

The “dish system” for calculating wages in rice farming in Majalengka District, West Java Province

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Abstract. Farmers play an important role in the agricultural sector; however, their welfare does not always increase with growth in this sector. Rice farming is generally affected by local customs and traditions, and labour costs are the largest expense. Local knowledge offers a distinctive feature in rice farming, such as the “dish system” in Majalengka District, where labourers are paid in *bawon*, a tradition in rice farming. However, this tradition may not always be economically beneficial to farmers. This study aims to identify the dish system of local wisdom in rice farming, analyse its economic efficiency, and compare the profit level with farming in general. Primary data were collected by conducting interviews with 65 farmers. The study revealed that the use of a dish system for wages results in greater profits and a higher R/C ratio value compared to daily wages in general. When using the *bawon* method, it is important to maintain socially adhered values because increasing farmers' income and welfare is also a priority for the sustainability of rice farming. This study suggests taking comprehensive steps, such as strengthening existing farmer institutions, providing training and empowerment for farmers, and maximising profits through agricultural businesses.

1 Introduction

The agricultural sector is important in Indonesia's economic life, especially for rural communities relying on it to meet their living needs. Despite being an agricultural country, farming communities in rural areas are often poor and dependent on labour for production. Farmers play a crucial role in the sector's success, but their welfare does not always improve with its growth [1].

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Modernisation has had an impact on all aspects of people's lives, including those in rural areas who are working in the agricultural sector. This includes changes in agricultural systems and labour use. However, despite these changes, traditional rice farming methods are still widely practiced in Indonesia. This is supported by factual evidence [2]. One of the factors causing this problem is the lack of quantity and quality of labour in the agricultural sector. These statistical data indicate that most Indonesian farmers live in poverty and struggle to improve their standard of living due to their inability to adopt advanced technology [3]. Consequently, establishing agricultural education institutions is still necessary for these farmers [4]. On the other hand, as a country with diverse cultures and customs, local areas often incorporate their unique cultivation methods. This is known as "local wisdom", the values and behaviours of local communities in wisely interacting with their environment. Local wisdom is a collection of wise ideas, full of value, embedded in the community, followed by its members [5,6].

Local customs and traditions vary among places, tribes, and periods [7]. In Majalengka District, there is a unique tradition of paying outside labour for planting and harvesting rice, which is called the "dish" (*piring*) system. This system pays wages to labourers outside the family who assist with rice farming. Women are responsible for planting rice, and typically 4-5 women are assigned to one land worker or an area of approximately 1600 m². During harvest time, the female plant worker and her husband harvest the rice in the area they previously planted. The rice farming owner uses the "dish" system to make payments, where for every seven dishes of harvested paddy rice (GKP), the labourer receives one dish. The "dish system" is also known as *bawon*.

This payment method has become an old tradition that has been passed down from generation to generation. Rice farming requires a lot of labour, which is the biggest expense for farmers. This means that high labour wages will affect farmers' income. To improve their welfare, it is important to reduce production costs while increasing rice production. By lowering costs, farmers can increase their income and improve their overall welfare (*ceteris paribus*) [8].

The *bawon* wage system has a positive impact on both rice field owners and labourers. Agricultural labour benefits from this system by providing them with higher wages, increasing their food stocks for their families, and guaranteeing jobs for the next planting season. However, the system also has weaknesses, as the risks tend to increase when there is harvest failure. On the other hand, landowners find the *bawon* wage system more profitable due to the low level of risk involved, the quality of the labourers' work, and the relatively cheaper planting costs. However, the profit from the harvest will be reduced by 20%, as it will be given to the cultivating labour [1].

The use of the dish or *bawon* system for wages is still prevalent. This tradition may have both positive and negative effects, particularly on the economic efficiency of rice farming and farmers' incomes. While it helps to preserve the family culture in farming, it is important to analyse if the "dish" system is beneficial for farmers from an economic perspective. This study aims to identify the "dish system local wisdom" in the rice cultivation system, assess its economic efficiency, and compare its profit levels with those of rice farming in general.

2 Methodology

2.1 Location and data collection

The study location was Majalengka District, West Java Province. In particular, the Majalengka Sub-district was purposively chosen as the research site because of the local

wisdom farming practices for a long time, from one generation to another. These practices include paying wages for planting and harvesting. Data collection was carried out in June 2023. Cross-sectional data were collected by conducting direct interviews with farmers using a structured questionnaire. Primary data collected includes land area, input use (seeds, fertiliser, pesticides, labour, and other inputs), input and output prices, and production. Secondary data were obtained from government agencies, such as the Ministry of Agriculture and BPS-Statistics Indonesia.

2.2 Data analysis

This study compares the profitability of rice farming using the dish system method of payment for labour versus the non-dish system method. The data are divided into two categories: (a) actual labour costs calculated using the dish system (*bawon*) and (b) simulated labour costs converted into daily wage rates. Revenue-to-cost (*R/C*) ratio analysis was used to determine the profitability of each method.

2.3 Cost and income analysis

The total revenue and expenses were considered in analysing income which was determined by multiplying the price of grain sold by farmers with the amount of grain produced or the revenue generated through the slashing system. Meanwhile, the total cost includes labour costs, production facility expenses (such as seeds, fertilisers, pesticides, and herbicides), and additional costs such as tractor rental and irrigation. The formula for calculating income is as follows:

$$TR_i = Y_i.P_{yi}$$
(1)

where *TR_i* is total revenue, *Y_i* is production obtained, and *P_{yi}* is the expenditure price during the production process.
Income analysis is the difference between farmer revenues (*TR*) and total costs incurred (*C*). The income analysis is formulated as follows.

$$I=TR-TC$$
(2)

where *I* is income, *TR* is total revenue, and *C* is total cost.

2.4 Profitability analysis

This ratio measures the gross revenue the business generates for every *rupiah* (IDR) spent on production. Mathematically, this can be calculated by dividing the gross revenue by the total production costs.

$$R/C = \frac{Total\ revenue}{Total\ cost}$$
(3)

Furthermore, an analysis of the paired t-test, with a 95% confidence interval, was carried out to determine whether there were significant differences in rice farming income between the dish and non-dish systems. The hypothesis was:
*H*₀ (initial hypothesis) : $\mu_1 = \mu_2$, no income differences between those categories

H_1 (alternative hypothesis) : $\mu_1 \neq \mu_2$, there are income differences between these groups.
An alternative hypothesis is that $\mu_1 \neq \mu_2$.

The number of two sample groups (n_1 , dish system wages and n_2 , non-dish system wages) was the same, so the sample difference test formula used was the paired t-test separated variant as follows:

$$T = \frac{\text{mean1} - \text{mean2}}{\frac{s(\text{diff})}{\sqrt{n}}} \quad (4)$$

where mean1 and mean2 are the average income (profit) of the dish system method and non-dish system, respectively, $s(\text{diff})$ is the standard deviation, n is the sample size, and $n-1$ is the degree of freedom.

Test criteria:

a. If the t-count > t table or a significant value ≤ 0.05 , H_0 was rejected (accept H_1); the difference was significant.

b. If the t-count $\leq$ t table or a significant value > 0.05, H_0 was accepted (reject H_1); the difference was not significant.

Data analysis was carried out with the SPSS program. The results were analysed and interpreted descriptively.

3 Results and discussion

3.1 Identification of the local wisdom in rice farming

Farmers in the Majalengka Sub-district engage in rice cultivation, utilising specialised knowledge passed down from previous generations. The dish system's local traditions are imbued with wisdom unique to the community. This custom has persisted through the ages and remains in practice to this day.

This unique "dish" system payment is used for non-family labourers who help farmers in planting and harvesting activities. Women are typically responsible for planting rice, with about 4-5 individuals per landworker covering approximately 1,600 m². During harvest time, these female plant labourers and their husbands gather the crops they planted. Wages are paid using the "dish" system, where for every six dishes of GKP, the labour receives one dish. This payment method is agreed upon not only by the employer and employees, but also by the entire local community. This dish system is similar to the *bawon* system commonly used in Indonesia. However, in the Majalengka Sub-district, agricultural labour only assists during planting and harvesting, while the farmer-owners handle the rest of the farming work.

The *bawon* system is a wage system that applies in villages on the island of Java. This system applies to rice pickers who work in other people's fields and receive a share of the rice yield they have picked. This share is called *bawon*. *Bawon* can also be seen as a wage system for agricultural labourers who receive a profit-sharing system from the land they work on, from planting to harvest. The amount of *bawon* depends on the land area and harvest results [5].

The *bawon* system has been known since 1932 during the Dutch era, when the colonial government implemented it to reduce financial expenditure during an economic depression. Due to the vast areas of paddy fields and rice plantations, there was a shortage of labour during harvest time. The colonists requested the government to bring in people who could

help cut rice, and in return, they provided shelter and food. This led to the emergence of a *bawon* system.

The dish system wage method has been a long-standing practice in Majalengka Sub-district since ancient times. It aligns with the values of rural communities, such as mutual cooperation, togetherness, and tolerance. Rather than prioritising profit, this method emphasises brotherhood and harmony, which remain integral to farming life in the district. As a result, the dish system wage method has endured and is still in use today.

Residents often assist with planting and harvesting in rice fields, and many of them have personal connections with each other. They take turns working on their rice fields, following the mutual aid and support principle among rice landowners and agricultural labour. In addition, rice field owners strongly desire to maximise profits through this system. This has led to the persistence of the wage system for rice farming, which is supported by strong social ties. According to a study [9], the *bawon* method of providing wages to farm labour, passed down through generations, has strengthened the bonds of brotherhood between groups of farm labour and rice field owners and labour [9].

Before commencing work, the farmer planting and harvesting rice will coordinate with the labourers. It is important to note that the "owner" of the rice field refers to the farmer who decides to cultivate rice on their land or rented land, not necessarily the actual landowner. Additionally, "agricultural labourers" are typically individuals who assist with farming tasks in the rice fields of others, often those who are related or live nearby.

The owners of the rice fields are responsible for preparing and processing the land. If they require additional labour, they may hire someone outside their family for approximately IDR 70,000 to IDR 100,000 per day for tasks such as weeding, fertilising, and spraying. However, for planting and harvesting, wages are provided by sharing harvested grain in a 1:7 ratio. This system requires cooperation among all agricultural labourers in a rice field. If the work is not done together, the rice will not be harvested, and farm labour will not receive immediate profits from rice or grain. Despite the simplicity of rice harvesting, farm labourers do not complain as they are motivated to make a profit and obtain paddy and unhusked grain, which are later converted into rice for their daily needs. Some farm labourers sell the grain they obtain, although the amount may be small. This depends on the individual. The spirit of cooperation among farm labourers is generally high.

From the given description, we can infer that farmers or landowners who use the dish system as a wage system prioritise social benefits over financial profits. They aim to foster good relationships between themselves and farm labour, who are mostly their relatives [10].

3.2 Income and profitability analysis

A key measure of success in farming is the level of profit generated by farmers in their businesses. Farmers strive to optimise the coordination and utilisation of production factors through farming to maximise their income. Farming is considered efficient when the output from these resources exceeds the input [11].

Successful farming occurs when farmers can make a profit after all costs have been taken into account. Table 1 shows the income analysis results of rice farming using the dish system in Majalengka District. For comparison, the dish system costs are converted to daily wages.

Table 1 shows that rice farming with a "dish" wage system is more profitable than daily wages for planting and harvesting labour (non-dish system). If wages are calculated using the dish system, farmers will gain a profit of IDR 5,865,512 with an R/C ratio of 1.45, while farmers only make a profit of around IDR 4,775,741 with an R/C ratio of 1.34 with daily wages. Labour costs are the largest component in rice farming, accounting for around 52% of the total farming costs with daily wages and around 48% of the total costs through the dish

system. This large labour component indicates that farming carried out in Indonesia uses more human labour. Several studies show that the labour component is always the largest part of the cost structure of rice farming [12,13].

Table 1. Analysis of rice farming in Majalengka District, 2023 (per hectare)

Description	Dish system (IDR)	Percentage (%)	Non-dish system (IDR)	Percentage (%)
Seed	1,421,989	10.83	1,421,989	10.00
Fertiliser	2,365,663	11.01	2,365,663	16.63
Pesticide	1,120,738	8.53	1,120,738	7.88
Labour	3,618,336	27.55	7,422,603	52.18
<i>Bawon</i> wage	2,714,495	20.66	-	-
Tractor rent	1,806,635	13.75	1,806,635	12.70
Irrigation (watering)	88,100	0.67	88,100	0.62
Total cost	13,135,956		14,225,728	
Revenue	19,001,468		19,001,468	
Income	5,865,512		4,775,741	
R/C	1.45		1.34	

After analysing farmers' income levels using a paired t-test, it was found that there is a significant difference between paying wages with the dish system method versus paying daily wages. The Sig value (2-tailed) is 0.000, which is smaller than the α value of 0.05 ($0.000 < 0.05$), leading to the rejection of the H_0 decision. These results indicate that rice farmers who use the dish system (*bawon*) with daily wages have significantly different and significant at 95% confidence.

This analysis also shows that landowners will benefit more if wages are paid using the dish system because the farming costs are cheaper. Remuneration in this way gives landowners a low-risk level and guarantees the quality of labourer work. Equally important, remuneration using a dish system for the labourers themselves is more profitable because the value of grain is considered worthier than money, which is supported by a guarantee of employment in the next planting season. The value of the wages obtained with this system is also greater than the fixed daily wages or piece rate [1].

The majority of the people in the research site are farmers who hold strong family values and prioritise mutual cooperation within their community. As a result, landowners and labourers have developed strong social bonds. It is considered impolite for landowners not to utilise local community labour, and vice versa. They also exhibited mutual assistance, such as person A working on land owned by person B, and person B reciprocating later on. This collaborative culture is a factor in why the dish system for wages is more profitable.

It is quite fascinating to compare the use of machine labour in agriculture to human labour. Research has shown that employing machine tools can save farming costs and increase profits for farmers by reducing labour expenses [14–16]. Adopting agricultural machinery can boost income by improving rice productivity, minimising losses, lowering non-labour expenditures, and decreasing the need for labour from outside the household [17]. As a result, income disparities exist between rice farming using machinery and conventional farming practices.

The use of machines to replace human labour in agriculture can have social impacts, especially in rural areas where traditional practices are ingrained. This is proven by research conducted by Kurniawan [18], which highlights the dilemma of agricultural mechanisation. While this is seen as necessary for agricultural development, it can also marginalise agricultural labour, especially women, and place them at risk from modernity. Therefore, it is important to reflect on existing risks and work towards inclusive agricultural development and gender equality. Although agricultural technology can provide benefits to farmers, it can also cause losses for them. However, ignoring the need for agricultural mechanisation would hinder efforts to improve the quality and quantity of agricultural production. It is important to note that the use of machines for labour in communities without rice fields may result in job losses and widen the gap between the rich and the poor.

As human labour becomes increasingly scarce, the use of machine tools in the cultivation process gradually becomes necessary. This change may initially cause problems but is becoming a concern considering the increasing age of farmers and the decreasing interest of the younger generation in rice farming. The extinction of local wisdom traditions may also be a threat. Policymakers must take action to address the plight of agricultural labour and community traditions.

4 Conclusions and policy recommendations

4.1 Conclusions

The wage system used in Majalengka District is based on the *bawon* method, which has long been known in Indonesian society. The practice of using wages through the *bawon* system is a long-standing local tradition that has been passed down from generation to generation. This tradition promotes strong family values, cooperation, and mutual support, benefiting both rice field owners and farm labourers. Those who utilise the *bawon* system prioritise social gain over financial gain.

In terms of the economic aspect, utilising a “dish system” for planting and harvesting in rice cultivation is more financially beneficial for rice farmers than using daily wages. This is due to the presence of strong social ties that prioritise family values, cooperation, and collaboration within communities.

Preserving this tradition is important because it promotes cooperation, but it may fade away with the increasing use of technology in agriculture. This is especially true due to the ageing farmers and the younger generation's disinterest in rice farming as they do not find it profitable. Therefore, alternative policies should be implemented to preserve the positive values of the tradition while ensuring that farming management remains profitable for farmers.

4.2 Policy recommendations

Using the “dish system” or the *bawon* method, preserving shared values of socially responsible wages is important. However, it is also necessary to increase farmers' incomes and welfare for the sustainability of rice farming. The following actions should be considered to anticipate such a direction.

- a. Farmer institutions, including farmer groups and associations, should be strengthened. This will provide a forum for cooperation, solidarity, and promotion of family values.
- b. Improving the use of agricultural mechanisation is important. Farmers should jointly manage machinery to preserve positive traditions, including ownership, maintenance, and

- use. This will foster a sense of belonging among farmers and encourage collaboration and teamwork.
- c. Farmers can increase profits in their businesses by staying informed of advancements in science and technology. To achieve this, they require extensive training, empowerment, guidance, and support from field extension labour. These professionals can be found in existing institutions and provide essential counselling and assistance to farmers.
 - d. Small farmers need attention and protection, as they often also work as agricultural labourers. Human resource development should empower them with special skills to survive technological development.

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