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Economic Factors Affecting Business Income from Potato Plants (Solanum tuberosum. L)

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ABSTRACT
Indonesia is an agrarian (agricultural) country where agriculture plays an important role in the national economy. One of the farming businesses that is currently developing is potato cultivation, especially in Mardingding Village, Pematang Silimahuta District, Simalungun Regency. In running and increasing farm production there are three important factors, namely: land area, labor, and capital. However, sometimes the levelof agricultural production is influenced by factors beyond the ability of farmers, one of which is natural factors, therefore there is a need for research to help and research is needed to help and analyze what factors affectfarming results, especially in plants. potato. In this study, it is explained how the influence of the determinants of potato crop yields, especially in Mardingding Village, Pematang Silimahuta District, Simalungun Regency.

Keywords: Farming, Potato Plants, Economic Factors

INTRODUCTION
In order to face the global market, the demand for quality assurance of farm products is the main requirement for the market. It is necessary to implement standardization in the agricultural sector aimed at harmonization and conformity of standards with developed countries. Therefore, the government through the Directorate of Processing and Marketing of Horticultural Products as a facilitator applies to agribusiness actors to better understand the quality management system, among others, by conducting quality development with relevant agencies through technical guidance in the area of horticulture development with the Provincial Agriculture Service (Anonymous, 2006).

North Sumatra is known as a producer of plantation and cultivation crops, which is produced is potato. The main producing provinces for leading aquaculture commodities are North Sumatra, South Sulawesi, West Sulawesi, South Kalimantan, East Java and East Nusa Tenggara (Ministry of Agriculture, 2009).

Mardingding Village, Pematang Silimahuta District, Simalungun Regency is also a center for potato production, where in the development of potato farming, local production facilities are applied which aims to see how the potential of a village in farming development is in accordance with what the area has. Potato plants are short plants that are not woody, annual and like cold climates. In the tropics, it is very suitable for planting potatoes or so-called highland areas. After 1600, potatoes became a staple food source in Europe and East Asia. Potatoes were introduced in the Philippines at the end of the 16th century, and entered Java and China in the 17th century (Idawati, 2012).

Potato (Solanum tuberosum. L.) has become a part of Indonesian society. There are thousands of people in Indonesia who depend on growing potatoes for their livelihood. Potatoes are very suitable to be cultivated in the highlands. This non-woody plant belonging to the tuber tribe originates from South America and is now widely cultivated in Europe and Asia, including Indonesia (Rahayu, 2007).

Agricultural production is strongly influenced by natural factors. In general, agricultural production is always changing from one season to another. Changes in seasons are mainly influenced by weather conditions, climate, and natural factors such as floods, too much rain or too long a drought as well as, the amount of competition between post-harvest processed products along with other business developments. There is a seasonal structure in the production process, because running a farming business involves a lot of risks and uncertainties, for example crop failure or production declines, pest/disease attacks, as well as droughts and floods.

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I. Therorical Basis

Farming science is a science that studies how a person cultivates and coordinates production factors in the form of land and the natural surroundings as capital so as to provide the best possible benefits. As a science, farming is a science that studies how farmers determine, organize, and coordinate the use of production factors as effectively and efficiently as possible (Sudarsono, 1990).

Hayami and Ruttan (1995), have developed a fairly good productivity measure with more emphasis on the outcome of the welfare level of farmers and the community. Land productivity is calculated by developing the levelof production with land area while labor productivity is calculated by comparing production with the number of workers. Several attempts to estimate the extent of the reaction of farmers to changes in agricultural prices, whether for annual crops or seasonal crops, have been carried out both in Indonesia and in several other countries. Research related to price behavior and market structure of red chili in Kulon Progo Regency, Jogjakarta. The conclusion obtained is that price fluctuations at the producer level indicate that the market is in a dynamic state and in the long run is approaching a perfectly competitive market.

The results of agricultural production, especially horticulture are considered important because they have different characteristics from other products, namely with the advantages and disadvantages they have, such as:

1. Seasonal
   Every agricultural product may not be available every season or at any time or throughout the year. The implication is that agricultural products require a treatment such as good and crossed stock management.
   Fresh (perishable) and easily damaged After harvesting the product is fresh so it is difficult to store for a long time so the implications for postharvest treatment
2. Large volume but relatively small value (bulky)
   Agricultural products usually have a large volume size, but the value is relatively small so that it requires alarge or large space and requires expensive storage costs. The way to overcome this is to implement stock management with the first in first out method (products that enter earlier should be issued earlier as well). This is to keep the stored products from being damaged and knowing how long the products must be stored in the warehouse.
3. Cannot be planted in all areas
   Agricultural products cannot be grown or cultivated in all areas or can only be produced in a certain location.

RESEARCH METHODS

This research was conducted in Mardingding Village, Pematang Silimahuta District, Simalungun Regency, North Sumatra Province. The research area was chosen purposively (deliberately). Because Mardingding Village prioritizes superior plants to increase farmers' productivity and income.

The determination method used in determining the sample is simple random sampling method because it wants to see farmers who apply production facilities to get more significant income. The total population is 160 families and the sample taken in this study is 30 samples or 12% of the population because after all the form of the population in the sampling theory guarantees that satisfactory results will be obtained.

The data collected in this study consisted of primary data and secondary data. Primary data is data obtained from respondents by means of direct interviews with farmers based on a list of questionnaires (list of questions) thathas been prepared in advance, while secondary data is selected from the literature and as related instructions.

RESULT AND DISCUSSION

Mardingding Village is one of the villages in Pamatang Silimahuta Subdistrict, Simalungun Regency, North Sumatra Province which has an area of : ± 600 Ha, population: 1,706 people consisting of men: 880 people and women: 826 people with the number of family heads: 394 families, while the number of poor families (Gakin) is 189 families, with a percentage of 47.96% of the total families in Mardingding Village.

Judging from the topography and soil culture, Mardingding Village, Pamatang Silimahuta District, Simalungun Regency, is generally in the form of land at an altitude between 1200 to 1400 DPL, and temperatures ranging from 20/30 degrees Celsius. Mardingding village consists of 3 hamlets (Mardingding I, Mardingding II, Tambasaribu). The orbit and travel time from the sub-district capital is 2 km with a travel time of 5 minutes and from the district capital 34 km with a travel time of ± 1 hour.

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Potato Farming Cost

The components of total costs are grouped into two parts, namely fixed costs and variable costs. Fixed costs are costs calculated by farmers or costs charged to farming for land rent, depreciation of agriculturalequipment and labor in the family. Variable costs are costs paid by farmers such as expenses for seeds, compost, chemical fertilizers, medicines, labor, tractor rental, diesel oil, and gasoline oil as shown below:

TC = FC + VC
TC = Rp.8,304,543.07 + Rp.5,148,551TC = Rp. 13,453,094.07

Variable costs are costs paid by farmers such as expenses for seeds, compost, chemical fertilizers, medicines, labor outside the family, tractor rental, diesel oil, and gasoline. The variable costs incurred by farmers in doing cabbage farming in Mardingding Village, Pematang Silimahuta District, Simalungun Regency can be seen in

Table 1. Variable Costs of Potato Farming Land Area 4.83 rante/season in Mardingding VillageVariable Cost

Description	Amount (Rp)
Seeds	3.740.350
Compost	336.666.67
Phoska Fertilizer	69.650
TSP Fertilizer	70.083,33
KCL Fertilizer	72.250
Drugs	368.750
Family Outside Worker	291.166,67
Tractor Rental	137.333,33
Diesel oil	20.067,67
Benzine Oil	42.233,33
Total	**5.148.551**

Source: Processed Primary Data

Potato farming revenue is the average amount of yields obtained by farmers multiplied by the selling price.The price received by farmers from collecting traders is an average of Rp.8.055/Kg. The income obtained by farmers with an average land area of 4.83 rante

Data on the development of potato plants in 2011 showed that the land area recorded was 738 ha and produced 15,460 tons with an average productivity of 209.49 quintals/ha. In 2012, the recorded land area increased to 830 Ha, resulting in a production of 17,620 Tons and an average productivity increase of 212.29 Kwintal/Ha. In 2013 the recorded land area decreased to 768 Ha and produced 17,620 Tons and experienced a decrease in average productivity to 212.29 Kwintal/Ha. In 2014 the land area increased to 867 Ha and produced 14,828 Tons and decreased productivity to 171.03 Kwintal/Ha. In 2015 the land area decreased drastically to 473 Ha and produced 8,089 tons so that the productivity was 171.01 Kwintal/Ha. The following can be seen a diagram of the development of potato productivity in Pematang Silimahuta District, Simalungun Regency.

Reasons for Decreasing Land conversion Crop failure caused by weather

1. X1= Availability of seedsDf = 26
   T tab = 2.056 T hits = 10,337

   Thus, T hit > T tab (10.337 > 2.056) or (0.000 <0.05) which statistically shows that the X1 variable (Availability of seeds) has a significant effect on the Y variable (income) at the 95% confidence level. In other words, Ha is accepted, Ho is rejected.
2. X2 = Price of seedDf = 26
   T tab = 2.056
   T hits = (-1.501)

   Thus T hit T tab -1.501 > -056 or (0.1450 > 0.05) which statistically, variable X2 (price of seeds) has no effect on variable Y (income) at the 95% confidence level. In other words, accept Ho rejected Ha.
3. X3 = Selling priceDf = 26
   T tab = 2.056 T hits = 2.621

   Thus, T hit > T tab (2.621 > 2.056) or 0.084 < 0.05, which statistically means that the X3 (fertilizer) variable has a significant effect on the Y variable (income) at the 95% confidence level. In other words, Ha accepted Ho rejected

F Uji test

The interpretation of the results of the simultaneous F-test on multiple regression analysis that affects the factors

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on the income of potato farming in Mardingding Village is obtained:
Ftab = n – k
= 30 – 3 = 27
F value tab = 2.96
F hit value = 36,458
The above shows that k = 3 (seed availability, seed price and selling price) and n = 30. So F tab is (30 – 3) = 27 with distribution value F tab = 2.96.

The value of F hit (36,458) > F tab (2,96) or 0.000 < 0.05, it can be concluded that the variables Availability of seeds (X1), price of seeds (X2), selling price (X3), simultaneously have a significant effect on the variable Income at 95% confidence level.

CONCLUSION

Based on potato production in Mardingding Village, Pematang Silimahuta District, North Sumatra Province, it reached an average of 15,269.5 Kg/Ha, where an average land area of 4.83 rante was able to produce 2,950 Kg of potato. This is an increase in production which is generally above the standard, which is 610.77 Kg per Rante. In Partial Variables X1 and X3 have a significant effect on variable Y while X2 has no significant effecton Variable Y with a 95% confidence level. Simultaneously, variables X1, X2, X3 have a significant effect on Variable Y with a 95% confidence level.

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