and control rooms should be set up for receiving information from the fishers and *vice versa*.

In the next Session, the Service Providers made brief interventions on the technologies and the services that they could provide to establish a seamless communication network for marine fisheries

sector in Tamil Nadu. The representative from Bharat Sanchar Nigam Limited (BSNL) provided details on the extensive coverage by BSNL in Tamil Nadu and said that BSNL-TN circle and the DoF-GoTN could work out modalities for taking on lease BSNL's towers located in the State. He also sought clarity on the restrictions placed on broadcasting signals 10 km from the International Maritime Boundary Line by the GoI. Reliance Communications, speaking on behalf of all the cell phone service providers (Aircel, Airtel, TATA Docomo, Idea, Vodafone, etc.) said that they were offering GSM (Global System for Mobile Application), CDMA (Code-Division Multiple Access) mobiles, landline phone, wireless broadband, etc. and said that they were capable of providing the required service to the fishermen but because of security reasons the broadcast distance was limited. The service providers also said that application-based solutions could be developed and customised for the fisheries sector, if required.

The service providers said that no single equipment would solve the problem but a system with multiple ranges and multiple actions was required. Besides, it may also be important to consider the requirements of the users and the roles and requirements imposed by the DoF-GoTN, DoT, Wireless Planning and Coordination Wing (WPC). It was opined that most fishermen were using LMR (Land Mobile Radio) meant for communication on land and not the sets meant for marine communication. It was also suggested that for range enhancement, high-rise towers with repeater stations could be considered or by using portable repeater arrangement located on an ICG vessel in the sea. It was further informed that now digital HF sets were also available and they could considerably reduce the noise and make communication more easy and seamless. TATA communications representing INMARSAT (International Maritime Satellite Organization) explained the range of services including value added services offered by INMARSAT. With respect to the mandatory permissions required to obtain the use of satellite phones, the INMARSAT representative said that there were two mandatory requirements, namely a) the end user's No Objection Certificate from the DoT; and b) consent from DoT to provide service in India. With respect to tariff, it was possible that the rates could come down (say from Rs 150 a minute to Rs 60 a minute) if a large number (*e.g.* 500) of fishing boats used the service. The potential users could be anyone in the marine or land segment. It was further informed that the size of the satellite phones had also reduced with the availability of hand-held devices. However, with regard to security angle their usage at sea was still very restricted. Further, the Closed User Group (CUG) was mainly with reference to tariffs and did not prevent incoming or outgoing calls and controls in terms of tracking could be done from one place.

In the next Session, independent experts presented their views on the technology and the needs of the sector. The ICG representative emphasized on the need for coordination and suggested that community interaction programmes in all coastal districts could be organized to demonstrate various technologies. The representative from the Indian Institute of Technology, Madras said that as the VHF works on the 'line of sight' principle, communication is limited to about 50 km. In warm air, VHF signals move faster and thus good weather conditions can extend the range to 100 km but this is highly unreliable. Similarly, HF radios were like shortwave radios with unlimited range and could work up to thousands of km. Since HF relies on ionosphere, it is susceptible to interference due to sun spots and other solar activities, etc. Therefore, under the circumstances, satellite phones appeared to be the most feasible solution, especially with the use of GMR2+ standards (Geo-Mobile Radio), which allowed GSM near the shore and satellite phones deeper into the sea. He said that regulatory issues due to the perception of security threat were delaying introduction into India. However, satellite phones were also expensive and cheaper sets were yet to be available in India. The representative from the Indian Meteorological Department (IMD) said that the IMD warning messages were sent to the DoF, All India Radio and the Commissioner Revenue Administration, GoTN. He said that there were limitations in HF radios and satellite phones were expensive but solutions could be sought. Suggestions from other experts included the need for addressing policy and regulatory issue; training and capacity building needs of fishers; use of solar batteries for communication systems, which could help in reducing use of engine and hence

fuel; interoperability of cell phones, especially at times of disaster, etc. The experts were also of the view that there was a need to move from 'fishing as a vocation' to 'fishing as a profession' that would help the sector in transition to a professional approach.

In the Session on 'Group Discussions', the Workshop participants were divided into three groups and discussed issues relating to the need for good communication strategy; simple and easy to use technology that also provides information on weather and potential fishing zones, etc.; provision of equipment (VHF/HF/satellite phones/DAT) with subsidy component; provision of life saving appliances (LSA) such as life floats, etc; proper and well-coordinated SAR strategy, which also has provisions for quick rescue; setting up of control rooms and connecting it to the State Disaster Management Centre; monitoring of all types of communication equipment; interoperability between all communication networks, especially at time of disaster; deployment of repeaters on vessels of ICG and Coastal Police; grant of special rights to fishermen just like tribal and forest rights; making fisheries a safe profession; skills and capacity development of fishermen in use of communication equipment; and organizing rescue drill/mock activities once a year in the coastal areas. It was also suggested that the fishers were prepared to meet 25 percent of the capital cost and a similar percentage of the implementation cost too and a pilot project should be taken up to implement and monitor the above suggestions from Kasimedu Fishing Harbour, Chennai for a minimum period of three months.

In the closing session, Dr Yadava said that the Workshop deliberations were very useful and hoped that a white paper on setting up of seamless communication mechanism would emerge from the deliberations. He said that there was consensus amongst the stakeholders on many issues and it was also clear that a comprehensive policy that defines the framework and standard operating procedures (SoPs) would be required. It also emerged that with respect to hardware, there could not be a thumb rule, and more than one equipment would be required keeping in view the distances at which the boats undertook fishing. Dr Yadava said that the most important aspect in this entire exercise would be the human resource development, without which nothing will work. This *inter alia* will include creating awareness, providing regular hands-on training and ensuring that fishers are part of the SoPs.

Mr Gagandeep Singh Bedi, Secretary, Revenue Department, GoTN chaired the closing session. He said that this was a golden opportunity for the Fisheries Sector of Tamil Nadu as the Government would shortly be signing an agreement with the World Bank for providing financial assistance for the sector and this assistance included a sizeable component for setting up of communication system for fishermen. Mr Bedi said that the satellite phones might turn out to be expensive for deep-sea fishers and simultaneously the security issues may also have to be looked into for such communication equipment. However, both the options (HF and Satellite phones) could be examined for taking a final decision.

Mr Vijayakumar, Secretary (Fisheries) in his concluding remarks said that the Workshop was conducted as planned. It was successful in bringing a range of stakeholders and also service providers, who were able to understand the requirements of the fisheries sector and present their considered views. He suggested that the next step would be to further discuss the outcome of the Workshop in focussed groups and take the initiative forward and develop the right policy for consideration of the Government of Tamil Nadu. Mr K Rengaraju, Additional Director of Fisheries, DoF proposed the vote of thanks.

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Participants at the Strategic Workshop

Workshop Report

1.0 A two-day Strategic Workshop on 'Communication Needs of Marine Fishermen' was held on 09 - 10 November 2013 at Hotel Ambassador Pallava, Chennai. The Workshop was jointly organized by the Department of Fisheries (DoF), Government of Tamil Nadu (GoTN); the Post Tsunami Sustainable Livelihoods Project (PTSLP) of the International Fund for Agricultural Development (IFAD), Chennai; Fisheries Management Resource Centre (fishMARC), Thiruvananthapuram; and the Bay of Bengal Programme Inter Governmental Organisation (BOBP-IGO), Chennai. A copy of the Workshop Prospectus and Agenda & Timetable is placed as ***Annexures 1 and 2***.

2.0 The Strategic Workshop was organized with the objectives of:

(1) *assessing the communication needs of fishermen in terms of technology and equipment for improving safety at sea;*

(2) *evaluating available technologies and their financial requirements; and*

(3) *charting a roadmap for integrating communication needs in to a larger fisheries management framework.*

3.0 The Strategic Workshop was attended by 146 participants representing the concerned Ministries/Departments of the Central Government, Government of Tamil Nadu, Research and Development Institutions from Chennai and elsewhere in the country, Experts, Inter-Governmental and Non-Governmental Organisations and Fishermen Associations. A List of Participants is attached at ***Annexure 3***.

Session 1: Opening Session

4.0 The Strategic Workshop began with the lighting of the traditional lamp. Mr C Munianathan, Director of Fisheries, Tamil Nadu in his welcome address said that the Hon'ble Chief Minister of Tamil Nadu had made a statement on the floor of the State Assembly on 05 April 2013 regarding the need for seamless communication for fishermen venturing into the sea and announced supply of communication equipment to the fishermen with a subsidy component of 75 percent. He said that this Workshop has been organized to discuss the requirements of marine fishermen and to work out modalities for establishing seamless communication network in the State.

5.0 Dr Yugraj Singh Yadava, Director, BOBP-IGO gave an introduction to the Strategic Workshop. He said that fishing has been recognized as one of the most dangerous occupations in the world, along with mining and aviation. According to the statistics of the International Labour Organization (ILO), annually about 24,000 fishermen die at sea. Dr Yadava said that this statistics comes from developed countries where good statistics are maintained on accidents at sea. In most developing countries where statistics of accidents at sea are not well maintained as in developed countries, this figure would be much higher. Stressing on the importance of safety at sea, he said that apart from personal flotation devices and good quality boats, aspect such as seamless communication network at sea was vital.

Dr Yadava appreciated the fact that the DoF-GoTN had flagged this requirement as of high priority with the Secretary of the Animal Husbandry, Dairying and Fisheries, Dr S Vijayakumar spearheading the process. "As co-organizers, we have tried to provide a 360° coverage to this Workshop that includes all aspects related to the establishment of an implementable, cost-effective and user-friendly communication network for marine fisheries sector in Tamil Nadu. Further, the structure of the Workshop has also been planned to ensure that discussions are inclusive and holistic," said Dr Yadava. Full text of Dr Yadava's address in English and Tamil is placed as ***Annexures 4 and 5***.

Lighting of the traditional lamp

Mr N Ravi Shankar, Special Secretary, DoT

Mr C Munianathan, Director, DoF-GoTN

6.0 Dr S Vijayakumar, Secretary, Department of Animal Husbandry, Dairying and Fisheries, GoTN referring to the Fisheries Policy of Tamil Nadu, said that the Hon'ble Chief Minister had stated that fishers in Tamil Nadu would be provided with communication facilities for use, especially at times of distress. In the pilot project implemented in Ramanathapuram District of Tamil Nadu, a number of issues had come up including the issue of licences, multiplicity of regulatory authorities, variety of fishing vessels being used by fishermen and the types of technologies available and it is to be seen that how all this could fit into the regulatory framework. Dr Vijayakumar said that communication facilities are to be used not only at times of distress, but also for exploiting fisheries resources and improving fishing operations. He requested the fishers and vendors of various technologies present at the Workshop to interact and to suggest technologies that would be suitable for different types of fishing vessels. He further suggested the establishment of a central command centre or hub for this purpose at Chennai or at some other suitable place to provide information to fishers on a regular basis. Dr Vijayakumar cited the example of tuna longliners, which required appropriate wherewithal, ranging from good infrastructural facilities such as harbours, cold storages, etc. to appropriate communication devices to enable proper resource exploitation in the deep sea. He said that along the west coast of Tamil Nadu, there was no fishing harbour earlier; now four harbours are coming up. On the east coastal also harbours are being expanded and or modernized. A number of schemes were being implemented and considerable amount of funds were now made available to the fisheries sector. Dr Vijayakumar hoped that at the end of the two-day deliberations, there would be clear-cut recommendations suggesting the way forward in terms of technology and equipment for establishing a sound communication network for fishermen in Tamil Nadu.

7.0 Mr L Shankar, Joint Commissioner (Fisheries), Department of Animal Husbandry, Dairying and Fisheries (DAHD&F), Ministry of Agriculture, Government of India (GoI) spoke about the marine fisheries policies of the Central Government. He said that the marine fisheries sector was a shared responsibility between the Centre and the coastal States and the Union Territories (UTs). Detailing the vast and varied fisheries resources and the institutional support available for fisheries development in the country, he said that the Government was providing support to the sector in various ways. The National Fisheries Development Board (NFDB) had been established for the coordinated development of fisheries sector and all Central Schemes would be routed through the Board. Referring to the Model Bill circulated by the GoI in 1979, Mr Shankar said that based on the Bill all coastal States and UTs had enacted their respective Marine Fisheries Regulation Act. In 2004, the GoI also brought out the Comprehensive Marine Fisheries Policy, which focused on increasing marine fish production, improving socio-economic status of fishers and curbing Illegal, Unreported and Unregulated (IUU) fishing. Currently, the draft of the Marine Fishing Regulation and Management Bill is under discussion and the GoI is also preparing an all India registry of sea-going fishing boats and issuing biometric identification cards to fishermen for strengthening the coastal security network. Mr Shankar said that the ReALcraft E-Governance Project covering the above referred activities had also earned the Ministry a special mention in the Manthan South Asia and Asia Pacific Award in 2010.

8.0 Mr N Ravi Shankar, Special Secretary, Department of Telecommunications (DoT), GoI gave the Keynote Address on 'Telecom Policies for Marine Communications'. He said that under the National Telecom Policy, 2012, telecommunication is seen as an infrastructure requirement that can have great impact on the socio-economic development in the country. "Ambitious development targets have been set up by the GoI for taking telecom infrastructure everywhere that would result in increase in voice communication facilities from the current level of about 42 percent in rural areas to about 70 percent by 2017 and 100 percent by 2020. In the case of broadband penetration, the target is from about 12 million connections now to 175 million connections by 2017 and 600 million by 2020. The Universal Service Obligation Fund (USOF) has made it obligatory on the States to bring communication everywhere and the national optical fibre network would take broadband to villages and promote e-governance, e-commerce, telemedicine, etc.," said Mr Ravi Shankar. Along with the development of telecom infrastructure, environmental concerns were also being addressed such as

reduction in the consumption of diesel by use of other energy systems (*e.g.* solar and hybrids) apart from bringing down the Electric and Magnetic Field (EMF) radiation due to the reported concerns about health impacts, he said. Further, spectrum management with sound management policy using the world's best practices was envisaged and the licencing framework was to be simplified by reducing the time duration as well as the processing requirements.

Focusing on fisheries, Mr Ravi Shankar said that his Ministry basically looks at three components, namely 1) security clearance, 2) designing frequency for usage, and 3) operating licence. The equipment to be used can vary depending on the distance travelled into the sea. There were some restrictions imposed in August 2012 for issuing VHF licences, which have now been removed. He said that the pending applications (over 2000 from Ramnad, Tamil Nadu alone) would be put on fast track; first clearing from the security angle, which has since been obtained, and then from the other mandatory requirements. Concluding his address, Mr Ravi Shankar stressed on the need for coordination between DoT and the Ministry of Home Affairs as well as the Ministry of Shipping and the Ministry of Space (for satellite communication) and said that the Telecom Department would strive to address the issues in a holistic manner.

9.0 Dr T S Sridhar, Additional Chief Secretary and Commissioner, Revenue Administration, GoTN in his Inaugural Address appreciated that a number of organizations had come together in a coordinated manner for the benefit of the fisheries sector. He said that the communication methods used ranged from traditional systems to scientific and highly technical methods. Post-2004 tsunami, a number of schemes were implemented for fishers and the supply of communication equipment to fishermen was one amongst them. He referred to the three tier set up of the National, State and District-level Disaster Management Agencies and said that at the State and District levels, there were toll free numbers, 1070 and 1077 respectively, which were linked to central control rooms for both natural and man made disasters where the police, fire and health services were linked. Dr Sridhar said that the State Disaster Management Plan was under preparation and the move was now from reactive to preventive and various preventive and mitigation measures as well as infrastructure were being put in place. He described the various early warning systems, including the advance warning given during cyclones and heavy rainfall by the use of remote sensing models and also referred to the post-tsunami assistance available to the GoTN through the World Bank's Emergency Tsunami Reconstruction Project (ETRP) and the Asian Development Bank's Tsunami Emergency Assistance Project (TEAP) that had heavy focus on fishing communities. More recently, the World Bank's Coastal Disaster Risk Reduction Project (CDDRP) was also being established, which is likely to further improve the situation. Dr Shridhar wished the Workshop all success and hoped that sound recommendations would emerge from the deliberations.

10.0 Mr V Vivekanandan, Secretary, fishMARC proposed the vote of thanks.

Session 2: Providing the background

11.0 In this Session two presentations were made to set the background to the Strategic Workshop. The first presentation was made by Dr S R Muthusamy, Consultant, World Bank Project on "Marine Fisheries of Tamil Nadu and their Communication Needs". Giving an overview of the Tamil Nadu coastline, he said that the coast could be divided into four parts: Coromandel Coast (357 km), Palk Bay (294 km), Gulf of Mannar (365 km) and West Coast (60 km) and provided data on the coastal districts, fishing crafts and gear, number of fishing days, distance from shore travelled by the fishermen and the scope of communication devices for different segments of the fishing sector. Dr Muthusamy also correlated the fishing voyage days and the distance of the fishing grounds and emphasized on an efficient, cost-effective and economic communication technology, especially for the offshore and deep sea sector that could also assist in monitoring and control of the fishing crafts and improved fishing operations. Dr Muthusamy's power point presentation is placed as ***Annexure 6***.

12.0 In the second presentation, Dr Y S Yadava said that safety at sea cannot be looked in isolation. It is an integral part of fisheries management. “While personal floatation devices and communication networks are the basic needs of sea-going fishermen, long-term measures to ensure safety and well-being of fishers require sound management of the sector as a whole,” Dr Yadava said. Citing the experience of the two Kanyakumari boats that were caught in cyclone Phailin off the coast of Odisha in early October 2013, he said that the two boats had both VHF sets and cell phones, yet they could not return on time and capsized mid-sea. Luckily, the crew of both the boats survived, clinging to water cans and other floating objects. As a post-incidence analysis, many questions have cropped; first whether the two fishing boats licenced by DoF-GoTN were allowed to fish off the coast of Odisha; second did the DoF-GoTN know about this? If yes, why were they permitted to sail without proper communication and safety devices? How did the two boats get registered without proper safety devices? Advance warning on the impending cyclone and its severity was communicated to all the boats in the area, including the two Kanyakumari boats, but they refused to return and continued fishing. While the boats had VHF radio, the distress information received from them was too late to mount search and rescue (SAR) operations. Thus, an incident of this nature clearly points towards lack of protocol and standard operating practices (SoPs) in the fisheries sector, especially required at times of such emergency situations.

13.0 Dr Yadava felt that fisheries management and fisher’s safety must be integrated through a sound Monitoring, Control and Surveillance (MCS) system. Rather than adopting a complete command and control mechanism, MCS regime in the Indian context could be community driven, especially keeping in mind the very high proportion of small-scale fisheries. Dr Yadava said that MCS is a popular tool used in fisheries management and in its simplest form includes establishment of seamless communication network for safety of fishers and their boats, ensures effective boat to shore and shore to boat communication, provides location of boats at times of emergency, places checks and balances on fishing vessels that lack safety and communication devices to fish in offshore waters and establishes protocols for SAR. He further said that MCS could also function as a business tool for fishers to aid in their marketing and can be set up in a Public Private Partnership (PPP) mode. Concluding the presentation, Dr Yadava said that the most immediate requirements to put in place a MCS system would necessitate a) comprehensive understanding of the needs of the sector; b) adequate controls on activities that can help in saving the lives and livelihoods of fishers and their families; and c) providing support to end users where it stands to benefit from State’s involvement. Dr Yadava’s power point presentation in English and Tamil languages is presented as ***Annexures 7 and 8*** respectively.

14.0 Initiating discussions on the two presentations made by Drs Muthusamy and Yadava, Commandant P K Kushwaha of the Indian Coast Guard (ICG) said that MCS was important. Drawing analogy with traffic on the road, he said that if traffic was not regulated on the road, there would be complete chaos leading to accidents. Therefore, a sound MCS system will help bring orderliness in the movement of fishing vessels and make their operations safer. To another query, Commandant Kushwaha said that awareness on the proper use of VHF sets was very low and in many cases due to high cost, the sets were also not repaired on time. Dr G Dharani of the National Institute of Ocean Technology (NIOT) suggested that a system should be in place where fishermen could inform the authorities or the fisher association(s) the location where they would be fishing on a particular fishing trip. Dr Vijayakumar said that this could be possible if the fishermen provided such information to a nodal point before leaving for fishing. Adding to this, Dr Yadava informed that the MCS system, among various other functions, would also ensure information on the location of fishers at sea as also the approximate duration of their fishing trips, etc.

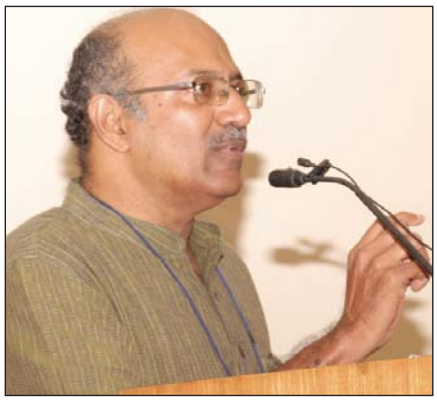
Participants at the Strategic Workshop

Dr S Vijayakumar

Dr T S Shridhar

Mr G S Bedi

Mr L Shankar



Mr V Vivekanandan

Commandant P K Kushwaha

Mr G Venkatesh

Mr G Dharani

Participants at the Strategic Workshop

Mr S R Muthusamy

Mr F Fraju

Mr Mukund Kumar

Mr J Vincent Jain

Mr Venkat Sundresan

Mr S R Ramanan

Mr Anbu Chezhian

Mr Nishit Dalal

Session 2 (Continued): Fishermen Panel sharing experience on sea safety and communication systems

15.0 A group of fishermen volunteered to join the Panel and speak on communication and safety equipment used by them and also explain the challenges that they face and their requirements.

16.0 Mr Manivannan from Chennai said that his fishing voyages normally lasted for 15 days. He uses a VHF set (ICOM 2100 2200 model), which is a 25 watt model using two 12 volt batteries. It is not a marine model. It works for a distance of 20-40 nautical miles (nm) and is normally used to maintain contact between boats as well as for hearing conversation taking place between other boats, especially to ascertain the fishing grounds and the resources. During rainy/bad weather, no communication is possible even between boats located close by. He said that running the engine is necessary even when the boat is stationary for use of the VHF set, contributing to higher fuel consumption. "I am not aware of the different channels that can be used by VHF users. With the help of service providers, we have formed two groups: the trawlers use one frequency number (157.125) and gillnetters another frequency number (157.450). One of the most important communication needs is to ascertain the location of the nets so that other fishing vessels do not damage them. Our biggest problem is of engine failure. While we do take spares, yet if we are unable to repair, we would first contact the nearby boats for assistance. If that does not work, then only we would contact the boat owner, who will mobilize a mechanic for help," said Mr Manivannan. "We would require communication equipment that would work beyond 140 nm and a 24X7 service should be available. As a boat owner, I would like to track my boat from shore and be in direct contact with it. And if the right equipment is available, my boat could even fish at a distance up to 200 nm east," he said. On a query, Mr Manivannan informed that the cost of VHF in his possession was about Rs 18,000; his boat was priced at Rs 35 lakhs and the engine Rs 6 lakhs. The GPS on the boat was mainly used to record the coordinates of the fishing grounds.

17.0 Mr T Sakthivel from Nagore said that his voyages also lasted for about 15 days, fishing yellowfin tuna and travelling to a distance of 200-300 nm from the shore. He said that he uses an ICOM 120 set that works up to a distance of 20-35 nm from the shore. Beyond that the set is used for communicating with other boats fishing in the vicinity. Availability of a satellite phone would help him to fish beyond 200-300 nm. Elaborating on his fishing practice, Mr Sakthivel said that the nets he uses are about 5 km long and 30 meter wide. On some occasion he has observed that the nets that were spread out got convoluted and twisted in the shape of a rope. On other occasion, the net was retrieved in the form of a lump. The cost of these nets ranged from 10-15 lakhs. Referring to such strange phenomenon at sea, he said that on some occasions, a group of boats found their positions interchanged overnight and the signal lights used for marking the nets also disappeared. In the absence of traditional knowledge on such fishing grounds, Mr Sakthivel wanted to know the cause(s) behind the phenomenon. Referring once again to the limited coverage provided by the VHF sets, he suggested that satellite phones may be made available, which would allow them to undertake fishing at longer distances for catching species such as tuna.

18.0 Mr Sakthivel informed that fishers from Thoothoor, Kanyakumari had started using laptops with internet and a software that provided information on bathymetry and fish location and asked why the same could not be provided for their boats. He also wanted to know if low-cost radar could be developed for fishermen to help them locate the position of their boats, especially at night. Further, the Government had provided one Distress Alert Transmitter (DAT) per village and it is time that all boats should be provided with the DATs. Mr Sakthivel was of the view that it was difficult to convey distress message to the ICG as they are on a different channel. This issue needs to be resolved. He informed that to overcome the problems arising from fishing in Sri Lankan waters, a number of boats were being converted into deep sea vessels. To ensure their safety at sea, it would be useful for the ICG to deploy a vessel with a helicopter on board to mount SAR as and when required. Such a vessel could be stationed in Nagapattinam. Expressing concerns on the post-harvest

situation in Tamil Nadu, Mr Sakthivel said that large quantities of fish were sent to Kerala as there are insufficient export processing units in Tamil Nadu. Such units could be set up in Tamil Nadu or buyers could directly buy the catch at sea. Concluding his interventions, Mr Sakthivel said that while life jackets were good for use during the day, at night a 'life float' would be more useful, as it would protect them from cold water as also from fish and sea snake bites.

19.0 Mr S Alex from Pamban explained his experience with VHF set that was provided to him as a part of the pilot project for Vallams implemented by the GoTN. The VHF set received signals up to 30 nm and he found it useful for communicating with other fishermen fishing in the area. Mr Alex said that since they fished much beyond the available VHF range, he was unable to communicate at times. Further, while his fishing operations were in the Gulf of Mannar, towers were located only in Pamban; hence there was no signal beyond the reach of the Pamban towers.

20.0 Mr Vincent Jain from Thoothoor (and also the Chief Executive of the Toothoor-based Association of Deep Sea-Going Artisanal Fishermen ADSGAF) said that the Thoothoor fishers venture on fishing voyages varying from 10-40 days in boats with an overall length ranging from 40-65 ft. They could use the VHF sets in 12-20 nm range. Mr Vincent suggested that such multi-day fishing vessels would need High Frequency (HF) sets, as the VHF sets had limited range. Citing the example of an Indian fishing boat rescued by a Sri Lankan fishing vessel, Mr Vincent said that the Indian boat could be rescued because the Sri Lankan boat could send the message through the HF radio to his base and help was immediately arranged. This incident happened when Mr Jain was on an exchange visit to Sri Lanka organized by the BOBP-IGO. Having witnessed the developments from close quarters, he was convinced of the utility of HF radio for multi-day fishing vessels operating at long distances from the shore. Mr Vincent further explained the need for setting up of control rooms for receiving information from the fishers and *vice versa*. In conclusion, he also provided information about the pilot trials being conducted by his Association on the use of solar energy in fishing boats.

21.0 Mr Santhiya Peter Patchek from Therespuram, Tuticorin operates a country boat. He said that there were about 600 vallams from the same area doing hook & line fishing. These boats no longer fished in the near-shore waters and were now fishing at distances ranging from 60-80 nm. They were equipped with only GPS and no other communication devices for use in case of distress. Narrating an incident, Mr Patchek said that his boat once developed engine trouble around 17 nm off Koodankulam and he could manage to inform the crew of another boat, who in turn informed the DoF and finally the information was received by the ICG. Although he could return to the shore safely with the help of the ICG, there was considerable time delay between the alert sounded and the rescue. He suggested for communication facilities that could provide coverage up to 60-80 nm.

22.0 Mr A Regish from Chinnamuttom said that his mechanised boats go for deep sea fishing. These boats cost about Rs 80 lakhs each. The crew carries cell phones and VHF sets. While the cell phones are useful up to 7-8 nm from shore, the VHF sets are useful up to 18 nm. During high winds and rough weather, the reach of VHF would be reduced to almost 6 nm. Mr Regish suggested that radio telephones, as used in merchant ships, could be provided to them. He related the incident of a boat that accidentally drifted into Sri Lankan waters because of the strong winds off the coast of Kanyakumari. By the time a SAR operation was completed, the cost of the mission was enormous.

23.0 Mr K Xavier Manoharan, Chairman TAFCOFED explained the problems faced by fishers and appreciated the steps taken by the Hon'ble Chief Minister of Tamil Nadu. He said that fishers should not be reluctant to share information and suggested a helicopter facility for SAR in Kanyakumari district.

24.0 In response to queries raised in the interventions made by the fishermen, Scientists present at the Workshop informed that at times the sea surface appeared calm from above with no winds, but there could be underwater currents and these currents could be the possible cause for twisting of the nets. The fishers were advised to use marine sets and marine channels while at sea. With respect to

the length of the nets used by fishers, it was pointed out that there was no restriction on the length; restrictions were only on certain mesh sizes.

Session 3: Technology demonstration and exposition

25.0 Introducing Session 3, Mr Vivekanandan said that the existing communication technologies concerning marine fisheries sector could be categorised under (i) cell phones, (ii) radios (VHF & HF) and (iii) satellite phones and could also be related to their distance of coverage from the shore. Cell phones are ubiquitous and most fishers posses a handset. He said that it was also not meaningful for small boats fishing in the near-shore waters to possess VHF radios when cell phones were sufficient. The second category of communication equipment included the VHF and HF radio and their use also depended on the distance from the shore at which the fishers were operating. Referring to the third category, he said that the satellite phones were range independent but nevertheless their operating costs were high and could be prohibitive for the fishermen. This Session was intended to understand the scope of different technologies in catering to the communication needs of the fishermen. Mr Vivekanandan then invited the cell phone service providers to make their brief interventions.

26.0 Mr P Santosham, Senior General Manager (Network Planning Consumer Mobility), Tamil Nadu Circle, Bharat Sanchar Nigam Limited (BSNL) provided details on the extensive coverage provided by BSNL. Mr Santosham said that there were three types of towers: ground-based, roof top-based and others (pole/MARR). The maximum numbers of towers were of 40 m or lower in height. Providing a break up of BSNL towers located in coastal areas of Tamil Nadu (by District within 5 km and from 5-15 km), he said that the DoF-GoTN had approached the BSNL, TN Circle for sharing the usage of the towers along the coastal belt to provide space for accommodating shore-based VHF equipment and providing Electricity Board's (EB) power supply for the VHF equipment. The BSNL had provided the details of towers falling within 5 km and up to 15 kms from the shore to the DoF. Mr Santosham said that now the commercial formalities were to be finalized for leasing out BSNL's towers by DoF. In concluding his interventions, he also sought clarity on the restrictions placed on broadcasting signals 10 km from the International Maritime Boundary Line (IMBL) by the Government of India. Mr Santosham's power point presentation is placed at ***Annexure 9***.

27.0 Mr Madhu Narayanan representing Reliance Communications said that his Company was a complete service provider offering GSM, CDMA mobiles, landline phone, wireless broadband, etc. He suggested that cell phones may be used up to 10 km from shore and the VHF radio beyond that distance. Mr Narayanan also informed that the cellular phone providers, including Aircel, Airtel, TATA Docomo, Idea, Vodafone, etc. work on the GSM/CDMA technology and the points made in his presentation were also applicable to the other cell phone service providers. The power point presentation Mr Narayanan is placed as ***Annexure 10***.

28.0 In the Q&A session that followed, the service providers said that they were capable of providing the required service to the fishermen but because of security reasons the broadcast distance was limited. On the issue of selective broadcast signal to a certain set of numbers so that the distance limitation could be overcome, the cell phone service providers said that this was not possible. The Closed User Group (CUG) facility was for the purpose of tariff and not for closed broadcast of signals. The service providers also said that application-based solutions could be developed and customised for the fisheries sector, if required.

29.0 Mr K Padmanaban, Senior Manager, Site Acquisition, Indus Towers said that his Company is the largest tower company offering passive infrastructure services to all telecom operators and other wireless services providers. Mr Padmanabhan's power point presentation is placed at ***Annexure 11***.

30.0 Mr Venkat Sundaresan, Chief Executive Officer of Pat & Venky Private Limited in his presentation referred to three main issues that emerged from the earlier presentations:

(i) range;(ii) use during unfriendly weather conditions; and (iii) additional facilities like data. He said that it was clear that no single equipment would solve the problem; but a system with multiple ranges and multiple actions was required. Besides, it may also be important to consider the requirements of the users and the roles and requirements imposed by the DoF, the DoT, WPC and licensing authorities.

31.0 Mr Sundaresan said that most fishermen were using LMR (Land Mobile Radio) meant for communication on land. The channels to be used are 80, 81, 82 for communication with shore towers, and channels 16 and 70 at sea. Marine radios have special features, specifically the Global Marine Digital Signalling System (GMDSS). The call sign and Maritime Mobile Service Identity (MMSI) provides the history of a boat and when the fisher presses channel 70, the GPS generated lat long coordinates and MMSI automatically gets captured by nearly all vessels in the vicinity, including the ICG vessels. No voice communication is required. This is effective to a maximum distance of 50-65 nm. Therefore, the first thing a fisherman has to do is to use the right equipment.

32.0 Explaining further, Mr Sundaresan said that the VHF works by the 'line of sight' and is limited by earth's curvature. Hence it should be judiciously used along with marine channels. For immediate increase of range, high rise towers with repeater stations are a solution. Range enhancement is also possible by using portable repeater arrangement located on a ICG vessel, which could enhance the range by another 25 nm. A similar repeater could be placed on a helicopter hovering above and would also increase the range. With respect to HF, Mr Sundaresan said that till now only analog systems were available, but now digital HF sets were also available and they are able to considerably reduce the noise and make communication more easy and seamless. Concluding his presentation, Mr Sundaresan said that communication requirements could be separated into distress and normal communications. Distress communication systems have to be foolproof and to support such systems appropriate shore infrastructure has to be built.

33.0 Following the above presentations, Dr A Anrose, Zonal Director, Fishery Survey of India (FSI) said that advanced technologies required higher certification and licensing and were also expensive. Hence, it is good to have cost-effective methods for the fishermen. Commandant P K Kushwaha of the ICG said that fishing boats did not require trained persons to operate such communication equipment. He said that the DAT developed by the Indian Space Research Organization (ISRO) cost less than Rs 10,000 and the DAT should be given to all fishing boats at subsidized rates. It requires a one page simple application form giving the boat number, mobile number of the fishermen, etc. The alert once set off, is received by the ISRO Office in Bengaluru and then transmitted to the ICG for mounting the SAR operation. Mr Shankar informed that the GoI under a Centrally Sponsored Scheme was providing 75 percent subsidy and the Government of Gujarat had taken up the project. It was also informed that 20-25 number of towers would be required for ensuring VHF coverage for the entire 1076 km long coastline of Tamil Nadu.

34.0 In the third category of communication equipment, Mr Nishit Dalal, Business Development Manager, Tata Communications said that INMARSAT (International Maritime Satellite Organization) was formed in 1979 as a maritime focused inter-governmental organization. It operates a number of geo stationary satellites designed to extend phone, fax and data communications all over the world. It is headquartered in London, UK. Tata Communications Ltd (TCL) is permitted to provide INMARSAT services in India. Mr Dalal said that the major network components of satellite phones included the space segment, the ground segment and the user. The Satellite Control Centre tracks and controls the satellite and the network operations centre is in charge of overall monitoring and control. The Land Earth Station located at Dighi, Pune is a gateway between the Ship/Mobile Earth Stations and the terrestrial telephony/telex networks (PSTN\ISDN and PSTxN) provide a link between INMARSAT satellite network and international telecommunications network. Mr Dalal also explained the range of services including value added services offered by INMARSAT. He said that the Indian Navy has taken on lease the satellite channel by paying lump sum charges and a Vessel Monitoring System (VMS) through INMARSAT is also available. Mr Dalal's power point presentation is placed as ***Annexure 12***.

35.0 Dr H Rayappa, Deputy Director, SatCom Applications, ISRO Headquarters, Bengaluru spoke about satellite communication solutions for the fishing community. Referring to DAT, he said that it is a simple battery operated equipment with four types of alerts built into the system: fire, boat sinking, man overboard and medical. He also explained its working. Dr Rayappa said that in January 2010 the technology was transferred to three companies and 1800 DATs were given to fishers on an experimental basis. The hub is located at the Maritime Rescue Coordination Centre (MRCC) of the ICG at Chennai for the last five years. The National SAR Board is deliberating on the marketing, operation and maintenance of DATs. The other issues that are being discussed include registration & de-registration, fitment of DATs on board fishing boats and database management. Elaborating on the Satellite Based Search and Rescue (SAR) System, Dr Rayappa said that various radio beacons are available. These beacons are fitted with GPS receivers and send accurate position information. For non-GPS beacon transmissions through LEO (Low Earth Orbiting Satellites), the position is derived using Doppler Effect. Most of the modern beacons come with inbuilt GPS. In India, five agencies participate in the SAR Programme through an Inter Agency Standing Committee and the Maritime SAR activities are reviewed and guided by a National Board. Finally, Dr Rayappa also explained the mobile satellite system including a satellite phone, connectivity on demand and a one way messaging service (limited to 40 characters) and the Cyclone Warning System, which is a DTH based Disaster Warning Dissemination System (DWDS), using low-cost satellite technology. Dr Rayappa made it clear that ISRO does not have the capacity to provide voice services at the moment and will have to make appropriate investments in future if a policy decision is taken in this regard. Dr Rayappa's power point presentation is placed as ***Annexure 13***.

Session 3 (Continued): Technology demonstration and exposition

36.0 The second day started with a presentation entitled "Fishermen Location Tracking using GPS and Information Storage in Black Box" by students of Annai Vailankanni College of Engineering, Kanyakumari. Their proposed tracking system uses a black box fixed to the boat to store and retrieve location and voice data. Each boat is also given a Unique Identification Number. The route traversed by the fishers is relayed to the base at regular intervals. Weather, fishing areas and other alerts can be regularly transmitted. The DoF and the ICG can be alerted by SMS with the information transferred to the base station from the boats through mobile satellite technology in case of emergency. According to the students, the initial investment in developing the system would amount to Rs 60 – 65,000. The power point presentation made by the students is placed as ***Annexure 14***.

37.0 The presentations were followed by a Q&A session. With respect to the mandatory permissions required to obtain the use of satellite phones, the INMARSAT representative said that there were two mandatory requirements, namely a) the end user's No Objection Certificate from the DoT; and b) consent from DoT to provide service in India. With respect to tariff, it was possible that the rates could come down (from say Rs 150 a minute to Rs 60 a minute) if a large number (*e.g.* 500) of fishing boats used the service. The potential users could be anyone in the marine or land segment. It was further informed that the size of the satellite phones had also reduced with the availability of handheld devices. However, with regard to security angle, their usage at sea was still very restricted. Further, the CUG was mainly with reference to tariffs and did not prevent incoming or outgoing calls and controls in terms of tracking could be done from one place.

Session 4: Panel of Independent Experts

38.0 In this Session, a set of independent experts presented their views on the technology and the needs of the fisheries sector.

39.0 Making the first presentation, Commandant Kushwaha, ICG, Chennai said that four basic things had to be kept in mind: (i) ensuring safety; (ii) providing means of communication, especially voice communication; (iii) tracking the boats; and (iv) good governance of the sector. With respect to the use of VHF and HF sets, Commandant Kushwaha said that marine bands should be used and the

available infrastructure in the major ports as well as in many minor ports could be utilized. He said that coordination was essential and all kinds of technologies were useful. With respect to satellite phones, the service could be made available under government subsidy schemes for genuine fishermen. In case of mobiles, he said that the range could be extended but there was concern about the 'buffer zone'. "It would be useful to check the current range provided and increase that first. The buffer zone issue is probably only in the Palk Bay, which is a relatively small area. A community interaction programme in all coastal districts (involving companies, as part of their CSR responsibilities) could be organized to demonstrate various technologies. Technology demonstration centres could be set up in different places by the DoF where users could get a look and feel of the various options. More colleges and institutions should be involved in research and more such workshops should be organized in future," said Commandant Kushwaha.

40.0 Dr G Venkatesh, Professor, Indian Institute of Technology, Madras made a presentation on "Evaluation of communication solutions for marine fishermen". Basing his presentation on the first day's discussions, Dr Venkatesh said that both cell phone and VHF have limitations with respect to their area of coverage. The VHF works on the 'line of sight' principle and communication is limited to about 50 km. In warm air, VHF signals move faster and thus good weather conditions can extend the range to 100 km but this is highly unreliable. As there are no hills along the Tamil Nadu coastline, the possibility of locating towers on higher grounds is also ruled out. Alternatively, buoys or boat mounted VHF relays could be used. The other option of improving range included use of BLIMPS (or balloons), which could go up to 1500 m height and provide a range of 280 km but it would be difficult to use them in bad weather. Referring to GSM, Dr Venkatesh said that GSM was not limited by the line of sight, but signal interferences do occur as GSM shares frequencies between users who are allocated different time slots. However, there was potential for GSM in a box, which was useful in emergency situations where it could be set up on a ICG ship, if regulatory approvals were available. Further explaining the HF radio, he said that they were like shortwave radios with unlimited range and could work up to thousands of km. Since HF relies on ionosphere, it is susceptible to interference due to sun spots and other solar activities, etc.

41.0 Dr Venkatesh said that under the circumstances, satellite phones appeared to be the most feasible solution, especially with the use of GMR2+ standards, which allowed GSM near the shore and satellite phones deeper into the sea. INMARSAT GSPS service is based on the GMR2+ standard, which uses the same GSM network infrastructure. He said that regulatory issues due to perception of security threat was delaying introduction into India. However, satellite phones were expensive and an IsatPhone PRO and GSPS service from INMARSAT cost about Rs 40,000 (600 USD), though not available in India. Dr Venkatesh's power point presentation is placed as ***Annexure 15***.

42.0 Dr G Dharini, Scientist E, NIOT said that his Institute receives data from buoys located in the ocean and has the capacity to develop and maintain communication systems for use at sea.

43.0 Dr Ramanan, Scientist E, Indian Meteorological Department (IMD), Chennai said that the IMD warning messages were sent to the DoF, All India Radio and the Commissioner Revenue Administration, Government of Tamil Nadu. He said that there were limitations in HF radios and satellite phones were expensive but solutions could be sought. In response to one of the queries raised by a fisherman on the first day of the Workshop, Dr Ramanan said that the fishers probably experienced eddy currents and the National Institute of Oceanography, Goa could perhaps provide more elaborate response on this issue. He said that the IMD also planned to include information on 'wave height' generated by the Indian National Centre for Ocean Information Services (INCOIS) into the fisheries advisories, as it was important to provide this information to the fishers.

44.0 Capt Muthukumar, Head, Nautical Science, Indian Maritime University (IMU), Chennai said that there were two aspects to communication needs: during distress and boat to boat and boat to shore communication. For distress communication, a foolproof method was required and DAT appeared to

be the best solution and all boats should be equipped with DAT. He said that marine VHF sets must be used while at sea. He pointed out that fishers were using the channels non-stop, which was clogging the channels that many other ships used. This need to be controlled. With respect to HF sets, low power sets could be tried and for this the Wireless Planning and Coordination Wing's regulatory norms should be explored. Capt Muthukumar said that like the Automatic Identification System (AIS) for merchant ships, VHF-based transponders on board fishing boats could be used, and satellite-based systems could also be explored. DG Shipping was already doing tracking and so it could be done but the cost factor has to be considered.

45.0 Dr Jayamani, Consultant, INCOIS said that the primary requirement for fishing boats was distress communication (boats to shore), broadcast of weather reports and navigational warnings (from shore to boat) and voice communication. Dr Jayamani said that based on cost (one time and recurring) and licencing procedures, smaller boats could be fitted with VHF and deep sea fishing boats with a combination of VHF, MF/HF. The transceivers should be marine models with Digital Selecting Calling (DSC). All boats should be fitted with DAT with the suggestion that DAT be procured by the State Government with maintenance entrusted to a vendor. In future, fishing boats could be augmented with INSAT two-way terminal for messaging and broadcast with the system being developed by Defence Electronics Application Laboratory (DEAL)/DRDO as part of VMS. All boats should be registered with proper identification. With GPS, the boat movement could be monitored and such information could be provided to the boat owners apart from sounding the alarm at the International Maritime Boundary Line. Further, a committee could be set up to draw specifications for communication systems for fishing vessels.

46.0 Mr Satish Babu, Director, International Centre for Free and Open Source Software said that the Indian fisheries sector was characterized by a variety of fishing boats that stayed out at sea for different periods of time. Categorizing the needs by importance, Mr Babu said that they could be voice, distress, alerts, data and operational (*e.g.* location of gill nets using locators linked with cell phone). He said that HAM Radios used balloon mounted antennae; similarly kite mounted antenna could be used to increase the range for even mobile phones. There were ways of reducing the cost of satellite phones by renting or the use of second hand phones. However, he also referred to the flip side of satellite phones usage as it took about 3-4 minutes to register. This could be a concern during emergency situations (*e.g.* fire on board). Further, unlike cell phones, satellite phones were not always 'on'. A message alert about an incoming call is normally used to call back as the cost of incoming calls is high.

Mr Babu said that a framework was required to analyse and address various issues, such as policy and regulatory needs. Besides technology, there is also a need to examine devices (*e.g.* tablets and applications) and address the training and capacity building needs of fishers – they were not aware of how to use international protocols. The use of solar batteries for communication systems could help in reducing usage of engine and hence fuel. "Policy-wise a lot has to be done as India is bracketed with some of the most backward countries with respect to the use of satellite phones. The role of market should also be examined. The move from 'fishing as a vocation' to 'fishing as a profession' would result in transition to a professional approach and thereby, the use of technology as well", said Mr Babu.

47.0 Mr Amarnath Raja, CEO, InAPP and IEEE Volunteer (Humanitarian Technology) said that IEEE was a global body including scientists and engineers and was well connected and could be tapped for research, especially considering that the Chennai chapter was the largest in India. He felt that the infrastructure side was weak and should be strengthened with repeaters and land stations. Further, power source was also a weak link and required more research. The up down movement of the fishing boats due to wave action could be used to generate energy at sea. Mr Raja shared the prevailing protocols in Japan that ensured that in a disaster situation, cell phones became inter-operable ensuring that there was no clogging of any network and also all bandwidth were allocated

for voice. He said that lateral thinking was required in an emergency situation. For example, there could be a relaxation of maritime boundary issue for a short spell so that strong signals could be broadcast.

48.0 Ms Velvezhi, Principal Scientist, M S Swaminathan Research Foundation (MSSRF), Chennai presented the results from Phase II of the Fisher Friend Mobile Application. Ms Velvizhi said that presently there was a need for (i) customization of technologies; (ii) localization of technologies according to local needs; (iii) awareness of various technologies through capacity building; and (iv) policy support for fishers. She said that the MSSRF was customizing mobile technologies for fishers since 2007. For small vessels fishing within 20 nm, an SMS that includes information on wave heights and potential fishing zones is sent. A mobile based 24x7 helpline works round the clock. The contents for the Fisher Friendly Mobile Advisory are provided by INCOIS, ICG, Universities and the DoF. When it was first launched, CDMA technology was used but now it is diversified to include GSM as well. Android applications that can be downloaded for smart phones have also been developed. Various features were incorporated after getting feedback from fishers. In Phase II, Android 4.0 supports the application that provides information on ocean state forecast such as wave height, wind speed and direction, disaster alert, PFZ (Potential Fishery Zone) advisory, IMBL alert, danger zones (corals, rocks, sunken ships, etc.), fish market information, contacts and weather details. On a pilot basis, 120 Android handsets have been distributed in six districts and 79 fishers have provided feedback on the services provided. By 2014, a full fledged application is envisaged. The power point presentation of Ms Velvizhi is placed as ***Annexure 16***.

49.0 Mr Anbuchezhiyan, Superintendent of Police, GoTN said that signals were received up to 4-5 km at sea, where cellphones could be used. Beyond that VHF was the most cost-effective option. As part of a pilot project, the Tamil Nadu Police had carried out a survey of VHF usage among fishers and found that most fishers used LMR (Land Mobile Radio), which was not suitable for use at sea and suggested that marine sets should be used. He suggested that a Fishers' Control Centre could be established like a Police Control Centre, which could also help in controlling unnecessary conversations on VHF sets and also provide additional information. Seamless communication was necessary and three frequencies could be used alternately and 17-18 repeaters could be used. The WPC Wing charged Rs 500 as licence fee and there were no other user charges. However, there were considerable problems in processing applications with the WPC server reporting downtime apart from complexities in processing. Concluding his intervention, Mr Anbuchezhiyan said that satellite communication was expensive and also involved high recurring cost.

Session 5: Group Discussions and Reporting Back

50.0 The next chapter of the Strategic Workshop involved group discussions on three pre-identified themes. While group 1 and 2 were mainly for fisher representatives, group 3 was meant for service providers and government representatives. Representatives from Institutions, NGOs and experts were given the option to join any of the three groups. To ensure that the group discussions remained within a framework, a set of guiding questions/issues were also provided to the three groups so that their larger discussions and suggestions could revolve around those questions. Based on the discussions, the three Groups made a set of recommendations (see pages 26-27).

51.0 Following Group presentations, it was suggested that since the GSM range is less than the CDMA, the latter technology could be used. On the use of repeaters on ICG ships, the ICG representative said that this was not practical as their ships were always on the move and not stationary. He further added that the proposal with regard to deployment of helicopters could be taken up on a pilot basis. The MMD representative suggested that the Emergency Position Indicating Radio Beacon (EPIRB) would be better than the DAT and a low cost EPIRB could be developed. In response, the INCOIS representative said that EPIRB had limitations as it had to link with the satellites whereas DAT worked with geosynchronous satellites. It was also agreed that a fisher self-response system should complement the ICG system to improve the SAR mechanism.

Group 1: Artisanal Sector (Near-shore fishery)	
Why Communication?	• We were earlier fishing within 5-6 nm, now we have to go beyond 13-14 nm or about 25 km – even with small craft. Hence the need for communication has increased. • Change in wave and current pattern and climatic conditions, which also makes fish move from one place to the other. To track their movement, we need regular information from INCOIS.
What do we want	• For safety of life, equipment and fishing vessel, we need VHF/HF that works like a cellphone. • Since majority of fishers are not educated, the technology should be simple and easy to use. Voice communication is a necessity. • Communication equipment should not be affected by water or ocean breeze. • Information on ocean conditions and other relevant parameters is required at regular intervals and in a coordinated manner. To effectively use this information, capacity building is necessary. The Assistant Director of Fisheries, who serves as a link between government and fishers, should provide quick information. • Presently, coordination is poor– especially in distress alert communication and SAR operations. The response from the ICG needs improvement. Language is an impediment while communicating with the ICG. Too many questions are asked by ICG, some not very relevant. • Provision of helicopter and speed boat may be considered for each coastal District. • Better coordination in SAR operations to reduce time as well as money. • Coordination committee should be organized in each coastal District and also at the State-level.
Suggestions	• Floating repeaters/buoys could be installed for improved signals. • Maximize subsidy to be provided for DAT.

Group 2: Mechanized boats	
What is the purpose of communication	• To protect life and property of fishermen. • To make fisheries profession safe and efficient and provide a fear-free environment. • To communicate effectively at times of distress/disaster. • To know the exact location where fishing is possible. • To know the location of fishing nets and prevent ships from going there. • To know the location of research and data buoys and prevent them from damage. • To inform authorities about unlawful presence of foreign fishing vessels and other anti-social elements in the Indian EEZ.
The present status of communication and its utility **What is required to improve communication infrastructure**	• The VHF sets have a limited range (approx. 10 nm). They are mainly used to stay in touch with nearby boats. Similarly, the cell phone range is also limited (approx. 4-5 nm). Difficult to remain in touch with shore if fishing beyond this distance. • Equipment to communicate from longer distances required (say 200 nm or so). Such equipment should be made available under government schemes. • Satellite phones to be provided with voice facility. Similarly, HF radio should also be provided. • The regulatory framework should provide for long distance communication with equipment as mentioned above. • For safety, life floats are required.

	• In all coastal Districts, helipad and helicopters must be available for rescue and recovery. ICG ships must also be pressed into rescue service. • Rescue committees must include fishermen. • Deep sea fishermen should have government issued identity cards. • Control rooms must be set up and adequately manned. • All boats must have emergency equipment. • Special rights must be granted to fishermen just like tribal and forest rights.
How much are fishermen prepared to implement these things	• Fishers are prepared to meet 25 percent of the capital cost and a similar percentage of the implementation cost too.

Group 3: Framework for developing a communication infrastructure	
Regulatory (Directed at the WPC)	• WPC has confirmed processing of applications for license. • Security clearance required. *Submission: Whether licence can be applied in the name of DoF for all fishermen for easy process and monitoring of all types of communication equipment.*
Infrastructure (Directed at the State)	• Presently, most fishermen have some form of communication equipment. • State Government should set up infrastructure to monitor and control all types of communication, namely GSM, VHF, HF and Sat phone and this should be connected with the State Disaster Management Centre. • State Government should invest in training and interoperability between all communication networks. • State Government should insist on interoperability between GSM networks during disaster situation. • State Government should set up command & control rooms at strategic locations. These rooms should be manned 24 x7 hours and should have connectivity with ICG and State Police for effective rescue operations. • Portable repeaters should be deployed in ICG rescue helicopters, ICG Boats and also the boats operated by the Police Department. • State Government should check the functionality of all communication equipment and other safety devices once a year for safety and compliance of procedures and then renew the licences. • DAT developed by ISRO should be pilot tested for efficiency of operation and then considered for fitment in all boats. • Pilot project should be taken up to implement and monitor the above suggestions from Kasimedu Fishing Harbour, Chennai for a minimum period of three months. • Rescue drill/mock activity to be carried out once a year in the coastal areas.
Other points for consideration	• Distress alert mechanisms in cell phones. • Installation of weather exchange NAVTEX 490 for weather announcement in Tamil. • Marine VHF with channel 70 mandatory. • Users crossing 100 nm from the shore should have Digital HF also with emergency button. • DAT using SAT technology from ISRO is also required. • Life Jacket use should be compulsory. • Training in use of communication equipment and sea safety on regular basis.

Group discussions in progress

Session 6: Closing Session

52.0 In the closing session, Dr Yadava said that the Workshop deliberations were very useful and the success of the Workshop could be gauged from the fact that there has been full attendance during the entire two days programme. Dr Yadava hoped that a white paper on setting up of seamless communication mechanism would emerge from the Workshop deliberations. He said that there was consensus amongst the stakeholders on many issues and it was also clear that a comprehensive policy that defines the framework and SoPs would be required. It also emerged that with respect to hardware, there cannot be a thumb rule, and more than one equipment would be required keeping in view the distances at which the boats undertook fishing. He also complimented the service providers for engaging in very constructive discussions, based on which there is now enough clarity on the type of infrastructure required as also the other paraphernalia to complement the infrastructure. Dr Yadava also suggested that the future communication network should be seamless and also place minimum burden on the administrative costs to the Government. In conclusion, Dr Yadava said that the most important aspect in this entire exercise would be the human resource development, without which nothing will work. This among other requirements will include creating awareness, providing regular hands-on training and ensuring that fishers are part of the SoPs.

53.0 Mr Gagandeep Singh Bedi, Secretary, Revenue Department, GoTN said that this was a golden opportunity for the Fisheries Sector of Tamil Nadu as the Government will shortly be signing an agreement with the World Bank for providing financial assistance for the sector and this assistance includes a sizeable component for setting up of communication system for fishermen. Therefore, organization of this Workshop was at the most opportune time. Mr Bedi said that issues such as allocation of frequency could be sorted out by getting it in the name of the Director of Fisheries. In this regard, he cited a similar situation where connections for the Block Development Officers in Tamil Nadu were obtained in the name of the District Collector. Mr Bedi also suggested that the DoF may not require building its own towers, but lease it from BSNL or any other service provider. Satellite phones may turn out to be expensive for deep sea fishers and simultaneously the security issues may also have to be looked into for such communication equipment. However, both the options (HF and satellite phones) could be examined for taking a final decision. Concluding his address, Mr Bedi said that Tamil Nadu would be a pioneering State in the country for developing communication system for marine fishermen.

54.0 Mr Vijayakumar, Secretary (Fisheries) in his concluding remarks said that the Workshop was conducted as planned. It was successful in bringing a range of stakeholders and also service providers, who were able to understand the requirements of the fisheries sector and present their considered views. He suggested that the next step would be to further discuss the outcome of the Workshop in focussed groups and take the initiative forward and develop the right policy for consideration of the Government of Tamil Nadu.

55.0 Mr K Rengaraju, Additional Director of Fisheries, DoF proposed the vote of thanks.

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Annexure 1

Report of the Strategic Workshop on Communication Needs of Marine Fishermen

09 - 10, November 2013, Chennai, Tamil Nadu

Prospectus

1.0 The Workshop

A State-level Strategy Workshop will be organized on 'Communication needs of Marine Fishermen' in Chennai on 09 - 10 November 2013. The objectives of the Strategy Workshop are:

(1) *assessing the communication needs in terms of technology and equipment for improving safety at sea;*

(2) *evaluation of available technologies and their financial requirements; and*

(3) *charting a roadmap for integrating communication needs in a larger fisheries management framework.*

The Strategy Workshop will be attended by fisheries administrators and policy makers from the Central and State Governments, academia and research institutes, regional and national fisheries development advisory agencies, service providers and representatives from fisherfolk organizations. The Strategy Workshop will be jointly organized by the Department of Fisheries, Government of Tamil Nadu (DoF-TN); International Fund for Agricultural Development (IFAD); Fisheries Management Resource Centre (fishMARC) and the Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO).

2.0 Background

Communication is an integral part of fisheries management. In the context of marine capture fisheries, communication can be primarily conceived as a three-way process: from shore to sea; sea to shore and within sea. The fourth process from shore to shore is also of importance now as capture fisheries is no more a localized operation.

Holding other factors, effective communication assumes much importance in marine capture fisheries due to inherently risky nature of this livelihood. According to the International Labour Organization (ILO), fishing is one of the riskiest occupations in the world with a reported casualty of 24 000 deaths per year. The casualty figure is possibly on the lower side as it comprises records of advanced nations. Owing to this fact, the need for improved communication through understanding the requirements of fishers were brought out as one of the strongest recommendations in 'Mahabalipuram Declaration' after a Global Meet on Safety at Sea organized by ILO, the Food and Agriculture Organization of the United Nations (FAO) and the BOBP-IGO in 2010 in Mahabalipuram.

The need for improving communication infrastructure was also highlighted in the recommendations of the Fisheries Management for Sustainable Livelihoods (FIMSUL) Project implemented by FAO and DoF-TN with others during 2010-12.

To sum up, an effective communication system in respect of ensuring occupational safety, is one where a functional communication loop is working amongst the fishermen venturing in to the sea, fisheries management agency (*e.g.* DoF-TN) and the surveillance agency (*e.g.* Indian Coast Guard) in the real time. However, the problem reported from various forums in this regard include poor cellular coverage, low penetration of VHF and hand-held radio, delays in receiving information on weather warning and improper use of VHF sets, etc.

Effective communication ideally should also be an integral part of the fisheries management system. The communication channels are necessary for bringing weather information, preferred fishing zone notification and market intelligence. They are also part of communicating Governmental policies to the fishermen and receiving feedback from the field.

The State of Tamil Nadu, by virtue of its long coastline, abundant natural resources and talented fisherfolk is one of the major fishing states in India. However, the State also suffers from frequent natural calamities. Therefore, to strengthen fisheries livelihoods, it is necessary that effective communication channels are established. However, with rapid development in communication technology and changing nature of fisheries, establishing and sustaining effective communication channels needs long-term planning. The proposed Strategy Workshop is expected to initiate this process and pave the way for a well-connected fisheries regime in the State.

The timing of this Workshop is of great significance. The World Bank has given an 'in-principle' approval for the establishment of communication system for the marine fisheries sector as part of the new Coastal Disaster Risk Reduction Project (CDRRP). This means that financial resources are available and the Government of Tamil Nadu now needs to make a proper choice of technologies and prepare a detailed plan. This Workshop is expected to help accelerate this process and enhance the quality of the plan.

3.0 Format and Arrangements of the Strategy Workshop

A. Date and Venue

The Strategy Workshop will be held on 09 - 10 November 2013 at Hotel Ambassador Pallava (30, Montieth Road, Chennai – 600 008, Tamil Nadu; Tel: +91 44 28554476, 28554068; Fax: +91 44 28554492; Website: www.ambassadorindia.com).

B. Conduct and format of the Workshop

The Workshop will include interactive technical presentations delineating the status, need and technological options for effective communication in fisheries and integrating communication needs in larger fisheries management framework. Following the technical presentations, a panel will be constituted to further explore the issues raised in the presentations through question/answers. Group discussions and experience sharing sessions will help the participating fishermen to contribute effectively to the process. This will lead to formulation of a strategy matrix which will be presented in the plenary during the concluding session and will be presented to the Government as 'recommendations' for further action.

C. Language

The Strategy Meeting will be conducted in English with simultaneous translations in Tamil.

D. Participation

About 100 participants from government, private sector and non-government organizations are expected to participate in the Strategy Workshop along with fishermen representing different parts of the coastal areas of Tamil Nadu and different types of fishing methods.

E. Travel and Logistics

Assistance for travel and logistics will be provided on selective basis. Detailed notes on travel and lodging and boarding arrangements will be communicated to the delegates once the nominations are received.

4.0 Expected outputs

- Identification of communication needs for improved safety at sea in Tamil Nadu.

- Mechanisms for integrating communication needs in fisheries management framework in Tamil Nadu.
- Recommendations on development of suitable communication infrastructure to meet the needs of fisheries sector in Tamil Nadu.
- A report on the proceedings of the Strategy Meeting.

The Workshop output is in turn expected to contribute to the development of a detailed proposal for funding that will cover the entire coast of Tamil Nadu and all categories of fishing units.

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Annexure 2

Report of the Strategic Workshop on Communication Needs of Marine Fishermen

09 - 10, November 2013, Chennai, Tamil Nadu

Agenda and Time Table

Time (hrs)	Activity	Speakers/Participants
Day 1: 09 November 2013		
0930 - 1000	**Registration**	
1000 - 1200	**Session-1: Inauguration & Opening Session**	
1000 - 1010	Welcome	C Munianathan, Director, DoF, TN
1010 - 1025	Introduction to the Strategic Workshop	Y S Yadava, Director, BOBP-IGO
1025 - 1045	Fisheries Policy of Tamil Nadu Government	S Vijayakumar, Secretary, Department of Animal Husbandry, Dairying and Fisheries, Government of Tamil Nadu
1045 - 1100	Government of India Policies for Marine Fisheries	L Shankar, Joint Commissioner, DAHD&F, Ministry of Agriculture
1100 - 1120	Keynote Address- Telecom Policies for Marine Communications	N Ravishankar, Special Secretary, Department of Telecommunications, Government of India
1120 - 1140	Inaugural Address	T S Shridhar, Additional Chief Secretary & Commissioner of Revenue Administration, Government of Tamil Nadu
1140 - 1145	Vote of thanks	V Vivekanandan, Secretary, fishMARC
1145 - 1230		***Tea break/Group photograph***
1230 - 1330	**Session-2: Providing the background**	
1230 - 1300	Marine fisheries of Tamil Nadu and communication needs	Department of Fisheries, Government of Tamil Nadu
1300 - 1330	Communication needs for an effective monitoring, control and surveillance system in fisheries	Y S Yadava, BOBP-IGO
1330 - 1430		***Lunch break***
1430 - 1500	**Session-2: Providing the background (Contd…)**	
1430 - 1500	Fishermen panel to share fishermen experiences on sea-safety and communication systems	
1500 - 1800	**Session-3: Technology demonstrations and expositions**	
1500 - 1600	Detailed presentations on the different technology options with demonstrations and Q & A sessions Cell phones, VHF, HF, Satellite phones, etc.	Technology service providers and equipment suppliers: BSNL, Reliance Communications, Tata Communications, Aircel, Airtel, ISRO/INSAT, INMARSAT, etc.
1600 - 1630		***Tea break***
1630 - 1745	**Session-3: Technology demonstrations and expositions (Contd…)**	
1745 - 1800	***Conclusion of Day 1***	

Time (hrs)	Activity	Speakers/Participants
Day 2: 10 November 2013		
0900 - 1030	**Session 4: Panel of Independent Experts**	
0900 - 1030	Independent experts comment on technologies presented on Day 1 with Q & A	
1030 - 1100		***Tea break***
1030 - 1100	**Session 4: Contd.**	
1030 - 1100	User perspective of technologies	Selected fishermen from TN already using communication technologies
1100 - 1300	**Session 5: Group Discussions**	
1100 - 1315	Break out session	All participants
1315 - 14 15		***Lunch***
1415 - 1515	**Session 6: Group Recommendations**	
1415 - 1445	Presentation of Recommendations by Groups	Group leaders
1445 - 1515	Open discussion	All participants
1515 - 1600	***Closing Session***	
1515 - 1600	Summing up of Workshop outcomes	Y S Yadava, Director, BoBP-IGO
	Chief Guest Address	G S Bedi, Revenue Secretary, GoTN
	Concluding Remarks	S Vijaykumar, Secretary, Fisheries, GoTN
	Vote of Thanks	K Rengarajan, Additional Director, DoF, TN
1600	***Conclusion of Workshop and TEA***	

Annexure 3

Report of the Strategic Workshop on Communication Needs of Marine Fishermen

9 - 10, November 2013, Chennai, Tamil Nadu

List of Participants

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Annexure 4

Introduction to the Strategic Workshop on Communication Needs of Marine Fishermen

Address by
Dr Yugraj Singh Yadava
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Excellencies and distinguished participants, a very good morning!

On behalf of the member-countries of the Bay of Bengal Programme Inter-Governmental Organisation and as a co-organizer, I also take this opportunity to welcome you all to this Strategic Workshop.

Fishing has been recognized as one of the most dangerous occupations in the world, along with mining and aviation. The International Labour Organization (the ILO) has estimated that annually about 24,000 fishermen die while fishing at sea. This ILO statistics originates from those developed countries which maintain a good record of accidents at sea. However, if the fishermen deaths from developing countries that do not maintain proper statistics are taken into consideration, the figure of 24000 will be much higher, perhaps three to four times more.

Safety of fishermen at sea has now been recognized as an integral part of fisheries management. It is no longer a stand alone requirement and all fisheries management initiatives have to consider the safety aspects of the fishermen, including their craft and gear. Within the larger framework of safety at sea, aspects such as communication, navigation, personal floatation devices, good design and proper construction of boats, appropriate use of gear and finally good conduct at sea are vital and cannot be ignored by the fisheries administrators, managers and other relevant stakeholders, including the fishermen.

Of all the above parameters, good communication network for fishermen at sea is of paramount importance. I am glad that the Department of Fisheries, Government of Tamil Nadu has now flagged this requirement as a high priority, leading to the organization of this two- day Workshop. While saying so, I must compliment the Hon'ble Minister of Fisheries, Mr K A Jayapal and Dr S Vijayakumar, Secretary (Fisheries), Government of Tamil Nadu for spearheading the process.

As a co-organizer, let me also share with you that the organization of this Workshop has been planned very meticulously. We have tried to provide a 360° coverage that includes all aspects related to the establishment of an implementable, cost-effective and user-friendly communication network for the marine fisheries sector in Tamil Nadu. To achieve these goals, we have with us very senior policy makers from the Union and the State Government; Senior Technical Officers representing the concerned Ministries and Departments from the Centre as well as the State of Tamil Nadu; Experts and Subject-Matter Specialists from the Research & Development Institutions and academia; Non-governmental Organizations; the Industry representing a wide range of service providers; and last but not the least, the key constituents of this entire exercise, the representatives of marine fisher associations and related organizations in Tamil Nadu.

To ensure that all key aspects of a sound communication network for fisheries sector are articulated and discussed in this two-day event, the Workshop has been organized into four main sessions – the first session provides the background; the second deals with the technologies in hand; the third session provides opportunities to the experts/academia to weigh the pros and cons of the technology; and the fourth session allows the participants to brainstorm the ideas and issues flagged in the previous sessions and provide their suggestions to the Workshop. In the concluding part of the Workshop, it is proposed to arrive at some concrete recommendations that would be submitted to the Government of Tamil Nadu for its consideration.

Complimenting once again the Government of Tamil Nadu for initiating this vital process of setting up of a communication network for the fisheries sector, I have no hesitation in saying that a sound framework set up in Tamil Nadu will also act as a role model for all the other coastal States and Union Territories of India.

With these words and once again welcoming you all, I conclude my brief introduction to the Workshop.

Thank you!

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Annexure 5

கடல் மீனவர்களுக்குத் தேவையான தகவல் தொடர்பு பற்றிய செயல் திட்ட கருத்துப்பட்டறையை அறிமுகப்படுத்துதல்

உரையாற்றுபவர்
முனைவர் யுக்ராஜ் சிங் யாதவா, இயக்குநர், வங்காள விரிகுடா திட்டம் – அரசிடை அமைப்பு

மேண்மை தாங்கியவர்களே மற்றும் புகழ்பெற்ற பங்கேற்பாளர்களே உங்கள் அனைவருக்கும் எனது காலை வணக்கம்!

வங்காள விரிகுடா திட்ட அரசிடை அமைப்பின் உறுப்பு நாடுகள் சார்பிலும் மற்றும் ஒரு இணை அமைப்பாளர் என்ற முறையிலும் நான் இந்த வாய்ப்பை பயன்படுத்தி கொண்டு உங்கள் அனைவரையும் இந்த செயல்திட்டக் கருத்துப்பட்டறைக்கு வரவேற்கின்றேன்.

சுரங்கம் தோண்டுதல் மற்றும் விமானம் ஓட்டுதல் போன்றே மீன்பிடித்தலும் ஒரு மிகவும் ஆபத்தான தொழிலாக உலகத்தால் அங்கீகரிக்கப்பட்டுள்ளது. பன்னாட்டு தொழிலாளர் அமைப்பு (The ILO) ஆண்டு தோறும் மீன்பிடிக்கையில் 24,000 மீனவர்கள் இறப்பதாக மதிப்பிட்டுள்ளது. வளர்ந்த நாடுகளில் கடலில் ஏற்பட்ட விபத்துக்கள் பற்றிய சிறந்த பதிவுகளில் இருந்து தான் இந்த பன்னாட்டு தொழிலாளர் அமைப்பின் புள்ளிவிவரம் தோன்றியுள்ளது. எனினும், வளரும் நாடுகளில் மீனவர்கள் இறப்பு பற்றிய சரியான புள்ளிவிவரம் பராமரிக்கப்படவில்லை. இதனைக் கருத்தில் கொண்டு பார்க்கும் போது அனேகமாக 24,000 மீனவர் இறந்தார்கள் என்ற புள்ளி விவரத்தை விட மூன்று முதல் நான்கு மடங்கு இறந்தவர்களின் எண்ணிக்கை அதிகமாக இருக்கலாம்.

மீன்வள மேலாண்மையில் கடலில் மீனவர்களின் பாதுகாப்பு என்பது தற்போது ஒரு ஒருங்கிணைந்த பகுதியாக உள்ளது. இனிமேல் அது தனி ஒரு நிலைபாடாக இருக்காது மற்றும் அனைத்து மீன்வள மேலாண்மை தொடர்பான தொடங்கங்களிலும் மீனவர்களின் படகுகள் மற்றும் வலைகளுடன் மீனவர்களின் பாதுகாப்பு அம்சங்கள் குறித்தும் பரிசீலனை செய்யப்பட வேண்டும். கடலில் பாதுகாப்பு என்ற பெரிய கட்டமைப்பில் தகவல் தொடர்பு, கலன்களைச் செலுத்துதல், தங்கள் மிதத்தல் சாதனங்கள், நல்ல வடிவமைப்பு மற்றும் படகுகளின் முறையான கட்டுமானம், வலைகளின் பொருத்தமான உபயோகம் மற்றும் இறுதியாக கடலுக்குச் செல்லும் போது நல்ல நடத்தை முதலிய அம்சங்கள் மிகவும் முக்கியமானவைகள் மற்றும் மீன்வள நிர்வாகிகள், மேலாளர்கள் மற்றும் இதர தொடர்புடைய பங்குதாரர்கள், மீனவர்கள் முதலியவர்களால் அலட்சியப்படுத்தப்படக்கூடாது.

எல்லாவற்றுக்கும் மேலாக கடலுக்குச் சென்றுள்ள மீனவர்களுக்கு சிறந்த தகவல் தொடர்பு அமைப்பு என்பது மலையளவு முக்கியத்துவம் வாய்ந்ததாகும். தமிழ்நாடு அரசு மீன்வளத்துறை தற்போது இந்த தேவையின் அதிக முன்னுரிமையைக் கருத்தில் கொண்டு இந்த இரண்டு நாள் கருத்துப்பட்டறையை நடத்த முன்வந்ததற்கு நான் மகிழ்ச்சியடைகிறேன். இதை சொல்லும் பொழுது மாண்புமிகு மீன்வளத்துறை அமைச்சர் திரு கே.ஏ. ஜெயபால் அவர்களையும், டாக்டர் எஸ் விஜயகுமார், தமிழ்நாடு அரசுச் செயலாளர், கால்நடை பாரமரிப்புத் துறை, பால்வளம் மற்றும் மீன்வளம் அவர்களையும் இந்த செயல்முறையை முன்னின்று நடத்துவதற்கு நிச்சயம் பாராட்ட கடமைப்பட்டுள்ளேன்.

ஒரு இணை அமைப்பாளராக, நான் உங்களுடன் சில விவரங்களை பகிர்ந்து கொள்ள விரும்புகிறேன். இந்த கருத்து பட்டறையைச் சிறப்பாக நடத்த மிகவும் கவனமாக திட்டமிடப்பட்டுள்ளது. தமிழ்நாடு கடல் மீனவர்களுக்கு செயல்படுத்தக்கூடிய, விலை குறைந்த, மற்றும் உபயோகிப்பவர்களுக்கு எளிமையான, தகவல் தொடர்பு அமைப்பை வழங்கக்கூடிய அனைத்து அம்சங்களிலும் நாங்கள் முழு முயற்சி எடுத்துள்ளோம். இந்த குறிக்கோளை அடைந்திட நம்முடன் கொள்கை முடிவுகளை மத்திய அரசிலும், தமிழ்நாடு அரசிலும் எடுக்கக்கூடிய உயர்ந்த பதவியில் உள்ள அதிகாரிகள் இங்கே உள்ளனர். மத்திய மற்றும் மாநில அமைச்சகத்தில் இருந்தும் மற்றும் துறைகளில் இருந்தும் தொடர்புடைய மூத்த தொழில்நுட்ப அதிகாரிகள் வந்துள்ளனர். வல்லுநர்கள், மற்றும் தகவல் தொடர்பு சார்ந்த விவரத்தில் சிறப்பானவர்கள் தொடர்புடைய நிறுவனங்களில் இருந்தும் மற்றும் கல்வியில் சார்ந்தவர்கள், அரசு சாராத அமைப்புகள், பரந்த அளவில் தகவல் தொடர்பு சேவையளிக்கும் நிறுவனங்களின் பிரதிநிதிகள் மற்றும் கடைசியாக ஆனால் முக்கியமாக இந்த நிகழ்வின் காரணமாகவுள்ள தமிழகத்தின் மீனவர் அமைப்புகளின் பிரதிநிதிகள் முதலியவர்கள் நம்முடன் உள்ளனர்.

மீனவர்களுக்காக சிறந்த, அனைத்து முக்கிய அம்சங்களையும் கொண்ட தகவல் தொடர்பு அமைப்பை உறுதிப்படுத்த இந்த இரண்டு நாள் கருத்துப்பட்டரை விவாதிக்கவும் மற்றும் வெளிப்படுத்தவும் ஒரு வாய்ப்பாக உள்ளது. இந்த கருத்துப்பட்டறை நான்கு முக்கிய அமர்வுகளைக் கொண்டதாக அமைக்கப்பட்டுள்ளது. முதலாவது அமர்வு தகவல் தொடர்பு பின்னணிகளை வழங்கிடுவதாகவும், இரண்டாவது அமர்வு தற்போதுள்ள தொழில் நுட்பங்களைக் கையாளுவதாகவும், மூன்றாவது அமர்வு வல்லுநர்களுக்கும் மற்றும் கல்வி அமைப்புகளில் இருந்து வந்துள்ளவர்கள் தொழில்நுட்பத்தின் சாதக மற்றும் பாதக அம்சங்களை மதிப்பீடு செய்து கருத்துத் தெரிவிப்பதாகவும், மற்றும் இறுதி அமர்வு பங்கேற்பாளர்கள் தங்கள் ஆலோசனைகள் மற்றும் கருத்துக்கள் மற்றும் முந்தைய அமர்வுகளில் எழுப்பப்பட்ட பிரச்சினைகள் ஆகியவற்றை அலசுவதாகவும் மற்றும் தங்கள் பரிந்துரைகளை கருத்துப்பட்டறைக்கு வழங்குவதாகவும் இருக்கும். முடிவில் சில தீர்க்கமான பரிந்துரைகளை முன்மொழிவதாகவும், அந்த பரிந்துரைகள் தமிழ்நாடு அரசின் பரிசீலனைக்கு பின்னர் சமர்ப்பிக்கப்படும்.

மீனவர் சமுதாயத்திற்காக ஒரு தகவல் தொடர்பை அமைத்திட இந்த முக்கியமான கருத்துப்பட்டறையினைத் தொடங்கிய தமிழ்நாடு அரசை மீண்டும் ஒரு முறை பாராட்டி, தமிழ்நாட்டில் அமையவுள்ள இந்த சிறந்த தகவல் தொடர்பு அமைப்பால் இந்தியாவின் மற்ற கடற்கரை மாநிலங்களுக்கும்/ யூனியன் பிரதேசங்களுக்கும் தமிழ்நாடு ஒரு முன்னோடி மாநிலமாக திகழும் என்பதை என்று சொல்வதில் எனக்கு எவ்வித தயக்கமும் இல்லை.

இத்துடன், அனைவரையும் வருக வருக என வரவேற்று, கருத்துப்பட்டறையின் எனது அறிமுக உரையை முடித்துக் கொள்கிறேன்.

நன்றி!

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MARINE FISHERIES OF TAMIL NADU AND COMMUNICATION NEEDS

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Coastal Information – Tamil Nadu

S.No.	Description	East Coast	West Coast	Total
1	**Coastal Length (in Km)**	1016	60	1076
2	**Continental shelf (in sq.km)**			
a.	Upto 50m depth	22411	844	23255
b.	51m to 200m depth	11205	6952	18157
3	**Exclusive Economic Zone (in million sq.km) Extends to 200 nautical miles from shore**			0.19

Coasts

- **East Coast**
  - Coromandal coast : 357 km
  - Palk Bay : 294 km
  - Gulf of Mannar : 365 km

  1016 km
- **West Coast** : 60 km

Coromandel Coast - 357 km

- Districts Involved
  - Tiruvallur
  - Chennai
  - Kanchipuram
  - Villupuram
  - Cuddalore
  - Nagapattinam

Coromandel Coast

- Crafts and Gears
  - Mechanized Boats
    - Trawling - 970 Nos
    - Gillnet - 303 Nos.
    - Line Fishing - 32 Nos

    Total 1305 Nos

Coromandel Coast

- Mechanized Boats
  - Craft- Lengthwise Distribution

Craft Length	Nos.
Upto 30'	28
30' – 32'	111
32' – 36'	95
36' – 40'	264
40' – 45'	347
45' – 50'	415
More than 50'	45
Total	**1305**

Coromandel Coast - Fishing Days

- Mechanized Boats

Fishing Days	Nos.
Daily Fishing	354
2 days Fishing	237
3-5 days fishing	377
6 days & More	337
Total	**1305**

Coromandel Coast – Distance of Fishing Area

Mechanized Boats

Distance of Fishing Area	Nos.
Up to 10 km	153
10 - 20 km	165
20 – 40 km	238
40 – 60 km	160
60 – 200 km	308
More than 200 km	281
Total	**1305**

Coromandel Coast – Distance of Fishing Area

Traditional Fishing Crafts

Distance of Fishing Area	Nos.
Up to 10 km	4950
10 - 20 km	4349
> 20 km	716
Total	**10015**

Coromandel Coast

- Scope for different segments of fishing sector
  - Cellphone
  - VHF
  - HF
  - Satellite phones

Palk Bay - 294 km

- Districts Involved
  - Tiruvarur
  - Tanjavur
  - Pudukottai
  - Ramnad (Part)

Palk Bay

- Crafts and Gears

Mechanized Boats

Trawling : 1651 Nos
Gillnet : -
Line Fishing : -

Total 1651 Nos

Palk Bay

- **Mechanized Boats**
  - Craft- Lengthwise Distribution

Craft Length	Nos.
Upto 30'	1084
30' – 32'	55
32' – 36'	374
36' – 40'	-
40' – 45'	84
45' – 50'	54
More than 50'	0
Total	**1651**

Palk Bay - Fishing Days

Mechanized Boats

Fishing Days	Nos.
Daily Fishing	567
2 days Fishing	1084
3-5 days fishing	-
6 days & More	-
Total	**1651**

Palk Bay – Distance of Fishing Area

Mechanized Boats

Distance of Fishing Area	Nos.
Up to 10 km	-
10 - 20 km	202
20 – 40 km	1449
40 – 60 km	-
60 – 200 km	-
More than 200 km	-
Total	**1651**

Palk Bay – Distance of Fishing Area

Traditional Fishing Crafts

Distance of Fishing Area	Nos.
Up to 10 km	2285
10 - 20 km	862
> 20 km	17
Total	**3164**

Palk Bay

- Scope for different segments of fishing sector
  - Cellphone
  - VHF
  - HF
  - Satellite phones

Gulf of Mannar – 365 km

- Districts Involved
  - Ramnad (Part)
  - Tuticorin
  - Tirunelveli
  - Kaniyakumari (Part)

Gulf of Mannar

- Crafts and Gears

Mechanized Boats

Trawling	:	906	Nos
Gillnet	:		
Line Fishing	:	157	Nos
Total		**1063**	Nos

Gulf of Mannar

- **Mechanized Boats**
  - Craft- Lengthwise Distribution

Craft Length	Nos.
Upto 30'	294
30' – 32'	0
32' – 36'	0
36' – 40'	0
40' – 45'	156
45' – 50'	73
More than 50'	540
Total	**1063**

Gulf of Mannar - Fishing Days

- **Mechanized Boats**

Fishing Days	Nos.
Daily Fishing	765
2 days Fishing	298
3-5 days fishing	-
6 days & More	-
Total	**1063**

Gulf of Mannar – Distance of Fishing Area

- **Mechanized Boats**

Distance of Fishing Area	Nos.
Up to 10 km	-
10 - 20 km	-
20 – 40 km	370
40 – 60 km	440
60 – 200 km	253
More than 200 km	-
Total	**1063**

Gulf of Mannar – Distance of Fishing Area

Traditional Fishing Crafts

Distance of Fishing Area	Nos.
Up to 10 km	329
10 - 20 km	3387
> 20 km	2961
Total	**6677**

Gulf of Mannar

- Scope for different segments of fishing sector
  - Cellphone
  - VHF
  - HF
  - Satellite phones

West Coast

- Districts Involved
  - Kaniyakumari (Part)

West Coast

- Crafts and Gears

Mechanized Boats

		Online	Without online	Total
Trawling	:	17 Nos	209 Nos	226 Nos.
Gillnet	:	427 Nos	247 Nos	674 Nos.
Line Fishing	:			
Total		444 Nos	456 Nos	900 Nos

West Coast

- Mechanized Boats
  - Craft- Lengthwise Distribution

Craft Length	Online (Nos).	Without online (Nos.)	Total
Upto 30'	-	-	-
30' – 32'	-	-	-
32' – 36'	-	-	-
36' – 40'	-	-	-
40' – 45'	-	-	-
45' – 50'	-	-	-
More than 50'	444	456	900

West Coast - Fishing Days

- Mechanized Boats

Fishing Days	Online (Nos).	Without online (Nos.)	Total
Daily Fishing	-	-	-
2 days Fishing	-	-	-
3-5 days fishing	-	-	
6 days & More	444	456	900

West Coast – Distance of Fishing Area

- Mechanized Boats

Distance of Fishing Area	Online (Nos).	Without online (Nos.)	Total
Up to 10 km	-	-	-
10 - 20 km	-	-	-
20 – 40 km	-	-	-
40 – 60 km	-	-	-
60 – 200 km	444	456	900
More than 200 km	-	-	-

West Coast – Distance of Fishing Area

Traditional Fishing Crafts

Distance of Fishing Area	Nos.
Up to 10 km	339
10 - 20 km	383
> 20 km	3272
Total	**3994**

West Coast

- Scope for different segments of fishing sector
  - Cellphone
  - VHF
  - HF
  - Satellite phones

ABSTRACT

S.No.	Name of the Coast	Mechanized Boats	Traditional Fishing crafts	Total
1	Coromandal coast	1305	10015	**11320**
2	Palk Bay	1651	3164	**4815**
3	Gulf of Mannar	1063	6677	**7740**
4	West Coast	900	3994	**4894**
	Total	**4919**	**23850**	**28769**

Points for Discussion

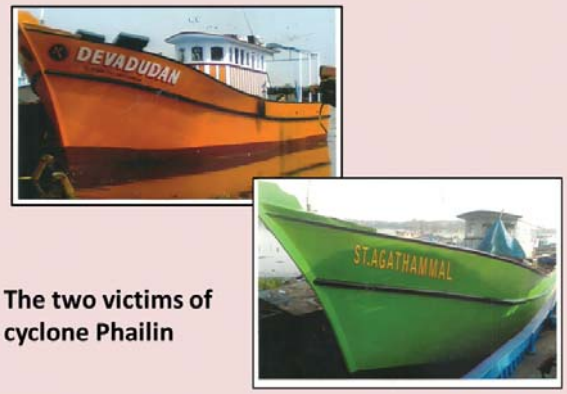
Equipments	Beneficiary	Points for Discussion
Cell phone Service Providers Tata Telecom Reliance BSNL Aircel Airtel Idea	For Non-motorised traditional fishing crafts	• Range at sea and factors affecting range • Willingness to set up towers to maximize range in sea • Scope for separate plan/ tariff for fishermen considering the needs and affordability • Marine fisheries content in Tamil, hand-set with Tamil • Regulatory Issues, if any
VHF	5 W – Range (for traditional fishing crafts) 25 W – Range (for Mechanized fishing Boats)	• Brief introduction to Technology (for laymen) • Range at sea: boat to boat, boat to shore • Handset options, costs • Shore Infrastructure needed; initial investment, annual maintenance & running costs • Administrative system required • Channels allocated and their use/misuse • Regulatory issues

Equipments	Beneficiary	Points for Disscussion
HF	Multiday and Multiweek Fishing boats and Fishing Vessels (including Trawlers, Resource specific vessels)	• Brief introduction to Technology (for laymen) • Range at sea – Theoretical and Practical • Reliability – issue of cloud cover (How do Srilankan Boats seems to manage so well ?) • Hand set options, costs • Shore infrastructure needed; initial investment, annual maintenance & running costs • Administrative system required • Channels allocated and their use /misuse • Regulatory issues
Satellite Phones INMARSAT, INSAT	For multiweek fishing boats, Fishing Vessels (including Trawlers, Resource specific vessels)	• Brief introduction to Technology and system • Hand set options, costs • Regular call charges and scope for reduction based on number of fishermen subscribing or fixing tariffs on affordability criteria rather than actual costs • Regulatory issues Future plans for INMARSAT/INSAT and how they may improve access and affordability to TN fishermen

Where do we begin?

Let us begin with the story of St. Agathammal (Simion) and Devadudan (Akash)- the two Toothoor (Kanniyakumari) boats that were victims of cyclone Phailin ?

(Landfall October 12, 2013 near Gopalpur, Odisha)



The two victims of cyclone Phailin

Survivors of St. Agathammal and Davadudan

Post mortem (1)

Let us first see what went right:

- Advance warning was given to Simion and Akash;
- Both the boats had VHF sets and the crew carried cell phones;
- A helicopter was also deployed by Coast Guard (?) to warn the fishing boats;
- Mr Bosco, another fisherman from the Toothoor Group, whose boat had landed on 09 October 2013 in Orissa was in touch with these two boats and was constantly warning them of the cyclone.

Post mortem (2)

Now what went wrong:

- The crew refused to comply with the warnings and stayed at sea till the last minute before being engulfed by the high waves and wind velocity;
- The two boats had no personal floatation devices (life jackets or floats);
- We have no details on what sort of information was received by the Coast Guard, but presumably even if the SOS was received, the sea was too dangerous to allow Coast Guard to mount any SAR operation.

Lessons Learnt

- St Agathammal and Devadudan were from Toothoor (Kanniyakumari); presumably first registered and licensed to fish by the Tamil Nadu Government. However, the boats were fishing off the coast of Orissa when the cyclone hit the area. Was the Department of Fisheries, Tamil Nadu aware of its boats fishing in waters off the coast of Orissa?
- The two boats had no personal floatation devices (life jackets or floats) but were still provided with registration and permitted to fish in deeper waters off the coast of other States;
- Despite having VHF and cell phones and the fishermen's version that they did establish contacts with Coast Guard, no rescue could be undertaken, until the sea conditions became severe and unfit to mount SAR operations.

How do we integrate safety with management…

Monitoring, Control and Surveillance (MCS)

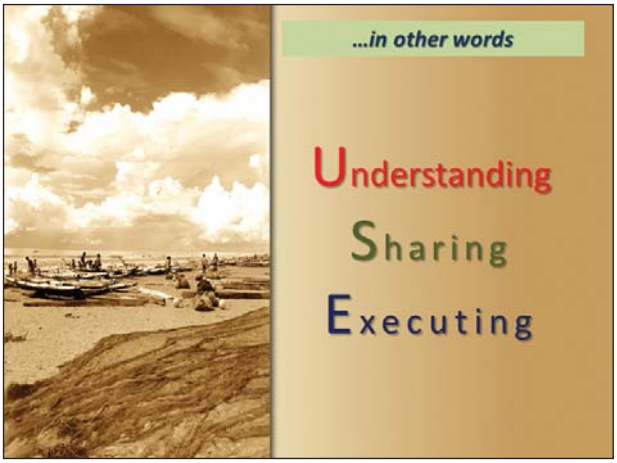
A sound MCS regime will come from…

Comprehensive understanding of the needs of the fisheries sector;

Placing adequate controls on activities that threaten the life and livelihoods of fishermen and their families;

Providing support to the sector where it stands to benefit from State's involvement; and

Working together to achieve the end objectives.



A good MCS regime in terms of its communication role can provide the following key functions;

Effective boat to shore and *vice versa* voice communication;

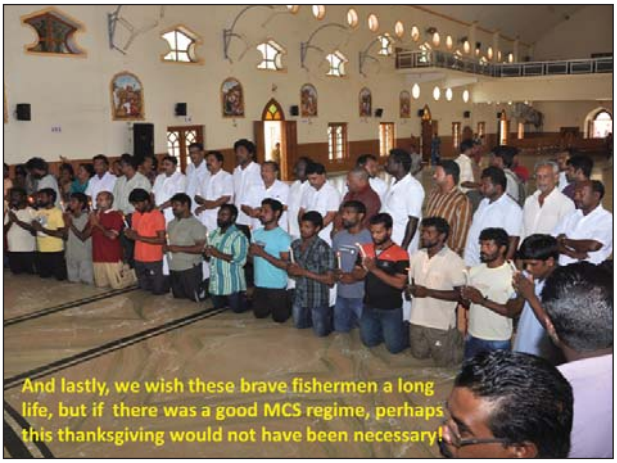
Record the movements of boats, which is extremely useful at times of distress;

Restrict plying of vessels that lack proper communication equipment (according to its size and area of operation);

Establish protocols for SAR;

Work as a business tool for fishers to aid their marketing, etc; and

Could also be set up as in a PPP mode.



மீன்வளத்திற்குத் தேவையான ஒரு திறமையான கண்காணிப்பு கட்டுப்பாடு மற்றும் அருகிலிருந்து கண்காணிப்பைக் கொண்ட தகவல் தொடர்பு அமைப்பு

யுக்ராஜ் சிங் யாதவா
yugraj.yadava@bobpigo.org;
www.facebook.com/BOBPIGO

எங்கிருந்து நாம் தொடங்குவது?

பைலின் புயலினால் பாதிக்கப்பட்ட தூத்தூர் (கன்னியாகுமரி) படகுகளான புனித அகத்தம்மாள் (சிமியோன்) மற்றும் தேவதூதன் (ஆகாஷ்) கதையிலிருந்து நாம் தொடங்குவோம்?

(நிலச்சரிவு அக்டோபர் 12, 2013 ஒடிசா அருகில், கோபால்பூர்)

பைலின் புயலில் பாதிக்கப்பட்ட இரண்டு படகுகள்

புனித அகத்தம்மாள் மற்றும் தேவதூதனில் சென்று உயிர் பிழைத்தவர்கள்

பிரேத பரிசோதனை (1)

முதலில் எது சரியாகச் சென்றது என நாம் பார்ப்போம்:

- சிமியோனுக்கும் மற்றும் ஆகாஷ்க்கும் முன்னரே முன்னெச்சரிக்கை கொடுக்கப்பட்டுள்ளது;
- இரண்டு படகுகளிலும் VHF கருவிகள் இருந்துள்ளன மற்றும் படகில் இருந்த மீனவர்கள் கைப்பேசி எடுத்துச் சென்றுள்ளனர்;
- மீன்பிடி படகுகளை எச்சரிக்க ஒரு ஹெலிகாப்டர் மேலும் ஈடுபடுத்தப்பட்டுள்ளது;
- 2013 அப்டோபர் 9ம் தேதி ஒடிசா கடற்கரையை அடைந்த திரு போஸ்கோ மற்றும் இதர மீனவர்கள் தொடர்ந்து இவர்களுடன் தொடர்பில் இருந்து புயல் எச்சரிக்கைகளைத் தெரிவித்துள்ளனர்.

பிரேத பரிசோதனை (2)

எது தவறாக சென்றது என தற்போது பார்ப்போம்:

- மீனவர்கள் வானிலை எச்சரிக்கைக்கு ஏற்ப செயல்பட மறுத்து கடலில் ராட்ச அலைகள் மற்றும் புயல் காற்று தோன்றி அவர்களை கடல் உள்ளிழுக்கும் கடைசி நிமிடம் வரை கடலில் இருந்துள்ளனர்;
- இரண்டு படகுகளிலிலும் மீனவர்களுக்கு தேவையான மிதவைகள் ஏதுமில்லை (லைப் ஜாக்கெட்ஸ் மிதவைகள்);
- கடலோரக் கவற்படை என்ன தகவல் பெற்றது என்ற விவரம் நமக்கு தெரியாத நிலையில் நாம் SOS தகவல் பெற்றதாக மாறாக நினைத்து கடல் மிகவும் சீற்றமாக காணப்பட்டதால் கடலோரக் காவற்படை மீட்பு பணி மேற்கொள்ள இயலாத நிலையிருந்தது.

கற்ற பாடங்கள்

- கன்னியாகுமரி தூத்துரைச் சார்ந்த புனித அகத்தம்மாள் மற்றும் தேவதாதன ஆகிய இரண்டு படகுகளும் முதலில் தமிழ்நாடு அரசு மூலம் பதிவு செய்யப்பட்டு உரிமம் பெற்றிருந்தது எனினும் இந்த படகுகள் புயல் அடிக்கும்போது ஒடிசா ஆழ்கடலில் மீன்பிடித்துள்ளன. இந்தப் படகுகள் ஒடிசா ஆழ்கடலில் மீன்பிடிப்பது தமிழ்நாடு மீன்வளத்துறைக்கு தெரியுமா என்று தெரியவில்லை?
- இந்த படகுகளில் மீனவருக்கான மிதவைச் சாதனங்கள் இல்லாத நிலையில் (லைப் ஜாக்கெட்ஸ் & மிதவைகள்) பதிவு செய்யப்பட்டு ஆழ்கடல் மீன்பிடிப்பிற்கு அனுமதிக்கப்பட்டுள்ளது;
- VHF மற்றும் செல்போன்கள் இருந்த நிலையில் மீனவர்கள் கூற்றுப்படி அவர்கள் கடலோரக் காவற்படையை தொடர்பு கொண்டதாகவும் ஆனால் மீட்பு நடவடிக்கைகள் கடல் மிகவும் கொந்தளிப்பாக இருந்தவரை மேற்கொள்ளப்படவில்லை மற்றும் தேடுதல் மற்றும் மீட்புபணியை அமைப்பது பயனற்றதாக இருந்தது.

எப்படி நாம் இந்த கடும்
சிக்கலான பாதுகாப்பை
நிர்வகிப்பது...

கண்காணிப்பு, கட்டுப்பாடு மற்றும் கண்காணித்தல் (MCS)

ஒரு சிறந்த MCS ஆட்சிமுறை வரக்கூடும்...

மீன்வள பிரிவு குறித்து ஒருங்கிணைந்த புரிந்து கொள்தல் தேவை;

மீனவர்களின், வாழ்க்கை மற்றும் வாழ்வாதாரம் மற்றும் அவர்களுடைய குடும்பங்களுக்கு அச்சுறுத்தலாக உள்ள செயல்பாடுகள் மீது போதிய கவனம் வைத்தல்;

எங்கே அரசின் ஈடுபாட்டினால் இந்தப் பிரிவு பலனடையுமோ அங்கே ஆதரவு வழங்கப்பட வேண்டும் ; மற்றும்

இணைந்து செயல்படுதல் நோக்கங்களை அடைய வழிவகுக்கும்.

ஒரு சிறந்த MCS ஆட்சிமுறை தகவல்தொடர்பு என்ற பங்கில் முக்கியமான கீழ்கண்ட செயல்களை வழங்குகிறது;

படகிலிருந்து கரைக்கும், மற்றும் கரையிலிருந்து படகிற்கும் திறமையான தகவல் தொடர்பிற்கு பயன்படுகிறது;

படகுகளின் இயக்கத்தைப் பதிவு செய்வதன் மூலம் தீவிரமான ஆபத்து காலத்தில் பயனுள்ளதாகயுள்ளது;

படகுகளின் இயக்கத்தை முறையான தகவல் தொடர்பு சாதனம் இல்லா நிலையில் குறைக்கிறது (அதனுடைய அளவு மற்றும் செயல்படும் பகுதிக்கேற்ப);

தேடுதல் மற்றும் மீட்பு நடவடிக்கைக்கான (SAR) நெறிமுறைகளை திர்மானிக்கிறது

மீனவர்களுக்கு வர்த்தகம் முதலியவற்றில் வியாபாரக் கருவியாகப் பயன்படுகிறது; மற்றும்

தனியார் மற்றும் பொதுத்துறை பங்களிப்பின் மூலம் மேலும் அமைக்க முடியும்.

Strategic Workshop on Communication Needs of Marine Fisherman

CHENNAI

on

9-10 November 2013

Presented by

Bharat Sanchar Nigam Limited

CONSUMER MOBILITY (NETWORK PLANNING -I)

TAMIL NADU TELECOM CIRCLE

Tamil Nadu Telecom Circle

Bharat Sanchar Nigam Limited
Tamil Nadu Telecom Circle
consists of
Tamil Nadu State
including
Puduchery Union Territory
And
excluding
Chennai, Kancheepuram & Tiruvallur
Revenue Districts.

GSM Network Status at a glance in TN Circle

Status at a glance of GSM penetration in TN Circle

- Population in TN Circle Covered by GSM Service : 5,15,33,031/5,33,35,933 (97%)
- Area of TN Circle in Sq. Km Covered by GSM Service : 94,186/1,22,478 (77%)
- No of Towns Covered : 964/964 (100%)
- No. of Dist. Head Quarters Covered : 31/31 (100%)
- No. of Taluk Head Quarters Covered : 202/202 (100%)
- No. of Block Head Quarters Covered : 362/362 (100%)
- No of Cities/Towns/Places (Stns) covered : 2,936

Status at a glance of GSM penetration in TN Circle

- Total Villages Covered : 12,362 /14,424 (86%)
- Villages >5K Population : 1,368/1,368 (100%)
- Villages <5K Population : 7,899/8,652 (91%)
- Villages <1K Population : 3,084/4,404 (70%)

- National Highway (Km) : 4,119/4,331 (95%)
- Rail Route (Km) : 3,231/3,366 (96%)
- State Highway (Km) : 5,058/8,298 (61%)

- Left out uncovered areas of Rail routes , NH & SH will be covered in Ph VII and up coming projects based on techno-commercial viability.

Net Work Elements at a glance in TN Circle

- No. of MSCs (Mobile Switching Centers) - 25
- No. of MGWs (Media Gate Ways) - 30
- No of BSCs (Base Station Controller) - 75
- No of RNCs (Radio Network Controller) - 15
- No of 2G BTSs (Base Transcever Station) - 5,497

- No of 3G Node Bs - 1,136
- No of Cities/Towns Covered by 3G Services - 38
  (All 31 District Head Quarters and 7 other Important Towns covered by 3G services)

Net Work Elements at a glance in TN Circle

- No of BSNL Towers Available - 4,726
- Ground Base Towers - 3,557
- Roof Top Towers - 735
- Others (Pole/MARR) - 437

- No of Radio Capacity Available (lines) - 73,92,450
- No of Subscribers Available - 79,99,208
- Pre paid - 77,58,014
- Post paid - 2,41,194

Ground Base Tower Details

- Number of Ground Base Towers available in TN Circle - 3,557

GBT Ht in Meter	No of GBTs
15	1
20	4
21	1
30	41
35	2
40	3,362
50	10
60	59
65	1
70	16
80	20
90	3
100	37
Total No of GBTs	3,557

Coastal Area BTSs (< 5Kms)

- No of BTSs working in BSNL Towers - 305
- No of BTSs in BSNL GBT Towers - 220
- No of BTSs in BSNL RTT Towers - 73
- No of BTSs in BSNL Poles - 12

District Wise	BSNL GBT	BSNL RTT	BSNL Pole	Total BSNL Towers
Cuddalore	17	4	2	23
Kanyakumari	47	7		54
Karaikal	8	3		11
Nagapattinam	30	3		33
Puduchery	17	32	8	57
Pudukkottai	7			7
Ramanathapuram	37	1		38
Thanjavur	8			8
Tirunelveli	10	1		11
Tuticorin	34	22	1	57
Villupuram	5		1	6
Total BSNL Towers	220	73	12	305

Microsoft Office Excel Worksheet

GBTs Available in Coastal Area (<5 Kms)

- No of GBTs available in Coastal Area (within 5 Kms) in TN Telecom Circle - 220

Distance within	30M	35M	40M	60M	80M	90M	100M	Total GBTs
1 Kms			43	1	2		1	47
2 Kms	1	1	49	2				53
3 Kms			39	1			2	42
4 Kms			39			1		40
5 Kms	1		37					38
Total GBTS	2	1	207	4	2	1	3	220

District Wise	30M	35M	40M	60M	80M	90M	100M	Total GBTs
Cuddalore	1		16					17
Kanyakumari			44	2			1	47
Karaikal			8					8
Nagapattinam			29	1				30
Puduchery			16		1			17
Pudukkottai			7					7
Ramanathapuram			34		1	1	1	37
Thanjavur	1		7					8
Tirunelveli			9	1				10
Tuticorin		1	32				1	34
Villupuram			5					5
Total GBTs	2	1	207	4	2	1	3	220

RTTs Available in Coastal Area (>5 Kms)

- No of RTTs available in Coastal Area (within 5 Kms) - 73

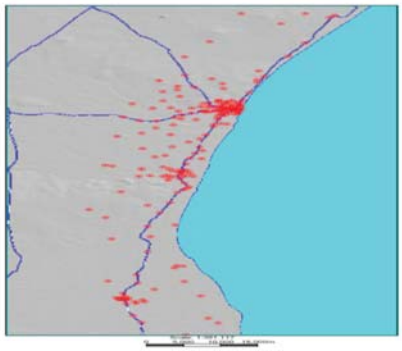
Distance within	RTT in M											
	6	9	12	15	18	20	21	24	27	28	15 MARR	18	Total
1 Kms	1		2		8		2	3	1	1	3		21
2 Kms				1	5		4	2		1	3		16
3 Kms		1	2	1	11						6		21
4 Kms				1	2					1	2	1	7
5 Kms				2	3	1		1			1		8
Total RTTs/Poles	1	1	4	5	29	1	6	6	1	3	15	1	73

District Wise	RTT in M											
	6	9	12	15	18	20	21	24	27	28	15 MARR	18	Total
Cuddalore				1	1				1		1		4
Kanyakumari					2	1	1	3					7
Karaikal					3								3
Nagapattinam					1		1				1		3
Puduchery	1	1	4	3	15					2	5	1	32
Ramanathapuram											1		1
Tirunelveli								1					1
Tuticorin				1	7		4	2		1	7		22
Villupuram													
Total RTTs/Poles	1	1	4	5	29	1	6	6	1	3	15	1	73

Chennai to Cuddalore Section (from 5 to 15 Kms)

District	GBT (In Meters)				RTT (In Meters)							Grand Total
	40	60	100	Total	9	15	18	24	28	15 MARR	Total	
Cuddalore	20		1	21			1		1		2	23
Kanyakumari												
Karaikal												
Nagapattinam	1			1								1
Puduchery	14	1		15	1		2	1			4	19
Pudukkottai												
Ramanathapuram												
Sivaganga												
Thanjavur												
Thiruvarur												
Tirunelveli												
Tuticorin												
Villupuram	8			8		1				1	2	10
Grand Total	43	1	1	45	1	1	3	1	1	1	8	53

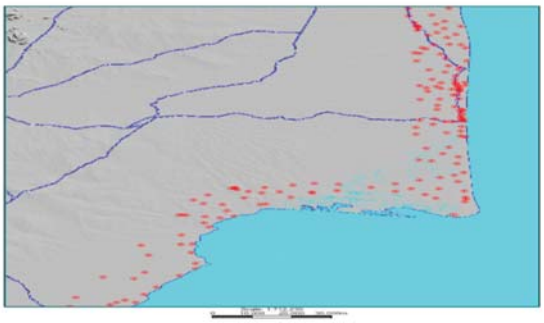
Chennai to Cuddalore Section (from 5 to 15 Kms)



Nagapattinam to Pudukottai Section (from 5 to 15 Kms)

District	GBT (in Meter)				RTT (in Meter)					Total
	30	40	60	Total	18	21	24	25	Total	
Cuddalore										
Kanyakumari										
Karaikal		3		3		1			1	4
Nagapattinam	1	36	1	38	1				1	39
Puduchery										
Pudukkottai		5		5						5
Ramanathapuram										
Sivaganga										
Thanjavur		13		13			2	1	3	16
Thiruvarur		7		7						7
Tirunelveli										
Tuticorin										
Villupuram										
Grand Total	1	64	1	66	1	1	2	1	5	71

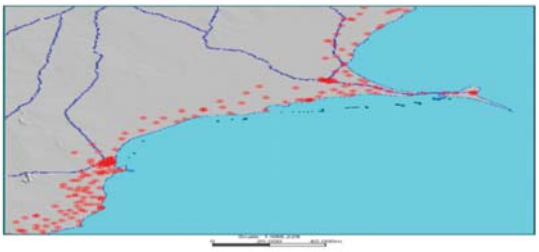
Nagapattinam to Pudukottai Section (from 5 to 15 Kms)



Mandapam to Tuticorin (from 5 to 15 Kms)

District	GBT (in Meter)			RTT (in Meter)								
	40	70	Total	12	18	21	24	28	15 MARR	18 MARR	9 MARR	Total
Cuddalore												
Kanyakumari												
Karaikal												
Nagapattinam												
Puduchery												
Pudukkottai												
Ramanathapuram	21	1	22	2		3			1	1		7
Sivaganga	1		1									
Thanjavur												
Thiruvarur												
Tirunelveli												
Tuticorin	25		25		1		4	1	1		1	8
Villupuram												
Grand Total	47	1	48	2	1	3	4	1	2	1	1	15

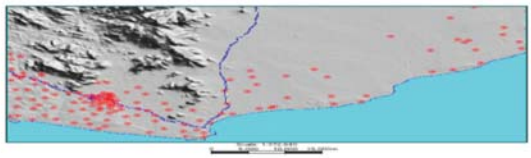
Mandapam to Tuticorin (from 5 to 15 Kms)



Nagercoil to Tirunelveli Section (from 5 to 15 Kms)

District	GBT			RTT (in Meter)										Grand Total
	40	100	Total	12	15	18	20	21	22	24	25	27	28	Total	
Cuddalore															
Kanyakumari	26	1	27	1	1	3	3	3	1	5	4		1	22	49
Karaikal															
Nagapattinam															
Puduchery															
Pudukkottai															
Ramanathapuram															
Sivaganga															
Thanjavur															
Thiruvarur															
Tirunelveli	8		8		1					1		1	1	4	12
Tuticorin	2		2												2
Villupuram															
Grand Total	36	1	37	1	2	3	3	3	1	6	4	1	2	26	63

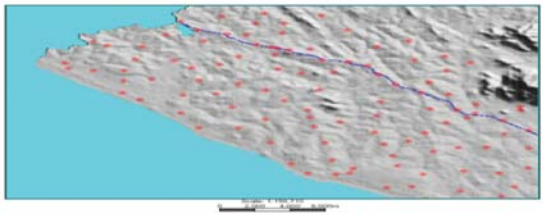
Nagercoil to Tirunelveli Section (from 5 to 15 Kms)



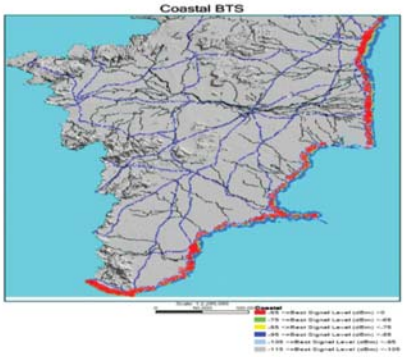
Colachal Section (from 5 to 15 Kms)

District	GBT (in Meter)			RTT (in Meter)						Grand Total
	40	100	Total	18	20	21	24	28	Total	
Cuddalore										
Kanyakumari	41	1	42	2	1	1	3	1	8	50
Karaikal										
Nagapattinam										
Puduchery										
Pudukkottai										
Ramanathapuram										
Sivaganga										
Thanjavur										
Thiruvarur										
Tirunelveli										
Tuticorin										
Villupuram										
Grand Total	41	1	42	2	1	1	3	1	8	50

Colachal Section (from 5 to 15 Kms)



TN Telecom Circle Coastal BTS Prediction Map



Requirements by Fisheries Department

- Department of Fisheries, Government of Tamilnadu has approached BSNL TN Circle for sharing the towers along the coastal belt.
- The specification given by Department of Fisheries indicate that
  a) Space for accommodating VHF Equipments;
  b)Providing EB power supply for the VHF equipments. A separate meter is to be installed to determine the EB consumption for functioning of VHF equipments.
- Based on the request from Department of Fisheries, details of towers falling within 5 Km and upto 15 Kms from the shore has already been submitted to Department of Fisheries for submitting the requirements.
- In this regard, the commercial formalities are to be finalized for leasing out of BSNL's towers for Fisheries Department.

BUFFER ZONE

BSNL GSM License Agreement (Para 44.8)stipulates that

The Licensee shall create a buffer zone of 10 KM width along the Indian International Border, if any where no service would be permitted. Width of the buffer zone along the borders within the Indian Territory shall be as decided by the Government of India from time to time.

As and when there is any change in the structure of defined buffer zone created by the Licensee, for whatsoever reason, it should be reported to the Licensor immediately.

The Government and its authorised representative may carry out physical verification of the accuracy of buffer zone so created.

So it is has to be clarified.....

RELIANCE

Communication Needs of Marine Fishermen

9th November, 2013

Telecommunications: Brief history

RELIANCE

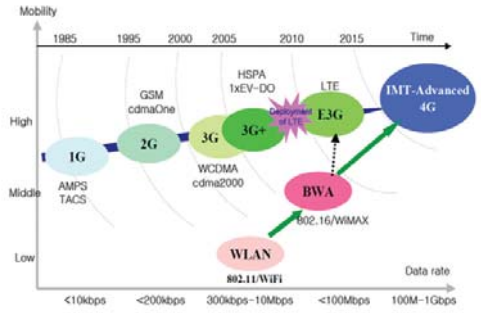
- *Pre-historic systems based on Telepathy, Smoke signals, Mirrors, Jungle drums, Pigeons and semaphores.*

- *Real telecommunication was born with the discovery that compass needle turned under wire carrying current (Oersted 1820) and movement of a conductor in a magnetic field produces electricity (Faraday 1821).*
- *Electric telegraphy (Morse) was invented in 1837 and Trans-Atlantic Cable laid in 1858. Led to formation of Western Union*

Confidential Slide 2

Technology Progression

RELIANCE



Confidential Slide 3

RELIANCE

Reliance Communications – A COMPLETE Telecom Solution provider

What do we offer ?

- GSM Mobile
- CDMA Mobile
- High Speed data cards with Speed upto 3.1 mbps
  (Coming soon: Rev B–7.2 to 14.4 mbps speed)
- Landline phones
- Wire line Broadband for Corporate, Small offices and home
- Pri and Centrix leased lines

Confidential Slide 4

What is MNP ????

RELIANCE

Customer can change the network without changing their mobile no

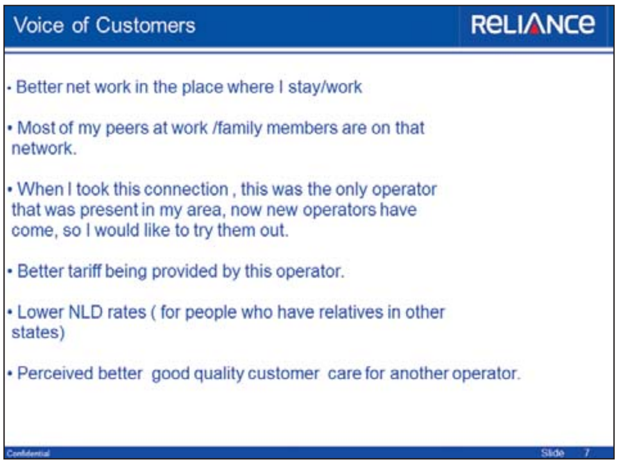
Confidential Slide 5

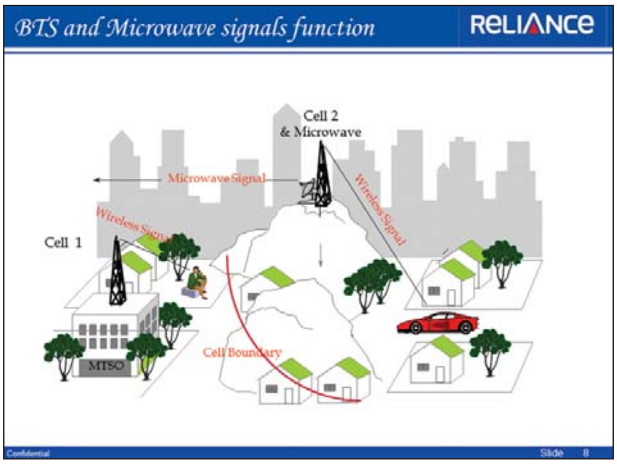
Mobile Number Portability

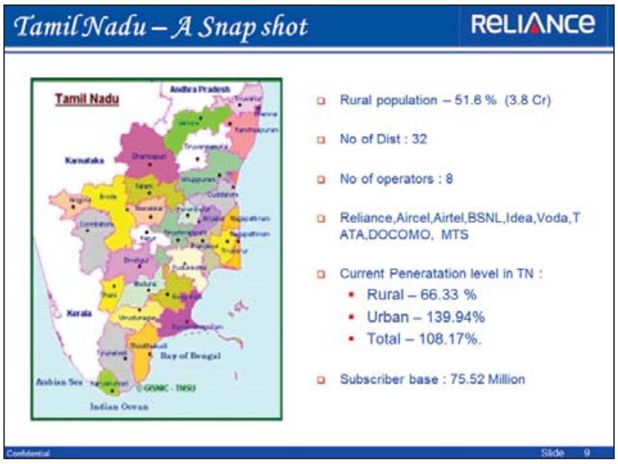
RELIANCE

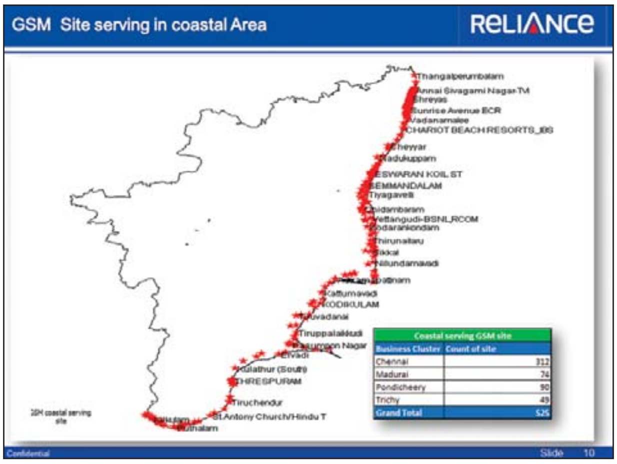
There are primarily 7 GSM and 3 CDMA operators providing mobile services in 19 telecommunication circles and 4 metro cities, covering more than 2000 towns across the country.

- *State owned companies like - BSNL and MTNL.*
- *Private Indian owned companies like - Reliance Communications and Others*
- *Foreign invested companies like – Vodafone, MTS*

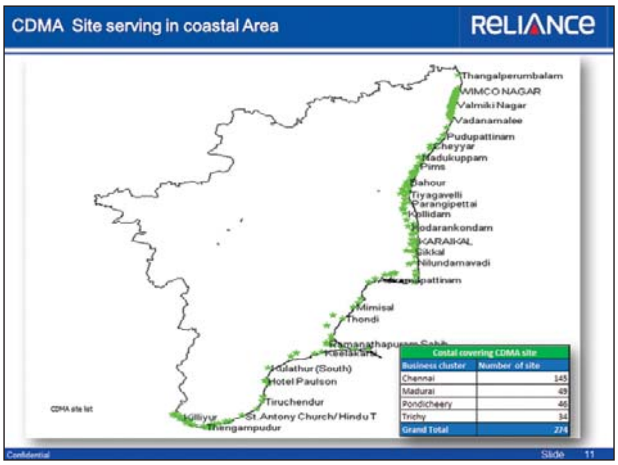




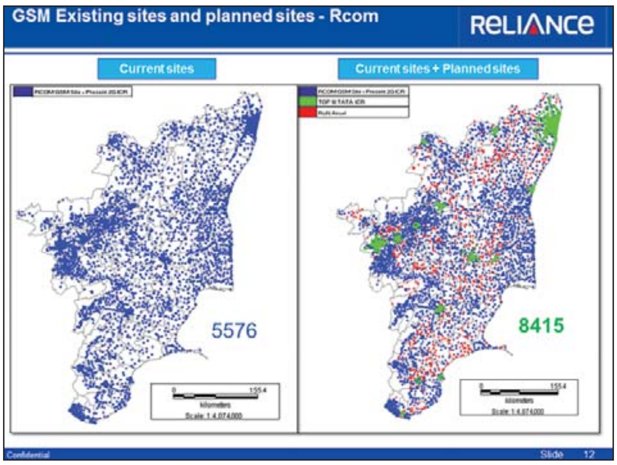


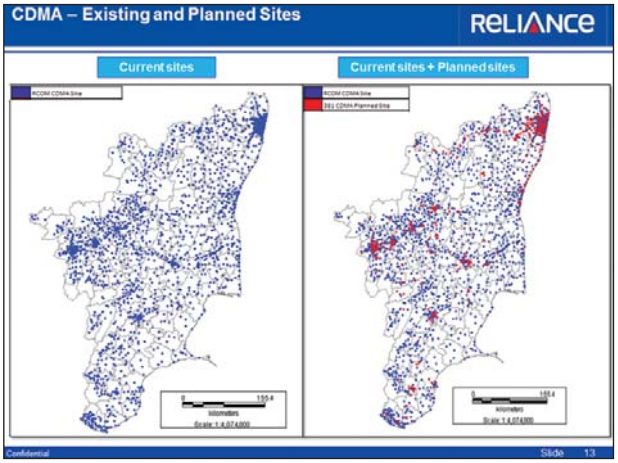


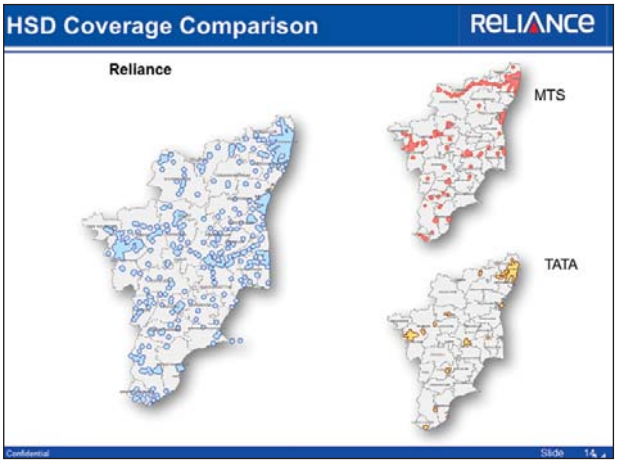
Coastal serving GSM site	
Business Cluster	Count of site
Chennai	312
Madurai	74
Pondicheery	90
Trichy	49
Grand Total	525

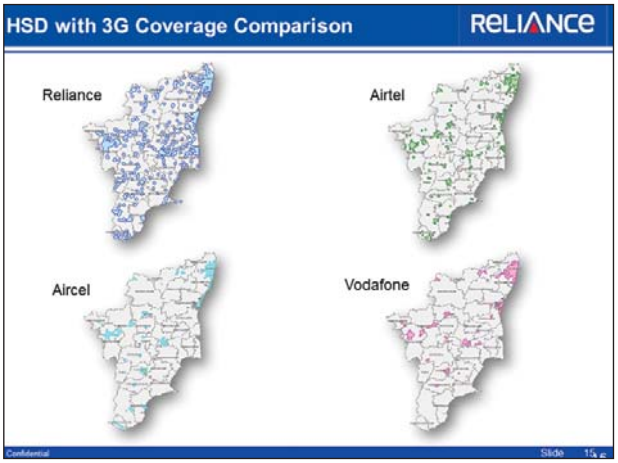


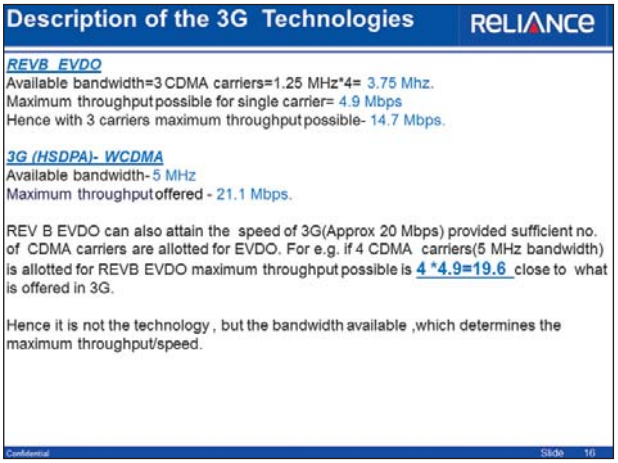
Costal covering CDMA site	
Business cluster	Number of site
Chennai	145
Madurai	49
Pondicheery	46
Trichy	34
Grand Total	274

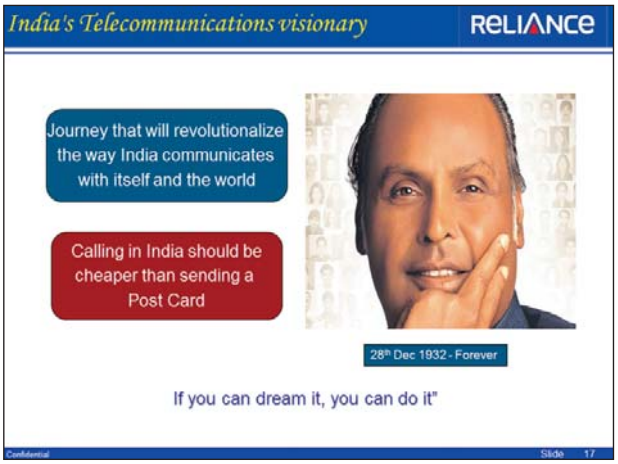



CDMA – Existing and Planned Sites
RELIANCE
Current sites
Current sites + Planned sites
Confidential
Slide 13


HSD Coverage Comparison
RELIANCE
Reliance
MTS
TATA
Confidential
Slide 14

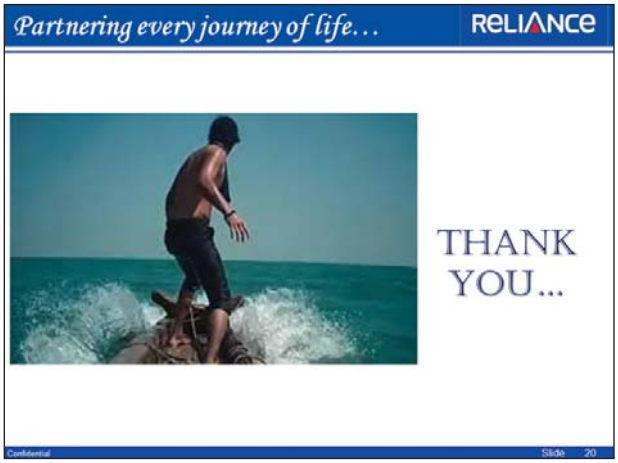

HSD with 3G Coverage Comparison
RELIANCE
Reliance
Airtel
Aircel
Vodafone
Confidential
Slide 15


Description of the 3G Technologies
RELIANCE
REVB EVDO
Available bandwidth=3 CDMA carriers=1.25 MHz*4= 3.75 Mhz.
Maximum throughput possible for single carrier= 4.9 Mbps
Hence with 3 carriers maximum throughput possible- 14.7 Mbps.
3G (HSDPA)- WCDMA
Available bandwidth- 5 MHz
Maximum throughput offered - 21.1 Mbps.
REV B EVDO can also attain the speed of 3G(Approx 20 Mbps) provided sufficient no. of CDMA carriers are allotted for EVDO. For e.g. if 4 CDMA carriers(5 MHz bandwidth) is allotted for REVB EVDO maximum throughput possible is 4 *4.9=19.6 close to what is offered in 3G.
Hence it is not the technology , but the bandwidth available ,which determines the maximum throughput/speed.
Confidential
Slide 16


India's Telecommunications visionary
RELIANCE
Journey that will revolutionalize the way India communicates with itself and the world
Calling in India should be cheaper than sending a Post Card
28th Dec 1932 - Forever
If you can dream it, you can do it"
Confidential
Slide 17


Mobile Service Product Construct
RELIANCE
All India Calls @ just 5p
Current Product Construct – 5 paise pulse across all legs
Local R2R Mobile @ 5p/30secs
Local R2 Other mobile @ 5p/10secs
Rs.30 Talktime in main account
STD mobile @ 5p/4secs
Full talktime on all topups of Rs.50 & above
50 MB data FREE for 1st month
VALIDITY 90 DAYS
Confidential
Slide 18


GSM Prepaid – Special Product
RELIANCE
SMS
within community
Per SMS
Per Minute
GROUP
SMS
Applicable to all members in the group
Confidential
Slide 19


Partnering every journey of life...
RELIANCE
THANK YOU...
Confidential
Slide 20

Annexure 11

Indus Towers Limited

Indus Towers Limited

we transform lives by enabling communication

1

About Us

Indus Towers is the largest tower company in the world formed as a joint venture between three of the largest telecom companies in the country: Bharti, Vodafone and Idea

We Transform Lives by Enabling Communication

OUR VISION

OUR BUSINESS

To provide "Shared Telecom Infrastructure Services" to all telecom operators in the wireless space and other wireless service providers such as broadband service providers in a non discriminatory manner

19/05/2018 2

What we do...

Our business: Setting up telecom towers and delivering uptime

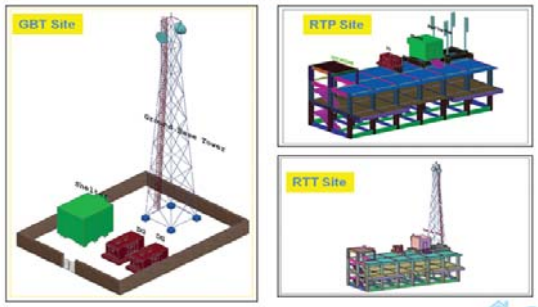
We strive for leadership in:

- Uptime
- Speed of delivery
- Cost efficiency
- Environmental sustainability

19/05/2018 Company Information 3

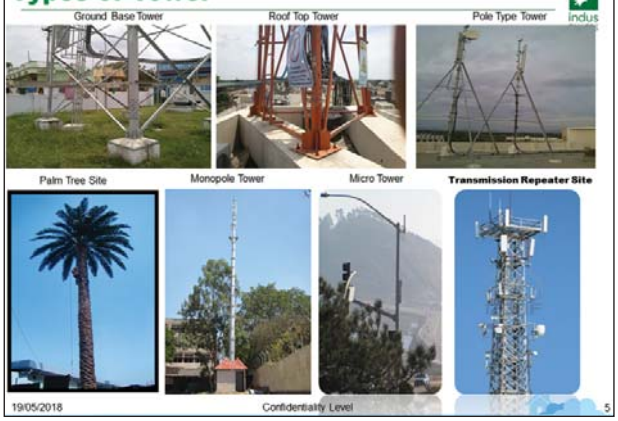
Types of Sites

There are three types of sites.



19/05/2018 Company Information 4

Types of Tower



19/05/2018 Confidentiality Level 5

Our Presence – 16 Circles

Indus operates in **15** Telecom circles… which account for **84%** of telecom revenues

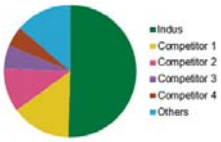
19/05/2018 Company Information 6

Our Customers

19/05/2018 Company Information 7

Interesting Facts

3 out of 5 calls in India are made through an Indus site



The nearest competitor is less than half our size in Indus presence circles

Indus has saved India a spectacular US$3 billion in capital expenditure through sharing telecom infrastructure

19/05/2018 Confidentiality Level 8

Indus Journey

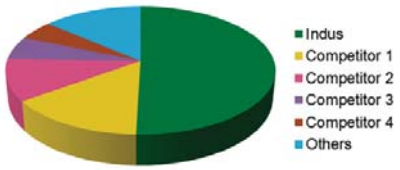
Mar 2013	111,819 Towers 221,511 Tenancies 11 customers	
Mar 2012	109,114 Towers 214,032 Tenancies 11 customers	
Mar 2011	108, 586 Towers 200,938 Tenancies 13 customers	
Mar 2010	104,900 Towers 184,600 Tenancies 12 customers	
May 2008	63,400 Towers 73,800 Tenancies 3 customers	

It took more than a decade to have 74,000, Indus added 128,000 in just less than 33 months

19/05/2018 Company Information 9

Tower Industry Landscape -Indian Market

Market Share of Tenancies in Indus 15 circles



The nearest competitor is less than half the size of Indus!

19/05/2018 Company Information 10

Corporate Responsibility

Indus believes that Corporate Responsibility means taking positive action, treating our stakeholders with respect, applying consistently high standards to everything we do and playing a constructive role in the communities in which we operate.

5-year partnership with TERI to sponsor clean energy and rural entrepreneurship through the Lighting a Billion Lives Program (LaBL) that reaches over 165,000 people across 660 villages in India. Indus Towers will help mitigate approx. 5,000 tonnes of CO2 per year and create over 660 green jobs.

Partnership with Vikram A. Sarabhai Community Science Centre, Department of Science and Technology to support the Science Express – Biodiversity Special (SEBS), in order to educate the youth on various issues related to environment.

Indus collects old clothes in all its offices across the country, which is donated to Goonj. These are then used to clothe people who cannot afford new clothes and make cloth bags and mats for school going children. All these efforts in turn create income generating opportunities for women self-help groups affiliated with Goonj.

19/05/2018 Company Information 11

Awards & Recognition

Tele.Net Telecom Operators
Best Infrastructure Provider For The Year 2013

This is the third consecutive year that Indus has won this award.

GSMA Green Mobile Award 2013
Green Sites Project
Indus Towers has won the coveted GSMA Green Mobile Award for its Green Sites Project at the prestigious GSMA Awards Ceremony held in Barcelona, Spain recently.

Et Now World Csr Awards 2013
Best Csr Practices
The award recognizes Indus's initiatives in the direction of Women Empowerment, Environment and Education simultaneously.

Amity Telecom Awards
Top Telecom Company Of The Year 2013
The award recognizes Indus's effort to connect an increasingly inclusive India, that has placed our Nation on a global superhighway of growth.

19/05/2018 Company Information 12

TATA COMMUNICATIONS

INMARSAT

GLOBAL MOBILE SATELLITE

COMMUNICATION

&

VESSEL MONITORING SYSTEM

For

COMMUMICATIONS NEED OF MARINE FISHERMEN
9-10TH NOVEMBER

TATA COMMUNICATIONS

INMARSAT–International Maritime Satellite Organization

- Formed in 1979 as a maritime-focused inter-governmental organization.
- Headquartered at London,UK with several countries as its members.
- Purpose was to provide Maritime, Aero and Land Mobile Satellite Communication.
- TATA Communications Limited represented India on behalf of the Government of India.

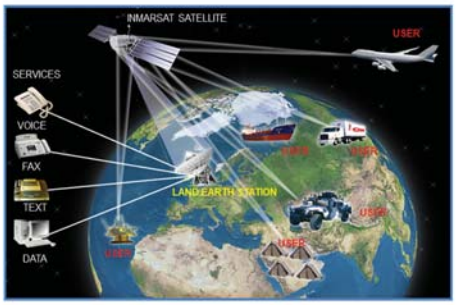
TATA COMMUNICATIONS

MAJOR NETWORK COMPONENTS

- **The Space Segment**
  - Inmarsat Satellites
- **The Ground Segment**
  - Satellite Control Centre .....SCC
  - Network Operations Centre.....NOC
  - Network Co-ordination Station .....NCS- Yamaguchi (IOR Region)
  - Land Earth Stations.....LES– TCL – Pune Dighi
- **The End User (Customer)**
  - Ship Earth Station.....SES
  - Mobile Earth Station.....MES
  - Also called as ship terminal or mobile terminal

TATA COMMUNICATIONS

INMARSAT NETWORK



TATA COMMUNICATIONS

The Space Segment

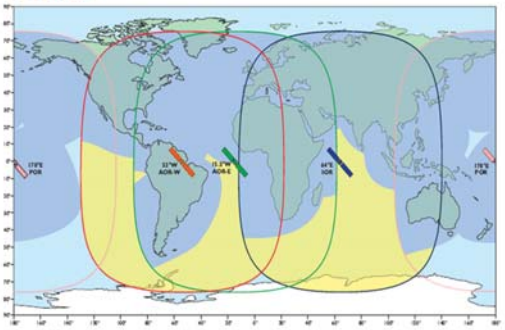
- Consists of four Geo-stationary operational satellites, with back-up satellites in orbit ready to be used if necessary.
- The satellites are named according to their coverage area as

Sr No	Coverage Area	Name
1	Atlantic Ocean Region (East)	AOR – E
2	Atlantic Ocean Region (West)	AOR – W
3	Indian Ocean Region	IOR
4	Pacific Ocean Region	POR

- The Inmarsat-2 series (2nd Generation) of satellites was launched during 1990-1992.
- The 3rd Generation (Inmarsat-3) satellites have been in service since 1996, they offer coverage using a global beam and spot beams.

TATA COMMUNICATIONS

COVERAGE



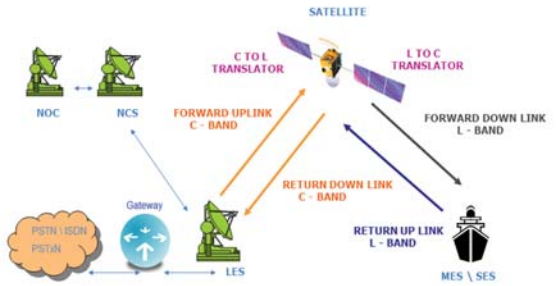
TATA COMMUNICATIONS

Space Segment

PRIMARY TRANSPONDER	
FORWARD DIRECTION	C RX 29 MHZ (6425.0 MHZ - 6454.0 MHZ)
	L TX 34 MHZ (1525.0 MHZ - 1559.0 MHZ)
RETURN DIRECTION	C TX 29 MHZ (3600.0 MHZ - 3629.0 MHZ)
	L RX 34 MHZ (1626.5 MHZ - 1660.5 MHZ)
SECONDARY TRANSPONDER	
NAVIGATIONAL	C RX C TX + L TX 2.2 MHZ
ORDERWIRE	C TX C RX 0.9 MHZ
INTERMOBILE	L TX L RX 1.0 MHZ
SATELLITE EIRP AND G/T	
EIRP dBW	L TX +39.0 GLOBAL, C TX 27.0 GLOBAL
G/T dB/K	C RX -13, L RX - 11.5 GLOBAL / - 5.5 SPOT
TRANSLATION FREQUENCY	
C TO L : - 4895 MHZ C TO C : - 2825 MHZ	L TO C : + 1968.5 MHZ L TO L : - 101.5 MHZ

TATA COMMUNICATIONS

Basic Operational Diagram



TATA COMMUNICATIONS

Ground Segment

➢ **Satellite Control Center (SCC)**

- SCC responsible for tracking, telemetry and control (TT&C) for satellite
- SCC is responsible for keeping the satellites in position above the Equator, and for ensuring that the onboard systems are fully functional at all times

➢ **Network Operations Center (NOC)**

- Overall monitoring and control of the entire Inmarsat global network and spectrum.
- Monitors and manages the flow of communications traffic.

➢ **Network Co-ordination Station (NCS)**

- One NCS for each ocean region and for each Inmarsat system
- NCSs manage the satellite resources, the primary role is to help set up each call by assigning a channel to the mobile terminal and the appropriate LES on demand.

TATA COMMUNICATIONS

Ground Segment

➢ **Land Earth Station (LES)**

- Tata Communications is a Land Earth Station operators (LESOs), operating LES at PUNE to provide services in IOR
- A Land Earth Station is a gateway between Ship/Mobile Earth Stations and the terrestrial telephony / telex networks (PSTN \ ISDN and PSTxN) thus it provides a link between Inmarsat satellite network and international telecommunications network.

➢ **The End User (Customer)**

- Fixed or Mobile terminal on Land, Marine and Aero

TATA COMMUNICATIONS

Role of Tata Communications in Inmarsat Network

➢ **Land Earth Station Operator**

- Tata Communications is Inmarsat Land Earth Station Operator (LESO) with LES @ Pune, Dighi.
- LES supports Inmarsat services like B, C, M, MiniM, GAN, Fleet etc

➢ **Routing Organization & Accounting Authority (AA – IN 01) (Point of Service Activation)**

• Tata Communications is the only entity which is designated by Inmarsat and the Department of Telecommunications (DoT Delhi) to act as the Routing Organization i.e. the entity who can route the Inmarsat registration and activation applications to Inmarsat for all the terminals belonging to Indian companies and Indian Flag Ships. In other words all Indian customers have to register and activate the terminals with Tata Communications only.

TATA COMMUNICATIONS

Range of Inmarsat Services

Segment	Service	Launch	Voice	Fax	Telex	Data	GMDSS	Beam
Maritime	Inmarsat-A	1982	√	√	√	Analog 9.6/64k	√	Global
	Inmarsat-C	1991		√	√	Digital 1.2k	√	Global
	Inmarsat-B	1993	√	√	√	Digital 9.6/64k	√	Global
	Inmarsat-E	1996				EPIRB	√	Global
	Inmarsat D+	1998				Digital 0.02k		Global
	Inmarsat mini C	2002		√	√	Digital 0.6k	√	Global
	Flee-77	2002	√	√		MPDS / ISDN 64k	√	Global / Spot
	Fleet-55	2003	√	√		MPDS / ISDN 64k		Global / Spot
	Fleet-33	2003	√	√		MPDS / 9.6k		Global / Spot
Land	Inmarsat-M	1993	√	√		Digital 2.4k		Global
	Inm mini-M	1997	√	√		Digital 2.4k		Spot
	Inmarsat M4	1999	√	√		MPDS / ISDN 64k		Spot
Aero	Swift-64	2002	√	√		MPDS / ISDN 64k		Spot
	Aero	2002	√	√		MPDS / ISDN 64k		Spot

TATA COMMUNICATIONS

Inmarsat Products & Services

Existing & Evolved Services	Next Generation Services
Inmarsat-B (Maritime / Land mobile)	Inmarsat-BGAN (Land mobile)
Inmarsat-C (Maritime / Land mobile / Aeronautical)	Inmarsat-FleetBroadband (Maritime)
Inmarsat-M (Maritime / Land mobile)	Inmarsat-SwiftBroadband (Aeronautical)
Inmarsat-miniM (Maritime/ Land mobile / Aeronautical)	Inmarsat-FleetPhone (Maritime)
Classic Aeronautical (H / H+ / I / L)	Inmarsat-IsatPhone Pro (Handheld)
Inmarsat-GAN (Land mobile)	Inmarsat-IsatM2M (Machine to machine)
Inmarsat-Swift64 (Aeronautical)	
Inmarsat-Fleet77/55/33 (Maritime)	

TATA COMMUNICATIONS

SERVICES OFFERED

Pune Inmarsat LES supports Inmarsat-M/B/Mini M/GAN/Fleet and Inmarsat-C services in Indian Ocean Region through Inmarsat 3F1 satellite at 64° East.

INMARSAT-M/B/mini M/GAN/Fleet Services:

- INMARSAT-miniM (Voice 4.8 Kbps, Data/Fax 2.4 Kbps)
- INMARSAT-M (Voice 6.4 Kbps, Data/Fax 2.4 Kbps)
- INMARSAT-B (Voice 16 Kbps, Data/Fax 9.6 Kbps, HSD 64Kbps, Telex)
- INMARSAT-GAN (Voice 4.8Kbps, 64 Kbps Speech, Data/Fax 2.4 Kbps, HSD 64Kbps/56 Kbps, 3.1 KHz Audio)
- INMARSAT-F77 (Voice 4.8Kbps, 64Kbps speech, Data/Fax 2.4 Kbps, Data/Fax 9.6 Kbps, HSD 64Kbps/56 Kbps, 3.1 KHz Audio)
- INMARSAT-F55 (Voice 4.8Kbps, 64Kbps speech, Data/Fax 9.6 Kbps, HSD 64Kbps/56 Kbps, 3.1 KHz Audio)
- INMARSAT-F33 (Voice 4.8Kbps, Data/Fax 9.6 Kbps)

TATA COMMUNICATIONS

SERVICES OFFERED

INMARSAT Services offered through PUNE LES

INMARSAT-C & Value Added Services:

- INMARSAT-C to Email
- Web/Email to INMARSAT-C
- Web/Email to INMARSAT-C EGC (Enhance Group Call)
- GMDSS (Global Maritime Disaster & Safety Services)

TATA COMMUNICATIONS

SERVICES OFFERED

INMARSAT-F77 LEASE LINE SERVICE:

Tata Communications is providing Inmarsat F77 lease line service to Indian Navy since May'2010.

Inmarsat leases the satellite channel (resource) for the group by F77 terminals and the group can use this channel for communication services 24x7 during the lease period. The customer pays lump sum charges for the leased resources rather than paying for the call duration for the individual terminals.

TATA COMMUNICATIONS

OTHER SERVICES

INMARSAT FLEET BROADBAND

LRIT – LONG RANGE INDENFICATION & TRACKING

SATMAIL CLIENT AND EMAIL SERVICE

ISAT PRO MARINE SOLUTION

SHIP SECURITY ALERT SYTEM

TATA COMMUNICATIONS

VMS

VESSEL MONIOTRING SYSTEM.....

TATA COMMUNICATIONS

OVERVIEW

- Isat Phone Pro is the first global handheld satellite phone from Inmarsat.
- Engineered to work in just about any environment, featuring an intuitive GSM-style interface and colour screen.
- Isat Phone Pro is designed for professional users in the government, Fishing, media, NGO, oil and gas, mining and construction
- Operating on Inmarsat's I-4 geostationary satellite network, IsatPhone Pro is the most robust handset ever built, easy to use.

TATA COMMUNICATIONS

Key Features

1. VOICE
2. DATA
3. SMS
4. ALERT & TRACKING FUNCTIONALITY:

- Dedicated GPS receiver
- Tracking messages sent via SMS, SMS to email Upon button press Present periodic internal ID/Lat/Long/Speed/Dir
- Alert Messages

ADDITIONAL FEATURES:

- High quality marine enclosure
- IP54 Rated enclosure
- Integrated antenna connections
- POWER 9 – 32V DC Input & Included 110/240V AC Plug pack
- Integrated to PABX System
- USB data access

TATA COMMUNICATIONS

Vessel Monitoring System - Network

TATA COMMUNICATIONS

THANK YOU.....

Indian Space Research Organisation

Satellite Communication Solutions for Fishing Community

H. Rayappa
Dy. Dir. SatCom Applications,
ISRO Headquarters, Bengaluru

November 9-10, 2013, Chennai

OUTLINE

- Distress Alert Terminal (DAT)
- Satellite Based Search and Rescue (SAR) System
- Mobile Satellite Systems (MSS)
- Disaster Warning Dissemination System (DWDS)

Distress Alert Transmitter (DAT)

Transmitter Features

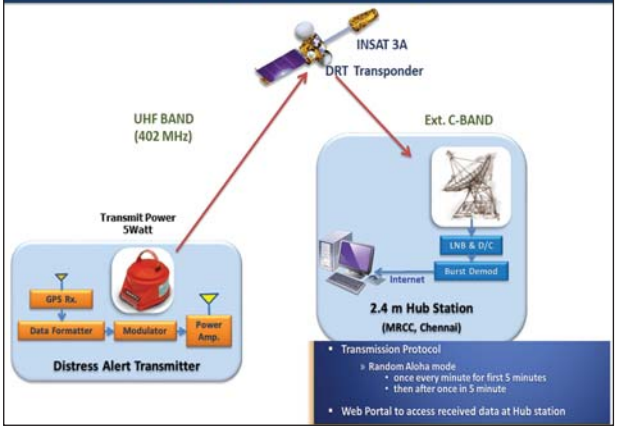
- UHF Satellite Terminal
- Floatable; suitable for marine environment
- Quadrifiller helix antenna quasi-directional antenna
- Self Test facility
- Inbuilt GPS to give position and time information
- Battery operated (battery life minimum 24 Hrs.)

Size: 300 x 230 x 195 mm³
Weight: 2Kgs

Type of distress

- Fire
- Boat sinking
- Man overboard
- Medical

DAT System Configuration



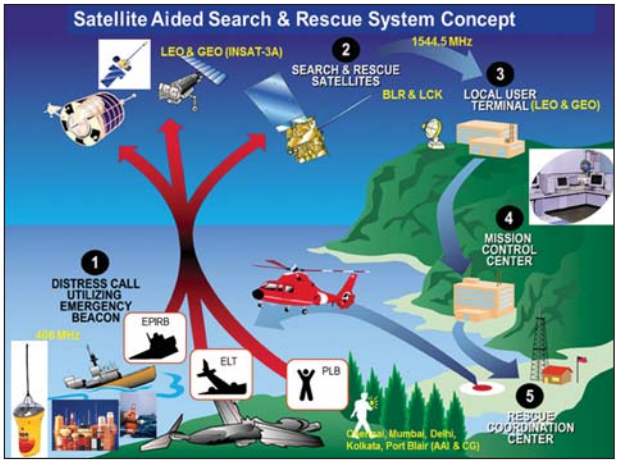
Status of System

- Technology transferred to three industry in January 2010
- About 1800 DATs are given to Fishermen, on experimental basis.

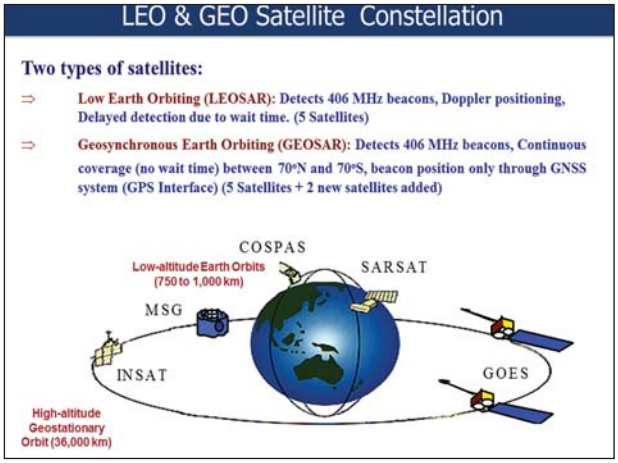
- Hub is located at MRCC, Chennai
- Coast Guards' operates HUB since last five year

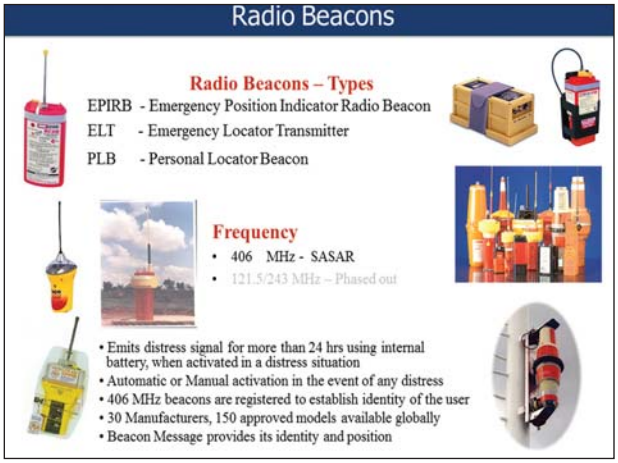
- National SAR Board is deliberating on the methodology of sales, operations, maintenance of DATs
  - Including issues like Registration & de-registration, Fitment of DATs on board fishing boat and database management.

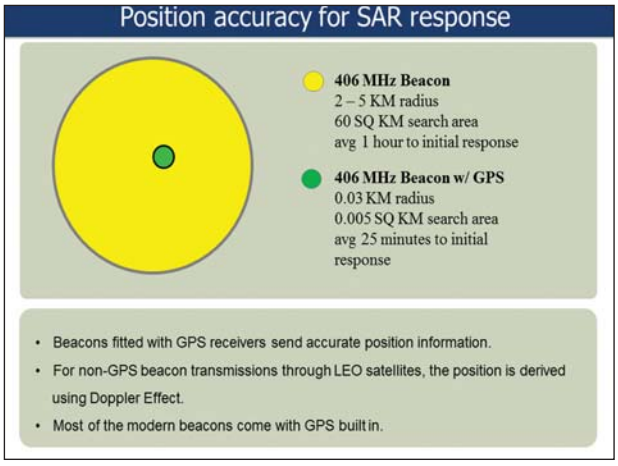
Satellite Based Search And Rescue (SAR) System

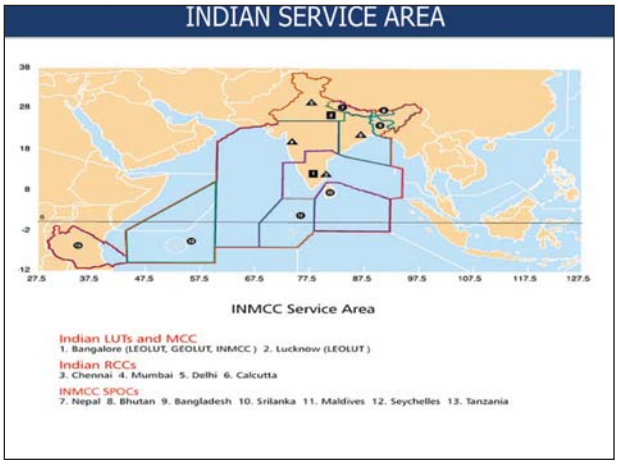

Satellite Aided Search & Rescue System Concept
LEO & GEO (INSAT-3A)
1544.5 MHz
SEARCH & RESCUE SATELLITES
BLR & LCK
LOCAL USER TERMINAL (LEO & GEO)
MISSION CONTROL CENTER
DISTRESS CALL UTILIZING EMERGENCY BEACON
406 MHz
EPIRB
ELT
PLB
RESCUE COORDINATION CENTER
Kolkata, Port Blair (AAI & CG)


Search And Rescue System
Guided by COSPAS-SARSAT, an international system (43 Countries)
Space Segment
LEOSAR
GEOSAR
Beacon
ELT, EPIRB, PLB
Ground Segment
Local User Terminal
Mission Control Centre
INMCC/ ISTRAC

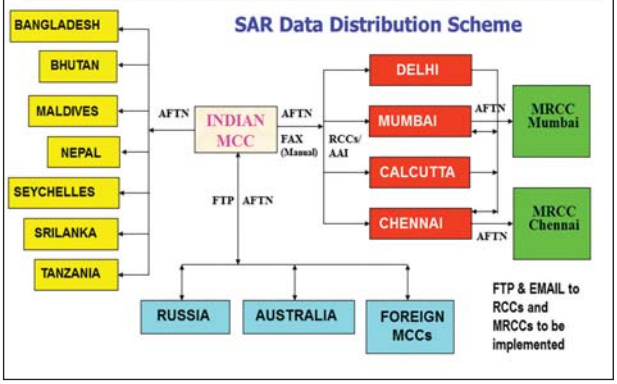

LEO & GEO Satellite Constellation
Two types of satellites:
Low Earth Orbiting (LEOSAR): Detects 406 MHz beacons, Doppler positioning, Delayed detection due to wait time. (5 Satellites)
Geosynchronous Earth Orbiting (GEOSAR): Detects 406 MHz beacons, Continuous coverage (no wait time) between 70°N and 70°S, beacon position only through GNSS system (GPS Interface) (5 Satellites + 2 new satellites added)
COSPAS
SARSAT
Low-altitude Earth Orbits (750 to 1,000 km)
MSG
INSAT
GOES
High-altitude Geostationary Orbit (36,000 km)


Radio Beacons
Radio Beacons – Types
EPIRB - Emergency Position Indicator Radio Beacon
ELT - Emergency Locator Transmitter
PLB - Personal Locator Beacon
Frequency
406 MHz - SASAR
121.5/243 MHz – Phased out
• Emits distress signal for more than 24 hrs using internal battery, when activated in a distress situation
• Automatic or Manual activation in the event of any distress
• 406 MHz beacons are registered to establish identity of the user
• 30 Manufacturers, 150 approved models available globally
• Beacon Message provides its identity and position


Position accuracy for SAR response
406 MHz Beacon
2 – 5 KM radius
60 SQ KM search area
avg 1 hour to initial response
406 MHz Beacon w/ GPS
0.03 KM radius
0.005 SQ KM search area
avg 25 minutes to initial response
• Beacons fitted with GPS receivers send accurate position information.
• For non-GPS beacon transmissions through LEO satellites, the position is derived using Doppler Effect.
• Most of the modern beacons come with GPS built in.


INDIAN SERVICE AREA
INMCC Service Area
Indian LUTs and MCC
1. Bangalore (LEOLUT, GEOLUT, INMCC) 2. Lucknow (LEOLUT)
Indian RCCs
3. Chennai 4. Mumbai 5. Delhi 6. Calcutta
INMCC SPOCs
7. Nepal 8. Bhutan 9. Bangladesh 10. Srilanka 11. Maldives 12. Seychelles 13. Tanzania

India Mission Control Centre (INMCC)



System Organisation at National Level

Following 5 agencies established in SAR Programme in India through an Inter Agency Standing Committee:

1. **Department of Space/ISRO**
2. **Directorate General of Shipping**
3. **Airports Authority of India**
4. **Indian Coast Guard**
5. **Defence Services (Army, Navy, Airforce)**

Each agency contributes annually for operations and maintenance of the system.

Maritime SAR activities are reviewed and guided by a national board – NMSARB.

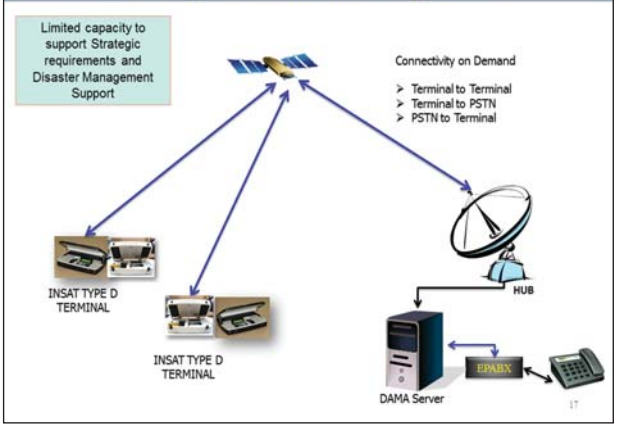
Mobile Satellite System (MSS)

INSAT MSS Type-D

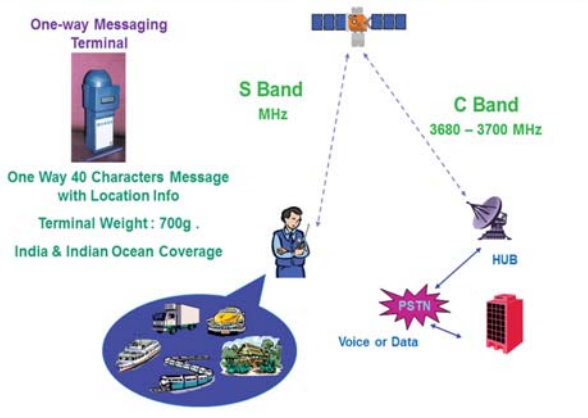
Frequency	S-Band
Data Rate (Voice)	5.4 Kbps
Package	Portable, ~3.5Kg
Power supply	Battery with 4 hr minimum talk time Provision for DC and 230V AC adapter

16

MSS Type-D network configuration



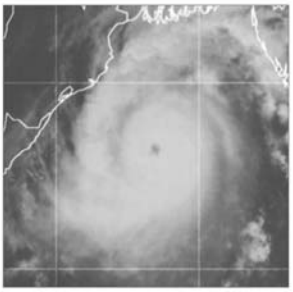
MSS Type-C: One way messaging service



Cyclone Warning Systems

DTH based Disaster Warning Dissemination System (DWDS)

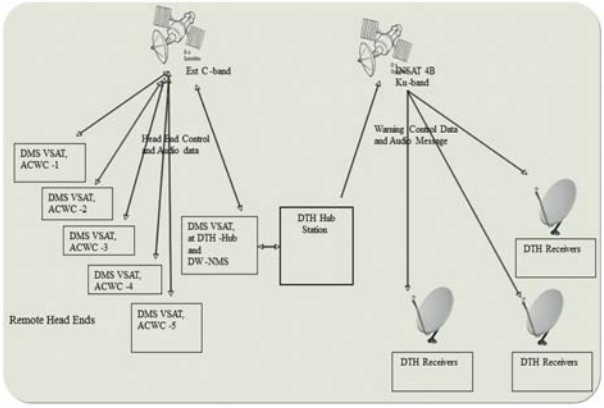
'Early warning system' for impending disasters



- Tripartite MOU between ISRO, IMD & DD: March 2011
- Uses low cost satellite communication technology
- Selective Addressing
- Developed by M/s BEL, Bangalore under guidance of ISRO
- Patent filed by ISRO
- Being deployed at 500 locations for cyclone-warning
- Can be used for disseminating other warnings.

Existing Cyclone Warning System

System Configuration



DWDS Receivers

Outdoor Unit

- 1.2m Ku-band rugged antenna to withstand 300 Kmph wind load.
- Commercially available LNB.

Indoor Unit

- Commercially available STB modified to make them controllable remotely
- Battery support for a longer duration (upto 6 days)
- Built-in Speakers – TV not necessary
- Built-in Signal Strength Indicator
- Separate Volume control for Warning mode

Comparative Advantages

- Low-cost substitute to existing CWDS
  - STBs costing about Rs 8000/-.
  - No separate hub required.
  - No separate satellite bandwidth needed
- Ease of maintenance (no proprietary system)
- Supports multiple warning-issuing locations
- Low power consumption of STB enables increased battery backup (upto 6 days)
- Allows user to watch DD's DTH bouquet during "quiet-period".

Status of Cospas-Sarsat LEOSAR Payload Instruments

Satellite	Repeater Instruments	SARP		Comments
	406 MHz	Global	Local	
Sarsat-7 (NOAA-15)	F	F	F	
Sarsat-8 (NOAA-16)	F	F	F	
Sarsat-10 (NOAA-18)	F	F	F	
Sarsat-11 (METOP-A)	F	F	F	In-plane and out-of-plane manoeuvers periodically made on the satellite.
Sarsat-12 (NOAA-19)	F	F	F	
Sarsat-13 (Metop-B)	IOC	IOC	IOC	Launched on 17 September 2012. IOC declared 4 April 2013. In-plane and out-of-plane manoeuvers periodically made on the satellite.

F Fully Operational
IOC Initial Operational Capability

Status of Cospas-Sarsat GEOSAR Payload Instruments

Satellite	Status	Comments
GOES-13 (75° W)	F	Operational Goes-East Satellite
GOES-14 (105° W)	F	In-orbit spare.
GOES-15 (135° W)	F	Operational GOES-West satellite.
INSAT 3A (93.5° E)	F	
MSG-2 (9.5° E)	F	
MSG-3 (0°)	IOC	IOC declared 24 September 2012
Electro-L1 (76° E)	IOC	
Louch-5A (167° E)	UT	
INSAT-3D (82° E)	UT	Launched 26 July 2013

F Fully Operational
IOC Initial Operational Capability
UT Under Test

Indian Space Research Organisation

THANK YOU

Fishermen Location Tracking using GPS and Information Storage in Black Box

Presented by
FRAJU.F
MEFFRIN.M
BABIJOSHI.S
ATHEESH KUMAR.G
(Annai Vailankanni College of Engineering, Kanyakumari)

Guided by
N.MICHAEL FRANKLIN
Assistant Professor, ECE

Need for this Innovation

- Lack of a real time tracking system to monitor the fishermen going for deep sea fishing.
- Insufficient alert system to inform the fishermen about the latest weather condition when they are in sea.
- Lack of awareness about the exact location of the fishermen in deep sea.
- To evolve a fisher friendly border environment, we have initiated this innovation.

GPS Location Data

Maritime Boundary in Gulf of Munnar

POSTIONS	LATITUDE	LONGITUDE
Position 1	09° 06'.0 N	79° 32'.0 E
Position 2	09° 00'.0 N	79° 31'.3 E
Position 3	08° 53'.8 N	79° 29'.3 E
Position 4	08° 40'.0 N	79° 18'.2 N
Position 5	08° 37'.2 N	79° 13'.0 E
Position 6	08° 31'.2 N	79° 04'.7 E
Position 7	08° 22'.2 N	78° 55'.4 E
Position 8	08° 12'.2 N	78° 53'.7 E
Position 9	07° 35'.3 N	78° 45'.7 E
Position 10	07° 21'.0 N	78° 38'.8 E
Position 11	06° 30'.8 N	78° 12'.2 E
Position 12	05° 53'.9 N	77° 50'.7 E
Position 13	05° 00'.0 N	77° 10'.6 E

Existing System

- Provides the location based services only
- uses GSM technology
- Not efficient to achieve GSM coverage after 10 km
- Existing Mobile based boundary identification warning apps solely depends on GSM technology

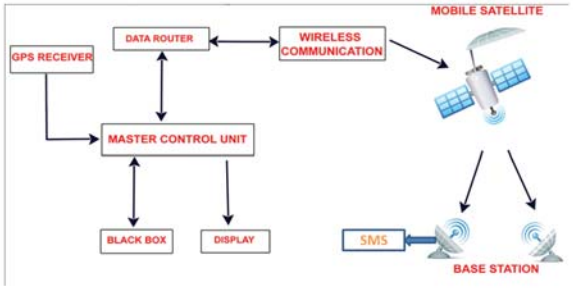
Our Solution

- An approach to identify the exact position of fishermen in the deep sea using GPS.
- A Black box is fixed in a boat to store and to retrieve the location and voice data.
- To inform the fishermen about the Maritime Boundary.
- Location of fishermen information is transferred to the base station through MSS.

Proposed System

- Each and every boat given unique identification number and stored in the boat itself.
- MICROCONTROLLER-stores the territory latitude and longitude values in a memory.
- Live GPS Data compared in the pre stored values in the memory.
- Entire route taken by the fishermen stored in the BLACKBOX and transferred to the base station at regular intervals.
- Fishermen regularly updated with the latest information like weather, fishy catching areas.
- Authorities of Fisheries, Coastal guards are also alerted by SMS with the Information transferred to the base station from the boats through Mobile Sat technology in case of emergency.

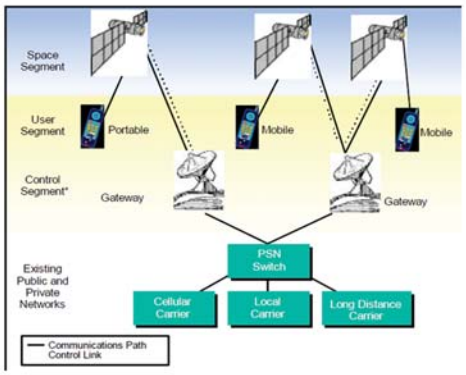
Proposed System Architecture



Mobile Satellite Service

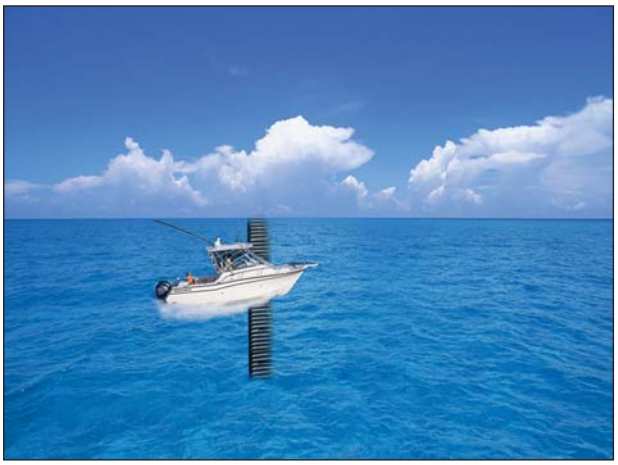
- Services delivered via satellite to or from mobile users
- Useful in remote areas where wired networks do not exist.
- Useful where terrestrial lines and portable radios are unavailable or ineffective during emergency situations.

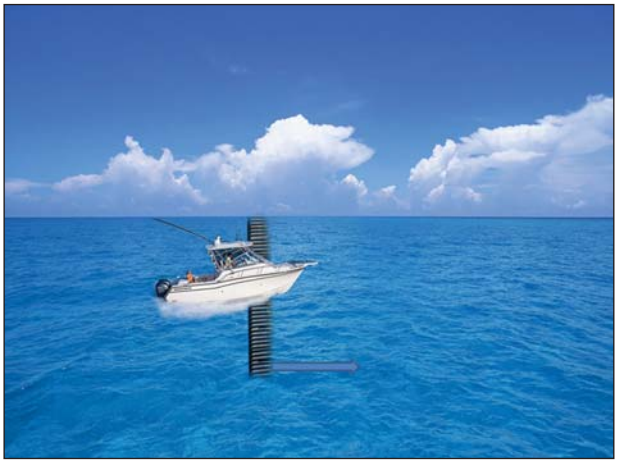
Mobile Satellite Service

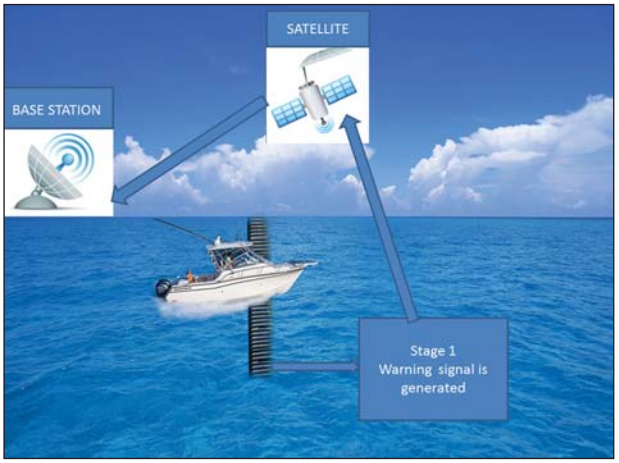


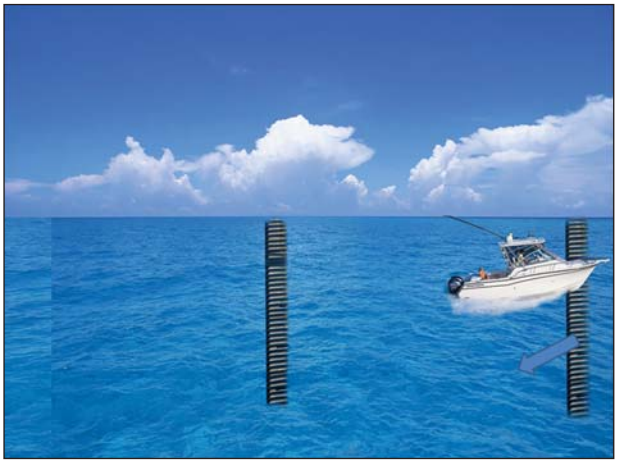
Mobile Satellite Service - Advantages

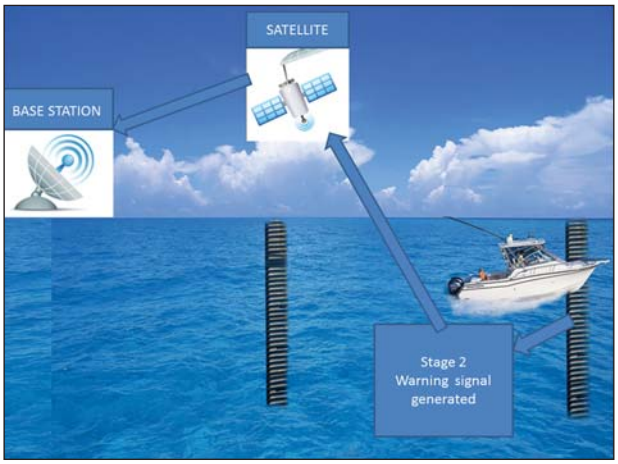
- Extends mobile communications beyond the range constraints of terrestrial based wireless systems
- Allows mobile-to-fixed and mobile-to mobile voice and data communications worldwide.
- Services will include voice, low-speed data, fax, paging, high speed data, and broadcast.
- Live pictures of fish catching areas transferred.
- Online trading through voice.
- Weather or any emergency information can be passed.
- Recurring cost is low.
- User is charged based on thee data usage.











CONCLUSION

- Real time tracking monitors the safety of fishermen.
- Black box holds the location record of the fishermen data.
- Data transferred to base station through mobile satellite technology.
- Fishermen updated with the latest information like weather, good fishing areas.

Evaluation of communication solutions for marine fishermen

G Venkatesh
IIT Madras

Understanding of requirement

Spend several days at sea at a stretch

Deep sea >200km

Boats go out in groups Spaced 5-10 km

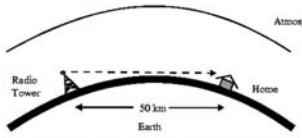
Motorised craft – upto 100km

Traditional craft – less than 10km

Communication in use today

- GSM in use by fishermen for near coast situations
  - » Limited to 5-10 km range; operators afraid to radiate deeper into sea due to regulatory uncertainty
- VHF (the land mobile radio variety) being used for fisherman to fisherman communication; relay of messages via VHF and Cell phones to shore a useful feature during emergencies
  - » Doesn't work beyond 30 km – so cant reach shore directly
  - » No master control centre to co-ordinate activities
- HF radio looks attractive
  - » Sri Lankan fishermen seem to be using them; but no first hand experience
- Satellite voice/data solution not affordable
  - » Not being used by any of the fishermen
- INSAT DAT deployed selectively
  - » Useful only during emergency

Fundamental limitations of VHF

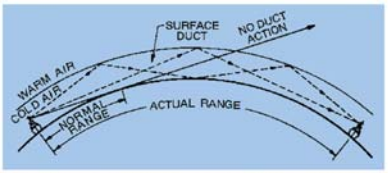


$$\text{horizon}_{\text{km}} \approx 3.57 \cdot \sqrt{\text{height}_{\text{metres}}}$$

If tower height is 50m, then horizon is 25km

If boat height is 10m, then horizon is 11km so boat to boat max distance is 22km

Line of sight communication limits distance to 50km



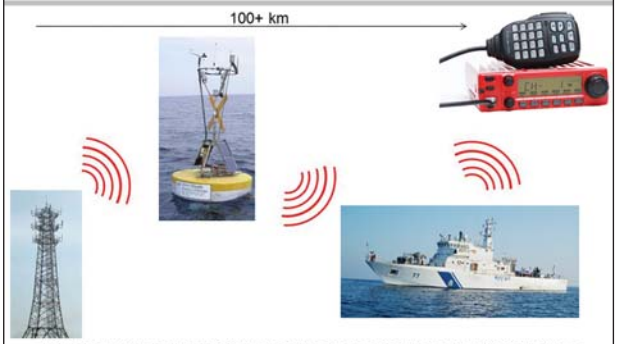
Weather conditions could extend range to 100km – but highly unreliable

Increasing range of VHF

Take advantage of a hill: 300m => 120 km

We don't have any tall hills on the coast of Tamil Nadu

Use buoy or boat mounted VHF relays



Direct communication to "Owner" on the shore rather than relay through others

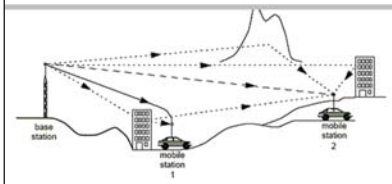
Who will maintain the relays?

USE BLIMPS

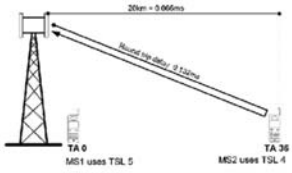
1500m height => range of 280 km

Can stay up for a few days at most
Is not usable during bad weather -
which is exactly when we need it !

FUNDAMENTAL LIMITATIONS OF GSM



GSM not limited by line of sight



GSM shares same frequency between users who are allocated different time slots

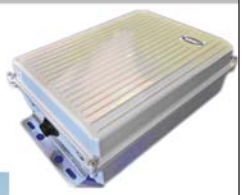
Mobiles farther away are "timing advanced" so that they don't interfere with nearby ones

Limit on timing advance restricts range to 35 km

LTE allows macrocells with 100km radius – not likely to be deployed along coasts

POTENTIAL FOR GSM NETWORK IN A BOX

Setup a GSM microcell within a coast guard ship – especially useful during emergency

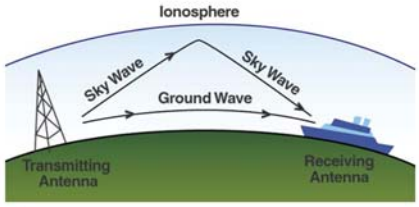


Backhaul using Satellite data link
mobile VSAT or Inmarsat Fleetbroadband

e.g. Vanu CompactRAN
- can be powered by solar
- can support upto 100 users

Needs regulatory approvals to operate normal geographical boundaries

HF RADIO



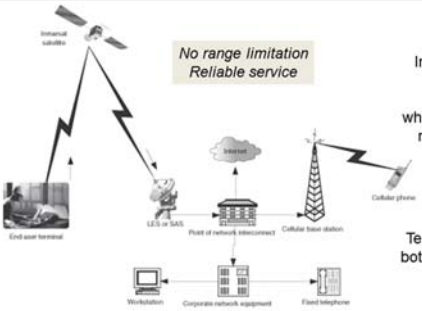
Like shortwave radio
No range limitations –
100s to 1000s of km

Susceptible to sunspot and other solar activity
Solar flares are known to disrupt communication for hours to days at a time

Solar Flare, Strongest Of 2013, Blamed For Hour-Long Radio Blackout
Posted: 05/13/2013 8:36 am EDT

http://www.huffingtonpost.com/2013/05/13/solar-flare-strongest-2013-radio-blackout_n_3265358.html

SATELLITE IS MOST FEASIBLE SOLUTION



No range limitation
Reliable service

Take advantage of GMR2+ standard

Inmarsat GSPS service is based on the GMR2+ standard which uses the same GSM network infrastructure

Terminal can support both GSM and GMR2+ air interfaces …

Use it as a GSM phone near the shore and as a satellite phone deeper at sea

Regulatory issues (security threat perception) delaying introduction into India

IS SATELLITE PHONE AFFORDABLE?

- Satellite telephony, voicemail, text/email messaging, GPS location data
- Locates satellite easily
- Up to 8+ hours talk time and up to 100 hours standby time
- -20°C to +55°C; dust, splash and shock resistant (IP54); IK03 certified, humidity tolerance from 0 to 95 per cent
- Bluetooth and handsfree use
- Over 100,000 in use
- Approx 600$ = 40,000 Rs
- Prepaid and postpaid available - approx. Rs 50 per minute

e.g. IsatPhone PRO and GSPS service from Inmarsat

Volume and collective negotiation can bring down prices

Fisher Friend Mobile Application : Phase II

QUALCOMM 25 MSSRF TATA

Fisher Friend Mobile Application

Fisher Friend Mobile Application – Introduction

FFMA is a mobile based application that enables the fisher folk access the latest livelihood information related to fisheries whenever and wherever using their mobile phones

The initiative of Fisher Friend Mobile Application (FFMA) for Fisher Folks has been conceived in the context of the structures and processes which are the outcome of the Mission 2007 activities

As envisaged by Mission 2007, one of the major obstacles in the emergence of 'Rural Knowledge Societies' across India is lack of cost effective and adaptive technologies that can address area specific needs and demands and function effectively in varied rural environments

The project was initiated during 2006 after a series of discussions among M.S.Swaminathan Research Foundation, Qualcomm, Tata Teleservices and Astute systems

FFMA Phase I – Services and Project Locations

Services

- Wave height forecast information
- Weather information
- Potential Fishing zone
- News flash
- Government schemes
- Market information
- Yellow pages
- Clip of the day
- Audio clips

Project Locations

Pondicherry
Chidambaram
Nagapattinam
Rameshwaram
Kanyakumari

Reach of the Application Phase 1

S.No	Categories	Total
1	Number of Districts in Tamil Nadu	4
2	Union Territory	1
3	Number of villages covered	19
4	Number of users reached	500
5	Number of users working in a boat as labour	242
6	Number of users owning a boat	258
7	**Category wise list the details of beneficiaries**	
7.1	Disaster prevention	81
7.2	Economic benefit (Fishing)	20
7.3	Other benefits (Like schemes etc)	13

Disseminating Fisheries Information through Mobile Phones

Fishermen feedback and suggestions on FFMA during the Phase I implementation

Feature requested	Has the feedback been incorporated	If Yes – How / If No- Why
Daily local news	Daily local news updated regularly.	

Feature requested	Has the feedback been incorporated	If Yes – How / If No- Why
Fishermen requested prediction on wave height; weather and wind speed for 4 to 5 days in advance.	Wave height, weather and wind speed information for the current time and date and for the subsequent 4 days in 12 hour cycles are currently provided	

Feature requested	Has the feedback been incorporated	If Yes – How / If No- Why
Fishermen especially from coastal Tamilnadu requested that they be given alerts and warnings as and when they approach the international border.	The feature has not yet been implemented. The features is planned to be implemented in the GPS based navigation system being designed for Phase 2.	1. Implementing the technology required time. 2. More feedback from fishermen needs to be analyzed. 3. Required Low cost GPS handset which was not available during development of Phase 1
Seafloor mapping on submerged objects details etc.	This feature will be incorporated in Phase 2 of the application	1. Implementing the technology required time. 2. More feedback from fishermen need to be analyzed. 3. Required Low cost GPS handset which was not available during development of Phase 1.
A navigational alert system, which would alert them of rock and coral formation underwater, Every year individual fishermen face heavy losses as their nets often get entangled in underwater rock, coral formationsetc	This feature will be incorporated in Phase 2 of the application.	1. Implementing the technology required time. 2. More feedback from fishermen neede to be analysed. 3. Required Low cost GPS handset which was not available during development of Phase 1.

Other Feed backs

GPS service

Provision of information on rock points and underwater hazards in the sea.

Can the mobile be bought? When will the application be commercialized and how do we obtain the handsets?

Request to make the mobile water proof.

Provision of facility such as message tones to alert the users whenever new information has been updated.

To provide Potential Fishing Zone information on a regular and continuous basis.

An operating manual in Tamil along with the application so that the fisher folk can refer to the manual in case they have any doubts regarding the use of the application

To provide a Tag so that the mobiles can be slung around the neck in order to prevent loosing the mobile during rough seas.

Fisher Friend Mobile Application Phase II

Goal of the Project:

- To optimize the role of mobile phone technology to reduce social and economic transaction costs in the fishery sector.

Objectives of the Project:

- To expand and Pilot Testing GPS interface FFMA application to the entire coastal districts of Tamil Nadu and Pudhcherry
- To expand and pilot testing TELUNGU version of the Fisher Friend Mobile Application to Andhra Pradesh
- To strengthen GPS interface into the Fisher Friend Mobile Application in a way it enables fisher folk realize larger benefit towards their livelihoods
- To study the effectiveness of the Mobile based Fishery Information System in enhancing the quality of life of fisher folk in terms of productivity, marketing, risk management, health, education, accessing government programmes etc.
- To define the scope for a self-sustaining, self-generative , self-replicative process mobile telephony based information services to fisher folk

FFMA Partnership - Responsibilities of Partners

Fisher Friend Mobile Application – Phase II

Stage 1	Stage 2	Stage 3
• Application development (April to August 2013)	• Piloting and field testing (September to February 2013)	• Launching the final application (March 2014)

FFMA Phase II – Application Development- Conception

2 - 3rd Jan. 2013	:	FFMA design team field visit to Nagapattinam and Cuddalore districts
4th Jan. 2013	:	Meeting with Commissioner of Fisheries, Tamil Nadu
1st March 2013	:	Started the FFMA design part by TCS
13th March 2013	:	Process and requirement of FFMA designing - MSSRF, TCS, Qualcomm
9th April 2013	:	Discussion on FFMA Phase II content designing and management – MSSRF , TCS
2nd May 2013	:	Validation of draft FFMA by the design team from MSSRF, TCS and Qualcomm
3rd May 2013	:	State level stakeholders meeting at Chennai
14th May 2013	:	FFMA Content review and designing –MSSRF, TCS and Qualcomm
17th May 2013	:	Content review and designing part of FFMA – MSSRF, TCS, Qualcomm
23rd May 2013	:	Roles of partners in FFMA designing and implementation - MSSRF, TCS, Qualcomm
11th June 2013	:	Discussion on content and involving partners for application development – MSSRF, TCS, Qualcomm
18th June 2013	:	Meeting on content designing - MSSRF, TCS, Qualcomm
8th July 2013	:	Developed project execution document and budget – MSSRF and Qualcomm
12th July 2013	:	FFMA web portal review – TCS and MSSRF
29th July 2013	:	FFMA application review meet at Chennai –MSSRF and TCS
31st July 2013	:	Content partners meeting with coast guard officials
7th August 2013	:	FFMA New Application ready for field testing

Stakeholders Meetings

FFMA Phase II Services

Services	Phase II
Ocean State forecast	Wave Height
	Wind Speed, Direction
	Disaster alert – High wave alert, Cyclone alert and Tsunami alert
PFZ Advisory	General PFZ
	Species Specific forecast (TUNA)
IBL Alert	IBL Alert (Siren)
Dangerous Zone Marking	Dangerous Zone Marking (corals, sunken ships, rocks)
Govt. Schemes	Government schemes
Govt. Announcements	District Announcements
Fish Market info	Fish Market Info with details
Contacts	Important contacts with direct dialling option
Weather details	Weather forecast, Temperature, Humidity and Rainfall

FFMA II – New Features

- Fisher Friend Mobile Application (FFMA) is being developed on the Android Mobile platform in English, Tamil and Telugu languages to provide local fishing related information to the Fisher folks.
- Along with the Android application, a web portal is also being developed to the data entry and validation.

- Android platform
- GIS interface

- Disaster alert
- IBL alert
- Dangerous zone marking
- Landing centre specific data
- PFZ navigating zone

FFMA Android - New Features

GPS (Assisted as well as Standalone) – Device Capability

- Navigation route to the PFZ and back
- Ability to mark danger zones like rocks, coral reefs, sunken boats and make them available to all the users
- International Border Line (IBL) alert – To help prevent Fishermen from crossing the International Maritime Border - Will alert fishermen when boat is within certain distance from the international border lat, long coordinates

Potential Fishing Zone(PFZ)

- General PFZ
- TUNA Species specific Fore cast
- Route from current position to the PFZ
- Two other nearest PFZ.

Disaster Alert

- high waves, cyclones and Tsunami alerts

Dangerous Zone

- Ability to market rocks, Corals, Sunken Ships and others
- Dangers zone lat long positions stored in server

FFMA Android - New Features

Mobile Devices which support FFMA

- Mobile phone with Android 4.0 and above
- E.g :- Sony Xperia, Karbon, Huawei, Samsung, LG etc
- 3G Data plan necessary

Fisher Friend Mobile Application Phase II - Project Locations

Tamil Nadu

1 . Cuddalore
2. Nagapattinam
3. Ramanathapuram
4. Kanyakumari
5. Pudukottai
6. Kancheepuram

Puducherry

8. Puducherry
9. Karaikal

Andra Pradesh

10. East Godavari
11. Krishna

Content Planning and Mapping

Name of the VRC	:	
Name of the district	:	
Block	:	
No. Villages selected	:	
Name of the villages and its lat long positions	:	

Content Sources

Services	Source of content	Form of content	Validation if any	Frequency in collection of content	Frequency in Updation of content	Who will collect	Whom will Update
Ocean State Forecasts							
Wind speed	INCOIS	Map	Convert into text/translation	6 hours/12 hours	24 hours	Mr. Ramesh	Mr. Ramesh
Wind direction							
Wave Height							

Pilot Testing of Application

Handsets Model

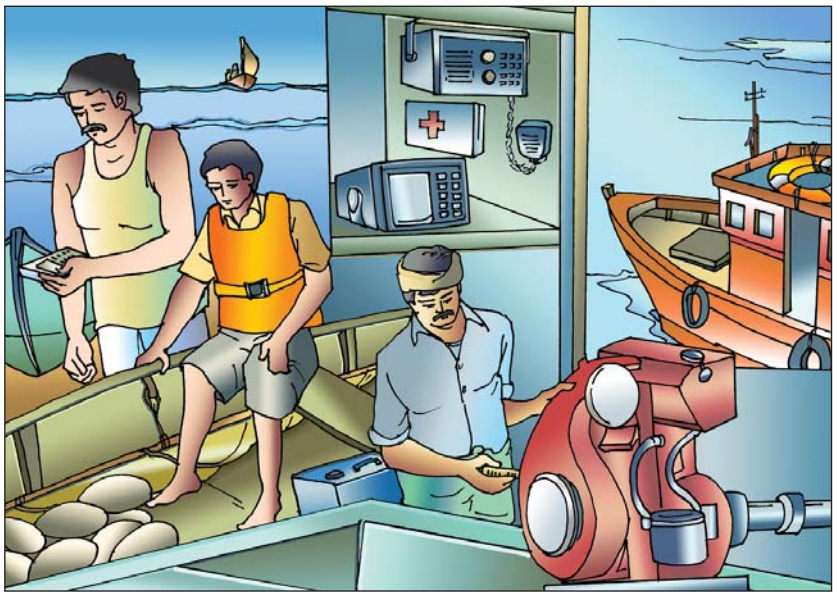
- Karbon
- Sony
- Tablets

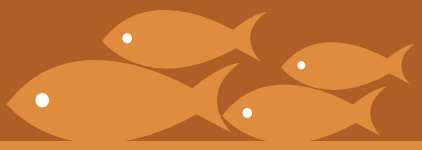
No. of Handsets

Tamil Nadu
- Nagapattinam District : 12 +1
- Cuddalore : 8+1
- Nagercoil : 8+1
- Ramanathapuram : 8+1
- Pudukottai : 6+1
- Kancheepuram : 5+1
- Thiruvalluvar : 3

Puducherry
- Puducherry : 9+1
- Karaikal : 5

Andra Pradesh
- East Godavari : 10
- Krishna : 10





BOBP/REP/143

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