Navigating Changes in Small Pelagic Fish and Forage Communities: Climate, Ecosystems, and Sustainable Fisheries

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IPMA

Aligning the Management of Small Pelagic Fish with Ecosystem Needs - A Global Review of Progress, Limitations, and Future Roadmap

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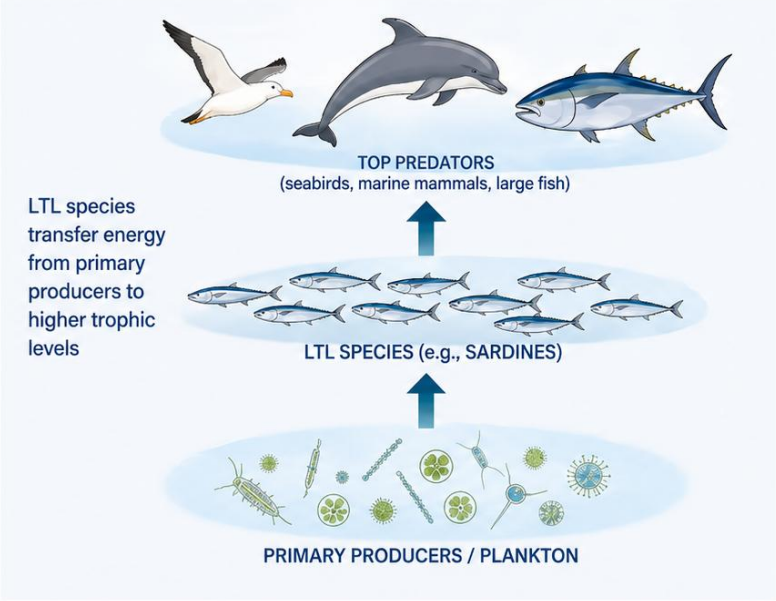
Why LTL species matters in EAFM ?



Ecosystem role

Stable predator populations depend on stable LTL populations.

Management implication

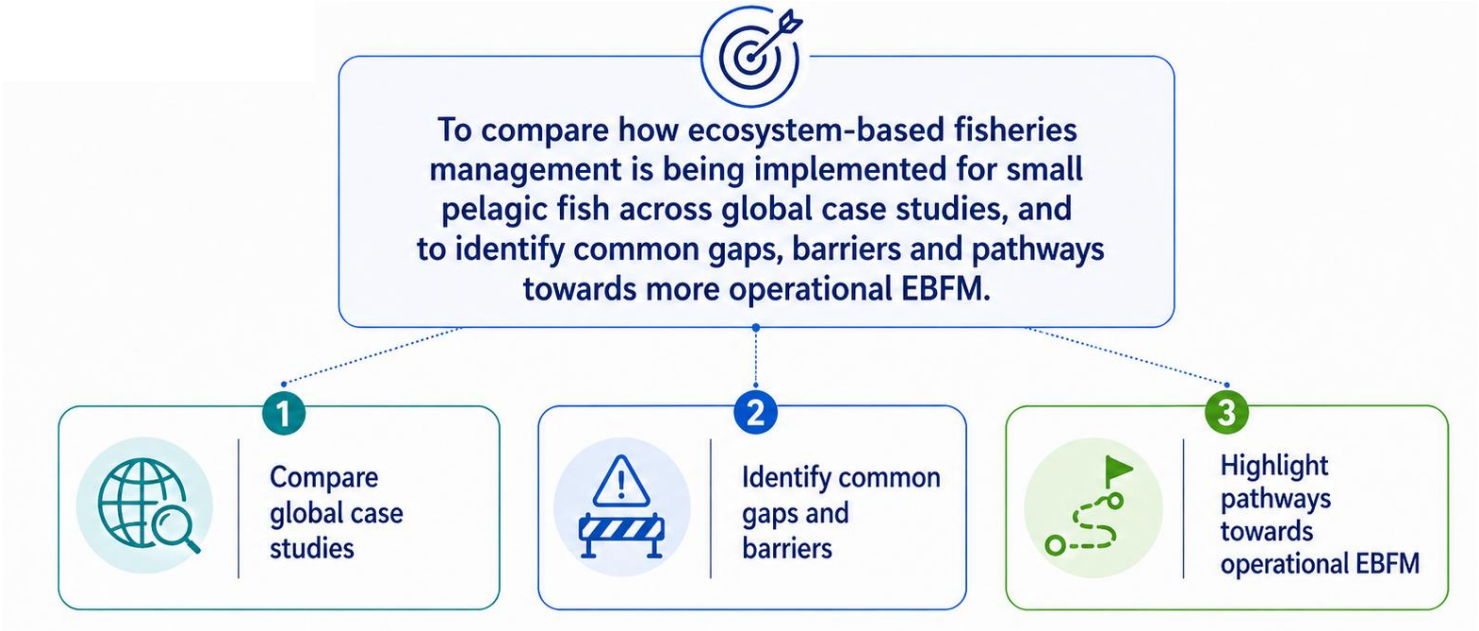
For key forage species, management should go beyond biomass and consider ecosystem stability.

EBFM

Ecosystem-Based Fisheries Management integrates food-web models, ecosystem indicators and other ecosystem considerations into management decisions.

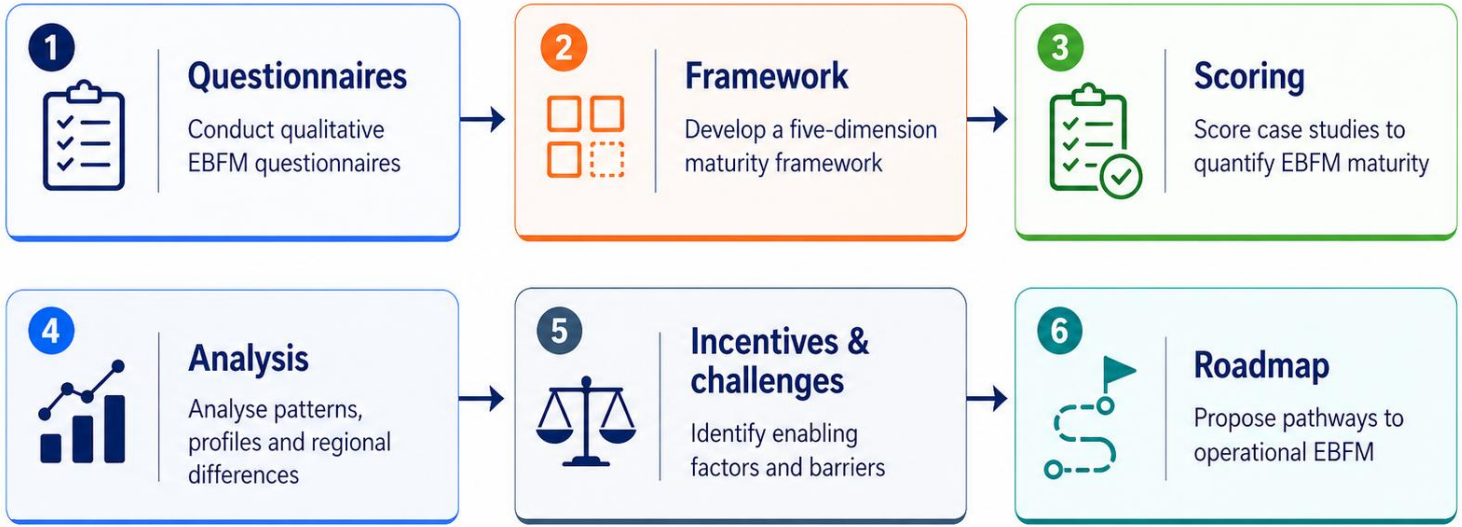
Progress is increasing, but operationalisation remains challenging.

Study objective

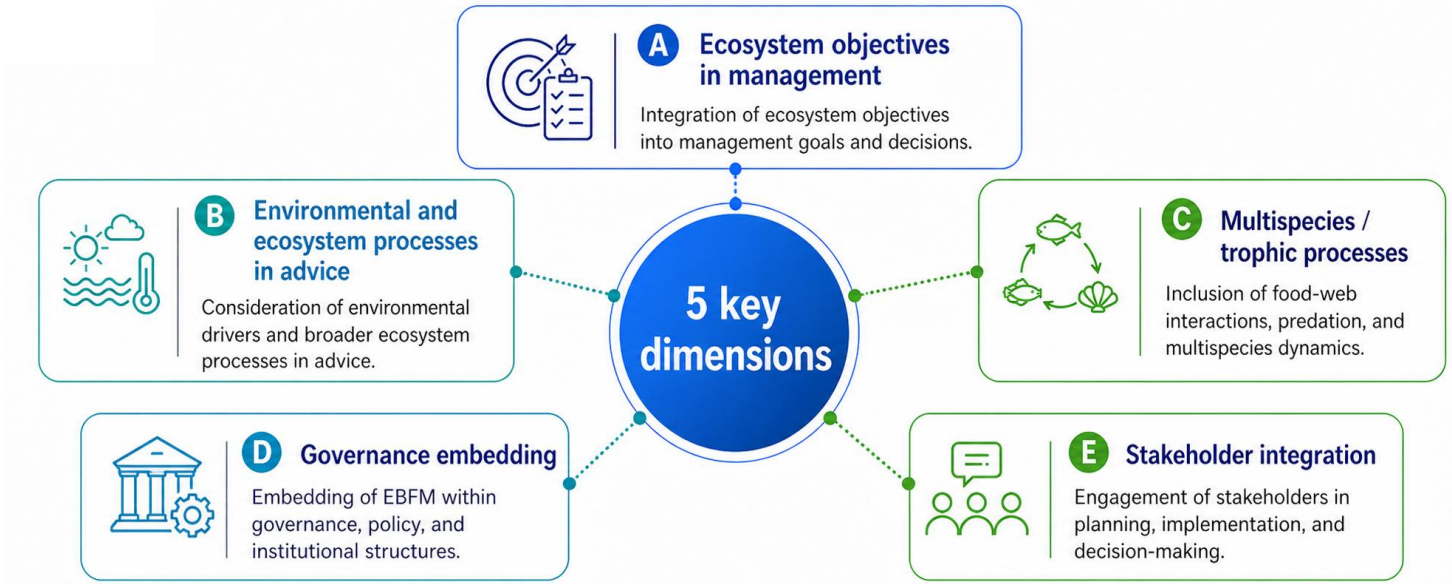


Case studies

Study workflow



Dimensions assessed in EBFM maturity framework



Scoring against EBFM maturity framework

1

Scoring scale

- **0** = Absent
- **1** = Conceptual recognition
- **2** = Quantitative analysis / exploratory use
- **3** = Operationalised in management or advice

2

Total score

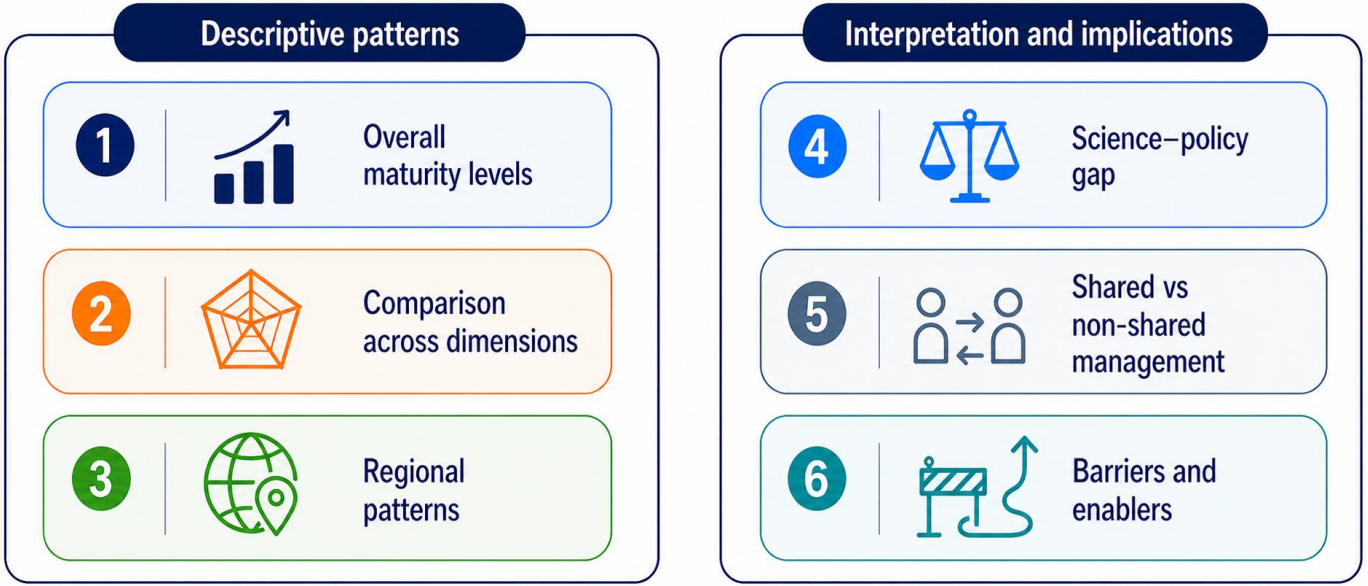
- Five dimensions combined into a total score
- Total score range: 0–15

3

Maturity categories

- Emerging: 0–4
- Early: 5–7
- Intermediate: 8–11
- Advanced: 12–15

Analysis of results



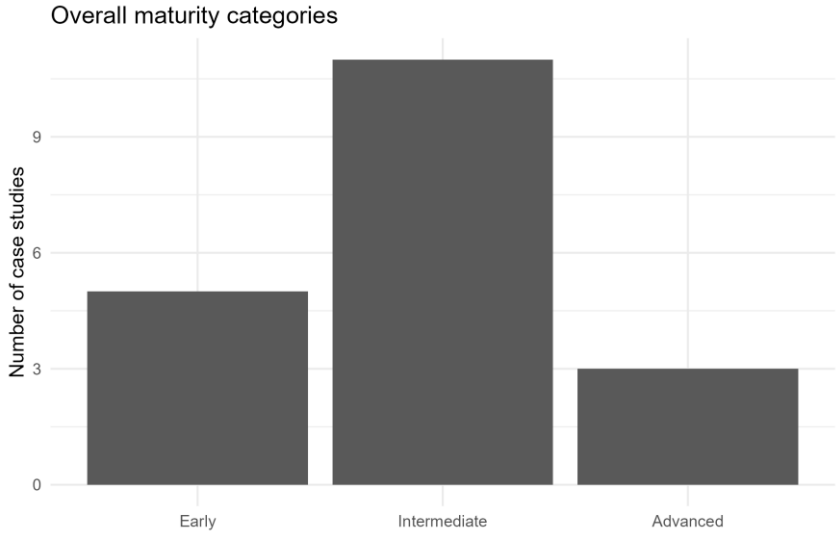
Science policy-gap assessment

Diagnostic logic

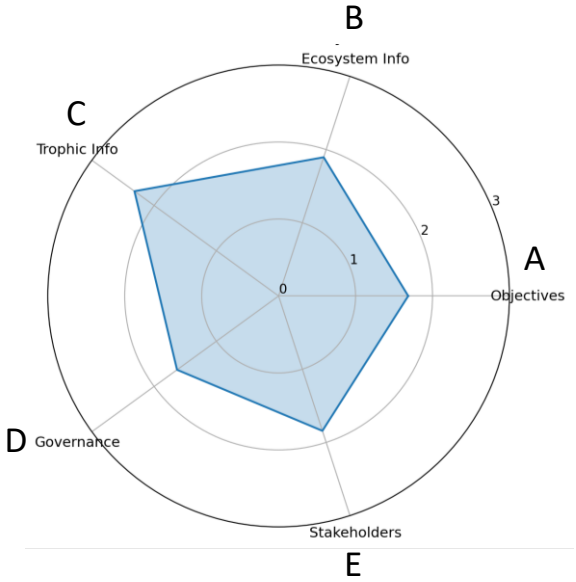
1. **Science present?**
   B ≥ 2 or C ≥ 2
   ecosystem or trophic science quantitatively assessed
2. **Advanced science?**
   B ≥ 2.5 or C ≥ 2.5
   stronger scientific integration
3. **Policy operationalised?**
   A ≥ 2.5
   ecosystem objectives operationalised in management
4. **Science–policy gap**
   Science present, but policy not operationalised
   gap recorded when S = 1 and P = 0

1. **Type 1**
   Low science, low policy
   A < 2, B < 2, C < 2
2. **Type 2**
   Science present, policy gap
   (B ≥ 2 or C ≥ 2), B < 2.5 and C < 2.5, A ≤ 2
3. **Type 3**
   Advanced science, policy gap
   (B ≥ 2.5 or C ≥ 2.5), A ≤ 2
4. **Type 4**
   Ecosystem operationalised
   (B ≥ 2 or C ≥ 2), A ≥ 2.5

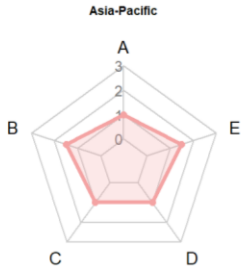
Overall maturity distribution

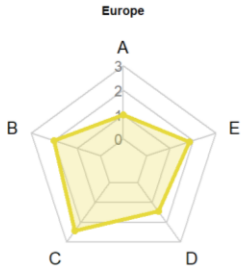


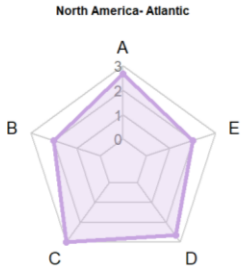
Dimension-level comparison

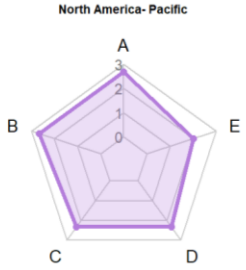


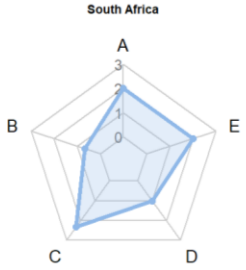
Regional comparison

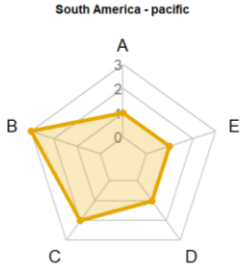




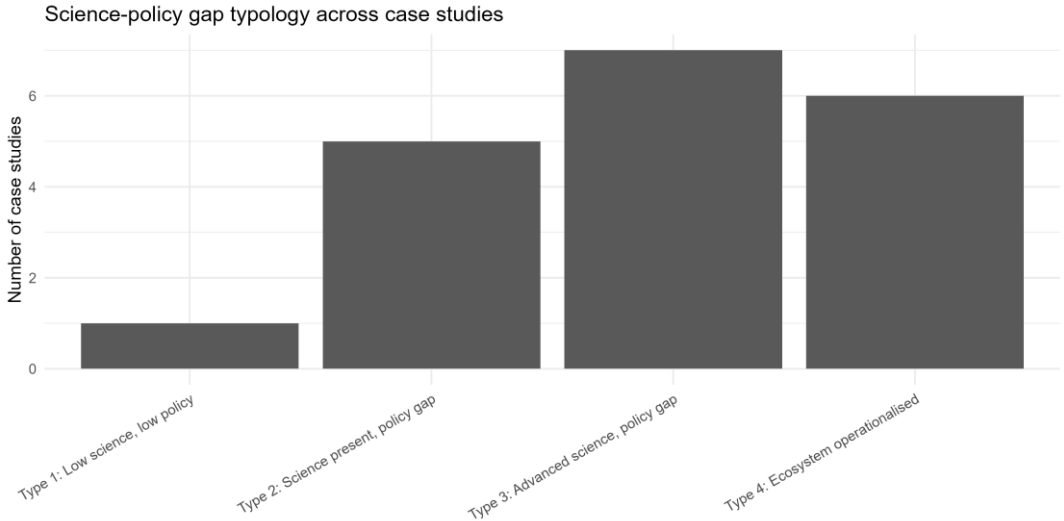






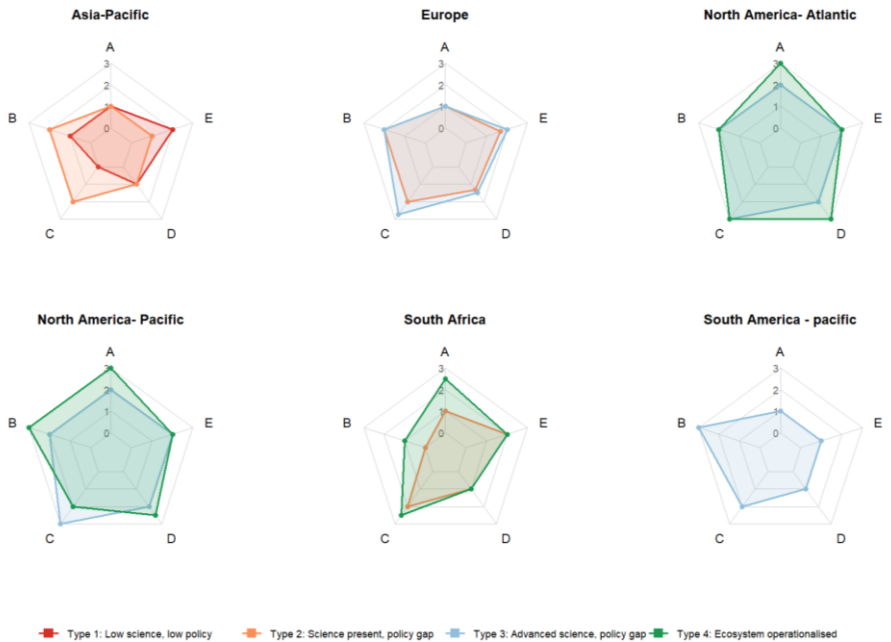


Science policy-gap assessment



Results

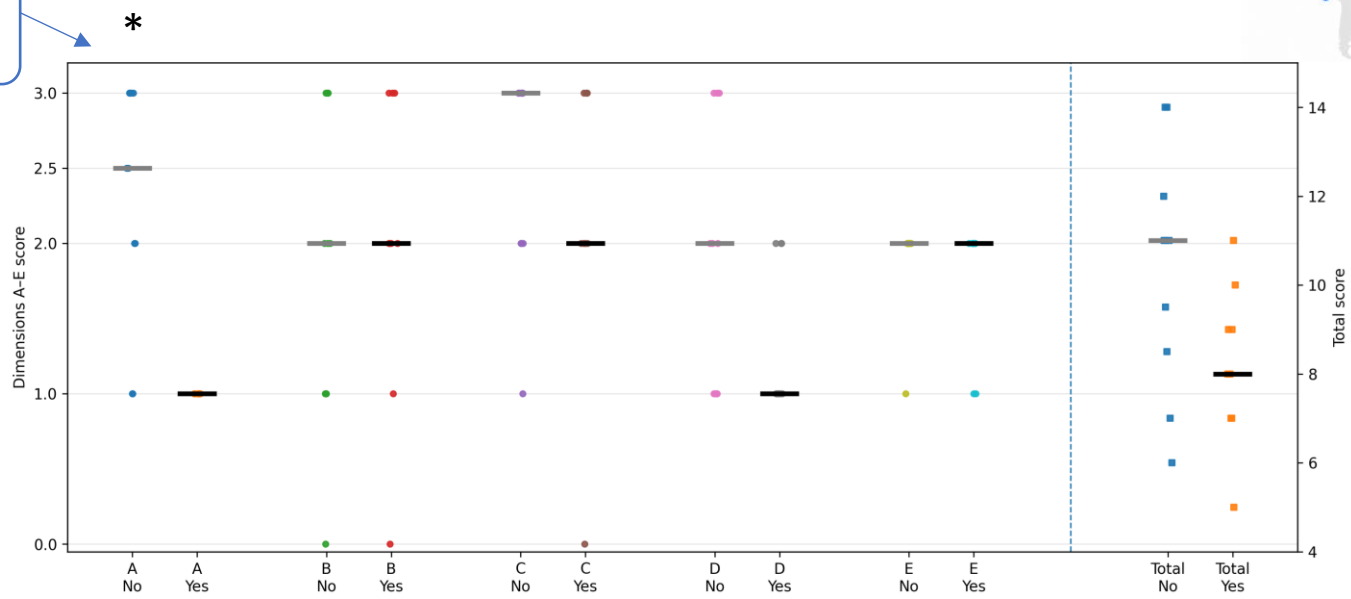
Science policy-gap assessment



Results

Shared management differences

Wilcoxon rank-sum tests
p=0.001



Incentives and challenges

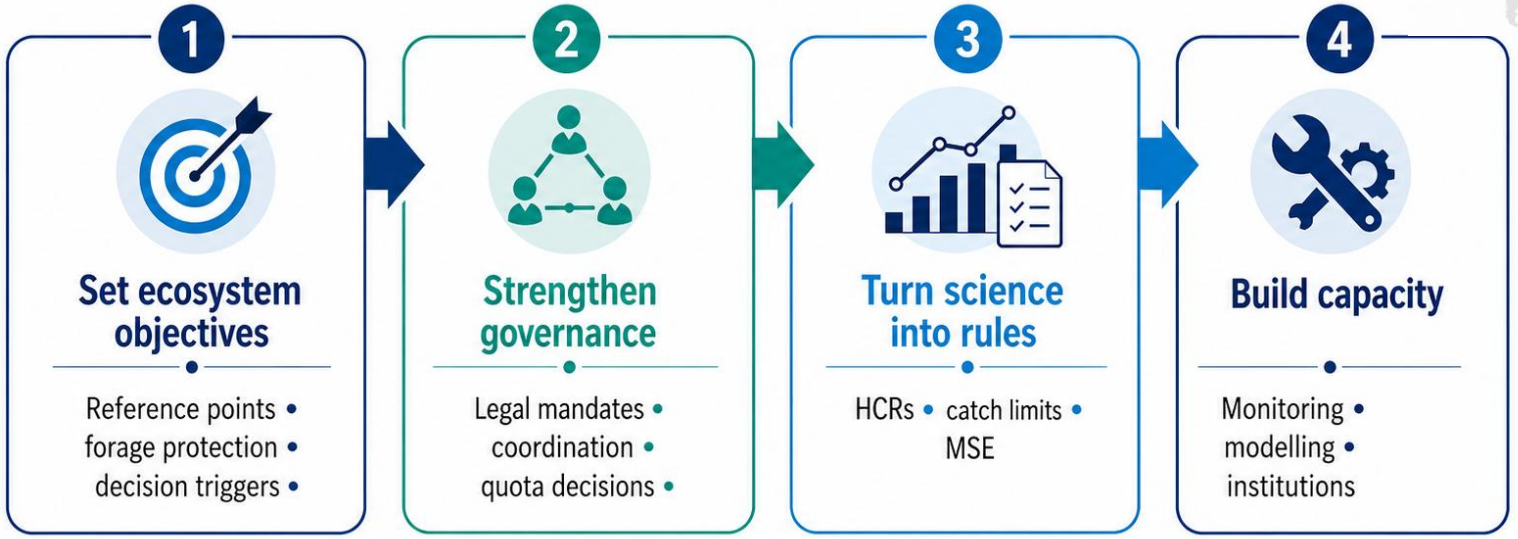
What helps

- Clear laws and policies for ecosystem-based management
- Good monitoring data, surveys and scientific models
- Market pressure: certification and sustainability commitments
- Good coordination among institutions, scientists, managers and stakeholders

What makes it difficult

- Fisheries and environmental responsibilities are often split
- Some regions still lack data or have uncertainty in food-web links
- Reducing catches for ecosystem reasons can be politically and economically difficult
- Indicators are monitored, but not always used directly in decisions

Roadmap: from ecosystem science to operational EBFM



Key home messages

- Science is often available, but not always operationalised.
- Science–policy gaps remain widespread.
- Governance and institutional embedding are key bottlenecks.
- Shared management can make operationalisation more difficult.
- There is no single pathway to EBFM.

Conclusions

We are still accepting contributions!

- Deadline: mid-June
- Aim: submit to the conference special issue ☺

If you are interested in contributing, please reach out to me:

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Thank you for your attention !