



*Hello*

**My name is : Choiril Maksum (Maksum)  
I am a retired BPS officer**



## **Sampling Design for Crop Cutting Surveys in Indonesia**

# Topics to be covered

- Background
- Sampling frame
- Survey Design
- Sampling Mechanism
- Crop Cutting Plot Selection
- Practical questions

## Background

**Productivity or yield per hectare data is collected by BPS-Statistics Indonesia through the Crop Cutting Survey that is conducted every sub-round (four monthly), as mostly food crops cultivation takes time of four months.**

**The first sub-round covers January – April period, the second sub-round covers Mei – August period, and the third sub-round covers September – December period.**

**The food crops covers paddy, corn, soybean, cassava, and sweet potatoes.**

**The productivity is collected through a survey that is satisfied the statistical sampling theory. BPS provide productivity data for district estimation level.**

## Sampling Frame

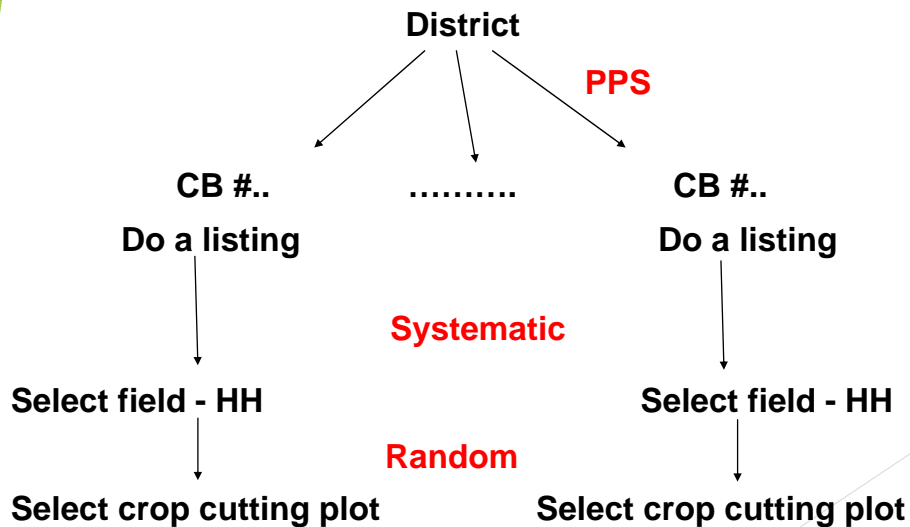
- In Indonesia there are five levels of Government: central, province, district, sub - district and village
- BPS created census blocks (CB), each CB consists of about 80 – 100 households
- BPS created a complete list of CB in each village that covers the whole area of the village
- CB list is up dated regularly
- For crop cutting purposes, CBs are loaded with number of crop households from the latest agricultural census

## Survey Design

The sampling design adopted in the crop cutting surveys is **Stratified Multi-stage Sampling**. The district have been taken as strata, selected CBs in a district as a first stage unit (fsu), selected households in a CB as a secondary stage units (ssu) and the selected crop cutting plots are the ultimate stage of sampling (usu).

The number of plots for each crop being selected in each district have been determined by BPS

# Sampling Mechanism



# Sampling Mechanism (cont.)

- Crop cutting surveys begin by treating district as strata
- In each district, select some CBs using probability proportional to size selection (PPS) with number of food crops households as size (first stage)
- Make a listing for all households in each of selected CB, and classify whether a household will harvest their crops in the next sub-round or not. Put a check mark and number of field will be harvested on crop column for those who will harvest their crops

# Sampling Mechanism (cont.)

- Next, number of field that will be harvested are listed within each selected block, and some of these field are selected systematically (second stage). This method makes it unnecessary to create a list of every CB and necessary only for selected blocks.

At this stage, household being selected is identified

- For each field being selected, a crop cutting plot will be selected randomly within the field (third stage). Crop cutting plot size is 2.5 X 2.5 square meters.

List of households in a selected block

HH No	Head HH	Crop will be harvested in the next subround									
		Paddy		Corn		Soybean		Cassava		Sweet Potatoes	
		Yes, no of field	No	Yes, no of field	No	Yes, no of field	No	Yes, no of field	No	Yes, no of field	No
1	A		X	V 3 1-3			X		X		X
2	B	V 5 1-5			X		X		X		X
3	C	V 3 6-8			X		X		X		X
4	D		X	V 2 4-5			X		X		X
5	E		X		X	V 2 1-2			X		X
	T	V 2 19 - 20		V 1 30			X		X		X


  
**Frame for selecting field**

### Example of household selection for Paddy

HH No	Head of HH	Crop will be harvested in the next sub-round	
		Paddy	
		Yes	No
1	A		X
2	B	V 5 1-5 → 3	
3	C	V 3 6-8 → 8	
4	D		X
5	E		X
6	F		X
7	G	V 2 9-10	
8	H		X
9	I		X
10	J		X
11	K		X
12	L		X
13	M	V 5 11-15 → 13	
14	N	V 3 16-18 → 18	
15	O		X
16	P		X
17	Q		X
18	R		X
19	S		X
20	T	V 2 19-20	

Select 4 fields →  $I = 20/4 = 5$

R1 = 03,

R2 = 03 + 5 = 8, R3 = 13, R4 = 18

### Household sampling list

District :.....

Sub-district :.....

Village :.....

CB # :.....

HH No	Head of HH	Field no	Estimated harvesting time	Note
1	B	3	Second week of January 2016	
2	C	3	First week of February 2016	
3	M	3	Fourth week of January 2016	
4	N	3	Second week of February 2016	

# Crop Cutting Plot Selection

- In each selected field, one (2.5 m x 2.5 m) plot is to be located at random. This is not to be done earlier than the date fixed for harvesting
- The procedure for locating a random plot is as indicated below :
  - 1) Let the four corners of the field in which crop cutting experiment plot is to be located be named as ABCD
  - 2) Let the point “A” represents the south-west corner of the field. For locating south-west corner of the field, the Official taking the crop-cut should stand at this point facing the field and keeping the cut area to his right

# Crop Cutting Plot Selection (cont.)

- 3) The point A, the South-West corner of the field ABCD will be the starting point
- 4) From the starting point measure the length and breadth of the field by footsteps
- 5) Deduct 5 footsteps from both length and breadth
- 6) Suppose the length and breadth of the fields as shown in Fig. below is 40 footsteps & 28 footsteps respectively. Then the length and breadth after deducting 5 footsteps, then length & breadth will be 35 & 23

## Crop Cutting Plot Selection (cont.)

- 7) Now select a pair of random numbers one for length and the other for the breadth from the random number table
- 8) The pair of random numbers being selected for length & for breadth is the south-west corner of the desired “center” for a (2.5m X 2.5m ) crop cutting plot

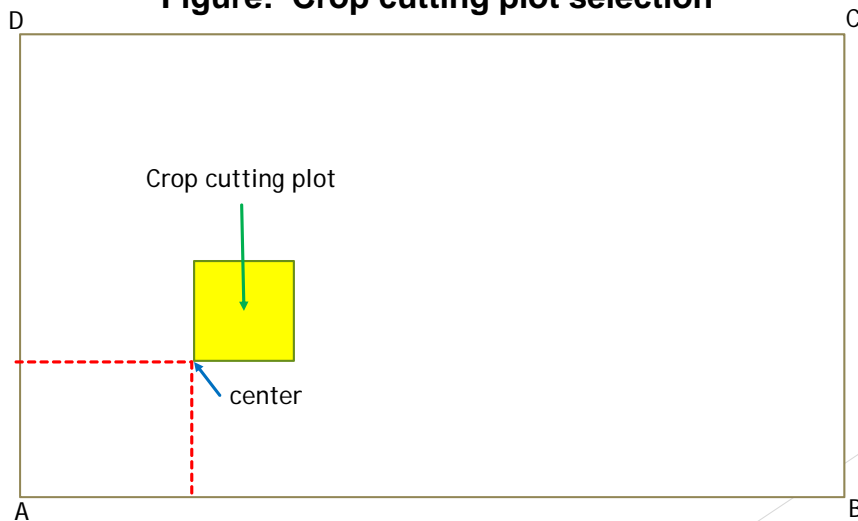
## Crop Cutting Plot Selection (cont.)

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# Crop Cutting Plot Selection (cont.)

Figure: Crop cutting plot selection



## Practical questions

A district consists of 7 (seven) CBs with households composition as follows:

CB no	# of Households
1	10
2	12
3	15
4	16
5	18
6	14
7	13

Select 2 CB using PPS with number of households as size (first stage).

In each CB being selected consists of 3 and 4 corn households that will harvest their crop in the next sub-round.

**The number of fields that will be harvested for 3 corn households each have 2, 3 and 4 fields respectively; while for 4 corn households have 5, 6, 7 and 3 fields respectively.**

**Select 3 (three) fields for each CB systematically.  
Make a household sampling list for each CB being selected.**

	CB 1	CB 2
Nos of Corn HHs	3 corn HHs	4 corn HHs
Nos of fields	1) 2 fields 2) 3 fields 3) 4 fields	1) 5 fields 2) 6 fields 3) 7 fields 4) 3 fields

