Is it possible for INCOIS to incorporate voice interface in their EDB for fisher folk who are not able to read.

Yes EDB has the facility for voice messages. However it will be difficult for INCOIS to provide voice based service for 11 languages. Thus INCOIS plans to train the local VRC coordinators to record the content and install it in the EDB so that it can be heard by the fisher folk. We can also sequence the flow of audio content in the EDB.

INCOIS is providing information on Potential Fishing Zone based on the longitude and latitude, however this can be utilized only by fisher folk who have access to GPS. Is it possible for INCOIS to provide this information in a form that can be interpreted by local and small fishermen?

Apart from latitude and longitudes, INCOIS provides PFZ data on the basis of distance from shore, direction and sea depth. This is something that can be easily understood by the fishermen. INCOIS will also soon provide data in local language such as instead of Meters/ Fathoms for depth. We can also provide it in the form of local unit such as Pagam.

Can INCOIS provide a resource person who can conduct a session on how to utilize the new EDB?

Yes, INCOIS will conduct a session on EDB for coordinators of the Village Resource Centers. The board has special features such as the ability to store and play audio messages and also transmission of data. All these new features will be demonstrated in that session.

The weather forecast given in Televisions is for the most part not accurate and thus fishermen face a loss when they take the forecast to be true and not venture into the sea?

Weather forecast is not absolute but only accurate to a certain degree. The forecasts are provided by IMD and not by INCOIS. However IMD has developed new weather models which can predict weather accurately to a greater degree.

Currently PFZ information is provided based on major fishing harbours and landing zones. This will be helpful for trawlers and bigger fishing vessels which are based in these places. However, smaller fishermen go fishing from their respective villages. Is it possible for INCOIS to provide this information based on longitude and latitude of a few villages which will be provided by MSSRF? Otherwise how could those villages use the existing information?

Yes, it is possible to provide the PFZ information from any landing centre provided the latitude and longitude details are made available to us.

How we will access GIS based PFZ in the INCOIS web site? What is the procedure?

To access the web - GIS facilities provided in INCOIS website, the user needs to make a one - time registration which is also offered at free of cost. After registration, the user may take printout of the registered form and send the original signed copy to us so that INCOIS could activate the account. From next login onwards, one can use his/ her username and password to login and access the data.

Is it possible for INCOIS to provide a higher resolution image of sea wave height map? It is easier for lay users to pin point the exact location of the different shoreline villages (major) or at least fish landing centers or fish harbors?

We are generating wave products for next seven days for various regions and coastal states and uploading into INCOIS web page on a daily basis. The products uploaded are gif images and there is no provision to zoom into the image and look at the particular village areas. But the OSF text data that is being sent to various EDB's installed at fish landing centers are derived out of the high resolution model that is being run daily.

What are the arrow marks? - Do these denote the wind direction or sea current or something else?

The arrows indicate the wave direction.

How to effectively use Tidal circulation data? Does tidal circulation exert an impact on sea current pattern or spawning and breeding of fishes or fishing practices?

Tidal circulation is the currents generated as a result of tide action and is very significant in those coasts having very high tidal range, such as gulf of Kutch and adjacent coastlines. It does impact the spawning and breeding since it can transport the larvae; however it is negligible in the south coast of the country.

How will we use the OSF data?

The intention of giving OSF data along with PFZ is that the OSF as an integrated product the data is more meaningful, as the fishermen have the option to look at the sea state before venturing out into the sea. The OSF data that is being provided consists of information in three categories i.e. shore-20 kms, 20-50 kms and 50-100 kms.

How do we use chlorophyll data for PFZ area?

Chlorophyll data is an indicator of the availability of phytoplankton which is the food for the fishes. The areas with higher chlorophyll concentrators are the zones where fishes try to migrate for their feeding.

How will the sea surface temperature be helpful for fisher folk to get information on where they will get the fish?

Fishes try to migrate to the areas where the environment is conducive for their life. The fishes prefer to move from high temperature areas to low temperature areas. SST will clearly demarcate these high and low temperatures gradients. These thermal boundaries are the one of the areas where the fish aggregate. Also the SST image also shows the upwelling zones where the nutrient rich sub surface waters are brought upwards leading to gathering high productivity. These are the most conducive areas where fishes will be gathering.

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Appreciation of the effectiveness of INCOIS information to

save lives on sea and livelihoods of fisher folk

Jamsetji Tata National Virtual Academy (NVA)

Since 1992, M S Swaminathan Research Foundation (MSSRF) - a non-profit research organization has been implementing the Village Resource Centres (VRCs) and Village Knowledge Centres (VKCs). In 2003 MSSRF established the Jamasetji Tata National Virtual Academy (NVA) to scale up the VKC programme. In 2004, in partnership with several national and international organizations MSSRF initiated steps to extend the Village Knowledge Centres (VKCs) concept to different parts of the country by creating multi-stake holder partnership called "Mission 2007: Every Village a Knowledge Centre". Since early August 2007 this network/ movement is referred to as "Grameen Gyan Abhiyan (Rural Knowledge Movement)". GGA is a multi-stake holder partnership, facilitating national and regional events related to ICT-enabled rural development activities.

VRCs are connected through the Indian Space Research Organization's (ISRO) uplink and downlink satellite facilities. Users located at one node of this network can fully interact with others located at another node through video and audio links. Each node can be expanded further using different technologies such as notice boards, pamphlets, public address system (wired/ wireless/ GSM), community newspaper (vernacular), press releases, cable TV, audio/video conferencing through wireless, telephone, meetings, mobile phone, SMS server, internet radio server, fixed wireless loop telephone closed user group, pen drives and CDs through bus drivers, K YAN-PC (it contains PC, projector, TV tuner card, DVD player, amplified speakers and modem) and intranet web site for dissemination of useful and necessary information.

Electronic Display Board (EDB)

The Indian National Centre for Ocean Information Centre (INCOIS) was established in 1999, as a natural sequel to a national project on marine satellite information system (MARSIS) mounted by the Ministry of Earth Sciences (MoES) to provide ocean data and information services for the country, with a mandate to synthesize, generate, promote, provide and co-ordinate various endeavours in the field of Ocean Sciences, Ocean Observations, Satellite Oceanography, Ocean Information, Advisory Services and Tsunami Warning. INCOIS has been playing key role in the Indian Ocean and provides ocean data, information and services to the society, academia and government. The main goal of the INCOIS is to develop capability to forecast key ocean parameters and processes such as availability of fish stocks, ocean state, tsunami, etc. for societal and economic benefits. In order to support these activities, an ocean observation system along with data management system has been designed.

INCOIS is having the State-of-the-art infrastructure facility and the experienced resources for the ecological and coastal studies. It has collaborations with the national and international organizations/bodies related to studies on the coastal zone and oceanography. The current on-going projects are the PFZ advisory services and Ocean State Forecast in mission mode. Government of India has formulated a program to provide the fishing community with credible advisories on Potential Fishing Zones (PFZ). This mission is part of the Common Minimum Program (CMP)" of the Government of India. In addition to this INCOIS is the nodal agency for Tsunami early warning in the Indian Ocean region and established Tsunami Early Warning System (TEWS) which operates on 24X7 basis. Another mission Ocean State Forecast (OSF) generates the information on ocean state routinely for the coastal and open ocean domains.

INCOIS provide its services on PFZ, OSF and TEWS to the entire community situated all over the entire coast of India. To improve the coverage, advances in information and state of art Communication Technology Electronic Display Boards (EDB's) have been adapted which facilitates dissemination of satellite pictures, animations, short-films, ocean state information, disaster information and Disaster warning and alert system in addition to the normal multi-lingual text information. These new generation display boards are facilitated with more advanced features in terms of display, communication, power and health monitoring. The features of the boards are ***32"*** LCD Display Panel, Two communication channels via GSM/GPRS/CDMA/Dial-up as primary channel and Satellite Radio as secondary channel, Built-in Single Board Computer. It has got online broadcast of voice messages and playback of recorded messages, secured siren system with audibility up to 1Km. The additional features good power backup, solar Panels, web-based dissemination, health report of the board and optional dissemination one-to-many/many-to-one information made the board more versatile.

Can INCOIS provide species wise information of Potential fishing zone?

Yes it is possible to provide Species- specific information; however an extensive R&D has to be carried out with accurate geo-referenced fish catch data on the targeted species. At present, INCOIS is providing species- specific forecast for Tuna on an experimental basis. INCOIS has developed this forecast system based on careful observation, data collection and validation in coastal areas of Andhra Pradesh and Tamilnadu. However for operationalisation of the tuna fishery forecast, further extensive validation is required for which feedback on the advisories and Tuna fish catch details from the fishermen community are essentially required. This forecast information will be soon available for all the fishermen and INCOIS will start working on other major varieties of fishes.

Is it possible for INCOIS to provide data on seabed (Bathymetry) so that fishermen can identify potential hazard areas such as sunken ship wrecks, rock formation where their nets often get entangled?

Currently bathymetry maps are produced by National Hydrographic Organisation (NHO), Dehradun. INCOIS has access to these Bathy maps. INCOIS will explore the possibility of sharing these maps. As of now, INCOIS is providing bathymetry contour lines (10m, 20m, 50m, 100m, 500m, 1000m and 2000m) in its PFZ Maps.

Very high resolution Bathy maps are available for major shipping areas only, thus very high resolution maps can be provided for other areas, if available with NHO. In case NHO does not part with the data, INCOIS will explore the possibility of providing the data from an alternative source.

Also potential hazard areas (rocks, wrecks) can be displayed on the INCOIS display board for reference of fishermen.

Why is data not available in EDB for a long time?

There can be two reasons
a. The board is switched off. b. The board has not been enabled.

The INOCIS board should never be switched off. In case INCOIS board is switched off or is not functioning the VRC coordinators should immediately inform INCOIS. The board, except LCD Screen will function up to 2 hours on UPS in case of mains power failure. Once the power is back, the boards will automatically switch ON, if the board was not switched of manually, and collects data automatically from the server at INCOIS.

But currently the problem seems to be that the board has not been "enabled" as of yet. It shall be enabled as soon as possible.

Fishermen do not have any connectivity in deep sea as their cell phones become out of range oftowers. In this scenario can INCOIS do anything to improve connectivity so that fishermen can receive data even in deep sea?

Currently there are two solutions available namely VHF radios and Satellite phones and both of them are very expensive and are out of reach of fishermen. Realizing this INCOIS has commissioned IIT to develop a small handheld device that utilizes Satellite Audio/data broadcasting technology to receive INCOIS data even in deep sea. The device will cost approximately Rs 4000 to Rs 5000. The device will be made available in a year.

In addition to the above equipment, INCOIS also developing a small plug & play instrument that can be used for receiving the data, SOS button for informing disaster happened in the sea for immediate rescue, Vessel tracking using GPS. This is in initial stage and can be made available after successful conducting of a pilot project work.

Can INCOIS provide prediction and data on sea currents as this can be used by fishermen to identify areas where fish will be available, save their nets as their nets can be swept into rocks by strong currents?

It is easier to predict sea current pattern in North western shores of India where there is significant rise in sea during tides. However in south India the tides are not significant enough to predict sea current so they require taking into account various factors. INCOIS has developed a numerical method to predict sea current pattern in sea, however it requires enormous computation power which they have acquired. Currently, they have the capability to provide the data in an experimental manner. They will soon be able to provide such data to fishermen in the near future.

Currently INCOIS board is available only in Village Knowledge centers, how will fishermen who live in other villages access the information.

INCOIS has provided M.S.Swaminathan Research Foundation with 12 digital boards. Overall across India INCOIS has provided 50 EDBs. INCOIS plans to roll out 200 more EDBs across India.

INCOIS requires agencies like MSSRF in a village to take responsibility for the board and also explain the contents in the board.

Can INCOIS provide early warning information on Tsunami?

Yes, INCOIS is the nodal agency for providing early warning information for Tsunami in India. Within eleven months post Tsunami INCOIS had set up Tsunami warning centre across India. INCOIS can predict and warn regarding Tsunami 3 hours before the wave reaches our coastal areas. INCOIS personnel monitor and maintain the warning centre for 24 hrs a day 7 days a week. INCOIS currently shares the predicted information with the Home Ministry which then routes the information across different locations. INCOIS can also provide warning by raising the siren provided along with the Electronic Display Board installed at 50 locations. The siren will be turned on by INCOIS personnel. The siren is audible up to 2 Kms diameter. INCOIS is planning to disseminate the information through mobile phones, and is also working on other modalities of it.

During cloudy seasons Potential Fishing Zones are not available. Can INCOIS provide PFZ data during cloudy seasons?

Currently INCOIS uses satellite imagery to derive PFZ. The satellite imagery lies in the optical bandwidth and so it is not possible for the satellites to take images during cloudy season. However if INCOIS has access to high resolution microwave imagery from satellites then it is possible. However INCOIS has mature numerical models and by using this, the data from various other platforms can be integrated and the final output product, that is cloud-free, can be used to predict the Potential Fishing Zone Information. This is planned to use in the near future after necessary standardization and validation.

Is it possible to provide Potential Fishing Zones for sea animals such as Prawns and Crabs?

In the sea there are two kinds of fishes namely Pelagic and Demersal. Pelagic fishes are usually available at the surface and the Demersal fishes such as Prawns and Crabs are usually available at the bottom. INCOIS PFZ has an success rate of 85% for pelagic fishes, however for Demersal fishes it is only 60%, INCOIS needs to validate more data and will improve upon it to provide more accurate data for Demersal species.

How will we use the SWELL data? We are a little confused regarding wave height and SWELL data particularly in the calm sea areas.

The SWELL cannot be distinguished from waves with our naked eye. The data that is being given on EDB's is wave height information which is a combination of wind component and swell component. Usually swell is nothing but waves caused by non local winds. Fishermen must use only the significant wave data given by INCOIS.

Fishes in sea are migratory in nature. In this scenario how is Potential Fishing Zone valid for three days? Is it possible to factor migration when giving PFZ.

Currently the INCOIS has assumed that the migration of fishes will be within a small zone and are providing the PFZ. However, it is understood that fish migrate based on sea currents and winds and as INCOIS has these data, it now possess the capability to factor in migration when deriving the Potential Fishing Zone. From the next season onwards INCOIS will mark points near the PFZ in a manner that each point away from the PFZ zone refers to where the fishes will be available for the successive days.