METHOD OF EXAMINING AFTER-HARVEST WASTAGE

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Rice is the main source of food for Vietnamese. In the past years, before-harvest pieces of work were examined carefully, but until quite recently, some attention has been given to after-harvest work so we haven't found out an effective method of reducing rice wastage.

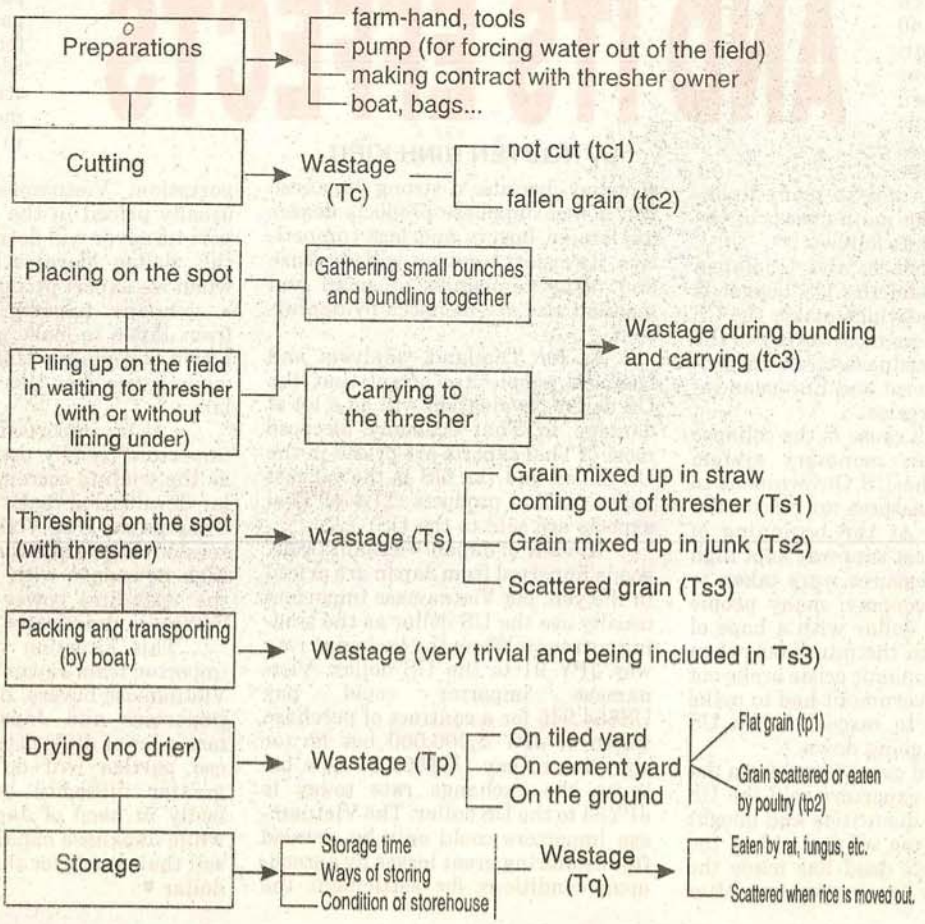
It's neccesary to examine and evaluate wastage in each piece of work after harvesting rice in order to find out causes of wastage at a specified locality, and then we can take technical measures to reduce it. As we know, wastage varies with the localities and rice fields because it depends on many factors such as weather, pest, farming habits, infrastructure in rural areas, skill of peasants, method of examiners, etc. Therefore, we will not interest in the amount that is wasted but will concentrate on finding out what pieces of work cause the biggest wastage in a certain locality before we can take suitable technical and economic measures to help peasants solve this problem.

There are many viewpoints and methods of evaluating after-harvest wastage. After carrying out many experiments, we would like to present here our method of examining the quantity of after-harvest wastage (qualitative analysis of the wastage will be done in the laboratory).

We should gather the following information before carrying out examination in a specified locality:

- Objective and subjective factors such as weather, climate, pest, vermin, etc. which can affect the rice crop before harvest. These data will serve as scientific and realistic bases for our evaluation.
- Weather conditions in the day of examination and characteristics of the rice field under examination (depth of water, ripeness of rice, hardness of rice stem, etc.)
- List of work to be done after harvesting (this list will help us find out what pieces of work should be examined).

The following is the list of work observed at Tân Lập village, Tân Thành district, Long An province:



1. Choosing specimen and calculating rice yield and output

- On six rice fields of six peasants growing the same rice species, we choose three pieces of land (specimens) of good, bad and medium quality. Each piece of land of 9sq.m is divided into two parts of 4.5 sq m each. The first part will have its rice cut carefully, the second one will be cut normally.

+ Rice output per one hectare carefully cut (SL1)

SL1 = yield from 4.5 sq m carefully cut x 10,000/4.5

+ Rice output per one hectare normally cut (SL2)

SL2 = yield from 4.5 sp m normally cut x 10,000/4.5

- Humidity is supposed to be 14%. Of 100kg of rice, if humidity decreases by 1%, total weight will reduce by 1.2 kg. This reduction will not be considered as wastage.

HA = (% of humidity reduced x 1.2) x rice yield per ha/100

+ SL1 at humidity of 14% = SL1 - HA

+ SL2 at humidity of 14% = SL2 - HA

2. Working out wastage during cutting (Tc)

$$Tc = tc1 + tc2 + tc3$$

tc1 is the weight of uncut rice.

tc2 is the weight of scattered grains during cutting.

tc3 is the weight of scattered grains during piling, binding and carrying

a. *Working out tc1*: collect ears of rice left uncut on 3 areas of 4.5 sq m from 3 specimens which are cut normally. Find out the wastage caused by cutting normally one hectare of rice.

b. *Working out tc2:* Difference between SL1 and SL2 is the wastage caused by uncutting and scattering during cutting.

SL1- SL2 = tc1 + tc2

From tc1, we can work out tc2

c. *Working out tc3:*

- Find out the weight of rice collected from 10 bunches of 5 kg each which are left on the spot without piling (w1)

- Find out the weight of rice collected from 10 bunches of 5 kg each each which are piled up beside the thresher (w2)

- Difference between w1 and w2 is the wastage caused by bundling and carrying 10 bunches of 50 kg.

- How many times of 10 bunches of 5 kg each are there in one hectare after cutting? This number (L) is found out by having the total weight of rice collected from one hectare divided by w2.

(w1- w2) x L = tc3

It's worth noting that the weight of rice collected by normally cutting the area of 4.5sq m may be bigger than what is collected from the other carefully cutting 4.5 sq m. The causes of this are as follows:

- Two areas of 4.5sq m each aren't equal in number of rice plants.

- There is a difference in density of rice plants on equal areas. Each ear of rice gives a different amount of grain.

- Cutters do the job uncarefully.

Just because of these causes, we have to choose 3 pieces of land (specimens) from one rice field. From 6 rice fields, we have 18 specimens. Examining all of 18 specimens, we may gather reliable data and information.

3. Working out wastage during threshing with a thresher (Ts)

Many facts should be noted before carrying out examination: capacity, trademark, and condition of the thresher; rice plants are piled up with or without a lining sheet, etc.

$$Ts = ts1 + ts2 + ts3$$

ts1: grain mixed up in junk

ts2: grain mixed up in straw coming out of thresher or scattered during packing.

ts3: grain not being separated from straw by thresher

a. *Working out ts1*: collect grains in the junk and multiply the weight of them by L.

b. *Working out ts2*: collect grains mixed up in straw coming out of thresher after threshing 10 bunches of rice plant of 5 kg each, and multiply the weight of them by L.

c. *Working out ts3*: collect grains attached to straw after threshing 10 bunches of rice plant of 5 kg each, and multiply the weight of them by L.

4. Working out wastage during drying (Tp)

In examining Tp, we measure the humidity of rice before and after drying, the temperature of the air (when it is hottest) during drying, the area of the drying yard and the amount of rice. We had better also observe ways of doing drying of the peasant and everything happens during drying (if rice is dried on roads, note the area which rice occupied on road, the times vehicles run over rice).

Difference between the weight of rice before and after drying is the wastage caused by drying (Hp)

Call HA the wastage caused by reduction in humidity:

HA: (difference between before- and after-drying humidity x 1.2 kg) x amount of rice/100

$$\% Tp = \% Hp + \% HA$$

5. Totalling wastage from cutting to drying

After working out average wastage during each piece of work, we can find out percentage of wastage from cutting to drying:

$$\% T = \% Tc + \% Ts + \% Tp$$ where

% T: percentage of wastage from cutting to drying.

% Tc: percentage of wastage during cutting

% Ts: percentage of wastage during threshing

% Tp: percentage of wastage during drying

6. Working out wastage during storing

The wastage during storing is hard to be worked out, because data and information about storing vary with localities and aren't fully recorded. In various storehouses, there is no device for measuring humidity or even an exact record of rice coming in or out. We can only interview and observe the way of storing, building of storehouse, and barns for storing rice of some peasants and gather information necessary for evaluation.

In short, our method of evaluating after-harvest wastage presented here can't find out exact numerical data about the wastage because of many factors (weather, pest, farming habits, infrastructure in rural areas. level of intensive farming, etc). This method is only what we have carried out in an attempt to envisage how big the wastage is. The method will be perfected afterward, but the problem we should pay attention to is to find out technical and administrative measures to reduce the wastage, and at the same time, to improve both quality and quantity of our rice output in order to meet domestic and foreign demand ■