

**THE FEASIBILITY ANALYSIS OF HANJELI FARMING
(CASE STUDY: WALURAN MANDIRI VILLAGE, SUKABUMI DISTRICT, WEST
JAVA)**

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ABSTRACT

The development of alternative staple foods is a solution to achieve food security and overcome dependence on rice imports. One of the local plants that has the potential to support food diversification programs is hanjeli (*Coix lacryma-Jobi*. L). On the other hand, hanjeli cultivation is almost extinct due to the conversion of agricultural land. The purpose of this study was to analyze the feasibility of hanjeli farming as an alternative food to support food security and to develop strategies for developing hanjeli farming to increase the profits of hanjeli farming. The data used is primary data through interviews with eight key figures. In addition, secondary data was obtained through literature study with the keywords "hanjeli", "agriculture", "agrotourism", "tourism village", and so on. The data analysis method used the R/C ratio to identify the feasibility of hanjeli farming. The results showed that hanjeli farming was feasible with an R/C ratio of 1.59, but efforts were still needed to increase the profits of hanjeli farming. The strategy to increase profits in hanjeli farming is the need to apply technology in hanjeli farming, improve the quality of human resources, add value to hanjeli products, and develop hanjeli agro-tourism sites.

Keywords: *alternative food, hanjeli, R/C ratio*

BACKGROUND

As an agricultural country with a population of 270.20 million in September 2020 (BPS, 2021), Indonesia still relies on imports to meet the needs of food commodities, namely rice. In 2018, Indonesia imported more than 2 million tons of rice from Vietnam (767,180 tons) and Thailand (795,600 tons) (BPS, 2020). One of the efforts that need to be made by the community, government, and also farmers in supporting food security is through a food diversification program (Valencia and Purwanto, 2020). Food security is a condition when people have social, economic and physical access to adequate, safe and nutritious food sources for health and daily activities (Peduruhewa et al., 2021). This policy has been regulated in Presidential Regulation No. 22 of 2009 concerning the Acceleration of Diversification of Food Consumption Based on Local Resources. Therefore, various local agricultural commodities were developed and socialized to the community to become alternative food. With the existence of alternative food, Indonesia can meet the availability of food stocks at affordable prices (Histifarina et al., 2020).

Currently, people in various regions have developed a variety of local agricultural products that can be used as companions, substitutes, or food diversification, especially for staple foods. One of the important commodities that can be developed to support food security is hanjeli. Hanjeli, Jalia or Jali-jali (*Coix lacryma-Jobi* L.) is one of the plants of the Poaceae tribe. According to Nurmala

(2011), morphologically hanjeli resembles a corn plant with an average height of 128.3–219.2 cm. Hanjeli also has white or grayish-white sorghum-like seeds. The color of the hanjeli seeds changes to brownish yellow and is ready to be harvested at around 161-182 days after planting. The yield of hanjeli can reach 2–3.5 tons with a weight of about 7.6–35.3 grams per 100 seeds with a spacing of 100x50 cm. The plants and seeds of hanjeli can be seen in Figure 1.

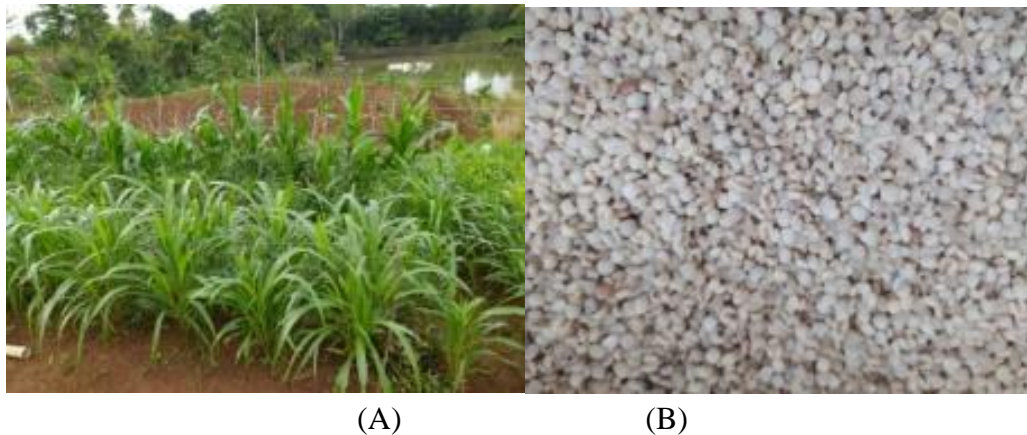


Figure 1. (A) Hanjeli Plant; (B) Hanjeli Seeds

In general, hanjeli that grows consists of two types, namely hanjeli batu and hanjeli pulut. Hanjeli batu (*Coix lacryma-Jobi* var. *lacryma-jobi*) has been used as a craft and accessory because it has hard seeds, while the hanjeli plant commonly consumed is the type of hanjeli pulut (*Coix lacryma-Jobi* var. *ma-yuen*) (Fauzi et al., 2020). Hanjeli pulut has a nutritional content similar to other cereals such as wheat, sorghum, and corn and even higher protein than rice (Dewardari et al., 2021). Each grain of hanjeli pulut contains 54 mg per 100 grams of calcium, 7.9 percent vegetable fat, 14.1 percent protein, and 76.4 percent carbohydrates (Nurmala, 2011). Therefore, hanjeli pulut has the potential to be an alternative because it has the same nutritional content as other food crops. In several East Asian countries, Hanjeli has been used massively for consumption and industrial needs. In China, hanjeli is used as an additive to health soups, while in Taiwan, hanjeli is used as an ingredient in oatmeal (Histifarina et al., 2020). Japan has also used hanjeli as a hypertension drug and anti-hyperpigmentation skincare (Yeh et al., 2021). According to Burnette (2012) in Irawanto et al. (2017), hanjeli can also be consumed as tea and fermented into beer.

On the other hand, the use of hanjeli in Indonesia is still very minimal and not widely known by the public. Although hanjeli cultivation can already be found in several areas in West Java, such as in Cipongkor, Gunung Halu, Kiarapayung, and Punclut in Kab. Bandung, Banjarwangi in Kab. Garut, Tanjungsari, Jatinangor, and Wado in Kab. Sumedang, Banjaran in Kab. Majalengka, Ciomas in Kab. Ciamis, and Waluran in Kab. Sukabumi, its use is only limited for cultural purposes and has not yet reached a large scale (Nurmala, 2011). Hanjeli only used to make traditional food such as tapai, dodol, porridge, compote, and so on. For example, people in Waluran Mandiri Village, Kab. Sukabumi have used hanjeli as a dish that must be available when village people hold weddings or other cultural activities. Hanjeli also serves as food during the famine season or when rice is experiencing crop failure.

Hanjeli has become part of the culture of the local community so Waluran Mandiri people have started cultivating hanjeli plants from generation to generation. According to local people, at first hanjeli was planted in the small area on the edge of the rice fields only to protect the rice plants

from attacks by wild animals. Hanjeli is only traded on a small scale if there are residents who need hanjeli for traditional ceremonies. The farming management system also have not prioritized sustainable principles in terms of ecology, economy, social, and technology yet. So, the harvest from hanjeli cultivation was not producing significant profits because it was only use for cultural use.

Over time, there was a significant decline in the hanjeli plant population due to illegal gold mining activities (Setiawan et al., 2020). To overcome this problem and to protect their local wisdom, the village community allocated part of the village area to become the Hanjeli Tourism Village in 2005. This place became the first tourist destination in Indonesia to make hanjeli as a tourist attraction. Hanjeli Tourism Village introduces hanjeli and its cultivation process to tourists. The local community has also started planting hanjeli based on farming principles, because the community can market hanjeli seeds and their processed products through the Hanjeli Tourism Village. Waluran Mandiri Village has made hanjeli a tourism icon that is a source of community income and supports food security.

Based on the problems and potentials above, this study aims to identify the feasibility of hanjeli farming as an alternative food to support food security. This research can be used as evidence of the feasibility of developing hanjeli to support food security. For the government, this research can be used as evidence of the feasibility of developing hanjeli to support food security. This research can also be useful as a baseline for hanjeli-based business development because there is no feasibility study of hanjeli that has not been widely carried out in Indonesia.

RESEARCH METHODS

The research was carried out in a blended manner for four months from June to September 2021. The research was carried out through online interviews with key persons, while discussions on the results of data processing were carried out offline by implementing health protocols, such as wearing masks and keeping a distance. The data used in this study consisted of primary data obtained through interviews with eight key persons, namely four hanjeli farmers, tourism village managers, the Tourism Office, the Food Security Service, and the Sukabumi Regency Regional Development Planning Agency. The selection of key persons is based on the role in the management and development of hanjeli farming as well as the ownership and ability of the resource persons to operate smartphones. Interviews were conducted online using the Whatsapp application via video calls and text messages as well as with the Zoom Meeting application. This study also uses secondary data obtained from domestic journals, foreign journals, proceedings, and other sources with the keywords "hanjeli", "farming technology", "education and income", "added value", and "agrotourism".

This study used a financial feasibility analysis method with an R/C ratio to identify the feasibility of hanjeli farming. The R/C ratio is the ratio between revenue (R) and costs (C) with a favorable status if the R/C ratio is more than 1, reaching a break event point if the R/C ratio is equal to 1, and unprofitable if the value of the R/C ratio is less than 1 (Febrianto et al., 2019). In addition, qualitative descriptive analysis is also used to develop strategies for improving hanjeli farming based on secondary data that has been obtained from the literature and based on the results of interviews with key persons.

RESULT AND DISCUSSION

Feasibility of Hanjeli Farming

According to local farmers, hanjeli cultivation is carried out in two ways, namely by planting it on the edge of the rice field and by planting it on certain land. Hanjeli planted on the edge of rice fields with an area that is not identified is a stone hanjeli. Hanjeli batu is planted to protect rice or other main crops from attacks by wild animals because the location of Waluran village is close to the forest. The cultivation of hanjeli batu is not carried out intensively such as receiving fertilization and so on because the seeds of hanjeli batu are very hard and cannot be consumed. Therefore, local residents only use the seeds as accessories such as bracelets, necklaces, prayer beads, and necklaces for masks.

On the other hand, hanjeli planted in certain areas are hanjeli pulut. Hanjeli pulut is planted on a five-hectare land owned by the State-Owned Forest Company (Perhutani). The land is managed by the local community at no rent to be used as hanjeli farmland. The analysis of farm income carried out in this study is an analysis of hanjeli pulut farming carried out on an area of five hectares. Analysis of the feasibility of hanjeli batu cannot be carried out because the planting has not been carried out extensively and is still on a very small scale.

Hanjeli farming can produce 3.5 tons of hanjeli seeds in a harvest season of about 6 months. The harvest is sold to the tourism village manager based on the agreement between the two parties because the tourism village manager has provided capital to the farmers. The dried hanjeli seeds are sold to the tourism village manager for IDR 4,500 per kilogram. According to the tourism village manager, the hanjeli seeds obtained from farmers are then processed into various processed products such as brownies, rengginang, lunkhead, flour, rice which will be sold in tourist villages. The cost of farming hanjeli in detail is presented in Table 1.

Table 1. Hanjeli Farming Costs per Hectare per Growing Season

No	Type of Expenditure	Unit	Volume	Price per Unit (Rp)	Total Value per Harvest Season (Rp)
Revenue					
1	Hanjeli dried seeds	Kg	3,500	4,500	15,750,000
Total Revenue					15,750,000
Cash Costs					
1	Seeds	Kg	10	10,000	1,000,000
2	Manure	Kg	200	10,000	2,000,000
3	Chemical Fertilizer				
	a) NPK	Kg	300	10,000	3,000,000
	b) Urea	Kg	500	3,000	1,500,000
4	Insecticide				
	a) Dangke	Bottle	10	25,000	250,000
5	Outside-Family Worker				
	a) Male	HOK	30	20,000	600,000
	b) Female	HOK	30	20,000	600,000
Total Cash Costs				8,950,000	
Non-cash Costs					

No	Type of Expenditure	Unit	Volume	Price per Unit (Rp)	Total Value per Harvest Season (Rp)
1	Inside-Family Worker				
	a) Male	HOK	20	20,000	400,000
	b) Female	HOK	20	20,000	400,000
2	Equipment Depreciation				
	a) Kored/ Cungkil	Unit	2	50,000	25,000
	b) Cangkul Runcing	Unit	1	70,000	17,500
	c) Sprayer	Unit	1	300,000	75,000
	d) Arit	Unit	2	50,000	25,000
	e) Ani-ani	Unit	2	5,000	2,500
Total Non-cash Costs				945,000	
Total Costs				9,895,000	

Source: Primary Data, 2021

Hanjeli farming in one harvest season requires cash costs of Rp. 8,950,000 and non-cash costs of Rp. 945,000. Based on the results of the analysis of the R/C ratio, revenue and cash costs (cash cost) then obtained a ratio of 1.76 while the ratio between revenue and total costs is 1.59. This means that the revenue from hanjeli farming is greater than the expenditure so that it can provide benefits (Rinto, 2017). It can be concluded that hanjeli farming is feasible to be cultivated as an alternative food to support food security. On the other hand, the value of the R/C ratio of hanjeli farming is still relatively small compared to other food crops, so it is necessary to develop efforts to increase the profits of hanjeli farming.

Strategy to Increase Profits of Hanjeli Farming

One strategy that can be applied to increase the profits of hanjeli farming is through the application of farming technology. According to Yu et al. (2021), technology can reduce crop loss and improve product quality so as to increase farmers' income. In addition, the use of superior varieties will also have an impact on increasing farmer profits. This can increase the quantity of crop yields (from 240 to 450 kg per hectare) as well as improve crop quality (protein content from 0.5 to 1 percent) (Batmunkh and Yadamsuren, 2021). Therefore, the Sukabumi district government through the Food Security Service has started conducting research on increasing hanjeli productivity and providing assistance in procuring post-harvest technology in the form of storage warehouses since 2021.

Another strategy that can be applied to improve hanjeli farming is through the education sector. The average farmer in Waluran Mandiri Village is an elementary school graduate. This shows that not many rural communities understand the importance of formal education. On the other hand, a higher level of farmer education has a significant effect on 1-10 percent increase in profits and 3.9 percent increase in household income, so efforts are needed to improve community education through development. schools, compulsory education programs, and training (Duy et al., 2021).

In addition, farmers can also provide added value to marketed hanjeli products so that it has an impact on increasing income. Hanjeli harvest from farmers in Waluran Mandiri Village is distributed to Hanjeli Tourism Village to be processed into various products. These include hanjeli rengginang for Rp. 15,000.00, hanjeli flour to Rp. 25,000.00, and hanjeli accessories such as

bracelets, necklaces, and prayer beads for Rp. 10,000 Rp. 35,000.00. This shows that hanjeli processed products have high added value so that they can reach more marketing options and provide better prices for hanjeli farmers (Qalsum, 2018). According to Bappeda Kab. Sukabumi, hanjeli product promotion activities need to be increased to increase farmers' income. One of them is by cooperating with hotels, restaurants, restaurants, and so on in Kab. Sukabumi to promote hanjeli products to the public.

The development of hanjeli farming into an agro-tourism area can also be a strategy to increase people's income. According to information from the manager of the Hanjeli Tourism Village, the net profit from managing the tourist village reaches 6-8 million rupiah per month. This shows that tourism is one of the fastest sectors that can be used to overcome poverty and eradicate hunger (Lan and Hanh, 2020). The location of Waluran Mandiri Village which is located in the Ciletuh tourist area can also be an advantage because according to the Sukabumi Regency Tourism Office, the area will be a top priority in developing the Sukabumi Regency tourism icon.

CONCLUSION AND SUGGESTION

Hanjeli farming is feasible for the community in Waluran Mandiri Village. The R/C Ratio value of hanjeli farming is still relatively small compared to other food crops, so it is necessary to develop an effort to increase the profits of hanjeli farming. One of them is through the application of technology in farming. In addition, it is necessary to improve the quality of human resources, add value to marketed hanjeli products, and develop agrotourism areas so that it has an impact on increasing income.

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