

Chapter 1

Crop cutting survey on major rice, Year 2006/2007

Crop cutting survey is one of the techniques that use for estimating of major rice yield per rai, it is accounted as the most reliable methodology for yield per rai assessment.

This document is prepared for Regional Offices of Agricultural Economic (ROAEs) to use as a guideline on crop cutting training for local agricultural economist (SorKorThor).

The objective of the crop cutting survey is to estimate major rice yield per rai, year 2007 in total of 39 provinces. Target provinces and the sample size are shown in the table 1 and 2.

The survey contents are coverage 4 parts: Crop Cutting Survey, Moisture Testing, Gleaning Survey and Dyke Survey.

The major part of field survey will be conducted by local agricultural economist (SorKorThor). The ROAE officers will be in charge for some parts of survey which included cleaning of production, moisture testing, gleaning survey and dyke survey. Necessary tools and equipment for the major rice crop cutting survey are shown in Chapter 2.

Chapter 2

Survey Method

2.1 Sampling plan

According to the previous survey result, we could not utilize the entire data because the inconsistent of data occurred when compared to other sources of data. The problem has been consulted with JICA expert in order to improve the data collection method by emphasizing on sampling method that could represent the efficient samples.

In order to use crop cutting survey result as a reference from list frame, the estimation must be made under the same sampling standard. The sampling standard is divided as (1) Two way steps (2) Systematic sub-sampling. For Systematic sub-sampling, use calculation formula as sampling plan. According to the list, there are 2 types of sample village; one is in-zone irrigation, another one is off-zone irrigation. The number of sample list are determined in table 1, page 2.

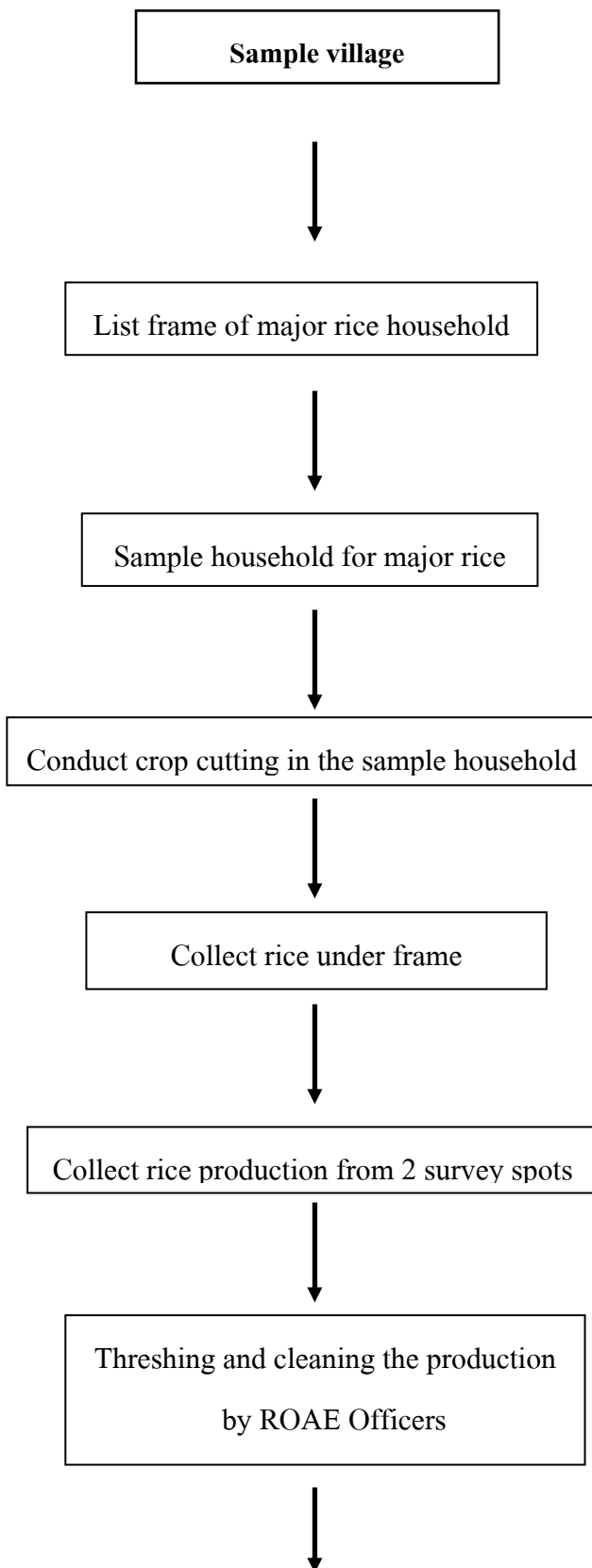
2.2 Determination of sample household

The determination of sample household on major rice crop cutting survey will be different from previous major rice crop cutting survey by only 3 sample households per village are determined (previously determination for 5 sample household per village). Select sample by using random table as shown below Form 2 in the crop cutting survey manual for major rice, year 2006/2007.

2.3 Random of sample household

Random table is provided for the convenience of users (as table shown below Form 2). Random of sample farm household, start by listing up the farm households which plant major rice in the sample village to the “List of Major rice Farming Households, Crop year 2006/2007” (Form 1). Count of the total number of farm households; select three sample households using the random table and enter in the “List of sample households for the survey of major rice production per rai, Crop Year 2006/2007”. Later on, SorKorThor will contact the sample farmer in order to cooperate with the authority.

2.4 Summary of survey procedures



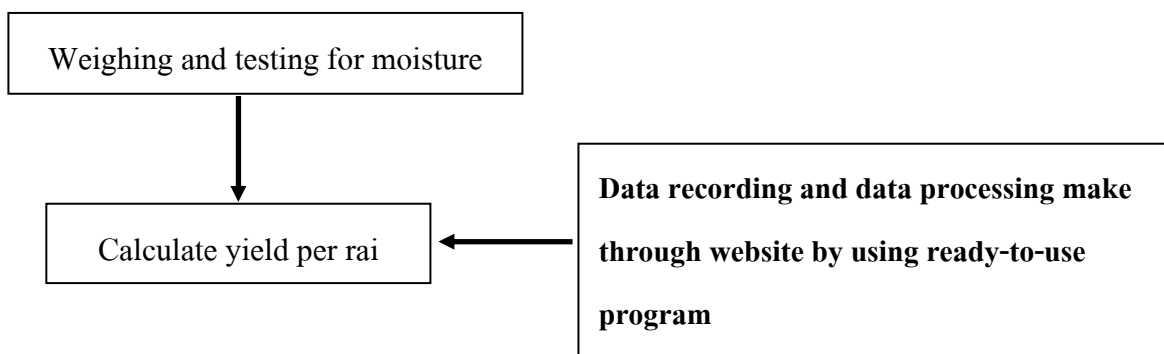
The list of sample village will be provided to each targeted province as the number determined in accordance to ROAE plans. Then, distribute the number of sample village to SorKorThor and ROAE Officers.

ROAE Officers and SorKorThor list up the farm households which plant major rice in the sample village to the “List of Major rice Farming Households, Crop year 2006/2007”

Random of sample household by using random table and random for 3 sample household.

Survey procedures are provided in the survey manual book.

Collect all the rice production under frame area from each survey spot (1 square meter per survey spot). Keep the production in the bag with name tag.



Remarks: Name listing must be carefully proceeded because:

1. The actual list must be matched with the list number in calculation part.
2. List number must be matched with the list number in the “List frame”

2.5 Working procedures for conducting crop cutting

Crop cutting procedures consisted of 4 steps as follows:

Step 1: Introduce yourself and explain clearly the objectives and survey method on the production per rai in the selected farm of the sample farmer to village headman/ sub-district headman and the sample farmer that you are the person assigned by the Regional Office of Agricultural Economics for the survey of major rice production per rai in the sample village.

Step 2: Random 1 sample field that own by sample household, then random 2 field blocks (by Table 2) and conduct 1 survey spot in each field block according to survey methodology. In case there is only 1 field block in the sample field, you are allow to conduct 2 survey spots in the same field block. The most critical part of the survey is random method.

Step 3: Collect major rice production and keep in the production bag and fulfill the detail of each survey spot.

Step 4: Return the production bag and survey manual to ROAE Officers.

Working details for SorKorThor

Step 1

- 1) Enter the sample village
- 2) Introduce yourself and explain clearly the objectives and survey method on the production per rai to village headman/ sub-district headman and the sample farmer.
- 3) Contact sample household, but in case you can not contact them use the reserve sample household, select the farm household alternately upper and lower of the actual sample household by using the list (Form 1).
- 4) Explain the detail of conducting survey and ask for the cooperation for interviewing according to the questionnaire.

Step 2

Random method for sample field and sample field block

1. Random of sample field

1.1 Ask sample farm household for the exact number of the field that able to conduct crop cutting and draw the location map for each field. In case that there is no field that able to conduct crop cutting because they already harvested the production, then you can use the reserved sample immediately.

1.2 Random 1 sample field by using random table (Table 1 in the survey manual book for SorKorThor) and ask for the exact date for harvesting and make appointment with them.

2. Random of sample field block

2.1 Enter the sample field

2.2 Interview sample farmer for total field block and draft the picture of field block and put the number on each field block. Select only the field that about to harvest on November 2006 – January 2007 (except Southern region during January – February 2007).

2.3 Random of 2 sample field block by using “Random table for the sample field block” (as shown in Table 2 on the manual survey book for SorKorThor)

Step 3

1. Collecting of production

- Survey Spot 1, start from the lower left-hand corner, walk along the edge of the farm field for 30 steps and turn right into the farm field and walk in for another 30 steps. The right-hand block is the first survey spot.
- Survey Spot 2, start from the lower left-hand corner, walk along the edge of the farm field for 30 steps and turn right into the farm field and walk in for another 30 steps. The right-hand block is the second survey spot.
- Place frame at the end of 30th paces on the left hand side, it takes 1 square meter
- Collect the major rice production only under frame

2. Put the production gathered from 2 survey spots into each bag and fill out the tag to each bag

3. Make the production dry by SorKorThor (average 2 days)

Step 4

After you have checked the data for accuracy and completeness, the production bag, manual and field survey note, it shall be kept in your residence and waits for submission to ROAE Officers.

2.6 Working procedures for ROAE officers

There are 7 steps for ROAE officers in accordance to the crop cutting field survey:

Step 1

Let's operate the crop cutting survey in some sample village as well as SorKorThor practice and be a trainer for SorKorThor.

Step 2

Conduct the dyke survey in the major rice field by measuring the dyke area of survey spot 1 and 2. Conduct the dyke survey on 2 sample households that already conducted crop cutting survey on yield per rai in order to obtain the ratio of unplanted area in each field block.

Step 3

The methodology for gleaning survey is the same practicing as crop cutting survey; using frame (1x1 square meter) at 1 survey spot per sample household only. First, conduct gleaning survey in the field that selected as crop cutting sample field. In case, there is no harvesting in the selected crop cutting sample field, then use the nearby field that already harvested (not more than 2 days).

Step 4

Re-check the accuracy of field survey note when obtained from SorKorThor.

Step 5

When received the production bag from the sample field, follows these steps:

- 1) Threshing the production by threshing machine
- 2) Weighing the production
- 3) Testing moisture of production

Step 6

Record data through website by using ready-to-use program

Step 7

Processed data will be transferred to Center for Agricultural Information (CAI)

2.7 Data processing of yield per rai (CAI)

Last step is to estimate, analysis and data presentation on crop cutting yield per rai by CAI.

Procedures are as follows:

1. CAI receives data through website from each ROAE
2. Data checking
3. CAI re-processes the data from each ROAE
4. The final version of survey result (including survey result and details) will be proceeded by Office of Agricultural Information (OAE) and JICA ASEAD PROJECT in order to analyze it with gleaning survey result together with dyke survey result as well.

✍ Formula for the estimation of yield per rai in provincial

In order to make the direction for the “List frame” and able to maximize the highest utilization of data, only using the same sampling method is not enough; therefore, the calculation of provincial yield must be harmonized to the sampling plan as well.

2.8 Data re-check, analysis and report

Before launching of report, Division of Field Crop Information has to analyze and re-check the accuracy of data that sent through Website. All the survey note must be sent back to Division of Field Crop Information, included of:

1. Crop cutting survey note (by SorKorThor and ROAE Officers)
2. Unplanted area survey note (Form 4)
3. Gleaning survey note (Form 5)

It must be done immediately after the data entry through website.

2.9 Tools and equipment necessary for survey

2.9.1 Crop cutting (ROAE Officers and SorKorThor)

- Frame (1x1 square meter)	1	set
- Measurement tape 10 meter (only for Officers)	1	set
- Production bag	2	bag
- Name tag	2	tag
- Writing board	1	set
- Pencil	2	pencils
- Manual book and Survey note for enumerator	1	book/village
- Document bag and equipment	1	bag
- Jacket and cap	1	set

2.9.2 Gleaning survey (ROAE Officers)

- Frame (1x1 square meter)	1	set
- Trimming scissor	1	set
- Production bag with name tag	2	set/village
- Gleaning survey note (Form 5)	1	set/village

2.9.3 Dyke survey (ROAE Officers)

- Measurement tape 100 meter	2	set
- Stake (2 meter)	4	set
- Dyke survey note (Form 4)	2	set/village

2.9.4 Tools and equipment using after harvested of production (only ROAE Officers)

- Threshing machine	1	set
- Weighing scale 2 kg.	2	set
- Digital weighing scale 1 kg.	1	set
- Plastic sheet	20	set

Chapter 3

Proportion of unplanted area (Dyke survey)

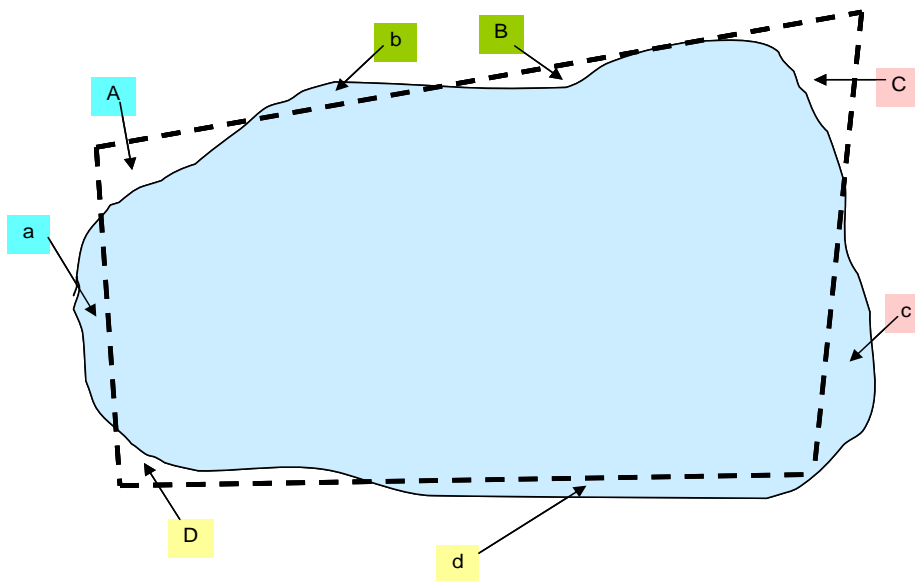
Currently, Thailand has major rice yield per rai of 407 kilogram/ rai, when compare to other countries it considered as below standard. For example, Philippines, Bangladesh, Myanmar, Vietnam, China and Australia; the estimated major rice yield per rai are 432, 441, 493, 633, 969 and 1,643 kilogram/ rai respectively.

Causes of the below standard are disaster, variety, improper production area. One of the causes that Office of Agricultural Economic (OAE) concerned is unplanted area in the rice field such as dyke area, pond, perennial crops, termite hill and etc. Mostly, published data for planting area of major rice included unplanted area; therefore, in order to prove the above assumption it is suppose to find the proportion of unplanted area and the impact to the published data.

Dyke survey is assigned to ROAE officers as the surveyors as well as gleaning survey in Chapter 4. Random only 2 sample village per province, the random made through the crop cutting sample village. Dyke survey and unplanted area survey must be completed in both 2 sample field blocks after conducted crop cutting. Mostly, the measurement is for dyke area, perennial crops or termite hill.

If the sample field block is a square shape, it will be easy and convenience for measurement. In some cases that field blocks are in different shape, unspecified shape, bended shape; therefore, using Offset Method could help. The Offset Method is as follows;

Draw a line to cover most of the area, and then calculate the area inside and outside the lines. It means matching of outside area with inside area to be equal (as picture shown).



Picture 3.1: How to measure field edge by Offset Method

Applying Heron's formula method in order to find planting area; by dividing field block area as many triangle shapes as possible. It is easy to calculate for the area of triangle and square shape, the more divided triangle shapes, the more it helps us gain accurate data.

$$A = \sqrt{s(s-a)(s-b)(s-c)}$$

When A = Triangle's area

a = Length of triangle side 1

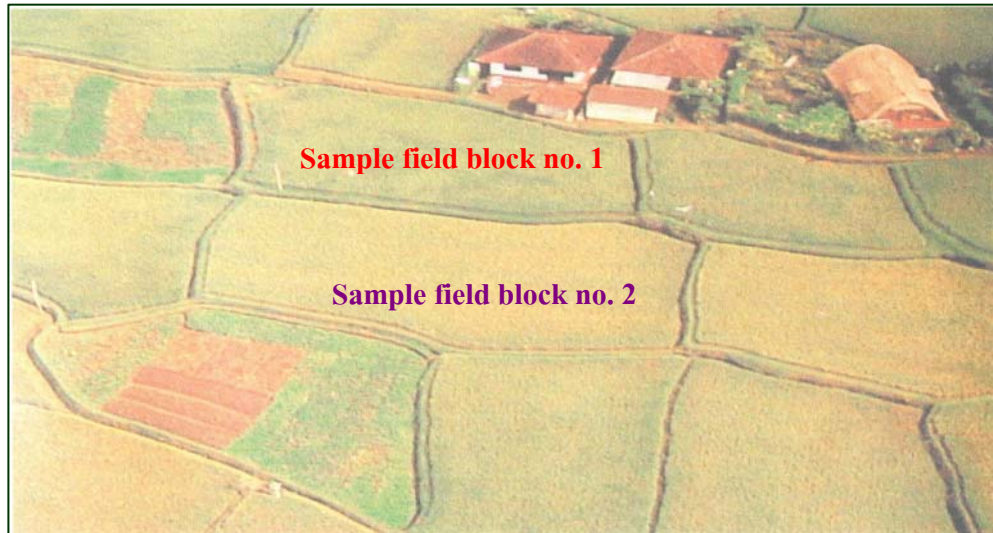
b = Length of triangle side 2

c = Length of triangle side 3

by $S = \frac{a+b+c}{2}$

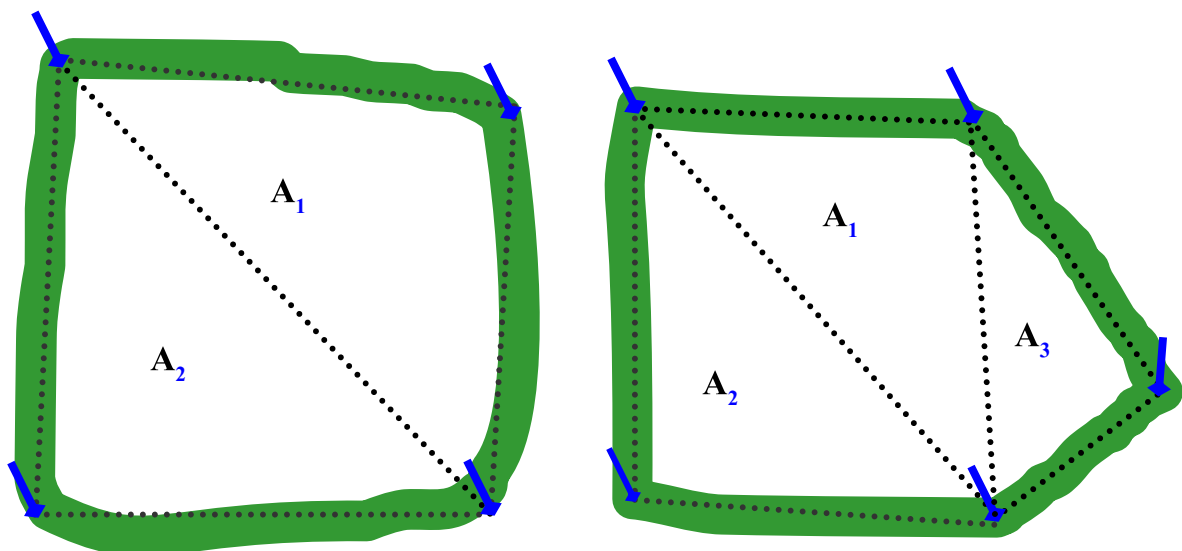
Dyke survey procedures are as follows:

1. Look at 2 sample field blocks and consider of how to divide it as a triangle shape and make it the most accurate to the fact. For example, if the shape of the sample field block is bended in/out then divide it as many shapes of triangle.



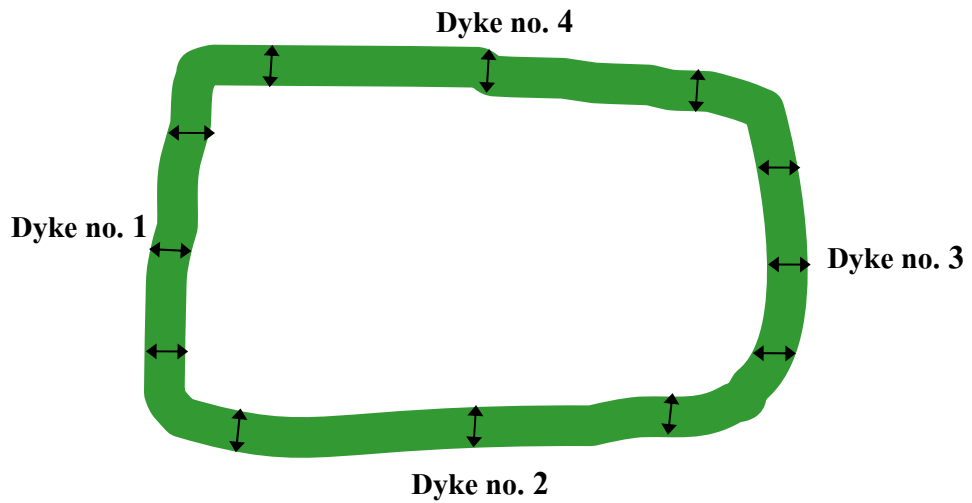
Picture 3.2: Consider 2 sample field blocks

2. Use stakes to stake out the corner of sample field block or bended corner, then measure the length between each stake in triangle shape. Divide the shape of triangle for at least 2 pictures; the unit count is “meter” with 2 decimal.



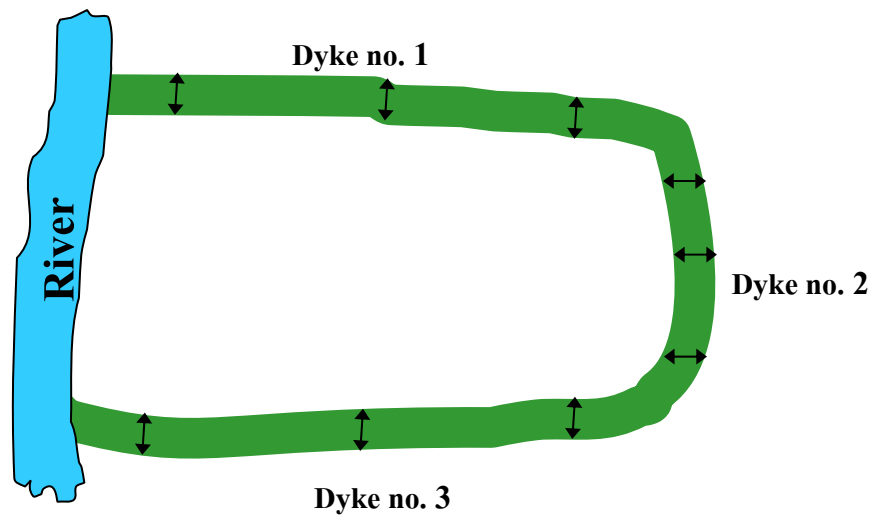
Picture 3.3 : Length measurement of field edge

3. Measure the width of dyke edge for 4 corners in field blocks; measure all positions to cover all 4 sides. The unit count is “meter” with 2 decimal.



Picture 3.4 : Measure the width of dyke edge in sample field block

In case there is one side of the field connects to the main road or river, it is acceptable not to measure the width of edge on that side.



Measure the width of dyke edge in sample field block (3 spots)

Chapter 4

Harvest loss survey (Gleaning survey)

Currently, rice harvesting is popular to conduct by using the harvesting machine in every regional of Thailand especially in Central region in accordance to the labors shortage problem and high labor cost; therefore, farmers turn to use harvesting machine instead but the problem of high cost still found; even the harvesting machines bring convenience to farmers.

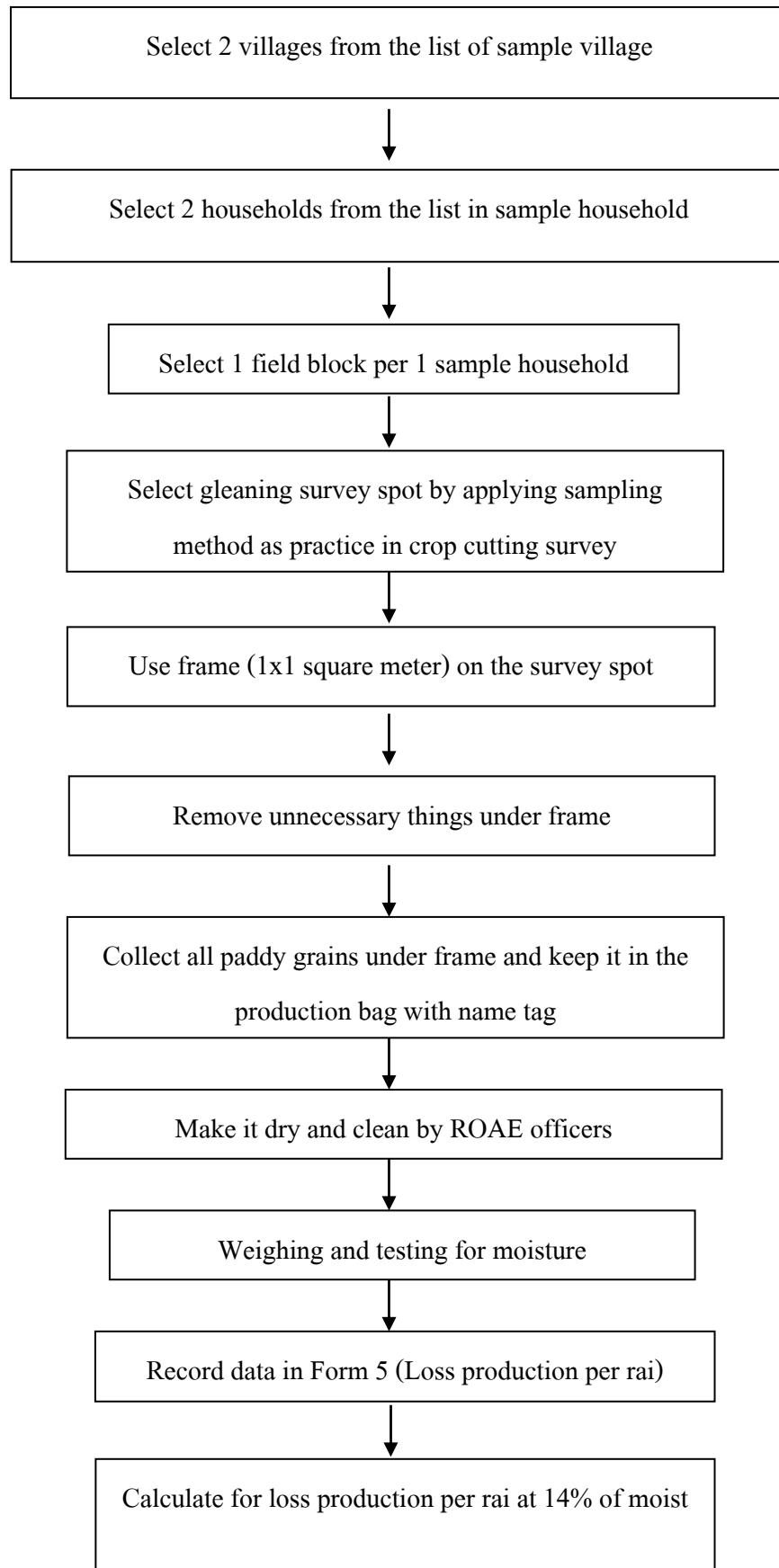
The problems that mostly found after used of harvesting machine is loss of production, it caused the problem of overestimated of yield per rai calculated by crop cutting data. Therefore, in order to have reliable and accurate data, it is essential to conduct harvest loss survey.

Gleaning survey is assigned to ROAE officer to response; it will be conducted in the same place as crop cutting survey field or nearby field. The methodology for harvest loss survey is the same as crop cutting survey method by using 30 steps method. Remove unnecessary things under frame in order to easily see the paddy grains and then collect all the paddy grains. Make it dry, weigh it and testing for moisture. Conduct harvest loss survey only 1 sample field block per 1 sample household.

In case of harvest loss survey will be conducted in the same place as crop cutting survey field, it should be selected different field corner in order to have the most reliable data that close to the farmer harvesting practice.

Harvest loss survey must be proceeded immediately after rice harvesting took place (happen in the same day is the better); before the remaining of rice production will be taken by bird, rat, duck or chicken. In order to do so, it is to maintain the most accurate of loss production data.

Gleaning survey procedures are as follows:



List of major rice farm household, crop year 2006/2007

Form1

Village name..... Moo..... Tumbon.....
 District..... Province..... ROAE.....
 Officer/Volunteer Name..... Surname.....
 Date..... Month..... Year

No.	Name list of major rice farm household	Remarks
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		

No.	Name list of major rice farm household	Remarks
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		
51		
52		
53		
54		
55		
56		
57		
58		
59		
60		

List of major rice farm household, crop year 2006/2007 (continued)

Form 1

No.	Name list of major rice farm household	Remarks	No.	Name list of major rice farm household	Remarks
61			101		
62			102		
63			103		
64			104		
65			105		
66			106		
67			107		
68			108		
69			109		
70			110		
71			111		
72			112		
73			113		
74			114		
75			115		
76			116		
77			117		
78			118		
79			119		
80			120		
81			121		
82			122		
83			123		
84			124		
85			125		
86			126		
87			127		
88			128		
89			129		
90			130		
91			131		
92			132		
93			133		
94			134		
95			135		
96			136		
97			137		
98			138		
99			139		
100			140		