COST AND LABOR PRODUCTIVITY OF BABY CHICKPEAS FARM

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Abstract. The selling price of baby chickpeas is higher than non-baby chickpeas, the planting period of baby chickpeas is shorter than non-baby chickpeas because baby chickpeas are harvested at a young age, the relatively short harvest period of baby chickpeas requires more harvesting labour, while the availability of labour is relatively stable both from within the family and outside the family. The purpose of this study is to analyse the allocation, cost and labour productivity of baby chickpeas. The research uses a survey method, samples are taken randomly, the analysis used is mathematical analysis and descriptive analysis, the research was located in Lembang subdistrict in Bandung Barat Regency. The results of the study show that labour costs are the most of the total farming costs, which is 34 %, the majority of labour for harvesting activities is 64% of the total labour, the productivity of labour to output is 22 kg per man hour.

Key word: Baby chickpeas, Cost, Labour, Productivity.

1 Introduction

Chickpeas are widely consumed people in developing countries because chickpeas have good nutrition (Handriatni and Jazilah 2008, Celmeli et al., 2018; Grela et al., 2017). Chickpeas production have not met its demand, the demand for chickpeas in 2019 was 106.4 tons, in 2020 it was 104.4 tons, and in 2021 it was 109.3 tons (BPS, Susenas, 2021) . The amount of chickpea production in West Java fluctuated in 2017 – 2021. Cianjur Regency is the largest producer of chickpeas at 23.4 tons, followed by Garut Regency at 15.6 tons, and Bandung Regency at 15.2 tons, West Bandung Regency at 6.05 tons (2020) and 3.94 tons (2021) (decrease by 2.1 tons) (BPS, 2022).

According to BPS (2022), the decline in chickpea production is due to a decrease in the harvest area of chickpeas in West Java, in 2020 the area of 5,526 ha decreased to 5,018 ha (2021). The largest decrease in the area of chickpea land occurred in West Bandung district, which was 589 hectares (2020) to 309 hectares (2021) or decreased (47.54%). The decrease in land area causes a decrease in production yield.

Farmers in Lembang sub-district, West Bandung regency produce chickpeas (Phaseolus vulgaris L.) with baby chickpeas (French beans or Kenya beans). Baby chickpeas have upright growth, while ordinary chickpea plants grow vines, baby chickpeas are relatively short-lived, plant height is 30-50 cm, smaller diameter and length, sweeter taste, higher selling price (Santoso & Wardoyo, 2010; Wafa, et al., 2023). The selling price of baby chickpeas at the supplier level (Rp.12,000 - Rp.16,000 per kilogram) is higher than the selling price of ordinary chickpeas which is Rp.8,000 - Rp.10,000 per kilogram (Rindiani and Murtilaksono, 2018). The selling price of baby chickpeas at the consumer level is Rp.22,000 per kilogram and the price of ordinary chickpeas at the consumer level is Rp.11,875 (Laily et al, 2022).

Farmers who plant baby chickpeas in Lembang sub-district are small farmers with a land area of 1000-3000 square meters (BP3K Lembang, 2022). The average productivity of baby chickpea land is 5 - 6 tons/hectare (BP3K Lembang, 2022), this productivity is below the potential productivity of 8 - 9 tons per hectare.

The production of baby chickpeas is still unable to meet the demand of the domestic retail and export markets (especially to Singapore). The export needs of baby chickpeas to Singapore are 600 - 900 tons per year (Nasrulhak, 2018; Bantolo, 2018; Romadlon & Susilawati, 2019), Indonesia is only able to export as much as 180 tons per year .

The problems faced by baby chickpea farmers are the inefficient use of inputs (Deviani et al., 2019) and high production costs, especially the cost of labour, seeds, fertilizers, pesticides (Kartiwa & Djuwendah, 2016). The use of human labour will incur higher costs than using technology (Santoso & Wardoyo, 2010). According to Shinta and Wiyono (2016), the labor needed when harvesting baby chickpeas with an area of 1,400 m2 in Lembang District is 3-4 people. This study aims to analyse the cost of labour and the labour productivity in baby chickpea farming

2 Research method

The research design uses a quantitative research design. Quantitative research design raises facts, variables, or phenomena in the field of research (Creswell, 2016). The research implementation technique uses survey techniques. The population in this study is farmers in farmer groups. The determination of farmer groups is based on the largest number of members, namely in Suntenjaya village, the number of group members in Suntenjaya village is 931 people. The technique of determining the sample size used is used using the Slovin (1960) formula as follows:

$$n = \frac{N}{N(d)^2 + 1}$$

where:
n = Sample size
N = Population size
d = Precision value of 90 percent or significant 0.10

Based on the number of members of the group, the following sample numbers were obtained:

$$n = \frac{931}{1 + 931\ (0{,}1)^2} = 90$$

The number of samples was obtained 90 farmers. The method of determining respondents was carried out randomly. The data used are primary data and secondary data. Primary data was obtained from the field of research through interviews and observations. Secondary data was obtained from searching literature studies such as the Central Statistics Agency (BPS), Pusdatin, Ministry of Agriculture, West Bandung Regency Agriculture Office, literature, journal articles, and scientific works related to research.

The variables used in this study are defined as follows:
Variable costs are costs that depend on the output produced, variable costs such as seeds, fertilizers, medicines, pesticides, and labour, its measured in rupiah units (Rp).
Fixed costs are costs are the cost that doesn`t depend on the output produced, fixed costs such as equipment costs and taxes, its measured in rupiah units (Rp).
The amount of production is the number of baby chickpeas produced by farmers, its measured in kilogram.
The price of baby chickpeas is the price of baby chickpeas sold at farmers as measured in units (Rp/Kg).

Data analysis uses mathematical analysis, namely the calculation of productivity, productivity is calculated by dividing output by the number of workers. Income analysis is calculated from revenue minus total costs (Soekartawi, 2006). Mathematically, farm income can be written as follows:

$$\pi = TR - TC$$

Where:

Π	= Income from baby chickpea farming (Rp)
TR	= Total baby chickpea receipts (Rp)
TC	= Total production cost of baby chickpeas (Rp)

3 Results and discussion

The age of farmers is between 26 - 59 years, the average age of farmers is 45 years. The respondent farmers are of productive age. The majority of respondents' education graduated from elementary school (44.79%), meaning that farmer education was low. The average experience of farmers is 18.8 years, which means that farmers are experienced in cultivating baby chickpeas. The average number of dependents of farmer families is four people.The respondent's farmer's land is either self-owned or rent. The average land area planted with baby chickpeas is 0.23 ha. The land area range of 0.1 ha – 0.2 ha (53.13%) is the most.

Labor is used for land cultivation, planting, maintenance and harvesting. The labor requirement is 243 people per hectare, the most labour is used for the harvest of baby chickpeas (68%). The large harvest workforce is due to the relatively short harvest period of baby chickpeas.

Table 1. Worker per Hectare per Season

Activity	Total number of worker	Cost of labour (Rp)	Percentage to cost of labour (%)	Percentage to total cost (%)
Land treatment	18	1.026.000	8	2,7
Planting	11	513.000	4	1,3
Maintenance + Pesticide	52	2.564.000	20	6,9
Harvesting	162	8.715.000	68	23,4
Total	243	14.250.000	100	35

The total cost of chickpea farming is Rp 41,250,000 per hectare, the largest cost is the cost of materials, labour costs are the second largest of the total cost of farming. The labour cost for baby chickpea farming is IDR 14,580,000 or 35% of the total cost.

Table 2. Cost of Baby Chickpeas per Hectare per Season

Cost	Value (Rp)	Percentage (%)
Variable cost-Material	19.279.800	47
Variable cost- Worker	14.580.000	35
Total variable cost	33.859.800	82
Fixed cost	7.390.800	18
Total cost	41.250.600	100

The production of chickpeas is 5,302 kilograms per hectare. The production is divided to the number of workers used, which is 243 people, so the labour productivity is 22 kilograms per worker.

Tabel 3. The Income of Baby Chickpea

Item	Value (Rp)
Production (kg)	5.302
Price (Rp)	15.000
Total revenue (Rp)	79.542.000
Cost (Rp)	41.250.600
Income(Rp)	38.292.000

The production multiplied by the selling price is total revenue, revenue from baby chickpea farming is Rp.79,542,000. Total revenue minus total costs are namely income. Baby chickpea farming income is Rp. 38,292,000. The ratio of income to total labour is labour productivity to income. Labor productivity to income is 157,580, meaning that each workforce used in chickpea farming will earn an income of Rp.157,580.

4 Conclusion and recommendation

The results of the study show that labour costs are the most of the total farming costs, which is 34 % of the totalcost, the majority of labour for harvesting activities is 64% of the total labour, the productivity of labour to output is 22 kg per man hour.

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