Analysis of Structure Cost, Break Event Point, and Income Level of Farming Black Rice:

A Case Study Palir Village, Cirebon

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Abstract—The aims of this study is to analyses black rice farming including cost, revenue, profit and R/C ratio in Palir Village, Cirebon. The research was conducted from March to August 2019 using purposive sampling. Depth interview with farmers, total revenue, total fixed cost and total variable cost are needed as qualitative and quantitative data. The analysis showed that from 0.12 hectare cultivate area, total revenue is Rp 10.500.000 and an average cost production is Rp. 8,018,000 consist of fixed cost and variable cost, so profit income of farmer is Rp. 2.482.000. Analysis R/C ratio = 1.3 (R/C ratio > 1) its means that black rice farming is profitable to cultivate.

Keywords: black rice, revenue, R/C ratio, profit

I. INTRODUCTION

Rice also main food commodity as source energy such carbohydrate and cultivated by most farmers in the world. In Asia, more than 80% of the people live on rice, and their primary food security is entirely dependent on the volume of rice produced in this part of the world [1]. Many efforts doing to increase the productivity of black rice. Rice has various types that can consumed by people, such black rice, brown rice, and white rice. Commonly peoples cultivated and consumed white rice, so only a few people that consume and cultivate black rice.

Black rice is one type of rice whose rice has not been widely consumed by the community. Historically, black rice is a type that is only consumed by certain groups, especially the upper middle class. But in terms of functional, this type of rice has many benefits, especially in terms of nutrition they contain. Black rice is a local variety that has long been known by Indonesians, especially in Java, South Sulawesi, Kalimantan and West Nusa Tenggara. Black rice has long been consumed by Chinese and Japanese and is considered a good food for health. Black rice contains components that can act as antioxidants [2].

Black rice content of hemicellulose as 5.8-7.5%. Black rice also has good taste and aromatic flavor with specify and unique performance [3]. Limited farmers know black rice, because it is new variance. Black rice is not famously as other rice such

brown and white rice. So the introducing of black rice is needed, because the vitamin contents and other benefit.

Only few farmers were willing to cultivate black rice, because of the long age of cropping and use local seed production less preferred. This resulted in increased declivous productivity of rice nationally. In 1981-1990 the production of rice increased by 4.08% per year, from 1991 to 2000 years of 1.31% per year, while in 2001-2007 by 0.58% [4]. But economically black rice cultivation is more profitable than rice cultivation in general, because the selling price of black rice is higher than white rice.

Some efforts in cultivating plants needed to improve the growth of black rice, such using a good fertilizer. Using of production factor of course affect to revenue or profit accepted by farmers. The calculating of black rice farming such total revenue, profit, R/C ratio are needed to know the effectively and suitability of black rice farming.

Farm business analysis is an activity of trying and coordinating of production factors (land, labors, and capital), so it gives some benefits. The research of Suryana, *et al.* show that the farm business analysis of black rice in Padangerang profitable individually and socially [5]. R/C ratio > 1 means that black rice farming profitable and efficiently. The aims of this research is to analyses of cost, income and efficiency of black rice cultivation.

II. METHODS

This research was conducted in Palir village, Kedawung, Cirebon from Maret to September 2019. The research method used is survey. According to Sugiyono, survey method is a method used to get data from a particular place that is natural (not artificial), but researchers do the treatment in collecting data for example by distributing questionnaires, test, structured interviews and so on (the treatment is not as in experiments) [6].

Population and respondent determination by purposive sampling. A sample of size 20 farmers was used. The farmers were also selected randomly. The data consist of primer and seconder data. Primer data are obtained from interview to farmers of black rice and seconder data collecting by study of

literature and other documentations. The income as variable measured by quantitative analysis and constraints of cultivating analyses by qualitative analysis. The measured of variable in this research consist of farm income, R/C ratio (Return and Cost Ratio), and descriptive analysis [7]. Farm income analysis calculated with formula:

$TC = FC + VC$

Where:

TC = Total Cost

FC = Fixed Cost

VC = Variable Cost

$TR = P.Q$

Where:

TR : total revenue (kg)

P : price (Rp)

Q : quantity (kg)

Black rice farming income calculate with formula:

$I = TR - TC$

Where:

I : Income

TR : Total revenue

TC : Total cost

To find out the feasibility of the business, an R/C ratio analysis is done by comparing the total revenue with the total cost formulated [8]:

$R/C = TR/TC$

Where:

R/C = Return and Cost Ratio

TR = Total Revenue

TC = Total Cost

If R/C < 1 then farming is not profitable, If R/C > 1 then farming is profitable to run and if R/C = 1 then farming is balanced.

III. RESULTS AND DISCUSSION

A. Labor Cost

Production is a process whereby some goods and services called inputs are transformed into other goods and services called outputs. Production of agriculture commodities not only results through the transformation of various inputs into

outputs but it is also subject to the physical, natural and socio economic condition of the area [1].

Farm analysis is known for three resources which affect farming, namely natural resources, energy resources work, and capital resources [9].

Labor cost data in this research from wholesale labor cost and labor in family farmers. The average of labor in farm household with land area of 0.12 hectare is Rp 8.018.000, consist of fixed cost Rp 2.000.000 and variable cost Rp. 6.018.000 (Table 1).

TABLE I.   PRODUCTION COST PER HECTAR BLACK RICE FARMING

Number	Cost	Black rice farming (0.12 hectare)
		Rp/hectare
1.	Fixed cost	
	a. Land rent	2.000.000
	Total Fixed Cost	2.000.000
2.	Variable Cost	
	a. Black rise seed	300.000
	b. Fertilizer	
	- Silica	300.000
	- Urea	98.000
	- Ponska (NPK)	150.000
	- POC Biotiful	75.000
	- Super Phosfat	90.000
	- Organic	700.000
	Total fertilizer cost	**1.413.000**
	c. Pesticide	
	- insektisida	30.000
	- fungisida	25.000
	Pesticide cost	**55.000**
	d. Labor	
	- nursery	450.000
	- First tillage	500.000
	- Second tillage	500.000
	- bedengan	240.000
	- planting	360.000
	- irigation	200.000
	- Maintenance 1	650.000
	- Maintenance 2	240.000
	- Fertilizing	150.000
	- Harvest	480.000
	- Drying and milling	480.000
	Labor cost	**4.250.000**
	Total variable cost	**6.018.000**
	Total cost	**8.018.000**

Source: primer data, 2019.

B. Farming Production

The average of black rice is 350 kg/hectare and most farmers in Palir village sell their harvest as dry grain.

C. Farming Revenue

The definition of farming revenue is total revenue all factors include amount of sales of harvest and all that consumed by family farmers [8]. The average production per hectare calculate by production (kg) multiple with price of grain when harvest. Assumed that price of grain when harvest is Rp 30.000/kg, so total revenue is Rp. 10.500.000/hectare (Table 2).

TABLE II.   TOTAL REVENUE OF BLACK RICE IN HECTARE

Number	Description	Black rice farming (0.12 hectare)
		per hectare
1.	Production (kg)	350
2.	Grain Price (Rp/kg)	30.000
Revenue		10.500.000

Source: Primer data, 2019.

D. Profit Farming

Net profit calculate analyses by total revenue minus total farming expenses, including labor salary in family and shrinkage farming tools. The average of revenue per hectare that receipt by respondents is Rp. 2.482.000 (Table 3).

TABLE III.   TOTAL PROFIT OF BLACK RICE IN HECTARE

Number	Description	Black rice farming (0.12 hectare)
		per hectare
1.	Production (kg)	350
2.	Grain price (Rp/kg)	30.000
	Revenue (Rp.)	10.500.000
3.	Total Fixed Cost (Rp.)	2.000.000
4.	Total Variable Cost (Rp.)	6.018.000
	Total Cost (Rp.)	8.018.000
	Profit	2.482.000
	R/C Ratio	1.3

Source: Primer data, 2019.

E. R/C Ratio

Return Cost Ratio (R/C Ratio) is a comparative between revenue and cost of farming. Based on Table 3 show that the value of R/C ratio of black rice farming in Palir village is 1.3. Its means that each Rp. 1.00 capital that invest for black rice farming give profit 1.3. Value of R/C ratio > 1.3 also means that the black rice farming is profitable and suitable to cultivate.

F. Constraint of Black Rice Farming

When cultivate black rice farming farmers also has several constraints such social, economic and technique. Based on depth interview with black rice farmer's cultivation technique, price of seeds is main constraint in black rice cultivation. Black rice seeds more expensive than others seed of rice. Only a few people whose consumes black rice.

IV. CONCLUSION

Black rice cultivation in Palir village has R/C ratio > 1, it means that black rice farming profitable to cultivate although price of seeds and cultivation technique become constraint in black rice farming.

REFERENCES

[1] S. Noonari, M.I.N. Memon, A.A. Jatoi, A.A. Chandio, S.A. Wagan, A.A. Sethar, and T. Shah, "Analysis of rice profitability and marketing chain: A case study of district Sukkur Sindh Pakistan," International Journal of Business and Economics Research, vol. 4, no. 3, p. 133, 2015.

[2] M. Suzuki, T. Kimura, K. Yamagishi, H. Shinmoto, and K. Yamaki, "Comparison of mineral contents in 8 cultivars of pigmented brown rice," Nippon Shokuhin Kagaku Kogaku Kaishi, vol. 51, no. 58, pp. 424-427, 2004.

[3] P. Narwidina, "Pengembangan Minuman Isotonik Antosianin Beras Hitam (Oryza sativa L.indica) dan Efeknya Terhadap Kebugaran dan Aktivitas Antioksidan pada Manusia Pasca Stres Fisik: A Case Control Study. Program Pascasarjana Fakultas Teknologi Pertanian," Unpublished.

[4] E. Purwanto, W. Hidayati and Nandariyah, "The yield and quality of black rice varieties in different Altitude," ICSAE. IOP Conference Series: Earth and Environmental Science, 2018.

[5] D.H.S. Suryana and M.N. Yusuf, "Analisis Usahatani Padi Hitam Organik (Oryza sativa L.)," Jurnal Ilmiah Mahasiswa AGROINFO GALUH, 2017.

[6] Sugiyono, Metode Penelitian Pendidikan. Bandung: Alfabeta, 2011.

[7] D. Suardi and I. Ridwan, "Beras hitam Pangan berkhasiat yang belum popular," Warta Penelitian dan Pengembangan Pertanian, vol. 31, no. 2, 2009.

[8] Soekartawi, Analisis Usahatani. Jakarta: UI Press, 2006.

[9] T. Wahyudi, T.R. Panggabean, and Pujianto, Panduan Lengkap Kakao: Manajemen Agribisnis dari Hulu hingga Hilir. Penyebar semangat. Jakarta, 2008.