FAO/FFA REGIONAL WORKSHOP TO PROMOTE THE FULL AND EFFECTIVE IMPLEMENTATION OF PORT STATE MEASURES TO COMBAT IUU FISHING

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PILOT PROJECT FOR MCS IN THE INDIAN OCEAN - AN EMPHASIS ON PORT STATES MEASURES

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ABSTRACT

Large pelagic resources (tuna and tuna like fish) constitute the single largest marine resource at the disposal of the small island states of the IOC (with the exception of Madagascar). Long-term sustainable management of these resources is of critical importance both to the coastal states of the Western Indian Ocean (WIO) and to the dependent markets of the European Union and Asia. Recognising the intrinsic role of MCS in achieving the goals of fisheries management the three year project 'A pilot project for MCS of large pelagics in the Indian Ocean' is being implemented financed under 9th European Development Fund (EDF) by the Indian Ocean Commission (IOC).[1]

[1] Member States: Seychelles, Mauritius, Madagascar, Comoros and France (on behalf of La Réunion)

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1. CONTEXT

Approximately 970,000 tonnes (t)[2] of oceanic tunas[3], with a processed value of €2-3 billion are harvested each year from the WIO. Landings in the WIO are close to triple those of the Eastern Indian Ocean (EIO) reflecting the high levels of productivity associated with nutrient rich upwellings adjacent to the Arabian and Somali coastlines. Indian Ocean large pelagic tuna and tuna-like[4] fisheries are unique for two main reasons:

- catches taken by the artisanal sector are similar in volume to those of the industrial sector; and,
- catches taken by the industrial sector are fairly evenly split between longline and purse seine fleets.

In contrast, tuna fisheries in both the Pacific and Atlantic Oceans are dominated by the industrial sector. The fisheries are estimated to be the most valuable in the world; this status reflects two important characteristics:

- the comparatively high value attributed to artisanal catches; and,
- that half of the industrial fleet's catches are taken by longliners for which catch values are considerably greater than for equivalent purse seine catches

Distant Water Fishing Nation's (DWFN's) began longlining for tuna in the WIO in the early 1950s. This was initiated by the Japanese; soon followed by the Taiwanese (1954) and the Koreans (1960). Since then, Asiatic longline presence in the Indian Ocean has increased significantly. Sri Lanka and Indonesia are also active players in the fishery with rapidly developing fleets active in almost all areas of the tropical Indian Ocean. Numbers of active Japanese and Korean longliners have diminished in recent years due to declining profitability.

The most significant increase in targeted fishing activity for tuna and tuna like species in the WIO dates back to the mid-eighties, reflecting the increase in industrial fishing fleet interest particularly on the part of the EU purse seine fleet. Large scale industrial purse seine fishing for tuna began in 1983 when the French and Spanish fleets moved into the Western Indian Ocean from the tropical Atlantic. By 1986 some 6% of the world tuna catch (143,099t out of 2,400,000t) was taken by WIO purse seine fleets; by 1997 this had risen to 14% and currently stands at some 19%.

The majority of the active purse seine fleet is Spanish and French fishing under access rights linked to European Community agreements, private and bilateral agreements and in high seas areas. Other purse seine fleets active in the WIO are registered in the Seychelles, Thailand and Iran. Purse seine fleets on the whole have remained fairly stable, with moderate increases in 1997. Activity in the WIO is widely distributed, although tends to follow an annual pattern of distribution summarised below:

- 1st Quarter Central WIO, Seychelles plateau and Northern Mozambique Channel
- 2nd Quarter Southern Somali basin and Mozambique Channel
- 3rd Quarter Somali basin and Western Seychelles plateau
- 4th Quarter Central WIO and Seychelles plateau

In contrast to purse seine activity, longline fishing is comparatively more dispersed ranging over the entire tropical and subtropical WIO.

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[2] 'If tuna-like' species are added, the WIO catch is 1 million tonnes (IOTC).

[3] The oceanic tunas include skipjack *(Katsuwonis pelamis),* yellowfin *(Thunnus albacares)* and bigeye *(T. obesus)* which are caught by purse seine fisheries, with Albacore *(T. alalunga)* and southern bluefin *(T .maccoyii)* which, together with yellowfin and bigeye tuna are caught by longlines.

[4] Tuna-like species include principally billfish, with swordfish *(Xiphias gladius)* having the highest catches.

The purse seine fleets appears on the whole to be operating legitimately. However, although large deep-freezer IUU longlining is regarded as being in decline in the WIO, large numbers of small fresh fish longliners[5] which have not to date been fulfilling management requirements have moved into the region, such that IUU fishing constitutes a significant threat to the economic and social wellbeing of IOC member states.

Revenues from the fisheries are generated both directly and indirectly through inter alia:

- Through the sale of fishing rights and access to foreign fleets (predominantly to the EU and Taiwan);
- Transhipment and associated downstream activities of foreign fleets;
- Onshore processing and canning of tuna; and,
- The landings (and associated activities) of local semi-industrial and industrial enterprises.

The European market for fish and associated products is the largest in the world, and the gap between demand and domestic supply has increased significantly in recent years. Global fisheries products imported into the community from developing countries was valued close to $20 billion in 2001. Over the period 1983-1990, annual fish consumption per capita in Europe rose from 15 to 22 kg, in parallel with diminishing marine resources in European waters. This situation has strengthened Europe's reliance on distant water fleet (DWF) catches. DWF imports are a major source of supply feeding the European market, and imports to Europe from lesser developed countries (LDCs) have increased by 900% over the period 1976-1996. Catches from LDCs are integral to meeting this demand, and at present contribute at least 20% of all EU fish production. Seychelles, Mauritius and Madagascar are in the top 10 largest ACP fish exporters to Europe largely as a result of tuna.

Underpinning EU DWF activity are Fishing Access Agreements which bring considerable direct, indirect value added and employment. The EU budget for Fishing Agreements, and de facto the activity of its DWFs, has increased substantially in recent years from €5 million in 1981 to €276 million in 2000. European Union Fishing Agreements for tuna and tuna like species have been negotiated with four IOC member states (Mauritius, Seychelles, Madagascar and Comoros).

Long-term sustainable management of tuna and associated resources is without doubt of critical importance both to the coastal states of the WIO and to the dependent markets of the European Union and Asia as they form significant renewable resources in their territorial seas and exclusive economic zones.

In line with the 1982 United Nations Convention on the Law of the Sea (UNCLOS), it is the prerogative of coastal states to utilize the natural resources of their EEZs, but it is also their obligation to assess the status of fish stocks, allocate surplus to third parties and to conserve fisheries and their habitats. It is within this framework, the terms of the 1995 Straddling Stocks Agreement and the context discussed above, that an effective and efficient framework for regional MCS for large migratory pelagic stocks in the WIO is essential. Monitoring, Control and Surveillance (MCS) is seen as an intrinsic mechanism for implementation of agreed policies, plans or strategies for fisheries management.

2. MCS AND REGIONAL COOPERATION AND THE IOTC

The Indian Ocean Tuna Commission (IOTC) is an intergovernmental organization established under Article XIV of the FAO constitution. Its mandate is to manage stocks of tuna tuna-like species in the Indian Ocean and adjacent waters. It brings together the coastal states of the Indian Ocean and some of the states that fish tuna and tuna-like species in this ocean. The IOTC obtains catch data from its 24 Members. This information, mostly inadequate in its current aggregated form, contributes to specific

[5] Many vessels freeze bycatch species or non-sashimi grade tuna

Working Parties and is analysed to form the basis of management decisions and resolutions and recommendations to its contracting parties.

The importance of MCS to the IOTC is significant. The IOTC actively supports the regulatory approach in the context of UNCLOS and the FAO Fish Stocks Agreement. IOTC states that up to 20% of large pelagic catches could be being made by IUU.

IOTC Resolutions endorse that contracting parties should control their own fleets by:

- Authorizing vessels to fish on the high seas6:
- Monitoring the activities of their fleets through:
  - Compulsory data reporting schedules/formats
  - VMS monitoring
  - Observer coverage
- Penalty systems that discourage non-compliance

IOTC Resolution 02/04 works towards a 'positive' and 'negative' vessel list, whereby vessels on the positive list are flagged in contracting and collaborating countries and are therefore authorized to fish in the Indian Ocean whereas those on the negative list have been placed their by the Compliance Committee and are not to be provided with any support, including port access and handling of catch, by IOTC members. Furthermore that contracting parties must deny licenses for IUU vessels to fish in their EEZ (although this does not tackle the problem of IUU fishing on the high seas). Parties should refuse landing and transshipment services for IUU vessels in line with resolution 02/03 and 06/02 and exercise Port State control measures through Resolution 05/03. Such provisions were recently reinforced with an updated list in Resolution 06/01 adopted at the 10th Session. The IOTC has also recently adopted Resolution 06/03 concerning VMS coverage.

3. SUMMARY OF MCS CAPACITY IN THE WIO AND THE RATIONALE FOR STRENGTHENED PORT STATE MEASURES FOR ENHANCED MANAGEMENT

3.1 Legal issues

The 1990s saw significant developments in international law relating to fisheries, with direct implications for MCS systems. The new international regulatory framework for fisheries, based on UNCLOS, the FAO Code of Conduct for Responsible Fisheries, the 1995 UN Fish Stocks Agreement, the FAO Compliance Agreement and the four FAO International Plans of Action, encourages the rapid strengthening of national and particularly regional MCS systems as a key mechanism for improving the conservation and management of marine fisheries.

A review[7] (Cacaud, 2001) for the IOTC shows that the laws of IOC states were poorly adapted to such instruments and required new features essential to a robust MCS regime such as rules of evidence, 'Lacey Act' clauses and penalty reviews. Furthermore, within the region, there is also the issue of contested sovereignty over various islands such as Isles Glorieuses, Tromelin and the Chagos Archipelago, which impacts on the effectiveness of such instruments, especially when conducting operational surveillance. Mechanisms are also not sufficiently developed to facilitate regional cooperation in MCS information, including statistics, operational data, monitoring standards and intelligence.

[6] A legislative study completed in 2001 (Cacaud, FAO, 2001) of selected Indian Ocean coastal states has shown that legislation often does not cover the high seas

[7] Review of fisheries legislation of selected Indian Ocean coastal states to assess the extent of their compliance with the requirements of international instruments pertaining to the law of the sea and high seas fishing in particular, Cacaud, August 2001)

3.2 Physical issues

The joint EEZs of IOC states is over 5.5 million square km. In parallel with the seasonality and transboundary nature of tuna and lack of fine scale data on fleet operations, it is clear any aerial or sea-borne offshore surveillance will be both excessively costly and ineffective.

The purse seine fleet uses Port Victoria (Seychelles), Antsiranana (Madagascar) and Mombassa and occasionally Port Louis (Mauritius) to offload and does not tranship at sea. The fleet fishing in the region is fairly well monitored in terms of overall reported catch although there is uncertainty on accurate location reporting. The re-flagging in 2005 of a Russian-owned purse seine fleet brings with it the end of IUU purse seine vessels in the Indian Ocean (although only 5 are now re-flagged in Thailand and hence on the IOTC positive list). There are however European-owned purse seiners, the majority being Spanish owned vessels flagged in the Seychelles.

Of the Asian longline fleet, many use Port Louis; the rest use either Singapore, Yaizu or Kaoshiung. Although the number of industrial IUU vessels is declining, transhipment is carried out on the high seas and, with less than a quarter of catches landed in the region and inherently long vessel campaigns, it is clear that the monitoring of this fleet sector is completely inadequate. A relatively new threat is that many of the several thousand small longliners are IUU as they do not provide statistics, do not observe management measures such as adequate vessel markings, VMS and are often flagged in non – IOTC member states. An assessment of the scale and nature of operations of such an IUU sector is an absolute priority.

With the exception of Comoros, all IOC countries have operational VMS systems (Comoros is shortly to have a system installed, following a tender procedure), however no regional standards (including minimum specifications etc.), exchange of VMS information between states and evidential value and legislative application with regard its strength in ‘direct enforcement’ has been established for VMS. Given this, it is clear that existing VMS capacity in its previous form could not have addressed the regional monitoring shortfalls presented, particularly within the longline sector.

National MCS baseline data (licence data, vessel registry information, inspection data, sightings etc.) as well as data captured at sea and in the air are not currently processed and stored in a harmonized way. Different users within the fisheries sector (e.g. coastguard, managers and IOTC etc.) have specific requirements in terms of data format and availability; however systems were focused towards domestic requirements at the expense of regional utility.

It is recognized that, despite reporting requirements in access agreements and license conditions, none of the IOC countries had access to fully satisfactory catch-and-effort data needed to extract the optimum benefits from foreign fishing in their EEZs. This statement masks considerable disparities, as some of the States have excellent data on segments of the foreign fleets, while others have access to virtually no data.

The reason for this situation rests in the fact that, where a foreign fishing vessel never calls into the ports of a given country and is not covered by an observer programme, it is often difficult to obtain the logbooks which are the basis for the collection of statistical data and impossible to conduct the sampling needed to correct for reporting errors and commercial categorization which are inherent in logbook records.

The end result of this situation is that:

- The country is poorly placed to negotiate favourable access agreements – this leads to a weakened negotiating position regionally, as negotiations leading to new agreements are usually based on existing arrangements,

- There may be an opening for the fishers to under-report catches in a given EEZ, passing off tonnage fees to a neighbouring country's waters where reporting and thus payment of licence fees is not enforced and
- The country does not dispose of detailed catch data that could be used to plan future investments.

Only two of the IOC countries have a significant port presence from foreign fishing fleets:

- Virtually all the European-owned fleet is based in Port Victoria in Seychelles – these vessels provide the Seychelles Fishing Authority (SFA) with logbook data covering the whole range of their activities,
- A large part of the longline fleet active in the western Indian Ocean use Port Louis in Mauritius for transhipment. It is recognised that in the longer term, it is desirable to, in the IOTC management regime, ban all high seas transhipments.

In this context, it is clearly in the interests of all the IOC States that each should have access to complete catch-and-effort data related to their EEZ.

3.3 Political issues

A critical consideration, ensuring effective MCS and the sustainable management of resources in the WIO is the degree of political will and commitment to the implementation and support of any regional MCS initiative. Clearly, both the actual and potential economic profile of the fisheries relative to the national economy will determine the extent of political support for a regional MCS initiative. IOC states will need to strike a balance between the potential long-term benefits of effective management against the cost of such activities. The establishment of evolved information systems for MCS management; effective legal frameworks; maximisation of potential revenues from licensing; greater control over access to resources and knowledge of the scale and nature of regional IUU fishing will all offer tangible long-term benefits. These benefits differ from state to state and as such will influence the extent to which strengthened MCS is prioritized.

4. A REGIONAL APPROACH TO FISHERY MANAGEMENT AND MCS IN THE WIO – THE IOC-MCS PROJECT

In February 1998, following the 'Antananarivo Report', the specific need for a coordinated approach to managing and protecting fishing zones was identified as a priority. Until this point MCS was given little priority by IOC Member countries. There was however awareness of the issues from international debates at the time, such as the 'Agreement on Straddling and Highly Migratory Stocks' and the fight against IUU fishing. With these issues in mind the Secretary General considered it necessary for the IOC to promote a regional approach, as discussed at the 25th meeting of the Council of Ministers of the IOC on the 2nd December 1999 and at the 2nd summit meeting of Heads of State of the IOC on 3rd December 1999. Following decisions taken at these meetings the IOC and the European Commission agreed to implement a feasibility study for strengthening regional MCS capacity and cooperation. The feasibility study was completed in April 2001 culminating in a workshop held in Mauritius 4-6 September 2001. The Workshop was attended by all concerned IOC Member countries and representatives of the EU and the IOTC and culminated in the definition of a framework for strengthening regional MCS. A key output of this workshop was a defined framework for strengthening regional MCS capacity in the WIO.

4.1 Project principal objective

Recognising the unique nature and importance of large pelagic resources in the WIO and the difficulties faced towards achieving a state where potential resource value is maximized in the long term – the overall objective of the project is 'to bring about a reduction in poverty and to increase food

security in the ACP countries of the IOC through sustainable management of the regional resource of large migratory pelagics'.

4.2 Specific project aims and results

It is worth stressing that this project is indeed a 'pilot project' formulated to test the conditions and pave the way for regional cooperation in MCS. The pilot stage will contribute towards meeting the objective by laying the groundwork for and identifying the barriers to enhanced regional cooperation in fisheries MCS, and will in so doing strengthen sustainable large pelagic resource management capabilities in the region.

The project is conducted through three layers of management, A Project Steering Committee involving the IOC Members, IOC, EC Delegation, PMU and to which are invited as observers, IOTC, SWIOFC, East African ACP States and the SADC MCS Project; a Project Management Unit (PMU) located at the Indian Ocean Commission and National Focal Groups (from each IOC state).

5. OVERVIEW OF SELECTED PROJECT ACTIVTIES

In the first phases of the project, an assessment into port state capabilities took place in all the countries of the IOC, looking into *inter alia* the following areas:

5.1 Port State Control

- Port state control in the member state
- Development / current IPOA IUU
- International legal instruments
- Relevance of national legislation
- Port state obligations:
- Prior notice of port access
- Denial of access to transship in port (ref IOTC Resolution 05/03)
- IOTC Authorized List of Vessels (ref IOTC Resolution 02/05 and 06/02)
- Vessel markings (Ref: IOTC Resolution 01/02)
- Inspections (Ref: IOTC Resolution 01/02)
- Landings of other species e.g. sharks (ref: IOTC Resolution 05/05)

5.2 Documentation

Inspection forms for recording information when boarding commercial fishing, support and carrier vessels:

- Non authorized vessels
- Non-licensed authorized vessels
- Licensed Longline Fishing
- Licensed Purse Seine Vessels
- Support vessels
- Carrier vessels

Operational evaluation and verification of inspection procedures on the following:

5.3 Pre-boarding

- Pre-boarding information collection
- Flag state authorization to fish
- Status of vessel on IOTC (and other RFMO) registers
- Information on previous black-listings by IOTC (and by other RFMOs) and coastal states

- Status of entry on the FAO HSVAR vessel listing
- Reports of national / regional inspections, convictions and fines
- Reports of port state inspections and sanctions
- Reports of boardings and inspections within RFMO regulatory areas
- Details of beneficial as well as direct ownership

5.4 Boarding

- Boarding procedures – health and safety
- Identification of inspectors
- Professional conduct
- Inspection procedures
- Verification and recording of documentation / data
- Vessel logsheets
- National logsheets
- Plotters / charts
- Anecdotal information
- Certificate of vessel registration
- Verification and recording of catches
- Verification and recording of VMS transponder(s) details and functionality
- Verification and recording of vessel external markings and characteristics
- Languages and communications
- Uniform and equipment (cameras, data recording tools)

5.5 Legal framework

- Law and the underlying framework for MCS
- 'Powers of enforcement'
- Areas of jurisdiction / Adjacent areas
- Status of bilateral cooperation arrangements between MCS departments in IOC states
- Incorporation of international obligations and requirements into national law
- Evidential value (e.g. aerial, marine, logbooks and VMS etc.)
- VMS standards (minimum specifications)
- Penalty reviews (e.g. linking to licence fees)
- Licence / access conditions
- Registration and flagging requirements
- Transhipment
- Application of 'Lacey Act' type Clauses

5.6 Prosecutions and citations

- Collection of evidence
- Documentation of events
- Confiscation of gear and catch
- Impounding of vessel
- Organizational considerations
- Roles and responsibilities

5.7 Data, information systems and data handling

- Data quality
- Forms of data recording
- Handling, entry and processing
- Formats
- Exchanges and reporting

- Security

5.8 Reference material/guidelines

- Inspection forms
- Training Manual (if available)
- Boarding inspection checklist (if available)
- Boarding inspection language cards (if available)
- Species and gear codes and reference ID's (if available)

Based on the results of these assessments the following areas are being addressed include:

- Strengthened national and regional information systems and port inspection training
- Revised and updated legal frameworks
- Improved collection and dissemination of catch data
- IUU fishing assessment

Strengthened National / Regional Information Systems and training

One of the main priorities of the assessment of port state measures was to identify the 'information systems' that are required to facilitate and reinforce port state measures, allowing them to be developed and regionally harmonised from pilot project outset. This has the advantage of creating the environment and systems framework to facilitate further pilot project activities.

The IOTC fisheries management system, FINSS (Fisheries Information and Statistical System) provides the baseline on which additional developments will be developed and integrated. The nature of FINSS as a system is technically suitable as its modular approach permits the development of solutions for specific needs and its distributed computing model facilitates data exchange while maintaining common standards. As the IOTC is one of the end-users for the statistical data the MCS project will generate, this will also facilitate reporting by the individual IOC States. Furthermore, this system, which is already used in two IOC States, is being considered by FAO and the CWP[8] as a global fisheries data management standard.

FINSS will be used for all aspects of MCS including licensing, statistics, shore sampling for correcting weights and commercial categories, bridges to national VMS systems (allowing VMS logbook data, sightings, license details analysis etc.), all aspects of port inspections, sightings, observer reports and vessel registration.

The Seychelles now has an electronic, automated licensing system using FINSS, linking vessel agents, the management authority, licensing authority, central bank as well as coast guard and enforcement authorities. Testing is ongoing with the inspection and enforcement modules (see case Study) and a regional vessel record and statistical hub using FINSS.

Case Study - Use of FINSS for one aspect of port inspection

For Port Inspection, two new modules have been developed for FINSS that source data from within Vessel Registry and Licensing registry within FINSS as well as other sources such as other regional inspection databases and other RFMO positive and negative lists. In operational terms, a compliance officer would, prior to making an inspection, generate FINSS Enforcements Reports, comprising of a 'Vessel Details Form', a 'Pre-boarding Form' and a 'Boarding Form'. The vessel details form contains all the known information on a certain vessel that an inspector would need; it also records updates to be entered while making an inspection. Furthermore the MCS Manager can highlight any

[8] The Coordinating Working Party on Fishery Statistics is a body involving all IGOs holding competence in fishery statistics.

item he wants the inspector to pay particular attention to when a certain vessel is next inspected. The 'pre-boarding report' draws information from multiple sources such as license information (together with a link to an image of the licence and conditions etc.), details of prior regional inspections (from other countries), sightings (e.g. from Coastguards), infractions and observations, as well as details of listings on the IOTC positive or any RFMO negative lists. The 'boarding report', like the others, acts both as a data collection form and information source. All items in both the 'vessel details form' and the 'boarding form' are automatically generate in both English or French depending on the language of the port state, and the spoken language of the vessel captain. The full customisation features of FINSS allows the forms to look identical to the database tables, thus minimizing errors when updating FINSS after boardings and allows comprehensive security measures to be put in place.

Added to enhanced resources and the supporting legal framework, directed training for the port inspectors will be based around the information systems described above with a view to strengthening the effectiveness of port state measures. Development of standardized regional boarding and inspection protocol and manuals, as well as tools and a series of theoretical and practical port inspection training courses are ongoing.

Revised and updated legal frameworks

As well as amendments to Regulations, new Regulations and revisions to license conditions, new Acts as well as amendments to Acts are being developed in Mauritius, Seychelles, Madagascar and the Comoros.

Improved collection and dissemination of catch data

The project proposes that two regional data hubs be created for collection of catch-and-effort data from tuna fishing vessels, validating and processing the data, and transmitting the data related to the EEZs of each of the other IOC States. It was recognized, however, that such activities raise a number of issues which are under discussion following a detailed impact study. These include:

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- The need to preserve commercial confidentiality, failing which the fishers might systematically misreport their statistics;
- Restrictions which might exist in national legislation related to the disclosure of fishery statistics by third parties;
- Restrictions which might exist in various access agreements related to the transmission of sensitive data to third parties;
- Estimation of the costs involved for data collection, verification and processing and of their allocation to each of the beneficiaries;
- Handling catch data from contested areas; and
- Type of cooperation required.

Pilot Operations for assessing regional IUU fishing

IUU fishing is an extremely broad category of behaviours and needs some very detailed refining, reviewing and participatory discussions throughout the project to ensure that 'useable estimates' are obtained from well planned, precisely designed and evaluated pilot operations.

New technology is being tested such as Satellite Remote Sensing (SRS) tools, through a number of Pilot Operations, these include:

Pilot Operation 1

The specific objective for this element of the project is to obtain quantitative estimates of IUU tuna fishing by using satellite Synthetic Aperture Radar (SAR) from the European Space Agency's

ENVISAT satellite in the EEZs of Indian Ocean Commission member states in association with overlaid VMS data, on the assumption that IUU vessels will not be associated with VMS records.

Two phases are envisaged. The first phase is intended to estimate the incidence of errors in identification of targets from the SAR imagery (i.e. not locating vessels that are known to be present or incorrectly categorizing them – particularly likely for small fibreglass and wooden longliners and of merchant shipping of the same size as fishing vessels, or of locating vessels which do not exist – possibly caused from large waves and wind), a process categorized as Ground Truthing.

The Second phase aims to sample the combined EEZs of the IOC members (5.5 million square kilometres) with SAR imagery to estimate the number of IUU fishing vessels present. The ground truthing might also contribute to improvement of the satellite imagery software, which explains the involvement of the Joint Research Centre of the European Space Agency in this project. The World Bank, FAO and the UK have also expressed interest. It should be noted that the French CROSS have been using SAR imagery for the control of IUU fishing in the “Terres Australes” (Kerguelen, St. Paul and Amsterdam Islands).

Pilot Operation 2

Under development, this will involve using other satellite remote sensing imagery and data (such as SST, colorimetry and altimetry data) and historical catch and effort data from the IOTC, verified from SAR and VMS data, to predict active areas.

APPENDIX A

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