



MARINE ELECTRONICS FOR FISHING VESSELS

DeepSea Master

Integrated navigation, crew safety, surveillance, dual-link communications and compartment monitoring for Indian fishing boats and vessels, with owner and fleet apps.

Complete v1.1 cutoff 2026-09-15 Session 4 · DeepSea Master India · Sri Lanka · Oman and GCC

Validate before selling

Confidence medium

53/100

Do not sell DSM yet: with no sale, installed base or certificate, first prove a legal satellite path, MTCTE and marine test evidence, and paid demand from multi-vessel fishing companies in Tamil Nadu and Karnataka, positioned as the monitoring layer above the free ISRO transponder.

35,000 ₹ per unit PMMSY ceiling for a tracking device Verified S21	50,000+ of 1,00,000 Free ISRO transponders installed by 21 February 2026 Verified S134 S24	2,01,869 craft Powered fishing craft on DoF registers, 2024 Publicly observed S12	2,330 ₹ Cr one-time Bottom-up TAM at DSM starting prices Estimated S12 S7	526 people Tamil Nadu fishers arrested by Sri Lanka, 2024 Verified S60
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AT A GLANCE

- DSM's safety core is already free: ISRO's VCSS transponder gives satellite messaging, SOS, weather and border alerts on more than 50,000 boats, is compulsory for EEZ fishing, and costs ₹35,000 a unit paid by government. Verified S134 S133 S31
- DSM's ₹50,000 boat tier is above the PMMSY ₹35,000 cap for tracking devices and is not a named item in any guideline; the only subsidy route is inclusion in a ₹1 lakh to ₹2 lakh safety kit. Verified S21 S81
- Demand for what the transponder does not do is real and vocal: fishing companies are buying ₹1.34 lakh satellite phones, and the National Association of Fishermen calls current systems little more than tracking and text at ₹25 a minute. Publicly observed S72 S74 S53
- Regulation is moving DSM's way: the draft Merchant Shipping (Fishing Vessels) Rules 2026 require AIS on every fishing vessel and a VMS or approved satellite tracker, but they also require IMO-type-approved equipment. Verified S45
- No DeepSea Master has been sold: there is no installed base, paying customer, pilot or reference, and Rax holds no satellite licence, MTCTE certificate or marine test evidence, with two salespeople and a service reputation to repair. Rax-supplied S140 S6
Verified S55 S51
- Bottom-up the pool is ₹2,330 Cr one-time at list prices, the serviceable share from Chennai about ₹440 Cr, and the obtainable revenue in 2031 about ₹12 Cr unless a state tender is won. Estimated S12 S9 S7

KEY TAKEAWAYS

- Validate before selling: the safety core DSM promises is now a free government service on more than 50,000 boats, so the product must be re-scoped as the monitoring layer above it before anyone is asked to pay. ● Verified | S24 | S134
- No DeepSea Master has been sold: there is no installed base, paying customer, pilot or reference. With no legal satellite link, no MTCTE or marine test evidence and a two-person sales team, direct selling is premature. ● Rax-supplied | S140 | S6 ● Verified | S51 | S55
- Paying demand exists at the top of the fleet: fishing companies buy ₹1.34 lakh satellite phones and associations are petitioning for data at sea. ● Publicly observed | S74 | S72
- The ₹50,000 boat tier is above the ₹35,000 PMMSY ceiling for tracking devices; subsidy is possible only inside a ₹1 lakh to ₹2 lakh safety kit. ● Verified | S21 | S81
- The obtainable market is small until a programme or yard carries volume: about ₹12 Cr a year by 2031 in the base case against a ₹2,330 Cr one-time pool. ● Estimated | S12 | S9 | S7

The decision

Rax should not sell DeepSea Master as a finished product in the next twelve months. It should run a funded validation programme that answers four questions a buyer will ask before the second boat: which licensed satellite network the transponder uses, whether the bridge units pass telecom and marine environmental certification, whether a fishing company will pay for monitoring that the free ISRO transponder does not provide, and whether a harbour partner can keep the first twenty installations working through a season. Classification: Validate before selling, on a scorecard of 53 out of 100. Confidence: medium, because the fleet, scheme and regulatory evidence is primary and current, while every product claim rests on a presentation. Rax has made no DeepSea Master sale; there is no installed base and no paying customer, and no pilot or reference exists. ● Verified | S9 | S21 | S24 | S45

● Rax-supplied | S1 | S6 | S140

Three facts drove this. First, the Vessel Communication and Support System has put two-way satellite messaging, SOS, weather and border alerts on more than 50,000 boats at no cost to the fisher, with one lakh planned, so the emotional core of the sales deck is no longer a gap. Second, the draft Merchant Shipping (Fishing Vessels) Rules 2026 require AIS on every fishing vessel and a vessel monitoring system, which creates demand, but only for equipment of approved type, which Rax does not yet have. Third, Rax's own record: no sale, no installed base, no paying customer, no coastal service, a referral problem in its main business, and a satellite module whose network is not named anywhere. ● Verified | S24 | S45 ● Rax-supplied | S6 | S1 | S140

Findings that matter most

The fleet is large and mostly powered. India's registers held 66,106 mechanised and 1,35,763 motorised fishing craft in late 2024, against 42,985 and 97,659 in the 2016 census; the census also counted 25,689 non-motorised craft that DSM cannot serve. Tamil Nadu, Gujarat, Kerala, Maharashtra and Karnataka carry three quarters of the mechanised fleet. ● Publicly observed | S12 ● Verified | S9

Government money is real, but it flows to named items with ceilings. PMMSY lists a communication or tracking device at ₹35,000 with 40 or 60 percent assistance, a safety kit at ₹1 lakh and vessel upgradation at ₹15 lakh; Tamil Nadu prices its own safety kit at ₹2 lakh and lists GPS, VHF, DAT, echo-sounder and fish finder as its contents. DSM appears in none of these lists, so the deck's "40 to 60 percent subsidy" applies only if a state schedules DSM components inside a kit. ● Verified | S21 | S81

The free transponder is not perfect, and that is the opening. Fishers in West Bengal told reporters the units were fitted but not functional; Dakshina Kannada's 2,067 units are being replaced after water ingress; the National Association of Fishermen says the system is "little more than location tracking and basic text messaging". Fishing companies in Mangaluru are queuing for BSNL satellite phones at ₹1.34 lakh. Demand for voice, data, engine and cold-store visibility above the transponder is documented. ● Publicly observed | S26 | S32 | S72 | S74 | S53

Regulation is tightening in DSM's direction but raises the bar. The draft 2026 rules apply to every Indian fishing vessel, require AIS transceivers "in working condition" on all of them, require a VMS or approved satellite tracker, and require radio and navigation equipment of IMO-approved type. A product that integrates AIS and tracking is well placed; a product without type approvals is not. ● Verified | S45

Rax's constraints decide the route. Only BSNL's Inmarsat service and ISRO programme links are legal civilian satellite paths in India; Iridium, Thuraya and Garmin inReach are banned or need DoT permission. Tracking devices with embedded SIMs and satellite equipment fall under mandatory TEC certification. Rax holds neither a satellite licence nor an MTCTE certificate, has two salespeople and no harbour presence. ● Verified | S55 | S51

● Rax-supplied | S6

The numbers to remember

₹35,000 per unit

The PMMSY ceiling for a communication or tracking device, and the cost of the free government transponder; any DSM configuration above it is unsubsidised unless placed inside a safety kit ● Verified | S21 | S31

Three numbers carry the argument. ₹35,000 is the price point the state has set for onboard safety electronics, and the free transponder lands exactly there. 50,000-plus is how many boats already have that transponder (February 2026), and the EEZ Rules make it compulsory for deep-sea fishing, so the addressable need is what it does not do. ₹2,330 Cr is the one-time pool if every powered craft bought DSM at list price; the serviceable share from Chennai is about ₹440 Cr and the realistic base case is ₹12 Cr a year by 2031. Together they say the business is a programme or fleet business with a thin private layer, not a harbour retail business. ● Verified | S21 | S24 | S134 | S133 ● Estimated | S12 | S9 | S7

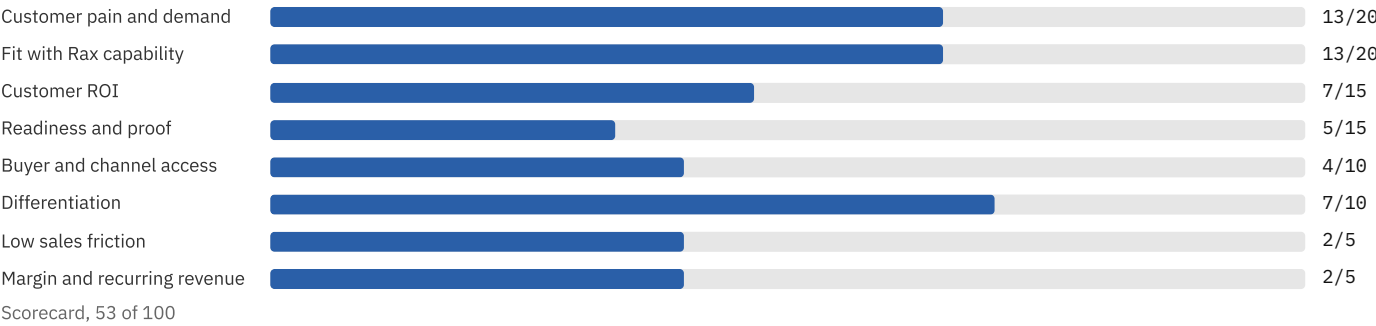
What would change the verdict

Upward to Pilot first: a signed airtime and licence agreement for the satellite path, MTCTE and IEC 60945 test reports, and one paid trial of ten or more vessels with logged SOS drills and fuel data. Upward to Sell now would need a state safety-kit inclusion or an NSIL sub-supplier position plus two paying company references. Downward to Defer: evidence that the final fishing vessel rules exclude non-type-approved bridge equipment from vessels beyond territorial waters, or a validation trial in which owners decline to pay anything above the free transponder. ● Recommendation

The first ninety days

Engineering names the satellite network and licence, or replaces it with a Skylo, BSNL or Xponder integration, and starts MTCTE and environmental testing. Sales signs one paid validation trial with a multi-boat operator at Kasimedu, Cuddalore or Kochi. The Managing Director obtains a written position from the Tamil Nadu Fisheries Department on scheduling DSM components inside the ₹2 lakh safety kit. Operations signs one harbour dealer-installer with a spares kit. Finance publishes a per-vessel-per-year service price and a bill of materials by tier. Each has a measurable result in the plan below.

● Recommendation



DIMENSION	SCORE	RATIONALE
Customer pain and demand	13/20	Documented, budgeted government demand for safety communication (₹364 Cr VCSS, state VHF and satphone schemes) and vocal fisher demand for two-way data at sea; but paying private demand for an integrated ₹50,000 to ₹2.5 lakh system is unproven and the free transponder now sits on 49,000 boats. ● Verified S24 S72 S74 S77
Fit with Rax capability	13/20	Hardware, firmware, cloud and apps are in-house and the ISO 9001:2015 scope covers customised hardware and software; but no marine environmental testing, no WPC or MTCTE certificates, an unidentified satellite path and no coastal service footprint. ● Rax-supplied S6 S1 S45 S51
Customer ROI	7/15	Fuel is ₹1.5 lakh to ₹2 lakh a three-day trip and gear loss is real, so route planning and net tracking could pay back; nothing is quantified and the government already gives the safety core away. ● Estimated S69 S67 S24
Readiness and proof	5/15	No DeepSea Master sale has been made: there is no installed base, paying customer, pilot or reference. What exists is a 24-page presentation, a website catalogue with model numbers and three decks; no test report, certificate or airtime contract. ● Rax-supplied S140 S1 S6 S139
Buyer and channel access	4/10	Buyers are reachable through harbour associations, fishing companies, state seminars and NSIL suppliers, but two salespeople in Chennai, no harbour presence and a referral drought limit reach. ● Rax-supplied S6 S25 S34
Differentiation	7/10	No competitor bundles navigation, crew tags, compartment sensing, cameras, dual comms and a fleet app for Indian fishing craft; but the SOS and alert core is free from VCSS and Skylo and ABJ Impex offer licensed comms with sensors. ● Inferred
Low sales friction	2/5	Installation on a working boat during the ban period, crew training, subsidy paperwork and the coming certification burden under the draft fishing vessel rules. ● Inferred
Margin and recurring revenue	2/5	No cost data; satellite airtime, harbour service visits and replacement of salt-damaged units (as the VCSS vendor is now doing) will erode margin unless priced. ● Unknown

01 Product truth

KEY TAKEAWAYS

- No DeepSea Master has been sold; there is no installed base, paying customer, pilot or reference. Five catalogued models and RT-SW-DSM software exist on paper and in a 24-page presentation; nothing is independently tested. ● Rax-supplied | S140 | S1 | S5 | S8
- The satellite transponder's network is unnamed; in India only BSNL's Inmarsat service and ISRO programme links are legal for civilians. ● Verified | S55 | S53 ● Unknown
- Certifications held are ISO 9001:2015 and ZED Silver; missing for this market are WPC ETA, TEC MTCTE, IEC 60945 environmental proof and any marine type approval. ● Rax-supplied | S6 ● Verified | S50 | S51 | S45
- Installed base, references, warranty terms and airtime costs are all unknown; the company's own service record is the strongest evidence available. ● Rax-supplied | S6 ● Unknown
- The nearest adjacent Rax products are the rack-monitoring controller, edge video analytics and GSM communicators, which share sensors and cloud with DSM. ● Rax-supplied | S6

What Rax describes



The presentation cover Rax uses in sales conversations. Source S1

DeepSea Master is described by Rax as an integrated system for fishing boats and vessels with four core parts: a rugged navigation HMI (RT-DSM-NAV01 in the presentation, RT-DSM-R0 on the website) with offline charts and route planning, a Master Bridge Unit (RT-MBU-R0) as the central hub, Slave Bridge Units (RT-SBU-R0) placed in compartments, and the DSM app and server (RT-SW-DSM). The product master adds a Master Control Unit (RT-MCU-R0) with a single SOS push button and a satellite transponder (RT-STJ-IM) "used to acquire satellite data for the system". Peripheral units named in the presentation are a weather-station bridge unit and a navigation-light bridge unit. ● Rax-supplied | S1 | S5 | S8

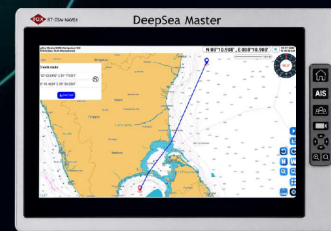
The presentation lists ten capabilities: offline navigation with saved routes; people safety through Bluetooth e-tags for up to twenty crew with panic buttons, SOS and help switches, smoke detectors and a hooter with voice announcements; IP camera surveillance to the HMI; an AIS boat locator with collision awareness and a net-locator buoy; two-way marine weather; fish-data recommendations by season, ocean and species; satellite communication limited to SOS, predefined messages and periodic positions when GPRS is lost; cellular as the primary link; room management; and an owner app with centralised fleet monitoring for administrators. Room management covers the captain room, engine room, accommodation, cold storage and deep freezer, each with panic and help switches, PIR and door sensors, smoke, temperature and humidity, and light and fan control; the engine room adds bilge sensing and pump control and engine RPM, coolant temperature and oil pressure. ● Rax-supplied | S1

NAVIGATION



Our DSM features a fully integrated Offline Navigation module within the onboard navigation HMI. Designed for total independence from internet connectivity, this system empowers fishing boats/vessels to navigate safely and efficiently.

Also the DSM offers advanced navigation features such as precise route planning, real-time vessel tracking, and route management. Users can plan custom routes, save them for future use, and retrieve or modify them as needed, supporting efficient and repeatable voyage operations.



Page 4 of the presentation: e-tags, SOS and panic switches, smoke detection and voice announcements. Source S1

ARCHITECTURE



System architecture as drawn in the Rax presentation, page 18: HMI, MBU, SBUs, satellite transponder, DSM server and apps. Source S1

The decks add positioning claims: "NavIC-ready comms", "AIS position reporting aligned with DG Shipping requirements", "rugged, marine-grade hardware", a Class-I local supplier position under the Public Procurement (Preference to Make in India) Order with a 50 percent local-content target, and a deployment model of survey and pilot, install and train, operate, and support and scale with "a coastal service network, SLAs, AMC". None of these is evidenced by a certificate, a test report or a named site. The investor deck is explicit that "no customer or pilot count [is] claimed until deployments are contracted".

Verified versus claimed

CAPABILITY	CLAIM IN RAX MATERIAL	INDEPENDENT EVIDENCE FOUND	STATUS
Offline navigation HMI with routes	Presentation, decks	None; no chart licence or ECS standard named	Rax-supplied
Crew e-tags, SOS, panic, smoke, hooter	Presentation page 4	None; Bluetooth tags need WPC ETA (self-declaration)	Rax-supplied
IP camera to HMI and app	Presentation page 5	None	Rax-supplied
AIS boat locator and net buoy	Presentation page 6; deck cites DGS AIS Order 15/2022	Order 15/2022 concerns switched-off AIS on ships; AIS for fishing craft over 20 m dates from 2009 and the 2026 draft rules extend it to all	Partly misattributed
Satellite SOS and periodic position	Presentation page 9	Network unnamed; only BSNL or ISRO links are legal	Unknown
Cellular primary link	Presentation page 10	Tracking devices with embedded SIM are an MTCTE product family	Rax-supplied, certification gap
Fish data by season, ocean, species	Presentation page 8	INCOIS publishes free PFZ advisories for 586 landing centres; the DSM data source is not named	Rax-supplied
Marine-grade ruggedness	Government deck	No IEC 60945 or IP rating stated	Unknown
Installed base	None claimed	None	Unknown

Rax-supplied

S1S2S3

Verified

S47S48S45S51S40S50

The AIS claim needs care in front of a department buyer. DGS Order 15 of 2022 tells masters of ships in Indian waters to report switched-off or non-operational AIS to the nearest MRCC and provides for detention and an ₹8 lakh fee; it applies to vessels that must carry AIS, not to small fishing craft. The mandate relevant to fishing boats is the 2009 requirement for AIS on vessels over 20 m and, prospectively, Rule 47 of the draft 2026 rules. The government deck's line "Vessels must keep AIS operational" should be rewritten to cite the right instrument.

Verified

S47S48S45

Recommendation

Certifications: held, applied and missing

Rax holds ISO 9001:2015 from Bureau Veritas, first cycle from 22 September 2025, with a scope that includes customised hardware and software design, and ZED Silver; BIS CRS is applied for; TEC MTCTE, CE, UL, FM and EN 54 are not held. For DSM the relevant gates are different from the e-surveillance business. Bluetooth crew tags and any Wi-Fi in the HMI need WPC Equipment Type Approval, now on self-declaration since 9 September 2024, which is cheap and fast. A Master Bridge Unit with an embedded SIM, an IoT gateway function and a satellite terminal falls under the Telecommunications (Framework to Notify Standards, Conformity Assessment and Certification) Rules 2025, under which notified equipment cannot be sold or used without a certificate; TEC's product families include tracking devices with embedded SIM, IoT gateways, satellite communication equipment and VHF/UHF radios. The draft fishing vessel rules require radio equipment "of approved type as per performance standards specified by the International Maritime Organization" and navigational equipment to IMO performance standards, which in practice means IEC 60945 environmental and EMC testing and the relevant IEC 6xxxx equipment standards.

Rax-supplied

S6

Verified

S50S117S51S52S45S118

Which buyer requires which: a private boat owner requires nothing beyond a working unit and a WPC licence for any VHF; a state tender or NSIL sub-supply will require ETA, MTCTE, an Indian manufacturing address and financial standing, as NSIL's own battery RFP shows; a vessel beyond territorial waters under the coming rules will need approved-type radio and navigation equipment. Rax should treat MTCTE and IEC 60945 as the two certificates that unlock the segments that pay.

Verified

S35S45S51

Recommendation

Installed base and references

Rax has made no DeepSea Master sale. There is no installed base, no paying customer, no pilot vessel and no reference, and no test report or field log has been supplied. rax-tech.com lists four Marine Engineering models and RT-SW-DSM software; the RT-DSM-R0 "Datasheet" link opens the same 24-page presentation, titled "Boat Management Console" and created on 6 July 2026, which carries no electrical, environmental, radio or dimensional specification. The investor deck states that no customer or pilot count is claimed until deployments are contracted. Every capability in this section therefore remains a Rax claim until the validation trial recommended in the strategy section produces evidence.

Rax-supplied

S140S139S4

Unknown

Service model

Rax's service record elsewhere is the best available predictor. The e-surveillance base of 3,000-plus EVA units carries a one-year warranty and no AMC; the sales lead reports frequent support calls including at installation, sample-based QC on large orders and missed urgent deliveries because of component dependency, and says no customer will refer the company. The government deck promises a coastal service network, SLAs and AMC; none exists today. A coastal product fails in salt, vibration and heat, and the field is already showing what that means: the VCSS vendor is replacing all 2,067 transponders in Dakshina Kannada after water ingress, trialling a redesigned unit on four boats for a month under NSIL inspection before replacement. A harbour-based installer with spares is therefore a precondition, not an option.

Rax-supplied

S6S3

Publicly observed

S32

SO WHAT FOR RAX

Until a named satellite network, an MTCTE certificate, an environmental test report and one working boat exist, every sales conversation asks the buyer to take the whole system on trust; the validation trial's first job is to manufacture that evidence, not revenue. ● Recommendation

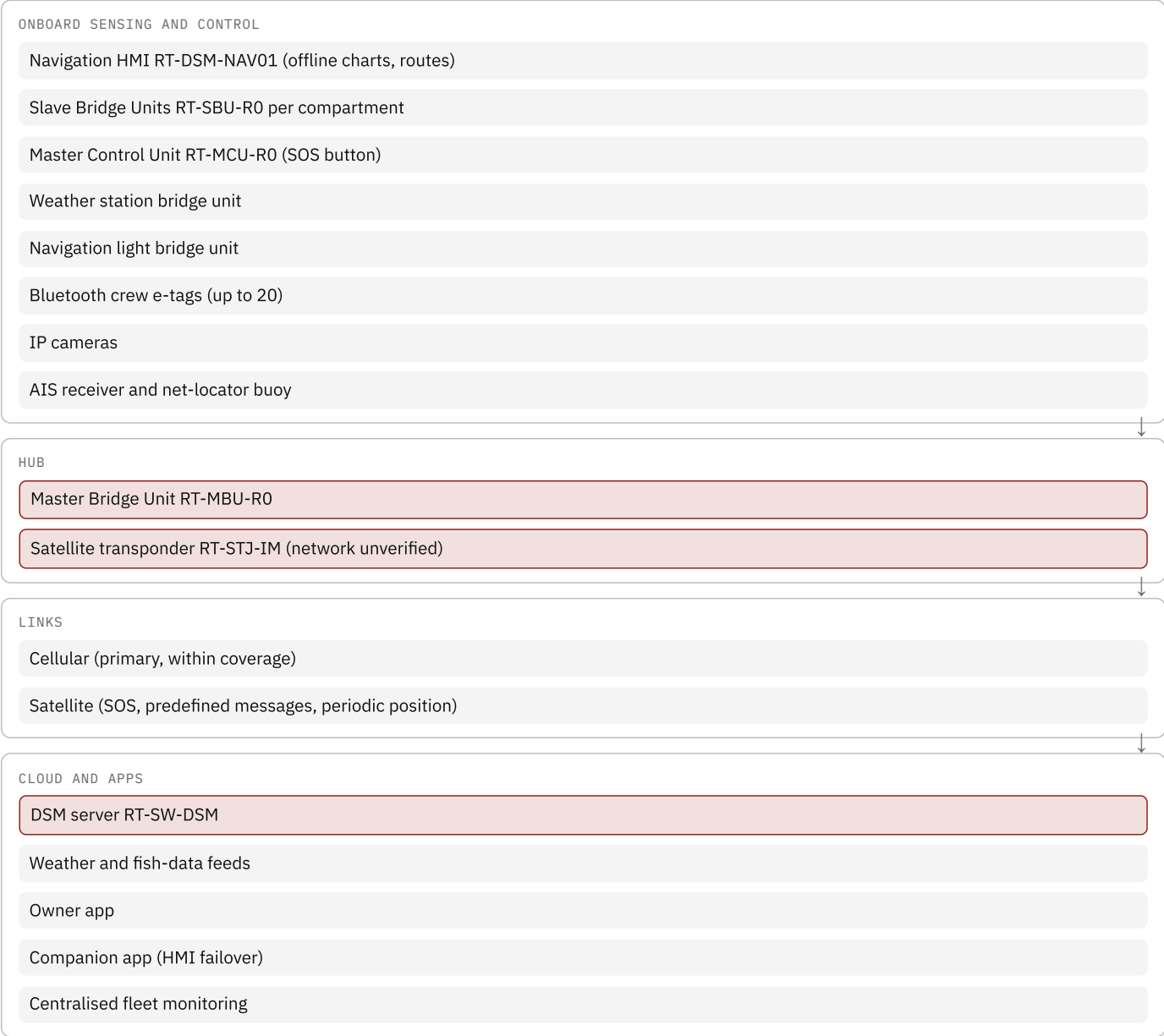
Readiness gaps ranked by commercial impact

1. Satellite path. RT-STJ-IM's network and licence are unnamed; India permits civilians only BSNL's Inmarsat service, and ISRO's MSS links run through NSIL programmes. Without a legal path the "dual comms" claim cannot be sold. ● Verified S55 S53 S34 ● Unknown
2. MTCTE certification for the MBU's cellular and satellite functions; a six to nine month effort that gates any government or NSIL route. ● Verified S51
3. IEC 60945 environmental and EMC evidence for the HMI, MBU and SBUs, which the draft rules will make the reference for vessels beyond territorial waters. ● Verified S45 S118
4. A working reference vessel with logged SOS drills, route data and fuel baselines. ● Recommendation
5. A harbour service partner with a spares kit and a service price. ● Rax-supplied S6
6. Interoperability with the VCSS Xponder and Nabhmitra so that DSM complements rather than duplicates the free system; the Xponder exposes Bluetooth and Wi-Fi to a phone app, which is a plausible integration point. ● Verified S34 S36 ● Recommendation
7. WPC ETA self-declarations for Bluetooth tags and any Wi-Fi radio. ● Verified S50
8. Chart licensing and an ECS standard for the offline navigation module. ● Unknown

Adjacent Rax products that bundle naturally

The RT-RMC-G2V0 rack monitoring controller already handles digital inputs, relay outputs, temperature, humidity, water leak, smoke and door sensors with a serial JPEG camera and Modbus, which is functionally a Slave Bridge Unit for a server rack; the EVA edge video analytics units and the GSM and 4G two-way communicators supply the surveillance and cellular building blocks. The software engineering bench has free bandwidth while hardware and firmware are booked, which favours the fleet dashboard and app as the parts to mature first. ● Rax-supplied S6

DeepSea Master system architecture as presented (presentation page 18)



Onboard units report to the Master Bridge Unit over a wired bus; the MBU reaches the DSM server over cellular and, for SOS and predefined messages, a satellite transponder whose network and licence are not identified; owners and administrators use the apps and the fleet dashboard.

92 Market definition

KEY TAKEAWAYS

- DSM straddles three categories fishers buy separately: navigation and fish-finding electronics, safety and communication equipment, and vessel monitoring; no Indian vendor bundles all three for fishing craft. Publicly observed S86 S84 S85
- The category is programme-dominated: a ₹364 Cr government programme is fitting one lakh transponders free, and states fund VHF, DATs, satphones and ₹2 lakh safety kits. Verified S24 S81
- Navigation hardware is an import market (Furuno, Garmin, Samyung, Onwa) sold by port dealers; safety communications are domestic and public (ISRO, NSIL, BSNL). Publicly observed S86 S93 S95 Verified S34 S54
- Buyers say GPS, wireless set, DAT, satphone, transponder and Nabhmitra, never "integrated bridge system"; tenders say safety kit, VCSS, MSS terminal, Xponder. Verified S81 S34 S35
- The inflection points were 26/11 (AIS on vessels over 20 m), Ockhi 2017 (satphones and VHF), VCSS 2023 (free transponders) and the 2026 draft rules (AIS and VMS for all). Publicly observed S48 S70 Verified S24 S45

Category and boundaries

DeepSea Master sits across three purchase categories that Indian fishing boats treat separately. Navigation and fish-finding electronics: GPS navigators and chartplotters, fish finders and sonar, radar, AIS. Safety and communication equipment: VHF radios, distress alert transmitters, EPIRBs, satellite phones and the government's MSS transponder. Vessel monitoring and telematics: engine and compartment sensors, cameras, fleet tracking and dashboards, which today exist on Indian fishing boats mainly through the government's Monitoring, Control and Surveillance network and a handful of private VMS vendors. DSM bundles the three into one bridge and one app. In scope for this report are all three categories as bought for mechanised and motorised fishing craft in India; out of scope are merchant-ship GMDSS equipment, leisure marine electronics, aquaculture monitoring and onshore harbour systems. Adjacent categories a buyer might substitute are a smartphone with free apps, a satellite phone, or simply the free transponder plus a ₹30,000 GPS. Rax-supplied S1 Publicly observed S86 S42 S53 Verified S34

Value chain

The chain runs from chipsets and satellite capacity, through design and manufacture, distribution, installation and service, to the owner, skipper and crew. Foreign brands design and make abroad and stop at an Indian distributor: Garmin through AMIT International since 2017, Furuno through A. S. Moloobhoy and service houses such as Master Systems, Samyung through Upbeat Technologies in Chennai, Onwa through IndiaMART traders in Panvel, Hyderabad and Jamnagar. Installation and after-sales sit with port dealers and yard electricians. The government programme bypasses this chain entirely: SAC/ISRO developed the MSS technology, NSIL is the implementing agency, three empanelled Indian firms (Saankhya Labs, Avantel, Accord Software & Systems) supply and install, NSIL maintains for two years, INCOIS hosts the hub and state monitoring centres watch the boats. Satellite capacity is a public bottleneck: BSNL's Inmarsat gateway is the only civilian satellite voice service and ISRO's GSAT links serve the programme. Rax proposes to hold design, manufacture, installation and service in-house, which is unusual in the category and is at once its differentiation and its service exposure. Publicly observed S91 S93 S94 S95 S86 S87 Verified S34 S27 S54 S26

Margin sits in three places. Dealers earn a mark-up on imported navigation units, visible in the spread between the ex-factory USD 208 to 215 for an Onwa Class B AIS on Alibaba and ₹53,000 for an Onwa plotter with AIS on IndiaMART. Programme suppliers earn on volume at about ₹35,000 a transponder installed. Airtime earns for BSNL at ₹5,835 a month for thirty minutes and ₹25 a minute after that. Rax today sits nowhere in this chain; the chain diagram after this section shows where it could. Publicly observed S89 S86 S31 S53 Inferred

How buyers describe and search for the category

Fishers and their associations talk about GPS, wireless sets or VHF, DAT machines, satellite phones, the transponder and the Nabhmitra app. Department and programme documents say safety kit, "communication and/or tracking devices for traditional and motorised vessels like VHF/DAT/NAVIC/Transponders", Vessel Communication and Support System, MSS terminal or Xponder, and vessel monitoring system. Tamil Nadu's scheme page itemises the safety kit as GPS, communication equipment, echo-sounder, lifejackets, lifebuoys, DAT, VHF radiotelephones, fish finder, backup battery and search-and-rescue beacon, and requires the beneficiary to hold an ownership certificate, ReALCraft registration, fishing licence and biometric ID. The draft 2026 rules use AIS transceiver, VMS "or other approved satellite-based tracking device", EPIRB, SART and "radio equipment of approved type". At the border the category splits across HS subheading 8526.91 (radio navigational aid apparatus: GNSS receivers and AIS) and 9014.80 (other navigational instruments, where echo sounders and fish finders sit), with transceivers and satellite terminals elsewhere in chapter 85, so no single import statistic measures it. The standards buyers and regulators name are IEC 60945 for environmental and EMC performance of marine navigation and radio equipment, the TEC MTCTE families for tracking devices, IoT gateways, satellite and VHF equipment, and IMO performance standards in the draft rules. Publicly observed S141 S142 Verified S118 S51 S45 Nobody searches for an integrated bridge system; a DSM listing that wants to be found must use the buyer's nouns. Verified S21 S81 S34 S45 Publicly observed S26 S72 S75 Recommendation

Market structure

The category is fragmented on the hardware side and concentrated on the programme side. Navigation hardware is imported and sold through dozens of small dealers; IndiaMART alone lists sellers in Bhavnagar, Mumbai, Thoothukudi, Porbandar, Jamnagar, Hyderabad and Kolkata, with prices from ₹23,000 for a Garmin GPS 152 to ₹1,00,000 for a Koden KGP-922. Safety communications are domestic and public: ISRO's DAT has more than 20,000 units in use since 2010, the Xponder programme targets one lakh, and Tamil Nadu alone procured 30,000 DATs in 2015 and gives VHF sets free or at 90 percent subsidy. Price tiers are therefore set by the state: ₹0 for the transponder and 5 W VHF, ₹1,800 for a subsidised 25 W VHF, about ₹26,000 for a subsidised satphone, ₹35,000 for a scheme tracking device, ₹1 lakh to ₹2 lakh for a full safety kit at scheme unit cost. A private product enters this ladder against a free anchor. Publicly observed S86 S77 S78 S79 Verified S37 S24 S21 S81

Domestic manufacturing capability exists for the satellite terminal (Accord, Avantel, Saankhya), for NavIC receivers (Accord) and for the DAT-SG, whose technology SAC offers to industry. There is no Indian maker of chartplotters or fish finders of note; Rax would be the first Chennai firm to combine an HMI, sensors and communications for fishing craft, which is a genuine gap and also the reason no benchmark exists. Verified S34 S38 Inferred

History of the category in India

Three shocks and one programme shaped the last fifteen years. After the November 2008 Mumbai attacks the Centre required AIS transponders on fishing vessels over 20 m and the Coast Guard introduced biometric cards and colour coding; the DAT went operational in 2010. Cyclone Ockhi in December 2017 caught fishing boats beyond VHF range: 661 fishers were reported missing at one point and the two states later declared 263 of the missing dead, taking the toll to 365; Tamil Nadu responded with satellite phones at 75 percent subsidy, free 5 W VHF sets and 25 W sets at 90 percent, and Kerala tendered DATs and VHF for traditional craft. In June 2023 the Centre approved the VCSS national rollout with NSIL as implementing agency; the Prime Minister launched it in Maharashtra on 30 August 2024, 400 units were installed by September 2024, 4,000 by November 2024 and more than 49,000 by February 2026. In 2025 the Merchant Shipping Act 2025 replaced the 1958 Act and the draft fishing vessel rules of 2026 propose AIS and VMS on every fishing vessel. The next inflection is a licensed data service at sea: Starlink holds a GMPCS licence and Tamil Nadu officials say the Centre is contemplating it; the National Association of Fishermen petitioned for it in July 2026. Publicly observed S48 S49 S63 S64 S76 S77 S78 S80 S57 S72

Verified S37 S33 S34 S12 S24 S46 S45

SO WHAT FOR RAX

DSM enters a market whose floor is a free, state-installed transponder and whose ceiling is being written by the shipping ministry; the product must be defined as what sits between those two, and it must carry the buyer's vocabulary and the regulator's certificates to be recognised at all.

Recommendation

Value chain for fishing-vessel electronics in India

- 1

Chips, modules and satellites
GNSS and NavIC chipsets, cellular and MSS modules; ISRO GSAT capacity; BSNL Inmarsat gateway
Satellite airtime is licensed to BSNL and ISRO programmes only
- 2

Design and manufacture
Furuno, Garmin, Onwa, Samyung abroad; Accord, Avantel, Saankhya for Xponders; Rax in Chennai
- 3

Distribution
AMIT (Garmin), A. S. Moloobhoy (Furuno), Upbeat (Samyung), IndiaMART traders; NSIL and state departments for VCSS
Programme units are free; dealer units carry 20 to 40 percent margin
- 4

Installation and service
Harbour dealers, yard electricians, NSIL vendors for two years
The stage Rax must build; the VCSS vendor is already replacing water-damaged units
- 5

Owner, skipper and crew
Boat owners and fishing companies; associations handle subsidy paperwork; district Assistant Directors sanction
Fisher pays the balance after 40 to 60 percent assistance where an item is eligible

Global brands stop at the distributor; the government programme bypasses dealers entirely; Rax proposes to hold design, manufacture, installation and service, which is where its differentiation and its service risk both sit. Inferred

03 Market growth, demand drivers and regulation

KEY TAKEAWAYS

- Marine fish production grew from 37.27 lakh tonnes in 2019-20 to 46.15 lakh tonnes in 2024-25, about 3 percent a year on the long trend with a Covid dip; the powered fleet grew faster on registers than in the census. Verified S14 S16 S9 Publicly observed S12
- PMMSY (₹20,050 Cr, restated at ₹20,750 Cr, extended to 2025-26 with ₹2,500 Cr in 2026-27) funds tracking devices at ₹35,000, safety kits at ₹1 lakh and the ₹364 Cr VCSS; ₹5,588 Cr of central funds had been released by March 2026. Verified S21 S18 S22
- The draft Merchant Shipping (Fishing Vessels) Rules 2026 would require AIS on all fishing vessels, VMS or approved satellite tracking, and IMO-type radio and navigation equipment by design category. Verified S45
- Incidents keep the issue live: 526 Tamil Nadu fishers arrested by Sri Lanka in 2024, 1,173 Gujarat boats in Pakistani custody, capsizings with lost contact in July and August 2026, and a 2026 diesel shock that tied fleets up. Verified S60 Publicly observed S62 S65 S66 S67
- Counter-drivers are strong: the free transponder, fuel at ₹140 a litre, and a subsidy list that names devices, not systems. Verified S24 S21 Publicly observed S67

Market growth

46.15 lakh tonnes

India's marine fish production in 2024-25, up from 37.27 lakh tonnes in 2019-20; the catch that pays for every device on board

Verified S16 S14

The category has no published revenue series; the primary statistics are catch, fleet and exports. Over the five years to 2024-25 marine production grew at a compound 4.4 percent a year, flattered by the Covid trough of 2020-21. Marine fish production by financial year was 37.27 lakh tonnes (2019-20), 34.76 (2020-21), 41.27 (2021-22), 44.32 (2022-23), 44.95 (2023-24) and 46.15 (2024-25); the 2025 handbook puts marine growth at 3.05 percent a year over the period against 7.69 percent inland. CMFRI's calendar-year landings, a different method, were 35.7 lakh tonnes in 2025, up 3 percent. Seafood exports reached ₹62,408 Cr in 2024-25 with capture fisheries supplying 38 percent of value. The fleet on Department of Fisheries registers stood at 66,106 mechanised and 1,35,763 motorised boats in November 2024, against 42,985 and 97,659 in the 2016 census; part of the difference is registration under ReALCraft and part is real growth in motorised craft. The 2025 census, run digitally with drone counts of craft in November and December 2025, will settle the number when published. Verified S14 S15 S13 S129 S18 S16 S19 S17 S20 S9 S10 Publicly observed S12

The growth chart after this section plots the production series with a dashed outlook at 3 percent. For sizing purposes the relevant driver is not catch but the mechanised fleet and its trip length: multi-day vessels beyond cellular range are the ones that need a bridge, and the government's own count of 64,414 registered mechanised vessels "suited to deep-sea operations" is the closest official proxy. Publicly observed S72 Estimated S12

Regulation and mandates

Fishing boats are registered under Part XVA of the Merchant Shipping Act 1958 and the Merchant Shipping (Registration of Indian Fishing Boats) Rules 1988, with inspection rules of the same year; DG Shipping's own manual records a review committee proposal to restrict Part XVA to boats of 20 m and above, and most small craft are in practice registered under state Marine Fisheries Regulation Acts through ReALCraft. AIS on fishing vessels over 20 m has been required since 2009. DGS Order 15 of 2022 makes switched-off AIS on ships in Indian waters reportable to the MRCC with detention and an ₹8 lakh fee for non-operational AIS. Enforcement of fishing regulation rests with states under their MFRAs, as the Lok Sabha was told in February 2026.

Verified S44 S47 S24 Publicly observed S48

The Merchant Shipping Act 2025 (Act 24 of 2025) received assent on 18 August 2025 and repeals the 1958 Act. The Ministry of Ports, Shipping and Waterways has published the Draft Merchant Shipping (Fishing Vessels) Rules 2026 for consultation. They apply to "every Indian Fishing Vessel, wherever it may be" (Rule 1(3)). Rule 3 sets four design categories: Category 1, 24 m or more beyond territorial waters; Category 2, under 24 m beyond territorial waters; Category 3, 24 m or more within territorial waters; Category 4, under 24 m within territorial waters. Rule 32 requires radio equipment "of approved type as per performance standards specified by the International Maritime Organization" and a six-hour battery reserve (one hour for Category 4). Rule 33 requires Categories 1 to 3 to carry a GNSS receiver, an echo sounder, a 406 MHz or Inmarsat EPIRB and a SART or AIS-SART, and Category 1 to carry radar. Rule 47 states: "All Fishing Vessels shall be fitted with AIS transceivers in working condition." Rule 48 requires "an operational Vessel Monitoring System (VMS) or other approved satellite-based tracking device capable of automatically transmitting the vessel's position, course and speed at prescribed intervals to the designated monitoring centre", kept functional whenever under way and not switched off without a logged reason. Schedule III Table 2 sets radio carriage: Category 1 as per GMDSS with fixed VHF-DSC and Inmarsat or MF/HF; Category 2 one fixed VHF-DSC and one handheld; Categories 3 and 4 one handheld VHF. The rules also require a crew statement, a garbage record and posted MRCC and Coast Guard contacts.

Verified S46 S45

	(1) A continuous watch shall be maintained 24×7 while the vessel is underway. (2) A lookout shall keep vigilance for unidentified or unlit small craft, especially during night fishing operations or drifting. (3) Harbour watch shall be maintained during port stay when unattended risks are present.
43.	Carriage of Security Personnel Vessels engaged in areas declared vulnerable to piracy or armed robbery may carry privately contracted security personnel.
44.	Control of Access (1) No unauthorized person shall be permitted onboard. (2) Category 1 & 3 vessels shall: (a) restrict access points; (b) identify and log persons boarding while at harbour; (c) secure deck and machinery access during night operations. (3) All fishing gear, tools and supplies shall be protected from unauthorized interference.
45.	Suspicious Activity Reporting (1) Any suspicious vessel, sea activity, floating object or communications anomaly shall be reported immediately to: (a) Maritime Rescue Coordination Centres (MRCC) (b) District Coastal Security Authorities (c) Coast Guard / Marine Police (d) DG Communication Centre (e) On receiving heightened alerts from authorities, the vessel shall adopt stricter precautions.
46.	Vessel Security Communication & Contact Information (1) Updated 24-hour contact details of the following shall be posted prominently onboard: (a) Port Facility Security Officer (PFSO) of home port and frequently visited harbours (b) Coast Guard and Marine Police (c) MRCC (d) Administration's Communication Centre
47.	AIS Requirements All Fishing Vessels shall be fitted with AIS transceivers in working condition.

Rule 47 (AIS on all fishing vessels) and Rule 48 (VMS or approved satellite tracking) in the draft rules published for consultation in 2026. [Source](#) [S45](#)

Enforcement reality: the draft is a consultation text and the Act was "not yet in force" when its summary was last updated; the coastal security apparatus (biometric cards, colour coding, manned landing centres) is real but uneven; Odisha reported 93 percent of boats colour-coded and ordered DAT fitment on motorised boats as early as 2017. The safe reading is that AIS-for-all and VMS-for-all will arrive over several years, with the VCSS Xponder likely to be recognised as the approved tracking device. [Verified](#) [S46](#) [S49](#) [Publicly observed](#) [S48](#) [Inferred](#)

A second instrument is already in force. The Sustainable Harnessing of Fisheries in the EEZ Rules, notified on 4 November 2025, make transponders and QR-coded Aadhaar or fisher ID cards mandatory, integrate ReALCraft with the Nabhmitra app, and require an Access Pass for about 64,000 mechanised vessels and motorised vessels over 24 m; the pass was launched nationally at Veraval on 20 February 2026, when the ministry put installed transponders at more than 50,000. For DSM this settles the tracking question: the government transponder is compulsory for EEZ fishing, so any DSM tracking function is additive. [Verified](#) [S133](#) [S134](#)

Telecom and satellite rules bite harder and sooner. Devices in de-licensed bands need WPC ETA, on self-declaration since September 2024. Tracking devices with embedded SIM, IoT gateways, VHF/UHF radios and satellite communication equipment are MTCTE product families under the 2025 conformity rules, without which notified equipment "shall not be sold or deployed". Civilian satellite communication is permitted only through BSNL's Inmarsat gateway; Iridium and Thuraya handsets are banned and two-way messengers such as inReach need DoT permission. Starlink received a GMPCS licence in June 2025 and a Unified Licence was confirmed in January 2026, but no maritime service for fishing boats exists at the cutoff. [Verified](#) [S50](#) [S117](#) [S51](#) [S52](#) [S55](#) [S53](#) [Publicly observed](#) [S57](#)

Government schemes and budgets

PMMSY was approved in May 2020 with a ₹20,050 Cr outlay for 2020-21 to 2024-25 (₹9,407 Cr central, ₹4,880 Cr state, ₹5,763 Cr beneficiary), extended to 2025-26, restated by the ministry at ₹20,750 Cr in March 2026, and given ₹2,500 Cr in the 2026-27 Union Budget within a record ₹2,761.80 Cr for fisheries. By March 2026 the department had approved projects worth ₹21,274.16 Cr with a central share of ₹9,189.79 Cr and released ₹5,587.56 Cr; a year earlier the Lok Sabha was told ₹4,670.79 Cr had been released and ₹3,160.86 Cr utilised. The beneficiary-oriented table that matters for DSM is Table 1 of the scheme booklet: item 60, communication and/or tracking devices for traditional and motorised vessels such as VHF, DAT, NavIC and transponders at a unit cost of ₹0.35 lakh with assistance of ₹0.14 lakh (general) or ₹0.21 lakh (SC/ST/women); item 61, safety kits for fishers of traditional and motorised vessels other than the tracking device, at ₹1.00 lakh with ₹0.40 or ₹0.60 lakh; item 63, PFZ devices at ₹0.11 lakh; item 55, deep-sea fishing vessels for traditional fishers at ₹120 lakh with ₹48 or ₹72 lakh; item 56, upgradation of existing vessels for export competency at ₹15 lakh with ₹6 or ₹9 lakh; item 57, bio-toilets at ₹0.50 lakh; items 66 and 67, premium subvention for vessel insurance and free group accident insurance. The Union Budget line the deck quotes is therefore right, and the "40 to 60 percent" rate is right, but the subsidy attaches to listed items with ceilings. [Verified](#) [S21](#) [S18](#) [S22](#) [S23](#)

PRADHAN MANTRI MATSYA SAMPADA YOJANA

Sl. No	Sub-component and Activities	Unit	Unit cost (Rs. lakhs)	Governmental Assistance (Rs. lakhs)	
				General (40%)	SC/ST/ Women (60%)
(i)	(ii)		(iii)	(iv)	(v)
Development of Deep Sea Fishing					
55	Support for acquisition of Deep sea fishing vessels for traditional fishermen	Nos.	120.00	48.00	72.00
56	Up gradation of existing fishing vessels for export Competency	Nos.	15.00	6.00	9.00
57	Establishment of Bio-toilets in mechanised fishing vessels	Nos.	0.50	0.20	0.30
Aquatic Health Management					
58	Establishment of Disease diagnostic and quality testing labs	Nos.	25.00	10.00	15.00
59	Disease diagnostic and quality testing Mobile labs/clinics	Nos.	35.00	14.00	21.00
C FISHERIES MANAGEMENT AND REGULATORY FRAMEWORK					
Monitoring, Control and Surveillance (MCS)					
60	Communication and /or Tracking Devices for traditional and motorised vessels like VHF/DAT/NAVIC/ Transponders etc.	Nos.	0.35	0.14	0.21
Strengthening of safety and security of fishermen					
61	Support for providing safety kits for fishermen of Traditional and motorized fishing vessels (other than Communication and/or Tracking Device mentioned at 60 above)	Nos.	1.00	0.40	0.60
62	Providing boats (replacement) and nets for traditional fishermen	Nos.	5.00	2.00	3.00
63	Support to Fishermen for PFZ devices and network including the cost of installation and maintenance etc.	Nos.	0.11	0.044	0.066

16

The PMMSY unit-cost table for monitoring, control and surveillance and for safety of fishers: the ceilings any DSM configuration must fit inside to attract assistance. Source S21

Disbursement is real and state-skewed. Central funds released to 2024-25 include Andhra Pradesh ₹430.1 Cr, Odisha ₹347.3 Cr, Kerala ₹344.2 Cr, Maharashtra ₹304.5 Cr, Karnataka ₹295.0 Cr, Tamil Nadu ₹153.9 Cr, Gujarat ₹103.7 Cr, Puducherry ₹61.2 Cr and West Bengal ₹55.1 Cr; the line "Others (Transponders, etc.)" shows a ₹364 Cr project cost, ₹218.4 Cr central share approved and ₹497.8 Cr released, the release exceeding the approval because the line pools other central items. Marine approvals to January 2026 include 480 deep-sea fishing vessels, 1,338 vessel upgradations and 2,259 bio-toilets. The Group Accident Insurance Scheme covers about 33 lakh fishers a year for ₹5 lakh on death or total disability with no premium from the fisher; Tamil Nadu enrolled 5.23 to 5.59 lakh fishers a year and paid ₹3.9 Cr to ₹6.2 Cr in claims annually. Kisan Credit Cards for fishers number 5,01,900 with ₹3,692.73 Cr disbursed. FIDF stands at ₹7,522.48 Cr with 64 Tamil Nadu projects worth ₹1,573.73 Cr. PM-MKSSY adds ₹6,000 Cr for 2023-24 to 2026-27 aimed at formalisation and insurance, with 30.60 lakh stakeholders on the National Fisheries Digital Platform. ● Verified S18 S17 S23 S43 S22

The Vessel Communication and Support System is the scheme that changes DSM's market. Approved in June 2023 on Odisha's request after an Orissa High Court case on turtle protection, it funds "indigenously developed transponders" on one lakh mechanised and motorised vessels across 13 coastal states and UTs at ₹364 Cr, shared 60:40 with states and 100 percent for UTs, free to eligible fishers. NSIL implements it, SAC/ISRO designed the S-band MSS terminal, three private firms supply and install, INCOIS hosts the hub, NSIL maintains for two years. The Xponder pairs over Bluetooth or Wi-Fi with the Nabhmitra Android app for periodic position reporting, two-way messaging, predefined SOS ("Fire on Boat", "Boat Sinking", "Medical Help Needed"), weather and cyclone alerts, PFZ advisories, IMBL geo-fence alerts, offline maps and trip declaration. By February 2025 42,316 mechanised and 46,900 motorised units had been allocated by state; by February 2026 more than 49,000 were installed. Goa reports the unit cost at about ₹35,000. ● Verified S33 S34 S24 S25 S36 S31 ● Publicly observed S26 S27 S29

State schemes complete the picture. Tamil Nadu fitted ISRO transponders on 507 mechanised boats on trial, is fitting upgraded units on all mechanised boats through ISRO at ₹18.01 Cr with 1,645 done, and has 7,373 motorised boats in the national plan; it gives 5 W VHF sets free (the fisher pays the ₹500 WPC fee), 25 W sets worth ₹18,000 at 90 percent subsidy, satellite phones worth ₹1.05 lakh at 75 percent to deep-sea clusters, and prices a safety kit at ₹2 lakh. Kerala tendered ₹4 Cr of DATs and ₹5 Cr of VHF for traditional craft in 2019. Maharashtra's fisheries minister reviewed BSNL satphones for deep-sea fishers in July 2026. ● Verified S30 S81 ● Publicly observed S78 S77 S76 S80 S73

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ENGLISH



Directorate of Fisheries, Government of Goa

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[Home](#) » [Photo Gallery 2024-25](#) » Transponder Installation

Transponder Installation

The installation of transponders has commenced at Vasco Jetty. All vessels will soon be equipped with transponders at the jetty. The Department of Fisheries has kick-started the installation of transponders on fishing vessels at Cutbana. This initiative aims to enhance maritime safety and security of the fishing vessels venturing in the sea.



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A state fisheries department documenting free transponder installation at its jetties, Goa, 2024-25 photo gallery. Source S31

Incidents and public events

Cyclone Ockhi (December 2017) is the founding incident of this market: 661 fishers were reported missing to Parliament on 27 December 2017; the Home Ministry told the Standing Committee that, as on 4 January 2018, 105 lives had been lost (30 in Tamil Nadu, 75 in Kerala) and 344 fishers were still missing (203 and 141), with 845 rescued; Kerala and Tamil Nadu later classified 263 of the missing as dead, taking the toll to 365. The deck's "about 427 missing" is the Kanyakumari Collector's interim count of 11 December 2017 for crews of 43 multipurpose boats that had not returned, a single-district figure the Collector himself declined to call missing; it should be replaced with the 661, 344 and 365 figures with dates. The same committee report records that mobile phones reach only 10 to 12 nautical miles from shore, which replaces the deck's "about 3 km"; the only figure near 3 km found is a Thoothukudi report of two nautical miles. Cross-border detention is the second driver. MEA told the Rajya Sabha that Sri Lanka arrested 74, 143, 229, 220 and 528 Tamil Nadu fishers in 2020 to 2024, and the Lok Sabha that 526 were apprehended in 2024 with 72 boats confiscated and only 2 boats released; 1,306 fishers and 179 boats were seized between 2023 and 23 July 2026, with 146 arrests in 2026 to that date. The deck's "535 arrested in 2024" traces to an Al Jazeera report citing Indian government data for all Indian fishers; the primary MEA replies give 526 (Lok Sabha) and 528 (Rajya Sabha) for Tamil Nadu, and 538 released, so the deck should cite MEA's 526 with the date or attribute 535 to its source. Gujarat had 144 fishers and 1,173 boats in Pakistani custody at the end of 2024. Capsizings with lost contact continued through 2025 and 2026: three missing off Alibaug in July 2025, six off Visakhapatnam in July 2026 after families lost contact, four off Thiruvananthapuram in August 2026 with families protesting a delayed search.

 Publicly observed

S63 | S64 | S131 | S71 | S130 | S61 | S62 | S123 | S66 | S65

 Verified

S37 | S38 | S34 | S40

 Rax-supplied

S2

Technology shifts

NavIC-based two-way messaging has moved from ISRO's DAT (2010, one-way, more than 20,000 units) to the DAT-SG (January 2024, acknowledgement and two-way, Bluetooth to phone, technology offered to industry) and to the S-band MSS Xponder now on tens of thousands of boats. Skylo launched a satellite NB-IoT hub for Tamil Nadu fishers on BSNL infrastructure in 2021. INCOIS publishes daily PFZ advisories for 586 landing centres and a free SAMUDRA app, and the MSSRF Fisher Friend app offers PFZ navigation in eight languages. Data at sea is the next step: ABJ Impex reports pilots with video calls and live CCTV beyond 300 nautical miles, and Starlink is licensed but not launched. Cheap Chinese AIS and plotters (an Onwa Class B AIS at USD 208 ex-factory) make the coming AIS mandate affordable.

 Verified

S37 | S38 | S34 | S40

 Publicly observed

S84 | S41 | S42 | S72 | S57 | S89

Macro and sector indicators

The sector's economics in 2026 are dominated by fuel. A Kerala boat owners' association put a three-day trip at 1,500 litres and ₹1.5 lakh of fuel in 2022, which is the deck's figure; Gujarat trawlers burn about 3,500 litres on a 15 to 21 day trip; Goa trawlers 5,000 to 7,000 litres. The Iran war pushed diesel up in 2026: Goa reported ₹138 a litre in April and Odisha's fishers stayed ashore from 15 June because harbour bulk diesel was ₹140 to ₹142 a

litre against ₹99 to ₹101 retail. Fuel-saving route planning is therefore a live selling point, and a cash-strapped owner is a harder buyer. Exports at ₹62,408 Cr and the EU's CATCH digital catch-certificate system, mandatory from 10 January 2026, add a traceability pull for deep-sea operators.

Publicly observed S69 S125 S124 S68 S67 S58 Verified S17

Timing windows

Fitting happens in the ban: the west coast trawl ban runs about 52 to 61 days from June (Kerala's ended on 31 July 2026) and Maharashtra's from 1 May to 1 August, so June and July are the installation window on the west coast and April to mid-June on the east coast. State budgets close in March and PMMSY sanctions run through district Assistant Directors during the year; VCSS's stated completion target was December 2025 and installation is still running in 2026, with replacements in Karnataka in August 2026. The draft rules' consultation is the window to seek recognition of integrated systems.

Publicly observed S65 S104 S27 S32 Verified S45 Recommendation

Counter-drivers

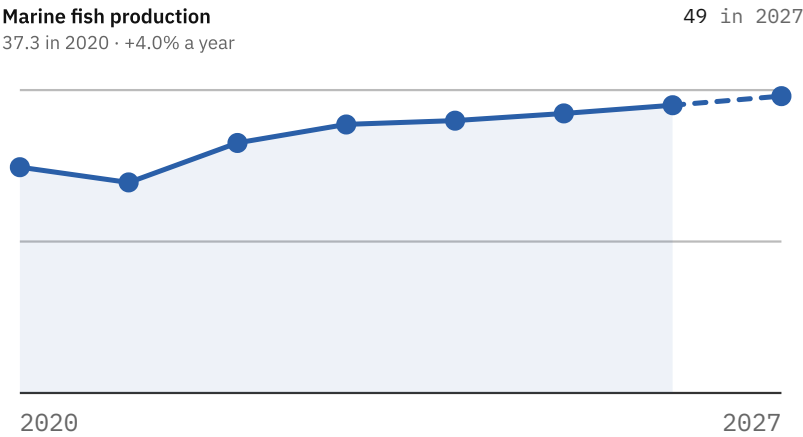
Four things suppress demand. The free transponder removes the most urgent reason to buy. Fuel and catch volatility remove discretionary cash, and the June 2026 strike shows owners will tie up boats rather than spend. The subsidy list names devices with ceilings, not systems. And the field record of electronics on Indian boats is poor: transponders not functional in West Bengal, water ingress in Karnataka, satphones that lose signal beyond 200 nautical miles. Each is an argument for a validation trial rather than a launch.

Verified S24 S21 Publicly observed S67 S26 S32 S72

SO WHAT FOR RAX

Demand for onboard electronics in India is created by regulation and paid for by schemes; DSM will be bought where a rule requires it, a scheme lists it, or a fleet owner pays for what the free system lacks, and Rax should aim its next twelve months at those three doors in that order of certainty.

Recommendation



India marine fish production, Department of Fisheries series (financial years labelled by closing year), lakh tonnes. Dashed from 2026 is outlook. 2019-20 to 2024-25 from Department of Fisheries handbooks and Parliament replies; 2025-26 and 2026-27 are an outlook at the 3 percent a year marine growth rate the 2025 handbook reports. CMFRI calendar-year landings (35.7 lakh tonnes in 2025) use a different method and are not mixed in.

2009-07	REGULATION	Centre requires AIS transponders on fishing vessels over 20 m Post-26/11 coastal security decision
2010	MARKET	ISRO Distress Alert Transmitter becomes operational More than 20,000 DATs in use by 2024
2016	MARKET	CMFRI Marine Fisheries Census counts 1,66,333 craft 42,985 mechanised, 97,659 motorised, 25,689 non-motorised
2017-12	INCIDENT	Cyclone Ockhi: 661 fishers reported missing; final toll 365 Kerala and Tamil Nadu later declared 263 missing fishers dead; demand for onboard communication rose sharply
2018-01	MARKET	BSNL launches civilian Global Satellite Phone Service (Inmarsat) The only permitted civilian satellite voice service; Iridium and Thuraya remain banned
2020-09-10	SCHEME	PMMSY launched with a ₹20,050 Cr outlay Item 60 caps tracking devices at ₹35,000 and item 61 safety kits at ₹1 lakh
2021-06	MARKET	Skylo launches a satellite NB-IoT hub for Tamil Nadu fishers on BSNL infrastructure Two-way messaging and catch reporting
2023-06	SCHEME	VCSS national rollout approved: ₹364 Cr for one lakh transponders, NSIL as implementing agency 60:40 Centre-state, free to fishers
2024-01-16	MARKET	ISRO announces DAT-SG with two-way messaging and Bluetooth Technology offered to Indian industry by SAC
2024-08-30	SCHEME	Prime Minister launches the VCSS national rollout in Maharashtra NSIL engages Saankhya Labs, Avantel and Accord for Xponders; 400 installed by September 2024
2024-09-09	REGULATION	WPC moves Equipment Type Approval to self-declaration Bluetooth and Wi-Fi modules approved via SARAL Sanchar
2025-06	REGULATION	Starlink receives GMPCS licence for India Unified Licence confirmed January 2026; no maritime service for fishing boats yet
2025-08-18	REGULATION	Merchant Shipping Act 2025 receives assent Replaces the 1958 Act; fishing vessel rules to follow
2025-09-22	RAX	Rax Tech certified to ISO 9001:2015 by Bureau Veritas Scope includes customised hardware and software design
2025-11	MARKET	Marine Fisheries Census 2025 field enumeration begins (digital, drone counts) Results expected in 2026; not published at cutoff
2025-11-04	REGULATION	EEZ Rules 2025 notified: mandatory transponders and QR-coded ID cards for EEZ fishing ReALCraft integrated with Nabhmitra; Access Pass for about 64,000 mechanised vessels and motorised vessels over 24 m
2025-11-14	REGULATION	DPDP Rules 2025 notified with an eighteen-month compliance period Obligations on data fiduciaries apply from 13 May 2027; relevant to crew-tag and camera data

2026	REGULATION	Draft Merchant Shipping (Fishing Vessels) Rules 2026 published for consultation AIS on all fishing vessels; VMS or approved satellite tracking; IMO-type radio equipment
2026-01-10	REGULATION	EU CATCH digital catch certification applies to all fishery imports Traceability pressure on exporters and deep-sea operators
2026-02-10	SCHEME	More than 49,000 VCSS transponders installed, Lok Sabha told Target remains one lakh
2026-02-20	SCHEME	Access Pass for EEZ fishing launched at Veraval; over 50,000 transponders installed Ministry says most Indian fishing remains within 40 to 50 nautical miles
2026-05	INCIDENT	Diesel spike from the Iran war; harbour bulk diesel ₹140 a litre in Odisha, fleets tied up Odisha fishers off the sea from 15 June 2026; Goa trips cost more
2026-07-04	MARKET	National Association of Fishermen petitions DoT for data-enabled two-way satellite communication Calls current VMS little more than tracking and text at ₹25 a minute
2026-07-07	REGULATION	Sri Lanka Cabinet mandates VMS on the remaining 1,500 multi-day boats Government pays; 4,200 of 5,200 already fitted
2026-07-11	RAX	Rax publishes DSM sales, government and investor decks From ₹50,000 for boats and ₹2.5 lakh for vessels; no customer count claimed
2026-08-17	INCIDENT	Dakshina Kannada transponders replaced after water ingress 2,067 boats fitted; vendor redesign trialled on four boats with NSIL

Regulation, schemes, incidents and market events that shape demand, in date order.

How public money reaches a fishing-boat safety device

1 Union Budget and PMMSY

Department of Fisheries; ₹2,500 Cr for PMMSY in 2026-27
Item 60 tracking device ₹35,000; item 61 safety kit ₹1 lakh

2 Central implementing agency

NSIL for VCSS (₹364 Cr, 60:40 with states)
Empanelled suppliers Saankhya, Avantel, Accord

3 State fisheries department

Directorate and district Assistant Directors; state plans (Tamil Nadu safety kit ₹2 lakh)
Beneficiary must hold ReALCraft registration, licence and biometric card

4 Harbour and association

Boat-owner associations and cooperatives collect applications
Paperwork and verification bottleneck

5 Fisher and vessel

Owner pays balance; device installed by vendor
DSM is not a named item in any guideline found

Two routes: the centrally implemented VCSS (NSIL buys and installs, fisher pays nothing) and beneficiary-oriented PMMSY items sanctioned by the state with unit-cost ceilings and 40 or 60 percent assistance. ● Verified S21 S24 S34 S81

KEY TAKEAWAYS

- Bottom-up TAM is ₹2,330 Cr one-time: 66,106 mechanised craft at ₹2.5 lakh plus 1,35,763 motorised craft at ₹50,000, at 2026 list prices. Estimated S12 S7
- SAM from Chennai is about ₹440 Cr on the 2016 census basis (15,018 mechanised and 12,782 inboard craft in TN, PY, KL, KA, AP), up to ₹660 Cr on register counts. Estimated S9 S12
- SOM in the base case is ₹0.3 Cr in 2026-27 rising to ₹12 Cr in 2031; a state tender win is the only path above ₹20 Cr. Estimated S6 S21
- Top-down, public spend on onboard safety electronics is about ₹120 to ₹180 Cr a year (VCSS ₹364 Cr over three years plus state VHF, DAT, satphone and kit schemes), consistent with a ₹2,330 Cr pool turning over every 10 to 15 years. Verified S24 S30 S80 Estimated S9
- Government demand is larger than private demand today and is spent through NSIL and district officers, not dealers. Verified S18 S34

Method

The market is sized bottom-up from craft counts, then triangulated against what governments actually spend on onboard safety electronics, because no analyst series for Indian fishing-vessel electronics exists. Units come from the 2016 CMFRI census (the only state-level primary count), the Department of Fisheries registration figures quoted in November 2024 (the latest national count), and the government's 64,414 "deep-sea suited" mechanised vessels quoted in July 2026. Prices are Rax's published starting tiers. The 2025 census, whose field work ended in December 2025, will replace the 2016 rows when published. Verified S9 S10 Publicly observed S12 S72 Rax-supplied S7

066 Marine Fisheries Census 2016 | India

TABLE 12. FISHING CRAFTS IN THE FISHERY (excluding Lakshadweep and Andaman & Nicobar Islands)

State	Mechanized						Motorized		Non-motorized		Total
	Trawlers	Gillnetters	Dolmenetters/Baginnetters	Liners	Ring seiners	Purse-seiners	Others	Total Mechanized	Inboard	Outboard	Total
West Bengal	2,004	1,764	191	31	0	0	24	4,014	6,564	0	11,054
Odisha	1,390	358	0	0	0	0	0	1,748	2,443	3,235	8,682
Andhra Pradesh	1,176	0	0	0	0	0	0	1,176	3,146	8,932	20,219
Tamil Nadu	5,278	441	0	16	219	0	7	5,961	8,945	22,334	43,355
Puducherry	223	0	0	0	78	0	0	301	387	975	2,319
Kerala	2,654	417	0	2	646	81	0	3,800	0	13,868	21,684
Karnataka	3,071	40	0	0	0	669	0	3,780	304	5,575	11,884
Goa	600	0	0	0	0	209	49	858	5	937	1,982
Maharashtra	3,408	584	1,637	0	0	230	8	5,867	5,979	809	15,520
Gujarat	9,905	2,602	1,554	0	0	0	0	14,061	3,541	9,284	27,642
Daman & Diu	1,063	342	14	0	0	0	0	1,419	95	301	1,992
Total	30,772	6,548	3,396	49	943	1,189	88	42,985	31,409	66,250	1,66,333

The state-wise craft table used for the serviceable market: mechanised, motorised (inboard and outboard) and non-motorised counts for eleven coastal states and UTs. Source S9

Bottom-up arithmetic

BLOCK	UNITS	BASIS AND YEAR	PRICE	VALUE
TAM, mechanised	66,106	DoF registers, Nov 2024	₹2.5 lakh vessel tier	₹1,652.7 Cr
TAM, motorised	1,35,763	DoF registers, Nov 2024	₹50,000 boat tier	₹678.8 Cr
TAM total	2,01,869			₹2,331 Cr

BLOCK	UNITS	BASIS AND YEAR	PRICE	VALUE
SAM, mechanised in TN, PY, KL, KA, AP	15,018	CMFRI census 2016	₹2.5 lakh	₹375.5 Cr
SAM, inboard motorised in the same states	12,782	CMFRI census 2016	₹50,000	₹63.9 Cr
SAM total	27,800			₹439 Cr
SOM 2031, vessel tier	400 a year	capacity and references	₹2.5 lakh	₹10 Cr
SOM 2031, boat tier	400 a year	capacity and references	₹50,000	₹2 Cr
SOM 2031 total	800 a year			₹12 Cr

Estimated
S12
S9
S7
S6

Non-motorised craft (25,689 in 2016) are excluded: no engine room, no power, day trips within sight of shore. Outboard motorised craft (66,250 in 2016) are excluded from SAM but kept in TAM at the boat tier, because they have no bridge or compartments and their owners buy through cooperatives on subsidy; the boat tier would need a sub-₹35,000 variant to reach them. Gujarat and Maharashtra, with 19,928 mechanised craft between them, are excluded from SAM until a west-coast service partner exists.

Verified
S9
Rax-supplied
S6
Recommendation

The deck's TAM floor of ₹2,185 Cr uses 1.46 lakh powered vessels and 72,749 mechanised vessels; those numbers come from an MPEDA page citing an older census and should be replaced. On the 2016 census the same arithmetic gives ₹1,563 Cr (42,985 × ₹2.5 lakh + 97,659 × ₹50,000); on 2024 registers it gives ₹2,331 Cr. The range, not the point, is the honest statement.

Rax-supplied
S4
Publicly observed
S11
Verified
S9

Estimated
S12

Top-down triangulation

Public spend is the only top-down series. VCSS spends ₹364 Cr on one lakh units over roughly three years, about ₹120 Cr a year; Tamil Nadu is spending ₹18.01 Cr on mechanised-boat transponders and procured 30,000 DATs for ₹36 Cr in 2015; Kerala tendered ₹9 Cr of DATs and VHF in 2019; Tamil Nadu's VHF and satphone schemes add single-digit crores a year. Private replacement of GPS and fish finders on 66,106 mechanised boats at about ₹40,000 every seven years is roughly ₹38 Cr a year, and AIS purchases ahead of the mandate could add ₹20 to ₹35 Cr a year at Onwa prices. The category therefore turns over about ₹180 to ₹250 Cr a year, of which two thirds is public. A one-time pool of ₹2,331 Cr at DSM list prices implies a 10 to 13 year replacement cycle at that spend, which is plausible for bridge electronics and confirms the bottom-up order of magnitude. The gap between methods is explained by list-price hardware versus scheme unit costs: the state pays ₹35,000 for what DSM prices at ₹50,000 to ₹2.5 lakh.

Verified
S24
S30
S79
S80
S21
Publicly observed
S86
S89
Estimated
S12

Five-year series

YEAR	TAM ₹ CR	SAM ₹ CR	SOM ₹ CR	WHAT DRIVES SOM
2026	2,330	440	0.3	Paid validation trial, 10 to 20 vessels
2027	2,355	445	1.5	Two company fleets and one association, mixed tiers
2028	2,380	450	4	Certificates in hand, two harbour partners, first district reference
2029	2,405	455	7	Yard fitment on PMMSY-upgraded vessels; Kerala entry
2030	2,430	460	10	State safety-kit inclusion or NSIL sub-supply
2031	2,455	465	12	400 vessel-tier and 400 boat-tier units a year

TAM and SAM grow about 1 percent a year, the assumed growth of the registered mechanised fleet; the motorised fleet grows faster on registers but at the boat tier it adds little value. SOM is capacity- and reference-constrained, not demand-constrained, until 2029.

Estimated
S12
S6
Inferred

Sensitivity

DRIVER	LOW	BASE	HIGH	NOTE
State programme win (2,000-vessel tender by 2029)	6	12	40	SOM 2031 ₹ Cr; a state-wide award at ₹1.5 lakh blended
PMMSY eligibility of the boat tier	8	12	20	Boat tier accepted inside a ₹1 lakh kit at 40 to 60 percent assistance
Coastal service capacity	7	12	18	One, two or four trained harbour partners
Licensed satellite path	5	12	12	No legal link means a cellular-plus-Xponder product only
Transponder overlap	7	12	14	Low if owners see DSM as duplicating the free Xponder; high if a certified interface makes it additive

The programme lever is the only one that moves SOM by more than a factor of two; the satellite lever only cuts. Subsidy eligibility matters less than the deck implies, because the ceiling caps assistance at ₹14,000 to ₹21,000 per tracking device regardless of DSM's price. Estimated | S21 | S6

Recommendation

Government versus private demand, India versus export

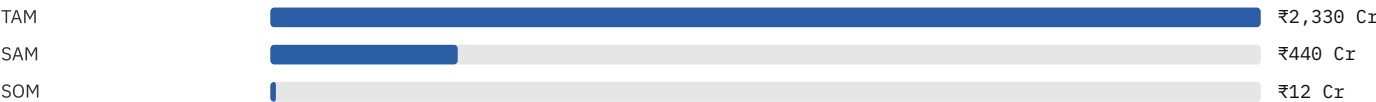
Government demand dominates in units and is spent through NSIL and district Assistant Directors: one lakh transponders, tens of thousands of VHF sets, thousands of satphones and DATs, and PMMSY vessel upgradations (1,338 approved) and deep-sea vessels (480 approved) whose electronics are specified by yards. Private demand is concentrated in fishing companies and multi-boat owners who already pay ₹1.34 lakh for a satphone and ₹5,835 a month for airtime, and in owners replacing GPS units at ₹23,000 to ₹45,000. Export demand is a programme question: Sri Lanka's 1,500-boat VMS mandate and Oman's national tracking system are closed to new devices without the operator's approval, so the export share of SOM is held at zero through 2028. Verified | S24 | S17 | S18 Publicly observed | S53 | S74 | S86 | S113 | S111 Recommendation

What the sizing does not capture

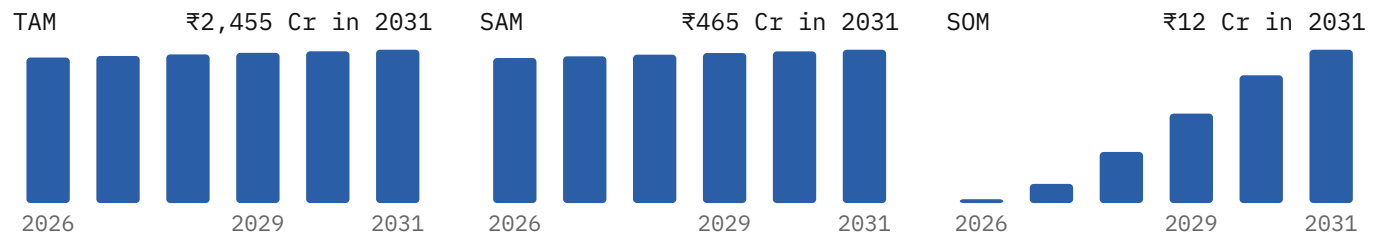
It excludes recurring revenue (airtime, dashboard, AMC), which the deck says is the expansion model but which Rax has not priced; at a hypothetical ₹6,000 a vessel a year on 2,000 connected vessels by 2031 that would add ₹1.2 Cr a year. It excludes replacement demand created by the AIS mandate, because timing depends on the final rules. It uses 2016 state rows for SAM and 2024 national registers for TAM, which are not the same base. It assumes DSM prices hold against Onwa at ₹53,000 for a plotter with AIS and the free transponder at ₹0. The honest reading is a TAM of ₹1,600 to ₹2,300 Cr one-time, a SAM of ₹440 to ₹660 Cr, and a SOM of ₹6 to ₹40 Cr a year by 2031 depending almost entirely on whether a state or NSIL carries the volume. Estimated | S9 | S12 | S86 Rax-supplied | S4 Unknown

SO WHAT FOR RAX

The size of the pool does not decide the business; the route does. Rax should plan for ₹1 to ₹4 Cr a year of DSM revenue through 2028 from companies and associations, and treat anything larger as contingent on a programme it must qualify for first. Recommendation



Addressable, serviceable and obtainable market, 2026. Bars share one scale.



VALUE		DEFINITION	ASSUMPTIONS	
TAM	₹2,330 Cr	One-time hardware at DSM starting prices across every registered powered fishing craft in India triangulated	66,106 mechanised craft at the ₹2.5 lakh vessel tier = ₹1,652.65 Cr, using the Department of Fisheries registration count reported in November 2024 Publicly observed S12 Rax-supplied S7 1,35,763 motorised craft at the ₹50,000 boat tier = ₹678.8 Cr Publicly observed S12 Rax-supplied S7 - Non-motorised craft (25,689 in 2016) excluded: no engine room, no power supply, day trips within sight of shore Verified S9 - Cross-check: the government is spending ₹364 Cr on one lakh transponders (₹36,400 each) and Tamil Nadu costs a full safety kit at ₹2 lakh, so a ₹2,330 Cr one-time pool at list price is consistent with observed public unit costs Verified S24 S81 - Recurring services (airtime, dashboard, AMC) are excluded from TAM and treated in the pricing section Estimated S12 S7 S9 S24 S81	
SAM	₹440 Cr	Mechanised and inboard craft in the five states Rax can install and service from Chennai with one harbour partner: Tamil Nadu, Puducherry, Kerala, Karnataka, Andhra Pradesh bottom-up	- Mechanised craft in TN 5,961, PY 301, KL 3,800, KA 3,780, AP 1,176 = 15,018 at ₹2.5 lakh = ₹375.5 Cr (2016 census state rows) Verified S9 - Inboard motorised craft in the same states 12,782 at ₹50,000 = ₹63.9 Cr; outboard craft excluded because they lack a bridge, power and compartments Verified S9 - Registration-based counts are about 50 percent higher nationally than the 2016 census; SAM is stated on the census basis and the scaled figure (about ₹660 Cr) is treated as the upper bound Publicly observed S12 - Gujarat and Maharashtra (19,928 mechanised craft) are excluded from SAM until a west-coast service partner exists Verified S9 Rax-supplied S6 Estimated S9 S12 S6	

	VALUE	DEFINITION	ASSUMPTIONS
SOM	₹12 Cr	Obtainable revenue in 2031 in the base case: about 800 mixed-tier installs a year through fishing companies, owner groups and one state pilot bottom-up	2026-27: a paid validation trial of 10 to 20 vessels (₹0.3 Cr) ● Recommendation 2027-28: 60 vessel-tier and 100 boat-tier units through two multi-vessel operators and one owners association = ₹2 Cr, rounded to ₹1.5 Cr for slippage ● Estimated S6 2031: 400 vessel-tier (₹10 Cr) plus 400 boat-tier (₹2 Cr) = ₹12 Cr, requiring two coastal service partners and at least one state programme reference ● Estimated S6 - Base case assumes no PMMSY eligibility for the boat tier; the high case in the sensitivity table assumes eligibility under item 61 safety kits ● Verified S21 ● Estimated S6 S21

Sensitivity

DRIVER	LOW	BASE	HIGH	NOTE
State programme win (a 2,000-vessel tender by 2029)	6	12	40	SOM 2031, ₹ Cr: no tender; one district pilot only; one state-wide award at ₹1.5 lakh blended
PMMSY eligibility of the boat tier (item 60 cap ₹35,000, item 61 kit ₹1 lakh)	8	12	20	SOM 2031, ₹ Cr: boat tier stays above the item-60 cap and unsubsidised; base no subsidy; high case boat tier accepted inside a ₹1 lakh safety kit at 40 to 60 percent assistance
Coastal service capacity (harbour partners)	7	12	18	SOM 2031, ₹ Cr, with one, two or four trained harbour partners
Licensed satellite path for RT-STJ-IM	5	12	12	SOM 2031, ₹ Cr: if no legal Indian satellite link exists DSM sells as a cellular-plus-VCSS-integration product only
Transponder overlap (owners who see DSM as duplicating the free Xponder)	7	12	14	SOM 2031, ₹ Cr: low case, half the boat-tier buyers and a fifth of vessel-tier buyers decline because tracking and SOS are free; high case, a certified Xponder interface turns the overlap into a selling point

95 Segments and ideal customer

KEY TAKEAWAYS

- Multi-vessel fishing companies and deep-sea operators rank first (66/100): they already pay ₹1.34 lakh for satphones, run several boats, and need the fleet visibility the free transponder does not give private owners. Publicly observed S74 S53 Estimated S17
- Owner-operators of multi-day boats in Tamil Nadu, Puducherry and Kerala rank next (58 and 57): the largest reachable fleets, the sharpest incident history, and associations that already handle subsidy paperwork. Verified S9 S60 Publicly observed S69
- State departments and NSIL are a channel more than a segment (48): they buy named devices at ₹35,000 from empanelled suppliers under tender rules Rax does not yet meet. Verified S21 S34 S35
- Outboard craft owners, Oman and Sri Lanka score below 40 and should not receive sales effort before 2028. Estimated S9 S111 S113
- Twelve segments are scored on the charter model; the top three carry the case studies and the pilot design below. Estimated S9 S12 S18

Segment table

RANK	SEGMENT	SIZE BASIS	BUDGET SOURCE	SCORE
1	Multi-vessel fishing companies and deep-sea operators	480 PMMSY deep-sea vessels, longliners, Mangaluru and Kochi fleets	Own funds; PMMSY vessel schemes; KCC	66
2	Owner-operators, multi-day mechanised boats, TN and PY	6,262 mechanised craft (2016)	Own funds plus state kit subsidies	58
3	Kerala mechanised and deep-sea fleet	3,800 mechanised craft (2016)	Own funds; Matsyafed credit; state schemes	57
4	Karnataka and Goa mechanised fleet	4,638 mechanised craft (2016)	Own funds; state schemes	54
5	Gujarat mechanised fleet	14,061 mechanised craft (2016)	Own funds; GFCCA credit	53
6	Andhra Pradesh mechanised and inboard fleet	1,176 mechanised, 3,146 inboard (2016)	Own funds; largest PMMSY book	52
7	Boat builders and yards	1,338 upgradations, 480 deep-sea vessels approved	PMMSY vessel items 55 and 56	50
8	Maharashtra mechanised fleet	5,867 mechanised craft (2016)	Own funds; state satphone plan	49
9	State fisheries departments and NSIL programmes	13 coastal states and UTs	PMMSY, state plans, VCSS	48
10	Oman and GCC artisanal fleets via Gulf Connect	Not established	Oman national tracking programme	38
11	Outboard craft owners through cooperatives	66,250 outboard craft (2016)	Cooperative credit and subsidy	38
12	Sri Lanka multi-day boats under VMS mandate	1,500 boats	Sri Lanka government	37

Estimated S9 S17 S18 S26 S111 S113 S102 Verified S21 S34

The eight scoring dimensions and their reasoning are in the data file; the pattern is simple. Demand is highest where trips are longest and losses largest: deep-sea companies, Palk Bay and Gulf of Mannar boats, Kerala's post-Ockhi fleet, Gujarat's Pakistan-exposed fleet. Fit and access fall with distance from Chennai and with the buyer's dependence on schemes. Readiness is uniformly low because nothing is certified or installed. Differentiation is highest where the buyer runs more than one boat, because the fleet dashboard is the one thing no free system gives a private owner. Estimated S9 S12

Verified S24 Inferred

Ideal customer profile

The ideal first customer is a fishing company or an owner with three to ten mechanised vessels of 15 to 24 m operating from Kasimedu, Cuddalore, Thoothukudi, Kochi or Mangaluru on trips of five to twenty days beyond territorial waters, already holding a BSNL satellite phone and a VCSS transponder, with an engine driver on board, a cold hold or freezer, and a shore manager who wants to know where each boat is and whether the engine and hold are healthy. Trigger events are a loss-of-contact scare, a detention, a fuel bill that tied up boats in June 2026, a PMMSY-financed upgrade or a new deep-sea vessel from a yard. The current alternative is a satphone, a plotter and WhatsApp within coverage. The budget holder is the owner; the decision takes one season because installation must happen during the ban. Willingness to pay is anchored by what these owners already spend: ₹1.34 lakh for a handset plus ₹70,000 a year of airtime, ₹45,000 for a Garmin plotter, and fuel of ₹1.5 to ₹2 lakh a trip. Publicly observed S74 S53 S86 S69 S67 S66

Verified S45 S24 Recommendation

Buying committee

For a company or multi-boat owner, six roles decide. The economic buyer is the owner or director, who needs a price after any subsidy, a visible payback in fuel, gear and downtime, and one working reference boat; the deal dies without a reference or when the price exceeds the free transponder plus a ₹50,000 plotter. The user is the skipper and the engine driver, who need offline charts, one-press SOS, alarms that do not nag and a Tamil or Malayalam interface; training burden and false alarms kill it. The champion is the fleet manager or association secretary, who needs paperwork support and a dashboard that answers "where are my boats" at two in the morning; a failed install on a member's boat in season kills it. The technical evaluator, in

programme deals a Fisheries Department joint director or NSIL engineer, needs ETA and MTCTE certificates, environmental test evidence and interoperability with the Xponder and AIS; an unlicensed satellite path kills it. The funder, a district Assistant Director sanctioning PMMSY items or a bank issuing a KCC, needs eligible-item status within a ceiling. The installer, a harbour dealer or yard electrician, needs margin, spares, training and a number that answers. Two further roles decide quietly. Risk and compliance sits with the Mercantile Marine Department surveyor or Coast Guard boarding officer who will check AIS, VMS and radio carriage under the coming rules, and with the insurer whose vessel premium PMMSY subsidises; a device that confuses an inspection kills the deal. Procurement is the company accountant or association treasurer in private deals, who needs a GST invoice, a warranty and a service price, and the tender committee in programme deals, which applies turnover, net worth and audit gates. The committee diagram after this section sets this out.

VerifiedS21S34S45S51S35S49

Publicly observedS32S74

Inferred

Jobs to be done and willingness to pay

JOB	WHO HAS IT	WHAT THEY PAY TODAY	EVIDENCE
Reach shore in an emergency beyond VHF range	Every multi-day boat	Free transponder; satphone ₹1.34 lakh plus ₹25 a minute	VerifiedS24 Publicly observedS53
Know where my boats are and talk to them	Multi-boat owners	Satphone airtime; nothing for tracking	Publicly observedS74S72
Avoid the IMBL and prove where we were	Palk Bay, Gulf of Mannar, Gujarat boats	Transponder geofence; boat seized if wrong	VerifiedS24S60 Publicly observedS62
Burn less fuel per trip	All mechanised owners	₹1.5 to ₹2 lakh of diesel a three-day trip	Publicly observedS69S67
Find fish faster	Skippers	Free INCOIS PFZ; ₹9,000 GEMINI; sonar ₹30,000 upward	VerifiedS40 Publicly observedS39S86
Comply with the coming AIS and VMS rules	All fishing vessels	Onwa plotter with AIS ₹53,000	VerifiedS45 Publicly observedS86
Protect crew below deck and the cold hold	Companies with freezers	Nothing today	Inferred

Willingness to pay is proven for the first three jobs at the company level and unproven for the last four at any level. The deck's fuel argument is plausible but unquantified; a validation trial that logs routes and fuel is the way to price it.

Publicly observedS74S69

Recommendation

Case study one: a Mangaluru fishing company with several boats

Karnataka's trawler fleet is concentrated in Mangaluru and Malpe, with 3,780 mechanised craft in 2016 and 2,067 boats fitted with VCSS transponders in Dakshina Kannada alone. In August 2026 BSNL's Mangaluru division reported rising demand for satellite phones from "fishing companies [that] operate several boats that venture into the sea at different times", expecting fifty more connections each from Udupi and Mangaluru; the same month the district's transponders were being replaced after water ingress under NSIL supervision. Six years earlier a Mangaluru association said hundreds of fishers die each year for want of connectivity and that it had tested BSNL's two-way data transponder. A DSM validation trial here would fit five to ten boats of one company with the vessel tier, integrate the Xponder feed, log engine and hold data, and measure whether the shore manager's satphone bill and search anxiety fall. Success looks like a signed second-season order and a written reference.

VerifiedS9

Publicly observedS32S74S75

Recommendation

Case study two: Palk Bay and Coromandel owner-operators

Tamil Nadu has 5,961 mechanised craft and 31,279 motorised craft, 349 landing centres and 7.96 lakh fisherfolk. Its owners face the country's sharpest border risk: 526 Tamil Nadu fishers were apprehended by Sri Lanka in 2024 with 72 boats confiscated and only 2 returned; 146 more were arrested in the first seven months of 2026. The state already gives 5 W VHF free, 25 W VHF at 90 percent subsidy, satphones at 75 percent subsidy to deep-sea clusters, fitted 507 boats with trial transponders and is fitting all mechanised boats through ISRO at ₹18.01 Cr; it prices a safety kit at ₹2 lakh. The National Association of Fishermen's Tamil Nadu president says boats avoid going beyond 200 nautical miles because "we have no way to contact anyone". A DSM validation trial here would work through one harbour association at Kasimedu or Cuddalore, fit ten boats with the boat tier plus IMBL geofence and immutable position logging, and seek the department's written view on scheduling DSM inside the ₹2 lakh kit.

VerifiedS9S60S30S81

Publicly observedS61S77S78S76S72

Recommendation

Case study three: Kerala's post-Ockhi fleet

Kerala has 3,800 mechanised craft and 13,868 outboard craft, 174 landing centres and 5.64 lakh fisherfolk, and it carries the memory of Ockhi, when 102 Kerala fishers were among the 263 missing later declared dead. Its boat owners' association put a three-day trip's fuel at ₹1.5 lakh in 2022; on 1 August 2026, the first day after the 52-day ban, two boats capsized off Thiruvananthapuram, four fishers went missing, several boats "could not be traced" and families protested a delayed search. Kerala has 6,000 transponders allocated, a cooperative federation of 654 societies with its own diesel bunks and outboard distribution, and PMMSY central releases of ₹344 Cr. A trial here would pair with the All Kerala Fishing Boat Operators Association at Kochi or Neendakara, fit mixed tiers on ten boats, and test whether the owner app's loss-of-contact alert and the crew tags change what families and coastal police do in the first hour.

VerifiedS9S18

Publicly observedS64S69S65S26S102

Recommendation

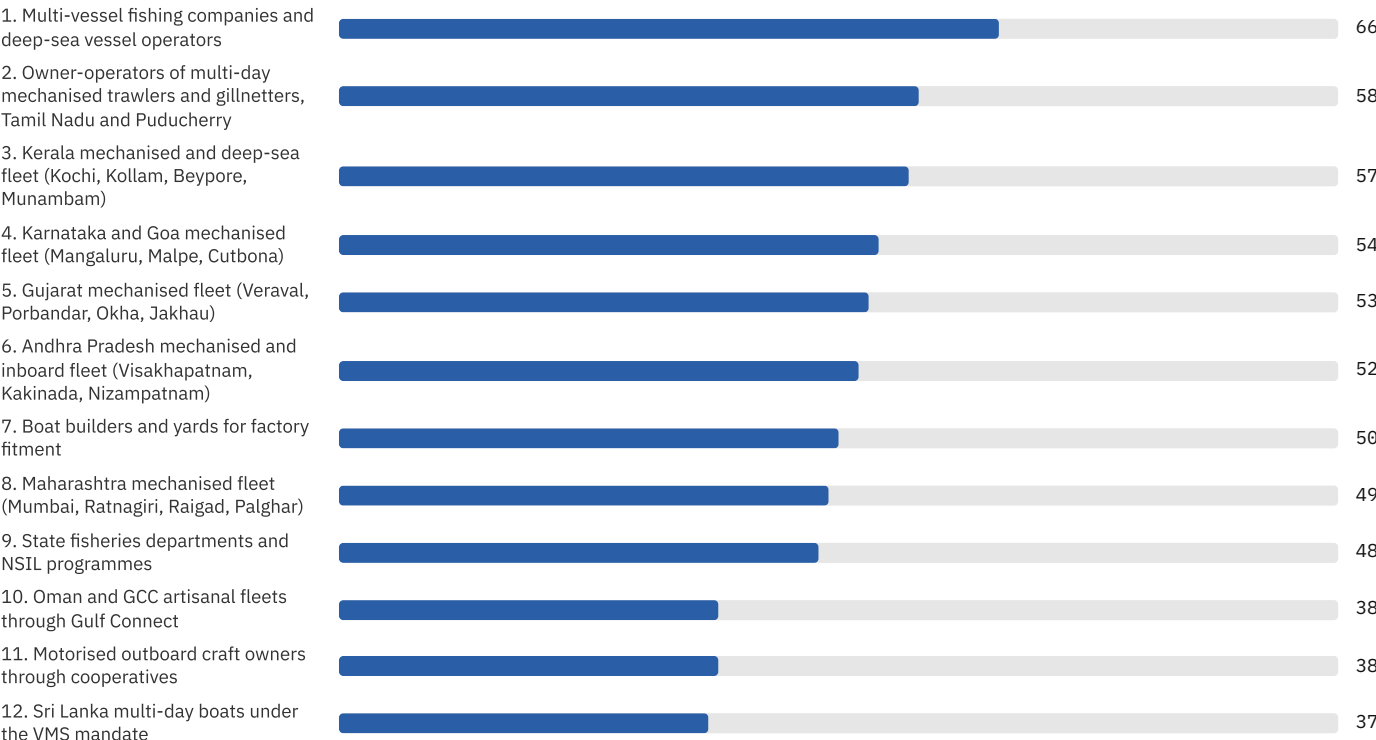
Named organisations to target

Inclusion below is a research target based on public evidence, not a relationship. Fishing companies and owner groups: the Mangaluru and Udupi fishing companies buying BSNL satphones; owners at Kasimedu, Cuddalore, Nagapattinam, Rameswaram, Thoothukudi and Karaikal represented by the National Association of Fishermen (Tamil Nadu) and the Rameswaram-based associations whose boats are seized; the All Kerala Fishing Boat Operators Association (Joseph Xavier Kalapurackal) and Kerala Matsya Thozhilali Aikya Vedi (Charles George); the Odisha Marine Fish Producers Association (Srikant Parida); ABJ Impex (J Mahiban) as a partner-customer with deep-sea pilots; the Visakhapatnam boat operators whose crews lost contact in July 2026. Cooperatives and federations: Matsyafed (654 societies), the Gujarat Fisheries Central Cooperative Association, the Maharashtra Fishery Cooperative Federation and its Palghar and Thane district federations. Departments and agencies: the fisheries departments of Tamil Nadu, Kerala, Karnataka (Dakshina Kannada joint director), Goa, Andhra Pradesh, Odisha and West Bengal; NSIL and its three Xponder suppliers, Accord Software & Systems, Avantel and Saankhya Labs; INCOIS for PFZ data licensing; BSNL for GPS or Skylo airtime. Yards and dealers: Cochin Shipyard, National Fibers (Nagapattinam), Upbeat Technologies (Chennai), A. S. Moloobhoy (Mumbai), Seanav Marine (Panvel). Export: Tadum (Oman) and Sri Lanka's Department of Fisheries and Aquatic Resources, both deferred.

Publicly observed S74 S72 S69 S82 S67 S85 S66 S102 S104 S31 S32 S35 S105 S106 S95 S93 S87 S111 S113 Verified S30 S80 S18 S34 S40 S54 Recommendation

SO WHAT FOR RAX

Rax should spend its first year on twenty named accounts in three harbours, all of them companies or associations with several boats, and refuse single-boat retail until a reference exists; the departments come second, through the suppliers they already trust. Recommendation



Segment priority score, out of 100

#	SEGMENT	BUYER	SIZE	SCORE	EVIDENCE
1	Multi-vessel fishing companies and deep-sea vessel operators Companies and owner groups running several mechanised or deep-sea vessels (tuna longliners, PMMSY-financed deep-sea vessels, Mangaluru and Kochi fleets) that already buy satellite phones and want fleet-wide visibility, engine and cold-store monitoring and crew accountability.	Company owner or fleet manager; skipper as user	480 deep-sea vessels approved under PMMSY plus Cochin Shipyard longliners and multi-boat owners; low thousands of vessels nationally	66	Estimated S17 S74 S72 S105
2	Owner-operators of multi-day mechanised trawlers and gillnetters, Tamil Nadu and Puducherry Single- and two-boat owners at Kasimedu, Cuddalore, Nagapattinam, Rameswaram, Thoothukudi and Karaikal making three- to ten-day trips, exposed to Palk Strait detentions, cyclones and fuel cost; many already carry state VHF, satphones and the VCSS transponder.	Boat owner, usually through a harbour association	6,262 mechanised craft in the 2016 census (TN 5,961, PY 301); 7,373 TN motorised boats in the VCSS plan	58	Estimated S9 S30 S59 S26

#	SEGMENT	BUYER	SIZE	SCORE	EVIDENCE
3	Kerala mechanised and deep-sea fleet (Kochi, Kollam, Beyypore, Munambam) Multi-day trawlers and gillnetters with strong boat-owner associations, the Ockhi memory, an active cooperative federation and 3,352 mechanised transponders allocated under VCSS.	Boat owner; All Kerala Fishing Boat Operators Association as influencer	3,800 mechanised craft (2016 census); 6,000 VCSS transponders allocated	57	 Estimated S9 S26 S64 S69
4	Karnataka and Goa mechanised fleet (Mangaluru, Malpe, Cutbona) Trawler-heavy fleets with visible demand for satellite phones, a transponder replacement episode after water ingress, and fishing companies operating several boats.	Boat owner or fishing company; Fisheries Department joint director as gatekeeper	4,638 mechanised craft (2016 census); 2,067 boats fitted with transponders in Dakshina Kannada alone	54	 Estimated S9 S32 S74 S31
5	Gujarat mechanised fleet (Veraval, Porbandar, Okha, Jakhau) The largest mechanised fleet in India with the sharpest border risk (1,173 boats in Pakistani custody) and the longest trips; strong cooperative fuel channel; far from Chennai service.	Boat owner; Gujarat Fisheries Central Cooperative Association and boat associations	14,061 mechanised craft (2016 census); 10,232 VCSS transponders allocated	53	 Estimated S9 S62 S26 S125
6	Andhra Pradesh mechanised and inboard fleet (Visakhapatnam, Kakinada, Nizampatnam) Inboard-heavy fleet with recurring loss-of-contact incidents, the largest number of fish landing centres and the biggest PMMSY project book of any state.	Boat owner; Visakhapatnam boat operators association	1,176 mechanised and 3,146 inboard craft (2016 census); 4,484 VCSS transponders allocated	52	 Estimated S9 S66 S18 S26
7	Boat builders and yards for factory fitment Cochin Shipyard (tuna longliners), FRP yards in Nagapattinam, Cuddalore and Chennai, and wooden-boat yards at Beyypore and Veraval that could fit DSM during build or refit under PMMSY vessel upgradation.	Yard owner or naval architect; buyer pays through the boat price	1,338 vessel upgradations and 480 deep-sea vessels approved under PMMSY; 80 boat yards in Tamil Nadu (2016 census)	50	 Inferred S105 S17 S106 S9
8	Maharashtra mechanised fleet (Mumbai, Ratnagiri, Raigad, Palghar) Trawler and purse-seine fleet with a state government now evaluating BSNL satellite phones and 11,960 VCSS transponders allocated; reachable only with a west-coast partner.	Boat owner; Maharashtra Machhimar Kruti Samiti and district federations	5,867 mechanised craft (2016 census)	49	 Estimated S126 S73 S26 S104
9	State fisheries departments and NSIL programmes Departments that buy or subsidise safety equipment (VHF, DATs, satphones, safety kits, transponders) through tenders and beneficiary schemes; NSIL as implementing agency for VCSS with three empanelled suppliers.	Director of Fisheries; NSIL programme office; district Assistant Directors	Nine coastal states and four UTs; PMMSY 'Others (Transponders)' releases ₹497.8 Cr to 2024-25	48	 Estimated S18 S34 S81 S30
10	Oman and GCC artisanal fleets through Gulf Connect Oman is fitting every artisanal boat with a tracking device under a national LoRaWAN-plus-satellite system run by Tadum; DSM could only enter as an approved add-on or a second-phase supplier.	Ministry of Agriculture, Fisheries and Water Resources; Tadum as system operator	Not established; Oman artisanal fleet count not found in this research	38	 Inferred S111 S112 S6
11	Motorised outboard craft owners through cooperatives Owners of outboard-engined craft organised in Matsyafed, TAFCOFED and district cooperatives; day trips, no bridge or compartments, purchases driven by subsidy and cooperative credit.	Cooperative society secretary; the fisher pays the balance	66,250 outboard craft (2016 census); 654 Matsyafed primary societies	38	 Inferred S9 S102 S103
12	Sri Lanka multi-day boats under the VMS mandate 5,200 registered multi-day boats, 4,200 with VMS and a July 2026 Cabinet decision to fit the remaining 1,500 at government cost; an incumbent Danish VMS supplier and no Rax presence.	Department of Fisheries and Aquatic Resources, Sri Lanka	1,500 boats in the current mandate	37	 Inferred S113 S114

Buying committee for a fishing company or multi-boat owner

Economic buyer

Owner or company director

NEEDS Price after any subsidy, visible payback in fuel, gear and downtime, and a working reference boat

KILLS THE DEAL No reference, no subsidy, or a price above the free transponder plus a ₹50,000 plotter

User

Skipper (tindal) and engine driver

NEEDS Offline charts, one-press SOS, alarms that do not nag, Tamil or Malayalam interface

KILLS THE DEAL Training burden, false alarms, screen unreadable in sun

Champion

Harbour association secretary or fleet manager

NEEDS Paperwork support, a dashboard that answers 'where are my boats' at 2 am

KILLS THE DEAL A failed install on a member's boat during the season

Technical evaluator

Fisheries Department joint director or NSIL engineer for programme deals

NEEDS ETA and MTCTE certificates, IEC 60945 environmental proof, interoperability with VCSS and AIS

KILLS THE DEAL Unlicensed satellite path, no type approval

Funder

District Assistant Director sanctioning PMMSY items; bank for KCC

NEEDS Eligible-item status with unit cost within the ceiling

KILLS THE DEAL Item not in guidelines

Installer and servicer

Harbour dealer or yard electrician

NEEDS Margin, spares, training, a phone number that answers

KILLS THE DEAL No local partner, salt damage without replacement

Risk and compliance

Mercantile Marine Department surveyor, Coast Guard boarding officer, vessel insurer

NEEDS AIS, VMS and radio carriage that pass inspection; no interference with approved equipment

KILLS THE DEAL A device that confuses an inspection or voids insurance

Procurement

Company accountant or association treasurer; tender committee in programme deals

NEEDS GST invoice, warranty terms, service price; turnover, net worth and audit documents for tenders

KILLS THE DEAL No service price; failing eligibility gates

Roles drawn from association statements, scheme rules and the deck's own deployment model; to be validated in the field trial. Inferred S35 S45 S49

96 Competitive landscape

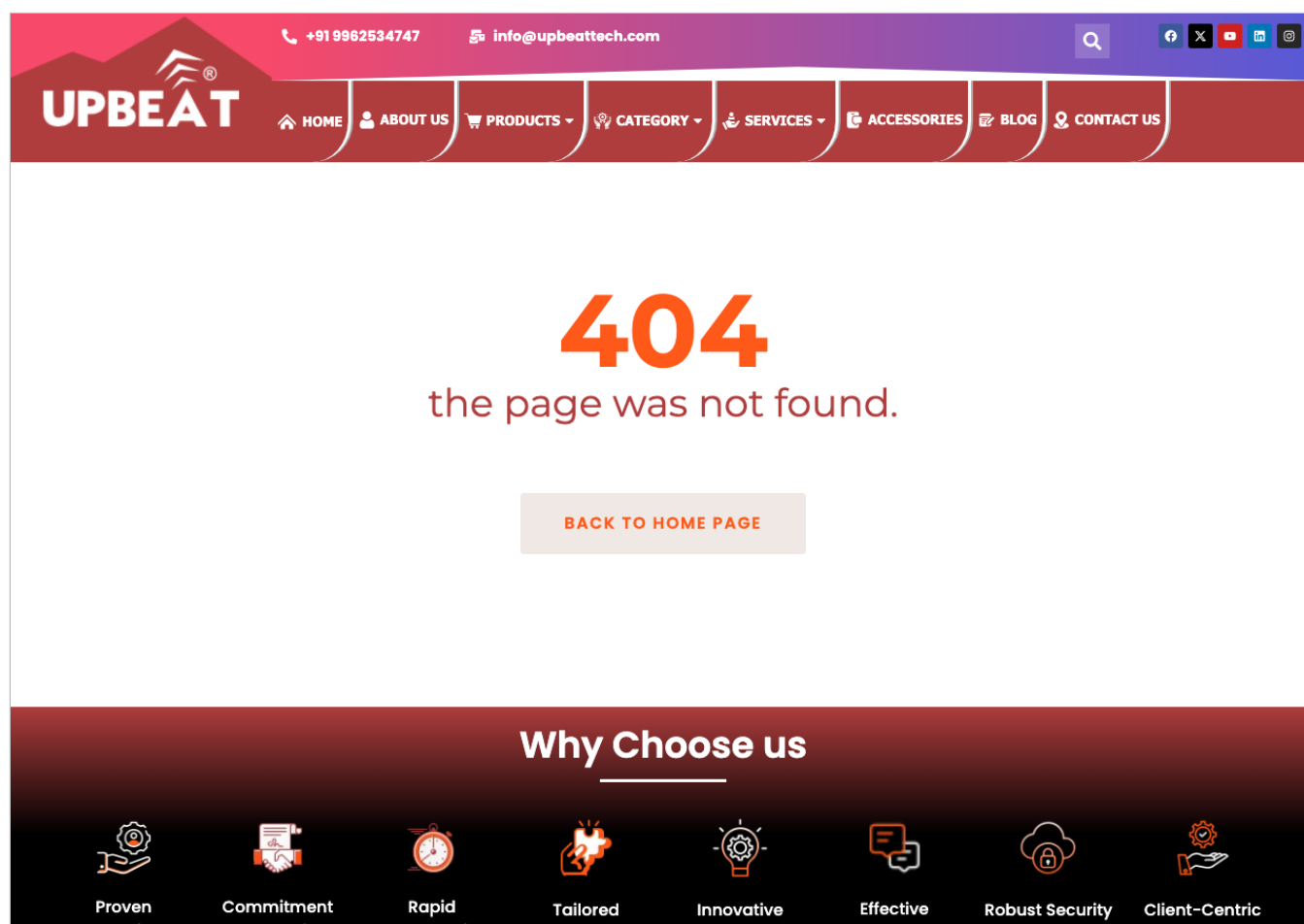
KEY TAKEAWAYS

- The most important competitor is free: the ISRO/NSIL Xponder with the Nabhmitra app, on 49,000-plus boats, supplied and installed by Accord, Avantel and Saankhya Labs. ● Verified | S24 | S34
- Navigation hardware is a dealer market of imported brands: Furuno and Garmin at ₹23,000 to ₹1,00,000 a unit, Samyung and Onwa below ₹55,000 including Class B AIS. ● Publicly observed | S86 | S87 | S95
- Two Indian firms already sell licensed two-way data at sea to fishers: Skylo (NB-IoT over satellite through BSNL) and ABJ Impex (cellular-plus-satellite VMS with cameras). ● Publicly observed | S84 | S85
- BSNL's Inmarsat service is the only legal satellite voice option and the one fishing companies are buying; Starlink is licensed but not launched. ● Publicly observed | S53 | S74 | S57
- No competitor integrates navigation, crew tags, compartment sensing, cameras, dual links and a fleet app; the empty space on the map is real, and so is the risk that fishers do not want to pay for it. ● Inferred

Landscape

Thirty-three competitors, substitutes and partner-competitors are profiled in the data file. They fall into five groups. First, the public safety-communication stack: the VCSS Xponder and Nabhmitra app, ISRO's DAT and DAT-SG, INCOIS's PFZ advisories, GEMINI receiver and SAMUDRA app, BSNL's Global Satellite Phone Service, and the state VHF networks; all free or subsidised, all domestic. Second, imported navigation and fish-finding hardware sold by port dealers: Furuno, Garmin, Samyung, Onwa, Koden, JRC, Simrad and Lowrance, Raymarine, ICOM, em-trak. Third, private connectivity and monitoring vendors: Skylo, ABJ Impex, and prospectively Starlink. Fourth, the substitutes: a smartphone with free apps, generic Chinese imports, and doing nothing beyond the handheld VHF the draft rules require. Fifth, partner-competitors who could carry or block DSM: the three Xponder makers, Cochin Shipyard, and the dealers AMIT, A. S. Moloobhoy, Upbeat, Seanav and Galaxy Technocom. Import versus domestic splits cleanly: hardware is imported, safety communications are Indian and public. Price tiers run from ₹0 (transponder, 5 W VHF) through ₹20,000 to ₹55,000 (plotters, AIS, handheld VHF) to ₹1.34 lakh (satphone) and beyond for professional Furuno stacks. ● Verified | S24 | S34 | S37 | S40 | S54

● Publicly observed | S86 | S87 | S95 | S84 | S85 | S57 | S89 | S45



Upbeat Technologies, Chennai, sells Samyung and Garmin marine units to fishing harbours from Kasimedu to Veraval; a 5 inch plotter-fishfinder is the typical small-boat purchase. Source S95

What it is: an S-band mobile-satellite-service terminal designed by SAC/ISRO with NavIC positioning, built-in Wi-Fi and Bluetooth, paired to the Nabhmitra Android app. The app offers periodic position reporting, two-way messaging with the control centre and other boats, predefined SOS messages ("Fire on Boat", "Boat Sinking", "Medical Help Needed"), weather and cyclone alerts, PFZ advisories, IMBL geofence alerts, offline maps and trip declaration. The hub sits at INCOIS with state monitoring centres and a data centre in Delhi; messages work to about 200 nautical miles. NSIL is the implementing agency, engaged Saankhya Labs, Avantel and Accord Software & Systems for supply and installation, maintains the units for two years and ran a separate RFP for lithium-ion batteries on motorised boats. Scale: 400 installed by September 2024, 4,000 by November 2024, 42,316 mechanised and 46,900 motorised allocated by February 2025, more than 49,000 installed by February 2026, against one lakh planned at ₹364 Cr; Goa puts the unit cost at about ₹35,000, shared 60:40. Weaknesses observed in the field: fishers in West Bengal said units were fitted but not functional; Dakshina Kannada's 2,067 units are being replaced after water ingress; the National Association of Fishermen calls the system little more than tracking and text; the app has 10,000-plus downloads and 13 reviews. Threat to DSM: high, because it makes SOS, alerts and geofencing free. Opportunity: the Xponder exposes Bluetooth and Wi-Fi, so an integrated bridge that reads its position and messages and adds sensors, cameras and a fleet dashboard is technically plausible; the three suppliers are also the natural route into NSIL tenders.

Skylo launched a Tamil Nadu fishermen solution in June 2021 on the world's first satellite NB-IoT network, connecting through BSNL's satellite ground infrastructure, which makes it a licensed path. The Skylo Hub mounts on the boat, draws from the battery, relays sensor data and two-way messages to a shore app, offers a catch-reporting app for selling from sea, and claimed a rescue of seven Maharashtra fishers in November 2020. Pricing was described as "as low as a daily cup of tea/coffee"; hardware price was not published. Its fisheries programme director, Ganesh Nakhawa, is a fishing-industry insider who also comments on AIS rules. No evidence of adoption at scale after 2021 was found in this research. Threat: high on the connectivity layer, because Skylo has what Rax lacks, a legal satellite data path, and low on the bridge layer, because it has no HMI, cameras or compartment control. It is the most obvious connectivity partner for DSM.

Publicly observed
S84
S83
Unknown
Recommendation

A Tamil Nadu company whose managing director, J Mahiban, is quoted by the National Association of Fishermen's campaign for data at sea. Its site describes a Vessel Monitoring System for fisheries that switches between cellular and satellite, sends positions, SOS and personal messages, camera images and trawl information to authorities and owners, plus GPS FleetPhone terminals and a harbour monitoring system built with Promatas of Oman. In July 2026 it reported pilots off Kerala, Tamil Nadu and Karnataka "maintaining uninterrupted contact on voice and video calls and live CCTV with boats

more than 300 nautical miles offshore", pending regulatory approval for wider deployment. Threat: high on positioning, because it sells the same integrated story to the same deep-sea buyers and has industry standing; unknown on execution, because no references, certifications or prices are published. It could be partner or rival; Rax should meet it early.

Publicly observed S85 S72 Unknown Recommendation

Deep-dive four: Furuno through A. S. Moloobhoy and Master Systems

Furuno is the name Indian trawler skippers trust for GPS and sonar. Its GP-39 navigator sells for ₹30,000 to ₹36,680 and the GP-25 for ₹28,640 on IndiaMART; A. S. Moloobhoy in Mumbai stocks its fishing range and Master Systems services it at Mumbai, Chennai, Kochi, Visakhapatnam and Kolkata. Furuno makes the FA-50 Class B AIS and professional sonar Rax does not offer; it issued a customer notice on the FA-50 in August 2026. It sells unit by unit through dealers with no integrated safety, communications or monitoring layer for small craft and no India-specific fleet software. Threat: high for share of the navigation budget, low for the integrated proposition; a DSM HMI that accepts Furuno sonar input would be stronger than one that competes with it.

Publicly observed S86 S87 S93 S94 S96 Recommendation

Deep-dive five: Onwa and the Chinese value tier

Onwa's KP-27 7 inch plotter sells for ₹28,000 in Jamnagar and its KP-39A 7 inch plotter with a Class B+ AIS transponder for ₹53,000 in Hyderabad; Seanav Marine in Panvel lists the KP-1299X five-in-one plotter with AIS and radar. Ex-factory, Alibaba sellers price the KS-200A Class B AIS at USD 208 to 215, the KP-1299A at USD 600 and the KS-33R AIS man-overboard personal locator at USD 100 to 150, which is a crew-safety wearable that competes with DSM's e-tags. When the AIS-for-all rule lands, this tier will supply most of the transceivers. Threat: high on price for every hardware element of DSM; weak on service, certification and integration.

Publicly observed S86 S87 S89 Verified S45

The rest of the field in brief

Garmin reaches Indian boats through AMIT, which has distributed its marine range since 2017 and became exclusive distributor in 2023; the GPS 152 sells for about ₹23,000 at Porbandar and the GPSMAP 585 Plus for ₹45,000 to ₹48,000 at Thoothukudi, but its inReach satellite messenger cannot be used in India without DoT permission, so Garmin competes for the screen, not the link. Samyung reaches the same harbours through Upbeat Technologies in Chennai, whose dealer page prices on enquiry; it is the brand a Kasimedu owner meets first. ICOM is the default VHF, with the IC-M25 handheld at ₹17,900, and its DSC sets are what the draft rules will require on Category 2 vessels. BSNL's satellite phone is the licensed voice incumbent at ₹1,34,166 a handset and ₹25 a minute, and the one product fishing companies are visibly buying in 2026. ISRO's DAT, with more than 20,000 units since 2010 and a two-way DAT-SG whose technology SAC offers to Indian industry, is the cheapest satellite SOS and a possible licensing route for Rax. INCOIS gives away the fish-finding advice DSM's "fish data" feature promises, for 586 landing centres. InCEve Electronics, a Bengaluru sonar-analytics startup, shows how hard the category is: no evidence of scale was found after 2019. Starlink holds its licences but has no fishing-boat service at the cutoff. Visma Consulting in Sri Lanka and Tadum in Oman are the gatekeepers of the two export programmes.

Publicly observed S91 S86 S95 S88 S53 S74 S98 S100 S57 S114 S111 Verified S37 S38 S40 S45

Feature and price comparison against DSM

CRITERION	BUYERS USE	DSM (RAX)	VCSS XPONDER	FURUNO / GARMIN	ONWA / SAMYUNG	SKYLO / ABJ	BSNL SATPHONE
Price to fisher		₹50,000 to ₹2.5 lakh	₹0	₹23,000 to ₹1,00,000 per unit	₹28,000 to ₹53,000	Not published	₹1.34 lakh plus airtime
SOS beyond VHF range		Claimed via unnamed satellite	Yes, NavIC MSS	No (inReach not legal)	No	Yes (Skylo via BSNL)	Yes, voice
Navigation display		Yes, offline charts	Phone app maps	Yes	Yes	No	No
AIS		Receiver and net buoy claimed	No	Yes (Class B)	Yes (Class B+)	No	No
Sensors, cameras, engine, hold		Yes, claimed	No	No	No	Partial (ABJ cameras)	No
Fleet dashboard for owner		Yes, claimed	State centre only	No	No	Yes	No
Certification and legality		None yet	Government-approved	Type-approved units	Varies	Licensed link	Licensed
Installed base in India		None	49,000-plus	Tens of thousands	Widespread	Small	Thousands

Rax-supplied S1 Verified S24 S34 Publicly observed S86 S89 S84 S85 S53 S56

Positioning map narrative

The map after this section plots cost of a fit-out against breadth. The crowded corner is cheap and single-function: transponder, VHF, DAT, apps. The mid-band is navigation hardware from ₹23,000 to ₹1,00,000, one function per box. The expensive single-function corner is the satphone. The empty space is integrated and mid-priced, where Rax places DSM, with Skylo and ABJ Impex the only neighbours, both stronger on connectivity and weaker on the bridge. The question the map cannot answer is whether the empty space is empty because nobody has built it or because fishers do not pay for it; Skylo's quiet five years since launch is a warning that connectivity alone did not sell.

Publicly observed S84 S86 S53 Inferred

Where Rax wins, where it loses

Rax wins where a buyer runs several boats and values one screen and one app for position, crew, engine and hold, where a yard is specifying a new deep-sea vessel and wants one supplier, and where Make in India preference applies to a state purchase. It loses on brand and dealer footprint to Furuno and Garmin, on price to Onwa and Samyung, on legality and airtime to BSNL and Skylo, on free-ness to the Xponder, and on trust to anyone with an installed base. Buyers' complaints about incumbents are consistent: transponders not functional or leaking, satphones that drop beyond 200 nautical miles and cost ₹25 a minute, no data, no video, no price information at sea. DSM should be written against those complaints, not against Garmin's feature list.

Publicly observed S26 S32 S72 S53 Inferred Recommendation

Competitor responses to expect

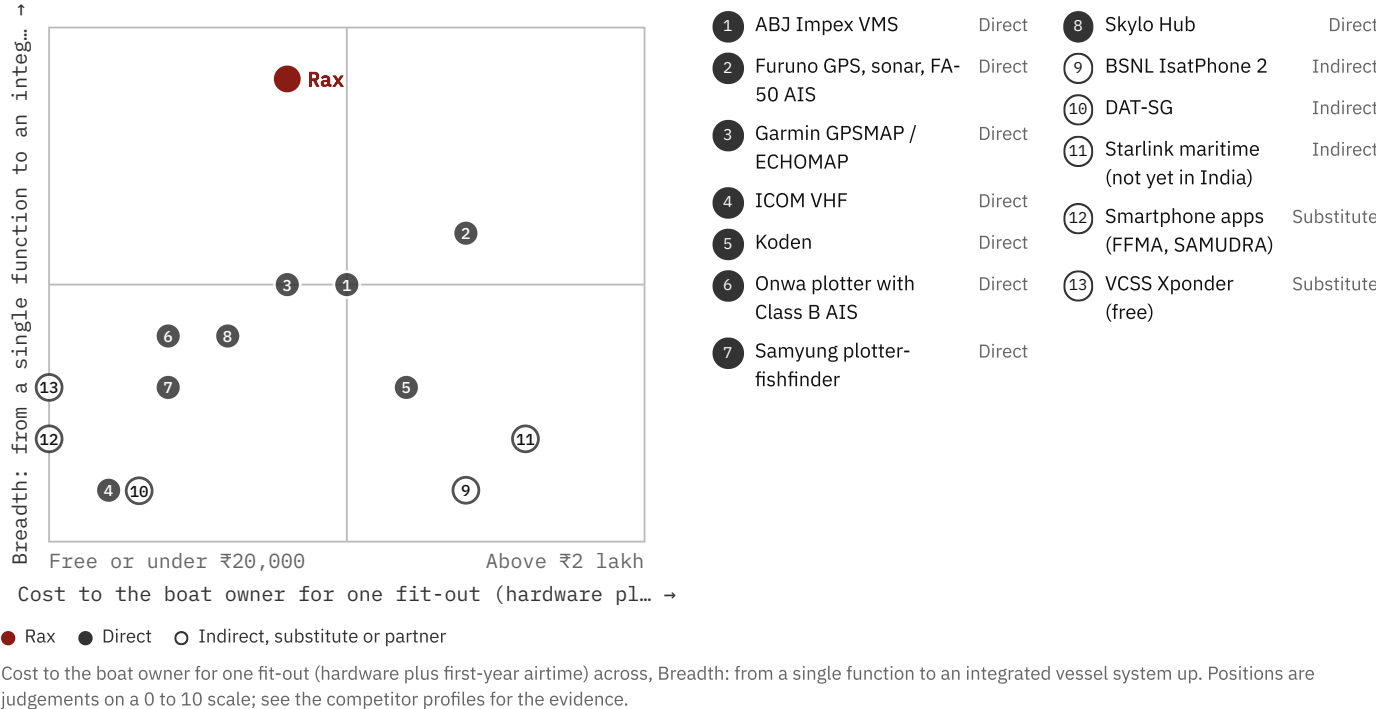
If DSM gains visible share in a harbour, Onwa dealers will bundle a plotter, AIS and an AIS MOB tag for under ₹70,000; Skylo or ABJ Impex will add a display and a dashboard; NSIL's suppliers may extend the Nabhmitra app with owner-side tracking, which would be the most damaging move; and BSNL will keep lowering the satphone entry price, as its ₹1 SIM offer in Mangaluru shows. Rax's defensible ground is the sensing and control layer inside the boat and a service relationship at the harbour, neither of which a satellite operator or an importer wants to own.

Inferred Publicly observed S89 S84 S85 S36 S74

SO WHAT FOR RAX

Rax should stop describing DSM as a rival to Garmin and Furuno and describe it as the layer that connects the free transponder, the skipper's plotter and the owner's phone; the first partnership conversations belong with Skylo or BSNL for airtime and with an Xponder supplier for the NSIL route.

Recommendation



COMPETITOR	TYPE	PRODUCTS IN INDIA	PRICE BAND	INDIA PRESENCE	THREAT
ABJ Impex Tamil Nadu, India	direct	VMS hardware, SOS and personal messaging, camera images, harbour monitoring, GSPS satellite phone terminals	Not published	Vessel monitoring system for fisheries with cellular and satellite switching, GSPS FleetPhone terminals; pilots of data-enabled satellite links off Kerala, Tamil Nadu and Karnataka with video and CCTV beyond 300 nautical miles	high
em-trak United Kingdom	direct	Class A and B AIS transceivers	Not observed in India listings	Stocked by regional AIS specialists; B921/B922 Class B units with Wi-Fi and Bluetooth	low
Furuno (A. S. Moloobhoy, Master Systems) Nishinomiya, Japan	direct	Fish finders, sonar, GPS navigators (GP-39, GP-25, GP-150), radar, FA-50 Class B AIS	GP-25 ₹28,640; GP-39 ₹30,000 to ₹36,680 observed	Fishing equipment stocked by A. S. Moloobhoy in Mumbai; service at Mumbai, Chennai, Kochi, Visakhapatnam and Kolkata ports; GP-39 and GP-25 units common on Indian trawlers	high

COMPETITOR	TYPE	PRODUCTS IN INDIA	PRICE BAND	INDIA PRESENCE	THREAT
Garmin (AMIT International, exclusive India distributor) Olathe, United States; distributor in India	direct	Striker fishfinders, ECHOMAP and GPSMAP chartplotters, AIS, VHF, inReach (not usable in India without DoT permission)	GPS 152 about ₹23,000; GPSMAP 585 Plus ₹45,000 to ₹48,000 observed; Striker 4 USD 131 abroad	Garmin marine sold in India by AMIT since 2017 through garmin-india.com and dealers in fishing ports (Thoothukudi, Porbandar listings)	medium
ICOM Osaka, Japan	direct	Marine VHF (handheld and fixed with DSC), Class B AIS	IC-M25 ₹17,900 observed	IC-M25 handheld VHF sold by Mumbai dealers; MA-510TR Class B AIS through regional stockists	medium
JRC (Japan Radio Co.) Tokyo, Japan	direct	Radar, GPS, AIS, GMDSS equipment	Professional tier; used units from ₹1,000 listed	Ship-chandler and dealer channels; JLR GPS units appear in second-hand listings	low
Koden Electronics Tokyo, Japan	direct	GPS navigators, radar, sonar for fishing vessels	KGP-922 ₹1,00,000 observed	Available through Mumbai dealers (KGP-922 listed)	low
Onwa Marine Electronics (Seanav Marine, Galaxy Technocom) Hong Kong / Guangzhou, China	direct	GPS chartplotters, Class B AIS, AIS MOB locator, radar, fishfinders	KP-27 ₹28,000; KP-39A with AIS ₹53,000 observed; KS-200A AIS USD 208 ex-factory	Sold through IndiaMART dealers in Panvel, Hyderabad and Jamnagar; KP-1299X five-in-one plotter with AIS and radar; KP-39A plotter with Class B+ AIS	high
Raymarine (Teledyne FLIR) Fareham, United Kingdom	direct	Axiom chartplotters, AIS350 receiver, AIS650 Class B transceiver, thermal cameras	Not observed in India listings	Distributor-led; AIS650 and Axiom units stocked by regional dealers	low
Samyung ENC (Upbeat Technologies, Chennai) Busan, South Korea	direct	GPS plotters, fishfinder combos, AIS, radar	Not published on the dealer page; comparable 5 inch combos sell below ₹40,000	Dealer network from Kasimedu to Veraval through Upbeat Technologies; NF500 plotter-fishfinder pitched for small fishing boats	medium
Simrad and Lowrance (Navico, Brunswick) Egersund, Norway	direct	Chartplotters, AIS, radar, autopilots, Hook Reveal fishfinders	Not observed in India listings	Distributor-led; AIS and chartplotters stocked by regional dealers	low
Skylo Technologies Palo Alto, United States, with India operations	direct	Skylo Hub terminal mounted on the boat and powered from the battery, two-way messaging to shore app, catch reporting, alerts; rescue case in Maharashtra 2020	Subscription described as 'as low as a daily cup of tea'; hardware price not published	Launched a Tamil Nadu fishermen solution in 2021 using BSNL satellite ground infrastructure; NB-IoT over satellite	high
BSNL Global Satellite Phone Service (Inmarsat IsatPhone 2) New Delhi, India	indirect	IsatPhone 2 handsets, prepaid and postpaid plans, SOS button	Handset ₹1,34,166 (about ₹90,000 earlier); plans ₹3,500 to ₹11,670 a month; ₹25 a minute	The only civilian satellite voice service permitted in India; states subsidise handsets for deep-sea boats; Mangaluru and Maharashtra demand rising in 2026	medium
InCEve Electronics Bengaluru, India	indirect	IoT-enabled sonar analytics	Not published	Startup building IoT sonar decision aids for fishers (2016)	low
INCOIS advisories: PFZ, GEMINI receiver and SAMUDRA app Hyderabad, India	indirect	Potential fishing zone maps, ocean state forecast, disaster alerts	Free (app); ₹9,000 (GEMINI)	Daily PFZ advisories for 586 landing centres; free SAMUDRA app; GEMINI satellite receiver at ₹9,000	medium
ISRO Distress Alert Transmitter (DAT and DAT-SG) and licensed manufacturers Ahmedabad, India (SAC)	indirect	One-button distress transmitter with GPS or NavIC; MRCC forwarding via INMCC	About ₹12,000 a unit in Tamil Nadu's 2015 procurement	Operational since 2010 with more than 20,000 in use; DAT-SG with acknowledgement, two-way messages and Bluetooth launched January 2024; technology offered to industry	medium
Starlink (SpaceX) Hawthorne, United States	indirect	Broadband terminals; Roam Ocean Mode at USD 6 per GB abroad; maritime priority plans	Not priced for India	GMPCS licence June 2025 and Unified Licence confirmed January 2026; commercial service and maritime plans for Indian fishing vessels not available at cutoff; Tamil Nadu officials say the Centre is contemplating it	medium

COMPETITOR	TYPE	PRODUCTS IN INDIA	PRICE BAND	INDIA PRESENCE	THREAT
Tadum (Future Cities Company) and Middle East Scientific Equipment Corporation (Oman tracking) Muscat, Oman	indirect	Tracking devices, operations room, emergency button	Not published	Operators of Oman's national fishing-boat tracking system on LoRaWAN plus satellite	low
Tamil Nadu VHF network (ELCOT) and state satellite phone scheme Chennai, India	indirect	VHF radios, repeaters, satellite phones	₹18,000 (25 W VHF), ₹1.05 lakh (satphone) unit costs	5 W handhelds free, 25 W fixed VHF at 90 percent subsidy with leased towers; satphones at 75 percent subsidy for deep-sea clusters	medium
Visma Consulting (Sri Lanka VMS) Denmark	indirect	Vessel monitoring transponders and shore software	Not published	Supplied VMS transponders for Sri Lanka's multi-day boats in 2022	low
Do nothing beyond the mandatory handheld VHF Not applicable	substitute	Handheld VHF, life-saving appliances	₹5,000 to ₹18,000	The draft rules require only a hand-portable VHF for Category 4 boats (under 24 m inside territorial waters)	high
Generic Chinese GPS, AIS and fishfinder imports (Alibaba) Guangzhou and Shenzhen, China	substitute	Plotters, Class B AIS, fishfinders, AIS MOB beacons	USD 100 to 600 ex-factory	Imported by small traders and sold on IndiaMART; some listed at ₹1,500 to ₹15,000	medium
ISRO/NSIL Vessel Communication and Support System (MSS Xponder and Nabhmitra app) Bengaluru, India	substitute	S-band MSS two-way messaging terminal with NavIC positioning, Bluetooth/Wi-Fi to an Android app: SOS, predefined messages, weather and cyclone alerts, PFZ, IMBL geo-fence alerts, trip declaration; state monitoring centres	Free to eligible fishers; about ₹35,000 a unit paid 60:40 by Centre and state	National programme: 49,000-plus transponders installed by February 2026 against one lakh planned across 13 coastal states and UTs; NSIL maintains for two years	high
MSSRF Fisher Friend Mobile Application Chennai, India	substitute	GPS navigation to PFZ, ocean state forecast, offline PFZ, danger-zone marking, scheme information	Free	Free multilingual app used along the Indian coast	medium
Smartphone with free charts and WhatsApp inside coverage Not applicable	substitute	Phone maps, free apps, calls and messages near shore	Zero incremental	Universal on Indian boats; coverage two to twelve nautical miles by official and press accounts	medium
A. S. Moloobhoy Mumbai, India	partner-competitor	Distribution, installation and service of navigation and safety electronics	Dealer margins	Marine electronics house stocking Furuno fishing equipment; safety equipment and service across ports	medium
Accord Software & Systems Bengaluru, India	partner-competitor	NavIC and GNSS receivers, MSS Xponder terminals, Nabhmitra app	Government contract pricing, about ₹35,000 a unit installed	Empanelled by NSIL for supply and installation of Xponders; developer of the Nabhmitra Android app	medium
Amit GPS & Navigation LLP (AMIT International) Mumbai, India	partner-competitor	Garmin marine, fitness and automotive distribution	Distributor margins	Garmin's exclusive India distributor with an online store and dealer locator	low
Avantel Ltd Hyderabad, India	partner-competitor	Satellite communication terminals and defence electronics; MSS Xponders	Government contract pricing	Empanelled by NSIL for supply and installation of Xponders	medium
Cochin Shipyard Ltd Kochi, India	partner-competitor	Deep-sea fishing vessel construction with bridge electronics specified by the yard	Vessel ₹80 lakh to ₹1.3 Cr under the Palk Bay scheme	Built 16 tuna longliner-cum-gillnetters for Tamil Nadu fishers under the Blue Revolution trawler-diversification scheme	medium
Saankhya Labs Bengaluru, India	partner-competitor	Software-defined radio and satellite terminals; MSS Xponders	Government contract pricing	Empanelled by NSIL for supply and installation of Xponders	medium
Seanav Marine and Galaxy Technocom (Onwa dealers) Panvel and Hyderabad, India	partner-competitor	Onwa GPS, AIS, radar	₹28,000 to ₹53,000 per unit	IndiaMART sellers of Onwa plotters and AIS to fishing boats	low
Upbeat Technologies Chennai, India	partner-competitor	Marine GPS, fishfinders, VHF, radar, satellite phones	Dealer margins	Samyung and Garmin dealer serving fishing harbours across Tamil Nadu, Kerala, Andhra Pradesh, Karnataka, Gujarat and Odisha per its own pages	medium

Competitor profiles

– **ABJ Impex** direct · threat high Publicly observed S85 S72

Tamil Nadu, India · Vessel monitoring system for fisheries with cellular and satellite switching, GSPS FleetPhone terminals; pilots of data-enabled satellite links off Kerala, Tamil Nadu and Karnataka with video and CCTV beyond 300 nautical miles · Not published

STRENGTHS

- Deep-sea fishing industry insider (managing director quoted by National Association of Fishermen)
- Cellular-plus-satellite VMS already built with an Oman partner

WEAKNESSES

- Small company, no published references or certifications
- Dependent on regulatory approval for data-enabled satellite service

– **em-trak** direct · threat low Publicly observed S97

United Kingdom · Stocked by regional AIS specialists; B921/B922 Class B units with Wi-Fi and Bluetooth · Not observed in India listings

STRENGTHS

- Certified Class B AIS with app connectivity

WEAKNESSES

- No India dealer evidence

– **Furuno (A. S. Moloobhoy, Master Systems)** direct · threat high Publicly observed S93 S94 S96 S86 S87

Nishinomiya, Japan · Fishing equipment stocked by A. S. Moloobhoy in Mumbai; service at Mumbai, Chennai, Kochi, Visakhapatnam and Kolkata ports; GP-39 and GP-25 units common on Indian trawlers · GP-25 ₹28,640; GP-39 ₹30,000 to ₹36,680 observed

STRENGTHS

- Strongest name among Indian trawler skippers for GPS and sonar
- Professional-grade sonar Rax does not offer

WEAKNESSES

- Component by component, no integrated safety or compartment layer
- Premium pricing on larger units

– **Garmin (AMIT International, exclusive India distributor)** direct · threat medium Publicly observed S91 S92 S86 S98

Olathe, United States; distributor in India · Garmin marine sold in India by AMIT since 2017 through garmin-india.com and dealers in fishing ports (Thoothukudi, Porbandar listings) · GPS 152 about ₹23,000; GPSMAP 585 Plus ₹45,000 to ₹48,000 observed; Striker 4 USD 131 abroad

STRENGTHS

- Brand recognition and broadest range
- Dealer and service presence in ports

WEAKNESSES

- Imported and priced above Onwa and Samyung
- No crew tags, compartment sensing or India fleet dashboard
- Satellite messenger not licensed in India

– **ICOM** direct · threat medium Publicly observed S88 S97 S45

Osaka, Japan · IC-M25 handheld VHF sold by Mumbai dealers; MA-510TR Class B AIS through regional stockists · IC-M25 ₹17,900 observed

STRENGTHS

- The default VHF brand; DSC models satisfy the draft rules' Category 2 requirement

WEAKNESSES

- Single-function; no data or monitoring

– **JRC (Japan Radio Co.)** direct · threat low Publicly observed S86 S97

Tokyo, Japan · Ship-chandler and dealer channels; JLR GPS units appear in second-hand listings · Professional tier; used units from ₹1,000 listed

STRENGTHS

- Type-approved GMDSS equipment for Category 1 vessels

WEAKNESSES

- Priced for merchant ships, not small fishing craft

– **Koden Electronics** direct · threat low Publicly observed S86

Tokyo, Japan · Available through Mumbai dealers (KGP-922 listed) · KGP-922 ₹1,00,000 observed

STRENGTHS

- Fishing-vessel specialist reputation

WEAKNESSES

- High price for a single-function unit
- Thin India presence

- **Onwa Marine Electronics (Seanav Marine, Galaxy Technocom)** direct · threat high Publicly observed S86 S87 S89

Hong Kong / Guangzhou, China · Sold through IndiaMART dealers in Panvel, Hyderabad and Jamnagar; KP-1299X five-in-one plotter with AIS and radar; KP-39A plotter with Class B+ AIS · KP-27 ₹28,000; KP-39A with AIS ₹53,000 observed; KS-200A AIS USD 208 ex-factory

STRENGTHS

- Lowest-price route to AIS and plotting in one unit
- Meets the coming AIS mandate cheaply

WEAKNESSES

- Chinese import with thin service
- No cellular or satellite link, no sensors

- **Raymarine (Teledyne FLIR)** direct · threat low Publicly observed S97

Fareham, United Kingdom · Distributor-led; AIS650 and Axiom units stocked by regional dealers · Not observed in India listings

STRENGTHS

- Integrated displays and thermal imaging

WEAKNESSES

- Leisure orientation, premium pricing

- **Samyung ENC (Upbeat Technologies, Chennai)** direct · threat medium Publicly observed S95

Busan, South Korea · Dealer network from Kasimedu to Veraval through Upbeat Technologies; NF500 plotter-fishfinder pitched for small fishing boats · Not published on the dealer page; comparable 5 inch combos sell below ₹40,000

STRENGTHS

- Value-priced Korean brand popular in Indian harbours
- Chennai dealer with coast-wide reach

WEAKNESSES

- No safety, comms or monitoring layer
- Dealer-dependent service

- **Simrad and Lowrance (Navico, Brunswick)** direct · threat low Publicly observed S97

Egersund, Norway · Distributor-led; AIS and chartplotters stocked by regional dealers · Not observed in India listings

STRENGTHS

- Broad integrated bridge range
- C-MAP charts

WEAKNESSES

- Leisure orientation; no India fisher safety features

- **Skylo Technologies** direct · threat high Publicly observed S84

Palo Alto, United States, with India operations · Launched a Tamil Nadu fishermen solution in 2021 using BSNL satellite ground infrastructure; NB-IoT over satellite · Subscription described as 'as low as a daily cup of tea'; hardware price not published

STRENGTHS

- Licensed satellite data path through BSNL
- Two-way data with sensors, not just SOS
- Fisheries programme team with industry insiders

WEAKNESSES

- No navigation display, cameras or compartment control
- Adoption at scale not evidenced after 2021 launch

- **BSNL Global Satellite Phone Service (Inmarsat IsatPhone 2)** indirect · threat medium Publicly observed S53 S54 S72 S74

New Delhi, India · The only civilian satellite voice service permitted in India; states subsidise handsets for deep-sea boats; Mangaluru and Maharashtra demand rising in 2026 · Handset ₹1,34,166 (about ₹90,000 earlier); plans ₹3,500 to ₹11,670 a month; ₹25 a minute

STRENGTHS

- Legal, proven, subsidised by states
- Voice, which fishers value most in emergencies

WEAKNESSES

- Expensive airtime, no data, drops beyond 200 nautical miles per Tamil Nadu officials

- **InCEve Electronics** indirect · threat low Publicly observed S100

Bengaluru, India · Startup building IoT sonar decision aids for fishers (2016) · Not published

STRENGTHS

- Fish-finding analytics for Indian fishers

WEAKNESSES

- No evidence of scale since 2019

- **INCOIS advisories: PFZ, GEMINI receiver and SAMUDRA app** indirect · threat medium Verified S40 S41 S39

Hyderabad, India · Daily PFZ advisories for 586 landing centres; free SAMUDRA app; GEMINI satellite receiver at ₹9,000 · Free (app); ₹9,000 (GEMINI)

STRENGTHS

- Authoritative fish-finding data DSM's 'fish data' feature competes with
- Free

WEAKNESSES

- Advisory only; no vessel hardware

– **ISRO Distress Alert Transmitter (DAT and DAT-SG) and licensed manufacturers** indirect · threat medium ● Verified S37 S38 S79

Ahmedabad, India (SAC) · Operational since 2010 with more than 20,000 in use; DAT-SG with acknowledgement, two-way messages and Bluetooth launched January 2024; technology offered to industry · About ₹12,000 a unit in Tamil Nadu's 2015 procurement

STRENGTHS

- Cheapest satellite SOS path, Coast Guard integrated
- State schemes fund it

WEAKNESSES

- No navigation, tracking or sensors; one-way in the first generation

– **Starlink (SpaceX)** indirect · threat medium ● Publicly observed S57 S99 S72

Hawthorne, United States · GMPCS licence June 2025 and Unified Licence confirmed January 2026; commercial service and maritime plans for Indian fishing vessels not available at cutoff; Tamil Nadu officials say the Centre is contemplating it · Not priced for India

STRENGTHS

- Would give data, voice and video at sea; fishers' associations are asking for exactly this

WEAKNESSES

- Not launched; terminal cost and power draw high for small boats

– **Tadum (Future Cities Company) and Middle East Scientific Equipment Corporation (Oman tracking)** indirect · threat low

● Publicly observed S111 S112

Muscat, Oman · Operators of Oman's national fishing-boat tracking system on LoRaWAN plus satellite · Not published

STRENGTHS

- National mandate covering all artisanal boats

WEAKNESSES

- Closed system; entry only through the operator

– **Tamil Nadu VHF network (ELCOT) and state satellite phone scheme** indirect · threat medium ● Publicly observed S108 S77 S78 S76

Chennai, India · 5 W handhelds free, 25 W fixed VHF at 90 percent subsidy with leased towers; satphones at 75 percent subsidy for deep-sea clusters · ₹18,000 (25 W VHF), ₹1.05 lakh (satphone) unit costs

STRENGTHS

- Free or near-free to the fisher; institutional habit

WEAKNESSES

- Voice only, limited range, no tracking

– **Visma Consulting (Sri Lanka VMS)** indirect · threat low ● Publicly observed S114 S113

Denmark · Supplied VMS transponders for Sri Lanka's multi-day boats in 2022 · Not published

STRENGTHS

- Incumbent in the Sri Lanka mandate

WEAKNESSES

- No India presence

– **Do nothing beyond the mandatory handheld VHF** substitute · threat high ● Verified S45 S78

Not applicable · The draft rules require only a hand-portable VHF for Category 4 boats (under 24 m inside territorial waters) · ₹5,000 to ₹18,000

STRENGTHS

- Cheapest compliant option for most boats

WEAKNESSES

- No tracking, no SOS beyond VHF range, no monitoring

– **Generic Chinese GPS, AIS and fishfinder imports (Alibaba)** substitute · threat medium ● Publicly observed S89 S86

Guangzhou and Shenzhen, China · Imported by small traders and sold on IndiaMART; some listed at ₹1,500 to ₹15,000 · USD 100 to 600 ex-factory

STRENGTHS

- Undercuts every branded unit

WEAKNESSES

- No warranty, no ETA or type approval, no service

– **ISRO/NSIL Vessel Communication and Support System (MSS Xponder and Nabhmitra app)** substitute · threat high

● Verified S24 S34 S31 S32 S26

Bengaluru, India · National programme: 49,000-plus transponders installed by February 2026 against one lakh planned across 13 coastal states and UTs; NSIL maintains for two years · Free to eligible fishers; about ₹35,000 a unit paid 60:40 by Centre and state

STRENGTHS

- Zero cost to the fisher and installed at scale
- Backed by ISRO satellites, INCOIS hub and state control rooms
- Meets the draft rules' VMS requirement

WEAKNESSES

- Messaging only, no navigation display, sensors, cameras or engine data
- Field problems reported: units not functional in some fleets, water ingress in Dakshina Kannada
- Requires a phone and app; no fleet dashboard for private owners

–	MSSRF Fisher Friend Mobile Application substitute · threat medium Publicly observed S42	
	Chennai, India · Free multilingual app used along the Indian coast · Free	
	STRENGTHS	WEAKNESSES
	Already on fishers' phones in eight languages	Works only within mobile coverage; no hardware
–	Smartphone with free charts and WhatsApp inside coverage substitute · threat medium Inferred	
	Not applicable · Universal on Indian boats; coverage two to twelve nautical miles by official and press accounts · Zero incremental	
	STRENGTHS	WEAKNESSES
	Free and familiar	Coverage ends a few nautical miles out; no SOS beyond it
–	A. S. Moloobhoy partner-competitor · threat medium Publicly observed S93	
	Mumbai, India · Marine electronics house stocking Furuno fishing equipment; safety equipment and service across ports · Dealer margins	
	STRENGTHS	WEAKNESSES
	Could distribute or install DSM on the west coast	Represents competing brands
–	Accord Software & Systems partner-competitor · threat medium Publicly observed S34 S36	
	Bengaluru, India · Empanelled by NSIL for supply and installation of Xponders; developer of the Nabhmitra Android app · Government contract pricing, about ₹35,000 a unit installed	
	STRENGTHS	WEAKNESSES
	- Deep NavIC receiver capability and ISRO relationships - Owns the app fishers already use	- No onboard sensing, cameras or fleet software for private owners - Dependent on programme volumes
–	Amit GPS & Navigation LLP (AMIT International) partner-competitor · threat low Publicly observed S91	
	Mumbai, India · Garmin's exclusive India distributor with an online store and dealer locator · Distributor margins	
	STRENGTHS	WEAKNESSES
	Coast-wide dealer network and service	Tied to Garmin
–	Avantel Ltd partner-competitor · threat medium Publicly observed S34	
	Hyderabad, India · Empanelled by NSIL for supply and installation of Xponders · Government contract pricing	
	STRENGTHS	WEAKNESSES
	- Listed satcom manufacturer with ISRO and defence heritage - Installation experience on fishing boats through VCSS	- No integrated bridge or compartment product - Focus on government and defence contracts
–	Cochin Shipyard Ltd partner-competitor · threat medium Publicly observed S105 S107	
	Kochi, India · Built 16 tuna longliner-cum-gillnetters for Tamil Nadu fishers under the Blue Revolution trawler-diversification scheme · Vessel ₹80 lakh to ₹1.3 Cr under the Palk Bay scheme	
	STRENGTHS	WEAKNESSES
	Specifies electronics for every new deep-sea vessel it builds	Buys from established marine brands; Rax has no yard reference
–	Saankhya Labs partner-competitor · threat medium Publicly observed S34	
	Bengaluru, India · Empanelled by NSIL for supply and installation of Xponders · Government contract pricing	
	STRENGTHS	WEAKNESSES
	- Radio and satellite terminal design capability - Programme volumes	No fishing-vessel monitoring product beyond the terminal
–	Seanav Marine and Galaxy Technocom (Onwa dealers) partner-competitor · threat low Publicly observed S86 S87	
	Panvel and Hyderabad, India · IndiaMART sellers of Onwa plotters and AIS to fishing boats · ₹28,000 to ₹53,000 per unit	
	STRENGTHS	WEAKNESSES
	Know the AIS mandate demand and the price ceiling fishers accept	Small traders with limited installation capacity

– **Upbeat Technologies** partner-competitor · threat medium Publicly observed 595

Chennai, India · Samyung and Garmin dealer serving fishing harbours across Tamil Nadu, Kerala, Andhra Pradesh, Karnataka, Gujarat and Odisha per its own pages
· Dealer margins

STRENGTHS

- Chennai base with harbour customers; a natural DSM installer partner

WEAKNESSES

- Represents competing brands
-

07 Pricing and unit economics

KEY TAKEAWAYS

- Thirty-three observed price points put the fisher's ladder at ₹0 (transponder), ₹18,000 (VHF), ₹23,000 to ₹53,000 (plotters, some with AIS), ₹1.34 lakh (satphone) and ₹5,835 a month for airtime. Publicly observed S86 S88 S53 Verified S24
- DSM's ₹50,000 boat tier sits above the ₹35,000 PMMSY tracking-device ceiling and roughly at the price of a plotter with AIS; the ₹2.5 lakh vessel tier is above any single device a fisher buys. Verified S21 Rax-supplied S7
- The scheme money that can touch DSM is the ₹1 lakh safety kit (₹40,000 or ₹60,000 assistance) and Tamil Nadu's ₹2 lakh kit, not the tracking-device line. Verified S21 S81
- Recurring costs (airtime, hosting, harbour service) are unpriced by Rax; BSNL's ₹25 a minute shows what fishers already tolerate and resent. Publicly observed S53 S72 Unknown
- Tender pricing is set by NSIL and states at about ₹35,000 a transponder installed, with two-year maintenance included; any programme bid must be built from that number. Publicly observed S31 Verified S27

Observed price points

CATEGORY	ITEM	PRICE	WHERE SEEN	SOURCE
GPS plotters	Onwa KP-27 7 inch	₹28,000	Jamnagar dealer, IndiaMART	S86
GPS plotters	Furuno GP-39	₹30,000 to ₹36,680	Bhavnagar and Navi Mumbai dealers	S86
GPS plotters	Furuno GP-25	₹28,640	Navi Mumbai dealer	S87
GPS plotters	Garmin GPSMAP 585 Plus	₹45,000	Thoothukudi dealer	S86
GPS plotters	Garmin GPS 152	₹23,000	Porbandar dealer	S86
GPS plotters	Koden KGP-922	₹1,00,000	Mumbai dealer	S86
AIS and tracking	Onwa KP-39A plotter with Class B+ AIS	₹53,000	Hyderabad dealer	S86
AIS and tracking	Onwa KS-200A Class B AIS, ex-factory	USD 208	Alibaba	S89
AIS and tracking	VCSS Xponder, government-paid	₹35,000	Goa Fisheries Department	S31
AIS and tracking	ISRO DAT, 2015 procurement	₹12,000	Tamil Nadu, 30,000 units	S79
AIS and tracking	INCOIS GEMINI receiver	₹9,000	INCOIS launch	S39
VHF and satellite	ICOM IC-M25 handheld VHF	₹17,900	Mumbai dealer	S88
VHF and satellite	25 W fixed VHF, scheme unit cost	₹18,000	Tamil Nadu (90 percent subsidy)	S77
VHF and satellite	BSNL IsatPhone 2	₹1,34,166	BSNL	S53
VHF and satellite	BSNL GPS plan, 30 minutes	₹5,835 a month	BSNL, Lok Sabha reply	S53
VHF and satellite	BSNL extra minute or SMS	₹25	BSNL	S53
Kits and ceilings	Tamil Nadu safety kit	₹2,00,000	State scheme unit cost	S81
Kits and ceilings	PMMSY tracking device	₹35,000	Item 60 ceiling	S21
Kits and ceilings	PMMSY safety kit	₹1,00,000	Item 61 ceiling	S21
Rax	DSM boat tier, from	₹50,000	Sales deck	S2, S7
Rax	DSM vessel tier, from	₹2,50,000	Sales deck	S2, S7

Publicly observed S86 S87 S89 S31 S79 S39 S88 S77 S53 Verified S81 S21 Rax-supplied S2 S7

The full set of thirty-three points with dates and URLs is in the data file. Two features of the ladder matter. Every point below ₹55,000 is a single device, and every point above it is either a satphone or a scheme kit. Nothing in the market is priced like DSM's vessel tier except a full state safety kit at ₹2 lakh, which bundles GPS, VHF, DAT, echo-sounder, fish finder, battery and beacon from several brands. Verified S81 Publicly observed S86 S53

Inferred

Rax's current pricing and its inconsistencies

The approved facts are "from ₹50,000 for fishing boats" and "from ₹2.5 lakh for fishing vessels", "priced after a vessel assessment", with "connectivity, weather, fish intelligence and fleet-monitoring services scoped to the modules and coverage you choose". Three inconsistencies need fixing. The government deck cites a "per-boat benchmark: ₹364 Cr / 1,00,000 vessels", which is ₹36,400 and below DSM's own entry price; it should either be dropped or used to justify a sub-₹35,000 configuration. The sales deck promises "40 to 60 percent subsidy on eligible deep-sea vessel and modernisation costs" next to the DSM tiers, which implies DSM is eligible; it is not a listed item. The investor deck's ₹2,185 Cr TAM uses superseded fleet counts. None of the decks prices airtime, hosting or service. ● Rax-supplied | S2 | S3 | S4 | S7 ● Verified | S21 | S24 ● Recommendation

Price architecture options

OPTION	STRUCTURE	FITS	RISK
A. Hardware plus annual service	₹50,000 or ₹2.5 lakh up front; ₹6,000 to ₹15,000 a year for airtime, dashboard and one harbour visit	Fishing companies; yards	Owners resist recurring fees; BSNL airtime pass-through
B. Programme unit price	₹35,000 to ₹45,000 installed with two-year maintenance, matching VCSS norms	State and NSIL tenders	Requires MTCTE and a sub-supplier position; margin thin
C. Safety-kit component	DSM boat tier scheduled inside a ₹1 lakh or ₹2 lakh kit at 40 to 60 percent assistance	Owner-operators in TN, KL	Needs a state ruling; Rax competes with GPS and VHF brands inside the kit
D. Fleet subscription	₹2.5 lakh hardware financed over 24 months plus ₹1,500 a month per vessel	Multi-boat owners with KCC access	Receivables risk; Rax has no financing partner

Option A is the only one Rax can execute alone in 2026-27 and the one the validation trial should test. Option B is the volume route and depends on certificates. Option C is the route the deck promises and the least under Rax's control. Option D is how satphone airtime already works and would be familiar to buyers. ● Verified | S21 | S27 | S31 ● Publicly observed | S53 ● Recommendation

Cost to serve and margin hypotheses

No bill of materials, unit cost, airtime tariff or service cost exists in the record; margin is Unknown. What the plan needs: a boat tier that carries at least 40 percent gross margin after a ₹5,000 installation and a ₹3,000 a year service reserve, and a vessel tier at 45 percent, because the harbour partner will expect 15 to 20 percent and one warranty visit to a boat 300 km from Chennai costs a day. The VCSS vendor's replacement of 2,067 units in one district shows the tail risk of salt damage; a 5 percent annual replacement reserve is prudent. Satellite airtime is a pass-through unless Rax resells a Skylo or BSNL plan with a margin. ● Rax-supplied | S6 ● Publicly observed | S32 | S53 ● Unknown ● Recommendation

Subsidy and scheme effects on effective price

Under item 60 the fisher's assistance is capped at ₹14,000 (general) or ₹21,000 (SC/ST/women) whatever the device costs, so a ₹50,000 boat tier accepted as a tracking device would cost the fisher ₹36,000 or ₹29,000; under item 61 a ₹1 lakh kit that included DSM would cost ₹60,000 or ₹40,000 for the whole kit; Tamil Nadu's ₹2 lakh kit follows its own funding pattern. The transponder itself is free. The deck's "₹20,000 to ₹30,000 after subsidy" is therefore only right if the state schedules DSM in a kit and the fisher belongs to the 60 percent category. ● Verified | S21 | S81 | S24 ● Estimated | S7

Tender pricing dynamics

NSIL's battery RFP shows the shape of programme procurement: an RFP with volumes across nine states and four UTs, bidder eligibility on turnover, net worth and Indian manufacturing addresses subject to audit, and L1 selection. Transponder supply and installation went to three empanelled firms at about ₹35,000 a unit including two-year maintenance. State tenders for VHF and DATs have run at ₹12,000 to ₹18,000 a unit. GeM listings for fisheries procurement exist but no open bid for integrated vessel systems was found. Price discovery for DSM in a tender therefore starts at ₹35,000 installed for anything that competes with the Xponder and at ₹1 lakh to ₹2 lakh for a kit. ● Verified | S35 | S27 ● Publicly observed | S31 | S79 | S77 | S109 ● Unknown

Payment terms and receivable risk

Fishing companies pay on delivery or through KCC-backed bank finance (5,01,900 KCCs, ₹5 lakh limit); owner-operators pay in instalments tied to the season and default when the catch fails or fuel spikes, as the June 2026 tie-up shows; state programmes pay 60 to 180 days after installation and inspection; NSIL pays its suppliers on milestones. Rax's e-surveillance receivable history, including an insolvent customer, argues for advance payment on hardware and monthly service billing in the private segments. ● Verified | S18 ● Publicly observed | S67 ● Rax-supplied | S6 ● Recommendation

SO WHAT FOR RAX

Price the boat tier at or below ₹35,000 installed for anything sold alongside the transponder, keep the vessel tier for companies who already pay ₹1.34 lakh for a phone, and publish a per-vessel service price before the first trial; without those three numbers the decks are selling a product that cannot be quoted. ● Recommendation

GPS chartplotters and fish finders

8 · ₹23,000 to ₹1,00,000

AIS and satellite tracking

5 · ₹9,000 to ₹53,000

VHF and satellite voice and data

7 · ₹25 to ₹1,34,166

Safety kits and scheme ceilings

5 · ₹11,000 to ₹15,00,000

Integrated vessel system (Rax)

3 · ₹36,000 to ₹2,50,000

₹10 ₹100 ₹1,000 ₹10,000 ₹1 L ₹10 L ₹1 Cr

● Rax ● Observed market price — Observed range

Log scale, INR. Hover or tap a point for item, vendor, basis and date; every point is listed in the table below.

CATEGORY	ITEM	PRICE	BASIS	EVIDENCE
AIS and satellite tracking	Onwa KS-33R AIS man-overboard personal locator (ex-factory) Alibaba sellers via Accio	USD 100 per tag, before duty and margin	observed 2025-12-31	Publicly observed S89
AIS and satellite tracking	Onwa KS-200A Class B AIS transceiver (ex-factory) Alibaba sellers via Accio	USD 208 per unit, before duty and margin	observed 2025-12-31	Publicly observed S89
AIS and satellite tracking	Onwa KP-1299A 12 inch plotter with Class B+ AIS (ex-factory) Alibaba sellers via Accio	USD 600 per unit, before duty and margin	observed 2025-12-31	Publicly observed S89
AIS and satellite tracking	INCOIS GEMINI ocean-state and PFZ receiver INCOIS / AAI	₹9,000 per device	published 2019-10-10	Publicly observed S39
AIS and satellite tracking	ISRO Distress Alert Transmitter (Tamil Nadu procurement of 30,000 at ₹36 Cr) Tamil Nadu Fisheries Department	₹12,000 per unit	estimated 2016-01-09	Estimated S79
AIS and satellite tracking	VCSS MSS Xponder (government-paid, free to fisher) NSIL programme, per Goa Fisheries Department	₹35,000 per unit installed	quoted 2026-03-17	Publicly observed S31
AIS and satellite tracking	VCSS all-in programme cost per vessel (₹364 Cr over one lakh vessels) Department of Fisheries	₹36,400 per vessel including earth station and app	modelled 2026-02-10	Estimated S24
AIS and satellite tracking	Onwa KP-39A 7 inch plotter with Class B+ AIS transponder Galaxy Technocom, Hyderabad (IndiaMART)	₹53,000 per unit	observed 2026-09-15	Publicly observed S86
GPS chartplotters and fish finders	Garmin Striker 4 fishfinder with transducer (United States benchmark) Amazon.com	USD 130.99 per unit	published 2026-09-15	Publicly observed S90

CATEGORY	ITEM	PRICE	BASIS	EVIDENCE
GPS chartplotters and fish finders	Garmin GPS 152 marine Navrang Marine, Porbandar (IndiaMART)	₹23,000 per unit	observed 2026-09-15	Publicly observed S86
GPS chartplotters and fish finders	Onwa KP-27 7 inch GPS chartplotter Mahamai Marine, Jamnagar (IndiaMART)	₹28,000 per unit	observed 2026-09-15	Publicly observed S86
GPS chartplotters and fish finders	Furuno GP-25 GPS navigator Navi Mumbai seller (IndiaMART)	₹28,640 per unit	observed 2026-09-15	Publicly observed S87
GPS chartplotters and fish finders	Furuno GP-39 GPS navigator Aarfa Marine, Bhavnagar (IndiaMART)	₹30,000 per unit	observed 2026-09-15	Publicly observed S86
GPS chartplotters and fish finders	Furuno GP-39 GPS navigator Nakhwa International, Navi Mumbai (IndiaMART)	₹36,680 per unit	observed 2026-09-15	Publicly observed S86
GPS chartplotters and fish finders	Dharmi Marine 7 inch GPS plotter and fish finder Dharmi Marine, Bhavnagar (IndiaMART)	₹40,000 per unit	observed 2026-09-15	Publicly observed S86
GPS chartplotters and fish finders	Garmin GPSMAP 585 Plus Banu Communications, Thoothukudi (IndiaMART)	₹45,000 per unit	observed 2026-09-15	Publicly observed S86
GPS chartplotters and fish finders	Koden KGP-922 GPS navigator Meeres Master Systems, Mumbai (IndiaMART)	₹1,00,000 per unit	observed 2026-09-15	Publicly observed S86
Integrated vessel system (Rax)	DSM boat tier net of PMMSY item-60 assistance if accepted as a tracking device (₹50,000 less ₹14,000 general-category cap) Rax Tech International (modelled)	₹36,000 effective price to a general-category fisher	modelled 2026-09-15	Estimated S21 S7
Integrated vessel system (Rax)	DSM fishing-boat configuration (from) Rax Tech International	₹50,000 per boat, from	published 2026-07-11	Rax-supplied S2 S7
Integrated vessel system (Rax)	DSM fishing-vessel configuration (from) Rax Tech International	₹2,50,000 per vessel, from	published 2026-07-11	Rax-supplied S2 S7
Safety kits and scheme ceilings	PMMSY item 63: PFZ device including installation and maintenance Department of Fisheries, PMMSY	₹11,000 per device	published 2020-09-15	Verified S21
Safety kits and scheme ceilings	PMMSY item 60: communication and/or tracking device (VHF/DAT/NavIC/transponder) unit cost ceiling Department of Fisheries, PMMSY	₹35,000 per device, assistance ₹14,000 general or ₹21,000 SC/ST/women	published 2020-09-15	Verified S21
Safety kits and scheme ceilings	PMMSY item 61: safety kit for traditional and motorised vessels unit cost ceiling Department of Fisheries, PMMSY	₹1,00,000 per kit, assistance ₹40,000 or ₹60,000	published 2020-09-15	Verified S21

CATEGORY	ITEM	PRICE	BASIS	EVIDENCE
Safety kits and scheme ceilings	Safety kit for a fishing boat (GPS, comms, echo-sounder, DAT, VHF, fish finder, battery, SAR beacon) Tamil Nadu Fisheries Department scheme unit cost	₹2,00,000 per kit	published 2026-09-15	 Verified S81
Safety kits and scheme ceilings	PMMSY item 56: upgradation of existing fishing vessel for export competency Department of Fisheries, PMMSY	₹15,00,000 per vessel, assistance ₹6 lakh or ₹9 lakh	published 2020-09-15	 Verified S21
VHF and satellite voice and data	Starlink Roam Ocean Mode data (not available in India) Starlink	USD 6 per GB	published 2026-09-08	 Publicly observed S99
VHF and satellite voice and data	BSNL GSPS additional voice minute or SMS BSNL GSPS	₹25 per minute or message	published 2026-02-11	 Publicly observed S53
VHF and satellite voice and data	WPC licence fee paid by fisher for a free 5 W VHF set Tamil Nadu Fisheries Department	₹500 per set	published 2018-01-10	 Publicly observed S78
VHF and satellite voice and data	BSNL GSPS cheapest commercial plan (30 minutes or SMS) BSNL GSPS	₹5,835 per month excl. GST	published 2026-02-11	 Publicly observed S53
VHF and satellite voice and data	ICOM IC-M25 handheld marine VHF Mintaka Electronics, Mumbai (IndiaMART)	₹17,900 per unit	observed 2026-09-15	 Publicly observed S88
VHF and satellite voice and data	25 W fixed marine VHF (Tamil Nadu scheme unit cost, 90 percent subsidy) Tamil Nadu Fisheries Department	₹18,000 per unit	published 2021-01-01	 Publicly observed S77
VHF and satellite voice and data	Satellite phone unit cost in Tamil Nadu deep-sea cluster scheme (75 percent subsidy) Tamil Nadu Fisheries Department	₹1,05,000 per phone	published 2021-01-01	 Publicly observed S77
VHF and satellite voice and data	BSNL Inmarsat IsatPhone 2 handset BSNL GSPS	₹1,34,166 per handset incl. taxes	published 2026-07-10	 Publicly observed S53

KEY TAKEAWAYS

- Five routes fit two salespeople: direct to fishing companies, harbour dealer-installers, NSIL and its Xponder suppliers, state safety-kit schemes, and yards; marketplaces and Gulf Connect come later. Rax-supplied S6 Verified S34 S81
- Programme procurement runs through NSIL RFPs and state district officers with eligibility on certificates, turnover and manufacturing audits; Rax can enter only as a sub-supplier or a kit component until certified. Verified S35 S21
- Twenty-three named intermediaries are assessed; the three that matter first are a Chennai dealer-installer, an Xponder supplier and one boat-owner association. Publicly observed S95 S69 S72 Verified S34
- Buyers find suppliers through harbour word of mouth, department seminars (11 seminars, 4,000 participants) and IndiaMART; Rax's inbound already comes from Google and IndiaMART. Verified S25 Rax-supplied S6
- Channel partners with their own sales teams failed for Rax before; a paid installer-servicer is a different contract and is re-proposed for that reason. Rax-supplied S6 Recommendation

Routes to market

Direct enterprise: fishing companies and multi-boat owners in Mangaluru, Kochi, Kasimedu, Thoothukudi and Visakhapatnam, reached through the associations and BSNL's own satphone demand lists; cycle one season; Rax must provide a demo boat, a trial contract, and a shore dashboard. Existing-account expansion: none of Rax's e-surveillance accounts fish, but FUJI and the OEM design business show Rax can sell a customised controller to an industrial buyer; a yard is the closest analogue. OEM and white-label: an Xponder supplier or a satellite operator could sell DSM's SBUs and dashboard under its own name; Accord, Avantel, Saankhya and Skylo are the candidates. System integrators and dealers: Upbeat Technologies (Chennai), A. S. Moloobhoy (Mumbai), Seanav Marine (Panvel) and Galaxy Technocom (Hyderabad) already install navigation units on fishing boats. Tenders and GeM: NSIL RFPs, state fisheries tenders for kits, VHF, DATs and satphones, and GeM listings. Government schemes: PMMSY items 60, 61, 55 and 56 sanctioned by district Assistant Directors, and Tamil Nadu's ₹2 lakh safety kit. Associations and cooperatives: the All Kerala Fishing Boat Operators Association, the National Association of Fishermen, the Odisha Marine Fish Producers Association, Matsyafed, GFCCA and the Maharashtra federation. Marketplaces: IndiaMART, where every competing plotter is listed and where Rax's inbound already originates. Export through group entities: Gulf Connect for Oman's tracking programme, deferred. The route diagram after this section shows the intermediaries and the proof each needs. Rax-supplied S6

Verified S34 S35 S21 S81 Publicly observed S95 S93 S87 S86 S69 S72 S67 S102 S104 S111

Intermediaries assessed

INTERMEDIARY	ROLE	WHAT RAX MUST PROVIDE	EVIDENCE IT WORKS IN THIS CATEGORY
Upbeat Technologies, Chennai	Dealer-installer, Samyung and Garmin, harbours TN to GJ	Margin, spares, training, demo unit	Sells to fishing harbours today [S95]
A. S. Moloobhoy, Mumbai	Furuno stockist, marine safety house, west coast	Same, plus type-approval evidence	Installs Furuno on trawlers [S93]
Master Systems	Furuno service at five ports	Service subcontract	Port service network [S94]
Seanav Marine, Galaxy Technocom	Onwa dealers, Panvel and Hyderabad	Bundle DSM with their AIS plotters	AIS demand ahead of mandate [S86, S87]
Amit GPS & Navigation (Garmin)	Exclusive Garmin distributor	Unlikely partner; competitor channel	Coast-wide dealers [S91]
Accord Software & Systems	Xponder supplier, Nabhmitra developer	Interface spec, joint bid	NSIL empanelment [S34, S36]
Avantel	Xponder supplier	Joint bid or OEM	NSIL empanelment [S34]
Saankhya Labs	Xponder supplier	Joint bid or OEM	NSIL empanelment [S34]
NSIL	VCSS implementing agency	MTCTE, ETA, audited accounts	Runs RFPs with eligibility gates [S35]
Skylo	Licensed satellite NB-IoT	Airtime agreement	Fisher product via BSNL [S84]
BSNL GSPS	Licensed satellite voice	Reseller or bundle	State-subsidised satphones [S53, S74]
Tamil Nadu Fisheries Department	Safety kit, VHF, satphone, transponder schemes	Written eligibility, demo	₹2 lakh kit; 1,645 transponders [S81, S30]
Kerala Fisheries Department	DAT and VHF tenders; call centre	Tender-ready product	₹9 Cr tender 2019 [S80]
Karnataka, Goa, AP, Odisha, WB departments	VCSS installation and state schemes	Same	Installation records [S32, S31, S33, S35]
District Assistant Directors of Fisheries	Sanction PMMSY beneficiary items	Item on the list	Application route in TN [S81]
All Kerala Fishing Boat Operators Association	Owner association, Kochi	Pilot boats, references	Speaks for fleet costs [S69, S82]

INTERMEDIARY	ROLE	WHAT RAX MUST PROVIDE	EVIDENCE IT WORKS IN THIS CATEGORY
National Association of Fishermen, TN	Deep-sea owners' voice	Pilot boats, DoT petition alignment	Petitioned for data at sea [S72]
Odisha Marine Fish Producers Association	Paradip owners	Later phase	Organised the 2026 strike [S67]
Matsyafed, GFCCA, Maharashtra federation	Cooperative credit and inputs	Financing of boat tier	Diesel and OBM channels [S102, S104]
Cochin Shipyard	Deep-sea vessel builder	Yard specification	16 longliners built [S105]
FRP yards, Nagapattinam and Cuddalore	New FRP boats ₹3 to ₹4 lakh	Boat-tier fitment kit	Active yards [S106, S81]
ABJ Impex	VMS vendor, industry insider	Partner or rival	Pilots beyond 300 nm [S85, S72]
Gulf Connect, Muscat	Group entity for Oman	Reference in India first	One OEM client, no marine sales [S6, S111]

Publicly observed

S95

S93

S94

S86

S87

S91

S84

S53

S74

S69

S82

S72

S67

S102

S104

S105

S106

S85

S111

Verified

S34

S36

S35

S81

S30

S80

S32

S31

S33

Rax-supplied

S6

Procurement mechanics

Three mechanisms exist. Beneficiary schemes: the fisher applies at the district Assistant Director's office with ownership certificate, ReALCraft registration, fishing licence and biometric ID; the state assesses "specific and essential requirement of items" for the vessel; assistance is released after verification. Only listed items with unit-cost ceilings qualify, which is why DSM must be scheduled inside a kit or priced under ₹35,000 as a tracking device. Central programme procurement: NSIL issues RFPs (the battery RFP asks for turnover, net worth, share capital and manufacturing addresses for audit) and empanels suppliers; states execute installation through their departments and monitoring centres. State tenders: fisheries directorates tender VHF, DATs and satphones on e-procurement portals with L1 selection; NFDB and GeM carry fisheries procurement. Pilot-to-scale paths in this sector are real: Tamil Nadu's 507-boat transponder trial preceded its ₹18.01 Cr mechanised programme, and Odisha's court-driven request preceded the national rollout. Empanelment with NSIL or a state, not a one-off tender, is the target.

Verified

S81

S21

S35

S30

S33

Publicly observed

S109

S110

Recommendation

What Rax tried before and why this differs

Rax's digital marketing agencies and channel partners with their own sales teams both failed for the e-surveillance business, and referrals are dead by the sales lead's account. The harbour dealer-installer proposed here is not a sales channel: it is paid per installation and per service visit, sells nothing, and exists because a boat 300 km from Chennai cannot be serviced from Medavakkam. The association route differs from a channel partner because the association is the buyer's own institution and handles the paperwork it already handles for VHF and satphone subsidies. The NSIL route differs because the buyer is a single agency with published RFPs. Each re-proposal is stated with its reason.

Rax-supplied

S6

Verified

S35

S81

Recommendation

Sales motion and enablement

Two people can run three harbours and one programme conversation. The motion is: identify ten multi-boat operators per harbour from association lists and BSNL satphone demand; demonstrate on one instrumented boat; sign a paid validation trial with an SOS drill, route logging and fuel baseline protocol; install in the ban window; report at season end; convert to a second-season order and a written reference. Proof assets needed before the first demonstration: a one-page legality note naming the satellite path and licences, ETA certificates for the tags, a test report for water and vibration, a service price, and an interface note showing how DSM reads the Xponder. The pilot design is in the strategy section. Reference-building given the quality history means one boat done well before ten, and a named champion in each association.

Rax-supplied

S6

Verified

S50

S45

S34

Recommendation

Marketing that matches how buyers find suppliers

Buyers in this category find suppliers at the harbour, at department seminars and on IndiaMART. The Department of Fisheries and ISRO have run eleven seminars and workshops on space technology in fisheries with more than 4,000 participants and a Mumbai session of 300 fishers, officials and boat owners; those rooms are where DSM should be demonstrated. IndiaMART is where every competing plotter is priced and where Rax's inbound already arrives; a DSM listing in the buyer's nouns (GPS, AIS, transponder-compatible, safety kit) is cheap. Associations' WhatsApp groups and harbour notice boards carry news of every capsizing and seizure; a working reference boat will travel through them faster than any advertisement. Digital marketing agencies should not be re-engaged.

Verified

S25

Rax-supplied

S6

Publicly observed

S86

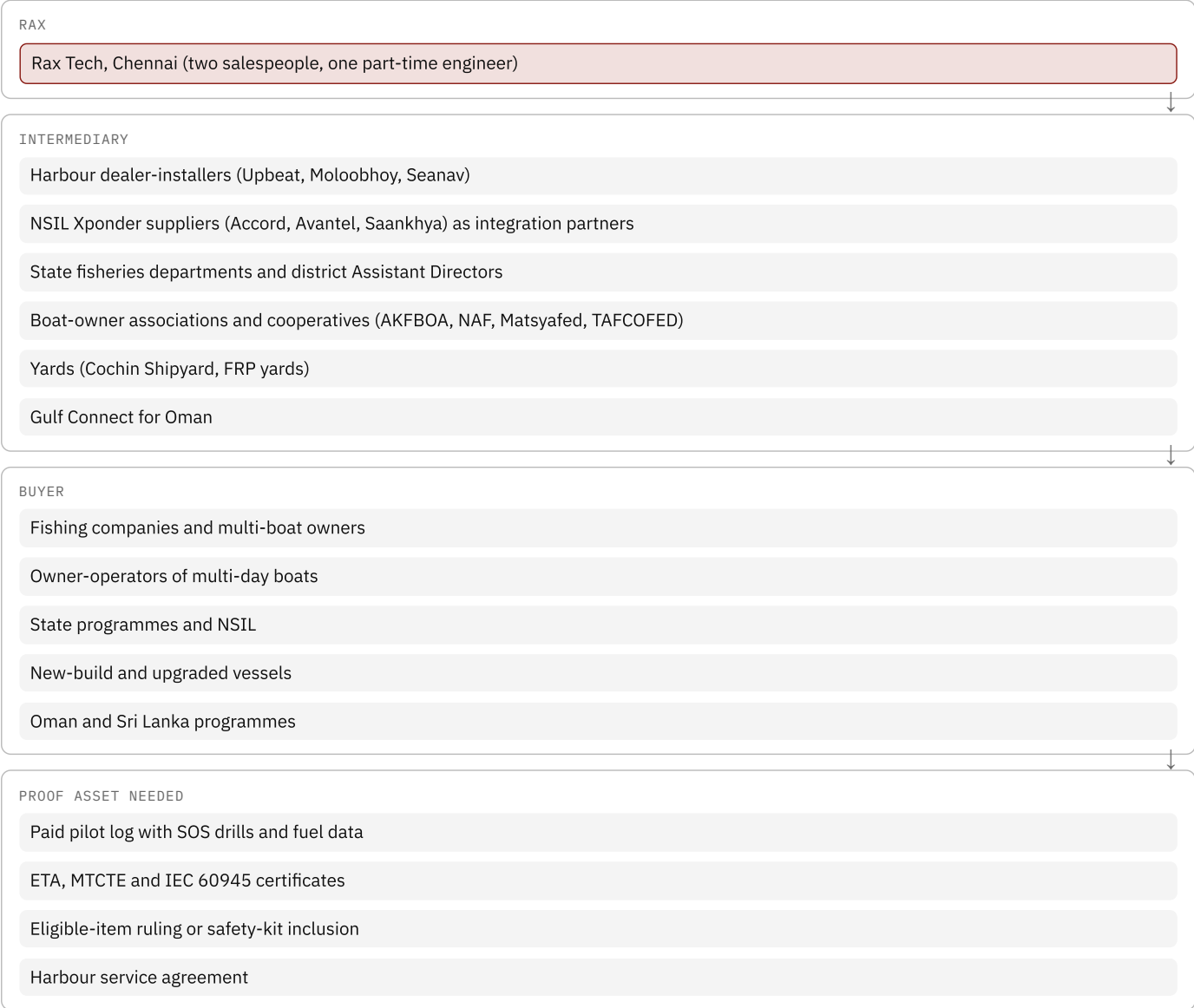
Recommendation

SO WHAT FOR RAX

The route with the shortest cycle and the lowest paperwork is a fishing company that already pays for a satphone; the route with the most volume is NSIL through an empanelled supplier; Rax should run the first now and qualify for the second by certification, and not spend a rupee on retail selling to single-boat owners in year one.

Recommendation

Routes to market that fit two salespeople in Chennai



Rax sells to fleet owners directly and through harbour partners, enters programmes through NSIL's suppliers or state tenders, and reaches yards through PMMSY vessel schemes; each route needs a different proof asset. Inferred

KEY TAKEAWAYS

- Tamil Nadu ranks first (88): the largest fleet within a day's drive, the sharpest border incidents, a ₹2 lakh safety kit and its own transponder programme. ● Verified S9 S30 S81 S60
- Kerala (74), Karnataka (66), Puducherry (62) and Andhra Pradesh (60) complete the reachable arc; Gujarat has the largest fleet but no service path from Chennai. ● Verified S9 S18 ● Publicly observed S26
- Export options are closed programmes: Sri Lanka's VMS mandate has an incumbent supplier, Oman's national system runs through Tadam; neither admits a new device without operator approval. ● Publicly observed S113 S114 S111
- The July 2026 Saudi research for iibdaei contains no marine content and offers nothing to reuse here. ● Rax-supplied S6
- Sequence: Chennai to Cuddalore first, Kochi and Mangaluru second, Visakhapatnam and the west coast only with a partner. ● Recommendation

India: state ranking

The tile map after this section scores thirteen coastal states and UTs from 0 to 100 on five weighted inputs: mechanised fleet (30 percent, 2016 census), PMMSY central funds released to 2024-25 (20 percent), VCSS transponders allocated as a proxy for programme activity (20 percent), incident and border pressure (15 percent) and service reach from Chennai (15 percent). The weights are the researcher's; the inputs are primary and are listed below.

● Verified S9 S18 ● Publicly observed S26 ● Estimated S60 S62

STATE	MECHANISED CRAFT 2016	PMMSY CENTRAL RELEASED ₹ CR	VCSS ALLOCATED (MECH/MOT)	PRESSURE	SCORE
Tamil Nadu	5,961	153.9	0 / 7,373 plus own 1,645	526 arrests 2024	88
Kerala	3,800	344.2	3,352 / 2,648	Ockhi; 2026 capsizings	74
Karnataka	3,780	295.0	4,646 / 1,091	Transponder replacement; satphone demand	66
Puducherry	301	61.2	582 / 2,465	Karaikal arrests	62
Andhra Pradesh	1,176	430.1	1,620 / 2,864	Vizag lost contact 2026	60
Gujarat	14,061	103.7	1,632 / 8,600	1,173 boats in Pakistan	56
Maharashtra	5,867	304.5	7,913 / 4,047	Alibaug capsizing 2025	50
Goa	858	47.7	859 / 1,000 approved	65 percent fitted	46
Odisha	1,748	347.3	1,733 / 350	2026 diesel strike	44
West Bengal	4,014	55.1	3,553 / 5,091	Units not functional reports	36
Daman and Diu	1,419	1.8	1,625 / 130		30
Andaman and Nicobar	not in table	12.0	113 / 1,561		28
Lakshadweep	not in table	14.4	0 / 810		16

● Verified S9 S18 S60 ● Publicly observed S26 S30 S31 S32 S62 S64 S65 S66 S67 S74 S123 S61

VCSS allocations are unstable between documents: NSIL's October 2024 battery RFP lists 10,961 motorised boats for Karnataka and 1,000 for Kerala, against 1,091 and 2,648 in the February 2025 state-wise data used in the table, so the allocation column is a proxy for programme activity, not a fixed plan. ● Verified S35 ● Publicly observed S26

Tamil Nadu leads on every input but scheme releases. It has 349 landing centres, 575 villages and 7.96 lakh fisherfolk; its owners lose boats to Sri Lanka every month; the state gives VHF free, subsidises satphones and prices a ₹2 lakh kit; it fitted 507 trial transponders before the national programme and is spending ₹18.01 Cr on its own; Kasimedu is thirty minutes from Medavakkam and Cuddalore two hours. Kerala combines the second-largest reachable mechanised fleet, the highest central releases in the south after Andhra Pradesh, the strongest associations and the Ockhi memory. Karnataka has the clearest evidence of paying demand from fishing companies and the clearest evidence of transponder failure. Puducherry is small but adjacent and shares Tamil Nadu's border problem. Andhra Pradesh has the largest PMMSY book of any state (₹2,405 Cr of projects, ₹430 Cr released), 350 landing centres and inboard-heavy motorised craft that suit the boat tier. Gujarat's 14,061 mechanised craft and Pakistan exposure would rank it second on demand alone, but Veraval is 2,000 km from Chennai and a west-coast partner does not exist. Maharashtra's state government is evaluating BSNL satphones and could become a programme buyer. Odisha has money and cyclones but a small mechanised fleet. West Bengal, the UTs and Lakshadweep are volume-poor or unreachable. ● Verified S9 S18 S30 S81 S60 ● Publicly observed S61 S77 S78 S69 S64 S74 S32 S62 S73 S67 S26 S29

Harbours, in order of first contact: Kasimedu (Chennai), Cuddalore and Nagapattinam, Thoothukudi and Rameswaram, Kochi (Munambam, Thoppumpady) and Neendakara, Mangaluru and Malpe, Visakhapatnam and Kakinada, then Veraval and Porbandar with a partner. ● Verified S9 ● Recommendation

Export

Sri Lanka: 5,200 registered multi-day boats, 4,200 already with VMS, and a July 2026 Cabinet decision to fit the remaining 1,500 at government cost, following a 2022 phase supplied by Visma Consulting of Denmark. Entry would require approval by the Department of Fisheries and Aquatic Resources and compatibility with the incumbent shore system; no Rax presence, no marine approvals, and the Palk Bay politics make an Indian-branded tracker a sensitive sale. Defer. Publicly observed S113 S114 Recommendation

Oman and the GCC: Oman's Ministry of Agriculture, Fisheries and Water Resources signed with Tadam in December 2025 to operate a national tracking system for all artisanal boats in phases, on a coastal LoRaWAN network of 40 to 70 km with satellite backup, after a 2021 agreement with Middle East Scientific Equipment Corporation and 250 vessels fitted by 2023. The system transmits position, speed, heading, stops, emergency alerts and tamper attempts; a new device enters only as an approved component. Gulf Connect in Muscat has one OEM client and no marine sales. The UAE monitors larger vessels through mandatory tracking. Saudi Arabia: the July 2026 iibdaei research contains no marine or fishing content and there is nothing to reuse; iibdaei has no sales. For all three, the requirements are an Indian reference first, then type approvals and a local partner. Defer to 2028 and treat as an add-on sensor supplier to the national operator, not a system vendor. Publicly observed S111 S112 Rax-supplied S6 Recommendation

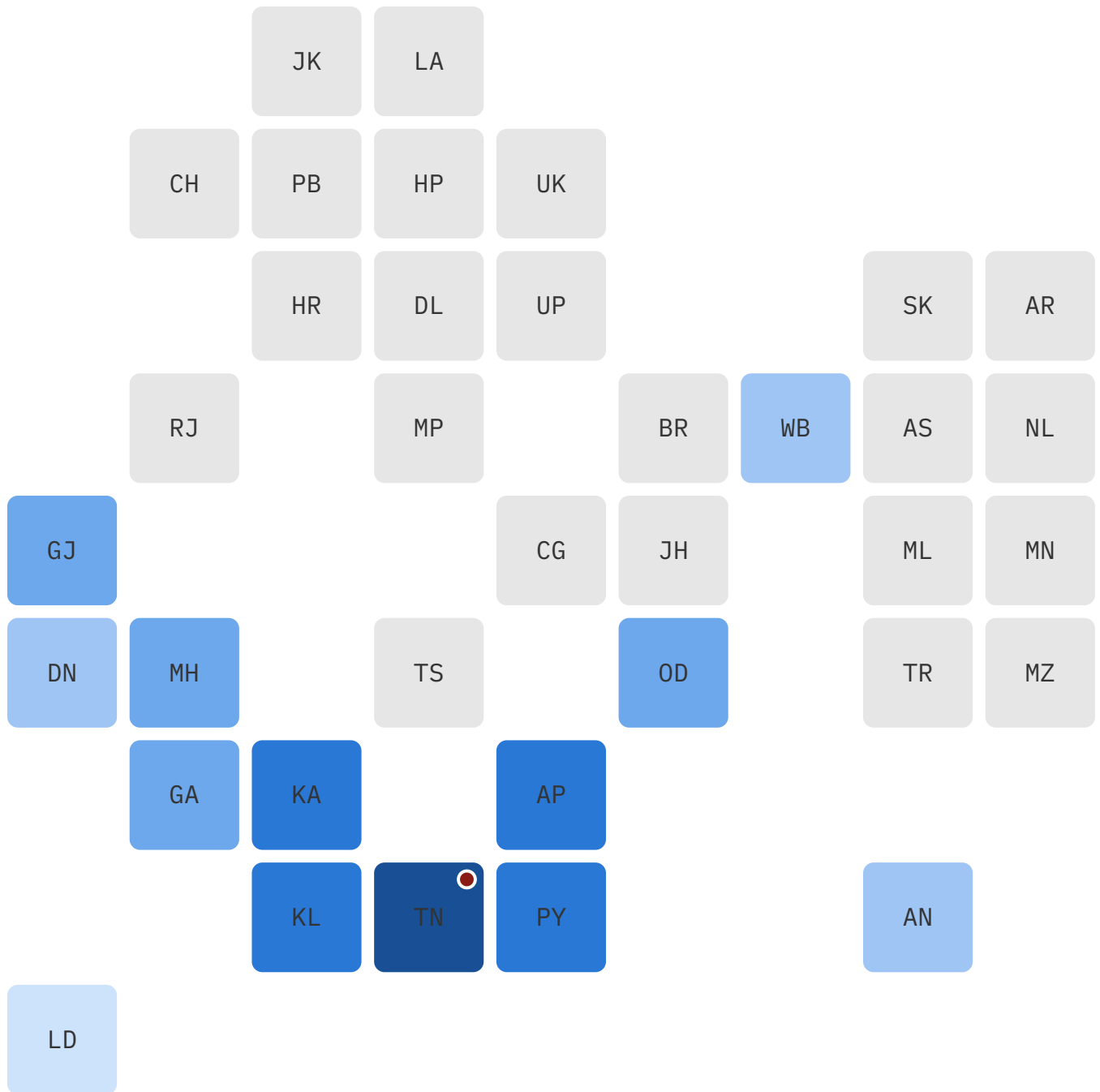
Europe: RaxTech Europe in Warsaw has no sales and Europe's fishing fleets are regulated under EU AIS and VMS rules with type-approved suppliers; no evidence of demand for DSM was sought or found. Out of scope for this product. Rax-supplied S6 Unknown

Sequence and triggers

Phase one (2026-27): Chennai to Cuddalore, one fishing company or association, one dealer-installer. Trigger to phase two: a paying second season and certificates. Phase two (2027-28): Kochi and Mangaluru through the Kerala association and a Karnataka fishing company, plus the Tamil Nadu kit conversation. Trigger to phase three: a state ruling or an NSIL sub-supply. Phase three (2028-29): Visakhapatnam and Kakinada, a Cochin Shipyard specification, and a west-coast partner for Gujarat and Maharashtra. Export only after phase three. Recommendation

SO WHAT FOR RAX

Geography is decided by service reach, not fleet size: Gujarat is the biggest fleet and the last stop; Tamil Nadu is the first because a technician can reach every harbour in a day. Recommendation



- TN Tamil Nadu 88**
 5,961 mechanised and 31,279 motorised craft; PMMSY central release ₹153.9 Cr; 7,373 transponders allocated plus own ₹18.01 Cr mechanised programme; 526 fishers arrested by Sri Lanka in 2024; home state
- KL Kerala 74**
 3,800 mechanised craft; PMMSY release ₹344.2 Cr; 6,000 transponders allocated; Ockhi memory and 2026 capsizings; strong boat-owner associations; 700 km from Chennai
- KA Karnataka 66**
 3,780 mechanised craft; PMMSY release ₹295.0 Cr; 5,737 transponders allocated; satphone demand from fishing companies; transponder water-ingress replacement in 2026
- PY Puducherry 62**
 301 mechanised craft; PMMSY release ₹61.2 Cr on a ₹352 Cr book; 3,047 transponders allocated; Karaikal fishers arrested with Tamil Nadu boats; two hours from Chennai
- AP Andhra Pradesh 60**
 1,176 mechanised and 3,146 inboard craft; largest PMMSY project book (₹2,405 Cr, ₹430.1 Cr released); 4,484 transponders allocated; Visakhapatnam loss-of-contact incident July 2026
- GJ Gujarat 56**
 14,061 mechanised craft, the largest fleet; PMMSY release ₹103.7 Cr; 10,232 transponders allocated; 1,173 boats in Pakistani custody; 2,000 km from Chennai
- MH Maharashtra 50**
 5,867 mechanised craft; PMMSY release ₹304.5 Cr; 11,960 transponders allocated; state evaluating BSNL satphones; west-coast partner needed

8. GA Goa 46

858 mechanised craft; 65 percent of boats fitted with transponders by December 2025; small fleet

9. OD Odisha 44

1,748 mechanised craft; PMMSY release ₹347.3 Cr; 2,083 transponders allocated; cyclone exposure; June 2026 diesel strike; Paradip far by road

10. WB West Bengal 36

4,014 mechanised craft; 8,644 transponders allocated; PMMSY release only ₹55.1 Cr; installation on 9,000 boats under way in 2025

Tile cartogram, priority score 0 to 100; darker is higher. The red dot marks Chennai. Score = 30 percent mechanised fleet (2016 census), 20 percent PMMSY central funds released to 2024-25, 20 percent VCSS transponders allocated (proxy for programme activity), 15 percent incident and border pressure, 15 percent service reach from Chennai. Weights are the researcher's; inputs are cited per state.

KEY TAKEAWAYS

- Thirty-seven sourced signals, nine each on losing contact beyond coverage and on mandates and programmes; the buyer's problem is being unreachable, not a missing screen. ● Verified S132 S24 ● Publicly observed S72 S65
- Fishers and officials say the free transponder falls short: units "yet to be made functional", water ingress, and "little more than location tracking and basic text messaging". ● Publicly observed S26 S32 S72
- The money signal comes from companies and states buying satellite phones at ₹1.34 lakh, not from owners asking for integrated systems; no buyer anywhere was found asking for crew tags or compartment sensors. ● Publicly observed S74 S73 S53 ● Unknown
- Programme tenders speak in eligibility clauses: NSIL's Xponder battery RFP demands an average turnover of ₹25 Cr over FY2021-22 to FY2023-24, UN 38.3 battery tests and three years of paid warranty. ● Verified S35
- No public signal about Rax or DSM exists outside Rax's own site; the only Rax voice on record is the sales lead's account of lost referrals and late deliveries. ● Rax-supplied S6 S139

Where the signals come from

The quote grid after this section holds thirty-seven verbatim signals with sources: parliamentary committee findings and Lok Sabha replies, PIB releases, state officials quoted in the press, association presidents, individual fishers and their families, a Google Play review, vendor statements and two internal remarks. Tamil Nadu, Kerala, Karnataka, Maharashtra, Odisha, Goa and West Bengal are represented, and every signal concerns India. Fishers' own channels were not reached: association WhatsApp groups are closed, and no public forum thread by an identifiable fisher surfaced in the web searches run for this report. The fisher's voice therefore reaches us mostly through reporters and officials, which filters it towards incidents and away from routine purchase decisions. ● Verified S132 S24 S133 S134 ● Publicly observed S72 S26 S65 S67 S69 S36 ● Rax-supplied S6

10 to 12 nautical miles

How far a mobile phone reaches from shore, as the Tamil Nadu government told Parliament after Ockhi; every multi-day boat spends most of its trip beyond it ● Verified S132

Theme one: nobody can reach us beyond coverage

This is the loudest signal and the oldest. After Ockhi the Standing Committee on Home Affairs recorded that mobile phones reach 10 to 12 nautical miles and that beyond 50 nautical miles "there are no means of communication available to the fishermen in such parts of the deep sea". Kanyakumari's Collector said of 427 trawler crew who had not returned, "We do not call them missing because they generally go for 30 to 45 days and they do not contact families." Nine years later the words are the same. The National Association of Fishermen's Tamil Nadu president says, "If an accident occurs or a fisherman falls ill at sea, we have no way to contact anyone." A West Bengal wife says the whole family lives in anxiety while her husband is out for ten to fifteen days. On 1 August 2026 officials in Thiruvananthapuram said several boats "could not be traced" and efforts were under way "to establish contact". The ministry itself says most Indian fishing still happens within 40 to 50 nautical miles, which is why the EEZ push makes the gap wider, not narrower. ● Verified S132 S134 ● Publicly observed S131 S72 S26 S65

If an accident occurs or a fisherman falls ill at sea, we have no way to contact anyone.

Praveen Kumar, Tamil Nadu state president, National Association of Fishermen, The New Indian Express, 4 July 2026 ● Publicly observed S72

Theme two: the free system falls short

The government's transponder is valued and criticised in the same breath. A Google Play reviewer writes that the Nabhmitra app "is very much useful for fishermen community", and Goa reports 1,219 vessels equipped by December 2025. But a West Bengal fisher told ETV Bharat the transponders had been fitted "but the system is yet to be made functional"; Dakshina Kannada's joint director confirmed that "following technical issue of water ingress" the vendor is replacing every unit; the fishermen's association petition says current systems "offer little more than location tracking and basic text messaging and expensive two-way calls at Rs 25 per minute"; and a Tamil Nadu official says the IsatPhone 2 "will lose satellite signal so it can't keep continuous connection". The complaint is about reliability, voice and data, not about the absence of an integrated bridge. ● Publicly observed S36 S31 S26 S32 S72

SO WHAT FOR RAX

DSM should be pitched against these exact complaints (a unit that works all season, voice or data when it matters, a shore view the family and owner can see), and its first proof must be a season without water ingress, because that is the failure fishers have just watched happen.

● Recommendation

Theme three: search and rescue is slow

Families protest at coastal police stations over delayed searches, as at Anchuthengu in August 2026; after Ockhi a Kanyakumari fisher said, "We heard some people screaming for help but we could not find anyone, so we tried informing the navy but they claimed that our voices were not audible." The signal is not a demand for a product; it is a demand for a position the rescuer can trust within the first hour. An owner app that raises a loss-of-contact

alert and hands a last-known track to the Coast Guard speaks directly to it. Publicly observed S65 S131 Inferred

Theme four: who is paying, and for what

Demand with money behind it is for satellite voice and data. Maharashtra's fisheries minister says "Satellite phones can serve as a lifeline for fishermen"; BSNL Mangaluru expects "around 50 additional connections from Udupi, and another 50 from Mangaluru", driven by fishing companies with several boats; Tamil Nadu gives satphones at 75 percent subsidy; a Mangaluru association in 2020 had already "tested BSNL's transponder which has two-way data communication directly over satellite". Vendors echo it: Skylo priced its service "as low as a daily cup of tea/coffee", and ABJ Impex reports "voice and video calls and live CCTV with boats more than 300 nautical miles offshore". Fuel is the counter-signal: "The steep hike in diesel prices has emerged as the most pressing concern for fishermen," says the Odisha producers' association, and Kerala owners put a three-day trip at ₹1.5 lakh of fuel.

Publicly observed S73 S74 S76 S75 S84 S72 S67 S69

Theme five: mandates and programmes set the terms

Official language frames what buyers expect to comply with. The draft rules say "All Fishing Vessels shall be fitted with AIS transceivers in working condition." The ministry says "By providing mandatory use of transponders, the safety and security of fishermen and fishing vessels is ensured in the deep-sea." The minister told the Lok Sabha that "more than 49,000 transponders have already been installed", and NSIL names Saankhya Labs, Avantel and Accord as its suppliers. An industry voice, Ganesh Nakhawa, notes that state acts already require AIS on mechanised boats. The buyer hears a mandate and a free device together, which lowers private willingness to pay for tracking and raises the value of anything that makes compliance easier.

Verified S45 S133 S24 S34 Publicly observed S83

Requirements observed in tenders and schemes

DOCUMENT	CLAUSE-LEVEL REQUIREMENT	WHAT IT MEANS FOR DSM
NSIL RFP NSIL/RFP/MSS/BAT/2024/01, section 3.3	Average annual turnover over FY2021-22 to FY2023-24 of ₹25 Cr or more; positive net worth in FY2023-24; Indian operational address open to NSIL audit	Rax's average over those years is ₹18.65 Cr, so Rax cannot bid as prime; only as a sub-supplier
Same RFP, technical and test plan	Cells and batteries tested to UN DOT 38.3; connectors protected against water when disconnected; unique marking with serial and support number	Crew e-tags and the net buoy need the same battery test evidence
Same RFP, payment schedule	80 percent on delivery, 20 percent on installation; 5 percent warranty retention; three-year extended warranty paid at 5 percent a year, half-yearly, after certification; deductions for units delivered but not installed within six weeks	Cash arrives over three years and depends on boats being available
Same RFP, annexure 7.1	45,252 motorised boats across nine states and four UTs, listed harbour by harbour	Programme volume is published in advance, by harbour
Tamil Nadu safety kit scheme	Ownership certificate, ReALCraft registration, fishing licence and biometric ID; kit of GPS, VHF, DAT, echo-sounder, fish finder, battery and beacon at ₹2 lakh	DSM must be a named kit item to be funded
Draft Fishing Vessels Rules 2026, Rules 32, 47, 48	Radio equipment of IMO-approved type; AIS transceivers in working condition on all vessels; VMS or approved satellite tracker reporting at prescribed intervals	Interoperate with approved AIS and the approved tracker rather than replace them
EEZ Rules 2025	Mandatory transponders and QR-coded ID cards; Access Pass through ReALCraft for about 64,000 mechanised vessels	The government transponder is compulsory for EEZ vessels, so DSM is additive by law

Verified S35 S81 S45 S133 S134 Rax-supplied S6

Signals about Rax

Searches for DeepSea Master, DSM and Rax Tech marine products returned only Rax's own pages: a products list with four Marine Engineering models and a "Datasheet" link that opens the 24-page presentation, which carries no electrical, environmental or radio specification. No news item, association mention, marketplace listing, review or tender record names Rax in this category. Internally, the sales lead says "no one will refer us because we have bad names in market" and that urgent orders are lost because "we depend on components". In a harbour where associations talk daily, those two sentences describe the risk more precisely than any external signal could. Rax-supplied S139 S6 Unknown

Patterns and what they imply

Four patterns stand out. First, the problem statement buyers use is unreachability and the families' first hours, which argues for positioning DSM's owner app and loss-of-contact alert ahead of navigation. Second, buyers already compare connectivity options by reliability and per-minute cost, so the satellite path must be named, legal and priced in rupees per month before anyone listens. Third, nobody in the record asks for compartment sensors, cameras or crew tags; those features are unvalidated, and the validation trial should test whether owners with freezers and large crews value them. Fourth, the government is the loudest voice and sets expectations at "free" for tracking and SOS, so DSM's paying buyer is the one who needs more than compliance: a company running several boats. Inferred Recommendation

THEMES No contact beyond coverage9 Mandates and programmes9 Paying for satphones and data5 Free system falls short4
Fuel squeezes budgets3 Slow search and rescue2 Rax delivery and reputation2 Cost of connectivity1 Free system is valued1
Border detention1

If an accident occurs or a fisherman falls ill at sea, we have no way to contact anyone.

Praveen Kumar, Tamil Nadu state president, National Association of Fishermen · The New Indian Express, Chennai · 2026-07-04 · source

Publicly observed S72 No contact beyond coverage

current vessel-monitoring systems offer little more than location tracking and basic text messaging and expensive two-way calls at Rs 25 per minute

National Association of Fishermen petition to the Union communications minister, as reported · The New Indian Express · 2026-07-04 · source

Publicly observed S72 Free system falls short

The ISAT-Phone 2 will lose satellite signal so it can't keep continuous connection with satellite. The state has written to the Centre multiple times to provide new data-enabled phones.

Tamil Nadu Fisheries Department official · The New Indian Express · 2026-07-04 · source

Publicly observed S72 Free system falls short

Centre is contemplating to upgrade it using Starlink technology.

Tamil Nadu Fisheries Department official · The New Indian Express · 2026-07-04 · source

Publicly observed S72 Mandates and programmes

Transponders have already been fitted in our boats for vessel communication systems but the system is yet to be made functional.

Ali Mohammad, fisherman · ETV Bharat · 2025-03-11 · source

Publicly observed S26 Free system falls short

Whenever Asif goes to the deep seas for 10-15 days, the whole family lives in anxiety

Wife of a deep-sea fisherman · ETV Bharat · 2025-03-11 · source

Publicly observed S26 No contact beyond coverage

The steep hike in diesel prices has emerged as the most pressing concern for fishermen.

Srikant Parida, president, Odisha Marine Fish Producers Association · The Times of India, Paradip · 2026-06-13 · source

Fuel squeezes budgets

Publicly observed S67

At 1,500 litres for a three-day fishing venture, the fuel cost alone totals ₹1.5 lakh, boat owners say

Kerala boat owners (All Kerala Fishing Boat Owners Association) · The Hindu BusinessLine, Kochi · 2022-05-03 · source

Fuel squeezes budgets

Publicly observed S69

The open market price is Rs 125 per litre, compared to a subsidised rate of Rs 80.

Charles George, president, Kerala Matsya Thozhilali Aikya Vedi (on kerosene for traditional craft) · Krishi Jagran · 2022-05-04 · source

Fuel squeezes budgets

Publicly observed S82

following technical issue of water ingress, the vendor that supplied the transponders is replacing them after making a slight change in their design to resolve the problem

Darshana K T, in-charge Joint Director, Fisheries Department, Dakshina Kannada · Deccan Herald, Mangaluru · 2026-08-17 · source

Free system falls short

Publicly observed S32

So far (upto December 2025), 541 motorised vessels and 678 mechanised vessels have been equipped with these devices, enabling real-time monitoring and safer fishing operations

Fisheries Department, Government of Goa · The Navhind Times · 2026-03-17 · source Publicly observed S31 Mandates and programmes

Hundreds of fishermen lose life every year in the sea due to non-availability of modern connectivity technologies, including satellite-based navigation system

Mangaluru fishermen's association · The Hindu, Mangaluru · 2020-10-08 · source Publicly observed S75 No contact beyond coverage

We have tested BSNL's transponder which has two-way data communication directly over satellite and works in the deep sea.

Mangaluru fishermen's association representative · The Hindu, Mangaluru · 2020-10-08 · source Publicly observed S75 Paying for satphones and data

These are being given at 75% subsidy to ensure the safety of the fishers.

D. Jayakumar, then Fisheries Minister, Tamil Nadu (on satellite phones for deep-sea clusters) · The Hindu, Chennai · 2020-10-28 · source Publicly observed S76 Mandates and programmes

several state marine fishing regulation Acts say that all mechanised boats of [shorter than] 24 metres are required to have automatic identification system transponders

Ganesh Nakhawa, fisher and industry representative · Janata Weekly · undated · source Publicly observed S83 Mandates and programmes

For centuries, industries like fisheries have been operating offline, and have not had the opportunity to take full advantage of the latest advancements in AI & IoT – until now.

Ganesh Nakhawa, Program Director Fisheries, Skylo · The Economic Times · 2021-06 · source Publicly observed S84 Paying for satphones and data

costing as low as a daily cup of tea/coffee

Skylo Technologies statement on subscription pricing for fishers · The Economic Times · 2021-06 · source Publicly observed S84 Cost of connectivity

Satellite phones can serve as a lifeline for fishermen by enabling uninterrupted communication with the shore.

Nitesh Rane, Fisheries Minister, Maharashtra · India Today · 2026-07-14 · source Publicly observed S73 Paying for satphones and data

the division anticipates demand for around 50 additional connections from Udupi, and another 50 from Mangaluru

BSNL general manager Borale, Mangaluru (on satellite phone demand from fishing companies) · The Times of India, Mangaluru · 2026-08-26 · source Publicly observed S74 Paying for satphones and data

maintaining uninterrupted contact on voice and video calls and live CCTV with boats more than 300 nautical miles offshore

J Mahiban, managing director, ABJ Impex, on pilots off Kerala, Tamil Nadu and Karnataka · The New Indian Express · 2026-07-04 · source Publicly observed S72 Paying for satphones and data

Family members of the missing fishermen staged a protest in front of the Anchuthengu Coastal Police Station, alleging delay in launching the search operation

India Today report on the Muthalappozhi capsizing · India Today, Thiruvananthapuram · 2026-08-01 · source Publicly observed S65
Slow search and rescue

Officials also said several fishing boats that had left from Vizhinjam and Sanghumugham could not be traced, and efforts were under way to establish contact and locate the vessels.

India Today report on the Vizhinjam incident · India Today, Thiruvananthapuram · 2026-08-01 · source Publicly observed S65 No contact beyond coverage

App is very much useful for fishermen community

Ramalinge Gowda K C, Google Play reviewer of the Nabhmitra (Xponder) app · Google Play · 2025-06-18 · source Publicly observed S36
Free system is valued

Till date, more than 49,000 transponders have already been installed in the coastal States/UTs under this project.

Rajiv Ranjan Singh, Union Minister of Fisheries, Animal Husbandry and Dairying, in the Lok Sabha · Press Information Bureau · 2026-02-10 · source Verified S24 Mandates and programmes

NSIL has shortlisted and engaged 3 Indian private companies viz. M/s Saankhya Labs Pvt Ltd, M/s Avantel Ltd, and M/s Accord Software & Systems Pvt Ltd for supply and installation of Xponders.

NewSpace India Limited · NSIL release, Bengaluru · 2024-09-03 · source Verified S34 Mandates and programmes

the mobile phone, which only has coverage up to 12 nautical miles

The Hindu report on Tamil Nadu's satellite phone plan after Ockhi · The Hindu · 2018-02-04 · source Publicly observed S70 No contact beyond coverage

Communication with mobile phones in the possession of all fishermen is possible only to a distance of two nautical miles.

The Hindu report from Thoothukudi after Ockhi · The Hindu · 2017-12-16 · source Publicly observed S71 No contact beyond coverage

Families of imprisoned fishermen allege that many have already served their sentences but remain behind bars due to delays in embassy verification.

Families of Gujarat fishers held in Pakistan, as reported · The New Indian Express, Ahmedabad · 2025-03-05 · source Publicly observed S62
Border detention

All Fishing Vessels shall be fitted with AIS transceivers in working condition.

Rule 47, Draft Merchant Shipping (Fishing Vessels) Rules 2026 · Ministry of Ports, Shipping and Waterways · 2026 · source Verified S45
Mandates and programmes

If I need to tell frankly means no one will refer us because we have bad names in market.

Sales lead, Rax Tech International · Internal conversation recorded in the ground-truth file · 2026-08-03 Rax-supplied S6 Rax delivery and reputation

Some orders loss like they need it urgent but we can't produce in short time because we depend on components.

Sales lead, Rax Tech International · Internal conversation recorded in the ground-truth file · 2026-08-03 · Rax-supplied S6 · Rax delivery and reputation

mobile phones can reach up to 10-12 nautical miles only

Parliamentary Standing Committee on Home Affairs, recording the Tamil Nadu government's account · 211th Report on Cyclone Ockhi, Rajya Sabha · 2018 · source Verified S132 · No contact beyond coverage

there are no means of communication available to the fishermen in such parts of the deep sea

Parliamentary Standing Committee on Home Affairs, on fishers beyond 50 nautical miles · 211th Report on Cyclone Ockhi, Rajya Sabha · 2018 · source Verified S132 · No contact beyond coverage

We do not call them missing because they generally go for 30 to 45 days and they do not contact families.

Sajjansingh R Chavan, then Collector, Kanyakumari · The News Minute, republished by The Quint · 2017-12-13 · source Publicly observed S131 · No contact beyond coverage

We heard some people screaming for help but we could not find anyone, so we tried informing the navy but they claimed that our voices were not audible.

Pious, fisherman, Thiruvattar, Kanyakumari · The News Minute, republished by The Quint · 2017-12-13 · source Publicly observed S131 · Slow search and rescue

By providing mandatory use of transponders, the safety and security of fishermen and fishing vessels is ensured in the deep-sea.

Ministry of Fisheries, Animal Husbandry and Dairying, on the EEZ Rules 2025 · Press Information Bureau · 2025-11-08 · source Verified S133 · Mandates and programmes

At present, most Indian fishing activity remains limited to 40–50 nautical miles from the coastline

Ministry of Fisheries, Animal Husbandry and Dairying, at the Access Pass launch · Press Information Bureau · 2026-02-21 · source Verified S134 · Mandates and programmes

11 Risks and compliance

KEY TAKEAWAYS

- Three risks score 20 of 25: no licensed satellite path, a free government transponder that covers the safety core, and owners who will not pay unsubsidised while diesel sits near ₹140 a litre. Verified S55 S24 Publicly observed S67
- Rax cannot bid programme tenders as prime: NSIL's Xponder RFP asked for ₹25 Cr average turnover over FY2021-22 to FY2023-24, and Rax averaged ₹18.65 Cr. Verified S35 Rax-supplied S6
- The compliance path is short and cheap if started now: WPC ETA by self-declaration, MTCTE for the Master Bridge Unit (mandatory for tracking devices and IoT gateways since January 2024), IEC 60945 evidence, DPDP readiness by 13 May 2027. Verified S50 S51 S135 Publicly observed S137
- Rax's service reputation is the risk most specific to this product: a failure at sea is a safety event that travels through associations the same day. Rax-supplied S6 Publicly observed S32
- Watch five indicators monthly: Xponder feature releases, the final fishing vessel rules, DoT satellite-IoT authorisations, Tamil Nadu kit guidelines, and pilot fault rates. Recommendation

The register

Eighteen risks are scored in the data file on likelihood and impact from 1 to 5; the matrix after this section plots them. The top ten by score are below with the owner role and the first mitigation. Verified S55 S24 S35 S51 S21 S45 S133 Publicly observed S67 S32 Rax-supplied S6

RISK	CATEGORY	L × I	MITIGATION	OWNER
RT-STJ-IM has no identified licensed satellite network; only BSNL's Inmarsat service and ISRO programme links are legal for civilians	Regulatory	4 × 5	Name the network and licence in writing, or integrate the Xponder, BSNL or Skylo before any sale	Engineering
The free Xponder covers SOS, messaging, weather and IMBL alerts on more than 50,000 boats	Competitive	5 × 4	Sell the monitoring layer above it; read its feed rather than duplicate it	Product
Owners will not pay unsubsidised when diesel is ₹140 a litre and trips are cancelled	Market	4 × 5	Start with companies already paying ₹1.34 lakh for satphones; prove fuel effect from route logs	Sales
MTCTE is required for tracking devices with embedded SIM, IoT gateways and satellite equipment; Rax holds none	Regulatory	4 × 4	Start testing the MBU now; budget three to six months	Engineering
DSM's ₹50,000 tier exceeds the ₹35,000 PMMSY tracking-device ceiling and is not a named item	Financial	4 × 4	Seek scheduling inside a ₹1 lakh or ₹2 lakh safety kit; design a sub-₹35,000 variant	Sales
Salt ingress and vibration failures with no coastal service team, as the VCSS vendor experienced in Dakshina Kannada	Product	4 × 4	IEC 60945 tests before the trial; sealed enclosures; harbour partner with spares	Engineering
Two salespeople cannot cover 1,363 landing centres	Operational	4 × 4	Two harbours and one company fleet in year one	Operations
Tender prime-bidder gates Rax fails (₹25 Cr average turnover, audits)	Financial	5 × 3	Sub-supply to an empanelled Xponder maker or a consortium	Sales
EEZ Rules make the government transponder mandatory, so DSM tracking is legally redundant	Competitive	5 × 3	Build the Xponder interface first; never position DSM as an alternative tracker	Product
Rax's service reputation follows it into a market run on word of mouth	Reputational	3 × 4	One flawless pilot with a named association champion; published service SLA	Managing Director

Verified S55 S53 S24 S134 S51 S21 S81 S118 S35 S133 Publicly observed S67 S74 S32 Rax-supplied S6 S9

The remaining eight are lower but not trivial: draft rules requiring IMO-type radio and navigation equipment, a booked hardware and firmware bench, unpriced airtime and hosting, component-driven delivery slips inside the fitting window, Starlink or a BSNL data service resetting expectations at sea, DPDP obligations on crew and camera data, blame after a seizure if a geofence alert fails, and export gatekeepers in Oman and Sri Lanka.

Verified S45 S135 Publicly observed S57 S60 S111 S114 Rax-supplied S6

₹25 Cr

Average annual turnover NSIL required of prime bidders in its 2024 Xponder battery RFP; Rax's average over the same three years was ₹18.65 Cr, so the programme route runs through a partner Verified S35 Rax-supplied S6

Compliance map

REQUIREMENT	WHAT IT COVERS IN DSM	STATUS	LEAD TIME	GATES WHICH SEGMENT
WPC Equipment Type Approval (self-declaration since 9 September 2024)	Bluetooth crew e-tags, Wi-Fi or Bluetooth in the HMI and MBU	Not filed	Days to weeks	All; a legal minimum for sale
TEC MTCTE, Tracking Device and IoT Gateway families (Phase III, from 1 January 2024)	Master Bridge Unit with cellular module and SIM	Not held	Three to six months: Indian designated-lab testing, then 40 to 60 working days' certification	All sales; checked by NSIL and states
TEC MTCTE, Satellite Communication Equipment	RT-STJ-IM	Not held; network unnamed	Six to nine months, and only with a licensed service partner	Any satellite claim
Satellite service authorisation	Airtime for SOS and position messages	No agreement	Partner-dependent: BSNL GSPS, Skylo on BSNL, or the VCSS link	Companies; programmes
IEC 60945 environmental and EMC testing	HMI, MBU, SBUs, buoy	No evidence	Three to six months at an accredited lab	Programmes; vessels beyond territorial waters under the draft rules
Draft Merchant Shipping (Fishing Vessels) Rules 2026, Rules 32, 33, 47, 48	AIS function, tracking function, radio claims	Draft, consultation	Final notification date unknown	Categories 1 and 2 vessels
EEZ Rules 2025: mandatory transponder, QR ID, Access Pass	Coexistence with the Xponder	In force since 4 November 2025	None; design constraint	EEZ vessels (about 64,000)
DPDP Act 2023 and Rules 2025	Crew tag identities, locations, camera feeds, owner app	Not assessed	Full obligations from 13 May 2027	All, from 2027
Battery safety to UN 38.3	Lithium cells in e-tags and the net buoy	Unknown	Two to three months	Programmes, as NSIL's RFP requires
Public procurement eligibility	Turnover, net worth, audit, Make in India Class-I claim	₹18.65 Cr average turnover; local content unevidenced	Not closable by Rax alone before 2028	NSIL and state prime contracts
ISO 9001:2015 (Bureau Veritas)	Design and manufacture	Held to 21 September 2028	None	Supports every bid
BIS CRS	Any bundled power adapter or IT equipment	Applied for	In process	Programmes
Chart data licence for offline charts	Navigation module	Unknown	Unknown	Any navigation claim

● Verified | S50 | S117 | S51 | S45 | S133 | S134 | S135 | S136 | S35 | ● Publicly observed | S137 | S138 | S52 | S118 | ● Rax-supplied | S6

Testing costs are modest against the risk they retire: a TEC-designated lab lists ₹1.1 lakh for ICT equipment safety and ₹1.5 lakh for radio transmitter safety, and administrative fees run ₹10,000 to ₹50,000 by product group; EMC, radio and technical-parameter tests add to that, and IEC 60945 prices must be quoted by a lab. A realistic certification budget for the MBU, HMI and tags is ₹10 to ₹20 lakh, which the strategy section carries.

● Publicly observed | S52 | S138 | ● Recommendation

The quality and service constraint

The ground-truth record says customers will not refer Rax, support calls are frequent including at installation, quality control is sample-based on large orders, and urgent orders are lost to component dependency. In e-surveillance those failures cost ₹3.22 Cr of revenue in one year. On a fishing boat they cost more: a crew tag that does not raise an alarm, or a bilge alert that fails, is a safety event, and fishing communities pass news of failures through associations and harbour WhatsApp groups within a day. The field has just seen what happens when a supplier gets the enclosure wrong: every transponder in Dakshina Kannada is being replaced after water ingress, with a four-boat, one-month trial under NSIL inspection before redeployment. For DSM this means three rules: 100 percent functional and soak testing of every pilot unit rather than sampling; spares and a technician within a day's reach of every pilot harbour; and no second harbour until the first has completed a season with a fault log the owner has signed.

● Publicly observed | S32 | ● Recommendation | ● Rax-supplied | S6

SO WHAT FOR RAX

Rax's reputation problem is survivable in this market only if the first twenty boats are over-served; the pilot budget must pay for 100 percent testing, a harbour technician and spare units before it pays for a single additional feature. ● Recommendation

Dependencies

Components: cellular modules, GNSS and AIS receivers, cameras and Bluetooth chips are imported, and the record shows component dependency already costs urgent orders; dual sourcing the cellular module and holding pilot stock before the ban ends are the minimum. Connectivity: DSM's satellite promise depends on a partner Rax does not yet have (BSNL, Skylo, or an interface to the Xponder), and cellular coverage ends 10 to 12 nautical miles out. Partners: a harbour installer-servicer, an Xponder supplier for the programme route, an association for trial boats. Scheme money: PMMSY item ceilings,

Tamil Nadu's ₹2 lakh kit, and the VCSS rollout's pace, which has already slipped past its December 2025 target. Internal: the hardware and firmware engineers who are booked on e-surveillance and rack-monitoring work, and cash from a business whose turnover fell to ₹7.91 Cr in FY2025-26.

Rax-supplied

S6

Verified

S132

S21

S81

S24

Publicly observed

S84

S53

S27

Early-warning indicators

INDICATOR	WHERE TO WATCH	TRIGGER THAT CHANGES THE PLAN
Xponder or Nabhmitra adds owner-side tracking, voice or sensor inputs	NSIL releases, Play Store changelog, DoF replies in Parliament	Drop overlapping DSM features; seek an integration or supplier role
Final Fishing Vessels Rules notified	Ministry of Ports, Shipping and Waterways gazette	Type-approval required for bridge electronics on Category 2 vessels means narrowing DSM to monitoring
Satellite IoT or maritime broadband authorised for fishing boats (Starlink, Skylo, BSNL)	DoT and TRAI notifications, operator launches	Make the MBU link-agnostic; re-price connectivity
Tamil Nadu or Kerala revises safety-kit contents or unit costs	State scheme pages, district Assistant Director circulars	Apply for inclusion within 30 days
VCSS installation count and replacement notices	Lok Sabha replies, PIB, district press	Faster rollout or failure reports change the size of the gap DSM fills
Diesel price at harbour bunks and trip tie-ups	Association statements, state press	Sustained tie-ups defer private purchases by a season
Pilot fault rate, repair time and owner app use	Rax's own pilot log	Any unit failing from water ingress triggers a design stop

Verified

S45

S134

Publicly observed

S36

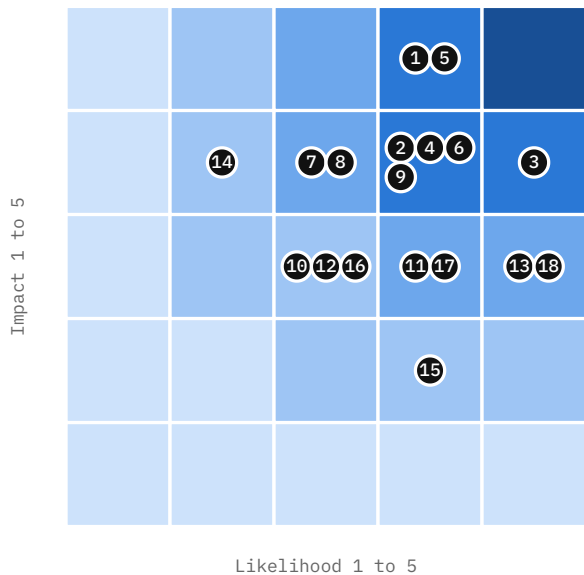
S57

S84

S67

S32

Recommendation



Numbers refer to the register below. Shade deepens with likelihood × impact.

#	RISK	L	I	MITIGATION
1	The satellite transponder RT-STJ-IM has no identified licensed network; only BSNL (Inmarsat) and ISRO programme links are legal for civilians in India regulatory · owner Engineering	4	5	Name the network and licence in writing; if none, integrate with the VCSS Xponder or a BSNL or Skylo link before any sale. VerifiedS53S55S1
2	MTCTE certification is required for tracking devices with embedded SIM, IoT gateways and satellite equipment; Rax holds no TEC certificate regulatory · owner Engineering	4	4	Scope MTCTE testing for the MBU and cellular module now; budget 6 to 9 months. VerifiedS51S52S6
3	The free VCSS transponder covers SOS, messaging, weather and IMBL alerts on 49,000 boats and one lakh soon, removing the most urgent reason to buy competitive · owner Product	5	4	Sell DSM as the monitoring layer above the transponder; integrate its position feed rather than duplicating it. VerifiedS24S29
4	DSM's ₹50,000 boat tier exceeds the PMMSY ₹35,000 cap for tracking devices and is not a named item in any guideline, so no subsidy applies financial · owner Sales	4	4	Seek inclusion as a component of the ₹1 lakh safety kit or Tamil Nadu's ₹2 lakh kit; price a sub-₹35,000 variant. VerifiedS21S81

#	RISK	L	I	MITIGATION
5	Boat owners will not pay unsubsidised for an integrated system when fuel is ₹140 a litre and trips are being cancelled market · owner Sales	4	5	Start with fishing companies that already pay ₹1.34 lakh for satphones; prove fuel savings from route logs. Publicly observed S67 S74
6	Salt water ingress and vibration failures in the field, as happened to the VCSS vendor in Dakshina Kannada, with no coastal service team product · owner Engineering	4	4	IEC 60945 environmental tests before the pilot; IP67 enclosures; harbour partner with spares. Publicly observed S32 S118
7	Rax's e-surveillance service reputation follows it to a market where associations talk daily and referrals decide reputational · owner Managing Director	3	4	One flawless pilot with a named association champion before any wider selling; published service SLA. Rax-supplied S6
8	Draft Merchant Shipping (Fishing Vessels) Rules 2026 require IMO-type-approved radio and navigation equipment; DSM components may not qualify as approved type regulatory · owner Engineering	3	4	Position DSM as monitoring and control alongside approved VHF, AIS and EPIRB rather than replacing them; track the final rules. Verified S45
9	Two salespeople cannot cover 1,363 landing centres; harbour partners want margin Rax cannot yet fund operational · owner Operations	4	4	Limit year one to two harbours (Kasimedu and Cuddalore or Kochi) and one company fleet. Rax-supplied S6 S9
10	Component dependency delays deliveries inside the short post-ban fitting window operational · owner Operations	3	3	Hold pilot inventory before the ban ends; dual-source cellular modules. Rax-supplied S6
11	Satellite airtime and dashboard hosting create recurring costs the deck does not price financial · owner Finance	4	3	Publish a per-vessel-per-year service price before the pilot; include it in the payback model. Unknown
12	Starlink or a BSNL data service arrives and makes voice, video and data cheap at sea, changing what fishers expect from an onboard system market · owner Product	3	3	Design the MBU as link-agnostic; treat connectivity as a partner service, not a feature. Publicly observed S57 S72
13	Programme tenders set prime-bidder gates Rax fails: NSIL's Xponder battery RFP required average turnover of ₹25 Cr over FY2021-22 to FY2023-24, against Rax's ₹18.65 Cr, plus manufacturing audits financial · owner Sales	5	3	Bid only as a sub-supplier to an empanelled Xponder maker or in a consortium; build the audit file (ISO 9001, ZED, factory address, test reports) before any approach. Verified S35 S6
14	Cross-border detention politics: a geofence alert that fails could expose Rax to blame after a seizure reputational · owner Product	2	4	Disclaim IMBL alerts as advisory; log positions immutably. Publicly observed S60 S62
15	Export entry into Oman or Sri Lanka requires approval by a national system operator (Tadum, Visma) that has no incentive to admit a new device market · owner Gulf Connect	4	2	Defer exports until an Indian reference exists; approach Tadum only as an add-on sensor supplier. Publicly observed S111 S114
16	Crew e-tags, vessel tracks and cameras process personal data; the DPDP Rules 2025 make consent, notice, security safeguards and breach reporting enforceable from 13 May 2027 with penalties up to ₹250 Cr regulatory · owner Engineering	3	3	Design consent for crew tags and camera feeds into the owner app, keep data in India, write a breach procedure and a retention rule before the pilot; review with counsel before May 2027. Verified S135 S136
17	Hardware and firmware engineering is fully booked by e-surveillance fixes and the rack-monitoring export push, so satellite integration, certification rework and field fixes for DSM compete for the same people operational · owner Managing Director	4	3	Ring-fence one firmware engineer for DSM for twelve months; move dashboard, app and fleet software to the free software bench; stop DSM hardware feature additions until the trial reports. Rax-supplied S6
18	The EEZ Rules 2025 make the government transponder mandatory for EEZ vessels and link it to ReALCraft, so any DSM tracking function is legally redundant and must coexist with, not replace, the Xponder competitive · owner Product	5	3	Build the Xponder interface first; market DSM as the owner-side and in-boat layer; never position DSM as an alternative approved tracker. Verified S133 S134

12 Strategy and recommendation

KEY TAKEAWAYS

- Recommendation: run a fleet-first validation with multi-vessel fishing companies in Tamil Nadu and Karnataka, and use the same twelve months to earn the certificates the programme route demands.

Recommendation
- The programme route through states and NSIL has the volume (45,252 motorised boats in one NSIL RFP) but a ₹25 Cr turnover gate Rax fails, so it is a partner route with cash two to three years out.

Verified S35

Rax-supplied S6
- Yard and association fitment is the scale route once a reference exists: 480 PMMSY deep-sea vessels and 1,338 upgradations are approved, but yards will not specify unreferenced electronics.

Verified S17

Inferred
- Twelve-month investment of about ₹50 to ₹75 lakh supports ₹0.3 Cr of revenue in 2026-27 and ₹1.5 Cr in 2027-28; the programme upside is ₹40 Cr a year by 2031 only if a state award follows.

Estimated S6 S21

Recommendation
- Kill the plan if no legal satellite or Xponder path exists by March 2027, if fewer than half the trial owners will pay a service fee, or if more than 10 percent of units fail at sea.

Recommendation

Three options

The starting point is zero: Rax has made no DeepSea Master sale and has no installed base, paying customer, pilot or reference, so every option below begins by creating the first evidence rather than scaling existing evidence. Each option is a genuinely different first buyer, cost base and time to cash. All three share one fixed cost: certification and a legal communications path, without which none of them can sell.

Rax-supplied S140

Verified S51 S55

Recommendation

	OPTION 1: FLEET-FIRST VALIDATION	OPTION 2: PROGRAMME-LED THROUGH STATES AND NSIL	OPTION 3: YARD AND ASSOCIATION FITMENT
First buyer	Fishing companies and owners with three to ten mechanised vessels	NSIL's Xponder suppliers; Tamil Nadu and Kerala fisheries departments	Boat yards building PMMSY deep-sea and upgraded vessels; owner associations buying in bulk
What DSM is sold as	Owner-side fleet monitoring above the Xponder, vessel tier	A sub-₹35,000 accessory or safety-kit component	Factory-fitted bridge and compartment system on new or upgraded hulls
Twelve-month investment	₹50 to ₹75 lakh	₹40 to ₹60 lakh plus working capital	₹35 to ₹50 lakh plus demonstration hull
Time to first revenue	3 to 6 months (paid trial)	18 to 36 months	12 to 24 months
Revenue scenario	₹0.3 Cr 2026-27, ₹1.5 Cr 2027-28, ₹4 Cr 2028-29	₹0 to 2027-28; ₹10 to ₹30 Cr over two years if a 2,000-vessel award is won	₹1 to ₹3 Cr a year from 2028-29
What must be true	Companies that already pay for satphones will pay for monitoring; a legal link exists; one harbour partner services well	MTCTE in hand; a supplier or state accepts Rax as sub-supplier; a cheaper variant exists; working capital for 80/20 milestone payments and three-year warranty	Yards want one electronics supplier; vessel cost schedules have room; an association can aggregate and finance twenty boats
Main risk	Small volumes; buyers are few	Gates, delays, thin margin, reputation at scale	No reference; yards default to Furuno and Garmin

Verified S35 S21 S17 S81

Publicly observed S74 S53 S105 S106

Rax-supplied S6

Estimated S7

Recommendation

Option 1: fleet-first validation

Rax sells a paid validation trial to one or two fishing companies and one owners' group: ten to twenty vessels, mostly the vessel tier, with the Xponder read into the DSM dashboard, crew tags, engine-room and cold-hold sensors, and a loss-of-contact alert to the owner and a named Coast Guard contact. The evidence that this buyer exists is direct: BSNL Mangaluru reports fishing companies operating several boats buying satellite phones at ₹1.34 lakh plus airtime, and Tamil Nadu's deep-sea owners petition for data at sea. The option matches Rax's size (two salespeople, one harbour at a time), produces evidence that the other two options need, and exposes the least cash. Its weakness is scale: there are hundreds, not thousands, of such buyers within reach.

Publicly observed S74 S72 S53

Rax-supplied S6

Recommendation

Option 2: programme-led through states and NSIL

Rax positions DSM components where public money already flows: as a sub-supplier to Accord, Avantel or Saankhya Labs for accessories to the Xponder, and as a scheduled item in Tamil Nadu's ₹2 lakh or PMMSY's ₹1 lakh safety kit. The prize is real: one NSIL RFP covered 45,252 motorised boats, harbour by harbour, and a state award of 2,000 vessels at a blended ₹1.5 lakh is the only lever in the sizing that moves 2031 revenue from ₹12 Cr to ₹40 Cr. But Rax cannot bid as prime: the RFP required ₹25 Cr average turnover over FY2021-22 to FY2023-24 and positive net worth, and paid 80 percent on delivery and 20 percent on installation with 5 percent retained and the extended warranty released over three years. The state tracking-device ceiling is ₹35,000, below DSM's entry price. Time to cash is two to three years, and a quality failure across thousands of boats would end Rax's marine business.

Verified S35 S21 S81 S34

Estimated S6

Rax-supplied S6

Option 3: yard and association fitment

Rax sells DSM to builders of new and upgraded vessels and to associations buying for members. PMMSY has approved 480 deep-sea fishing vessels at up to ₹120 lakh and 1,338 upgradations at ₹15 lakh each; Cochin Shipyard has built longliners for the Palk Bay scheme; FRP yards in Nagapattinam sell 31 to 41 foot commercial boats from ₹3.35 lakh; Kerala's owners' association and Matsyafed's 654 societies aggregate demand and credit. Factory fitment removes the hardest part of retrofit (wiring a working boat in a short ban window) and a ₹2.5 lakh system is a small share of a ₹120 lakh hull. The option

fails today because yards specify what owners trust and what surveyors accept; an unreferenced, uncertified system is a liability on a new hull. Re-proposing associations as a channel also needs a reason, because channel partners with their own sales teams have failed Rax before: the reason here is that the association is the buyers' own body, but that only works after a member's boat has proved the product.

Verified
S21
S17
S18
Publicly observed
S105
S106
S69
S102
Rax-supplied
S6
Inferred

SO WHAT FOR RAX

Option 1 is the only route whose first twelve months produce both cash and the evidence the other two need; Options 2 and 3 are not rejected, they are sequenced behind a signed reference and a certificate.

Recommendation

Recommendation and why the alternatives lose now

Choose Option 1 and run the certification workstream of Option 2 in parallel, because the certificates serve both. Option 2 loses as a first move because Rax fails the prime-bidder gate, the price ceiling sits below DSM, and cash arrives after two to three years. Option 3 loses as a first move because no yard or association will specify a system with no reference boat, no environmental test report and no service partner. Option 1 is the cheapest way to create the reference boat, the test report and the service partner. Open Option 3 in 2028-29 with the trial references, and bid Option 2 through a supplier once MTCTE is issued.

Verified
S35
S21
Rax-supplied
S6
Recommendation

Ninety-day plan (to mid-December 2026)

ACTION	OWNER	COST	MILESTONE AND KPI
Name RT-STJ-IM's network and licence; if none, open talks with BSNL (GSPS), Skylo and an Xponder supplier on an interface	Engineering	Internal	Written path chosen by day 60
File WPC ETA self-declarations; book an Indian TEC-designated lab for MBU safety, EMC and radio tests; request IEC 60945 quotes	Engineering	₹3 to ₹5 lakh committed	Lab slot booked; ETA filed
Rewrite the decks: Ockhi as 661 missing at the peak and a final toll of 365, not 427; coverage at 10 to 12 nautical miles, not 3 km; 2024 arrests as 526 Tamil Nadu fishers (MEA) or 535 Indian fishers (Al Jazeera, attributed); DSM as a layer above the Xponder	Sales	Internal	Corrected decks
Shortlist ten multi-vessel operators each in Kasimedu, Cuddalore and Mangaluru through associations and harbour visits	Sales	₹0.5 lakh travel	Twenty meetings; three trial term sheets
Sign one harbour installer-servicer with a spares kit and a per-visit rate	Operations	₹1 to ₹2 lakh retainer	Signed agreement
Price per-vessel service and airtime; build the bill of materials by tier	Finance	Internal	Price sheet with gross margin by tier
Ask Tamil Nadu Fisheries in writing whether DSM components can be scheduled in the ₹2 lakh kit	Managing Director	Internal	Written reply or logged refusal

Verified
S132
S60
S59
S50
S51
S81
Publicly observed
S52
S63
S64
S130
Rax-supplied
S6
Recommendation

Twelve-month plan (to September 2027)

QUARTER	ACTIONS	KPI AT QUARTER END
Q1 (Oct to Dec 2026)	Ninety-day plan above; build twenty pilot units with 100 percent soak and water tests	Legal link chosen; ETA filed; twenty units passed
Q2 (Jan to Mar 2027)	Sign the paid trial; install between trips and before the east-coast ban; MTCTE testing under way; DPDP consent flow in the app	Ten to twenty vessels live; MTCTE application filed
Q3 (Apr to Jun 2027)	Monthly SOS drills beyond 20 nautical miles; fault log; fuel baselines; Xponder interface in production; demonstrate at a Department of Fisheries seminar	95 percent of sea-days reporting; zero ingress failures
Q4 (Jul to Sep 2027)	Season report to owners; convert to paid second season; approach one Xponder supplier and Cochin Shipyard with the report	Renewal decision from 60 percent of vessels; two written references; MTCTE issued

Verified
S25
S51
S135
Recommendation

Proof pilots

Design. One fishing company with five to ten vessels at Mangaluru or Kasimedu (vessel tier) and one owners' group of ten boats at Kasimedu or Cuddalore (boat tier plus Xponder integration). Trial fee at cost plus service, about ₹10 to ₹15 lakh in total, so the buyer has committed money. Each vessel carries a signed protocol: monthly SOS drill, route and fuel logging for at least ten trips, crew-tag wearing, engine and hold alarms, and a fault log countersigned by the skipper.

Recommendation

Target accounts. The Mangaluru and Udupi fishing companies adding BSNL satphones; multi-boat members of the National Association of Fishermen in Tamil Nadu; owners at Kasimedu, Cuddalore and Thoothukudi exposed to Palk Bay seizures; members of the All Kerala Fishing Boat Operators Association at Kochi for the second season.

Publicly observed S74 S72 S61 S69 Recommendation

Success criteria that unlock scale. Positions received ashore on at least 95 percent of sea-days; every SOS drill received within five minutes beyond cellular range; no water-ingress failure and a hardware fault rate at or below 5 percent of units; median repair within 48 hours; owner app used weekly by 80 percent of trial owners; crew tags worn on 70 percent of crew-days; at least 60 percent of vessels renewing at the list service price; two written references. Meeting them moves the verdict to Pilot first and opens Options 2 and 3.

Recommendation

Investment and the revenue it supports

ITEM, FIRST TWELVE MONTHS	BUDGET
Certification and testing: ETA, MTCTE for MBU, IEC 60945 environmental and EMC, UN 38.3 for tag batteries	₹12 to ₹20 lakh
Pilot hardware for twenty vessels, built at cost	₹20 to ₹30 lakh
Harbour installer-servicer retainer, spares and replacement units	₹5 to ₹8 lakh
Field travel, drills, airtime and data hosting	₹4 to ₹6 lakh
Ring-fenced firmware engineer and DPDP legal review	₹9 to ₹11 lakh
Total, before trial fees of ₹10 to ₹15 lakh	₹50 to ₹75 lakh

The figures are planning allocations; lab quotes, the bill of materials and salary costs must replace them. Against them, the base-case revenue in the sizing section is ₹0.3 Cr in 2026-27, ₹1.5 Cr in 2027-28 and ₹4 Cr in 2028-29, about ₹5.8 Cr over three years; at the 40 to 45 percent gross margin the pricing section sets as a floor, that returns ₹2.3 to ₹2.6 Cr of gross profit against a ₹0.5 to ₹0.75 Cr investment. The upside is the programme: a 2,000-vessel award would add ₹10 to ₹30 Cr over two years but needs working capital of the same order because payments trail delivery.

Estimated S6 S7 S21 S35 Recommendation

₹50 to ₹75 lakh

Twelve-month cost of the recommended fleet-first validation, about 6 to 9 percent of Rax's FY2025-26 turnover of ₹7.91 Cr

Recommendation Rax-supplied S6

Dependencies on other Rax product lines

DSM borrows from four lines. The RT-RMC-G2V0 rack monitoring controller is functionally a Slave Bridge Unit (digital inputs, relays, temperature, humidity, leak, smoke, door, camera, Modbus) and its hardware should be the SBU's starting point. The EVA edge video units and IP-camera integration supply surveillance. The GSM and 4G two-way communicators supply the cellular path. The CMMS and FIOT platforms can host the DSM server and fleet dashboard, where the software team has spare bandwidth. The conflicts are in hardware and firmware: the same booked engineers support e-surveillance quality fixes and the rack-monitoring Saudi push, so DSM needs a ring-fenced engineer or it will slip. DSM also depends on e-surveillance cash while that business shrinks, and on Gulf Connect only after 2028.

Rax-supplied S6 S5 Inferred

Kill criteria

TEST	DATE	IF IT FAILS
A legal satellite path or a working Xponder interface exists	March 2027	Remove satellite claims; if neither path works, move to Defer
Trial signed with committed fees	March 2027	Stop hardware spend; keep certification only if Option 2 has a written supplier interest
Units failing at sea from water ingress or silent alarms	Any time	Above 10 percent of units: stop installs and redesign
Owners renewing for a paid second season	September 2027	Below 50 percent: Defer and salvage the software
Final fishing vessel rules require type approval for DSM's functions on Category 2 vessels	On notification	Narrow DSM to monitoring and control on Categories 3 and 4
Spend without a paid follow-on order	September 2027	Above ₹75 lakh: stop

Verified S45 S55 S34 Recommendation

13 Evidence gaps

KEY TAKEAWAYS

- The biggest gaps are internal: the satellite network behind RT-STJ-IM, the bill of materials, and any test evidence; Rax holds the answers and no public search can close them. Rax-supplied S6 S149 Unknown
- The biggest external gap is whether an owner will pay for DSM above the free Xponder; no buyer signal in thirty-seven asks for crew tags, compartment sensors or cameras. Publicly observed S72 S74 Unknown
- Two primary datasets are pending: the Marine Fisheries Census 2025 results and the final Fishing Vessels Rules; both would change the sizing and the compliance map. Verified S10 S45 Unknown
- Four deck figures were wrong, secondary or misapplied (Ockhi 427, 3 km coverage, 535 arrests, 40 to 60 percent subsidy on DSM) and are corrected in this report. Verified S132 S60 Publicly observed S131 S130 Rax-supplied S2

Internal facts Rax must supply

FACT	WHY IT MATTERS	WHO HOLDS IT
The satellite network, modem and licence behind RT-STJ-IM, and its airtime cost	Decides whether "dual comms" can be sold at all	Engineering lead
Bill of materials and unit cost for HMI, MBU, SBU, tags, buoy, by tier	Gross margin, the sub-₹35,000 variant, trial pricing	Engineering and Finance
Any environmental, ingress, vibration or EMC test done on prototypes	IEC 60945 plan and pilot risk	Engineering
Power draw and battery design of tags and buoy	UN 38.3 testing, boat battery load	Engineering
Source and licence of the offline charts and of the "fish data"	Legality and accuracy of navigation and fish-finding claims	Software lead
Installation time per boat and the tools and skills needed	Harbour partner economics and ban-window capacity	Operations
Warranty and service terms Rax is willing to offer	Price architecture and reserve	Managing Director and Finance
Engineering hours available for DSM after e-surveillance and rack-monitoring work	Whether the twelve-month plan is staffable	Managing Director
Any conversation already held with fishers, associations, departments or yards	Avoids duplicate approaches; may hold early signals	Sales lead

Rax has confirmed that no DeepSea Master sale has been made and that there is no installed base or paying customer; the facts above are therefore about design and cost, not about field performance, which does not yet exist. Rax-supplied S149 S6 S1

External unknowns, searches run and what would close them

UNKNOWN	SEARCHES ALREADY RUN	CLOSES IT
Whether owners pay for monitoring above the free Xponder	News and association statements on satphones, transponders and data at sea (Parallel web search, English-language press); Play Store reviews of the Xponder apps	A paid validation trial and renewal decisions
Marine Fisheries Census 2025 craft counts by state	"Marine Fisheries Census 2025 results fishing craft released"; CMFRI MFC 2025 pages, last updated 24 August 2026, show field work and apps but no results	CMFRI publication; until then 2016 census and 2024 registers are used
Whether the Xponder or Nabhmitra exposes an interface to third-party devices	"Nabhmitra Xponder API third party integration", "VCSS Xponder specifications"; found two supplier apps (Accord and Saankhya Labs) on Google Play and no public interface document	A written request to NSIL and one supplier
Final Merchant Shipping (Fishing Vessels) Rules and commencement date	Ministry of Ports, Shipping and Waterways site and press searches	Gazette notification
State-wise VCSS installations in 2026	Lok Sabha replies and PIB (national totals of 49,000 in February and over 50,000 later in February 2026 only); press by state	A parliamentary question or RTI to the Department of Fisheries
Whether Tamil Nadu or Kerala would schedule DSM components inside a safety kit	Tamil Nadu scheme pages; no guideline on integrated systems found	A written reply from the state department
IEC 60945 test cost and lead time in Indian labs	"IEC 60945 testing laboratory India marine" returned only foreign lab pages	Quotes from two NABL-accredited labs
Skylo's fisher adoption after 2021 and ABJ Impex prices and references	Company pages, news since 2021; no adoption numbers, prices or named customers found	Direct conversations with both
Dealer margins and installed counts for Furuno, Garmin, Samyung and Onwa in Indian harbours	IndiaMART listings, distributor pages; margins and counts not published	Dealer interviews at Kasimedu and Kochi
Ex-post fate of Ockhi's 661 missing by state beyond the 365 toll	Standing Committee report, Lok Sabha and ICSF; final state-wise reconciliation not found	State disaster management records

Load-bearing assumptions that are unverified

1. DSM's list prices of ₹50,000 and ₹2.5 lakh hold as the tiers buyers will be quoted; the TAM of ₹2,330 Cr rests on them.

● Rax-supplied

S7
2. The registered fleet of 66,106 mechanised and 1,35,763 motorised craft is a working fleet; registers may include idle craft.

● Publicly observed

S12
3. The serviceable market uses 2016 state rows scaled only as an upper bound; the 2025 census may move it either way.

● Verified

S9
4. Obtainable revenue of ₹12 Cr in 2031 assumes two harbour partners and 800 installs a year, a capacity Rax has never demonstrated in marine.

● Estimated

S6
5. A 40 to 45 percent gross margin is achievable after installation and service reserves; no cost data exists.

● Unknown
6. The Xponder can be read by a third-party system without breaching programme terms.

● Unknown
7. Fuel savings from route planning are material; no measurement exists.

● Publicly observed

S69

● Unknown

Recommended next research actions, in priority order

1. Internal session with Engineering to answer the first five internal facts, within two weeks.

● Recommendation
2. Written enquiries to NSIL, one Xponder supplier, BSNL and Skylo on interface and airtime.

● Recommendation
3. Ten harbour interviews at Kasimedu and Mangaluru with multi-boat owners, testing willingness to pay for each DSM module separately.

● Recommendation
4. Lab quotes for MTCTE and IEC 60945, and a DPDP review of crew-tag data.

● Recommendation
5. A written eligibility request to the Tamil Nadu Fisheries Department.

● Recommendation
6. Re-run sizing when MFC 2025 results appear; track the final fishing vessel rules monthly.

● Recommendation

KEY TAKEAWAYS

- 140 dated sources: 31 primary or regulatory, 7 official datasets, 54 news reports, 19 vendor pages, 19 references, 8 internal documents and 2 academic papers; 126 concern India only. ● Verified S18 S45 S9 ● Rax-supplied S6
- Every load-bearing number was traced to the most primary source reachable: Parliament replies, PIB, scheme booklets, NSIL tenders, the draft rules and the 2016 census tables. ● Verified S21 S24 S35 S60 S132
- Where a primary source could not be opened (a Department of Fisheries PDF blocked with HTTP 403, the MFC 2025 results not yet published), the claim is carried with a secondary source and a lower label. ● Publicly observed S133 S10 ● Unknown
- Two passes were run: a first complete draft of all fifteen sections and thirteen data files, then a gap audit against every brief and a second pass that re-verified the ten most load-bearing numbers. ● Recommendation

Search strategy

Research ran from 14 to 15 September 2026 and covers events from the 2009 AIS order to August 2026, with most sources from 2025 and 2026. Query families followed the prompt's thirteen questions: fleet counts (CMFRI census, Department of Fisheries handbooks, ReALCraft registrations); schemes (PMMSY booklet and guidelines, Lok Sabha and Rajya Sabha replies, PIB backgrounders, state scheme pages for Tamil Nadu, Kerala and Goa); the Vessel Communication and Support System (NSIL releases and RFPs, ISRO and SAC pages, district press on installation and replacement); regulation (the Merchant Shipping Act 2025, the draft Fishing Vessels Rules 2026, DG Shipping orders, the EEZ Rules 2025, DoT and TEC certification rules, DPDP Rules); incidents (Ockhi records, MEA replies on arrests, capsizing reports); competitors and prices (distributor and dealer sites, IndiaMART listings, Alibaba ranges through an aggregator, BSNL tariffs, Google Play); buyers and voice (association statements, state ministers, parliamentary committee findings); and export gatekeepers in Sri Lanka and Oman. ● Verified S9 S21 S24 S34 S45 S133 S51 S59 S132 ● Publicly observed S86 S53 S72 S111 S113

Tools were the Parallel search service (several queries per call, then targeted page extraction), direct PDF download with text extraction for the census, the NSIL RFP and the Rax catalogue, and headless page capture through the project's snapshot script for evidence images. Portals used include pib.gov.in, sansad.in, mea.gov.in, nsilindia.co.in, dof.gov.in, fisheries.tn.gov.in, cmfri.org.in and its eprints, shipmin.gov.in, dgshipping.gov.in, mtcte.tec.gov.in, eservices.dot.gov.in, bsnl.co.in, incois.gov.in, isro.gov.in and sac.gov.in. Searches were in English; Tamil and Malayalam press were not searched, which is a limit on voice of customer. ● Verified S18 S60 S35 S30 S10 S45 S44 S51 S50 S54 S40 S37 S38 ● Unknown

Source mix and confidence

TYPE	COUNT	HOW CONFIDENCE WAS ASSIGNED
Primary (Parliament, PIB, ministries, NSIL, ISRO, state departments)	24	High where the document was opened and the figure read; medium where only an excerpt was reachable
Regulatory (rules, orders, certification portals)	7	High for texts opened; medium for portal summaries
Official datasets (census, handbooks, MPEDA, CMFRI landings)	7	High for tables opened; medium for summaries of handbooks
News	54	Medium by default; low for re-publications without a byline or date
Vendor and marketplace pages	19	Medium; prices treated as observed on the access date, not as transaction prices
Reference and consultancy pages	19	Low to medium; used only for context or where a primary page was blocked
Internal Rax documents	8	Labelled Rax-supplied whatever their internal confidence
Academic	2	Low; context only

Each claim carries one label. Verified was used only when the primary document itself was opened in the session; a primary figure reported by a newspaper is Publicly observed. Figures calculated from stated assumptions are Estimated and name the sources of each input. Non-India sources are 14 of 140, within the charter's one-fifth limit. ● Verified S9 S132 ● Publicly observed S26 S74 ● Rax-supplied S140

Limits and workarounds

The Department of Fisheries PDF of the EEZ Rules returned HTTP 403 to both fetch tools, so the transponder mandate is cited from the PIB release that announces it. MFC 2025 results were not published at the cutoff, so the 2016 census and the November 2024 registration counts are used side by side. No paid analyst report exists for Indian fishing-vessel electronics, and none was bought. GeM bid search requires a login and was not used; NSIL's own RFP stood in as the clause-level tender evidence. Fishers' WhatsApp groups are closed and no attributable forum posts were found, so voice of customer relies on reporters and officials. The Browser pane and logged-in browsers were reserved for the lead session; evidence images were captured headlessly or from PDFs. No person was contacted, no form submitted and nothing bought. ● Verified S133 S35 ● Publicly observed S10 ● Unknown

Changes between the first and second pass

The first pass replaced every sample section, data file and source with researched material and was committed in stages. The gap audit then checked each section against its brief and each prompt question, traced every deck figure to a primary source, and found four problems: the deck's Ockhi, coverage and arrest figures were secondary or wrong, and the "40 to 60 percent subsidy" was attached to a product that is not a listed item. The second pass added the parliamentary committee report on Ockhi, the EEZ Rules and Access Pass releases, the DPDP Rules, MTCTE phase dates and lab charges,

the NSIL RFP's eligibility and payment clauses, and Rax's public catalogue; rewrote the voice, risk, strategy, gaps and method sections; recorded Rax's statement that no DeepSea Master sale has been made; and re-verified the ten most load-bearing numbers against their sources, as logged in the pass log. Verified S132 S133 S134 S135 S35 Rax-supplied S139 S140 S2

Source list

- S1

DeepSea Master product presentation, 24 pages

~/Downloads/DeepSea Master_Presentation_compressed (1).pdf

Rax Tech International · 2026 · accessed 2026-09-15 · India · internal · confidence high · Feature list, room-management sensor lists, system overview and architecture (page 18); read with pdftotext and viewed as images
- S2

DeepSea Master sales deck, July 2026

<https://rax-decks-july-11.pages.dev/deepsea-master/sales>

Rax Tech International · 2026-07-11 · accessed 2026-09-15 · India · internal · confidence medium · Problem statistics (Ockhi ~427, ~3 km coverage, ~₹1.5 lakh fuel, 535 arrests), pricing tiers, scheme references, competitive table; also PDF copy in RAX-Pitch-Decks/DeepSea-Master/
- S3

DeepSea Master government and tender deck, July 2026

<https://rax-decks-july-11.pages.dev/deepsea-master/government>

Rax Tech International · 2026-07-11 · accessed 2026-09-15 · India · internal · confidence medium · 1.46 lakh powered vessels, 3.77 million fisherfolk, DGS AIS Order 15/2022 claim, NavIC-ready claim, Class-I local supplier positioning, deployment model
- S4

DeepSea Master investor deck, July 2026

<https://rax-decks-july-11.pages.dev/deepsea-master/investor>

Rax Tech International · 2026-07-11 · accessed 2026-09-15 · India · internal · confidence medium · TAM floor ₹2,185 Cr from 1.46 lakh vessels and 72,749 mechanised vessels; business model; three-channel go-to-market; no customer or pilot count claimed
- S5

Rax product master, 57 models

landings/_rax-data/_analysis/rax-product-master.csv

Rax Tech International (internal extract) · 2026-08-04 · accessed 2026-09-15 · India · internal · confidence high · Rows 44 to 48: RT-SW-DSM, RT-MBU-R0, RT-SBU-R0, RT-MCU-R0, RT-STJ-IM
- S6

Rax Tech verified internal context (ground-truth record)

<charter/CONTEXT-RAX.md>

Rax Tech International (internal analysis) · 2026-08-05 · accessed 2026-09-15 · India · internal · confidence high · Sales capacity, certifications held and missing, revenue trend, quality and reputation constraint, DSM summary; summarises RAX-GROUND-TRUTH.md
- S7

Deck placeholder and brand audit: approved product facts

<landings/RAX-Pitch-Decks/docs/deck-placeholder-audit.md>

Rax Tech International (internal) · 2026-07-11 · accessed 2026-09-15 · India · internal · confidence high · DSM from ₹50,000 for boats and from ₹2.5 lakh for vessels; ISO 9001:2015 and ZED Silver; no customer count claimed
- S8

rax-tech.com: Marine industry page and Marine Engineering product category

<https://rax-tech.com/industries/marine>

Rax Tech International · undated · accessed 2026-09-15 · India · vendor · confidence medium · Lists RT-DSM-R0, RT-MBU-R0, RT-SBU-R0, RT-SW-DSM, RT-STJ-IM; no prices, datasheets or references; category page at /products/category/marine-technology
- S9

Marine Fisheries Census 2016, India, Part I (Table 1 state profile; Table 12 fishing crafts in the fishery)

https://www.indiaspend.com/uploads/2021/10/14/Marine_Fisheries_Census_INDIA_2016.pdf

ICAR-Central Marine Fisheries Research Institute and Department of Animal Husbandry, Dairying and Fisheries · 2020 · accessed 2026-09-15 · India · dataset · confidence high · Mirror of eprints.cmfri.org.in/17490. 1,66,333 craft: 42,985 mechanised, 97,659 motorised (31,409 inboard, 66,250 outboard), 25,689 non-motorised; state rows used for geography; 37,74,577 fisherfolk; 1,363 landing centres
- S10

Marine Fisheries Census page and Marine Fisheries Census 2025 (MFC 2025)

<https://www.cmfri.org.in/marine-fisheries-census>

ICAR-CMFRI · 2025 · accessed 2026-09-15 · India · dataset · confidence medium · Census history (2005, 2010, 2016); MFC 2025 digital and geo-referenced enumeration ran November to December 2025 with drone counting of craft; results not published as of research cutoff (see <https://www.cmfri.org.in/Mfc2025>)
- S11

Fisheries infrastructure: fishing fleet statistics

https://mpeda.gov.in/MPEDA/fishery_infrastructure.php

Marine Products Export Development Authority (MPEDA) · undated · accessed 2026-09-15 · India · reference · confidence low · States 199,141 vessels: 52,982 non-motorised, 73,410 motorised, 72,749 mechanised, citing an earlier CMFRI census; this is the source of the deck's 72,749 and 1.46 lakh figures
- S12

India: Focus on transponders on marine fishing boats

<https://icsf.net/newss/india-focus-on-transponders-on-marine-fishing-boats/>

International Collective in Support of Fishworkers (ICSF), citing Department of Fisheries · 2024-11 · accessed 2026-09-15 · India · news · confidence medium · 66,106 mechanised and 1,35,763 motorised boats operating; over 4,000 transponders installed in seven states by November 2024; two-way messages up to 200 nautical miles
- S13

Handbook on Fisheries Statistics 2022 (summary and factoids)

<https://ruralindiaonline.org/en/library/resource/handbook-on-fisheries-statistics-2022/>

Department of Fisheries, via People's Archive of Rural India · 2022-11-21 · accessed 2026-09-15 · India · dataset · confidence medium · Marine fish production 41.27 lakh tonnes in 2021-22; Gujarat, Kerala, Tamil Nadu top marine states; 4.9 million marine fisherfolk; the full PDF at mpeda.gov.in is image-only and could not be text-extracted
- S14

Handbook on Fisheries Statistics 2020 (summary and factoids)

<https://ruralindiaonline.org/hi/library/resource/handbook-on-fisheries-statistics-2020/>

Department of Fisheries, via People's Archive of Rural India · 2020 · accessed 2026-09-15 · India · dataset · confidence medium · Marine fish production 37.27 lakh tonnes in 2019-20

- S15** Marine fish production rises to 44.95 lakh tonnes (Parliament reply, 20 August 2025) <https://ddnews.gov.in/en/marine-fish-production-rises-to-44-95-lakh-tonnes-govt-pushes-climate-resilient-strategies/>
DD News, citing Minister of State George Kurian · 2025-08-20 · accessed 2026-09-15 · India · news · confidence medium · 34.76 lakh tonnes in 2020-21 to 44.95 lakh tonnes in 2023-24; 100 climate-resilient coastal villages at ₹2 crore each
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- S16** Handbook of Fisheries Statistics 2025: sector at a glance <https://en.vikaspedia.in/viewcontent/agriculture/agri-directory/handbook-of-fisheries-statistics?lg=en>
Vikaspedia (MeitY), summarising Department of Fisheries handbook · 2026-06-26 · accessed 2026-09-15 · India · reference · confidence medium · Marine production 46.15 lakh tonnes in 2024-25; marine growth 3.05 percent a year 2019-20 to 2024-25; Gujarat 7.64, Tamil Nadu 6.81, Kerala 6.47 lakh tonnes
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- S17** Fish production has increased to 197.75 lakh tonnes in FY 2024-25 (PIB backgrounder, 12 January 2026) <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2213532>
Press Information Bureau, Ministry of Fisheries, Animal Husbandry and Dairying · 2026-01-12 · accessed 2026-09-15 · India · primary · confidence high · Exports ₹62,408 crore; 480 deep-sea fishing vessels, 1,338 vessel upgradations, 2,259 bio-toilets approved; ₹364 crore VCSS with transponders free of cost; 2,494 Sagar Mitras
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- S18** Pradhan Mantri Matsya Sampada Yojana: Lok Sabha reply with state-wise annexures (17 March 2026) <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2241147>
Press Information Bureau, Ministry of Fisheries, Animal Husbandry and Dairying · 2026-03-17 · accessed 2026-09-15 · India · primary · confidence high · Outlay stated as ₹20,750 crore; approvals ₹21,274.16 crore, central share ₹9,189.79 crore, released ₹5,587.56 crore; Annexure II state-wise project cost and releases; 'Others (Transponders, etc.)' ₹364 crore project cost with ₹497.80 crore released; GAIS 33.14 lakh fishers a year; 5,01,900 KCCs
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- S19** ICAR-CMFRI releases India's marine fish landing data for 2025 <https://www.cmfri.org.in/news/icar-cmfri-releases-indias-marine-fish-landing-data-in-2025-indias-marine-fish-catch-increases-3>
ICAR-CMFRI · 2026 · accessed 2026-09-15 · India · dataset · confidence medium · Calendar-year landings 35.7 lakh tonnes in 2025, up 3 percent; CMFRI landings differ from Department of Fisheries production series
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- S20** Seafood export performance 2023-24 (press release) https://mpeda.gov.in/wp-content/uploads/2024/06/Export-performance_2023-24-approved_V5.pdf
MPEDA · 2024-06 · accessed 2026-09-15 · India · dataset · confidence high · Capture fisheries 38 percent of export value; frozen shrimp 66 percent; exports to 132 countries
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- S21** Pradhan Mantri Matsya Sampada Yojana booklet with Table 1 unit costs and assistance <https://static.pib.gov.in/WriteReadData/userfiles/PMMSY%20BookEnglish.pdf>
Department of Fisheries, published by PIB · 2020-09-15 · accessed 2026-09-15 · India · regulatory · confidence high · Item 60: communication and/or tracking devices (VHF/DAT/NAVIC/transponders) unit cost ₹0.35 lakh, assistance ₹0.14 lakh general and ₹0.21 lakh SC/ST/women; item 61 safety kits ₹1.00 lakh; item 63 PFZ devices ₹0.11 lakh; item 55 deep-sea vessels ₹120 lakh; item 56 vessel upgradation ₹15 lakh; items 66-67 insurance; outlay ₹20,050 crore
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- S22** Advancing India's Fisheries Sector: institutions, investment and inclusion (PIB backgrounder, 6 April 2026) <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2249228>
Press Information Bureau · 2026-04-06 · accessed 2026-09-15 · India · primary · confidence high · Union Budget 2026-27: ₹2,761.80 crore for fisheries, PMMSY allocation ₹2,500 crore; PM-MKSSY ₹6,000 crore 2023-24 to 2026-27; NFDIP 30.60 lakh stakeholders; Sustainable Harnessing Rules for the EEZ; MFC 2025
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- S23** Lok Sabha Unstarred Question 1885, Fishing Infrastructure (11 March 2025) https://sansad.in/getFile/loksabhaquestions/annex/184/AU1885_yGUgOT.pdf?source=pqals
Lok Sabha Secretariat (sansad.in), answered by MoS George Kurian · 2025-03-11 · accessed 2026-09-15 · India · primary · confidence high · PMMSY approvals ₹20,990.79 crore, central share ₹8,926.33 crore, released ₹4,670.79 crore, utilised ₹3,160.86 crore; FIDF ₹7,522.48 crore, 64 Tamil Nadu projects ₹1,573.73 crore; GAIS 131.30 lakh fisher-years, 1,047 claims ₹52.13 crore; Tamil Nadu GAIS enrolment 5.23 to 5.59 lakh a year
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- S24** Vessel Monitoring System: Lok Sabha reply (10 February 2026) <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2225774>
Press Information Bureau, Ministry of Fisheries, Animal Husbandry and Dairying · 2026-02-10 · accessed 2026-09-15 · India · primary · confidence high · VCSS approved under PMMSY for one lakh vessels at ₹364 crore with ISRO technical support; two-way satellite messaging, weather, no-fishing zones, IMBL geo-fencing, Nabhmitra app; more than 49,000 transponders installed; enforcement under state Marine Fisheries Regulation Acts
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- S25** With an allocated budget of ₹364 crore, 1,00,000 transponders on marine fishing vessels: Union Minister at national seminar (13 August 2024) <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2044893>
Press Information Bureau · 2024-08-13 · accessed 2026-09-15 · India · primary · confidence high · Transponders free of cost under the National Rollout Plan; 11 seminars with 4,000 participants; DoF and ISRO collaboration on VCSS and PFZ
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- S26** Vessel communication for helping deep-sea fishermen (state-wise transponder distribution and fisher interviews) <https://www.etvbharat.com/en/bharat/vessel-communication-for-helping-deep-sea-fishermen-enn25031104401>
ETV Bharat, citing Rajya Sabha data of February 2025 · 2025-03-11 · accessed 2026-09-15 · India · news · confidence medium · 42,316 mechanised and 46,900 motorised transponders distributed; state split (Tamil Nadu 7,373 motorised, Kerala 2,648/3,352, Gujarat 8,600/1,632, Maharashtra 4,047/7,913, Karnataka 1,091/4,646 and others); GSAT-6 and GSAT-N3, hub at INCOIS; Cyclone Dana use; 535 fishers repatriated from Sri Lanka since 2024; fisher quotes
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- S27** One lakh fishing vessels to get transponders for safety support (9 November 2024) <https://timesofindia.indiatimes.com/india/one-lakh-fishing-vessels-to-get-tra>
nsponders-for-safety-support-tech-to-help-constant-monitoring-in-high-seas/articleshow/115122860.cms
The Times of India · 2024-11-09 · accessed 2026-09-15 · India · news · confidence medium · Target December 2025; NSIL to maintain for two years; fishers operate the app on Android phones
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- S28** India: NSIL entrusted to install and commission MSS terminals on nearly 1 lakh fishing boats (June 2023) [https://icsf.net/newss/india-nsil-has-been-](https://icsf.net/newss/india-nsil-has-been-entrusted-to-install-and-commission-mss-terminals-on-nearly-1-lakh-motorised-and-mechanical-marine-fishing-boats/)
entrusted-to-install-and-commission-mss-terminals-on-nearly-1-lakh-motorised-and-mechanical-marine-fishing-boats/
ICSF, citing The Times of India · 2023-06 · accessed 2026-09-15 · India · news · confidence medium · Xponders use NavIC and MSS; built-in Wi-Fi/Bluetooth to smartphone app; Tamil Nadu already installing for nearly 5,000 vessels through industry
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- S29** One lakh fishing vessels to be fitted with transponders developed by ISRO soon (IANS, 31 July 2026) <https://www.newkerala.com/news/a/one-lakh-fish>
ing-vessels-fitted-transponders-developed-isro-253.htm
NewKerala.com (IANS) · 2026-07-31 · accessed 2026-09-15 · India · news · confidence medium · Rollout plan approval restated; free to eligible fishers; 60:40 Centre-state, 100 percent for UTs; Nabhmitra features including e-Token/trip declaration; 423 of 1,547 fish landing centres planned for infrastructure
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- S30** Fisheries schemes and initiatives: Tamil Nadu (state presentation to Department of Fisheries) <https://www.dof.gov.in/static/uploads/2026/04/b345ace3bc>
b986b555c4a2316db55053.pdf
Department of Fisheries, Government of India (hosting Tamil Nadu Fisheries Department slides) · 2026-04 · accessed 2026-09-15 · India · primary · confidence high · ISRO transponders fitted in 507 mechanised boats on trial; fitment of upgraded transponders in all mechanised boats through ISRO in progress at ₹18.01 crore with 1,645 fitted; 7,373 motorised boats proposed under VCSS; tiered communication pattern (NavIC, Navtex, satphone, transponder)
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- S31** State equips 65 percent of fishing boats with safety transponders (Goa) <https://navhindtimes.in/goanews/state-equips-65-of-fishing-boats-with-safety-transponders/>
The Navhind Times · 2026-03-17 · accessed 2026-09-15 · India · news · confidence medium · 541 motorised and 678 mechanised vessels fitted by December 2025; approval for 859 mechanised and 1,000 motorised; cost per transponder approximately ₹35,000 shared 60:40
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- S32** Transponders fitted on fishing boats in Dakshina Kannada replaced with upgraded design <https://www.deccanherald.com/amp/story/india/karnataka/mangal>
uru/transponders-fitted-on-fishing-boats-in-dakshina-kannada-replaced-with-upgraded-design-4113865
Deccan Herald · 2026-08-17 · accessed 2026-09-15 · India · news · confidence medium · 1,379 mechanised and 688 motorised boats fitted; water ingress reported; vendor replacing units after design change, trial on four boats for a month with NSIL inspection; TED affidavit linked to diesel subsidy
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- S33** Transponders to be installed in sea vessels across India's coastal areas (Orissa High Court affidavit) <https://www.downtoearth.org.in/wildlife-biodiversit>
y/transponders-to-be-installed-in-sea-vessels-across-india-s-coastal-areas-to-protect-marine-life-90329
Down To Earth · 2023-06-30 · accessed 2026-09-15 · India · news · confidence medium · National rollout approved on Odisha's request; 60:40 sharing; Odisha sought 1,740 transponders from ISRO for registered mechanised vessels
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- S34** National rollout of Vessel Communication and Support System for 1 lakh marine fishing vessels (NSIL release, 3 September 2024) [https://](https://www.nsilindia.co.in/sites/default/files/rolloutofvc.pdf)
www.nsilindia.co.in/sites/default/files/rolloutofvc.pdf
NewSpace India Limited · 2024-09-03 · accessed 2026-09-15 · India · primary · confidence high · NSIL is implementing agency; MSS technology from SAC/ISRO; Xponders with Wi-Fi/Bluetooth and app; NSIL engaged Saankhya Labs, Avantel and Accord Software & Systems for supply and installation; PM launched rollout in Maharashtra on 30 August 2024; 400-plus installed by September 2024
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- S35** RFP for supply, installation and commissioning of rechargeable lithium-ion battery for MSS terminals (Xponders) in marine fishing vessels <https://www.nsilindia.co.in/sites/default/files/TenderDoc.pdf>
NewSpace India Limited · 2024-10-29 · accessed 2026-09-15 · India · primary · confidence high · Tender NSIL/RFP/MSS/BAT/2024/01 for batteries on motorised boats across 9 states and 4 UTs; bidder eligibility asks for turnover, net worth and Indian manufacturing addresses
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- S36** Xponder - Accord Software (Nabhmitra) on Google Play <https://play.google.com/store/apps/details?id=com.accord.nabhmitra>
National Informatics Centre developer listing; app by Accord Software & Systems · 2025-07-25 · accessed 2026-09-15 · India · vendor · confidence medium · S-band MSS transceiver terminal paired over Bluetooth/Wi-Fi; predefined SOS messages, weather, offline maps; 10K+ downloads, 4.5 stars from 13 reviews; support nabhmitra-dof@dof.gov.in
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- S37** Distress Alert Terminal - Second Generation (DAT-SG): an ISRO initiative https://www.isro.gov.in/Second_Generation_DistressAlertTransmitter.html
Indian Space Research Organisation · 2024-01-16 · accessed 2026-09-15 · India · primary · confidence high · DAT operational since 2010 with more than 20,000 in use; DAT-SG adds acknowledgement, two-way messages from INMCC, PFZ, Bluetooth to phone; declared operational 24x7
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- S38** DAT-SG technology transfer offer https://www.sac.gov.in/SAC_Industry_Portal/SAC/Communication_Navigation/DAT-SG.pdf
Space Applications Centre, ISRO · undated · accessed 2026-09-15 · India · primary · confidence medium · SAC offers to transfer DAT-SG technology to Indian industries with adequate experience and facilities; UHF transmitter on NavIC receiver module
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- S39** GEMINI device (INCOIS ocean-state and PFZ receiver) <https://www.drishtias.com/daily-updates/daily-news-analysis/gemini-device>
Drishti IAS (reference summary) · 2019 · accessed 2026-09-15 · India · reference · confidence low · Priced at ₹9,000 per device with subsidy proposed up to 90 percent; developed by INCOIS with Airports Authority of India GAGAN
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- S40** **Potential Fishing Zone (PFZ) advisory** <https://incois.gov.in/MarineFisheries/PfzAdvisory>
Indian National Centre for Ocean Information Services (INCOIS) · undated · accessed 2026-09-15 · India · primary · confidence high · Daily satellite-derived advisories with reference to 586 fish landing centres; web GIS for about 1,223 nodes
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- S41** **INCOIS launches SAMUDRA mobile app for seafarers and fishing community** <https://www.thehindu.com/news/national/telangana/incois-launches-samudra-mobile-app-for-seafarers-and-fishing-community/article67193794.ece>
The Hindu · 2023-08-14 · accessed 2026-09-15 · India · news · confidence medium · Free app with PFZ advisories, ocean state forecast and disaster alerts
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- S42** **FFMA (Fisher Friend Mobile Application) on Google Play** https://play.google.com/store/apps/details?id=com.mssrf.ffma&hl=en_IN
M.S. Swaminathan Research Foundation · undated · accessed 2026-09-15 · India · vendor · confidence medium · Multilingual app with GPS navigation to PFZ, ocean state forecast, offline PFZ and danger-zone marking; free
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- S43** **Group Accident Insurance Scheme (GAIS)** <https://nfdb.gov.in/welcome/GAIS>
National Fisheries Development Board · undated · accessed 2026-09-15 · India · primary · confidence high · ₹5 lakh on death or permanent total disability, ₹2.5 lakh partial, ₹25,000 hospitalisation; fishers aged 18 to 70; premium fully borne by Centre and state
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- S44** **Fishing boats: Chapter 9 of the DG Shipping ship manual (Part XVA of the Merchant Shipping Act 1958)** <https://www.dgshipping.gov.in/Content/ShipManualChap9.aspx>
Directorate General of Shipping · undated · accessed 2026-09-15 · India · regulatory · confidence high · Registration of Indian fishing boats under Part XVA; MS (Registration of Indian Fishing Boats) Rules 1988 and Inspection Rules 1988; review committee proposal to restrict Part XVA to boats of 20 m and above
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- S45** **Draft Merchant Shipping (Fishing Vessels) Rules, 2026** [https://shipmin.gov.in/sites/default/files/Draft%20Merchant%20Shipping%20\(Fishing%20Vessels\)%20Rules,%202026.pdf](https://shipmin.gov.in/sites/default/files/Draft%20Merchant%20Shipping%20(Fishing%20Vessels)%20Rules,%202026.pdf)
Ministry of Ports, Shipping and Waterways · 2026 · accessed 2026-09-15 · India · regulatory · confidence high · 103 pages under the Merchant Shipping Act 2025; applies to every Indian fishing vessel; four design categories by 24 m and territorial waters; Rule 32 radio equipment of IMO-approved type; Rule 33 GNSS receiver, echo sounder, EPIRB and SART for categories 1 to 3; Rule 47 AIS transceivers on all fishing vessels; Rule 48 VMS or approved satellite tracking device; Schedule III Table 2 radio carriage by category
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- S46** **Merchant Shipping Act, 2025 (Act 24 of 2025)** https://en.wikipedia.org/wiki/Merchant_Shipping_Act,_2025
Wikipedia summary with links to PIB release of 11 August 2025 · 2026-03-23 · accessed 2026-09-15 · India · reference · confidence medium · Passed Lok Sabha 6 August and Rajya Sabha 11 August 2025, assented 18 August 2025; repeals the 1958 Act; status not yet in force as of the page date; newly regulates fishing and small vessels
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- S47** **DGS Order No. 15 of 2022: non-operational AIS on ships in Indian waters (technical circular 063/2022)** <https://www.irclass.org/technical-circulars/goi-dgs-order-no-15-of-2022-reg-non-operational-automatic-identification-system-ais-on-ships-in-indian-waters/>
Indian Register of Shipping, reproducing the DG Shipping order · 2022 · accessed 2026-09-15 · India · regulatory · confidence high · Ships of any flag with AIS switched off must inform the nearest MRCC and DGCOMM; vessels with non-operational AIS may be detained with a fee of ₹8 lakh; applies to vessels required to carry AIS, not a new mandate for small fishing craft
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- S48** **AIS transponders now made must for all fishing vessels over 20 metres** <https://timesofindia.indiatimes.com/india/ais-transponders-now-made-must-for-all-fishing-vessels/articleshow/4767112.cms>
The Times of India · 2009-07-12 · accessed 2026-09-15 · India · news · confidence medium · Post-26/11 coastal security decision by the Centre to require AIS on fishing vessels longer than 20 m
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- S49** **Coastal security drill Operation Sajag: biometric cards and colour coding of fishing boats** <https://www.pib.gov.in/PressReleaseDetailm.aspx?PRID=1958624>
Press Information Bureau, Indian Coast Guard · 2023-09 · accessed 2026-09-15 · India · primary · confidence medium · Coastal security measures include biometric cards for fishers, state-wise colour coding of boats and manning of landing centres
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- S50** **Equipment Type Approval (ETA) on self-declaration** <https://eservices.dot.gov.in/equipment-type-approval-eta>
Department of Telecommunications eServices portal (WPC) · undated · accessed 2026-09-15 · India · regulatory · confidence high · ETA required for devices in de-licensed bands (Bluetooth, Wi-Fi); granted on self-declaration through SARAL Sanchar since 9 September 2024; per-model, no expiry
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- S51** **Mandatory Testing and Certification of Telecommunication Equipment (MTCTE) portal and 2025 Rules** <https://www.mtcte.tec.gov.in/>
Telecommunication Engineering Centre, Department of Telecommunications · 2025 · accessed 2026-09-15 · India · regulatory · confidence medium · Telecommunications (Framework to Notify Standards, Conformity Assessment and Certification) Rules 2025: notified telecom equipment may not be sold or used without a certificate; product families include tracking devices with embedded SIM, IoT gateways, satellite communication equipment and VHF/UHF radios
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- S52** **MTCTE: mandatory testing and certification of telecom equipment in India (product list)** <https://www.nemko.com/product-certification/mtcte>
Nemko (certification body summary) · undated · accessed 2026-09-15 · India · reference · confidence medium · Lists 55 product types including tracking device with embedded SIM, IoT gateway, satellite communication equipment, VHF/UHF radio, smart camera. Nemko India, a TEC-designated lab, lists testing charges excluding GST of ₹1,10,000 for IT or ICT equipment safety (IEC 62368-1) and ₹1,50,000 for radio transmitting equipment safety (IEC 60215).
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- S53** **BSNL advertises ₹1.34 lakh satellite phone: who is it for?** <https://www.forbesindia.com/article/news/deep-dive/bsnl-advertises-rs-1-34-lakh-satellite-phone-who-is-it-for/2995824/1>
Forbes India · 2026-07-10 · accessed 2026-09-15 · India · news · confidence medium · Inmarsat IsatPhone 2 at ₹1.34 lakh; GSPS since January 2018; cheapest commercial plan ₹5,835 a month for 30 minutes or SMS, ₹25 per extra minute or SMS (Lok Sabha reply 11 February 2026); only BSNL GSPS permitted for civilians; DoT verification Re-verified in pass 2 (2026-09-15) against BSNL figures reported by The Hindu BusinessLine and ETTelecom on 9 and 10 July 2026; handset ₹1,34,166 including taxes; commercial plans ₹5,835 a month for 30 minutes or ₹64,185 a year for 360 minutes, excluding GST; ₹25 a minute or SMS thereafter.
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- S54** **Global Satellite Phone Service (GSPS)** <https://www.bsnl.co.in/opencms/bsnl/BSNL/services/enterprises/gspesEb.html>
Bharat Sanchar Nigam Limited · undated · accessed 2026-09-15 · India · vendor · confidence high · Inmarsat-based service for defence, disaster management, trekkers and fishermen; gateway in India
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- S55** **Is the use of satellite phones banned in India? Restrictions explained** <https://www.hindustantimes.com/india-news/is-the-use-of-satellite-phones-banned-in-india-restrictions-explained-101776616094909.html>
Hindustan Times · 2026-04-19 · accessed 2026-09-15 · India · news · confidence medium · Only BSNL (Inmarsat) services permissible with permits; Thuraya and Iridium banned
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- S56** **Satellite phones and inReach/SPOT in India: rules (2025)** <https://himalayatrekker.com/trek-permits-regulations/satellite-phones-garmin-inreach-spot-india-rules/himalaya-trekker-reference> · 2025-08-11 · accessed 2026-09-15 · India · reference · confidence low · Garmin inReach, SPOT and Iridium GO are two-way satellite communicators not permitted without DoT permission; receive-only GNSS is free to import
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- S57** **Starlink secures licence to launch satellite services in India** <https://www.rcrwireless.com/20250609/5g/starlink-satellite-in-india>
RCR Wireless News · 2025-06-09 · accessed 2026-09-15 · India · news · confidence medium · GMPCS licence granted June 2025 pending IN-SPACE authorisation and spectrum; Unified Licence confirmed January 2026 per later reports; commercial maritime service for fishing boats not yet available
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- S58** **Alert: the EU CATCH system will enter into force on 10 January 2026** <https://fiata.org/n/alert-the-eu-catch-system-will-enter-into-force-on-10-january/>
FIATA · 2026-01-07 · accessed 2026-09-15 · EU and India · reference · confidence medium · EU digital catch certification applies to all fishery product imports from 10 January 2026; MPEDA validates catch certificates for Indian exporters
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- S59** **Rajya Sabha Unstarred Question 402: arrest of fishermen by Sri Lankan Navy (6 February 2025)** https://www.mea.gov.in/rajya-sabha.htm?dtl/38982/QUESTION_NO402_ARREST_OF_FISHERMEN_BY_SRI_LANKAN_NAVY
Ministry of External Affairs · 2025-02-06 · accessed 2026-09-15 · India · primary · confidence high · Tamil Nadu fishermen arrested: 74 (2020), 143 (2021), 229 (2022), 220 (2023), 528 (2024), 53 (to 31 January 2025); deaths at sea in Sri Lankan waters 5 (2021), 2 (2024); JWG on fisheries 29 October 2024
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- S60** **Lok Sabha Unstarred Question 1026: Tamil Nadu fishermen arrested by Sri Lankan Navy (25 July 2025)** https://sansad.in/getFile/loksabhaquestions/annex/185/AU1026_wFviTO.pdf?source=pqals
Ministry of External Affairs via sansad.in · 2025-07-25 · accessed 2026-09-15 · India · primary · confidence high · Apprehended 229 (2022), 220 (2023), 526 (2024); boats confiscated 31, 33, 72; released 268, 240, 538; boats released 1, 14, 2; 28 in custody on 15 July 2025
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- S61** **Sri Lanka has arrested 1,300 Indian fishermen since 2023; 30 still in custody** <https://timesofindia.indiatimes.com/city/chennai/sri-lanka-has-arrested-1300-indian-fishermen-since-2023-30-still-in-custody/articleshow/132765260.cms>
The Times of India · 2026-07-31 · accessed 2026-09-15 · India · news · confidence medium · 146 arrested to 23 July 2026 (119 Tamil Nadu, 27 Puducherry); boats seized 35 (2023), 75 (2024), 48 (2025), 21 (2026); 165 of 179 seized boats from Tamil Nadu
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- S62** **144 Gujarat fishermen, 1,173 boats in Pakistani custody; no repatriation since 2024** <https://www.newindianexpress.com/amp/story/nation/2025/Mar/05/144-gujarat-fishermen-1173-boats-in-pakistani-custody-no-repatriation-since-2024>
The New Indian Express · 2025-03-05 · accessed 2026-09-15 · India · news · confidence medium · Gujarat Assembly reply as of 31 December 2024; 22 fishermen and 4 boats seized in two years; 432 released February 2023 to January 2024; no boat returned
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- S63** **Cyclone Ockhi: 661 fishermen still missing (Defence Minister in Parliament)** <https://www.ndtv.com/kerala-news/cyclone-ockhi-661-fishermen-still-missing-1792800>
NDTV · 2017-12-27 · accessed 2026-09-15 · India · news · confidence medium · Union figure of 661 missing as of 27 December 2017
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- S64** **Cyclone Ockhi: 263 missing people considered dead; death toll at 365** <https://icsf.net/newss/tamil-and-kerala-cyclone-ockhi-263-missing-people-considered-dead-death-toll-at-365/>
ICSF, citing Kerala and Tamil Nadu government decisions · 2018 · accessed 2026-09-15 · India · news · confidence medium · States classified 263 missing fishers as dead, taking the toll to 365; 102 from Kerala and 191 from Tamil Nadu among the missing declared dead (page dated 2021-09-21 on the archive)
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- S65** **Four fishermen missing after two boats capsize off Kerala coast** <https://www.indiatoday.in/india/kerala/story/thiruvananthapuram-fishermen-missing-after-twin-boat-cap-sizes-in-rough-seas-ptag-2961158-2026-08-01>
India Today · 2026-08-01 · accessed 2026-09-15 · India · news · confidence medium · Muthalappozhi and Vizhinjam incidents on the first day after the trawl ban; families protested alleged delay in search; several boats could not be traced and efforts were under way to establish contact
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- S66** Six fishermen missing after boat capsizes off Visakhapatnam coast <https://www.thehindu.com/news/national/andhra-pradesh/six-fishermen-missing-after-boat-capsize-off-visakhapatnam-coast/article71185183.ece>
The Hindu · 2026-07-05 · accessed 2026-09-15 · India · news · confidence medium · Mechanised boat left Visakhapatnam on 1 July 2026; families reported lost contact; one rescued by a passing cruise ship
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- S67** Fishermen to stay off sea from June 15, cite diesel price rise (Odisha) <https://timesofindia.indiatimes.com/city/bhubaneswar/fishermen-to-stay-off-sea-from-june-15-cite-diesel-price-rise/articleshow/131704479.cms>
The Times of India · 2026-06-13 · accessed 2026-09-15 · India · news · confidence medium · Odisha Marine Fish Producers Association strike; harbour bulk diesel ₹140 to ₹142 a litre against retail ₹99 to ₹101; a deep-sea vessel burns several thousand litres a voyage
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- S68** Fishing boats worldwide stuck dockside as diesel prices surge on Iran war <https://www.reuters.com/business/energy/fishing-boats-worldwide-tuck-dockside-diesel-prices-surge-iran-war-2026-05-21/>
Reuters · 2026-05-21 · accessed 2026-09-15 · Global · news · confidence high · 2026 diesel spike tied to the Iran war; fleets in several countries reducing trips
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- S69** Rising fuel cost hits Kerala fisheries operation <https://www.thehindubusinessline.com/economy/agri-business/rising-fuel-cost-hits-kerala-fisheries-operation/article65378012.ece>
The Hindu BusinessLine · 2022-05-03 · accessed 2026-09-15 · India · news · confidence medium · 1,500 litres for a three-day trip, fuel alone ₹1.5 lakh, per boat owners (All Kerala Fishing Boat Owners Association); this is the deck's fuel figure
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- S70** Satellite phone to aid fishing in troubled waters (Tamil Nadu, post-Ockhi) <https://www.thehindu.com/news/national/tamil-nadu/satellite-phone-to-aid-fishing-in-troubled-waters/article22646939.ece>
The Hindu · 2018-02-04 · accessed 2026-09-15 · India · news · confidence medium · Mobile phone coverage only up to 12 nautical miles; associations demanding communication equipment on board after Ockhi
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- S71** Fishermen must have good communication gear (Thoothukudi, after Ockhi) <https://www.thehindu.com/news/cities/Tiruchirapalli/fishermen-must-have-good-communication-gear/article21804287.ece>
The Hindu · 2017-12-16 · accessed 2026-09-15 · India · news · confidence medium · Communication with fishers' mobile phones possible only to about two nautical miles
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- S72** Tamil Nadu deep-sea fishermen seek satellite internet to boost safety, market access <https://www.newindianexpress.com/states/tamil-nadu/2026/Jul/04/tamil-nadu-deep-sea-fishermen-seek-satellite-internet-to-boost-safety-market-access>
The New Indian Express · 2026-07-04 · accessed 2026-09-15 · India · news · confidence medium · National Association of Fishermen petition to DoT; VMS offers little more than tracking and text with ₹25 per minute calls; IsatPhone 2 effective to 200 nautical miles; state relies on BSNL satphones, NavIC transceivers and VHF; Centre contemplating Starlink; ABJ Impex pilots with video and CCTV beyond 300 nautical miles; 64,414 registered mechanised vessels
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- S73** Maharashtra explores satellite phone connectivity for deep-sea fishermen (BSNL GSPS) <https://www.indiatoday.in/amp/india/story/bsnl-maharashtra-govt-discuss-satellite-phone-connectivity-for-deep-sea-fishermen-2948066-2026-07-15>
India Today · 2026-07-14 · accessed 2026-09-15 · India · news · confidence medium · Fisheries Minister Nitesh Rane reviewed BSNL GSPS coverage and suitability; statement on absence of mobile coverage in deep-sea areas
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- S74** Fishing industry drives demand for satellite phones in Mangaluru <https://timesofindia.indiatimes.com/city/mangaluru/fishing-industry-drives-demand-for-satellite-phone-in-mangaluru/articleshow/133542648.cms>
The Times of India · 2026-08-26 · accessed 2026-09-15 · India · news · confidence medium · BSNL GM anticipates about 50 additional connections each from Udupi and Mangaluru; fishing companies with several boats buying satphones; requests routed to central supplier in Ghaziabad
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- S75** Fishermen seek introduction of the latest communication technology (Mangaluru) <https://www.thehindu.com/news/cities/Mangalore/fishermen-seek-introduction-of-the-latest-communication-technology/article32798026.ece>
The Hindu · 2020-10-08 · accessed 2026-09-15 · India · news · confidence medium · Association says hundreds of fishers die each year for want of modern connectivity; association tested BSNL's two-way satellite data transponder
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- S76** Fishermen must use tracking devices: Minister (Tamil Nadu) <https://www.thehindu.com/news/cities/chennai/fishermen-must-use-tracking-devices-minister/article32967369.ece>
The Hindu · 2020-10-28 · accessed 2026-09-15 · India · news · confidence medium · Satellite phones distributed to clusters of deep-sea boats at 75 percent subsidy; department to insist on use during monsoon
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- S77** Tamil Nadu: sustainable marine plan can help catch coastal votes (equipment subsidies) <https://timesofindia.indiatimes.com/city/chennai/tamil-nadu-sustainable-marine-plan-can-help-catch-coastal-votes/articleshow/80056912.cms>
The Times of India · 2021-01-01 · accessed 2026-09-15 · India · news · confidence medium · Satellite phones costing ₹1.05 lakh at 75 percent subsidy for multi-day vessels; 25 W VHF worth ₹18,000 at 90 percent; 5 W VHF free for small boats
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- S78** VHF sets distributed to fishermen (Tamil Nadu, 100 percent subsidy) <https://www.thehindu.com/todays-paper/tp-national/tp-tamilnadu/vhf-sets-distributed-to-fishermen/article22415852.ece>
The Hindu · 2018-01-10 · accessed 2026-09-15 · India · news · confidence medium · 5 W VHF sets at 100 percent subsidy; fishers pay only the ₹500 WPC licence fee; department leased eight towers (one police, seven BSNL)
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- S79** **Distress Alert Transmitters to rescue fishermen at sea (Tamil Nadu procurement of 30,000 DATs)** <https://www.deccanchronicle.com/160109/nation-currennt-affairs/article/distress-alert-transmitters-rescue-fishermen-sea>
Deccan Chronicle · 2016-01-09 · accessed 2026-09-15 · India · news · confidence medium · Union approval in July 2015 for Tamil Nadu to procure 30,000 DATs at ₹36 crore, about ₹12,000 a unit
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- S80** **Traditional fishing crafts to get safety equipment (Kerala DAT and VHF tender)** <https://timesofindia.indiatimes.com/city/thiruvananthapuram/traditional-fishing-crafts-to-get-safety-equipment/articleshow/71039902.cms>
The Times of India · 2019-09-09 · accessed 2026-09-15 · India · news · confidence medium · Kerala tendering ₹4 crore of DATs and ₹5 crore of VHF marine radios for traditional craft
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- S81** **Start a Business: marine schemes including safety kit for boats** <https://www.fisheries.tn.gov.in/StartABusiness>
Fisheries Department, Government of Tamil Nadu · undated · accessed 2026-09-15 · India · primary · confidence high · Safety kit unit cost ₹2.00 lakh: GPS, communication equipment, echo-sounder, lifejackets, lifebuoys, DAT, VHF, fish finder, backup battery, SAR beacon; beneficiary needs ownership certificate, ReAlCraft registration, fishing licence and biometric ID; FRP boat up to ₹4 lakh; applications at Assistant Director offices
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- S82** **Kerala's fisheries operations badly hit by increasing fuel costs** <https://krishijagran.com/animal-husbandry/keralas-fisheries-operations-badly-hit-by-increasing-fuel-costs>
Krishi Jagran · 2022-05-04 · accessed 2026-09-15 · India · news · confidence low · Quotes Joseph Xavier Kalapurackal (All Kerala Fishing Boat Owners Association) and Charles George (Kerala Matsya Thozhilali Aikya Vedi); kerosene ₹125 open market against ₹80 subsidised
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- S83** **India wants a Blue Revolution. What do India's fishers want?** <https://janataweekly.org/india-wants-a-blue-revolution-what-do-indias-fishers-want/>
Janata Weekly (reproducing a reported feature) · undated · accessed 2026-09-15 · India · news · confidence low · Fisher Ganesh Nakhawa on Coast Guard life-jacket rules and state MFRA provisions requiring AIS on mechanised boats under 24 m
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- S84** **Skylo Technologies launches solution for Tamil Nadu fishermen to communicate from sea** <https://economictimes.indiatimes.com/tech/tech-bytes/skylo-technologies-launches-solution-for-tn-fishermen-to-communicate-from-sea/articleshow/83779244.cms>
The Economic Times · 2021-06 · accessed 2026-09-15 · India · news · confidence medium · Skylo Hub on BSNL satellite ground infrastructure; NB-IoT over satellite; subscription 'as low as a daily cup of tea'; November 2020 rescue of seven Maharashtra fishers; catch-reporting app
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- S85** **ABJ Impex: services, vessel monitoring system for fisheries, GSPS FleetPhone** <http://www.abjimpex.com/>
ABJ Impex · undated · accessed 2026-09-15 · India · vendor · confidence medium · Cellular plus satellite VMS with SOS messaging and camera images; Promatas (Oman) partnership; SPIT-1000 and SPST-1100 products; 2019 VMS announcement
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- S86** **Marine GPS: latest price, manufacturers and suppliers (India listings)** <https://dir.indiamart.com/impcat/marine-gps.html>
IndiaMART · undated · accessed 2026-09-15 · India · vendor · confidence medium · Observed asking prices: Onwa KP-39A 7 inch with Class B+ AIS ₹53,000 (Galaxy Technocom, Hyderabad); Onwa KP-27 ₹28,000 (Mahamai Marine, Jamnagar); Furuno GP-39 ₹30,000 (Aarfa Marine, Bhavnagar) and ₹36,680 (Nakhwa International, Navi Mumbai); Garmin GPSMAP 585 Plus ₹45,000 (Banu Communications, Thoothukudi) and ₹48,000 (Jaipur); Garmin GPS 152 ₹23,000 (Navrang Marine, Porbandar); Kodon KGP-922 ₹1,00,000 (Meeres Master, Mumbai); Dharmi Marine 7 inch ₹40,000 (Bhavnagar)
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- S87** **ONWA KP-1299X 12.1 inch GPS chartplotter, fishfinder, radar, AIS (Seanav Marine, Panvel) and similar listings** <https://www.indiamart.com/proddetail/onwa-kp-1299x-12-1-inch-gps-chartplotter-fishfinder-radar-ais-2851838788912.html>
IndiaMART · undated · accessed 2026-09-15 · India · vendor · confidence medium · Five-in-one plotter with Class B AIS function; price on request; related listings Furuno GP-25 ₹28,640, Furuno GP-39 ₹35,000, Japan Marine GP-300 ₹29,900
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- S88** **Icom IC-M25 VHF marine transceiver at ₹17,900 (Mintaka Electronics, Mumbai)** <https://www.indiamart.com/proddetail/icom-ic-m25-vhf-marine-transceiver-20156340933.html>
IndiaMART · undated · accessed 2026-09-15 · India · vendor · confidence medium · Handheld marine VHF asking price
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- S89** **Onwa marine electronics top sellers 2025 (Alibaba B2B price ranges)** <https://www.accio.com/business/onwa-marine-electronics-top-sellers>
Accio (marketplace aggregator) · 2025 · accessed 2026-09-15 · Global · reference · confidence low · KP-27A 7 inch plotter USD 300 to 330; KS-200A Class B AIS USD 208 to 215; KP-1299A 12 inch with Class B+ AIS USD 600; KS-33R AIS man-overboard personal locator USD 100 to 150; ex-factory, before Indian duty and margin
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- S90** **Garmin Striker 4 with transducer, 3.5 inch GPS fishfinder** <https://www.amazon.com/Garmin-Striker-Transducer-Fishfinder-Traditional/dp/B017NI17HQ>
Amazon.com · 2026 · accessed 2026-09-15 · United States · vendor · confidence medium · USD 130.99 (list USD 159.99); entry fishfinder benchmark, not an India price
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- S91** **Garmin selects AMIT International as exclusive distributor for India** <https://www.prnewswire.com/in/news-releases/garmin-selects-amit-international-as-exclusive-distributor-for-india-301967983.html>
Garmin (PR Newswire) · 2023-10-30 · accessed 2026-09-15 · India · vendor · confidence high · AMIT India has distributed Garmin marine products since 2017; Amit GPS & Navigation LLP
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- S92** **Chartplotters and fishfinders (Garmin India authorised distributor store)** <https://www.garmin-india.com/c/marine/chartplotters>
garmin-india.com (AMIT) · undated · accessed 2026-09-15 · India · vendor · confidence medium · Series positioning (Striker, ECHOMAP, GPSMAP); page captured as figure; individual INR prices were not rendered in the capture
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- S93 Fishing equipment in India: Furuno fish finder, sonar and GPS** <https://www.asmolooobhoy.com/Sales/Fishing>
A. S. Moloobhoy · undated · accessed 2026-09-15 · India · vendor · confidence medium · Mumbai-based marine electronics house stocking Furuno fishing equipment in India
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- S94 Furuno in India: radar and navigation system service** <https://www.mastersystems.com/partners/furuno-in-india/>
Master Systems · 2025-11-22 · accessed 2026-09-15 · India · vendor · confidence medium · Furuno service at Mumbai, Chennai, Kolkata, Visakhapatnam and Kochi ports
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- S95 Samyung NF500 GPS plotter and fishfinder combo: India dealer page** <https://www.upbeattech.com/samyung/samyung-nf500-marine-gpschartplotter-fishfinder-combo.html>
Upbeat Technologies, Chennai · undated · accessed 2026-09-15 · India · vendor · confidence medium · Samyung and Garmin dealer serving fishing harbours from Kasimedu to Veraval; page captured as figure; prices on enquiry
-
- S96 Marine equipment for fishing vessels (Furuno) and FA-50 Class B AIS notice** <https://www.furuno.com/en/fishing/index.html>
Furuno Electric Co. · 2026-08-25 · accessed 2026-09-15 · Global · vendor · confidence medium · Fish finders, sonar, GPS, AIS; important notice to FA-50 Class B AIS users dated 25 August 2026
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- S97 Class A and Class B AIS transponders (brands stocked)** <https://tecocomart.co/product-category/marine-communication/class-a-b-ais-transponders/>
Tecocomart · undated · accessed 2026-09-15 · Global · vendor · confidence low · em-trak, Samyung ENC, ICOM, Raymarine, JRC, Koden, Simrad and Furuno AIS units; prices on request
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- S98 Countries where inReach compatible devices may be regulated, prohibited or embargoed** <https://support.garmin.com/en-US/?faq=Dq3CEPZjfrAhtToGD4Yrz9>
Garmin support · undated · accessed 2026-09-15 · Global · vendor · confidence medium · Garmin's own list of restricted countries for inReach; India requires DoT permission
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- S99 Starlink for boats: plans, dishes and what it costs** <https://travelsketchsailing.com/post/starlink-for-boats/>
Travel Sketch Sailing · 2026-09-08 · accessed 2026-09-15 · Global · reference · confidence low · Roam Ocean Mode USD 6 per GB from 27 September 2026; Global Priority maritime plans; not available for Indian fishing vessels as of the cutoff
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- S100 Deep tech at sea: startup helps fishermen in India take IoT-enabled decisions (InCEve Electronics)** <https://yourstory.com/socialstory/2019/08/startup-fishermen-iot-sonars>
YourStory · 2019-09-05 · accessed 2026-09-15 · India · news · confidence low · Bengaluru startup founded 2016 building IoT sonar decision aids for fishers
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- S101 MarineServe: an IoT-based AI-enabled real-time alerting system for fishing boats (Amrita research)** https://www.researchgate.net/publication/364680373_MarineServe_An_IoT-based_AI-enabled_Multi-Purpose_Real-time_Alerting_System_for_Fishing_Boats
ResearchGate (Amrita Vishwa Vidyapeetham authors) · 2022 · accessed 2026-09-15 · India · academic · confidence low · Academic prototypes for boat tracking and OceanNet long-range Wi-Fi offshore internet; not commercial products
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- S102 Matsyafed (Kerala State Co-operative Federation for Fisheries Development)** <https://en.wikipedia.org/wiki/Matsyafed>
Wikipedia and matsyafed.in · 2026-05-30 · accessed 2026-09-15 · India · reference · confidence medium · Apex of 654 primary societies (332 marine); Suzuki outboard distributor for south India; diesel bunks; motorisation scheme subsidies
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- S103 Kerala State Cooperative Federation for Fisheries Development (Matsyafed) and cooperative societies** <https://fisheries.kerala.gov.in/en/matsyafed>
Fisheries Department, Government of Kerala · undated · accessed 2026-09-15 · India · primary · confidence medium · Registered 19 March 1984 as apex federation; cooperative structure with 41 cooperative inspectors
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- S104 Fish cooperatives: development and performance (VAMNICOM)** <https://enaca.org/enclosure?id=1357>
Network of Aquaculture Centres in Asia-Pacific (NACA) · 2024-07-17 · accessed 2026-09-15 · India · academic · confidence medium · Gujarat Fisheries Central Cooperative Association (1956) runs diesel outlets; Maharashtra federation three-tier structure with 57 primary societies under Palghar district; NCDC and NFDB roles
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- S105 Cochin Shipyard flags off first tuna long liner cum gillnetter fishing vessel** https://www.business-standard.com/article/news-cm/cochin-shipyard-flags-off-first-tuna-long-liner-cum-gillnetter-fishing-vessel-119022000556_1.html
Business Standard · 2019-02-20 · accessed 2026-09-15 · India · news · confidence medium · 16 tuna longliners for Tamil Nadu fishers under the Blue Revolution trawler-diversification scheme
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- S106 FRP commercial fishing boat, 31 to 41 feet, ₹3,35,000 (National Fibers, Nagapattinam)** <https://www.indiamart.com/proddetail/commercial-fishing-boat-24770077812.html>
IndiaMART · undated · accessed 2026-09-15 · India · vendor · confidence low · FRP yard active since 2021 in Nagapattinam; other yards listed in Chennai, Cuddalore and Puducherry
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- S107 Palk Bay scheme and Marine Fisheries Bill** <https://www.drishtiiias.com/daily-news-analysis/palk-bay-scheme-and-marine-fisheries-bill>
Drishti IAS (reference) · undated · accessed 2026-09-15 · India · reference · confidence low · Deep-sea vessel unit cost ₹80 lakh proposed to rise to ₹1.3 crore; 2,000 vessels target; Centre 50 percent, state 20 percent
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- S108** **Twelfth Five Year Plan Tamil Nadu: fisheries (VHF scheme through ELCOT, HSD subsidy, trawler buy-back)** https://agritech.tnau.ac.in/12th_fyp_tn/2.%20Agriculture%20and%20Allied%20Sectors/2_8.pdf
Government of Tamil Nadu via TNAU · 2013 · accessed 2026-09-15 · India · primary · confidence medium · Handheld VHF free to traditional fishers, 25 W fixed VHF with GPS subsidised for mechanised boats with towers and repeaters, implemented by ELCOT; HSD subsidy ₹3 a litre up to 500 litres a month for boats under 20 m
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- S109** **Latest Department of Fisheries tenders (aggregator)** <https://tenderlabs.in/department-tenders/department-of-fisheries-tenders>
tenderlabs.in · 2026-07-29 · accessed 2026-09-15 · India · reference · confidence low · GeM and e-tender listings for fisheries procurement; no open tender for integrated vessel systems found at cutoff
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- S110** **Tenders** <https://nfdb.gov.in/welcome/tenders>
National Fisheries Development Board · undated · accessed 2026-09-15 · India · primary · confidence low · NFDB procurement notices; none for onboard electronics at cutoff
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- S111** **Pact inked to operate fishing boats tracking system (Oman MAFWR and Tadam)** <https://timesofoman.com/article/165919-pact-inked-to-operate-fishing-boats-tracking-system>
Times of Oman (ONA) · 2025-12-07 · accessed 2026-09-15 · Oman · news · confidence medium · National system for all artisanal boats in phases; coastal LoRaWAN 40 to 70 km plus satellite; emergency button, tamper alerts
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- S112** **Oman ministry fixing satellite tracking devices on fishing fleet** <https://www.icsf.net/newss/oman-ministry-fixing-satellite-tracking-devices-on-fishing-fleet-to-modernise-operations/>
ICSF, citing Oman Observer · 2023 · accessed 2026-09-15 · Oman · news · confidence medium · 250 vessels fitted; 2021 agreement with Middle East Scientific Equipment Corporation
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- S113** **Sri Lanka to expand vessel tracking to 1,500 fishing boats to curb mid-sea smuggling** <https://economynext.com/sri-lanka-to-expand-vessel-tracking-to-1500-fishing-boats-to-curb-mid-sea-smuggling-277631/>
EconomyNext · 2026-07-08 · accessed 2026-09-15 · Sri Lanka · news · confidence medium · 5,200 registered multi-day vessels, 4,200 already with VMS; Cabinet mandates VMS on remaining 1,500 at government cost
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- S114** **Sri Lanka to install VMS (Visma Consulting transponders on 1,500 multi-day boats)** <https://www.worldfishing.net/sri-lanka-to-install-vms/113707.article>
World Fishing & Aquaculture · 2022-07-12 · accessed 2026-09-15 · Sri Lanka · news · confidence medium · Earlier VMS phase supplied by Visma Consulting A/S, Denmark
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- S115** **Mint Explainer: why India is equipping fishing vessels with transponders** <https://www.livemint.com/industry/agriculture/indian-fishermen-arrest-pakistan-sri-lanka-satellite-transponders-monitoring-fishing-boats-maritime-security-11759206008951.html>
Mint · 2025-09-30 · accessed 2026-09-15 · India · news · confidence medium · Context on Sri Lanka and Pakistan detentions as drivers of the transponder programme
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- S116** **India: fishing vessels to be fitted with tracking system (Odisha, 2021)** <https://icsf.net/newss/india-fishing-vessels-to-be-fitted-with-tracking-system/>
ICSF · 2021-09-21 · accessed 2026-09-15 · India · news · confidence medium · About 1,000 transponders fitted on a pilot basis in Tamil Nadu, Puducherry and Gujarat; over 22,000 vessels and 1,754 trawlers registered in Odisha; foreign craft without transponder to be treated as intruders
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- S117** **Issuance of ETA for licence-exempt wireless equipment on self-declaration (notification of 9 September 2024)** <https://www.bl-india.com/notifications/wpc-eta-approval/issuance-of-equipment-type-approval-for-license-exempt-wireless-equipment-devices>
Brand Liaison (regulatory consultancy summary of DoT notice) · 2024-09-09 · accessed 2026-09-15 · India · reference · confidence medium · Self-declaration ETA via SARAL Sanchar; DGFT import NOC still needed for imported modules
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- S118** **IEC 60945 Ed. 4.0: maritime navigation and radiocommunication equipment, general requirements, methods of testing** <https://webstore.ansi.org/standards/iec/iec60945ed2002>
IEC via ANSI webstore · 2002 · accessed 2026-09-15 · Global · reference · confidence medium · Environmental, EMC and safety test standard referenced by IMO performance standards that the draft fishing vessel rules invoke
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- S119** **Manickam Tagore urges Centre to intervene over arrests of Indian fishermen by Sri Lankan Navy** <https://aninews.in/news/national/general-news/manickam-tagore-urges-centre-to-intervene-over-arrests-of-indian-fishermen-by-sri-lankan-navy20260813100512/>
ANI · 2026-08-13 · accessed 2026-09-15 · India · news · confidence medium · Cites Rajya Sabha data: 1,306 arrested and 179 boats seized since 2023; 30 fishers and 171 boats in custody on 23 July 2026
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- S120** **All fishing boats to have VHF equipment (Tamil Nadu, 90 percent subsidy)** <https://www.thehindu.com/news/national/tamil-nadu/all-fishing-boats-to-have-vhf-equipment/article7026100.ece>
The Hindu · 2015-03-24 · accessed 2026-09-15 · India · news · confidence medium · VHF devices at 90 percent subsidy for fishing boats
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- S121** **Waiting on shore: families of Indian fishermen jailed in Pakistan** <https://frontline.thehindu.com/the-nation/indian-fishermen-jailed-pakistan-gujarat-families-crisis/article70542233.ece>
Frontline · 2026-01-24 · accessed 2026-09-15 · India · news · confidence medium · 1,173 Gujarat boats in Pakistani custody as of December 2024; livelihood loss for families
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- S122** Schemes for development of fisheries sector in Kerala (Lok Sabha reply 5 August 2025) <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2152513>
Press Information Bureau · 2025-08-05 · accessed 2026-09-15 · India · primary · confidence medium · VCSS rolled out in all coastal states including Kerala at ₹364 crore
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- S123** Three fishermen missing, five escape as boat sinks off Alibaug <https://www.ndtv.com/india-news/3-fishermen-missing-5-escape-as-boat-capsizes-in-sea-in-maharashtra-8958866>
NDTV (PTI) · 2025-07-27 · accessed 2026-09-15 · India · news · confidence medium · Boat from Karanja capsized in heavy rain; multi-agency search with drones
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- S124** Soaring diesel prices threaten Goa's fishing industry <https://timesofindia.indiatimes.com/city/goa/diesel-price-surge-hits-coastal-fishing-sector/articleshow/130150438.cms>
The Times of India · 2026-04-09 · accessed 2026-09-15 · India · news · confidence medium · Diesel from ₹89 to ₹138 a litre; 5,000 to 7,000 litres per trip for Goa trawlers
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- S125** Between diesel price and deep sea: many fishermen unable to set sail this season (Gujarat) <https://indianexpress.com/article/india/between-diesel-price-and-deep-sea-many-fishermen-unable-to-set-sail-7481261/>
The Indian Express · 2021-09-01 · accessed 2026-09-15 · India · news · confidence medium · A trawler burns around 3,500 litres of diesel on a 15 to 21 day trip
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- S126** Marine Fisheries Census 2016: Maharashtra (state report) <https://eprints.cmfri.org.in/17496/2/MAHARASHTRA%20Marine%20Fisheries%20Census%20India%202016.pdf>
ICAR-CMFRI · 2020 · accessed 2026-09-15 · India · dataset · confidence high · 15,520 craft; 5,867 mechanised (3,408 trawlers), 6,788 motorised, 2,865 non-motorised; Ratnagiri, Raigad and Mumbai Suburban lead
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- S127** Nabhmitra app for Indian fishermen <https://agriculture.vikaspedia.in/viewcontent/agriculture/fisheries/advisories-for-fisheries-sector/nabhmitra-app-for-indian-fishermen?lgn=en>
Vikaspedia (MeitY) · 2026-03-24 · accessed 2026-09-15 · India · reference · confidence medium · Two-way messaging through the MSS Xponder over satellite; official summary of features
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- S128** New satellite-based communication aid to help fishermen find catch, warn against disasters (GEMINI launch) <https://timesofindia.indiatimes.com/india/new-satellite-based-communication-aid-to-help-fishermen-find-catch-warn-against-disasters/articleshow/71518049.cms>
The Times of India · 2019-10-10 · accessed 2026-09-15 · India · news · confidence medium · Minister notes VHF coverage is limited while fishers go beyond 50 and up to 300 to 500 nautical miles; Ockhi warnings did not reach boats at sea
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- S129** Handbook on Fisheries Statistics 2023 published (summary) <https://icsf.net/newss/india-ministry-of-fisheries-animal-husbandry-dairying-government-of-india-published-the-handbook-on-fisheries-statistics-2023/>
ICSF, summarising Department of Fisheries handbook · 2023-12 · accessed 2026-09-15 · India · reference · confidence medium · Total production 175.45 lakh tonnes in 2022-23: 44.32 lakh tonnes marine and 131.13 lakh tonnes inland; exports USD 8.09 billion
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- S130** 'Treat us like humans': fishing wars trap Indians in Sri Lankan waters <https://www.aljazeera.com/features/2025/1/1/treat-us-like-humans-fishing-wars-trap-indians-in-sri-lankan-waters>
Al Jazeera · 2025-01-08 · accessed 2026-09-15 · India and Sri Lanka · news · confidence medium · States 'a record 535 Indian fishermen were arrested by Sri Lanka in 2024 ... according to Indian government data'; 141 in Sri Lankan jails and 198 trawlers confiscated as of 29 November 2024. This is the most likely origin of the deck's 535 figure; it covers all Indian fishers, not only Tamil Nadu.
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- S131** Post Ockhi, Kanyakumari fishermen find dead bodies in the sea <https://www.thequint.com/news/environment/dead-bodies-in-the-sea-post-ockhi>
The Quint (The News Minute) · 2017-12-13 · accessed 2026-09-15 · India · news · confidence medium · Kanyakumari Collector: 43 multipurpose boats with 427 fishermen had not reported back, plus 13 small boats with about 35 fishers, 'we do not call them missing'. Origin of the deck's 'about 427 missing': an interim single-district figure of 11 December 2017, not a national or final count. Also carries a fisher's account of failed contact with the Navy.
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- S132** Two Hundred Eleventh Report: The Cyclone Ockhi, its impact on fishermen and damage caused by it <https://sdma.kerala.gov.in/wp-content/uploads/2020/08/Ockhi-Parliamentary-Standing-Committee-Full-Report-2018.pdf>
Department-related Parliamentary Standing Committee on Home Affairs, Rajya Sabha (copy hosted by Kerala State Disaster Management Authority) · 2018 · accessed 2026-09-15 · India · primary · confidence high · MHA data as on 4 January 2018: lives lost Tamil Nadu 30, Kerala 75; 203 Tamil Nadu and 141 Kerala fishers missing; 845 rescued. Para 2.2.6: 'mobile phones can reach up to 10-12 nautical miles only'; para 2.2.7: no means of communication beyond 50 nautical miles; recommends extending ISRO vessel tracking to every deep-sea boat. Official source for Ockhi casualties and offshore coverage.
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- S133** Government of India notifies Rules for 'Sustainable Harnessing of Fisheries in the Exclusive Economic Zone (EEZ)' <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2187691>
Press Information Bureau, Ministry of Fisheries, Animal Husbandry and Dairying · 2025-11-08 · accessed 2026-09-15 · India · primary · confidence high · EEZ Rules notified 4 November 2025; 'By providing mandatory use of transponders, the safety and security of fishermen and fishing vessels is ensured in the deep-sea'; QR-coded Aadhaar or Fisher ID cards mandatory; ReALCraft integrated with Nabhmitra.
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- S134** National launch of Access Pass for fishing in India's Exclusive Economic Zone <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2231184>
Press Information Bureau, Ministry of Fisheries, Animal Husbandry and Dairying · 2026-02-21 · accessed 2026-09-15 · India · primary · confidence high · Access Pass launched at Veraval on 20 February 2026 for all 13 coastal states and UTs; required for about 64,000 mechanised vessels and motorised vessels above 24 m; most fishing limited to 40-50 nautical miles from the coast; over 50,000 free transponders installed.
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- S135

Digital Personal Data Protection (DPDP) Rules, 2025 notified

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=2190655>
Press Information Bureau, Ministry of Electronics and Information Technology · 2025-11-14 · accessed 2026-09-15 · India · regulatory · confidence high · DPDP Rules notified 14 November 2025 with an eighteen-month period for phased compliance.
- S136

Digital Personal Data Protection Rules 2025: highlights

<https://www.lexology.com/library/detail.aspx?g=8cd518f8-7b2e-4379-95bb-d91f6c873acc>
Lexology · 2025-11-17 · accessed 2026-09-15 · India · reference · confidence medium · Obligations on data fiduciaries, consent and the remaining powers of the Board apply after 18 months, on 13 May 2027.
- S137

TEC/MTCTE approval: process, documents, fees and phase-wise product list

<https://alephindia.in/tec-mtcte-approval-process-document-fees.php>
Aleph India (certification consultancy) · undated · accessed 2026-09-15 · India · reference · confidence low · Phase-wise MTCTE dates: IoT Gateway and Tracking Device Phase III from 1 January 2024; VHF/UHF radio Phase IV from 1 August 2024; only TEC-designated Indian labs accepted; certificate validity typically 5 years; certification 4 to 8 weeks after reports.
- S138

TEC certification and MTCTE registration: timeline and cost

<https://instacertify.com/certification/india/tec-approval>
InstaCertify (certification consultancy) · undated · accessed 2026-09-15 · India · reference · confidence low · General Certification Scheme 40 to 60 working days; administrative fees ₹10,000 (Group A) to ₹50,000 (Group D), laboratory testing charged separately.
- S139

rax-tech.com product catalogue and the RT-DSM-R0 datasheet link (24-page Deep Sea Master catalogue, created 6 July 2026)

<https://www.rax-tech.com/products>
Rax Tech International · 2026-07-06 · accessed 2026-09-15 · India · vendor · confidence medium · Products page lists 40 products, 4 under Marine Engineering (RT-DSM-R0, RT-MBU-R0, RT-SBU-R0, RT-STJ-IM) plus RT-SW-DSM under Software. The RT-DSM-R0 'Datasheet' link opens the same 24-page presentation titled 'Boat Management Console' (R2 file catalog-1783916744511.pdf); it carries no electrical, environmental, radio or dimensional specification.
- S140

Statement from Gabriel Antony Xaviour on DeepSea Master sales, 15 September 2026 (recorded in the internal context file)

[charter/CONTEXT-RAX.md](#)
Rax Tech International (internal) · 2026-09-15 · accessed 2026-09-15 · India · internal · confidence high · "DeepSea Master: no sales have been made. There is no installed base or paying customer." Stated during the research run; consistent with the investor deck, which claims no customer or pilot count, and with the absence of any public deployment record.
- S141

HS code 852691: radio navigational aid apparatus (India tariff classification)

<https://www.trademo.com/hscodes/852691-radio-navigational-aid-apparatus/india>
Trademo · undated · accessed 2026-09-15 · India · reference · confidence low · Heading 8526 covers radar apparatus, radio navigational aid apparatus and radio remote control apparatus; subheading 852691 radio navigational aid apparatus (GNSS receivers, AIS).
- S142

Customs tariff number 90148000: other navigational instruments and appliances

<https://www.tariffnumber.com/2026/90148000>
tariffnumber.com (EU Combined Nomenclature reference) · 2026 · accessed 2026-09-15 · Global · reference · confidence low · Subheading 901480 other navigational instruments and appliances; unofficial examples include echo sounders, fish finders and fixed-mount chart plotters. Six-digit HS subheadings are common to India and the EU; the eight-digit lines differ.