Analysis of the Correlation Amount Sweet Potato Waste to Community Empowerment in Cikarawang Village

Dicky. Hasian Zulkarnain¹, and M. Irfan. Fathoni²

Abstract—Based on data analysis shows that there are 72 ha of land of sweet potato production and productivity of 12-20 tons ha⁻¹ in Cikarawang village. This research aimed to analyze the relationship between the amount of sweet potato waste with community empowerment in Cikarawang village as an effort to reduce yields not used. Methods of research carried out by the surveys and interviews with farmers group and women farmers group in the village Cikarawang. Each hectare production will lose 20% of the total weight bulbs that do not fit the criteria of the market caused by pests and diseases and not yet entered the harvest criteria (unripe). “Hurip” farmers group and “Melati” women farmers group initiate the sweet potato waste treatment as well as waste reduction efforts around community empowerment. Based on the analysis contained sweet potato processing results in the form of chips, flour, sponge cake, brownies, muffins, sweet rolls, juice, filler sauce, syrup, and rice analog. The effort by social empowerment to reduce the harvest neglected through product innovation has increased 62.5%.

Keywords—waste, empowerment, sweet potato.

I. INTRODUCTION

Harvest loss is a phenomenon that always occurs in agriculture. This situation often becomes one of the reasons the need for post-harvest activities in order to reduce losses due to heavy losses on a commodity. Reference [1] reported that one-third of the world's food production suffered a loss globally reached 1.3 billion tons per year. Crop losses are quite high there on horticultural crops that are voluminous and contains a lot of water. Besides losing harvest due to the dominance of pests and diseases that occur as a result of monocultures in agriculture today. Modern era with an increasing number of people demanding the fulfillment of the world's growing food. This resulted in farmers applying crop monocultures on so that the dominance of pests and diseases that often damage the crop uniformly faster. One of the commodities that experienced crop losses are sweet potatoes.

Sweet potato (Ipomoea batatas L.) is a food commodity that has a high potential and can be used as raw material for a variety of processed foods. Reference [2] mentions that the sweet potato has the economic and social potential is quite high as a food ingredient that is efficient in the future, as animal feed ingredients, and raw material for various industries. According to [3], in 2011, sweet potato production in Indonesia reached 2,196,033 tons / year. Sweet potatoes contain water as much as 68.50 g; 27.90 g carbohydrates; 1.80 g protein; and 0.70 g of fat in every 100 g of fresh product [4]. Sweet potatoes also contain pigments which are dominated by carotene and anthocyanins that are rich in antioxidants.

Behind the excellence of sweet potato, there are also anti-nutritional substances and a variety of conditions that affect its quality. Sweet potatoes also contain several anti-nutritional substances and lowering the taste that gives a negative influence on the preference of sweet potato. Anti main nutrients in sweet potatoes is a trypsin inhibitor that is blocking the action of trypsin as breaking protein. The result is a protein digestion in the gut is inhibited, resulting in lower levels of protein breakdown in the body [5]. Beside that, some pests and diseases in crops of sweet potatoes often result in decreased quality of sweet potatoes. Reference [6] states that the pests are abundant in sweet potatoes are derived from insects and fungal infections. In addition, the sweet potato is voluminous resulted in heavy losses to the tubers harvested.

Storage treatment also influence the quality and weight loss of sweet potato bulbs. Based on [7] in storage at a temperature of 19-23 °C and humidity of 68-80%, the longer the storage of potatoes produced weight loss is also higher. He reported that weight loss during storage potato varieties Cilembu Nirkum Orange reached 4.46% at the end of the storage (5 weeks). This is related to the results of research [8], sweet potato weight loss at the end of treatment (eight weeks) reached 16.87% for sweet potato Gisting storage space. A similar trend also occurred in Marga sweet potato with a big weight loss results by the end of the storage (eight weeks) reached 19.84% on storage space. Weight loss is due to water loss of material in the process of transpiration and evaporation of gases decomposition of glucose to carbon dioxide in the process of respiration during storage [9]. Based on the high weight loss can be detrimental to farmers with high enough quantities, so it takes an activity that can minimize post-harvest crop losses.

One of the area in Indonesia which experienced a weight loss of the crop of sweet potato is Cikarawang village. Cikarawang village is a village located in the district Dramaga, Bogor regency, West Java province, Indonesia. Land conditions supporting state also has implications for the village which is very suitable for crop land has been utilized by the dominant society of farmers. Sweet potato planting area of land in this village reached 72 ha. The extent of the sweet potato crop has resulted in there are some pests that develop thus reducing the amount of crop that can be taken. In addition, sweet potatoes are often harvested do not fit into the...
criteria of the market. Potato harvesting is done 3-4 months after planting [10], but there are tubers of sweet potato unripe so it cannot be marketed. There are also some conditions that result in tubers into waste because it cannot be sold. It initiated “Hurip” farmers group and group of women farmers “Melati” of Cikarawang village to conduct a post-harvest activities that can reduce the crop losses.

Community empowerment becomes one of the efforts to overcome the loss of weight of the harvest in a way to accommodate the idea of community in the processing of the results. The production of sweet potato that does not meet the standards of the market will be processed into downstream products that have added value. This study aims to examine the relationship between the amount of crop losses with higher innovation made public and its benefits for the empowerment of the community who are members of Hurip Farmers Group and Melati Women Farmers Group.

II. RESEARCH METHODS

A. Location and Time Research

The study was conducted in the village Cikarawang, Bogor, West Java province. The choice of location is done deliberately because it is known as a center of sweet potato in Bogor. Retrieval and data processing carried out in September - October 2015.

B. Determination of Respondents

Respondent is done by surrounding communities meet fused research sites in Hurip Farmers Group and Melati Women Farmers Group. The object of research is that people who are active in the sweet potato crop rotation and post-harvest activities of the sweet potato. Respondents were chosen as at least 30 people.

C. Data retrieval

This research uses primary and secondary data. Data collection is done by:
1. Literature study to obtain secondary data about the benefits of post-harvest and other matters related to the study;
2. Observation by observing and recording observations in the field;
3. The interview questionnaire was used to obtain data that includes data on age, sex, income, education level, and questions associated with perceived benefit society after post-harvest processing of sweet potatoes.

While secondary data in this study as a general overview and condition of the sweet potato crop land areas and liveliness members of farmers group and women farmers group, chairman of farmers group, literature, and internet facilities.

III. DISCUSSION

A. General Description of Respondents

1) Characteristics

Respondents were 30 villagers who are from Cikarawang village. Most respondents lived in RT 04 RW 03 Cikarawang. Respondents are members of Hurip Farmers Group and Melati Women Farmers Group. Hurip Farmers Group was founded in 2007 by farmers group chairman is Mr. Ahmad Bastari. This group developed many kinds of commodities including crystals guava, peanuts, corn, rice and sweet potatoes. Hurip Farmers Group role is to assist its members in the capital as well as the distribution of the harvest, so farmers have more stable production.

Melati Women Farmers Group is a group of women who work as farmer or have a husband as farmer. The group was founded in 2008. The group was formed to help women who do not have a regular job to be creative by using local materials that exist in the village. Initial formation Melati Women Farmers Group is to encourage housewives to be more productive in daily so that their time is not wasted.

2) Respondents age

Age of respondents varies greatly with the youngest aged 36 years old and the oldest 80 years. Most respondents are in the age range 41-50 years a number of 12 people, the next 51-60 years a number of 9 people. The next, respondents with a lifespan of 61-70 years as many as 4 people, less than 40 years 3 and greater than or equal to 70 years 2. The distribution of age can be seen in Picture 1.

Based on the survey results we can conclude that the majority of farmers are in the age range 41-50 years. Reference [11] state that the productive age who are in the age range 16-64 years. Therefore, it can be concluded that Cikarawang farmers in general are in the productive age.

3) Gender

In general, respondents in this study were men, because men have an important role in agriculture in Cikarawang village. 80% of a field farmers in Cikarawang village are men. From the total 30 respondents there are 16 men or about 53% of the total respondents and 14 women or about 47% of the total number of respondents. Distribution of sex of the respondents can be seen in Picture 2.

4) Formal education

Formal education level is measured at the level of formal education that successfully graduated by the respondents. The classification level of formal education starts from primary school, junior high school, high school and college. Based on
the results of interviews obtained by the fact that out of 30 respondents majority of farmers are primary school graduates as many as 12 people, equivalent to 40% of the total respondents. Followed by the farmer with the junior high school graduates as many as 11 people, equivalent to 37% and there were 7 farmers high school graduate or equivalent to 23% of the total respondents. No farmer who is a bachelor graduate. Distribution of formal education Cikarawang village sweet potato farmers can be seen in Figure 3.

![Fig. 3 Farmers According to Formal Education](image)

**B. Sweet Potato’s Potentials**

Sweet potato (*Ipomoea batatas* L.) is one of carbohydrates which is needed to be developed in order to support food diversification program in Indonesia. Seeing some important components are contained, the sweet potato should be prioritized to be developed as food source alternative to rice and it is important to make the raw materials industry, especially the baby food industry [12].

Potential development of sweet potato commodities is still very wide, besides to be consumed directly as food, its dairy products such as flour and pasta are required by the food industry, animal feed industry, and chemical industries. Its processed products are sweet potato starch, sweet potato pasta, chips, jams, sauces, syrups, sugar alcohols fructosa dna. In addition, sweet potato flour is used as raw material for food processing. It is recognized that mostly a large part of Indonesian people only process the sweet potato conventionally such as frying, boiling or steaming. Wheat starch is a semi-finished products of sweet potato can be used as a raw material in the manufacture of confectionery, ice cream, bread, cakes and some drinks syrup.

Cikarawang is a village that utilize sweet potato as one of the main ingredients for processed products. The village is known as one of the central sweet potato producer in Bogor and it takes the advantage of sweet potato waste to be processed into higher-value products. The excellence of village in processing sweet potato is supported by a group of farmers and women farmers who successfully empower the majority of communities to take part in fostering creativity in terms of processing sweet potato.

**C. Sweet potato planting in the Cikarawang village**

Sweet potato planting in Cikarawang village is conducted twice a year. Crop rotation is done usually by a combination of rice, sweet potatoes, peanuts, sweet potatoes. It is associated with the prevention of pests and diseases and suitable climatic conditions for planting. Reference [13] stated that pest and disease control can be done by integrated control. One of the integrated controls is crop rotation in the land area. Crop rotation can reduce the dominance of pests and diseases which can lead to a reduction of non-harvested sweet potato. Crop rotation is one way to control pests in integrated agriculture [14]. The system is also used in Cikarawang village in order to reduce pests in soil, thus can reduce the attack. Reducing the number of these attacks is expected to minimize crop losses.

Sweet potato area in several production centers are generally grown on irrigated land and non-irrigated in the dry season after the harvest of rice and dry land. Planting sweet potato on dry land is generally carried out in the beginning or middle of the rainy season. Sweet potatoes can be harvested in 4 months for the lower land and 6 months in the highlands [15].

Cikarawang village which is located in Bogor regency has a lower level production of sweet potato compared to national production. The village has a production of 9.5 tons ha\(^{-1}\)while Indonesian national production amounted to 12.232 tons ha\(^{-1}\)[16]. In general, land size of sweet potato farmers in Cikarawang village is about 0.5 ha.

<table>
<thead>
<tr>
<th>Year</th>
<th>Productivity (Ku/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>94</td>
</tr>
<tr>
<td>2001</td>
<td>97</td>
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<td>2002</td>
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<td>2007</td>
<td>107</td>
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<td>2008</td>
<td>108</td>
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<tr>
<td>2009</td>
<td>112</td>
</tr>
</tbody>
</table>

Based on national production, it appears that Cikarawang village production is not optimal. There are many factors that cause the minimum result of sweet potato farm in Cikarawang village such as capital production, pests and diseases, and fertilization.

**1) Capital**

Capital is a crucial thing in agriculture. Stable capital can affect the next crop. Farmers with enough capital can supply agricultural crops with adequate material and high quality. In contrary, farmers with low capital is difficult in supplying adequate agricultural materials.

The farmers’ capital level of Cikarawang village had an average of Rp 1.57625 million to an average area of 1820 m\(^2\). Cikarawang village capital calculation is to calculate the cost of each 4 m\(^2\). Capital gives a significant influence for the increase of production at farm level Cikarawang. The positive correlation with the magnitude of the correlation coefficient of 0.975 between the amount of capital with an increase in production means a correlation with the pattern of a strong relationship between the two variables, the greater the initial capital of farmers, the higher the production of sweet potato farmers. The coefficient of determination relation to the amount of capital increases in production amounted to 95.1%. This figure means that the diversity of the total production result amounted to 95.1% can be explained by a given amount of capital.
Correlations: capital; production
Pearson correlation of capital and production = 0.975
P-Value = 0.000

Regression Analysis: production versus capital
The regression equation is
production = - 9 + 0,00123 modal
Predictor SE Coef T P
Constant -8.5 107.5 -0.08 0.937
capital 0.00123406 0.00005298 23.29 0.000
S = 370.438 R-Sq = 95.1% R-Sq(adj) = 94.9%
Analysis of Variance
Source DF SS MS F P
Regression 1 74447392 74447392 542.52 0.000
Residual Error 28 3842274 137224
Total 29 78289667

2) Pests and Diseases
Pests and diseases give enough effect to the results obtained by farmers. The losses that farmers obtained were not only a decline in production but also the quality of the decline due to injuries caused by pests that attack sweet potato plantation. The main pests in sweet potato is black shank or called Boleng caused by Cylas formicarius. These pests can harm qualitatively and quantitatively. The reduction caused by this species ranges from 5-100% [18].

The main disease of sweet potato is Elsione batatas that cause leaf curling and stunted plants [19]. The attacked plants can influence their vegetative growth and assimilation activities which lead to inhibited enlargement of tubers, so that the production of tubers become very low.

3) Fertilization
Sweet potato plant is very responsive to the addition of fertilizer. The addition of potassium of 150 kg KCl ha⁻¹ on local variety can increase yields by 28.7% and the addition of 150 kg KCl ha⁻¹ on the source of nitrogen urea 100kg ha⁻¹ and the nitrogen source ZA 200 kg ha⁻¹ turned out to increase yield significantly by 67.7 and 23.8% [20].

In the sweet potato cultivation, farmers often do not pay attention to fertilization, while the tubers of plants take nutrients from the soil is relatively large. In general, the fertilizer dosages given is lower than the recommended one, even fertilization often given indirectly. It causes the low production of sweet potato [21].

Cikarawang village farmers paid little attention to the composition of the fertilizer at planting sweet potatoes. Fertilization generally is only done as an additional activity and not as a main activity in the cultivation of sweet potato. Many farmers use manure fertilizer for the improvement of the soil and use the chemical fertilizers very little because it is considered very expensive for farmers with inadequate capital size.

D. Losing Harvest
Based on observations of the data yields the village there are 20% of the total weight of the harvest that has certainly wasted outside of crop losses due to decay or which can not be used. This weight reduction is due to the loss of moisture from the tubers. Weight reduction or better known as weight loss is a phenomenon that always occurs on horticultural crops that are voluminous. Weight loss is closely related to the loss of water from the product. In addition to water loss, weight loss can also occurs due to loss of the dry weight of sweet potatoes.

In addition to the obvious loss in the whole sweet potato tubers, are lost harvest of bulbs that do not meet market criteria including tubers rot and size do not match the standard commonly called bulicik. Bulbs that do not meet the standards had a considerable quantity of between 50-250 kg of fresh sweet potatoes. Prior to 2007 farmers simply discard the bulbs which do not fit this standard without any processing. This makes non-added value obtained by the farmer.

E. Total Amount of Non-Economic Sweet Potato
Number of sweet potato lost of Cikarawang village is very volatile. This is due to the high influence of the weather which can not be controlled by the farmers. Sweet potato crop is influenced by the availability of water during planting. Sweet potato planting season that is too dry will not grow the sweet potatoes which can meet the market criteria. The sweet potatoes which can not market criteria referred to as non-economic sweet potato because it can not be sold by farmers. Here is the number of non-economic sweet potato in Cikarawang village.

<table>
<thead>
<tr>
<th>TABLE II</th>
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<tbody>
<tr>
<td>AMOUNT OF NON-ECONOMICAL SWEET POTATO PRODUCTION</td>
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<tr>
<td>NO</td>
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<td>1</td>
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</tbody>
</table>

The big number of non-economic sweet potatoes influence the farmers. The amount of non-economic sweet potatoes found in 2006 was 5281kg. It forced the farmers who are the members of Hurip Farmers Groups to innovate in order to reduce losses due to many sweet potatoes in the category of non-economical. It was started in 2007 the processing of sweet potato flour which initiated the processing of non-economic sweet potatoes to be processed more economic valuable products.

F. Non-economical processing Bulbs
Since 2007 Hurip Farmers Groups initiated the creation of sweet potato flour. Sweet potato flour can be made by using several methods of drying [22]. The method commonly used include drying using sunlight and drying using a dryer such as a dryer shredded sweet potato [23] oven and drum drier [24].

It is preferred to make cassava flour from the sweet potato which does not meet market standards. By using methods of drying and milling flour sweet potato, Hurip Farmers Groups can be produced. The members of the Hurip Farmers Group began to feel the impact of the making flour process.

The increase number of non-economic sweet potatoes is increasingly volatile. This is related to climatic conditions increasingly uncertain and lead to frequent crop failures in sweet potatoes. The highest point ever experienced crop losses of farmers was 5281 kg in 2006. The long drought that occurs often resulting in death or fruits that do not match
expected. This is because the nature of sweet potato that requires a lot of water in its growth.

G. Number of Processed Sweet Potato

Sweet potatoes have many benefits that can be processed into various types of products which can be sold or for their own consumption. According to [25] sweet potato contains flour carbohydrates 94.07%, 3.11% protein and 0.58% fat. Sweet potato flour becomes the pioneer in the presence of other processed products such as brownies, muffins and other processed in Cikarawang village. The awareness of the sweet potato potential makes Melati Women Farmers Group further develop their products until the syrup and fruit juice.

The members of Hurip Farmers Group utilize sweet potato into compost for a long time. In 2006, Hurip Farmers Group only use sweet potatoes into fertilizer, boiled potatoes, fried potatoes and fodder. The purpose of the utilization of sweet potato, especially non-economical only for personal consumption. In 2007 began the production of flour which became the beginning of the other products arising from the collaboration of Hurip Farmers Group and Melati Women group. In 2008, Hurip Farmers Group and Melati Women Farmers Group began producing sweet potato cake for personal consumption and for commercial. Until 2014, Hurip Farmers Group and Melati Women Farmers Group had 14 kinds of processed form of fertilizers, boiled, fried, fodder, chips, flour, cake, brownies, muffins, juice, syrup, filler sauces, dodol (sweet rolls), and rice analog aiming for personal consumption and commercial purposes.

H. Marketing

Marketing is the process of preparing a unified communications which aims to provide information about the goods or services in relation to satisfy the needs and desires of man [26].

Marketing the variety of sweet potato products become euphoric pleasure for Hurip Farmers Group and Melati Women Farmers Group. This is because the great marketing system for both organizations is in the current exhibition or a show or a food bazaar of local products held by outside agencies. In this bazaar usually Melati Women Farmers Group take part more in the management and marketing at the appointed day. This is because the sweet potato processing techniques more widely known by Melati Women Farmers Group. Melati Women Farmers Group follows the bazaar twice a year which is usually held in February and October. Marketing outside the bazaar which is usually followed by a group of women farmers Melati is the booking system that is usually done by IPB students or the surrounding community.

I. Level of Community Creativity

Reference [27] mentions that creativity is the production of a novel and appropriate response, product, or solution to an open-ended task. Although the response must be new, it can not be merely different; the nonsensical speech of a schizophrenic may be novel, but few would consider it creative. Thus, the response must also be appropriate to the task to be completed or the problem to be solved; it must be valuable, correct, feasible, or somehow fitting to a particular goal.

The level of creativity in society is measured by the amount of processed generated per respondent, whereas the creativity levels were also measured at the level of the farmers group to look at the impact of farmers group to members of the group.

Here are the parameters used by researchers to measure creativity of society in sweet potato. This parameter is used because the authors assume that the more the number of products produced lead to the increase level of creativity in society.

<table>
<thead>
<tr>
<th>TABLE III</th>
<th>LEVEL OF CREATIVITY BASED ON AMOUNT OF PRODUCTS</th>
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<tbody>
<tr>
<td>Level</td>
<td>Amount of products</td>
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<tr>
<td>1</td>
<td>≥3</td>
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<td>2</td>
<td>≥5</td>
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<tr>
<td>3</td>
<td>≥7</td>
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<tr>
<td>4</td>
<td>≥9</td>
</tr>
<tr>
<td>5</td>
<td>≥12</td>
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<tr>
<td>6</td>
<td>≥14</td>
</tr>
</tbody>
</table>

The level of creativity of individual remained at level 4 by the number of processed products as much as 9 product. This is because some farmers still do not perform individual processing so that an increasing number of products are not so pronounced at the individual level. But for the group, the level of creativity has reached a point 6 by the number of processed products as much as 14. This is because the production of processed are often done at the group level due to the completeness of tools and adequate manpower. Hurip Farmers Group consuct a lot of processing sweet potato became a key ingredient for subsequent processing such as fertilizer and flour, while a group of women farmers Melati process sweet potato into something that can be consumed or sold as boiled sweet potato, sweet potato fries, cakes, brownies, syrups, until the muffins. The Employment increased from 2006 to 2014 by 63.5% in terms of numbers.

J. Community Empowerment

Reference [28] said that empowerment is a key means to achieve sustainable development and other vital goals. But it also has a value in and of itself.

Community empowerment is measured by the previously passive community involvement in the processing of sweet potatoes. Empowerment of people do not see the economic side, but the social side. Empowerment is how to empower those who previously did not have productive activities into having productive activities, while the economy in terms of increased revenue and other side benefits perceived merely as a result of involvement in the processing of sweet potato in Cikarawang village.

<table>
<thead>
<tr>
<th>TABLE III</th>
<th>THE AVERAGE LEVEL OF CREATIVITY OF THE COMMUNITY</th>
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<tbody>
<tr>
<td>No</td>
<td>Year</td>
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<td>1</td>
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<td>2011</td>
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<td>7</td>
<td>2012</td>
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<td>8</td>
<td>2013</td>
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<tr>
<td>9</td>
<td>2014</td>
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</tbody>
</table>
Here are the average of empowerment at the farmer individual level in Cikarawang village.

<table>
<thead>
<tr>
<th>No</th>
<th>Year</th>
<th>Empowerment</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>2006</td>
<td>2</td>
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<td>2</td>
<td>2007</td>
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<td>8</td>
<td>2013</td>
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<tr>
<td>9</td>
<td>2014</td>
<td>5</td>
</tr>
</tbody>
</table>

Here are the analysis results of the relationship between the amount of material in Cikarawang village and the increase of empowerment in society. Empowering the community is the amount of additional labor involved whereas there is no previous involvement to prior treatment in the activity of on-farm or off-farm sweet potato.

**Correlations: absorption of labor, processed of Hurip Farmer Group**

Pearson correlation of uptake labor and processed = 0.903

P-Value = 0.001

The positive correlation with the magnitude of the correlation coefficient of 0.903 between the number of products processed by the absorption of labor means that there is a correlation with the pattern of the strong relationship between these two variables, the more types of preparations are able to be made, the higher the absorption of labor.

**Regression Analysis: labor uptake versus processed**

The regression equation is absorption labor = -2.54 + 1.19 processed

Predictor COEF SE T P
Constant -2.5371 0.9809 -2.59 0.036
Processed 1.1931 0.1019 11.71 0.000

S = 0.949876 R-Sq = 95.1% R-Sq (adj) = 94.4%

The coefficient of determination absorption of labor relations with a number of processed amounted to 95.1%. This figure means that the diversity of the number of workers absorbed by 95.1% can be explained by the number of types of processed products produced.

**Correlations: absorption of labor, processed of Melati Women Farmer Group**

Correlations: refined, uptake labor

Pearson correlation of processed and uptake labor = 0.772

P-Value = 0.015

The positive correlation with the magnitude of the correlation coefficient of 0.772 the number of products processed by the absorption of labor means that there is a correlation with the pattern of the strong relationship between these two variables, the more types of preparations are able to be made, the higher the absorption of labor.

**Regression Analysis: labor uptake versus processed**

The regression equation is uptake labor = 0.31 + 0.893 preparations

Predictor COEF SE T P
Constant -2.5371 0.9809 -2.59 0.036
Processed 0.8926 0.2780 3.21 0.015

S = 2.59112 R-Sq = 59.6% R-Sq (adj) = 53.8%

Analysis of Variance

Source DF SS MS F P
Regression 1 69.225 69.225 10.31 0.015
Residual Error 7 18.589 2.656
Total 8 116.222

The coefficient of determination absorption of labor relations with a number of processed amounted to 59.6%. This figure means that the diversity of the number of workers absorbed by 95.1% can be explained by the number of types of processed products produced.

**Correlations: loss of harvest; uptake labor Cikarawang Village**

Pearson correlation of loss of harvest and uptake labor = -0.266

P-Value = 0.490

The negative correlation with the magnitude of the correlation coefficient of 0.266 between the amount of crop losses with labor absorption means that there is a correlation with the pattern of a weak relationship between these two variables, the more lost harvest is not necessarily able to increase employment in the cultivation of sweet potatoes.

**Regression Analysis: labor uptake versus loss of harvest**

The regression equation is uptake labor = 6.32 to 0.0176 crop losses

Predictor COEF SE T P
Constant 6.321 3.230 1.96 0.091
crop losses -0.01764 0.02420 -0.73 0.490

S = 1.62957 R-Sq = 7.1% R-Sq (adj) = 0.0%

Analysis of Variance

Source DF SS MS F P
Regression 1 1.411 1.411 0.53 0.490
Residual Error 7 18.589 2.656
Total 8 20.000

Data analysis of Hurip Farmers Group

Correlations: refined, uptake labor

Pearson correlation of processed and uptake labor = 0.975

P-Value = 0.000

The positive correlation with the magnitude of the correlation coefficient of 0.975 between the number of products processed by the absorption of labor means that there is a correlation with the pattern of the strong relationship between these two variables, the more types of preparations are able to be made, the higher the absorption of labor.

The high correlation in the level of farmer group Hurip farmers. This empowerment can be either on-farm activities or processing of the product so that the number of processed will greatly influence the amount of people who are empowered.

**Regression Analysis: labor uptake versus processed**

The regression equation is labor uptake = -2.54 + 1.19 processed

Predictor COEF SE T P
Constant -2.5371 0.9809 -2.59 0.036
Processed 1.1931 0.1019 11.71 0.000

S = 0.949876 R-Sq = 95.1% R-Sq (adj) = 94.4%

The coefficient of determination absorption of labor relations with a number of processed amounted to 95.1%. This figure means that the diversity of the number of workers absorbed by 95.1% can be explained by the number of types of processed products produced.

**Correlations: loss of harvest; uptake labor Cikarawang Village**

Pearson correlation of loss of harvest and uptake labor = -0.266

P-Value = 0.490

The negative correlation with the magnitude of the correlation coefficient of 0.266 between the amount of crop losses with labor absorption means that there is a correlation with the pattern of a weak relationship between these two variables, the more lost harvest is not necessarily able to increase employment in the cultivation of sweet potatoes.

**Regression Analysis: labor uptake versus loss of harvest**

The regression equation is labor uptake = 6.32 to -0.0176 crop losses

Predictor COEF SE T P
Constant 6.321 3.230 1.96 0.091
crop losses -0.01764 0.02420 -0.73 0.490

S = 1.62957 R-Sq = 7.1% R-Sq (adj) = 0.0%

Analysis of Variance

Source DF SS MS F P
Regression 1 1.411 1.411 0.53 0.490
Residual Error 7 18.589 2.656
Total 8 20.000
The coefficient of determination absorption of labor relations with a number of processed amounted to 7.1%. This figure means that the diversity of the number of workers absorbed only 7.1% can be explained by a number of lost harvest the sweet potato cultivation.

The decrease in the number of women farmers estimator on Melati is because the decreasing of empowerment community since 2013 until 2014. This is because the market is not totally available yet. The initial appearance of the product will be a temporary trend in the market and will disappear by itself. Melati women farmers who basically do not do the main activity of sweet potato cultivation can not keep stability community empowerment. This is because this group is to empower its members to order products and training.

Total empowerment continues to increase from 2006 to 2012. The number of empowerment is because the emergence of sweet potato processing into flour that became the beginning of processing many kinds of processed products other sweet. Increasing empowerment is because it takes manpower to stripping, drying, milling, and processing. The people come from family, neighbors, and casual laborers. However, in 2013 this empowerment began to decline due to the processing of flour having problems in less developed parts of marketing. The society who are not familiar with sweet potato flour combined with small capital to lead the promotion of sweet potato flour is not so developed in the market. On the other hand processed products such as muffins, brownies still continues to increase bookings. However, the amount of raw materials in the form of sweet potato flour for further processing is not so big, so it does not have a major impact on the decrease amount of flour in the warehouse. This resulted the processing of sweet potatoes into potato flour dismissed and would be produced if it is necessary.

IV. CONCLUSION
1. Capital significant effects in increasing production. The greater the capital owned by a farmer, will further increase the production of sweet potatoes.
2. Total loss of crop or non-economical bulbs do not have a positive relationship to employment both at the individual farm level and at the level of Hurip Farmers Group and Melati farmers group.
3. The level of creativity as measured by an increase in the number of products in each year showed a positif with employment at the level of Hurip Farmers Group and Melati Women Farmers Group.
4. The absorption of labor since the establishment of Hurip Farmers Group and Melati Women Farmers Group budget amounted to 62.5%.

REFERENCES
[28] Remarks of UN Secretary-General Mr. Ban Ki-moon at the International Conference on “People’s Empowerment and Development”, in Dhaka, Bangladesh, on 5 August 2012.