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**FINANCIAL AND ECONOMICAL FEASIBILITY OF BUSINESS IN MAKING  
SAGO WASTE INTO ANIMAL FEED (METROXYLON SAGO)**

Haedar<sup>1</sup>

Sekolah Tinggi Ilmu Ekonomi Muhammadiyah Palopo<sup>1</sup>  
(sinole33@yahoo.co.id<sup>1</sup>)

**Abstract**

This study aims to identify the cost both financially and economically, and the determination of financial and economic benefits for the feasibility of the production of Sago waste in an effort of utilizing it into animal feed products which has commercially economic value. Availability of abundant sago dregs resulting from the process of producing sago (sago Metroxylon) is a problem for rural communities because it pollutes the environment and become useless waste. Sago waste utilization in large scale rarely occurs in Indonesia. One of other alternatives in utilizing sago waste is converting it into the main raw material of animal feed production. This allows a solution to overcome the chains of poverty that spreads in the countryside as well as increasing the low level of production and revenue of society. One of the obstacles faced by the farming business is about inadequate nutritional needs of cattle and high prices of packaged animal feed in market, so it still takes effort to cope with the problems by utilizing alternative feed sources which are affordable and abundant in terms of quantity. The data that will be used in this study include primary and secondary data. The method of analysis used in this study to determine the financial and economical benefits, as well as the financial and economic costs, is using shadow pricing method, estimation Opportunity Cost of Capital (OOC) method, analysis of Investment feasibility and sensitivity. The results of the financial analysis shows that the business of making cattle feed made from sago waste is feasible. The results of the sensitivity analysis with the scenario shows that in the business of making cattle feed would not be feasible on the condition in which the decline in the amount of output (sago waste) by 10 percent accompanied by falls captive market by 10 percent, fixed costs (labor experts and operational) by 20 percent. Switching Value Analysis shows that these efforts will not be feasible on a decline in potential waste sago of more than 18.428 percent and a captive market decline by 12 percent.

**Keywords:** *Sago waste, Financial Feasibility Analysis, Economic Feasibility, Cattle Feed.*

**Background**

Measures of success are oriented on improvement of agricultural production, and not on changing of structure which can empower rural communities, so that it can cause refraction as the result of main stream which is too oriented to the promotion of economic growth, thus it emphasizes the orientation just on the industrial sector.

One of the obstacles faced by the farm is not inadequate nutritional needs, especially protein feed, so that the animal can not grow and develop properly. Feed in tropical areas is mostly junky with high fiber. This situation is a challenge for the livestock sub-sector, because the need to find alternative feed to increase livestock production. Agriculture enterprise especially in the livestock sub-sector is more modern and professional prosecuted by utilizing technological innovations to emphasize aspects of business efficiency, including the materials and technology of feed. Development of

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livestock enterprises must be supported by the development of feed industry by optimizing the utilization of the resources of local raw material-specific and oriented pattern of crop-livestock integration.

Potential of local raw materials such as agricultural wastes, agriculture and agro-industry is very large, but only a small part is used as feed. Sago dregs (sago Metroxylon) is the remainder of processing sago starch which is the pith. According to, Prastowo (2007); Kiston et al., (2011), Overlay wild sago palm in Indonesia has an area of 1.5 million hectares in 2005 which can produce as much as 15 million tons of sago tree that each tree can produce 200 kg of sago. Sago plantation area in Indonesia reached 1.2 million hectares with production ranging from 8.4 to 13.6 million tons per year (Balika Research and Development, 2013). Sago processing wastes obtained in the processing of corn starch with a ratio of 1: 6 (Rumalatu, 1981). In such proportion, the amount of sago waste reaches as much as  $\pm$  245 000 tons / day. The large amount of waste has not been used as it should be until now, it is just left to accumulate at the site where sago flour is being processed and it may cause environmental pollution. Even if there are cattle that consume it, only cattle which are around area of sago flour processing, which can directly consume the waste in a buildup of residue without being controlled. The process includes cutting to change the particle size, drying, grinding / crushing, mixing between the fiber material and concentrates in the form of solids or liquids, as well as packaging.

Optimally use of local resources is a strategic step in achieving business efficiency of poultry produced in Indonesia. This will be more obvious, if the resources are not an immediate requirement for a competitor such a human or other animal types. Due to the feed is closely associated with productivity and production costs, the use of local raw materials will efficiently have real impact on livestock development.

The agricultural sector is still considerable potential for expansion, if it succeeds in overcoming the constraints which include productivity, business efficiency, conversion of agricultural land, agricultural infrastructure limitations, and limited credit and agricultural infrastructure. Specifically facilities and infrastructure sub-sector farms in the eastern region of Indonesia are still very limited so that the farms resource in this region with huge potential has not been used optimally.

From the description above indicates to the present rural communities including farmers, mostly in rural areas still live in less well in terms of economic, social, political and cultural aspects. This study will address the conditions and opportunities that exist in the community to provide a solution to increase the potential of local resources and the economic value of abundant and untapped agribusiness waste, although development policies oriented on countryside has long been implemented by the government. This study aims to analyze the feasibility and the sensitivity of the project business of making animal feed in managing waste of Sago dregs in the study site.

The costs and benefits need to be identified to assess the business plans of making animal feed. The most practical way is to compare the difference of goods and services directly and to state it in terms of money. The basic step in planning the implementation of a business is the business cycle. The business cycle consists of the stages of identification, preparation and assessment analysis, implementation and evaluation (Gittinger, 1986). Evaluation is the most important tool in an ongoing effort and can be done in a couple of times during the execution of the project. Assessment of a business or project is basically conducted in order to ascertain whether the project is feasible or worth for survival maintenance.

Financial rate is to compare the costs and benefits of business based compensation granted to the company. Activities that provide value to the company are referred to as a benefit. Cost is an activity that reduces the value of the company. Financially, determination of costs and benefits of business are based on market prices.

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Assessment is based on the economical status of the community as a whole. Economic analysis uses shadow price to assess the costs and benefits (Gray, 2002)

### **Method**

The success of making silage means to maximize the nutrients that can be preserved. In addition to the dry ingredients, the sugar content of the material is also an important factor for the development of bacteria forming lactic acid during the fermentation process (Khan et al., 2004) In the early phase of the ensilage process, enzymes that work in the process of respiration in the material oxidizes dissolved carbohydrates, generating heat and using sweets that should be ready for fermentation. Loss of sugar in the process of respiration is troublesome both in preservation through silage processing and in terms of nutritional value. Sugar is a substrate for bacteria producing lactic acid which will produce acids function as preservative ingredients such disilage.

Initial phase of silage making is by chopping sago dregs using chopping machine, then reducing the amount of water contained in sago dregs (by drying it under the sun) for  $\pm$  6-8 hours depending on the intensity of sunlight so that the levels of water in sago waste ranged from 50-55%, then it is processed into silage by mixing it with additive materials namely molasses / sugar drops to 15% to stimulate microbial activity in the fermentation process of making silage, as well as to increase energy and protein content of silage which is produced later on. Once it is evenly mixed then it is put into bags (two layers) with the size of 50kg, compacted to minimize air (anaerobic fermentation process). Next, it is stored under a shade (free from sun) for  $\pm$  3 weeks depending on the length of silage process.

Sago dregs which have been perfectly fermented have characteristics as follows: typical fragrance / aroma of the fruit or scented like sticky tape, a little reddish color, soft texture and slightly sweet taste. Fermented result is then sun dried and is ready for use in the ration.

### **Aspects in Research**

#### **Technical Aspects**

The technical aspect is that which pertains to the project of technical development process and its operation after the project is completed. Based on this analysis it can be seen an early draft assessment of the investment cost which includes the cost of exploitation (Husnan and Suwarsono, 2000)

This analysis further investigates about the location of the project, whether there is water supply, electricity, roads infrastructure. The technical aspects also discussed about whether the supply of raw materials needed for the project are sufficient or not, and whether the goods are (partially or entirely) should have to come from elsewhere or imported. Technically in terms of production, this analysis discusses the availability of storage facilities and delivery of products.

#### **Institutional -Managerial Aspects**

This aspect is related to establishment of the agency or institution of projects that must consider what jobs needed to run the project operation. It covers the requirements which are necessary to be able to run these jobs and also the organizational structure that will be used in a project.

#### **Social aspects**

The social aspect takes into account patterns and wider social habits of investment which is proposed. The project must be responsive to the social conditions and adverse environmental impacts. Consideration of social aspects in the analysis of projects is important for the continuity of the project, because there is no project that will last a long time if it is not friendly to the environment (Gittinger, 1986).

### **Aspects of the Market**

Market aspects need to be done since the number of new companies that emerge and the possibility of having the same type of business. Aspects of market becomes absolute to be analyzed in order not perform failure in running the business. According Kadariah et.al, (1999), the commercial aspects when offering input (goods and services) are needed by projects, whether it is to build a project or when the project is already in production, and analyzing output marketing to be produced by the project. The marketers use a number of tools to get the desired response from their target market.

### **Financial aspects**

The financial aspect is associated with the financial effects of a proposed project to the members who joined in the project. This aspect compares between expenditures and receipts of a project.

### **Financial analysis**

In the financial analysis, what is being noted is the result of the share capital (equity capital) invested in the project, it is the result of which must be accepted by farmers, entrepreneurs (businessmen), a private company, a government agency, or anyone with an interest in development of the projects. Financial results are often also called "private return". Financial analysis is important in calculating the incentive for people who are participating in the success of the project. Therefore, there is no point to carry out projects that benefit from the perspective of the overall economy in part, if the farmers who run production activity did not gain any benefits.

The fundamental differences between financial analysis and the economic analysis exist in several components, namely prices, taxes, subsidies and interest. A financial analysis uses market prices for the elements of cost and results. Economic analysis uses shadow price, which is the price that describes the social value or actual economic value to the elements of cost and results. Interest calculation is based on a financial analysis differentiated as follows:

1. Interest paid to creditors regarded as a cost, while repayments of external projects are deducted from the gross proceeds before any benefit flows.
2. Interest on capital projects (input or paid to the entity) is not considered as a cost, because it is part of a "financial return" received by the capital project.

### **Investment Decision Criteria**

To know whether an investment decision runs or not, it may use judgment of "Investment Decision Criteria". Criteria for investment decisions is composed of various methods that have quantified the benefits of a project based on the estimated current cost benefits (benefit-cost flow) companies which have been discounted over the life of the project. Those criteria are: Net Present Value (NPV), Internal Rate of Return (IRR), Net Benefit and Cost Ratio (Net B / C) and payback period or period of return on investment (MPI). Each of the criteria used to determine whether a project is accepted or used to provide a variety of investment proposals according to the order of the advantages of each.

### **Analysis of Sensitivity**

One of the advantages of the project analysis which is carried out carefully is that capacity of the project results can be known when it turns out that things happen beyond planning. Therefore it is necessary to do a sensitivity analysis, which examines back an analysis to be able to see the effects that will occur as a result of changing circumstances (Gittinger, 1986). It aims to see what will happen with the results of the project if there is something wrong or changes in the fundamentals of the calculation of the cost or benefit (Kadariah, 1987)/

Data and information that have been collected are processed using Microsoft

Excel program. Data and information are grouped in prior into the current component costs and benefits, and are presented in tabular form that is used to classify existing data and to simplify the process of data analysis.

The data analysis was done qualitatively and quantitatively. Qualitative analysis was performed to determine the image on the implementation of waste processing sago dregs. Quantitative analysis is used to analyze the financial feasibility of the manufacture of animal feed were processed using Microsoft Excel Software.

The technical aspects of this research is based on matters of a technical nature. These explanations include: a description of the manufacture of animal feed and support facilities; technology concept; raw material requirements; mixing ingredients; labor; production plan and sales plan.

Technically the project can be implemented if the project needs can be met, both the need for materials and the need for facilities and technology. The study of the technical aspects will determine the values contained in the financial aspects, thus it can determine whether or not the project is feasible financially.

Financial analysis process data using financial eligibility criteria, namely NPV, IRR, Net B / C and Payback Period. The data processing is done based on a framework that had been developed. Moreover, it also conducted sensitivity analysis (sensitivity) to view the sensitivity of business development efforts fodder in the face of the possibility of change.

The formula used in the calculation of NPV is as follows:

$$NPV = \sum_{t=0}^n \frac{B_t - C_t}{(1+i)^t} \dots\dots\dots (1)$$

Where :

- Bt = Revenue earned in year t
- Ct = Costs incurred in year t
- n = Age economical project
- i = Interest rate (%)
- t = The rate of investment (t = 0,1,2, ..., n)

In the NPV method, there are three criteria for eligibility of investment, namely:

1. NPV > 0, meaning the business is financially feasible because the benefits outweigh the costs.
  2. NPV = 0, means financially effort is difficult because benefits obtained are only enough to cover the costs incurred.
- NPV < 0, means the business is not financially feasible because the benefits are smaller than the costs incurred.

**Net Benefit Ratio (NBCR)**

Net B / C ratio is the number of comparisons between the present value of current benefits divided by the present value cost flow. The figure shows the magnitude of the level of additional benefits at any additional cost of one unit of money. The criteria used for selecting the size of the Net B / C ratio of the benefits of the project is to choose all the projects with the value of the Net B / C ratio of one or more if the benefits in discounted at cost levels opportunities capital (Gittinger, 1986), but if the value of the Net B / C < 1, then the project is not feasible. The formula used is as follows:

$$Net\ B/C = \frac{\sum_{t=0}^n B_t - C_t > 0}{\sum_{t=0}^n B_t - C_t < 0} \dots\dots\dots (2)$$

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Information :

$B_t$  = Revenue earned in year  $t$

$C_t$  = Costs incurred year-to- $t$

$i$  = interest rate (discount)

$t$  = The rate of investment ( $t = 0, 1, 2, \dots, n$ )

$n$  = Age of economical project

### **Payback Period**

The payback period is the period required to pay back all the costs that have been incurred in the investment project. The faster retrieval time is, the better the project is to be conducted. But the analysis of payback period has drawbacks because it ignores the time value of money (present value) and does not take into account the period after the payback period. Systematically can be formulated as follows:

$$P = I / A$$

Where :

$P$  = The amount of time required to recoup

$I$  = Investment costs

$A$  = Net profit at each year (average profit)

### **Sensitivity Analysis**

#### **a. Sensitivity analysis of the scenario**

It is an analysis by counting back the size of the benefit of the project by using a new estimation of one or more components of costs or benefits. The higher the expected results get, the more sensitive observed projects are. The sensitivity analysis is done by combining the components changed to be able to estimate the effect of changes to the assumptions used in measuring the usefulness

The sensitivity analysis in the animal feed business project uses ten scenarios with four variables. the basis for determining The scenario is the related conditions at field.

#### **b. Substitute Value (Switching Value)**

A variation of the sensitivity analysis is replacement value (switching value). According Gittinger (1986), this test is done to achieve a minimum level in which the project can be done by determining how large proportion of the benefits that will fall due to the current net profit is at zero ( $NPV = 0$ ). NPV which is equal to zero will make IRR equal to the interest rate and Net B / C is equal to one. Analysis was conducted on changes in input and output prices which consist of four changes, namely:

- Decrease of the amount of output
- Decrease of captive market
- The increase in fixed costs (labor and operational experts)
- The increase in variable costs (labor executive, packing)

In the project of making Animal feed at Palopo, Enterprises use their own capital. The price used is the price at the time of the study which is in May 2016 until July, 2016.

## **Results and Discussion**

### **Cash Flow Projections**

Project cash flow in the business of making animal feed consists of cash inflows and cash outflow. Cash inflows came from sales receipts of animal feed and residual fiber waste sieve (organic fertilizer) is cultivated. Cash outflow is derived from investment expenditures and operating costs. The difference between cash inflows with cash outflows is an advantage or disadvantage of cattle feed manufacturing business project.

### **Flow Acceptance (Inflow)**

Benefits or income of the project business of making animal feed derived from the sale of animal feed products and residual waste (organic fertilizer) produced. The

amount of the reception is very dependent by the amount of feed production capacity generated. Products of animal feed produced will be sold to meet the needs of feed for farmers who exist around the project site and market in Luwu Raya (Palopo, Luwu, North Luwu and East Luwu regency) then to get the sale of animal feed product in the form petet is based on the price of feed alternatives on the market, namely Rp 868.3 per kg. Revenue stream can be seen in appendix 1. Thus receipts can be seen during the year, amounting to Rp. 182.343.000.

The fixed costs incurred on the project installation of Animal Feed Manufacture consist of fixed salary cost of skilled labor and operational, maintenance, and PBB. Spending on wages of skilled labors of one person per year is Rp 24,000,000, for the operational workforce salaries of two people per year is Rp 24,000,000. Maintenance costs for machinery and equipment are issued per year amounting to Rp 120 million per year and to PBB is amounted to Rp. 2,000,000

Implementing Labor cost of Rp 250 / kg is used to process waste into organic fertilizer that is ready to sell, the target of 465 kg per month of organic fertilizer costs per year amounting to Rp.1.395 million. Organic fertilizers are ready to sell packed with 25kg packs, costs incurred for packaging Rp 2.6784 million per year for marketing costs are charged Rp 25 / kg of total organic fertilizer ready for sale, with a monthly sales target is 465 kg, the costs incurred for the marketing of Rp 1.395 million per year.

**Financial Feasibility Analysis Results of Installing Animal Feed Production with Discount Factor 9%**

Based on the calculation of the installation feasibility analysis of Animal Feed production with a population of 500,000 sago tree trunk, with a discount rate of nine per cent of the value generated from the project NPV feed production amounted to Rp 1,140,146,594 in assuming raw material (pulp waste sago) is bought Rp.25 / kg, meaning that the present value of earned income is positive for 12 years at a discount rate of nine percent. With the results of the NPV analysis, it is found out that business projects of animal feed production in waste management of sago dregs is declared feasible.

Net B / C is produced at a discount rate of nine percent, which amounted to 2,272 assuming raw material (pulp waste sago) bought USD 25 / kg. These values indicate that any expenditure of Rp 1.00 would generate net benefits of US \$ 2,272 or may be mentioned that the revenue generated is equal to 2,272 times the costs incurred.

No	Feasibility Indicators	Value
1	NPV (Rp)	1.140.146.594
2	IRR (%)	19
3	Net B/C	2,272
4	Payback Period (year)	3,084

The results of the analysis also shows that the IRR obtained is equal to 19 percent with the assumption that the raw material (pulp waste sago) bought USD 25 / kg. This value indicates that investors have nothing to lose if the funds held for investment in the project business of making animal feed. The ability of the project to restore the capital employed greater than the discount factor used is equal to nine per cent. In other words, in terms of the criteria IRR, the project has met the financial eligibility criteria.

Based on the time of investment return, it used payback period analysis. From the analysis conducted, animal feed venture project will reach the point of return on investment at the time the project was 3.08 years old in assuming raw material (pulp

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waste sago) bought Rp.25 / kg. It is claimed that the project could recoup its investment before the project life ends. From the results of the financial analysis using four criteria of eligibility and a discount rate of nine percent, it can be concluded that the installation project business making animal feed is feasible.

#### **Scenario analysis**

The sensitivity analysis on the business of animal feed using 10 scenarios with four variables that affect a decrease in the number of outputs (waste pulp sago) which may affect the inflow, as well as the captive market, the increase in fixed costs (labor experts and workers operating) and variable costs (energy implementing work and packaging). The observed changes is how the NPV, Net B / C and IRR if there is a change in the amount of output with a 10 percent decline, decline in captive market 10 percent, the increase in fixed costs (labor experts and workers operating) and variable costs (labor executor and packaging) respectively 20 percent.

At the time of decreasing the number of output (dregs sago) resulting inflow drops that are not accompanied by a drop captive market, fixed costs (labor experts and operational), variable costs (labor implementers and packaging) and a decrease in the captive market were not accompanied by changes in three variables more and rising fixed costs (labor experts and operational) that are not accompanied by changes in three other variables, it can be said that businesses installation of animal feed is still viable, it is because the NPV is still positive value, the Net B / C ratio is greater of one and the IRR is still above the deposit interest rate of nine percent.

The decline in captive market by 10 percent, along with the increase in fixed costs (labor experts and operational) and variable costs (labor implementers and packaging) respectively 20 percent, it can also be said that this business is still feasible because the NPV is still positive, Net B / C ratio is greater than one and IRR is still above the level of interest rates. Similarly in the captive market decline of 10 percent coupled with the increase in variable costs (labor implementers and packaging) by 20 percent, this business is still feasible due to the NPV, IRR and Net B / C ratio is still at expected number.

At the time of decreasing number of output (dregs sago) by 10 percent with a decrease in the captive market by 10 percent, the increase in fixed costs and variable costs each still amounted to 20 percent can be said of this business was not feasible, because the value of IRR below the discount rate is 5 percent.

In the criteria of this business can not be profitable because the IRR below the level of discount factor, it is better to invest at other projects that have a value of IRR which is greater than the discount factor.

#### **Switching Value (Substitute Value)**

Analysis of switching value is used to determine the rate of change in the number of outputs (sago dregs) to produce Fanimal feedorage and compost as inflow, reduction in the captive market as well as the cost of outflows so that the business approached normal profit, which the IRR is equal to the deposit interest rate, the NPV is close to zero, and net B / C is close to one. In business establishments of this poultry feed, the switching value analysis shows that this project would be feasible if the decrease in the number of outputs (sago dregs) decreased by 18.428 percent. To change the cost, it would not be worth the effort if the captive market decreased by 12 percent with the increase in fixed costs (labor and labor expert operational) by 30 percent and the increase in variable costs (labor executor, packaging) 26.675 percent. Calculation of switching value analysis showed animal feed business is highly sensitive to a decrease in the number of outputs (sago dregs).



### **Economic Analysis of Business Feed**

The economic analysis is an analysis of farming which is viewed from the point of the overall economy. In the economic analysis considered is the total yield, or productivity or profits from all sources used in the project business of making animal feed for society or the economy as a whole, regardless of who is providing those resources and who in the community receive the results of the project. The result was called "social returns" or "the economic returns" from the farm.

In the feasible project or having a comparative advantage, it means that in terms of efficiency, the project is considered profitable, in other words, opportunities cost of the means of production used by the project is lower than the opportunities of cost sources that need to be used to obtain or save a dollar, Conversely, if the project is not feasible or does not have a comparative advantage, meaning that the project resulted in the waste of national resources for investment opportunities that exist outside of the project is still able to provide the level of higher returns.

#### 1) Determination of shadow prices

##### a. Land

Land included in the input untradable, where the shadow price of land used is equal to the forgone production value of the land value which is the highest selling production of other crops lost if the land is not being used as an active plantation. In district of Telluwanua, crops grown by respondent farmers prior to be used as production of animal feed are rice and corn. From both of these plants, corn turns out to be the production with highest sale value that is equal Rp.6.229.000 / ha / year, therefore, the shadow price of land is at Rp6.229.000 / ha / year.

##### b. Currency exchange rate

The shadow price of the rupiah against the dollar obtained by the following formula:

$$SER = OER / SCF$$

Information:

SER = shadow exchange rate

OER = official exchange rate

SCF = conversion factor for the raw material (shadow Conversion factor)

Where SCF obtained by the formula:

$$SCF = \frac{M + X}{(M + Tm) + (X - Tx)}$$

Information:

SCF = conversion factor for the raw material (shadow Conversion factor)

M = the value of imports (Rp)

Tm = Import tax (Rp)

X = exports (Rp)

Tx = Export tax (Rp)

The official exchange rate (OER) that is used is the average exchange rate in 2016 amounted to Rp.12.585 / US \$. In I-III quarter 2016, revenues from export taxes (Tx) amounted Rp36.024.010, while the import duties (Tm) amounted Rp30.942.040. The export value of Indonesia (X) I-III quarter 2016 was Rp710.191.700, while the value of imports (M) Indonesia amounted Rp637.088.300.000 (South Sulawesi BPS, 2016). Based on these values, the obtained raw material conversion factor (SCF) in 2016 amounted to 1,037, so the shadow price of the currency exchange rate obtained amounted Rp12.549,63 / US \$.

##### c. Sago Dregs "entries"

The shadow price of raw materials used is the same as the private prices.

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Similarly, the shadow price of rod "entrys" used is private prices. This is due to "entrys" are goods that are not traded (untradeable input).

d. Variable support (Yeast)

Yeast used in the fermentation of waste dregs sago is a yeast cake on the market. Then the shadow price calculated using CIF prices. While the shadow price of yeast used is the same as the private prices.

e. Labor

The shadow price of labor is determined by the amount of foregone production (the value it would have received by a labor concerned when he did not work in the business of making fertilizers), the cost of transporting the workers from the residence to the location of the project, and the cost of food and clothing.

Labor used in this study came from the local community were idle when there is no business of making fertilizer, so it is assumed that the value of foregone production is equal to zero, otherwise it because it comes from the local community, it is assumed there is no transport cost labor. So the shadow price of labor or shadow wage is equal to the value of a financial or labor by 0% of the value of financial reward amounting to Rp 25,000 / hour for all workers.

f. The building and the means of production

Production equipment used in the manufacture of animal feed businesses that are tradable is sprayer. The sprayer is imported using CIF prices.

Shadow price for the building and equipment in addition to the business of making feed sprayer used in the manufacture of animal feed is the same as private prices for construction and agricultural tools that include items that are not traded (untradeable inputs).

g. output

The output of this research is the feed of poultry in a dry form (pellets) with a yield of 20%, in addition to the farmers in the district Telluwanua, they also cultivate intercropping crops (pepper and cocoa) on the sidelines of the production area of their animal feed businesses, where the sale of its production can add receipts.

Shadow price of animal feed (pellets), pepper and cocoa derived from the border price (border price).

h. capital interest

The shadow price of capital interest is the interest rate of private savings in 2016 amounting to 11.80% plus the average monthly inflation rate for 2 years (2015-2016) in the amount of 12.69% (www.bi.go.id, accessible dated January 26, 2016). Based on these calculations, the shadow price of capital interest of 24.49% is obtained.

## Conclusion

Analysis on aspects of supporting feasibility such as technical aspects, market aspects, management aspects and social aspects indicate that the animal feed business establishment is feasible.

On the technical aspects of the procurement of inputs in machinery and equipment investment costs are still very high. Based on the aspects of management, management of the business of making animal feed is very simple for this new venture will be established. For the aspects of the market, there is a huge potential to market opportunities around the region of Luwu Raya Area. The results of a financial analysis of Business Development Feed the potential waste and produce 5,000 tons of animal feed of 2,100 kg per year, with a discount rate of nine percent NPV of Rp.114,014,659.48 assuming raw material (pulp waste sago) bought USD 25 / kg or greater than zero, the Net B / C is equal to 2,272, or more than 1. The IRR obtained is 19 percent or greater than the discount rate is determined. Value payback period is three years. Based on the

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analysis of financial feasibility, the business making animal feed made of sago pulp waste is feasible.

The results of the sensitivity analysis with the scenario shows that in the business of making animal feed would not be feasible on the condition if the decline in the number of output (waste Chiapas sago) by 10 per cent accompanied by falls captive market by 10 percent, fixed costs (labor experts and operational) by 20 percent. While the captive market conditions decline by 10 percent with the increase in variable costs and fixed cost increases show business is still feasible.

Analysis of Switching Value shows these efforts will not be feasible on the potential reduction of waste dregs sago more than 18.428 percent and a decrease in the captive market by 12 percent with the increase in fixed costs (labor experts and operational) tolerated is 30 percent and the increase in variable costs (energy implementing labor, packaging) of 26.675 percent. It can be said animal feed manufacturing business is highly sensitive to a decrease in the number of outputs (sago dregs) and a captive market that affect inflow.

Poultry Feed-making business in the District of Telluwanua Pentojangan, Palopo is feasible on the condition of the capital employed is entirely its own capital. This is not only as a core for business, but also as an effort to handle the plantation waste and as a responsibility of Higher Education on the environment and surrounding communities.

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