

GLOBAL STRATEGY --- GUIDELINES FOR INTEGRATION OF FISHERIES AND AQUACULTURE

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Importance of fish in the Region

- For food, fish provide :
 - 23 % of animal proteins and 8 % of total proteins;
 - Bangladesh, Cambodia, Indonesia, Kiribati, Maldives, Solomon Isl., Sri Lanka: over 50 % of animal proteins
 - This may be substantially under-estimated
- In international trade:
 - Fish accounts 20-30 % of export and 15-25 % of import of food trade in value
 - Share decreasing, though amount of trade increasing during the last decade
 - Fish and fishery products earns USD 54 billion in 2012

Importance of fish in the Region (cont.)

- For Local Communities (in particular, inland water and small islands):
 - An integrated part of rural life
 - A part of multiple sub-sector engagement, e.g. agriculture (esp. rice-field cultivation), food processing, restaurants, tourism
 - Important protein sources for locals
 - Often non-commercial – subsistence, communal, direct inputs local food vendors/ manufacturers / tourisms
 - Often seasonal: rice-filed in dry season and fishing and farming area in wet season
 - Often last resource of livings for people without access to land

Environmental impacts

- Impacts on natural resources by fisheries and aquaculture:
 - Over harvest, destructive harvest
 - Pollution (chemical, biological, bio-diversity)
- Competition in access to natural resources:
 - Access to land and water
 - Use of chemical
 - Poor regulatory framework and lack of zoning and planning
- Intervention with economic developments:
 - Pollution, loss of key ecosystems, mangrove removal
 - Prioritization among economic growth, food security and conservation of ecosystem services
 - Further pressure on competitions to land and water, increased regulations
- No statistics, no policy attention = Need of representative statistics on small scale operations of fisheries and aquaculture

Benefits of Global Strategy for Fisheries sub-sector

- Establish comparability among statistics of different domains through master sampling framework
- Enhance data collection in social and economic aspects
- Improve recognition on actual contribution of small-scale and subsistent activities
- Enable holistic rural and national management (esp. climate change mitigation and adaptation, bio-diversity)
- Improve sampling efficiency through coordinated data collecting efforts.

Dual roles of Fisheries and Aquaculture Statistics

□ Resource Monitoring:

- Species specific catch and effort information
- Impacts on ecosystems; bycatch, impacts on vulnerable ecosystems

□ Sector management:

- Social aspects -- employments, inter-relationship with other sectors (marketing, processing, infrastructure, joint/combined activities etc), contribution to food
- Economic aspects -- trade, product value, earnings, costs, economic contribution
- Environmental aspects -- pollution, use of land and waters, bio-diversity (contamination, invasions etc)

Objective of Fisheries and Aquaculture Statistics

Fisheries specific

Impacts of fishing operations – Resource monitoring:

- ❑ Status and changes of fishing operations
- ❑ Status and changes of targeted resources
- ❑ Status and changes of non-targeted biological environment
- ❑ Status and changes of physical environments

Contribution of fishery sector:

- ❑ Food security (fish supply and consumption)
- ❑ Social aspects (engagement in fishing, holding fish)
- ❑ Economic aspect (cash earning, GDP contribution)

Impacts from other sectors:

- ❑ Interaction with other sectors (e.g. inputs, outputs, competitions over land/ water use)
- ❑ Shift and changes of environments supporting fishery sector (e.g. habitat deterioration, climate changes impacts)

Global Strategy

Tools supporting the Global Strategy implementation for Fisheries sub-sector

Under Global Strategy Research Agenda – General:

- ❑ Master sampling framework
- ❑ Minimum core set of data (expanded for Fisheries)
- ❑ Guideline for Cost of Production survey (final draft)

Under Global Strategy Research Agenda – Fisheries specific:

- ❑ Guideline for fisheries and aquaculture census survey (final draft)
- ❑ Guideline for integrating census and other surveys results (ongoing)
- ❑ Procedure for easy utilization satellite imageries (FI specific, pipe-line project):

Under FAO FI Initiatives:

- ❑ Coordinating Working Parties on Fisheries Statistics (CWP)
- ❑ Training course materials for fisheries statistics (FAO publications)
- ❑ System of Environmental and Economic Account (SEEA) for Fisheries (fish resource, water, land)
- ❑ Data sharing and communication framework (IT tools)
- ❑ Community based management approach

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Available tools (under development)

– FI/A data integration framework

Situation:

- Challenging for statistically accurate monitoring
 - Some information available but only partial and not comparable
- >> Establish FI/A standard data integration framework

Basic principles - targets:

- ✓ Build upon *existing* data collection systems and activities
- ✓ Focus on *better understandings* on relative roles of *small scale operations*
- ✓ Cover *social, economic, food security* and natural resource use aspects - support tools for fact-based management with ecosystem approach (e.g. Blue Economy)
- ✓ Link with national statistical systems – SNA/ SEEA/ censuses

Available tools (under development)

– FI/A data integration framework (cont.)

Concepts:

- Common conceptual framework – Core data frame
 - Define a full range of data needs as [structural data] and [ratio data]
 - Standardize concepts throughout whole data collection systems (incl. statistical, administrative, managerial, research etc)
 - Identify opportunities and holes in data collection
- Each data collection system, i.e. survey module, to fulfill a part suitable for its own purpose
- Integrate data and get overall picture



Available tools (under development)

– FI/A data integration framework (cont.)

Possible survey modules

Census surveys:

- One-time nation-wide snapshot for both structural and ratio data
- Full picture including small scales, subsistent, secondary engagements
- Act as a scale for inter spatial/ inter components imputations

Regular surveys/ fishery management:

- Continuous regular observations of time trend at selected spots
- Detailed information more focused on commercial activities
- Act as a scale for time trend of productivities, economic

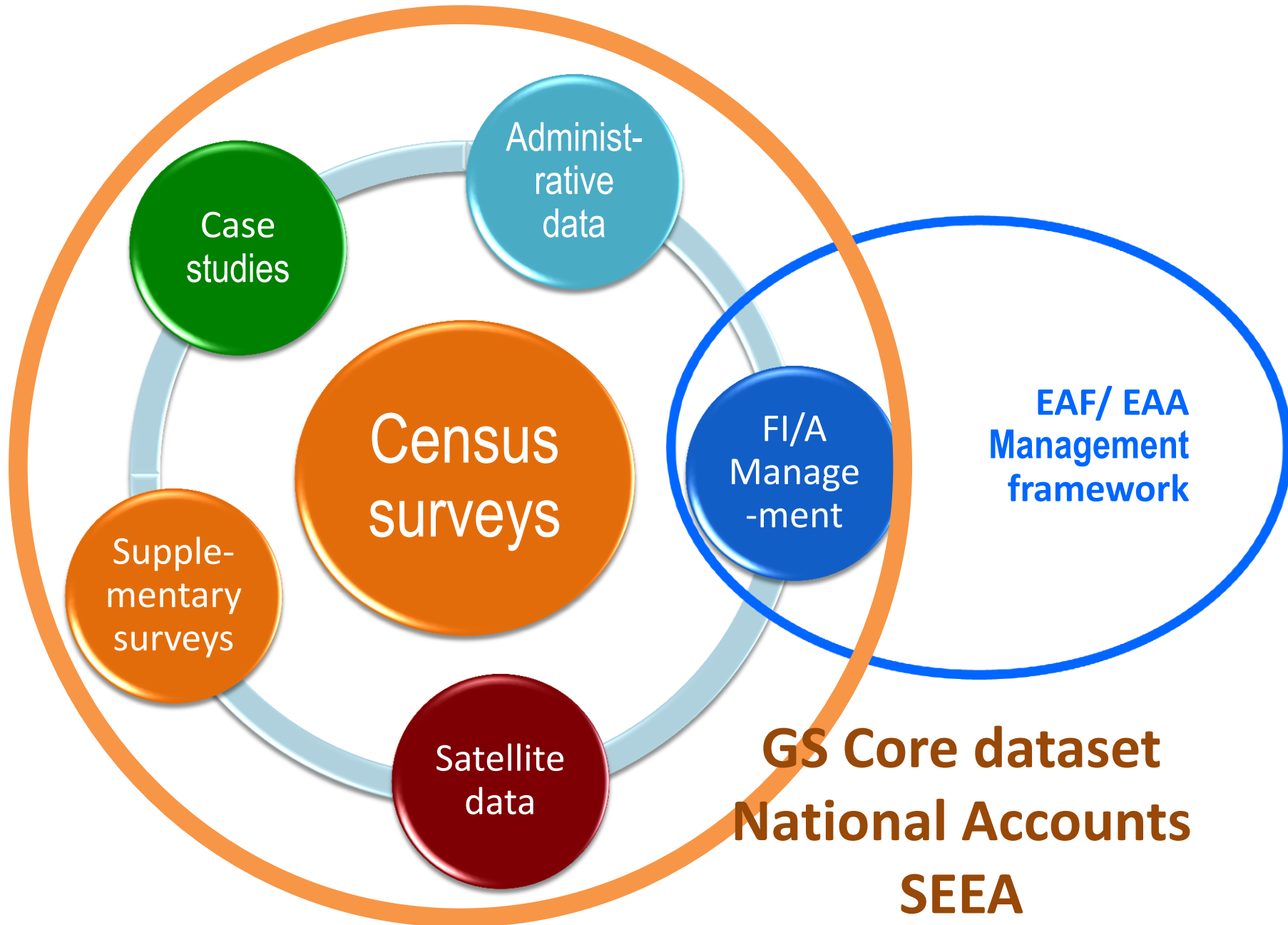
Administrative/ License data:

- Time trend in structural data of controlled components
- Act as a scale for time trend of structural data

Field surveys/ case studies:

- Ad-hoc spot data for imputation adjustments

Overall Vision:



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Available tools (draft for review and testing)

– Guideline for FI/A census surveys

Basic principles - targets:

- ✓ Provide Core Data Frame to link variable data sources (both FI/A and other relating sectors)
- ✓ Full correspondence with GS Minimum Core Data (FI expanded version)
- ✓ Integration of aquaculture, capture fisheries, post harvest into one survey frame
- ✓ Inclusion of tourism into scope
- ✓ Catalogue of survey items for users to select based on their priority
- ✓ No separation of capture fisheries and aquaculture except individual HH survey level

Situation:

- Final draft is ready for feedbacks and field evaluation
 - Indonesia, Algeria, Bangladesh, Brazil
- Draft will be soon available in GS web-site

Available tools (draft for review and testing)

– Guideline for FI/A census surveys

- To be integrated into World Census of Agriculture:
 - WCA-2020 including fisheries and aquaculture survey modules
 - Follow the same structure as WCA Guidelines
- Measuring units – Households
- Three survey layers:
 - Identification of target communities -- engagement information through censuses, administrative / registry data, GIS / remote sensing data
 - Community survey – work, community infrastructure & services, product and destination, grants / subsidies, governance*
 - Household survey
 - Household – land / water Use, products and destination, equipment, inputs, unexpected losses
 - Individual HH Member – work, food consumption, quality of life, governance*

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Available tools (pipeline)

– Use of satellite information

Targets:

- ✓ Assessment of water surface extension
- ✓ Early warning / forecasting for seasonal floods use of water height
- ✓ Facilitation tools of identifying aquaculture facilities
- ✓ Modeled assessment of aquaculture and inland capture production potentials
- ✓ Global inventories/ data warehouse

Basic principles:

- ✓ Using the existing technology
- ✓ Develop a simplified algorithm for specific statistical objectives – provision of facilitation tools

Situation:

- Limited inventories of aquaculture facilities locations on Google map
- Concept note is ready, seeking for funds

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Available tools (compilation of country profiles)

– SEEA Fisheries (water)

Basic principles - targets:

- ✓ Understand water availability constraints in inland capture fisheries & aquaculture for climate change planning
- ✓ Provide comparable indicator for fisheries and aquaculture in water policy arena (irrigation, industrial use, drinking waters, electricity, etc.)
- ✓ Provide holistic picture of water use and contribution obtained for social, economic, nutrition and environmental aspects
- ✓ Follow SEEA concepts, but with many expansion
- ✓ Compilation of multiple sources of data
- ✓ Next step: develop guideline for SEEA compilation for FI/A

Situation:

- Compilation of country profiles for 9 African and 9 Asian (Bangladesh, Cambodia, China, India, Lao, Myanmar, Sri Lanka, Thailand, Viet Nam) countries
- Final draft for publication

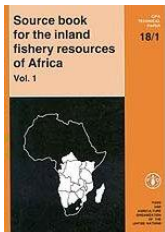
DATA INTEGRATION – water availability

Environment

PERMANENT INLAND WATERS



(High res. GIS data)



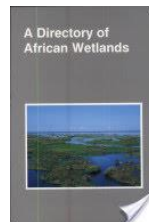
Minimum reference figure

Low res. GIS data

SEASONALLY FLOODED AREAS



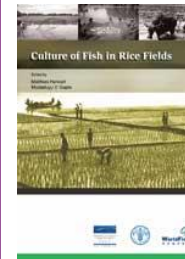
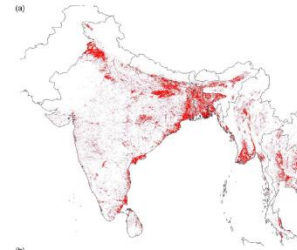
(High res. GIS)



Minimum reference figure

Low res. GIS data

RICE FIELDS



Country	Huke rice category (× 000 ha)			
	Upland	Deepwater	Irrigated paddy	Rainfed paddy
Bangladesh	698	1221	2617	6144
Bhutan	4	0	5	17
Cambodia	24	152	305	1418
India	5060	1364	19,660	16,432
Indonesia	1209	2	5926	3878
Laos	219	0	44	348
Malaysia	80	0	438	150
Myanmar	214	362	3198	2511
Nepal	68	118	730	572
Philippines	165	0	2204	1252
Sri Lanka	0	0	628	239
Thailand	203	342	939	8160
Vietnam	322	177	3260	2614

AQUACULTURE PONDS



NATIONAL AQUACULTURE SECTOR OVERVIEW (NASO)



FAO/CWP FORM FOR REPORTING STATISTICS ON AQUACULTURE

INDICATORS - water availability

Environment

Inland water area (km²)

Percentage of inland water over country area

Percentage of permanent inland water over inland water area

Inland water area & aquaculture pond area (km²)

Percentage of deep rice cultivation over national rice crop area

Extent of lowland rice crop cultivations (km²)

INDICATORS – fish production

Economy

Inland fish production (tonnes)

Percentage of inland fish production from aquaculture - quantity

Market value of overall inland fish production (USD)

Fish-water productivity-quantity (kg/ha/year)

Percentage of inland fish production from aquaculture - value

Fish-water productivity - value (USD/ha/year)

INDICATORS – employment & livelihood

A light blue diamond shape with a rounded pink square inside. The word "Social" is written in black text inside the pink square.

Social

Overall number of inland fishermen & aquaculture farmers (persons)

Expected number of inland fishermen calculated on the basis of the extent of different inland waters (persons)

Average density of inland fishermen & aquaculture farmers (persons/km²)

INDICATORS – nutrition

A light blue diamond shape with a rounded purple square inside. The word "Nutrition" is written in black text inside the purple square.

Nutrition

Estimated annual quantity of proteins supplied by inland capture fisheries and aquaculture (kg)

Average fish proteins supplied by inland water area & aquaculture ponds (kg/ha/year)

Number of inland fishermen & aquaculture farmers

A decorative graphic in the top right corner consisting of a light blue diamond shape with a rounded red rectangle inside it. The word "Social" is written in black text inside the red rectangle.

Social

Number of inland fishermen
& aquaculture farmers

Expected number of
inland fishermen

BANGLADESH

4 276 000

2 795 000 – 5 481 000

LAOS

30 000- 1 700 000

504 000 – 1 091 000

THAILAND

3 080 000- 10 275 000

2 471 000- 5 146 000

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Available tools (functional)

– Coordinating Working Party on FI Statistics

<http://www.fao.org/fishery/cwp/en> (since 1960)

- Review fishery statistics requirements for research, policy-making and management;
- Agree on standard concepts, definitions, classifications and methodologies for the collection and collation of fishery statistics;
- Make proposals for the coordination and streamlining of statistical activities among relevant intergovernmental organizations.

Main outputs and new developments:

- ✓ Handbook (under revision) – Aquaculture and Capture fisheries
- ✓ International Statistical Standards Classifications: Major production areas, aquatic species, fishing gears, fish and fisheries commodities, fishing vessels
- ✓ Standardization of operational, administrative, surveillance data and data communication

Available tools (available)

– Training course materials

“International training course in fisheries statistics and data collection”

de Graaf, G.J., Nunoo, F., Ofori Danson, P., Wiafe, G., Lamptey, E. & Bannerman, FAO Fisheries and Aquaculture Circular No. 1091. Rome, FAO. 134 pp.

<http://www.fao.org/3/a-i3639e.pdf> (just released)

- Accumulated summary of sampling theory and procedures used in capture fisheries production estimates
- Possibility to provide assistance in setting a course for interesting countries

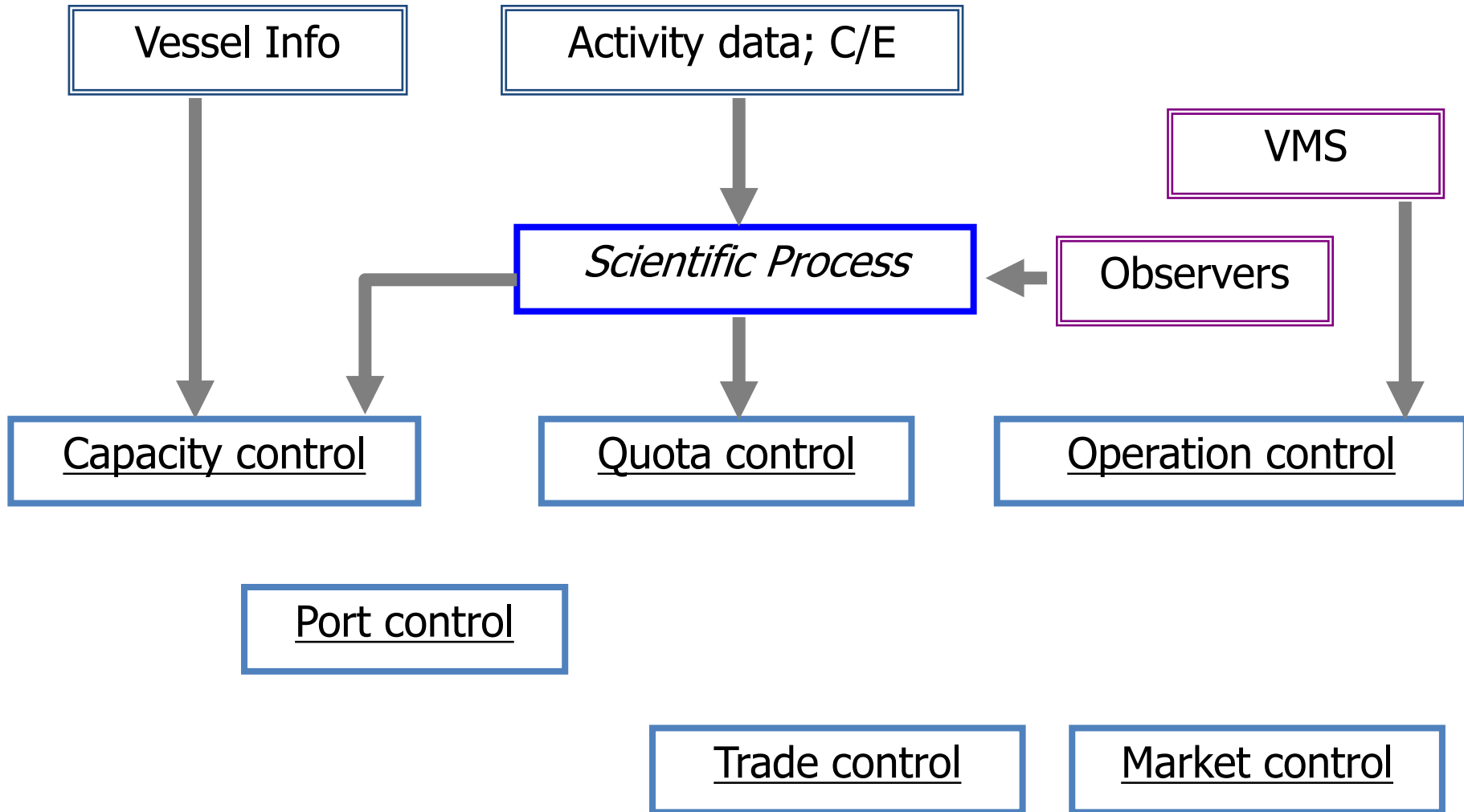
Available tools (functional)

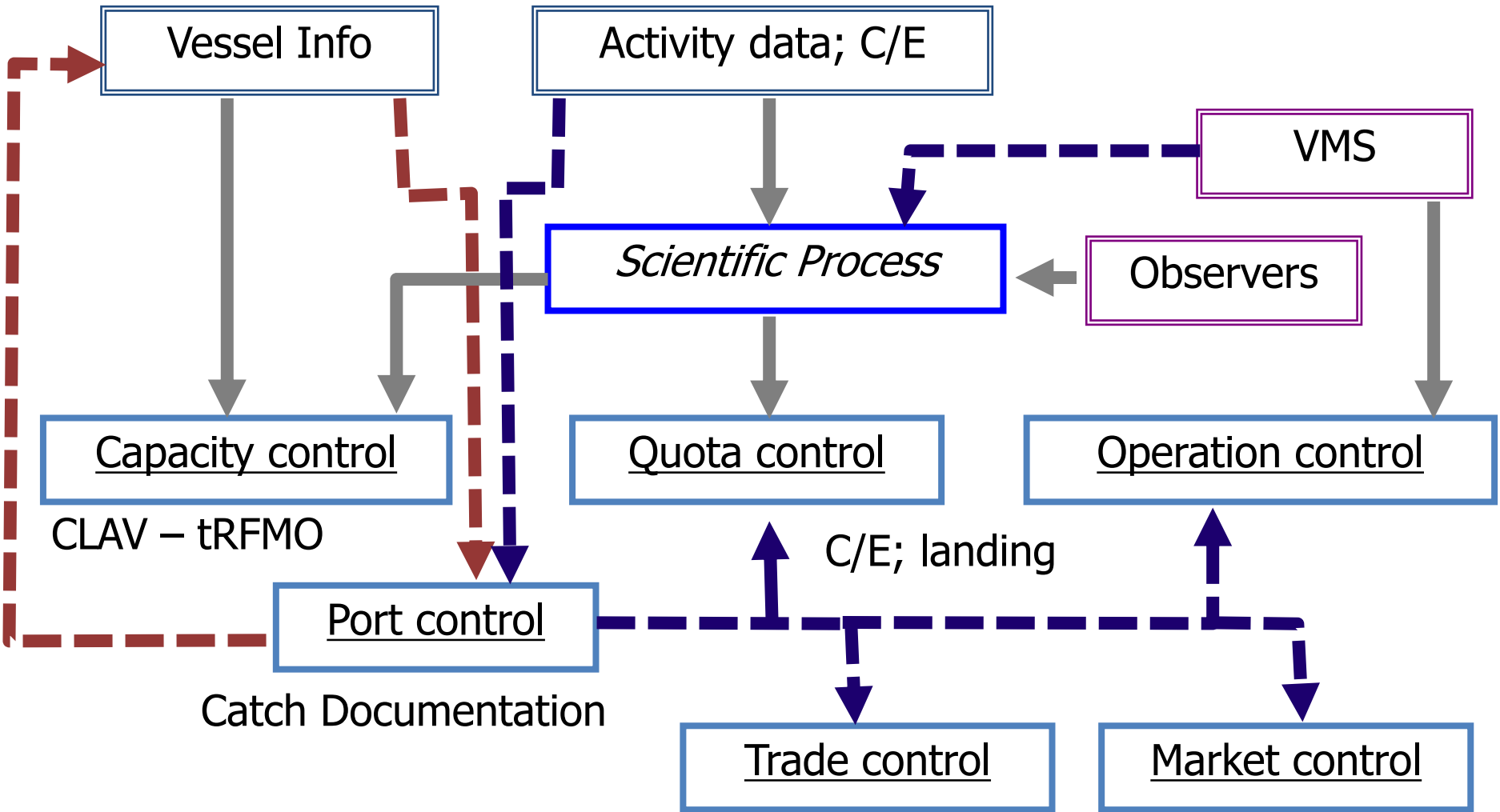
– IT framework to support database integration

Basic principles - targets:

- ✓ Integration tools (framework) of multiple databases using different formats and classifications
- ✓ Provide a linking bridge among existing data systems in operation
- ✓ Quick operational solution in short term
- ✓ System harmonization in a long-run
- ✓ Initial implementation to support enhanced communication within Fisheries line-authorities for regulatory and administrative data collection and management

Example -- Fishing Vessel Finder







Proceed hand in hand:
Fisheries Statistics -- Global Strategy

**THANKS FOR
YOUR ATTENTION**