

Determinant of Intangible Benefit and Cost in Integrated Biosystem Cattle in Yogyakarta

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ABSTRACT: Implementation of Rural Industries Research and Development Corporation (IRDC) through integrated farming with bio-cycle farming or integrated biosystem is very useful to increase the Total Economic Value. The objectives of the research was identify and measure the intangible value benefit and cost, calculate the Total Economic Value (TEV), and analyze the sensitivity of the farm business with the assumption that the change in maintenance management, pricing, and environmental changes. Sampling was carried out on cattle farmers who are members of the village group system and individual system in Sleman Regency which implement business diversification cattle and crops and organic vegetable and waste management into organic fertilizer. Measurement of intangible benefits and costs, Total Economic Value and sensitivity were analyzed descriptively in table form. The results showed that the highest value of the intangible benefits derived from the use of manure that adds value to land productivity 6,196,500 IDR/head/year or 4,312,620 IDR/AU/ year, Value of intangible costs are Willingness To Accept (WTA) of 3,320,000 IDR/head/ year, or 2,199,500 IDR/AU/year higher than Willingness To Pay (WTP) of 456,765 IDR/head/year or 302,605 IDR/AU/year. The Total Economic Value of the assets showed that resource in village group system 237,548,645 IDR/head/year or 157,375,978 IDR/AU/year. An increasing number of cows population and improvement of the environment by offering individual system farmers willingness to relocate to the village group provides the highest TEV so that it can be concluded that the need for linkages between economic and environmental factors to increase the Total Economic Value.

Keywords: intangible benefit, intangible cost, integrated biosystem, Total Economic Value

INTRODUCTION

Every economic activity should make the process of “internalizing external costs” which takes into account the environmental cost or value of the losses suffered by the other party as one of the main components of production costs (Pearce *et al.*, 1990). Measurement appreciation of the environment is needed to determine the intangible cost is how much willingness to pay for external costs or willingness to pay (WTP) and a willingness to accept compensation or Willingness To Accept (WTA) in cattle (Cao *et al.*, 2010, Carson *et al.*, 2000)). On the other hand in the assessment of environmental economics-cattle farming need to include intangible benefits or indirect use value which is a function of livestock as savings and insurance as well as the value of land productivity of livestock manure utilization. This is expected to increase the total economic value of added value environmental resources. The total economic value (TEV) is applied here as framework used to categorise ecosystem values (Hugues, 2011, Fagiola *et al.*, 2004).

MATERIAL AND METHOD

Sleman regency election as a test site for the reason that in this area of beef cattle that could potentially be developed and had many cattle village group (Anonymous, 2003). The material in this study are farmer Sembada samples belonging to the enclosure of village groups and individual systems. Sampling was done by census farmers are taking all the respondents were joined as

members of as many as 24 farmers. Which shows the Total Economic Value of the asset value of livestock resources formulated : $\text{Net benefit} = (\Delta B_t - \Delta C_t) / \text{head or AU} / \text{year}$ (after the discount factor is discounted at an interest rate of agricultural loans x number of cattle (head or AU)). Sensitivity analysis related to the possibility of a change in maintenance management, the addition of the cow population, output price, environmental changes then made a simulation and TEV ordered by highest value. What percent decline in CI values, the increase in selling prices, great willingness to accept compensation for relocating farmers individual system to village group is determined through interviews with farmers.

RESULTS AND DISCUSSION

Application of Integrated Bio Cycle Farming in the village group produces security measures against the resilience and availability of food and energy, namely: (1) F1 (food), namely the members of the group seeking human food in the form of plant food (rice plants, crops and vegetables) and cattle meat, (2) F2 (feed), from the cultivation of rice and pulses waste can be utilized for making fermented feed, (3) F3 (fertilizer), cattle feces to produce organic compost with a variety of nutrient content. Bio or organic fertilizer not only as fertilizer but also as a nurse ground (soil conditioner), which from an economic standpoint as well as the character of their products are not inferior to artificial fertilizers .

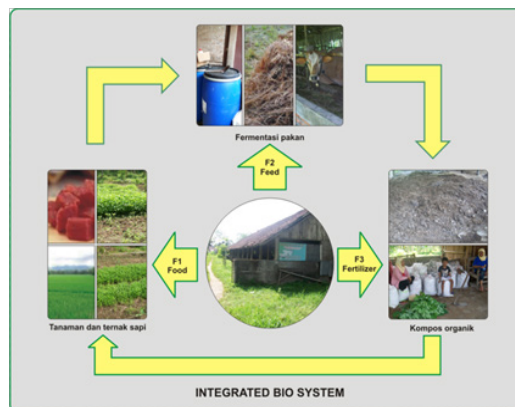


Figure 1. Integrated Biosystems cycle in cattle farmer- group Sembada

Table 1. Intangible Benefit and Cost Group Livestock Farmer-Sembada

Component	(IDR/head/yr)	(IDR/AU/yr)
Intangible benefit		
Livestock as savings	138,450	91,725
Livestock as insurance	174,665	115,715
Land productivity	6,196,500	4,105,181
Total Intangible benefit	6,509,615	4,312,620
Intangible cost		
Time risk based on mileage	100,800	66,780
The risk of labor	118,190	78,300
Willingness To Pay (WTP)		
Improve livestock barn	180,190	119,375

Add plants around the barn	68,850	45,615
Processing cattle feces	207,725	137,615
Total WTP	456,765	302,605
Willingness To Accept (WTA)		
Subsidies on the purchase of livestock	1,000,000	662,500
Labor wages	1,500,000	993,750
Renting land and cattle	270,000	178,875
The cost of transport to the barn	550,000	364,375
Total WTA	3,320,000	2,199,500
Total Intangible cost	3,995,755	2,647,185

Source: primary data, 2014

Assuming the bank rate at 7.5% and 8% interest rate insurance and dirt weight of approximately 7.5 kg/head/day, the total value of intangible benefits gained 6,509,615 IDR/head/year, or 4.312.620 IDR/AU/year. Khan *et al.* (2013) and Dilek *et al.* (2010), the most of the farmers were willing to participate in cattle insurance. Willingness To Accept (WTA) is higher than the Willingness To Pay (WTP). This is due to the compensation/damages that farmers want to switch to village group are higher than the value of WTP farmer in village group. Farmers are still reluctant to switch to village group because most groups have non-farm jobs that require a lot of work time so chose raising cattle in the house for ease in maintenance. This indicates an appreciation of the environment of the individual system is still low. They hope that if the relocation to the village group then there are groups maintain their livestock or paid for cattle raising the opportunity cost to replace their non-farm activities. The Total Economic Value of 237,548,645 IDR/year for the head or 157,375,978 IDR/year for the Animal Unit (AU). This shows the great value of resource assets in village Sembada group of beef cattle in the hamlet village Sanggrahan, Condongcatur each year.

The simulation results showed that the increase in the number of cow population is very influential on the increase in value of the total economy if farmers can increase business scale then an increase in productivity of livestock. On the other hand despite the appreciation of the individual system is still low, but if they get the socialization of the importance of raising cattle in a certain area of the environment for the sake of convenience, there will be an increase in the total economic value of the area due to the presence of enclosure group of beef cattle, so it can be concluded that the need for linkages between economic and environmental factors to increase the Total Economic Value.

Table 2. Priority Order Feasibility TEV in Village Group System for Next 5 Years

kind	TEV (IDR/yr)	note	Rank order
Normal conditions	79,188,901	-	5
CI decline and the weaning period	91,569,283	Increased TEV 15.64%	4
An increase in the selling price of calves	98,191,866	Increased TEV 24.00%	3
Increased cow population	152,286,349	Increased TEV 92.00%	1
Environmental changes	128,276,861	Increased TEV 61.99%	2

CONCLUSIONS

Strengthening cooperation is necessary capital to increase the cattle population in the village group and socialization of the Department of farms and educational institutions to farmers about the importance of maintaining cows in a specific area for improvement and environmental comfort. In addition, more research is needed on the measurement of the content of organic compost to increase soil fertility at the same time increase the productivity of land.

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