



GUIDELINES



POSTHARVEST LOSSES DETERMINATION FOR CHILI



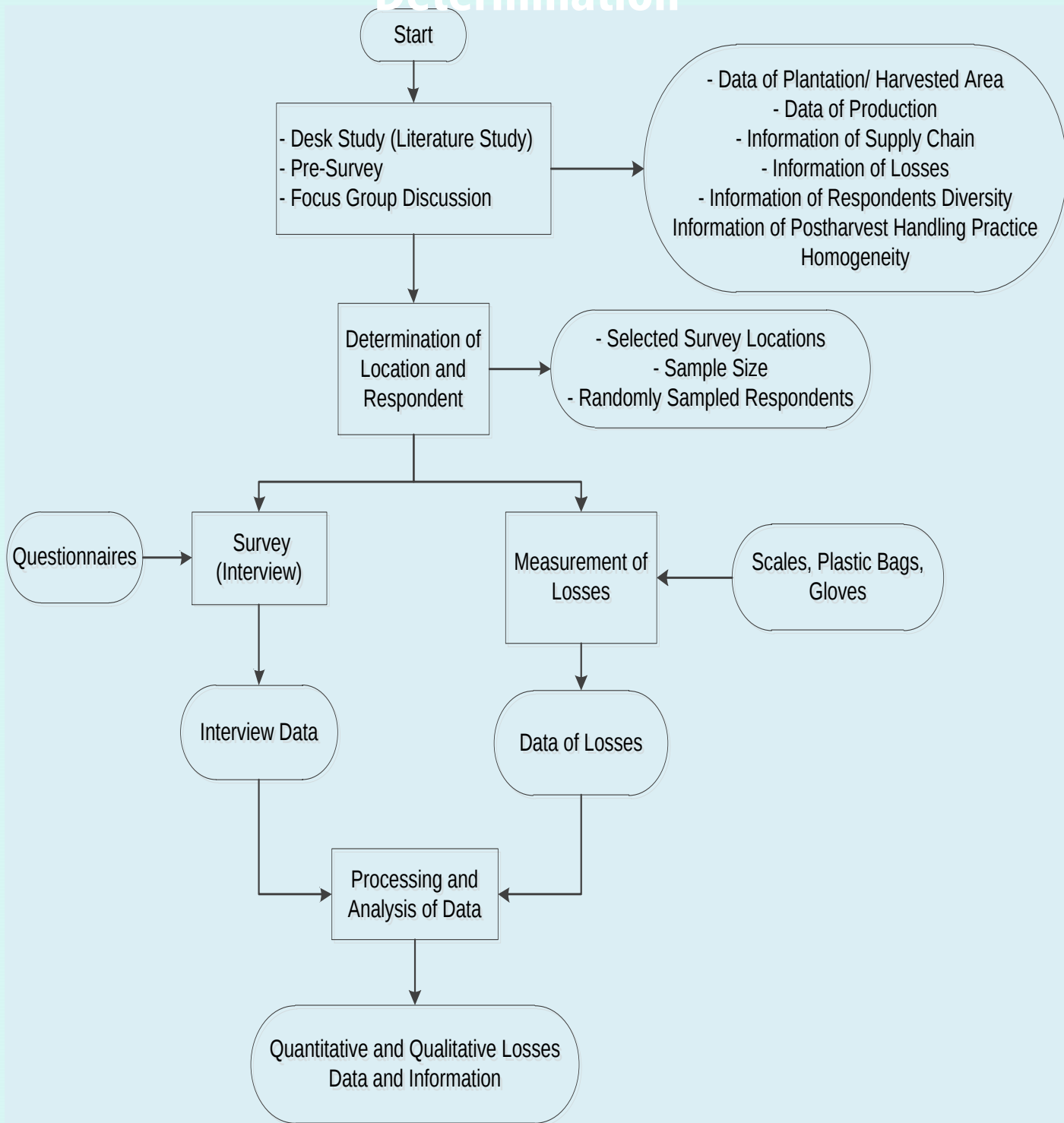
**PILOT ACTIVITIES
OF
REDUCTION OF POSTHARVEST LOSSES (PHL)
CASE OF INDONESIA: Red Curly Chili**



ACKNOWLEDGEMENT

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Activities and Supporting Data for PHL Determination



DESK STUDY & FOCUS GROUP DISCUSSION

- To obtain data of plantation/harvested area and chili production, supply chain and losses
- The data obtained is to be confirmed by conducting pre-survey in the target location
- Identification of behavior of supply chain actors as the basis to determine distribution and diversity of respondents of survey

- Data obtained in desk study is further confirmed in Focus Group Discussion (FGD)
- FGD aims to capture should include actors of supply chain, experts, government, chili business practitioners

Example. Table of Data Obtained in FGD

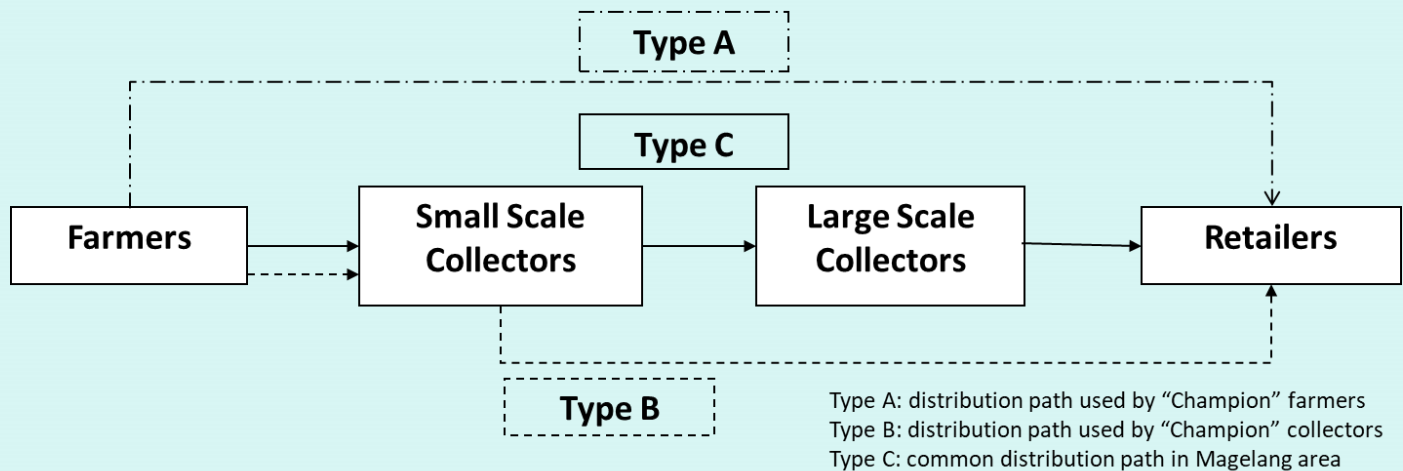
Supply Chain Actors and Postharvest Handling Practice in

Actors	Total number ^{a)}	Activity ^{b)}	Losses ^{c)}	Technology that use
1. Farmers				
2. Small scale collector	B	3	...%	Bycycle
		4	...%	Plastic,
		7	...%	sack ,etc
3. Large Scale collector				
4. Processing industries				
5. Retailer				
6. Supermarket				

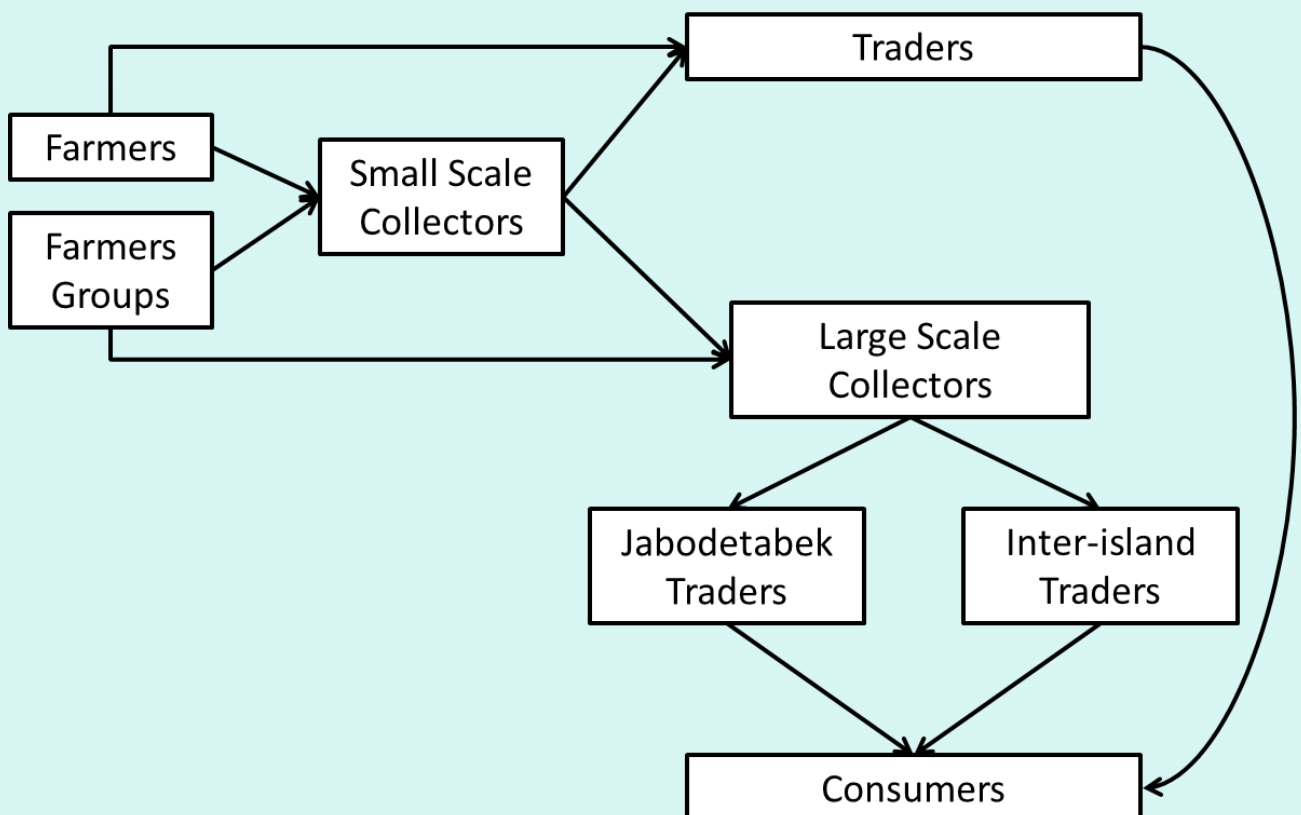
a) A=1 person; B=2-9 person, dan C=many>10 person
(at area that discussed)

- b) (1)= buy and sell;
 (2)= transfer if goods;
 (3) =transportation;
 (4)= storage;
 (5)= processing;
 (6) =funding;
 (7) =standardization;
 (8) =financing

Example. Flowchart of Supply Chain Obtained in Desk Study and Pre-Survey



Example. Enhanced Flowchart of Supply Chain Obtained in Focus Group Discussion



FOCUS GROUP DISCUSSION



INTERVIEW



-Method: In-depth interview

-Tools: questionnaires

-Respondents: actors of chili supply chain (farmers, collectors, traders, retailers, etc)

Information target (farmers):
Identity of respondents,
types/varieties of chili,
production volume, farming costs, postharvest activities, postharvest losses, causes of losses.

Information target (other actors of chili supply chain):
the identity of the respondent,
supply information (supplier, volume, purchase price),
handling activities,
market (marketing objectives, volume, selling price),
cause of losses and
required technology

SURVEY LOCATION AND SAMPLE SIZE DETERMINATION

1. Method of determining location/respondent

- a. Determine 1-3 locations for survey and measurement of losses in the region/sub district, select the ones with the higher chili production.
- b. Select the respondents with random sampling.

2. Behavior and number of respondents

a. Farmers

☐ Homogeneous : The number of respondents, 20-30 respondents

☐ Heterogeneous : Needed more respondents, (≥ 30 respondents)

b. Small scale collectors

The number of respondents is determine based on the number of small scale collectors in the area. Try to select those who collect in the surveyed area for farmers.

c. Large scale collectors

The number of respondents is determine based on the number of large scale collectors in the area. Try to select those who collect in the surveyed area for farmers.

If there is no large scale collector in the village, select a large scale collector in the village around the surveyed are for farmers.

d. Retailers

Respondents are retailers in the local market/Agribusiness Sub Terminal (STA) in each production center area. The number of respondents is all retailers in the local market/STA.

e. Trader in central market

Respondent is a trader in the central market where the chili from the surveyed area is distributed to. One or two respondents, preferably from different locations of central markets (different range of distance/transportation duration), would be sufficient.

MEASUREMENT AND CALCULATION OF LOSSES

QUANTITY LOSSES

Quantity losses quantity is defined as the weight loss caused by storage time or transportation.

- Weigh the harvested chili (subtract the weight of the packaging material), record as initial weight
- Weigh the delivered chili in the end of supply chain (in this case is central market), record as end weight
- Calculate the percentage of weight loss as follows:

$$\frac{\text{Initial weight} - \text{Final weight (kg)}}{\text{Initial weight (kg)}} \times 100\%$$



MEASUREMENT AND CALCULATION OF LOSSES

QUANTITY LOSSES

FARMER

- a) From each packaging of harvested chili in the field, take samples from different spots in the packaging, at least 5 kg
- b) Record weight
- c) Sort to separate damaged/ decayed/green chili (use farmers' definition of unsaleable chili)
- d) Record the weight of the damaged/decayed/green chili
- e) Calculate the losses of each type of losses

SMALL & LARGE SCALE COLLECTOR, RETAILER, TRADER AT CENTRAL MARKET

- a) Select randomly one sack of chili from the respondent (10-30 kg)
- b) Sort to separate damaged/ decayed/green chili (use collectors/retailers/traders' definition of unsaleable chili)
- c) Record the weight of the damaged/decayed/green chili
- d) Calculate the losses of each type of losses

Percentage of quality losses =

$$\frac{\text{Weight of damage chili (kg)}}{\text{Total weight of chili sample}} \times 100\%$$

DATA PROCESSING AND ANALYSIS

1. Descriptive statistical analysis (chilli farming business data presented in tables and graphs)
 - a) Compilation of all data survey / interview
 - b) Analysis of compiled data with simple statistics (average, standard deviation, standard error and others) and present descriptively (tables, graphs, etc.)
2. Inferential statistical analysis: analysis of predicted middle values (average of losses and standard error (SE) of losses)
 - a) Compilation of all data measurement results of losses (quantity and quality losses)
 - b) Analysis of the compiled data by inferential statistics

$$\bar{x} - z_{\alpha/2} \frac{\sigma}{\sqrt{n}} < \mu < \bar{x} + z_{\alpha/2} \frac{\sigma}{\sqrt{n}} \quad \text{or} \quad \bar{x} - t_{\alpha/2(n-1)} \frac{s}{\sqrt{n}} < \mu < \bar{x} + t_{\alpha/2(n-1)} \frac{s}{\sqrt{n}}$$

EXAMPLE. DATA PRESENTATION OF POSTHARVEST LOSSES OF CHILI IN EACH POINT OF SUPPLY CHAIN

Points	Losses (%)	Standard Error
Farmers	2.19	0.67
- Individual farmers	2.48	0.76
- Farmers group	1.52	0.47
Transportation 1	1.27	
Small scale collectors	2.66	0.99
Large scale collectors	8.67	4.03
Retailers	6.93	2.98
Transportation 2	2.33	0.31

