Analysis of farmer’s revenue and factors which affect carrot production in Surbakti Village

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Abstract. The purpose of this research is to calculate the level of income/revenue of carrot farmers in Surbakti Village, and analyse the factors of production which affect carrot production in Surbakti Village. The study population was carrot farmers in Surbakti Village, a sample of 82, the sampling method used is accidental sampling. The analytical method used in this study was the Cobb-Douglas production function method. The results of the analysis showed that the independent variables (land area, fungicide and labour) had a significant effect on carrot production, while hydro complex and insecticide had no real effect. The income per farmer from carrot farming is IDR 28,871,664.02 or IDR 41,266,802.34 per hectare.

1. Introduction
Carrot is included as vegetable which is widely known by Human. Human kind started consuming carrot after they find out about the benefits in it [1]. Carrot grows good at the pH between 5.5 – 6.5 and for the best result it needs to grow at the pH 6.0-6.8. The excellence of this plant is that, it can be planted the whole year, both in dry or raining season. The stem is short and has a taproot while function will turn into round and elongated. But then, the weather is still need to be concerned, because if the weather is too hot, often causes the tuber to be small and pale, while in a cold weather the roots would turn long and small [2].

Carrot is source of detoxification food which has a potential to control the unbalance in the body [3]. carrot has a bioactive compound such as carotenoid and fibre, which are enough to improve health significantly. A fresh carrot contains water, protein, carbohydrate, fat, ash, anti-cancer nutrients, pectin, minerals (calcium, phosphorus, iron, and sodium), vitamins (βetakaroten, B1 and C) as well as asparagine [4].

The Sub-District of Simpang Empat is one of the areas which has a lot of potential to support economics in Karo District, mainly in term of agriculture. One of the commodity that is often cultivated is vegetable, one of them is carrot. Because of that, this research is focused to see how big the revenue of carrot farmers is, in Surbakti Village, analyse what kind of factors that affect productivities of carrots in Surbakti Village.
2. Data and method
The Data that is used in this research consist of primary and secondary data. Primary data is data that is received from carrot farmer through interview using questionnaire that has been prepared, while secondary is data that is received from agencies/institutions which is related to research, journal and internet. Carrot farmer’s population is carrot farmer in Surbakti Village Sub-District of Simpang Empat. Number of carrot farmer, 443 farmers, and sample 82. Large sample of research in the Slovin formula. The analytical method used is the Cobbs-Douglas production function.

\[ Y = a_0L^{a_1}P^{a_2}F^{a_3}TK^{a_4} \]  
\[ \ln Y = \ln a_0 + a_1 \ln L + a_2 \ln P + a_3 \ln F + a_4 \ln TK \]

3. Results and discussion

Table 1. Total cost production of carrot farming

| No  | Expenditure Component | Cost per Farmer (IDR) | Cost per Ha (IDR) |
|-----|-----------------------|-----------------------|-------------------|
| 1   | Seed                  | 1,593,170.732         | 2,277,148.335     |
| 2   | Fertilizer            | 1,117,092.073         | 1,596,680.321     |
| 3   | Pesticides            | 601,000               | 859,020           |
| 4   | Workers               | 4,026,829.268         | 5,755,621.59      |
| 5   | Cost of Production    | 7,338,092.07          | 10,488,470.45     |

Table 1 shows that there is no indicator that depreciation of tool and land tax data are not included in the calculation. Cost of the tax of the land per Ha in Surbakti Village is IDR 100,000. Generally, the tool that is owned by farmer is sprayer while tools for farming are owned by wage workers (outside family). The biggest cost component that is spent by carrot farmer is cost for workers that is IDR 5,755,621.59 per hectare while the least cost for carrot farming is for pesticide that is IDR 859,020 per hectare. Total cost of production for carrot farming is IDR 7,338,092.07 per farmer or IDR 10,488,470.45 per hectare.

3.1. Revenue of carrot farming
Farmer’s income of carrot farming is a multiplication of total of production and the price per kg. Each farmer produces 18.09 ton or 25.84 ton per hectare, price of the carrots to buyers is IDR 2,000 per kg, so that the revenue per farmer is IDR 36.20 million or IDR 51.75 million per hectare. Revenue of the carrot farming will increase along with the increasing of carrot production.

Table 2. The revenue of carrot farming

| No  | Variables          | Per Farmer | Per Hectare |
|-----|--------------------|------------|-------------|
| 1   | Production (Ton)   | 18.08      | 25.84       |
| 2   | Price (IDR/Kg)     | 2,000      | 2,000       |
| 3   | Income (Million/Rupiah) | 36.20 | 51.75 |
| 4   | Cost of Production (Rupiah) | 7,338,092.07 | 10,488,470.45 |
| 5   | Revenue (Rupiah)   | 28,871,664.02 | 41,266,802.34 |
Table 2 show that the revenue of carrot farming is the difference between revenue and production costs for carrot farming. Revenue per farmer from carrot farming is IDR 28,871,664.02 or IDR 41,266,802.34 per hectare.

### 3.2 Result of analytical factors which affect carrot production

Result of Test results on assumptions indicate no violations, so continued with the estimation of the factors affecting carrot production. Coefficient on Table 3 shows production elasticity. The sign of each coefficient of the independent variable is positive. Table 3 shows that all independent variables have a significance level smaller than 0.05 except for hydrocomplex and insecticide variables.

| Model                | Coefficient | T     | Sig. |
|----------------------|-------------|-------|------|
| (Constant)           |             | 7.347 | .000 |
| Lnx1 (Total Area)    | 0.834       | 16.573| .000 |
| Lnx3 (Insecticide)   | 0.020       | 1.969 | .054 |
| Lnx4 (Fungicide)     | 0.057       | 2.709 | .009 |
| Lnx5 (Workers)       | 0.155       | 2.855 | .006 |
| Lnx9 (Amapos)        | 0.032       | 2.559 | .013 |
| Lnx11 (Hydrocomplex) | 0.006       | .445  | .658 |

The result of analytical factors which affect the production of carrot is mentioned on Table 3. Coefficient total area of 0.834 shows if area was added by 1% production will increase by 0.834%. Total area reacts to production. Coefficient of insecticide 0.020 shows if insecticide value added by 1% production will increase by 0.020%. Insecticide does not really affect the production. Coefficient of fungicide of 0.057 shows if fungicide was added by 1% production will increase by 0.057%. Fungicide affect in a realistic way towards production.

Worker coefficient of 0.155 shows that if worker was added by 1%, production will increase by 0.155%. Worker has a real affect to production. Coefficient amapos of 0.032 shows that if amapos of 1% production will increase by 0.032%. Amapos has a real affect toward production. Coefficient hydrocomplex of 0.006 shows that if hydrocomplex of 1% production will increase by 0.006%. Hydrocomplex does not cost affect towards production. The results obtained, match accordingly to the theory of production. The results of this study are consistent, see carrot research. From Table 3. Function of carrot production in Simpang Empat, Surbakti village, the formula is:

\[
\ln Y = b_0 + x_1^{0.834} + x_2^{0.020} + x_4^{0.057} + x_5^{0.155} + x_9^{0.032} + x_{11}^{0.006}
\]  

(3)

### 4. Conclusion

Based on the result and discussion of observation that has been explained, the conclusion of this research is revenue carrot farming per farmer is IDR 28,871,664.02 or IDR 41,266,802.34 per hectare. Factors which really affect toward the production of carrots in Karo District, Surbakti Village is total area, pesticide, workers, amapos.

### References

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