

## **GREEN ACCOUNTING PRACTICE OF NIPAH (PALM TREES) FARMERS ALONG MONCONGLOE LAPPARA RIVERBANKS**

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### **Abstract**

*This study aims to implement practical management accounting on nipah water by looking for inputs and outputs for other commodities. The data source is primary data taken directly from 30 nipah farmers located on the banks of the Moncongloe Lappara River, Moncongloe District, Maros Regency, South Sulawesi during 2020. The analytical method used is to measure input-output commodities with the Social Accounting Matrix. The results of this study indicate that the total contribution index of sap water production from Nipah is 456.66 to other commodities, while commodity B is 1236.04 and commodity C is 851.66. With this contribution, accounting management can change the environment from the direct consumption pattern of Nipah, by changing Nipah water into other products or into capital to manage other commodities. So management accounting can change the input of nipah water into other products, as long as the elasticity is higher in demand by the market, farmers can manage their own sources of funds sourced from nipa palm water in a sustainable manner, not only farmers in the Lappara Moncongloe River area, but also the condition of nipa palm farmers in other parts of Indonesia.*

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## 1. Introduction

The nipah plant is a trunkless palm. This plant has long fiber roots and can reach dozens of meters. The stems spread on the ground to form rhizomes that are submerged by mud. Only the leaves appear above the ground so that this plant looks as if it is trunkless. From the rhizome grows compound leaves (as in other types of palms) large and long with petioles of about 1-1.5 m, leaflets number between 25-100 with a pointed tip. Nipah (*Nypa fruticans*) belongs to the palm family. This plant grows along rivers that depend on the influence of tides, and belongs to a group of mangrove forest plants that inhibit abrasion and erosion of river liquid and prevent flooding of riverbank areas. The habitat of nipah plants is no different and being in a mangrove ecosystem is one part of a productive wetland ecosystem for settling various types of freshwater fish and crabs. This plant has high ecological and socioeconomic value as a source of food, fuel, building materials and medicinal raw materials with high economic value (Indriani et al., 2009). Nipah is a source of food and energy. In addition, this plant contains polyphenols, tannins and alkaloids. Based on Maspari Journal (2013), nipah plants have been commonly used as ingredients for traditional medicines such as stomach aches, diabetes and internal febrifuge by coastal communities. This plant extract is efficacious as a carminative (can help expel wind from the body), antidote and sedative. It was also reported that the traditional use of nipah by the community is to produce sugar and salt in addition to snacks made from nipa fruit (Santoso et al., 2005). Nipah sugar is obtained through processing sap (a sweet liquid obtained from flower bunches before they bloom), while nipah salt is obtained from the flesh of the old midrib. Another advantage of nipa palm is that it can produce 0.4 to 1.2 L of nipa sap per tree per day. Nira nipa contains 13-17% sucrose, this is a very potential material to be processed into bioethanol (Endro Subiandono, N.M, Heriyanto, Endang Karlina. (2011).

The economical object of the nipah plant is when the nipah flower has started to bud and is ready to release flower stalks that are ready to become fruit tanks. Nipah farmers who live on the banks of the Moncongloe Lappara river do not cultivate nipa palm trees but only maintain their existence and carry out output-and cross-input between peanuts, corn, and interspersed with fruit cutting to get nipah liquid (anne'ba'). Compound nipah flowers emerge from the leaf axils with female flowers gathered at the ends to form balls and male flowers arranged in panicles like strands of red, orange or yellow on the branches below. The length of the flower stalk reaches 100-170 cm. With the emergence of flower bunches, they can be tapped to take the juice (Siregar, 2012). Nipah plants have oval fruit that are faceted with the shape of 2-3 ribs, and are reddish brown in color. The length of the fruit is about 13 cm with a width of 11 cm, the tip is sharp and the middle fruit wall is fibrous. The fruit clusters into a ball about 30 cm in diameter (Kepridia, 2011). In one bunch, it can consist of between 30-50 pieces of fruit. The input-output price policy, in this case the change in yields of other commodities to other commodities, including the input price of Nipa sap liquid, becomes a basis for determining the cost of production. The conversion price between one commodity is expected to overcome the impact of the use of fertilizers and other agricultural inputs (Jamal et al. 2008; Kariyasa 2007). Kariyasa's research (2007) that if the effectiveness of the cost of goods sold policy can be above 90%, the selling price can be suppressed. We



recommend that if there is an increase in the cost of goods sold, it will have an impact on the output price so that it becomes an incentive for producers and the impact of the increase in input prices can be minimized. In relation to input diversification between agricultural products for Nipah farmers in the Moncongloe Lappara river area, it will certainly have an impact on reducing the price of corn, beans, and other secondary crops, and even efforts to diversify agricultural product production can be increased. This policy can be adopted by the government to reduce dependence on capital to buy inputs that protect domestic producers and consumers (Widyawati et al. 2014). Thus, by making input-output efforts between commodities, the cost of goods sold can be lower.

The cost behavior of the agricultural products is influenced by many factors, including the income obtained from other commodities as inputs for other commodities. Therefore, to study the characteristics and pricing of agricultural products, a model is needed as a simplification of complex and sustainable pricing methods. Prices of agricultural commodities are more vulnerable than prices of non-agricultural commodities and services (Huiguan Ding, Shiyong Li, Tingting Liu, Boyang Liu., 2014)). This happens because the biological condition of agricultural products is the main reason for price instability. The output of agricultural products is highly volatile due to climate, pests and diseases, selling points, and quotas of agricultural products. The growing season in the on farm system recognizes a significant time interval. This causes a time lag between production decision making and the final output realization. With this time lag, farmers can plan price changes that occur in the market. For this reason, it takes at least a year to study the harvest intervals and plan the cost of goods for other commodities.

Environmental accounting practices are often faced with the problem of pricing agricultural products made more complicated by the concentration of agricultural locations and geographic distribution. Until now, the agricultural product industry is still an industry with a small-scale production unit (Ghaemmaghama, 2018). Geographical dispersion in agricultural production in addition to increasing production costs also makes it difficult to estimate the supply of commodities accurately. In addition, the pricing system for agricultural products is not only in the interests of various parties at the national economic level, in this case the role of international trade is no less important. According to Magablih (2017), Green accounting practice aims to reduce costs from various internal perspectives of each economic unit and develop information that clarifies its role in environmental improvement, contributes and provides information for decision making that leads to optimal resource exploitation and environmental conservation. and threat prevention.

The main problem in this research is how accounting can raise environmental problems in the form of practical green accounting practice (I Dewa Made Endiana, Ni Luh Gd Mahayu Dicriyani, Md Santana Putra Adiyadnya, I Putu Mega Juli Semara Putra. (2020)). The accounting review can be viewed from the perspective of management accounting to see how many production inputs cross between nipah liquid production by providing capital input to other commodities. Environmental accounting according to Amer Shakkour, et.al. (2018) and Nguyen Huu Anh,



Nguyen La Soa & Ha Hong Hanh (2020) can contribute and ensure sustainable development, most organizations often ignore the large environmental costs. Healthy green accounting practice is the availability of production financial data that can provide indications to measure improvement, efficiency, and probability of changing one product into another. Healthy green accounting practice is required to have authority in the field of financial reporting (Hosam Alden Riyadh, Maher A. Al-Shmam, Henry Hongren Huang, Barbara Gunawan, Salsabila Aisyah Aifaliza, 2020). For this reason, good environmental accounting practices are very important for sustainable development (Tsuji Koji., M.N.F. Ghazalli., Z. Ariffin., M.S. Nordin., M.I. Khaidizar, M.E. Dulloo and L.S. Sebastian, 2011), especially to focus on environmental and environmental taxes, fees, and appreciation of ecosystem services, costs of carbon dioxide, and costs of liquid pollution that ensure sustainable development.

## **2. Literature Review**

### **Fixed costs**

Fixed costs are costs that do not change in the amount of output produced. This means that fixed costs do not change even when there is no production or when production has reached its maximum production capacity.

### **Variable costs**

Variable costs are costs that change with changes in the level of production. That is, they increase when the production volume increases and decrease when the production volume decreases. If the production volume does not exist then no variable costs are incurred.

### **Total cost**

Total costs include variable costs plus fixed costs. Total costs take into account all costs incurred in the production process or when offering services.

### **Average cost**

Average cost refers to the total cost of production divided by the number of units produced. The average cost is obtained by adding up the average variable cost and the average fixed cost. Management uses average costs to make pricing decisions for its products for maximum revenue or profit. The company's goal should be to minimize the average cost per unit so as to increase profit margins without increasing costs.

### **Marginal cost**

Marginal cost is the cost incurred by adding one more unit of output. Marginal cost shows the increase in total cost that comes from producing one more unit of product, fixed costs remain constant regardless of the increase in output, marginal cost is mainly affected by changes in variable costs. Company management relies on marginal cost to make decisions about resource allocation, seeking to allocate production resources in an optimally profitable manner. Production elasticity needs to be considered in analyzing changes in costs to the resulting production, because there is an effect on changes in input prices on the number of goods produced. In other words, elasticity is the level of sensitivity (change) of an economic



phenomenon to changes in other economic phenomena. The elasticity of demand is the effect of price changes on the size of the quantity of goods demanded or the level of sensitivity of changes in the quantity of goods demanded to changes in the price of goods. Meanwhile, the size of the change is expressed in the elasticity coefficient or elasticity number which is abbreviated as E. To measure elasticity based on environmental inputs, environmental accounting also detects the elasticity of changes in inputs and their relationship with production sustainability, for that reason, a strong elasticity according to Gbenga Ekundayo & Festus Odhigu (2021) can be seen on the profitability gap, financial leverage, type of industry and social and moral responsibility of environmental accounting. Based on these interesting findings, it is recommended that the emerging cost elasticity of other commodities for planting new commodities is decisive. The elasticity of supply is the effect of price changes on the size of the number of goods produced and offered or the level of sensitivity of changes in the number of goods to changes in the price of goods offered. In the production process, a producer allocates a number of factors of production to produce goods. In the production process there are 2 considerations that form the basis, namely how much production must be produced to achieve maximum profit and how many factors of production must be used to achieve that production. The basic assumptions of producers in making decisions are:

- a. Rational producers: always try to achieve maximum profit,
- b. Producers operate in markets with perfectly competitive market conditions.

Rational producers are not oriented to the maximum amount of production (output) or product oriented but are oriented to maximum profit or profit oriented. Therefore, in the production process, producers do not use as many production factors as possible to obtain high production, but optimize the use of production factors to obtain the amount of production that can produce high or maximum profits. How much influence the factors of production have on the resulting production. Changes in the resulting product caused by changes in the production factors used, can be expressed by the elasticity of production. For example, the relative change in the number of factors of production used is + 5%, while the relative change in the number of products produced as a result of changes in the use of the factors of production is +10%, it is said that the elasticity of production is  $10\% / 5\% = 2.0$ . This production elasticity is also called the coefficient of function and is symbolized by the sign e or eprod. The relationship between eprod with average product and marginal product is as follows:

$e\text{-prod} = \frac{dy/y}{dx/x}$  or  $\frac{dy}{y} \times \frac{x}{dx}$  then change to  $\frac{dy}{dx} \times \frac{x}{y}$ . Based on the value of this eprod, production economic theorists divide a production process in the production area as follows:

### **Regions with eprod > 1 (Irrational)**

At the production level where  $MP > AP$ , large  $e\text{prod} > 1$ . This means that the addition of a factor of production of 1% will cause the addition of products to be greater than 1%. Percentage of additional factors of production results in a higher percent of additional production. In this condition, the marginal product curve is above the average product curve. If the production in question is profitable to run, the entrepreneur will continue to increase his production so that income increases



by using more factors of production, as long as the average product continues to rise. So wherever in this area the maximum income will not be achieved, because the income can always be increased. Therefore this area is called the irrational area and is marked with Region I of production. It would be irrational if the entrepreneur stopped the use of factors of production in this area, because in fact the addition of factors of production could still increase the average production or productivity. Rational decision making means decision making based on calculations to obtain maximum income with a certain number of factors of production. At the production level where  $MP=AP$ ,  $e_{prod}=1$ . At this level the addition of factors of production by 1% will cause an increase in product of 1% as well. This condition is described in the area where the magnitude of the marginal product is equal to the average product.

### **Regions with $0 < e_{prod} < 1$ (Rational)**

In this area the addition of factors of production by 1% will cause the addition of products to be greater than 0% and up to less than 1%. Depending on the prices of products and factors of production, it is in this area that maximum income will be achieved, although so far it has not been determined at which point of the area. Because it is possible in this area that entrepreneurs will get maximum profit, this production area is called a rational area and is marked with Region II of production. In Region II, the condition of economic efficiency will be achieved after considering product prices and production factor prices. The condition where  $e_{prod} = 1$ , then the maximum average production (productivity) will be achieved, this is the area where technical efficiency is achieved. Region II of production is the center of attention of entrepreneurs, because in that area there is maximum income.

### **Region with $e_{prod} < 0$ (Irrational)**

At the production level where  $MP = 0$ , large  $e_{prod} = 0$  as well. At this level the addition of factors of production by 1% will not cause a change in the total product. In this production area, the addition of factors of production will cause a reduction (negative addition) of the product. So the addition of factors of production in this area will reduce income. Therefore it is also called the irrational area and is marked with Region III of production. Finally, at the production level where  $MP$  is negative, then  $e_{prod} < 0$ . Production elasticity is a coefficient that describes the magnitude of the change in the amount of output or output produced as a result of changes in input or input. If  $Q$ = the amount of production produced, if  $P$ = the number of factors of production then the elasticity is  $\eta_p = \frac{\% \Delta Q}{\% \Delta P}$  with Limit  $P \dots > 0$  Or  $\frac{\Delta Q/Q}{\Delta P/P} =$  First derivative  $= \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$

## **3. Research Methods**

The technical analysis on this research is to measure inputs between one commodity and another is for the development of nipah palm trees. The tool used is the Social Accounting Matrix with input-output analysis model using the application of linear programming in the accounting field. The use of input-output analysis was first introduced by Wassily W. Leontief in 1936 from Harvard University. This analysis is a mathematical model to examine various sectors of economic activity. As an illustration of a country's economy which is divided into several sectors, including:



agriculture, industry, services and so on. The output of a particular sector is not only used by the sector itself, but also by other sectors as its input. The output of the agricultural sector, for example, will be used by the agricultural sector itself (eg for seeds) and used by the industrial sector (such as rubber produced from the agricultural sector will be used as input to the industrial sector, namely rubber for making tires, cotton for raw materials for making textiles), output the industrial sector is used for the benefit of the industrial sector itself (such as yarn to make textiles) and is used by the agricultural sector (such as the output of the industrial sector in the form of fertilizers, chemicals used to eradicate pests). Thus, it can be said that the development of a sector will depend on other sectors.

#### 4. Results

In table 1, it can be described to the side, namely, that the entire output of the agricultural sector is worth 200, which is used for the needs of the agricultural sector itself, worth 40 as input; worth 70 for industrial sector inputs, 10 for service sector inputs, while the remaining 80 is consumed by users/end users as consumer goods. This side table description also applies to all industrial sector outputs as well as service sector outputs. While the table description read below shows that all of the agricultural sector outputs worth 200 actually came from the agricultural sector itself, worth 40 as input, 30 in the form of inputs from the industrial sector, 20 in the form of inputs from the service sector; while the remaining 110 is in the form of added value from the agricultural sector or often referred to as primary inputs.

**Table 1. Social Accounting Transaction Matrix if Compiled in Notation Form**

Sectors	1	2	3.....	j.....	n	FD	TO
1	X1.1	X1.2	X1.3	X1.j	X1.i	B1	X1
2	X2.1	X2.2	X2.3	X2.j	X2.i	B2	X2
3	X3.1	X3.2	X3.3	X3.j	X3.i	B3	X3
⋮							
I	Xi.1	Xi.2	Xi.3	Xi.j	Xi.n	bi	Xi
⋮							
n	Xn.1	Xn.2	Xn.3	Xn.j	Xn.n	bn	Xn
Value Added	Y1	Y2	Y3	Yj	Yn	Yn+1	Xn+1
Total Output	X1	X2	X3	Xj	Xn	Xn+1	X
Information: 1 2 3 ..... = Name of Each Commodity FD = Final Demand TO = Total Output							

This transaction matrix table shows that  $X_{i.j}$  represents sector  $i$ 's output which is used as sector  $j$ 's input. While  $b_i$  represents the final demand for sector  $i$  output, while  $Y_1$   $Y_2$  and so on represent the added value of each sector, as well as  $X$  is the total output. Thus it can be stated that the total input of sector  $i$  is:

$$X_i = \sum_{j=1}^n X_{i.j} + B_i \quad \text{where } i = 1, 2, 3, \dots, n+1$$







**Information:**

A = coefficient matrix or often called the technology matrix, because its elements indicate the amount of input required to produce 1 unit of output from a particular sector, and these values are influenced by technological advances.

X = column matrix of the total output of each sector

b = column matrix of the final demand of each sector

From the matrix equation:  $X = AX + b$  will be obtained, namely  $b = X - AX = X(I - A)$ . (I - A) is a Leontief matrix in which all the diagonal elements are positive between 0 to 1 while the other elements are negative between 0 to close to -1 or zero. (I - A) is a non singular matrix, the determinant (I - A) is positive, so it can be calculated inverse  $(I - A)^{-1}$ . Thus the total output can be calculated:  $X = (I - A)^{-1} \cdot b$ . This formula is used if there is a change in final demand and the total output of each sector must be calculated. (All elements of the inverse (I - A) are positive, even if the diagonal is 1). With this formula, it means that if the matrix A and the column vector b are known, then automatically the X vector can be searched according to the matrix multiplication rule. In other words, if each sector's input coefficient and final demand for each sector are known; Then the total output of each sector can be calculated. One thing that must be considered in the input-output analysis is that the input coefficient is always considered constant. So the input-output analysis model presented is a static analysis.

Based on Table 2, the results of observations of several farmers who are in the area of the Moncongloe Lappara river that the nipa palm plantation area owned by 30 farmers is 436 acres, besides that there are rice fields as the main commodity. The production of nipah liquid per day produces 0.4 to 1.2 liters per tree (Suparto, H.A.Oramahi, Lolyta Sisilia, 2019). Nira liquid production per hectare depends on the number of palm fruit bunches ready to be tapped, and the schedule made by skilled farmers. Nipah is able to produce more juice than other alcohol-producing plants. In comparison, uncultivated nipa palm produces 6,480-10,224 l/ha/year sugar cane, 3,350-6,700 l/ha/year cassava, 3,240-8,640 l/ha/year, sweet potato 6,750-18,000 l/ha/year, coconut sap 5,000 l/ha/year (Tsuji et al., 2011 in Dedi Soleh Effendi, Nurya Yuniyati and HT Luntungan. 2014). The production of nira liquid is sold at a market price of Rp. 25,000 per five liters, either sold in the form of raw sap liquid, it can also be processed in the form of processed nipa liquid to make cakes and raw materials for making soy sauce.

**Table 2. List of Nipah Farmers in the Moncongloe Lappara River in 2021**

No	Name of Farmer	Rice Field (Are)	Garden (Are)	Nipah Palm Oil (Are)	Production Per Month	Predicted Value of Nira Nipa Liquid Production
1	Tallasa	50	25	35	2.436	12.180.000
2	Dg Pia	75	85	0	-	-
3	Dg Alle Bokoi	45	40	25	1.740	8.700.000
4	Dg Ngerang	37	15	0	-	-
5	Dg Luru	85	35	15	1.044	5.220.000
6	Dg Sanre	65	40	0	-	-



No	Name of Farmer	Rice Field (Are)	Garden (Are)	Nipah Palm Oil (Are)	Production Per Month	Predicted Value of Nira Nipa Liquid Production
7	M.Natsir	70	45	0	-	-
8	Tiro	65	25	30	2.088	10.440.000
9	Dg Nombong	15	27	20	1.392	6.960.000
10	Dg Sangkala	35	35	42	2.923	14.616.000
11	Saparuddin	45	0	0	-	-
12	H.Maudu	40	65	0	-	-
13	Dg.Rahimi	25	65	0	-	-
14	H.Nyikko	0	55	0	-	-
15	Abd.Malik	30	25	15	1.044	5.220.000
16	Udin	0	42	42	2.923	14.616.000
17	Dg Kulle	55	25	0	-	-
18	Dg Rapi	0	37	42	2.923	14.616.000
19	Baharuddin	0	0	55	3.828	19.140.000
20	Dg Sese	0	60	0	-	-
21	M.Ramli	70	45	0	-	-
22	Abd.Azis S	20	15	0	-	-
23	Saharuddin	15	30	0	-	-
24	Dg jalling	0	25	15	1.044	5.220.000
25	M.Syarif	28	15	55	3.828	19.140.000
26	Hendra	30	20	45	3.132	15.660.000
27	Dg Sibali	0	80	0	-	-
28	Sanuddin	30	15	0	-	-
29	Dg Pole	0	28	0	-	-
30	Abd.Azis T	0	40	0	-	-
<b>Total</b>		<b>30</b>	<b>1059</b>	<b>436</b>	<b>30.346</b>	<b>151.728.000</b>

Source: Head of the Moncongloe Boko Farmers Group, 2021

It is clear that the input-output analysis of palm liquid with other commodities essentially rests on the assumption that an economic system consists of related commodities managed by palm liquid farmers on the banks of the Moncongloe River that are interconnected. Thus, if an input-output data from various sectors is collected and tabulated, a matrix-shaped table will be obtained and this kind of table 3 is often called a transaction matrix table. As a first step in the input-output analysis, namely compiling a table containing information on the distribution of the output of one sector into other sectors as inputs, and to users/end users as consumer goods. For example, the transaction matrix table looks like the following:



**Table 3. Social Accounting Matrix - Economic Transactions Between Nipah Palm Liquid Commodities**

Commodity	A	B	C	Final Demand	Total Output
A	40	70	10	80	200
B	30	160	120	270	580
C	20	100	110	240	470
Value Added	110	250	230	140	730
Total Output	200	580	470	730	1980
<b>Informations:</b>					
A = Nipah Liquid Commodity    B = Commodity B    C = Commodity C					

Source: Hypothesis Data

$a_{1.1} = 40 : 200 = 0,20$	$a_{1.2} = 70 : 580 = 0,12$	$a_{1.3} = 10 : 470 = 0,02$
$a_{2.1} = 30 : 200 = 0,15$	$a_{2.2} = 160 : 580 = 0,28$	$a_{2.3} = 120 : 470 = 0,26$
$a_{3.1} = 20 : 200 = 0,10$	$a_{3.2} = 100 : 580 = 0,17$	$a_{3.3} = 110 : 470 = 0,23$

$$\begin{aligned} X_1 &= (1,3108)(200) + (0,2461)(600) + (0,1171)(400) \\ X_2 &= (0,3635)(200) + (1,5775)(600) + (0,5421)(400) \\ X_3 &= (0,2505)(200) + (0,3802)(600) + (1,4336)(400) \end{aligned}$$

$$X_1 = 456,66$$

$$X_2 = 1236,04$$

$$X_3 = 851,66$$

So the total output of each sector becomes:

1. Nipah Liquid Commodity = 456,66
2. Commodity B = 1236,04; and
3. Commodity C = 851,66

Meanwhile, the added value of each sector is

$$\text{Nipah Liquid Commodity} = (1 - 0,20 - 0,15 - 0,10)(456,66) = 251,16$$

$$\text{Commodity B} = (1 - 0,12 - 0,28 - 0,17)(1236,04) = 531,50$$

$$\text{Commodity C} = (1 - 0,02 - 0,26 - 0,23)(851,66) = 417,32$$

$$\begin{aligned} \text{Nipah Liquid Commodity} &= (1 - 0,20 - 0,15 - 0,10)(456,66) = 251,16 \\ &456,66 \times 0,20 = 91,34 \\ &456,66 \times 0,15 = 68,50 \\ &456,66 \times 0,10 = 45,66 \end{aligned}$$

$$\begin{aligned} \text{Commodity B} &= (1 - 0,12 - 0,28 - 0,17)(1236,04) = 531,50 \\ &1236,4 \times 0,12 = 148,32 \\ &1236,4 \times 0,28 = 346,09 \\ &1236,4 \times 0,17 = 210,13 \end{aligned}$$

$$\begin{aligned} \text{Commodity C} &= (1 - 0,02 - 0,26 - 0,23)(851,66) = 417,32 \\ &851,66 \times 0,02 = 17,00 \\ &851,66 \times 0,26 = 221,45 \\ &851,66 \times 0,23 = 195,89 \end{aligned}$$



From the results of the calculations, the new transaction matrix that can be displayed in table 4. is:

**Table 4. Production Input Index and Production Demand per unit**

Sektor	Nipah Liquid Commodity	Commodity B	Commodity C	F D	T O
Nipah Liquid Commodity	91,34	148,32	17	200	456,66
Commodity B	68,5	346,09	221,45	600	1236,04
Commodity C	45,66	210,13	195,89	400	851,66
Nilai Tambah	251,16	531,5	417,32		
T O	456,66	1236,04	851,66		
Information: F D = Final Demand T O = Total Output					

The results of the calculation of the social accounting matrix Table 5 using input-output analysis for each sector, the calculation is based on the prediction of the economic benefits given by Commodity nira nipa Liquid to other commodities, this happens because of regular processing and land use that is carried out on a scheduled basis and the environment is maintained. Total output is a value that is predicted to occur based on production and sales based on constant prices, so the input-output value of nipa nipa Liquid in table 5 can provide economic added value for cultivating gardens and rice fields whose capital comes from nipa sap Liquid. Table 4 turns out to provide.

**Table 5. Number of Production Inputs and Production Demand**

Sektor	Nipah Liquid Commodity	Commodity B	Commodity C	F D	T O
Nipah Liquid Commodity	30.348.258	49.280.202	5.648.351	66.451.189	151.728.000
Commodity B	22.759.532	114.990.460	73.578.079	199.353.567	410.681.639
Commodity C	15.170.806	69.816.942	65.085.617	132.902.378	282.969.098
Nilai Tambah	83.449.403	176.594.035	138.657.051		
T O	151.728.000	410.681.639	282.969.098		
Information: F D = Final Demand T O = Total Output					

Can be used as an example of the production function of an item shown by the equation  $P=6X^2-X^3$ , then calculate the elasticity of production for the production of 3 and 7 units. Then  $dp/dx= 12X - 3X^2$ , and  $X/P = X/(6X^2-X^3)$ , then  $dp/dx \cdot X/P = 12X - 3X^2 \cdot X/(6X^2-X^3)$

$$\frac{dp}{dx} \times \frac{X}{P} = 12X - 3X^2 \cdot \frac{X}{6X^2-X^3} = = 12(3)- 3(3)^2 \cdot \frac{3}{6(3)^2-(3)^3} = 1$$

$$\frac{dp}{dx} \times \frac{X}{P} = 12X - 3X^2 \cdot \frac{X}{6X^2-X^3} = = 12(7)- 3(7)^2 \cdot \frac{7}{6(7)^2-(7)^3} = 9$$

If production increases by 1%, at a price of 7, then demand increases by 7%.



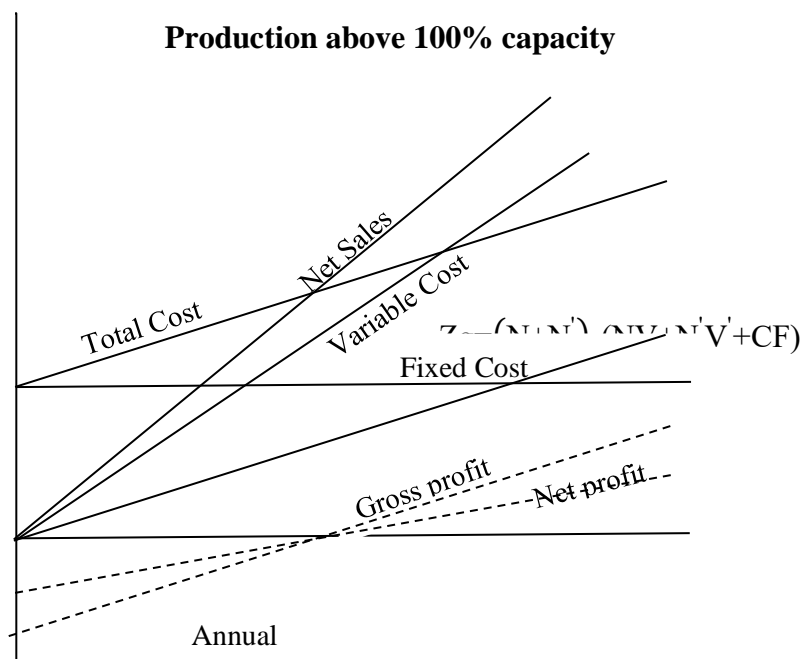
Similarly, if the production function is known  $Q = 5P^2 - 5P^3$ , then the elasticity of supply at the price  $P=2$  units is  $\frac{dq}{dp} = 10P - 15P^2$ ,  $\sqrt{\frac{dq}{dp} \times \frac{p}{Q}} = 10P - 15P^2 \cdot \frac{P}{5P^2 - 5P^3}$   
 $= \frac{10P^2 - 15P^3}{5P^2 - 5P^3} = \frac{10(4) - 15(8)}{5 \cdot 4 - 5 \cdot 8} = \frac{40 - 120}{20 - 40} = \frac{-80}{-20} = 4$ , if production increases by 1%, at price 2, demand will increase by 4%. So the elasticity exceeds 1, very elastic, so for every 1% increase in the price of a factor of production, demand will increase 4% in the amount of production, and vice versa.

In relation to the products produced, entrepreneurs always try to maximize profits by maximizing product efforts. One of the efforts made by applying the Lagrange method. This method is usually used for optimization problems with one objective function and many constraint functions.

$$\begin{aligned} W1 &= E1 (X,Y,Z) \dots\dots\dots 1 \\ F2 (X,Y,Z) &= 0 \dots\dots\dots 2 \\ F3 (X,Y,Z) &= 0 \dots\dots\dots 3 \end{aligned}$$

Equations 2 and 3 can be used to eliminate Y and Z in equation 1 so that only X remains. Equations 2 and 3 are called the limiting function. In its use, this method requires a new function called a Lagrange expression. This new function is obtained by linearly adding the existing functions and each limiting function is multiplied by a Lagrange multiplier. The number of Lagrange multipliers used is as much as the existing limiting function. Here is the Lagrange expression form of equations 1, 2 and 3., where  $L = F1 (X,Y,Z) + \lambda_1 F2 (X,Y,Z) + \lambda_2 F3 (X,Y,Z)$ , or  $L = F \text{ Goal} + \lambda \text{ Obstacle}$ . The above equation consists of three original variables, namely X, Y, and Z and two Lagrange multipliers, namely 1 and 2 so that there are 5 conditions that must be met so that optimization can be carried out.

$$\frac{\partial LE}{\partial X} = 0, \frac{\partial LE}{\partial Y} = 0, \frac{\partial LE}{\partial Z} = 0, \frac{\partial LE}{\partial \lambda_1} = 0, \frac{\partial LE}{\partial \lambda_2} = 0, \text{ the five conditions can also be simplified to 3 conditions with form of } \frac{\partial W1}{\partial X} = 0, \frac{\partial W1}{\partial Y} = 0, \frac{\partial W1}{\partial Z} =$$



When nipah farmers produce 2000 units per unit time at 100% capacity, then the fixed costs are \$10,000/unit time. The variable cost per unit is \$3 up to 100% capacity and \$3.30 over 100% capacity. All units sell for \$5. The tax rate is 10%. To determine the break-even point and profit per unit time after deducting tax at 80% and 120% production capacity.

Break-even Point:  $\frac{\text{Fixed Cost}}{\text{Sales Unit}-\text{Variable Cost Unit}}, \frac{2.000}{5-3} = 1.000$  Units per time rule. Then the profit achievement at 80% capacity, before tax as follows:

$$Z_g = 0.80(1,000)(5) - [0.80(1,000)(3) + 2,000]$$

$$Z_g = 4.000 - [2.400 + 4.000] = \text{Loss } \$2,400/\text{unit time}$$

Then determine the profit at 180% production capacity or before tax

$$Z_g = 1.80(1.000)(5) - [1.000(3)(1.8)+2.000]$$

$$Z_g = 9.000 - [5.400+2.000] = \text{Laba } \$1.800/\text{satuan waktu}$$

Then determine the profit at 200% production capacity or before tax

$$Z_g = 2.0(1.000)(5) - [1.000(3)(2.0)+2.000]$$

$$Z_g = 10.000 - [6.000+2.000] = \text{Profit } \$2,000/\text{unit time}$$

Profit at 120% capacity, after tax

$$Z_t = 2.000(1-0.1) = \$1.800/\text{year}$$

The average net sales for one unit of product in dollars for nipah Liquid production per unit time is 2000 - 40M. Determine the realized net sales at the production level of 2500/year and the increase in revenue at that level. If M represents 1000 units of production(N), then  $M = N/1000$ , or  $2.000-40M=2.000-40\frac{N}{1.000}=2.000-0,04N$ .

For  $N = 2500$ . Average sales  $\frac{\sum NV}{N} = 2.000-0,04N$ , so net sales  $NV = 2000N - 0.04N^2 = 2000(2500) - 0.04(2500)^2 = \$4,750,000$  net sales. If there is an increase in revenue  $\frac{d}{dN} (2.000N - 0,04N^2) = 2.000 - 0,08N = 2.000 - 0,08(2.500) = \$1.800$ , so if the addition of 1 product results in an additional \$1800 in revenue. Production is above 100% capacity ( $N >$ ), and the selling price of goods above 100% capacity is lower than the normal price. Dumping can also mean production at 100% capacity, but two price levels are applied,  $S$  and  $S >$ . If variable costs are fixed ( $V$ ), then the total profit is  $Z_g = NS + NS - [(N + N'')V + C_f]$ .

## 5. Conclusion and Suggestion

Based on the results of the analysis that has been done, it turns out that Nipah Liquid Commodity provides many economic benefits to help farmers in the area along the Moncongloe Lappara river. Niah Liquid which was previously only used directly for drinking as a consumption material can then be traded in the form of nipah Liquid, processed nipah Liquid, as an ingredient for making cakes, soy sauce, and other products containing fermented ingredients and ingredients for making cakes. In various regions in Indonesia, Nipah fruit is processed into a source of food and culinary making materials that are of great interest to the public. Although including wild plants that live in swamps around the riverbanks. This nipa fruit can be used as a productive preparation. This nipa fruit processing is carried out by, not only as a food ingredient for consumption, as a refreshing beverage preparation, nipah fruit turns out to have various health benefits. This plant with the Latin name Nypa



Fruticans is believed to have benefits for preventing the appearance of cancer cells, diabetes, kidney disease, and heartburn. There are also those who call nipah fruit as a potential sugar-producing plant other than sugar cane. Then, several articles mention that nipah fruit has a lot of carbohydrates, besides that this one fruit contains many natural antioxidants. Natural antioxidants are a type of substance found in plants that can prevent, reduce, and slow down diseases in the body. Then, ward off free radicals, and kill toxic cells in the body.

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