

MODULE 6: SAMPLING METHODS FOR THE FISHERIES AND AQUACULTURE SURVEYS

SESSION 6.2: SAMPLING DESIGNS FOR FISHERIES AND AQUACULTURE SURVEYS

Regional Training Course on Sampling Methods for Producing Core Data
Items for Agricultural and Rural Statistics

Jakarta, Indonesia ,29Sep-10 October 2014.

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Given same budget, what makes sampling designs so different ?

Survey objectives



Discussed

Statistical units



Frame

Variation in the population



stratification

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Statistical units:

What should be selected? **Sampling unit (s)**

What should be observed? **Observational unit(s)**

- Fish from a catch?
- Vessels landing their catch at the port?
- Fishers?
-

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Constructing a sampling frame

- Depends on infrastructure and information available on it
- Define target area (*water bodies included*)
- Primary fishery units (*ports, landing sites, fishing fleets, fishers, markets & transportation routs*)

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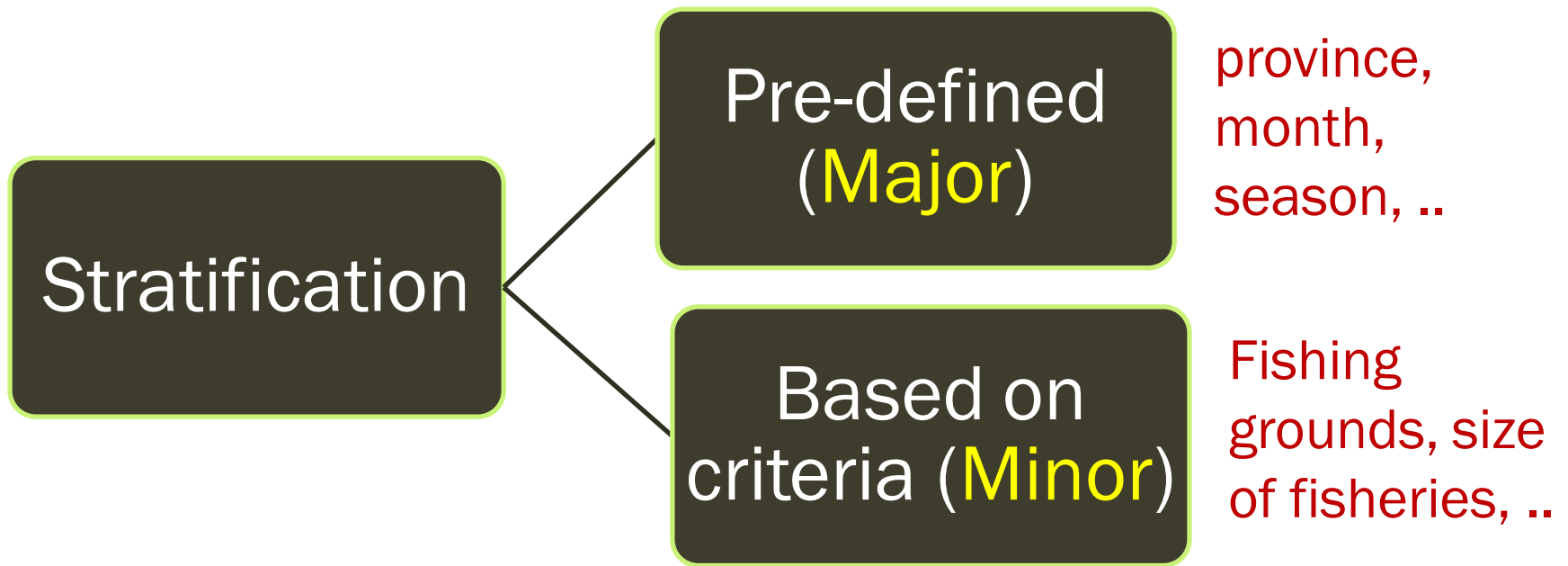
Oftentimes

- A “frame survey” is required
- Information is available from scattered sources (including registers)

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How to stratify the population?

Purpose: to reduce the variability



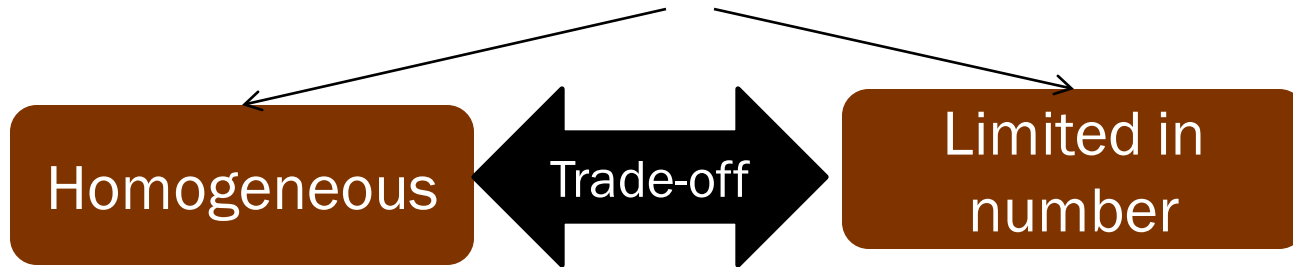
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Examples of stratification criteria:

Spatial	Vessel/gear
Time	Landings
Enterprises	Households
Trade	Environment

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Strata have to be



How do you balance? *(examples)*

Combine gears (two sizes of nets)

Reduction of sampling effort

Stratify in time

Stratify in space

Generate a size variable

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How to generate a size variable?

➤ Size is a composite value of multiple variables

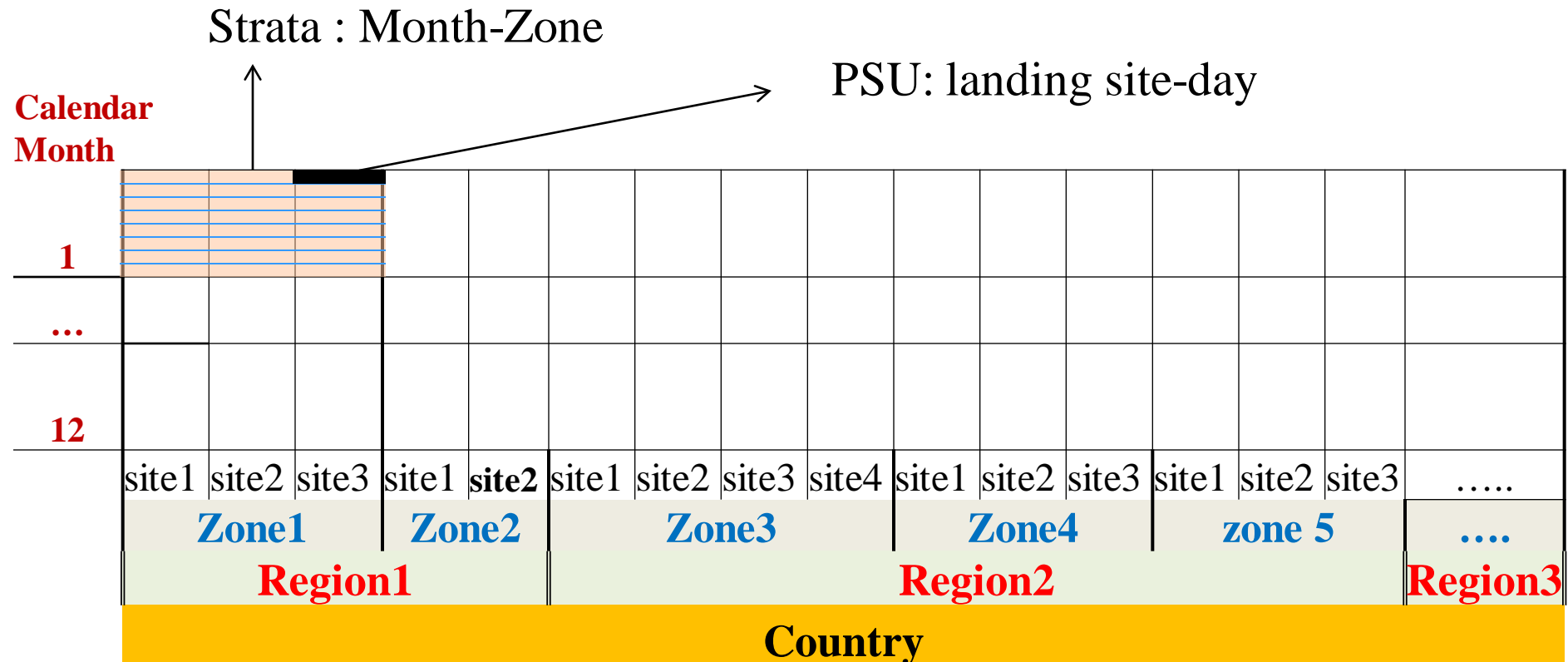
Example:

Sites	fishing units	type1 gear	type2 gear
1			
2			
3			
...			

- 1- normalize each variable
- 2- calculate total of normalized vars
- 3- size of site is its percentage from grand total
- 4- stratify based on the size value (by using cumulative size)

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Sampling design *(example of marine fishery)*



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Sampling design *(example of marine fishery)*

- Large zones may be self-representative
(strata=month)
- Number of PSUs (sites-day) in each stratum= *#of sites* × 30

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Selection procedure (Stage 1)

- Each month may be segmented into 3 or 6 parts for data collection purposes and samples taken systematically from each segment (*say 16 days*)
- In each zone, select a sample of sites and allot to the selected days
- Better to allot each selected site two consecutive days and in each day collect data in different time periods (*day and night landings*)

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Selection procedure (Stage2)

- In each selected site, select a sample of boats/crafts
- Decide a threshold for total enumerations, for instance:

Number of units landed	Sampling rate
less than or equal to 15	100%
16 to 19 landed	first 10 and the balance 50%
20 to 29 landed	50%
30 to 39 landed	1 in 3
40 or more landed	1 in 4

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aquaculture survey design

- **Objective:** *to generate statistics on volume and value of aquaculture production*
- **Sampling units:** *Aquafarms*
- **Sampling frame:** *list of aquafarms from the relevant authority of created prior to the survey*
- **Coverage:** *Normally define a cut-off of total production/area*

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aquaculture survey design

- **Design:** Normally *one-stage stratified sampling*
- **Stratification:** *Aquafarm type-Area*
- **Self representative strata:** *define a threshold like up to 15 aquafarm*
- **Selection:** *Sample aquafarms shall be selected through systematic random sampling*