🌊 Recommendation Inputs for Concluding & Way Forward

Strategic Recommendations Emerging from the National Survey and Marine Fisher Folk Meet

From Sea Voices to Science Systems – India's National Marine Risk Intelligence Brief 2026

Converging Fisher Field Evidence, Research Priorities, Digital Advisory Systems, and Institutional Deliberations at WOSC 2026

Introduction

The following recommendation inputs are derived from the structured National Marine Risk Intelligence Survey, multi-state fisher consultations, student focus group discussions, and the interactive deliberations held during the Marine Fisher Folk Meet at the World Ocean Science Congress (WOSC) 2026, Goa.

These recommendations synthesise fisher field realities, scientific discussions, institutional presentations, technology demonstrations, and governance reflections into a forward-looking framework. They are positioned as strategic inputs for the Concluding and Way Forward section, intended to guide future research priorities, innovation pathways, advisory system strengthening, and institutional coordination mechanisms.

The recommendations aim to bridge ground-level marine risk experiences with national-level science systems and digital advisory transformation, ensuring that community-validated evidence informs long-term marine governance and resilience planning.

🌊 Concluding & Way Forward – Strategic Recommendations

World Ocean Science Congress (WOSC) 2026 – Marine Fisher Folk Meet

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A) Research & Development Focus

(Scientific, Technical, and Innovation Priorities)

1️⃣ Predictive Marine Risk Intelligence & Climate Adaptation

- **Build corridor-level, journey-based marine risk modelling systems** to address weather unpredictability, compressed safe-return windows, and reaction-time analytics, incorporating harbour-sensitive intelligence and vessel-density patterns.
- **Develop cyclone-linked fisheries risk models** integrating Ocean State Forecasts (OSF), drift analytics, swell patterns, and vessel mobility data using AI/ML, GIS, and GeoAI systems.
- **Establish long-term climate-linked marine adaptation modelling**, including:
    - Sea surface temperature rise trends
    - Species migration and stock redistribution patterns
    - Coastal erosion and harbour vulnerability projections
    - Climate-induced livelihood exposure mapping
- **Create a National Marine Data Spine** including:
    - Trip-level catch and effort logs
    - Corridor network coverage mapping
    - Incident and near-miss safety records
    - Harbour sea-condition observations
    - PFZ performance validation datasets
    - Vessel tracking compliance logs
- **Advance confidence-scored advisory systems**, integrating catch-effort datasets, harbour validation inputs, corridor connectivity metrics, and incident analytics to improve predictive reliability and advisory credibility.

2️⃣ Smart Fishing & Integrated Decision-Support Systems

- **Develop integrated "Smart Fishing" decision-support architecture**, combining:
    - Safety alerts
    - Species probability forecasts
    - Fuel-distance optimisation
    - Trip-cost modelling
    - Market price intelligence
    - Export vs domestic sale decision overlays
- **Scale Profitable Fishing Tracks and species forecasting**, expanding from pilot fisheries (e.g., Hilsa) to mackerel, sardine, tuna, and other high-value species with expected catch probability and advisory confidence scoring.

- **Integrate real-time fish price intelligence and landing-volume forecasting**, reducing income volatility and preventing price crashes through predictive landing alerts and storage coordination modelling.
- **Embed economic exposure mapping into advisory systems**, identifying high-risk, high-cost, or low-profit corridors.

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3 Digital Advisory Enhancement & Inclusion Research

- **Strengthen low-bandwidth and resilient advisory delivery systems**, including:
  - Store-and-forward logic
  - Offline data caching
  - Voice-first emergency alerts
  - Assisted digital onboarding models
- **Prioritise Machli App R&D enhancements**, including:
  - Market buyer information
  - Alert accuracy improvements
  - Safe harbour navigation guidance
  - Training videos and simplified onboarding
  - Multilingual expansion
  - In-app feedback analytics
- **Institutionalise participatory "photo-upload" validation systems**, allowing fishers to upload catch evidence and location confirmation to refine PFZ and species forecasts.

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4 Safety Systems & Behavioural Compliance Research

- **Embed behavioural compliance analytics in research systems**, tracking:
  - Transponder activation rates
  - Life jacket usage
  - Communication redundancy (backup mobile systems)
- **Integrate Search and Rescue (SAR) intelligence** with transponder and drift modelling for predictive rescue mapping.
- **Develop pre-departure digital safety confirmation systems** based on behavioural nudging rather than enforcement-only approaches.

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5 Livelihood Diversification & Blue Economy Innovation

- **Align R&D with deep-sea fishing readiness**, developing offshore risk models, training frameworks, and preparedness certification systems.
- **Expand open-sea cage culture innovation**, integrating:
    - AI-based fish biomass monitoring
    - Environmental parameter tracking (temperature, turbidity, salinity)
    - Automated feeding systems
    - Affordable and scalable design prototypes
- **Advance women-led marine enterprise R&D**, including:
    - Seaweed cultivation scaling models
    - Post-harvest processing innovation
    - Value-addition technology incubation
- **Develop conservation communication research tools**, explaining seasonal bans, ecosystem cycles, and biodiversity protection in region-specific, non-blame frameworks.

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6 Youth, Academic & Innovation Ecosystem Integration

- **Establish structured Marine Innovation Fellowships** linking students, research institutions, and marine advisory systems.
- **Integrate academic institutions into applied marine AI development**, including:
    - Species modelling
    - Climate simulation
    - Risk forecasting
    - Smart fishing optimisation
- **Create student–fisher–scientist collaborative research labs** for community-validated innovation testing.

B) R&D-Based Policy Recommendation Focus

(Governance, Institutional Reform, and Implementation Architecture)

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1 Institutional Architecture & Consortium Governance

- **Institutionalise a Marine Risk Intelligence Consortium**, aligning INCOIS, NIOT, CMFRI, ICAR–CIFT, CSIR–NIO, State Fisheries Departments, and digital advisory partners.
- **Define clear institutional mandates**, role mapping, and shared governance dashboards.
- **Adopt National Advisory Reform & Data Governance Standards**, including:

    - Structured catch-effort reporting
    - Incident and near-miss reporting mandates
    - Confidence-scored alert systems
    - Tiered urgency classifications
- **Strengthen interoperability via Open APIs and shared dashboards**, enabling district marine resilience indices and corridor-level governance analytics.

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2 Harbour, Infrastructure & Coastal Governance

- **Embed harbour vulnerability mapping into advisory systems**, including:
    - Congestion-sensitive docking protocols
    - Breakwater reinforcement prioritisation
    - Corridor-based vessel density regulation
- **Modernise coastal cold-chain and value-addition infrastructure**, using predictive landing analytics and storage coordination planning.

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3 Digital Inclusion as Public Safety Infrastructure

- **Institutionalise digital inclusion as marine safety infrastructure**, ensuring:
    - Voice-first advisory architecture
    - Multilingual expansion
    - Assisted onboarding in harbour communities
    - Structured fisher volunteer models
- **Operationalise geo-tagged validation and embedded feedback loops**, tracking:
    - Active users
    - Feedback rates
    - Compliance self-checks
    - Incident reporting metrics
- **Institutionalise Annual Marine Risk Intelligence Review Forums**, evaluating adoption, advisory accuracy, safety compliance, and governance performance.

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4 Behavioural Compliance & Safety Governance

- **Treat behavioural compliance as policy**, not merely equipment distribution.
- **Strengthen safety-linked subsidy governance**, embedding compliance messaging into implementation protocols (e.g., life jacket subsidy schemes).

- **Institutionalise communication redundancy norms**, mandating backup communication systems for deep-sea journeys.
- **Integrate marine risk social protection workflows**, including:
    - Immediate incident relief tracking
    - Insurance-linked compensation systems
    - Digital claim processing dashboards
- **Replicate monitored scheme-delivery accountability models**, ensuring follow-up until benefits reach fishers.
- **Institutionalise technology stewardship governance**, encouraging community protection of scientific instruments and reduction of vandalism.

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5 National Mission & Global Alignment

- **Adopt "Smart Fishing" as a National Mission Vision**, integrating safety, species, and market intelligence under AI-enabled governance systems.
- **Align Marine Risk Intelligence with the National Blue Economy Mission**, coastal resilience planning, and long-term (2026–2035) digital governance transformation.
- **Position WOSC 2026 outcomes as the foundation for:**
    - A Marine Risk Intelligence White Paper
    - A National Digital Fisheries Governance Roadmap
    - Applied Marine AI Research Pilots
    - Cross-institutional Data Convergence Models
    - Community-linked Science-to-Policy Implementation Pathways

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🔹 National Strategic Direction Emerging from WOSC 2026

The WOSC 2026 Marine Fisher Folk Meet establishes a national transition:

- From advisory dissemination → to predictive marine intelligence
- From equipment distribution → to behaviour-based safety governance
- From fragmented institutions → to consortium-driven accountability
- From reactive response → to risk-informed planning
- From static forecasting → to AI-enabled adaptive systems
- From income uncertainty → to integrated safety + profitability + sustainability intelligence