

SECTION 6.2

SAMPLING DESIGN

– AQUACULTURE

Sachiko TSUJI, FIPS, FAO

Aquaculture production survey

No standard methodology – rapidly growing

- Principle is the same – “Livestock in water”
- Sampling unit:
 - holdings
 - households
 - facility (e.g. cage, pond, tank)
- Measuring unit: productivity – yields per unit surface area
- Stratification:
 - Operational types (e.g. extensive, intensive, mixed species)
 - Major species
 - Type of facilities
 - Geo-location, communities

Aquaculture production survey

Mostly relying on interview questionnaires to sampled unit:

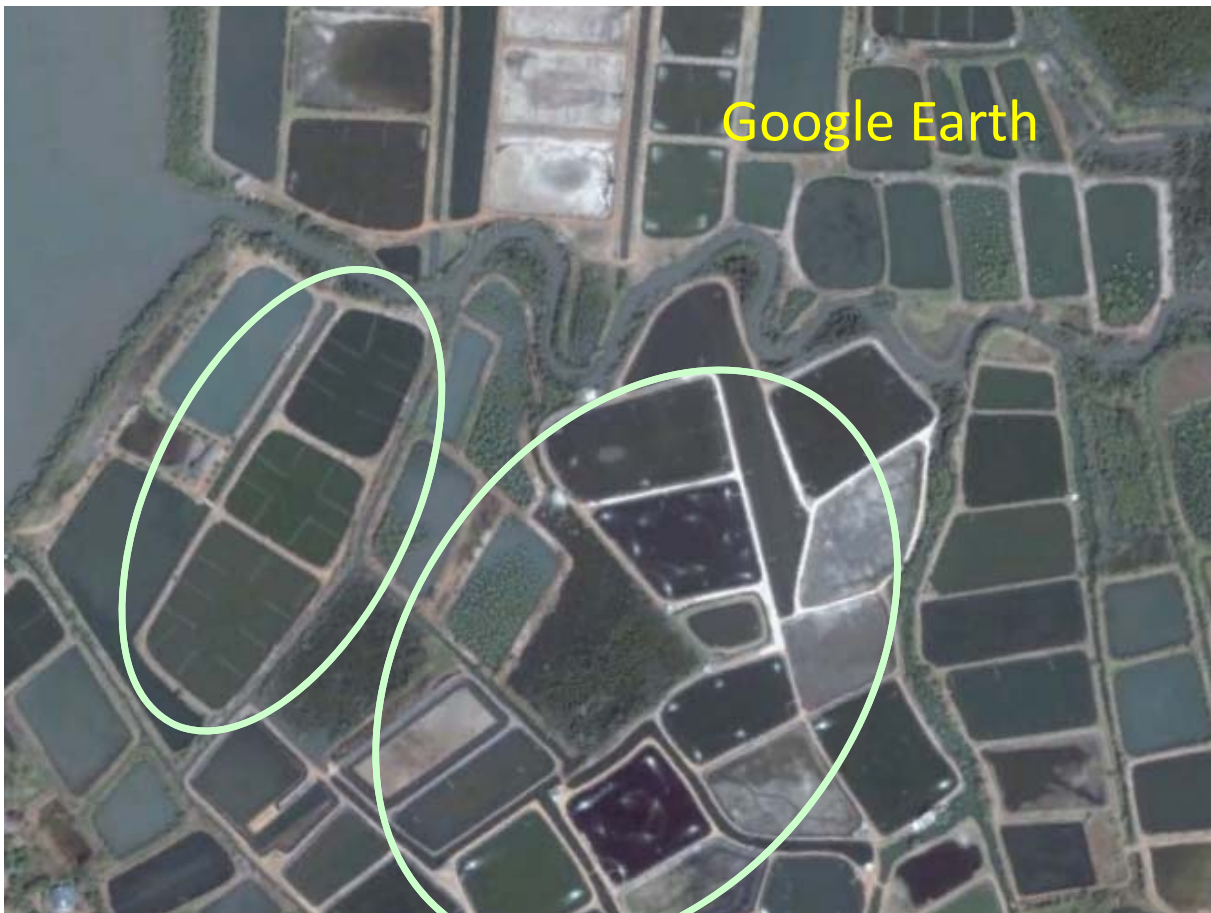
- Questions to ask (examples):
 - Structural information:
 - Type of facilities (e.g. cage, pond, tank), Size, Number
 - Land of holdings/ water surface registered
 - Stocks:
 - Species, size and quantity (number) of fish in hold for production
 - Species, size and quantity (number) of fish in hold for breeding
 - Inputs:
 - Seeds (from where, how, when; quantity)
 - Feeds (what, quantity – daily use)
 - Water (source, volume, turn-over rate)
 - Outputs:
 - Harvesting schedule
 - Size and unit price of fish at harvest

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Aquaculture production survey

- Frame information
 - Administrative data – registration
 - Census, frame survey
 - Satellite images

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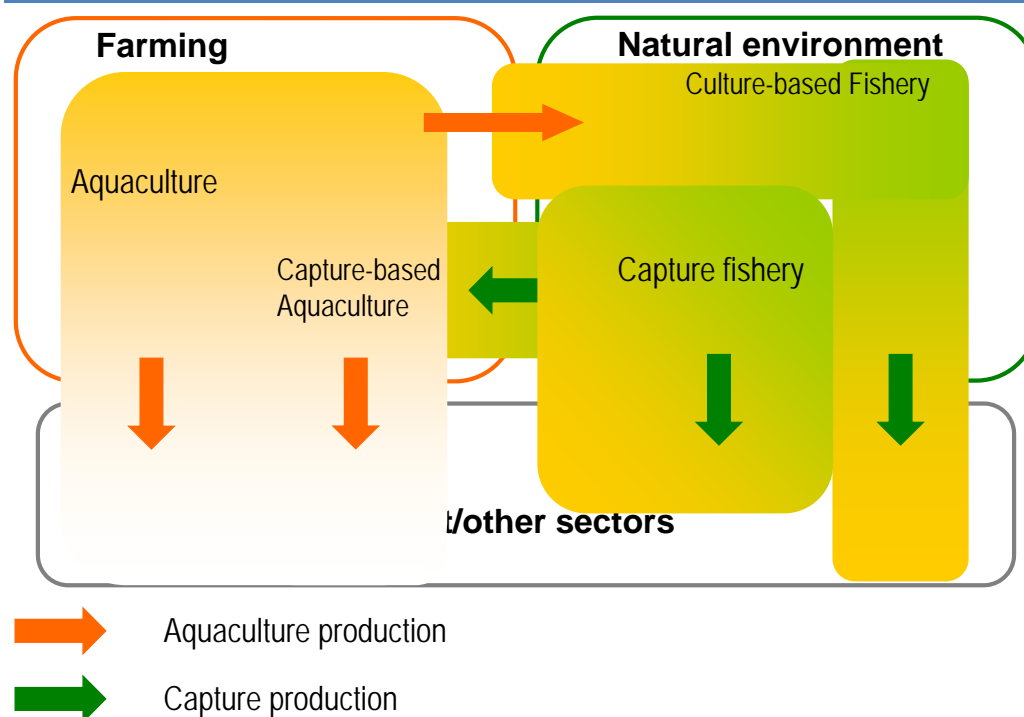


Aquaculture production survey

CWP efforts toward standard survey methodology:

- Aquaculture Handbook [\[Appendix 11 of CWP-24 report\]](#)
 - Concepts
 - Minimum reporting:
 - Input (seeds, size of facilities)
 - Output (harvest quantity, destination)
 - Missing ?? (stock, unexpected loss, feed)
- CWP standard questionnaire
 - Harvest, hatchery production, wild seeds, aquaculture areas (which one?)

Statistical separation of Fishing and Aquaculture



Aquaculture production survey

Other achievements toward standard survey methodology:

- SEEA Central Framework -- Fish asset
<http://unstats.un.org/unsd/envaccounting/seearcv/>
 - Cultivated aquatic resources (farmed fish asset)
 - For harvest (inventories)
 - For breeding (fixed asset)
 - Land/ water use classification – land/ water bodies for aquaculture (Annex I-B)
- Central Product Classification of the United Nations (CPC)
<http://unstats.un.org/unsd/cr/registry/cpc-21.asp>
 - Ver. 2.1 – separation of farmed and wild primary fish products
 - HS comparable species groupings
- Global Strategy Research Agenda
 - Frame survey and harvest estimation with satellite images for aquaculture

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SAMPLING DESIGN

-- OTHER INFORMATION

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What information need to collect?

Impacts of fisheries operations to natural resources/ environment:

- Status and changes of operations
- Status and changes of biological environment (targeted and non-targeted components)
- Status and changes of physical environments **Fisheries specific**

Contribution of fisheries sector:

- **Food security**
- Social aspects (number of people supported by fishery sector)
- **Economic aspect (contribution to national GDP)**

Impacts from other sectors/ environment:

- Interaction with other sectors (e.g. inputs, outputs, competitions with aquaculture and agriculture)
- Shift and changes of environments supporting fisheries sector (e.g. habitat deterioration, climate changes impacts)

Other data needs for fisheries and aquaculture

Global Strategy – Core data set

Economy		[Fishing]	[Aquaculture]
Output	Production	Production	Production
	Yields	CPUE	Productivity
Trade	Export	Export (no separation)	
	Imports	Import (no separation)	
Resources	Land cover/ use	Land/ water n.e.c	Land/ water for aquaculture
	Econ. active population	Engagement	Engagement
	Livestock	Natural fish asset	Stock
	Machinery	Boats/ Engines/ Gears	Boats/ Machinery
Inputs	Water	X	Water
	Fertilizers/ pesticides	X	Chemicals

Other data needs for fisheries and aquaculture

Global Strategy – Core data set (cont.)

Economy		[Fishing]	[Aquaculture]
Agro Processing	Food processing	Seafood processing (no separation)	
	Other uses	Other uses (no separation)	
Prices	Producer pr.	Fish producer prices (no separation)	
	Consumer pr.	Fish consumer prices (no separation)	
Final expend.	Gov. expend.	Gov. expenditure	Gov. expenditure
	Machinery	Boats/ Engines/ Gears	Facilities/ boats/ Machinery
	Household consum.	Household consumption (no separation)	
Rural infrastructure			
International transfer (ODA)			

Other data needs for fisheries and aquaculture

Global Strategy – Core data set (cont.)

Social		[Fishing]	[Aquaculture]
Demo-graphics	Age, sex, education, labour status, economic sector in employment, occupation		
	Household income, composition, family/ hired workers in holdings, housing condition		
Environment		[Fishing]	[Aquaculture]
Land	Soil degradation	X	✓
Water	Pollution	✓	✓
Air	Emission	✓	✓

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Other data needs for fisheries and aquaculture

- Sample-based production is not enough to cover fisheries and aquaculture data needs
- Fishing/ aquaculture difference only applicable for primary sector
 - Processing, marketing trading – no way to separate the origins
- Same requirement for social economic data needs as other agriculture component

>> Expansion of surveys to cover fisheries and aquaculture sector:

- Frame (census) surveys
- Household surveys
- Price/ consumption surveys

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Group discussion:

- Country presentation -- Indonesia
- Review Global Strategy core data and identify the areas that do not cover fishing and aquaculture.
- Identify the main challenges to expand the coverage.
- Focus on
 - Sectoral engagement surveys
 - Agricultural (household) surveys
 - Price surveys
- Food processing surveys

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G1	FIA coverage	Challenges
Engagement	# holding for Aq	
Census Survey modules	Next include FI in WCA	Proper arrangement with farmers/ fishers needed; financial assistance needed.
Price	Y (all)	Change frequently (even within a day)
Food manufacturers	Y (all)	Small processors – no accounting system – no proper mechanism for reporting

G2	FIA coverage	Challenges
Engagement	Aq – y, census - engagement	
Census Survey modules	Incl. fish food consumption/	
Price	Consumer price – selected market average price	
Food manufacturers	Census; establish all food processing,	

G3	FIA coverage	Challenges
Engagement	Incl. establishment, in WCA;	
Census & Survey modules	Both Y; CoP; expenditure	
Price	Y, fish selected commodities	
Food manufacturers	Establishment survey, cost structure survey, household, investment survey	