EVIDENCE-BASED FISHERIES MANAGEMENT: WHAT IS NEEDED TO ACHIEVE BIOLOGICAL SUSTAINABILITY OF GLOBAL FISHERIES?

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1. Availability of information on resource status and trends relative to desirable levels

2. Capacity to adjust harvest controls in response to changes in stock abundance

3. Ability and willingness to implement and enforce harvest regulations
MANAGEMENT CYCLE

Fishery:
Catches have an impact on the resource

Data Collection
from the fishery and the resource

Decision on harvest regulation

Stock Assessment
estimate stock status relative to desired levels
1. Information on resource status and trends relative to desirable levels

FORMAL STOCK ASSESSMENTS

- Analyze data collected using rather complex statistical models
- Estimate current stock status and changes over time
- Estimate desirable levels of stock size
2. Adjust harvest regulations in response to changes in stock abundance

The most common approach is to limit the annual catch

**Total Allowable Catch = harvest fraction \times biomass estimate**
3. Ability to implement and enforce harvest regulations

A TOP-DOWN MANAGEMENT MODEL

- Monitoring and assessments conducted by a government agency
- Enforcement of regulations are centralized
- Strong legal mandates to avoid overfishing and rebuild overfished stocks
Key attributes of fisheries where this approach has resulted in good outcomes:

- They are industrial: landings concentrated in a few ports with significant infrastructure

- Concentration of landings
  - facilitates data collection: tend to be data-rich
  - facilitates enforcement of catch regulations

- Strong government institutions
Conditions are not met in the majority of world fisheries that remain unassessed, especially in the developing world, which tend to be:

- Data limited
- Capacity limited
- Have weak government institutions and support

The challenges are especially difficult in small-scale fisheries, both inland and marine.
SMALL-SCALE FISHERIES: DATA AND ENFORCEMENT LIMITATIONS

- Dispersed landing sites
- Fisheries heterogeneous in space
- Often multiple species & multiple gears
- Difficult to collect representative data
- Centralized monitoring and control is too costly

Data-limited + weak enforcement
Tools and methods have been prescribed with a focus on:

- Resource assessment and harvest controls
- Management institutions
### TOOLS TO ADDRESS DATA LIMITATIONS

<table>
<thead>
<tr>
<th>Stock assessment</th>
<th>Industrial &amp; data-rich</th>
<th>Small-scale &amp; data-limited</th>
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<tbody>
<tr>
<td></td>
<td>- Quantitative, complex stock assessment models</td>
<td>- Indicators of resource trends</td>
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<td>- Size-based methods</td>
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<td>- Local participatory surveys</td>
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<td>- Folk knowledge</td>
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<tr>
<td>Harvest controls</td>
<td>- Total Allowable Catch (TAC)</td>
<td>- Effort limits, size limits, closed areas</td>
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<td>- TAC determined based on estimates of absolute biomass</td>
<td>- Empirical rules that respond to indicators</td>
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But, technical progress has yet to produce on-the-ground impacts at scale
Most suitable approaches for monitoring, assessment and management depend on fishery-specific characteristics (biology, geography, fishing dynamics, markets, economics, etc.) and on the local institutional context.

The design of monitoring programs and simple harvest control rules still requires expertise that is often lacking in developing countries.

Data sometimes exist but are not accessible nor standardized, and there is limited capacity to analyze them.

Information often exists but suitable processes need to be put in place to make it available for its use in management.
### EMPHASIS ON INSTITUTIONS

<table>
<thead>
<tr>
<th>Large-scale, developed countries</th>
<th>Small-scale, developing regions</th>
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<tbody>
<tr>
<td><strong>Governance</strong></td>
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<tr>
<td>- Strong legal mandates to</td>
<td>- Devolution of power to local</td>
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<tr>
<td>eliminate overfishing</td>
<td>communities:</td>
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<tr>
<td>- Command-and-control approach</td>
<td>• Community-based</td>
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<td></td>
<td>• Co-management</td>
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<tr>
<td><strong>Access rights</strong></td>
<td></td>
</tr>
<tr>
<td>- Quota shares allocated by</td>
<td>- Territorial Use Rights (TURFs)</td>
</tr>
<tr>
<td>government agencies to</td>
<td>- Communal/fishers’ organizations</td>
</tr>
<tr>
<td>individuals or companies</td>
<td>- Attention to traditional forms</td>
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<td>of tenure</td>
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</table>
Too much emphasis has been placed on tools

Tools and methods often prescribed as silver bullets

It is not just about tools but mainly about capacity and process!

Must avoid the “panacea trap”!
Build management institutions that facilitate:

- Involvement of fishers and fishing communities in all stages of management and in the identification of ways forward
- Provision of feedback, not just about resource status but also about human responses to management interventions
Lack of simple universal recipes implies that local capacity is required to design and implement strategies that are tailored to each situation.

Local successes cannot be scaled up simply by replication.

Sustained global efforts are needed to train and build local capacity to monitor, assess and manage fisheries and to support communities of practice.
Key role for on-site agents that provide local technical support to:

- catalyze data collection and analysis
- help in routine implementation of primary management
- facilitate processes and help build social capital

Have to be converse in all aspects of fisheries management, equipped with toolbox, and have good facilitation skills

The “barefoot ecologist”, Prince 2003
Acknowledgements

Thank you

snapp team:
DATA-LIMITED FISHERIES

snapp team:
FISHERIES MEASURES
Partnering with FAO to make fisheries sustainable