

## Competitiveness of Potato Farming in Central Aceh Regency

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**Abstract:** The agricultural sector in Kabupaten Aceh Tenggara is the leading sector as a source of community income including potatoes (*Solanum tuberosum L*). The development of the horticultural sector aims to encourage the development of horticultural agribusiness that is capable of producing competitive horticultural products, able to absorb labor, increase the income of farmers and business actors in the horticulture sector. The methods used is a survey, using the Domestic Resource Cost (BSD) analysis. The results showed that both the comparative and competitive value of BSD was Rp. 6,597.68 and the value of BSD\* Rp. 9,644.57, this value is smaller than the shadow price of the money exchange rate (Rp. 14,750.80). This condition shows that the domestic resources used in potato farming are efficient as seen from the comparative and competitive advantages in producing one unit of foreign exchange. This is an indicator that potato farming has a comparative and competitive advantage and is efficient, both economically and financially in the use of existing domestic resources.

**Keywords:** Potatoes, Domestic Resources, Comparative Advantage, Competitive Advantage

### Introduction

Potatoes (*Solanum tuberosum L*) are one of the world's five staple foods as a source of carbohydrates. The five staple foods are rice, wheat, potatoes, sorghum, and corn. The potato commodity is quite essential as a food material needed throughout the year besides rice as the primary food ingredient. The need for potatoes increases in line with population growth, level of community income, awareness of available nutrition, export demand and the development of the potato processing industry (Soegihartono, 2008).

The potato commodity is one of the entities that is widely cultivated by farmers in Aceh Tengah City. Aceh Tengah is located at an altitude between 200 - 2,600 meters above sea level, making it very suitable for potato cultivation. In 2019, the total area for potato crops was 216 ha, the harvested area was 252 ha, and production was 3,876 tonnes with a productivity of 15 tonnes/ha (BPS, 2019).

Potato (*Solanum tuberosum L*) is a shrub-shaped seasonal plant. According to Sunarjono (2007), the classification of potato plants includes *Spermatophyta division, Angiosperms subdivision, Dicotyledonae class, Tubiflorae order, Solanaceae family, Solanum genus, and Solanum tuberosum L*. *Solanum tuberosum L* have many varieties. Potato plants age varies according to type. Early varieties of potatoes are 90-120 days old, medium varieties are 120-150 days old, and combinations are 150-180 days old. Potato leaves are located alternately on the plant stem. The leaves are wrinkled and the underside of the leaves is hairy. Leaf colour is light green to dark green to grey, medium leaf size and short stalks. Stems are rectangular or pentagonal, depending on the variety, are not woody, have a slightly stiff texture, potato stems are generally weak so they can easily collapse when exposed to strong winds. The colour of the branches is typically dark green with a purple pigment (Samadi, 2007).

According to Simatupang (1993), the concept of comparative advantage is a measure of potential competitiveness in terms of competitiveness that will be achieved if the economy does not experience any distortion at all. Commodities that have a comparative advantage are also said to have economic efficiency. Furthermore, Simatupang (1995) argues that to improving the competitiveness of agricultural products, agribusiness development strategies can be done through vertical coordination so that the final product can be guaranteed and adjusted to the preferences of the end consumers. Its implementation in the field by agribusiness actors is carried out by building business partnership institutions in various business partnership patterns.

Competitive advantage refers to the ability of an organization to formulate a strategy that places it in a favourable position for other companies. The competitive advantage arises when customers feel that they receive more value from transactions made with a competing organization (Tangkilisan, 2003). The concept or theory of competitive advantage (competitiveness) is used to measure the feasibility of activity or private profit which is calculated based on the prevailing market price (financial analysis). Porter (2008) states that competitiveness is a concept that is not easily understood, but on the other hand, its importance is widely accepted. The most intuitive definition of competitiveness is a country's share of the world market for a particular product. This makes competitiveness a "Zero-sum game" because one of the benefits of a nation comes from the costs of other countries.

The comparative advantage of a product is often analyzed using the Domestic Resource Cost (DRC). Domestic resource costs are a measure of the social balancing cost of receiving one marginal net unit of foreign exchange, measured in terms of domestic production factors that are used either directly or indirectly in economic activity. It is said that DRC is a measure of the total real opportunity cost of generating additional net foreign exchange for export commodities or an effort of the use of domestic resources in saving other net foreign exchange in import substitution. Thus, this concept is closely related to the theory of comparative advantage in international trade theory. The assumptions used in the Domestic Resource Cost (DRC) analysis are as follows: (1) the output to be analyzed is tradable, and the input can be broken down into domestic and foreign components, (2) the shadow prices of inputs and results can be calculated, and the relative factor prices. production does not change, and (3) the government intervenes (disrupts) the value of money and the analyzed commodity trade, in the form of regulations and other policies.

## Methods

This research was conducted for five months from March to August 2019. The methods are used in this study was a survey methods with 56 respondents of potato farmers. The data that has been collected to facilitate the analysis of competitiveness analysis data using Domestic Resource Costs (DRC). According to Pearson (1989).

### 1). Comparative Advantage

Mathematically, the cost of domestic resources of comparative advantage is formulated as follows:

$$DRC_j = \sum_{s=1}^n p_s f_{sj} + E_j (U_j - m_j - r_j) \dots \dots \dots (1)$$

Information:

$f_{sj}$  = primary production factors to  $s$  which are directly used in activity  $j$

$V_s$  = shadow price per unit of primary production factors (Rp)

$E_j$  = The externality effect of the activity to  $j$ , which is negative or positive

Test = The total value of output from the activity to j at the value of world market prices (\$)

m<sub>j</sub> = The total value of imported, indirect, intermediate inputs used in activity j (\$)

r<sub>j</sub> = The total value of foreign input receipts used in activity j, either directly or indirectly (\$)

From this formula, it can be derived the Domestic Resource Cost Coefficient (DRCR), namely:

$$\text{DRCR} = \text{DRC} \cdot \text{SER} \dots\dots\dots (2)$$

Note:

DRC = Domestic Resource Costs

SER = Shadow Exchange Rate

DRCR = Domestic Resource Cost Coefficient

DRC can be used as a measure of the efficiency of economic activity as follows:

1. DRCR < 1, meaning that economic activity is economically efficient in the use of domestic resources, or an economic activity has a comparative advantage so that the fulfilment of domestic demand is more profitable by increasing domestic production.
2. DRCR > 1, which means that economic activity is not economically efficient in the use of domestic resources, or an economic activity will cause comparative losses so that the fulfilment of domestic demand is more profitable by importing the commodities concerned.
3. DRCR = 1, meaning that the economic activity provides standard benefits or economic activity is at the break-even point (neutral).

2). Competitive advantage

Mathematically the coefficient of competitive advantage is stated as follows:

$$\text{DRCR}^* = \text{DRC} \cdot \text{Vsp} \dots\dots\dots (3)$$

Note:

DRCR\* = Domestic Resource Cost Coefficient based on prevailing market prices

DRC\* = DRC based on the prevailing market price (Rp)

Vsp = The official exchange rate (\$)

A commodity is said to have a competitive advantage in certain activities if DRCR\* < 1, this means that the item can compete in the international market, assuming there are a marketing system and government intervention. Conversely, if the value of DRCR\* > 1, then the commodity does not have a competitive advantage in producing a particular item so that it cannot compete in the international market. The DRCR\* formula can also be written as follows:

$$\text{DRC} \cdot \text{Vop} = \text{DRC} \cdot \text{Vsp} \times \text{DRC}^* \cdot \text{DRC} \times \text{Vsp} \cdot \text{Vop} \dots\dots\dots (4)$$

Note:

DRC\*Vop = Competitive advantage coefficient (DRCR\*)

DRCVsp = DRC deviates proportionally

VspVop = Proportional deviation of the exchange rate

## Result

Income is the difference between total revenue and total costs incurred during potato farming. The potato farming period is approximately four months in one period. Revenue is the multiplication of all potato production produced in one period with the selling price of potatoes in the research area. At the same time, expenditure is the total cost incurred during the calculated potato farming period. In this study, the income analysis is divided into 2 (two) parts, namely economic income and financial income.

Table 1. Potato Farming Revenues, Costs and Net Income Based on Analysis of Economic Income and Financial Income, 2019.

No	Description	Economic Income (Rp)	Financial Income (Rp)
<b>1.</b>	<b>Revenues</b>	<b>90.944.942,86</b>	<b>90.944.942,86</b>
<b>2.</b>	<b>Cost Incurred</b>	<b>48.119.192,02</b>	<b>52.233.526,75</b>
a.	Seed	11.761.904,76	-
b.	Urea	1.147.714,29	1.021.982,22
c.	TSP / SP 36	2.897.142,86	2.059.377,05
d.	KCL	708.571,43	637.491,07
e.	Fuel Oil	135.642,86	81.304,33
f.	Pesticides	1.168.843,45	827.145,48
g.	Labour	23.457.145,24	23.457.145,24
h.	Capital Interest	-	12.732.292,00
i.	Land Rent	4.410.714,29	4.410.714,29
j.	Depreciation	2.431.512,86	2.431.512,86
k.	Taxes	-	4.547.247,14
<b>3.</b>	<b>Net Income</b>	<b>42.825.750,83</b>	<b>38.711.416,11</b>

Table 2. Calculation Results of Potato Comparative Advantage and Competitive Advantage in Central Aceh District, 2019

Description	Comparative Advantage	Description	Competitive advantage
DRC	6,597,68	DRC*	9,644,57
DRCR	0,447	DRCR*	0,636

## Discussion

The highest cost is labour cost which reaches Rp. 23,457,245.24 per period. Because this potato farming needs to get special treatment so that the maximum results are obtained, labour costs starting from the process of soil processing, making beds, planting, fertilizing, maintaining (maintenance is carried out once a week by spraying, if the rain intensity is high, it is necessary to do triple spraying. once a day), harvest and post-harvest (transportation costs). Based on the results of the income analysis, both economically and financially, potato farming in the research area is considered feasible. This can be seen from the not too large difference in income. However, potato farming needs to be developed and improved. In normal conditions, potato farming with potato seeds as much as 2,000 kg per hectare can produce 20,000 tons per hectare, while in research areas with the same number of seeds, the product obtained is lower than 20,000 tons per hectare. The existing potato production cannot be exported and can only meet regional needs.

Based on the analysis results show that both the comparative and competitive value of DRC is Rp. 6,597.68 and the amount of DRC\* Rp. 9,644.57. This value is smaller than the shadow price of the money exchange rate (Rp. 14,750.80). This shows that the domestic resources used in potato farming are efficient with comparative advantage and competitive advantage in producing a unit of foreign exchange. Meanwhile, if the lower DRCR and DRCR\* values will provide a higher level of efficiency in economic activity. In this potato farming, the DRCR value was 0.447, and the DRCR\* value was 0.636. This is an indicator that potato farming in the research area has a comparative advantage and a competitive advantage and is efficient both economically and financially in the utilization of existing domestic resources. The results of the DRCR value can be interpreted that to generate foreign exchange of US \$ 1,000 from potato farming, the use of domestic costs of US \$ 0.447 to the US \$ 0.636 is required.

### Conclusion

Potato farming has a comparative advantage with DRCR value 0.447 and competitive advantage with DRCR\* 0.654. The amount of DRCR<1 indicates that the potato commodity economic activity is economically efficient in the utilization of domestic resources. After conducting a sensitivity analysis, the DRCR value and the DRCR\* value were still smaller than 1, so that the economic activity of potato farming had a comparative advantage and a competitive advantage.

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