Economic feasibility analysis of agribusiness sub terminal in integrated agricultural program area

Wawan Tolinggi; Amelia Murtisari; Yanti Saleh; Ahmad Fadhly

Agribusiness Department, Faculty of Agriculture, Gorontalo State University

Correspondence e-mail : wawan.tolinggi@ung.ac.id

Abstract.
Agribusiness sub terminal development intends to enable the commodity handling system of the agricultural products covered by one agribusiness management. In addition, farmers and related stakeholders can gain benefits from the development of creating mutual prosperity. This research aims at; 1) analysing the feasibility of agribusiness sub terminal in integrated agriculture program area based on financial non-financial aspects, such as market, organizational management, technical operation, and social economy including technical side of agribusiness sub terminal; and 2) generating a policy in supporting the establishment of agribusiness sub terminal in integrated agriculture program area in Bone Bolango regency. This descriptive quantitative and qualitative research employs *mix method*, which consists of exponential comparison method, to determine the technical feasibility of agribusiness sub terminal in the integrated agriculture area in Bone Bolango regency. The results reveal that: (1) based on the technique of location determination exponential comparison method, decent sub-districts for the development of agribusiness sub terminal, in sequence, are Tapa, Suwawa, Kabila, and Tilongkabila; (2) From the analysis of economic feasibility of agribusiness sub terminal, Bone Bolango regency shows its worthiness and therefore has potential to advance further; (3) The most potential site is Tapa district; (4) Based on the financial feasibility, specifically the economic aspect, the prospect of, implementing agribusiness sub terminal is high in Bone Bolango regency.

Keywords: Agribusiness Sub Terminal, Feasibility, Policy

INTRODUCTION

Development paradigm that emphasizes on a large-scale infestation in city areas has failed in practice. This failure triggers the backwash effect from rural areas to cities and, as a consequence, changes in rural areas are inevitable. The example of such a case is the concept of agropolitan. This concept refers to the initiation of a rural area to provide city-class services to ease its farmers and citizen accessing their needs such as production and distributing crops as well as the access to supply for daily needs (Friedmann in Gore, (1985), in Rustiadi and Pranoto, (2007)).

One example of policy manifestation in grouping agricultural areas is the development of agribusiness sub terminal. The concept aims at diminishing the series of import regulation and mending the structure of market that is somewhat monopolist and put farmers at a disadvantage. A number of empirical studies conclude that the series of import regulation is quite long and unable to promote farmers' prosperity (Arifin, 2004

in, Lestari, 2012). Therefore, the agribusiness sub terminal is expected to solve the problem and may be beneficial to farmers. Munawir (2009 in Lestari, 2012) adds that the agribusiness sub terminal will connect sellers and customers in person and, in consequence, elevate farmers' bargain power in controlling prices of agriculture commodity. Moreover, the presence of the agribusiness sub terminal is proposed to solve some issues, such as commodity-related problem, site of production, and access to information. Agriculture commodity is generally prone and so requires farmers to sell it immediately. Relatively remote production sites lead farmers to the problem of accessing transportation. Moreover, insufficient information on price, quality, and quantity needed by consumers might be abused by the marketing bodies that deal with the farmers (Munawir, 2009 in Lestari, 2012). This result is echoing to the study by Edward and Shulzt (2005). They argue that Agribusiness refers to the shift from market centralization whereas the activities of marketing will be effective for the consumers. This shift requires a wider and fundamental concept; that is also discipline, integrated, and continuous.

In 2015, Gorontalo province assigned five integrated agriculture sites to turn those sites further to be *intercropping*-oriented and livestock-oriented. This is based on the prospectus of an integrated agriculture area, such as the condition of the soil, the availability of wellspring, human resources, site accessibility, and tools of production. Furthermore, integrated agriculture is a system that assimilates a number of business units which are organized in an integrated and ecological-oriented manner. This aims to increase the economic value, efficiency level, and high productivity. One of those areas is Huluduotamo village with corn plants, horticulture, animal husbandry, and freshwater fisheries as its commodity priority.

The results by Canon et.al with State Agency for National Development (Bappeda) Bone Bolango regency (2016) report that Gorontalo is on the 13th rank for the commodities, such as (1) corn; (2) coconut; (3) palm coconut; (4) capture fishery; (5) cattle; (6) *kur* chicken; (7) cloves; (8) cane; (9) rice crop; (10) chilli; (11) coffee; (12) palm tree; (13) cacao. The rank is based on the indicator of superior commodity assessment through a comparative method in Gorontalo province. The economic structures of Bone Bolango regency consist of four main sectors, namely agriculture, animal husbandry, forestry, and fishery. The contribution of these areas to Gross Domestic Regional Product is placed on the first rank compared to other business (State Agency for National Development, Bappeda, Bone Bolango). In other words, Bone Bolango has market potential for the development of these four sectors. Problems regarding providing system of managing agriculture commodity, animal husbandry, fishery, and forestry are in line with the improvement of farmers' welfare. Additionally, in 2015, the government of Gorontalo province established Bone Bolango regency as one of the five integrated agriculture sites in the Gorontalo province.

Among a number of issues on developing agriculture sites in Bone Bolango regency, the lack of farmers' bargain power is the determining factor of the quality of the commodity. Farmers are unable to set the commodity price due to the absence of the warranty of the commodity product. Products from other competitors have a lower price but with high quality make the matter even worse. Consequently, a solution is needed to prepare farmers to compete with a better standard commodity with a decent price.

Another issue of the four sectors of the marketing is the long series of marketing from the farmers to the *user* or consumers. This leads to inefficient marketing because the marketing margin is getting more complicated. On top of that, the price for the farmers is lowering and affecting the income as well. The issue of time also involves in the long series of marketing since the agriculture products are naturally less durable. These impacts to farmers' loss for its lowering price. Incompetent facilities (transportation, hygiene of distribution site, and access to information), as well as marketing management, is a problem in the system of agriculture commodity, animal husbandry, forestry, and fishery. Providing better facilities is necessary to distribute information to all people.

Such a condition turns to be the background of modern market concept widely known as agribusiness sub terminal. The aims of agribusiness sub terminal is to increase the pricing set for the farmers and as a medium for accommodating the needs of business practitioners, such as the media and infrastructure, packaging, storage, washing service, and commodity auction. Moreover, farmers and Agribusiness practitioners can exchange information with each other.

The agribusiness sub terminal intends to enable the commodity handling system of the agricultural products covered by one agribusiness management. This contributes to the prosperity of farmers and related stakeholders. This study is to analyze the feasibility of agribusiness sub terminal in Bone Bolango regency, determine factors of its feasibility, and the application of agribusiness sub terminal development model in integrated agriculture area Bone Bolango regency.

METHODS

This study employs descriptive quantitative and qualitative which consists of two sources of data, the primary and secondary data. The qualitative approach is used to analyze the production centers and commodity marketing in the integrated agriculture area Bone Bolango regency. Furthermore, the quantitative approach is employed to review economic aspects and the feasibility of the attempts of agribusiness sub terminal. Selecting agriculture commodity marketing body and interviewees related to Agriculture Sub Terminal in Bone Bolango regency are due through purposive sampling. Primary data are obtained from direct observations, *focus group discussion* (FGD), in-depth interviews, and by giving questionnaires to the stakeholders. The secondary data include books, scientific journals, previous research reports and literature from a number of stakeholders. This study employs the (1) exponential determinant method while the exponential comparison method is due in determining the site of agribusiness sub terminal. The exponential comparison method is one of the decision-making methods which quantify argument from a person or more to certain extent. This is a method of scoring choices. The exponential calculation allows classifying differences between criterion based on the capability of assessors. Procedures of the exponential comparison method are: a) Determine alternative decision, b) Arranging decision criteria that will be reviewed, c) Determining relative importance criteria of each decision by using a specific conversion scale according to the needs of decision-makers, c) Determine relative importance criteria of each alternative decision, and 5) Ranking the obtained value of each alternative decision.

Following is the formula of scoring for each alternative strategic site in Bone

Bolango regency based on exponential comparison method :

$$TN_i = \sum_{j=1}^{m}(RK_{ij})TKK_j$$

Description:

TN$_i$:Total of the alternative value #i

RK$_{ij}$:Relative importance criteria #j on the decision option #i

TKK$_j$:Relative importance criteria of decision #j; TKKj > 0 ; integers

n   :Number of decision choice

m   : Number of decision criteria

Determining the level of importance of criteria is done through interviews with expert and brainstorming agreement. On the other hand, the alternative score on certain criteria is conducted by scoring each alternative according to its criteria. The bigger the alternative value, the bigger the alternative scores. The total score of each alternative decision will be relatively different in the real situation due to the exponential function. The exponential comparison method is helpful to lower the possibility of bias during the analysis. The value score that depicts the order of priority will be increased (exponential function). Ultimately, the order of alternative priority will be more realistic. (2) The feasibility analysis by using financial analysis is the basis for assessing the most profitable commodity.

The Financial Analysis on the aspect is namely, *NPV (Net Present Value), IRR (Internal Rate of Return), Gross B/C ratio, Net B/C ratio and PBP (Payback Period)* .

NPV = PV Gross Benefit – PV Gross Cost

Criteria : NPV (+)   = Feasible

NPV (-)   = Not feasible

$$IRR = i_1 + \left(\frac{NPV}{NPV_1 - NPV_2}\right) x\, i_2 - i_1$$

Criteria :

IRR > i (interest rate)   = Profitable

IRR < i (interest rate)   = Loss

$$Gross\ B/C\ Ratio = \frac{PV\ Gross\ Benefit}{PV\ Gross\ Cost}$$

Criteria :

B/C R > 1   = Profitable

B/C R = 1   = Break-even

B/C R < 1   = Loss

$$Net\ B/C\ Ratio = \frac{Total\ of\ PV\ Net\ B\ Positive}{Total\ of\ PV\ Net\ B\ Negative}$$

Criteria :

B/C R > 1   = Profitable

B/C R = 1   = Break-even

B/C R < 1   = Loss

$$PBP = T_{p-1} + \frac{\sum_{i=1}^{n} G\bar{I}_{|} - \sum_{i=1}^{n} \bar{B}_{icp-1}}{\bar{B}_p}$$

Description:

PBP = *Payback Period*

T_{p-1} = Year before PBP before PBP

I_I = Total of discounted infestation

$\bar{B}_{icp-1}$ = Total of discounted benefit before *Payback Period*

$\bar{B}_p$ = Total of Benefit during *Payback Period*

RESULTS AND DISCUSSION

Site determination method

The exponential comparison method is among several ways for determining the order of priority through multiple criteria decision making. The method is employed to use a well-defined model on the processing stage. The zoning found four strategic sites that are feasible as agribusiness sub terminal in Bone Bolango regency. Those are Suwawa district, Kabila district, Tilongkabila district, and Tapa district. The approach aims at deciding one of the four sites. The assessment is shown in Table 1.

Table 1. Assessment of strategic site determination on each indicator

No	Criteria	Value	Strategic Alternative Values			
			Suwawa	Kabila	Tilongkabila	Tapa
1	Easy to access the site	9	7	7	6	7.5
2	The availability of infrastructure and media	8	8	7	7	7.5
3	Policy and institutional support	8	8	7.5	7.5	8
4	Community's readiness and willingness	6	7	8	6	8.5
5	Government's readiness and willingness	7	8	8	8	8
6	Capital aspect	6	8	6	8	7.5
7	The availability of artificial resources	7	8	8	7	7.5

Source : analysis results, 2017

The result for each alternative value of each site is raised to (exponential function) with the value of each alternative site. This is based on the assessment of the agribusiness sub terminal sites with the value of the exponential comparison method. The result from the exponential function will be added to each of the alternative sites. Table 2 shows the calculation result of the site of agribusiness sub terminal in Bone Bolango regency according to the exponential comparison method.

Table 2. Calculation result of exponential comparison method

Number	Strategic Site	Exponential Comparison Method Value	Ranking
1	Suwawa	78.482.142.00	2
2	Kabila	60.632.809.50	3
3	Tilongkabila	29.083.289.50	4
4	Tapa	105.860.318.68	1

Source : analysis results, 2017

The ranking of four strategic sites of agribusiness sub terminal has been established based on the calculation. The sites are, in order of sequence, (1) Tapa; (2) Suwawa; (3) Kabila; (4) Tilongkabila. The exponential comparison method calculation infers that Tapa district has the potential for developing agribusiness sub terminal among other sites in Bone Bolango regency with the score 105.860.318.68. This is preceded by Suwawa district with score 78.482.142.00. These two sites score high on the aspects, such as policy and institutional supports, community's readiness and willingness. The government, through Spatial Zoning Plan Bone Bolango regency 2011-2031 number 8, emphasize that the sites have strategic values that contribute to the economic growth in the sector of industry (Tapa) and agriculture (Suwawa). On top of that, Tapa district in Bone Bolango regency has been established as the agricultural area of the organic commodity, whereas Huludutuamo village, based on the Governor's Decree number 96 / 20 / III / 2015, in Suwawa is the center for harvesting corn, horticultural crops, livestock husbandry, and fishery. This is echoing the results seen in Wibowo (2008) states that elements that support from solid institution and stakeholders, community's contribution, and reinforcements from the government will help continuously help agriculture activities

Analysis of business feasibility criteria

The feasibility analysis of agribusiness sub terminal which comprised of *Net Present Value* (NPV), *Internal Rate of Return* (IRR), *Net Benefit Cost Ratio* (Net B/C), and *Pay Back Period* (PBP) is due based on the cash flow forecast. The calculation of the analysis uses the assumption of *discounting factor* (DF) at 14 percent and tax at 10 percent on each year. The feasibility analysis is shown in the following Table 3.

Table 3. Analysis of criteria of agribusiness sub terminal feasibility

CRITERIA OF BUSINESS FEASIBILITY	VALUE	FEASIBILITY JUSTIFICATION
Net Present Value (NPV)	Rp.11.547.020.421	> 0
Internal Rate of Return (IRR)	16%	> 14%
Net Benefit Cost Ratio (Net B/C)	3.85	> 1
Pay Back Period (PBP)	1.9 Year	< 15 years

Source : analysis results, 2017

The criteria analysis of the feasibility of Sub Terminal Agribusiness in Bone Bolango regency is as follows:

a) The NPV value is Rp.11.547.020.421; in other words, the difference between the *present value* of the benefits and the *present value* can cover the used *social opportunity of capital*.

b) IRR is at 16 percent which means that the profit level of the net investment is bigger than the *discount* factor.

c) Net B/C is 3.85; this signifies that the profit outnumbers the cost.

d) PBP is 1.9 year; in other words, there is a need to conduct a project to return the investment and working capital that is lower than the duration of the project. From the results of the feasibility analysis, it is worth to implement agribusiness sub terminal in Bone Bolango regency

CONCLUSIONS

Agribusiness sub terminal in Bone Bolango regency plays a major role in agriculture commodity marketing. The Agriculture Sub terminal sites are promising to be developed because of its strategic agriculture production site. This cuts unnecessary operational costs and improving the quality and the sustainability of commodity supply and technical of marketing system that has been established in the regency. The strategic sites are four districts, namely Tapa, Suwawa, Kabila, and Tilongkabila. This is from the results of exponential comparison method in analyzing the determinant site. The most potential site is Tapa district with the value of exponential comparison method of 105.860.318.68. Based on the financial feasibility and its NPV of Rp.11.547.020.421, specifically, the economic aspect, the prospect of, implementing agribusiness sub terminal is high in Bone Bolango regency. In other words, the difference between the present value of the benefits and the present value of cost can cover the used social opportunity of capital. The profit level of the net investment is bigger than the discount factor with the IRR of 16 percent. The Net B/C of 3.85 signifies that the profit outnumbers the cost. The PBP will take 1.9 years, which means that the duration to carry out the project and to get the investment and working capital payback cost is shorter than the project duration.

REFERENCES

Anugrah, Iwan Setiajie. (2004). Agribusiness Sub Terminal Development (STA) and Auction Market of Agricultural Commodities and the Problems. Center for Socio-Economic Research and Development Bogor Agricultural Universityr. Vol 22 No 2

Regional Development Planning Board of Bone Bolango. (2011). Regional Medium Term Development Plan of Bone Bolango 2011-2015.

Canon, Sarwani. et.al. (2016) General Plan of Economic Development of Bone Bolango Regency in 2016. The research team of Gorontalo State University cooperation with development planning agency of Bone Bolango Regency

Agriculture Department. (2005). Guidelines from Terminal and Sub Terminal of Agribusiness. Directorate General of Processing and Agricultural Products Jakarta

Edward, Mark R, Shultz, Clifford J. (2005). Reframing Agribusiness: Moving from Farm to Market Centric. in Journal of Agribusiness. Vol 23 (1). School of Bussines, Faculty publications and other works, Loyola University Chicago

Lestari, Puji, (2012). Performance and Continuity Prospect of Sub Terminal of Agribusiness Sewukan, Kabupaten Magelang in Increasing Farmer's Wealth in Merapi Merbabu Area after Merapi Eruption. Journal of Regional and City Development is a scientific journal published by the Master of Regional and Urban Development, Diponegoro University. Vol 8.

Government of Bone Bolango Regency. (2012). Spatial Plans of Bone Bolango District in 2011-2031, Decree of Regent of Bone Bolango number 8 year 2012

Government of Bone Bolango Regency. (2015). Determination of Integrated Agricultural Area of Gorontalo Province, Governor of Gorontalo Decree No. 96/20 / III / 2015

Rustiadi, Ernan dan Sugimin Pranoto. (2007). Agropolitan: Build the Rural Economy. Bogor : Cresspent Press

Wibowo, Soesilo. (2008). Sustainable Vegetable Vegetable Farmer Management Mode. Dissertation. Graduate School of Bogor Agricultural University