e-ISSN 2581-0405
Asian Journal of Applied Research for Community Development and Empowerment
Halaman jurnal: http://ajarcde-safe-network.org ISSN 2581-0405

The Influence of Group Roles in the Utilization of Tofu Pulp in KWT Lestari Maju Selopamioro Village, Kapanewon Imogiri, Bantul Regency

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ARTICLE INFORMATION

Article History:
Received: 07 April 2025
Final Revision: 12 May 2025
Accepted: 19 May 2025
Online Publication: 20 May 2025

KEYWORDS

group role, tofu dregs, learning class, cooperation vehicle, production unit

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A B S T R A K

This study aimed to analyze the influence of the role of the Women Farmers Group (KWT) in the use of tofu pulp in KWT Lestari Maju, Selopamioro Village, Kapanewon Imogiri, Bantul Regency. The method used was a descriptive quantitative approach with multiple linear regression analysis techniques. The research sample of 32 people was selected by purposive sampling. The independent variables studied included the role of groups as learning classes, cooperation vehicles, and production units, while the dependent variable was the use of tofu pulps. The results showed that the role of groups as a learning class (56.07%), a vehicle for cooperation (57.18%), and a production unit (67.10%) was in the medium category. The utilization of tofu pulps in KWT Lestari Maju was classified as a medium category with an average utilization of 41.33%. The regression analysis indicated that the simultaneous variables of learning classes, cooperation vehicles, and production units significantly affect the utilization of tofu pulps (Simultaneous F value (7.513) Sig 0.001 and determination R^2 0.387 Sig <0.05). However, partially, the role as a learning class of Sig 0.008 and production unit of Sig 0.027 has a significant influence, while the cooperation vehicle is not significant Sig 0.348. This shows that the role of groups was significant in increasing the use of tofu pulp waste into products with selling value, such as crackers. However, there is still a need to strengthen cooperation and continuous further training.

Contribution to the Sustainable Development Goals (SDGs):
SDG 2: Zero Hunger
SDG 3: Good Health and Well-being
SDG 15: Life on Land

1. INTRODUCTION

1.1. Research Background

As an agrarian country, Indonesia has an agricultural sector divided into several subsectors, including food crops, horticulture, fisheries, livestock, and forestry [1]. One of the strategic food crop commodities in Indonesia is soybeans. The demand for soybeans in Indonesia is increasing along with the population increase and changes in the consumption patterns of the Indonesian people towards processed products from vegetable proteins. One of the processed soybeans that is the prima donna of the Indonesian people is tofu.

Tofu is a processed soybean commodity obtained through crushing soybeans with cold or hot water [2]. One of the problems that arises from the tofu processing industry is liquid waste in the form of residual tofu water squeeze, and solid waste (tofu pulp), resulting in environmental pollution and unpleasant odors [3]. Meanwhile, liquid waste is produced from various stages such as washing, boiling, pressing, and printing, which produce high liquid waste. So, the tofu industry must use waste treatment to create valuable products [4]. According to research by Ref. [5], turning tofu pulp by-products into valuable products is essential for reducing waste.

The tofu industry, based on agricultural business households in the Special Region of Yogyakarta, amounted to 431,133, starting from the household industry of 101,908 units [6]. One of

which is in Selopamioro Village, Imogiri District, Bantul Regency. The Lestari Maju Farmers Women Group (KWT) is a group that has a tofu processing business unit on a household scale. They produce tofu with a capacity of 2.5 kg of soybeans daily and produce 5 kg of tofu. This production will produce solid waste in the form of tofu pulp of 30 plastic packs, measuring 1/4 kg per 2 days.

Tofu pulp waste has not been optimally utilized, while KWT Lestari Maju has good human resource potential, active group members, and skills in food processing. Members' skills in processing agricultural products into a product have potential in the market because processed tofu from KWT Lestari Maju will continue to be sold out, and the market potential will be an opportunity for KWT Lestari Maju members. One of the potential preparations is tofu dregs crackers, proving that crackers are a snack that the community loves. Because it has a good taste and a spicy aroma, it has a taste [7].

However, despite the potential of tofu pulp, processed products have not developed optimally. This is because we know the handlers in the use of tofu pulp for the tofu industry, becoming a processed product with a long shelf life by adding selling value to increase income. The tofu pulp run by KWT Lestari Maju has been processed as gembus tempeh. However, the production of gembus tempeh that is carried out has problems with a short shelf life, so it requires innovation with the use of by-products of tofu production that have a long shelf life.

The role of the group is also very influential because human resources impact the group's success. The role of the group as a learning class, a vehicle for cooperation, and a production unit carried out by KWT Lestari Maju as a learning class to improve attitudes, skills, and knowledge has never been made other than tempeh gembus. The role of KWT Lestari Maju as a vehicle for cooperation has not been optimal in carrying out its duties, where only 10 people process tofu and tempeh gembus, 4 people produce Brazilian spinach chips, bitter melon chips and tempeh chips, and 5 other people carry out sales and purchases to the market for tofu processing needs. So of the 42 groups, 19 members are actively carrying out processing activities. The role of KWT Lestari Maju as a production unit is that it has not planned to continue the activities.

The existence of the group is one of the solutions to the problems faced by KWT Lestari Maju as its function and role, namely as a learning class, a vehicle for cooperation, and a production unit per the Regulation of the Minister of Agriculture [8]Regarding the guidelines for the organization of groups and farmer group associations. The group can play an important role in improving the performance of KWT by bringing positive changes in the processing of by-products of tofu production that have added value, through the role of the group as a helpful learning class to increase KWT knowledge, a vehicle for cooperation to deal with problems that arise, and production units to assist in financing businesses run with KWT.

Role is the behavior that others expect of someone according to their position in the ongoing activity [9]. If a person performs his duties according to his rights, he has carried out his duties following his role [10]. The success of the use of by-products of tofu production in the form of pulp (pulps) can be achieved by optimizing the role of various parties, one of which is the role of KWT in the processing or utilization of tofu pulp by providing guidance, assistance to KWT so that farmer women groups are more prosperous by utilizing tofu pulp by turning it into food with selling value. This is carried out because the group acts as a learning class, a vehicle for cooperation, and a production unit for farmers to solve various existing problems [11]. Therefore, researchers want to know the role of groups in the use of tofu pulp in crackers.

1.2. Literature Review

1.2.1. The Women Farmer Group (KWT)

KWT is defined as increasing women's involvement in agriculture due to economic encouragement to meet the needs of family members. Based on the role of KWT, it is not small, because it has two roles at once: a housewife and a group member. The role of Farmer Groups can be carried out from planting and maintenance to post-harvest management, which women farmers carry out. The role of KWT in managing businesses needs to be continuously improved to improve the welfare of its families [12].

KWT, a forum for women's coaching, was formed by the government to train women in adopting new technologies [13]. Therefore, from several important components, the role of KWT, which is divided into 3, namely as a learning class, a vehicle for cooperation, and a production unit for its members, can influence efforts to increase the productivity of farming by managing farming together. The learning class aims to improve skills, knowledge, and attitudes to create a sense of independence, while increasing agricultural production, which is expected to create a level of welfare [14]. The farmer women's group (KWT) is a non-formal organization located in the countryside that grows and develops from, by, and for the group, so the following are some of the characteristics of the farmer women's group according to Ref. [15]

a. Know each other, get to know each other, and trust each other
b. Have a panda and have the same interests in farming
c. Have similarities ranging from traditions or settlements, business spreads, types of businesses, economic and social status, education, language, and ecology
d. There is a division of duties and responsibilities among fellow members under the agreement that has been made together

According to Ref. [16] the role of farmer groups as a learning class, a vehicle for cooperation, and production units provides the involvement of each group member to interact with others. As for the role of the group as a production unit, the farmer group can provide facilities and infrastructure to support all business activities, improving the economic scale of farming by the group and group members [17] in [16].

1.2.2. The Role of Farmer Groups

Referring to the Minister of Agriculture Regulation No. 82/Permentan/OT.140/8/2013 Guidelines for the Development of Farmer Groups and Farmer Groups Associations, it is necessary to improve to legal certainty and coaching efforts for farmer groups and farmer groups combined. According to the regulation, farmer institutions are described as entities from, by, and for farmers to strengthen and fight for the interests of farmers. Furthermore, farmer groups are referred to as poktan, which is a collection of farmers/breeders/planters that are formed based on common interests, standard conditions of the social, economic, and resource environment, community safety, and familiarity that establishes and develops member businesses [8]. Therefore, the

 https://doi.org/10.29165/ajarcde.v9i2.656

purpose of forming a farmer group has a role and contributes to achieving a common goal, so the role of farmer groups is needed to realize their similarities.

1.2.3. Tofu Processing

Tofu is a product produced from the coagulation of proteins derived from soybeans. Tofu is a processed product that is already known by the public as a daily food, is generally popular, and has high digestibility. The stages of making tofu are divided into two parts: the production of soy milk and protein clumping [18]. According to SNI 01-3142-1998, tofu is a food product in the form of soft solids through the process of processing soybeans by deposition of proteins, whether or not it is added with other permitted ingredients.

1.2.4. Utilization of Tofu Pulp

The source of food waste includes all food materials discarded throughout various stages, namely production, processing, distribution, and consumption. One type of food waste occurs during the agricultural production stage. The large scale of agricultural activities and the lack of modern technology result in agricultural products that do not meet market standards, pre-harvest damage, and traditional processing methods. Due to inefficient methods, traditional food processing contributes to a high volume of food waste, leading to significant waste generation. One example is tofu production in household-scale industries, which are commonly found in rural areas and produce soybean pulp waste that is not utilized correctly. [19].

Tofu pulp is a by-product of the process of making tofu in solid form. The high water content of tofu pulp causes a very short shelf life. One of the treatments carried out is by processing tofu pulp into valuable food products, because the nutritional content, such as vegetable protein and carbohydrates, is quite high in it. The protein content of tofu pulp reaches 23.55%, or equivalent to 26.6 grams per 100 grams. In addition to protein, tofu pulp also contains carbohydrates of 26.92%, fat of 5.54%, and fiber of 16.55% [20]. The remaining content in tofu pulp is because not all ingredients can be extracted in the tofu manufacturing process, let alone using the traditional drying process [21].

Meanwhile, according to research by [22], the fiber content in tofu pulp is 36.41%, following balanced nutrition guidelines from the Ministry of Health of the Republic of Indonesia. The average adult needs 25-30 grams of fiber per day, so the fiber contained in tofu pulp is worth consuming. The concept of waste utilization can be done by knowing its chemical and physical properties, making it possible to estimate the various products produced.

Various kinds of processing that can be carried out, for example, by-products of production in the form of pulp waste have chemical properties that are dominated by protein, so that they can be processed into food, such as nuggets that function as a source of protein [23]. Another process that can be done for processing tofu pulp is rengginang as an innovation to make tofu pulp waste useful and not wasted [24]. Meanwhile, according to [25]Another processing of tofu dregs is to be made into crackers with simple processing, and can be done on a home scale. Solid waste, usually known as tofu dregs, is the main ingredient used in making crackers. According to Law Number 32 of 2009, waste is the residue of a business or activity that is meaningless and useless. So it can be concluded that waste by-products of tofu production are no longer used, or that materials are taken as the central part. From an economic point of view, waste by-products of tofu production are wasted and have not been utilized optimally, while from an environmental point of view, waste by-products of tofu production cause pollution problems and disturbances to environmental sustainability.

1.3. Research Objectives

This study aimed to determine the utilization of tofu pulp in KWT Lestari Maju and analyze the influence of the role of the Lestari Maju Women Farmer Group (KWT) in the use of tofu pulp in Selopamioro Village, Kapanewon Imogiri, Bantul Regency.

2. MATERIALS AND METHODS

The research was carried out from November 2024 to January 2025, which was located at KWT Lestari Maju, Selopamioro Village, Kapanewon Imogiri, Imogiri Regency, Special Region of Yogyakarta.

This study useds a quantitative approach with a descriptive method. Data was collected through interviews, questionnaires, and direct observation. The research sample was 42 KWT Lestari Maju members selected by purposive sampling. Data analysis used multiple linear regression to see the influence of group roles on tofu pulp utilization.

In this study, the measurement method applied using the Likert scale category scores consisted of 5 (very frequent/ss), 4 (frequent/s), 3 (occasionally/k), 2 (rarely/j), and (never/tp). Indicators of the role of KWT in research include learning classes, cooperation vehicles, and production units, so scores can be used as a tool to facilitate data analysis. The study using the Likert scale is useful as a measure of the role of groups in utilizing tofu production by-products in KWT Lestari Maju.

Descriptive analysis is used as a calculate of questionnaires that have been collected and calculates the scores obtained from farmers, then the results are tabulated in the form of a frequency distribution. In calculating the average score on each farmer's answer obtained through a questionnaire, the score is entered in the class interval of each variable using the following formula:

$$\text{Class Interval} = \frac{\text{N}\,max - \text{N}\,min}{\text{Number of Classes}}$$

With the number of classes 3, the maximum value of 5 assumptions is 100% and the lowest value is 1% assumption of 20% resulting in a class interval of 26.67. So the measurement categories are based on the class intervals in Table 1.

Table 1. Variable Class Category Range

Class Range	Category
Score 73.34% - 100%	Height (T)
Score 46.67% - 73.33%	Medium (S)
Score 20.00% - 46.66%	Low (R)

3. RESULTS AND DISCUSSION

3.1. Characteristics of Farmers

The characteristics of farmers in the study include gender, age, education level, status in the group. So the characteristics of farmers in detail can be seen in the table as follows:

Table 2. Farmers' Status Based on Age, Education, and One Hundred Groups

Criteria	Category	Frequency	Percentage (%)
Age (Years)	30-37	1	3
	38-45	7	22
	46-53	11	34
	54-61	9	28
	62-69	2	6
	70-77	2	6
Sum		32	100
Education Level	SD	11	34.375
	SLTP	5	15.625
	SLTA	8	25
	D3	1	3.125
	S1	1	3.125
	Not Finishing School	6	18.75
Sum		32	100
Status in a Group	Management	8	25
	Member	24	75
Sum		32	100

The study's results on respondents' age characteristics showed that most were between 46–53 years old (34%). This age group is considered a productive age with a higher capacity for work and reasoning, and farmers in this productive range generally possess greater physical and work abilities, making it easier for them to adopt innovations [26]. Productive age is defined as between 15–64 years, characterized by a higher efficiency level than the average in non-productive age groups, which are <15 years and >64 years [27].

The highest level of education among respondents was elementary school graduates, accounting for 34.375%. The low education level among KWT members can become an obstacle to understanding the importance of proper domestic waste management, such as tofu dregs, and adopting environmentally friendly practices [28]. Meanwhile, according to Ref. [29], As a person's level of education increases, the type of job they hold and the appropriateness of the employment also improve. Formal education is related to broader thinking patterns and richer experience, contributing to better decision-making and suitability. The more educated a person is, the higher the individual capacity index for women in processing agricultural products to support household food diversification [30]. However, technological adoption is often challenging in conservative groups with predominantly elementary school education levels. Nevertheless, for housewives who are accustomed to working in the kitchen, technology can be more easily accepted due to their practical experience. This is in line with the opinion of [30], which states that years of business experience are related to technological skills, utilization and management of business capital, and market reach, reflected in knowledge, attitude, and skill.

The technology introduced to KWT Lestari Maju involves simple food processing methods, such as making crackers from tofu dregs, making it easier to be accepted despite the members' predominantly elementary school educational background. Moreover, since most members are housewives accustomed to food preparation activities, they already possess basic skills that support the process. Therefore, if the material delivered focuses on utilizing tofu dregs into crackers, it will be more easily accepted by KWT members who already have experience in food processing and have received related training through their involvement in KWT Lestari Maju.

Regarding group status, the study found that 75% of members were regular members, while the remaining 25% served as administrators. Group administrators—such as the chairperson, treasurer, secretary, and other section heads—have the task of coordinating activities, planning work programs, and overseeing the implementation of group activities.

Based on interviews, administrators tend to be more active in attending training programs. However, they also involve a few other members as representatives to participate in training and visits organized by KWT Lestari Maju. Despite this, only around 10 members are highly active in the production of tofu. This is due to several factors, such as many members being elderly, joining the group mainly for social gatherings (like savings circles), or being occupied with other activities such as selling goods. These conditions lead to some members being more passive in the tofu processing activities conducted by the group. This indicates that activity in the group is not solely determined by structural status but is also influenced by each member's motivation.

3.2. The Role of Groups in the Utilization of Tofu Pulp

In analyzing the role of groups in the use of tofu pulp, it is categorized into learning classes, cooperation vehicles, and production units. The role of KWT Lestari Maju as a vehicle for cooperation has not been optimal in carrying out its duties, where only 10 people process tofu and tempeh gembus, four people produce Brazilian spinach chips, bittermelon chips and tempeh chips, and five other people carry out sales and purchases to the market for tofu processing needs. So of the 42 groups, 19 members are actively carrying out processing activities. Meanwhile, the management and chairman of KWT actively participated in training activities and visits with several group members. Group meetings are held monthly to coordinate the management and members in utilizing tofu pulp. Based on the data obtained, the role of groups in the use of tofu bags can show the results of the category of group roles in the use of tofu bags according to Ref. [10] as follows:

The learning class, as a forum for women to carry out various thoughts in the field of agriculture as a means of gaining knowledge and insight in the group, holds regular meetings, and each meeting is attended by a Lapanagan supervisor from BPP who will provide direction and guidance for group members.

A forum for cooperation, as a forum for special women's associations in a village, by providing new experiences in the field of agriculture, as a place to cooperate in the utilization of potential in agriculture and creativity in agricultural management, to marketing.

https://doi.org/10.29165/ajarcde.v9i2.656

Production units to produce useful products by maintaining quantity, quality, and continuity. The following are the results of the group's role in the use of tofu pulp at KWT Lestari Maju as follows:

Table 3. The Role of Groups in the Utilization of Tofu Pulp

Group Roles	Percentage (%)	Category
Learning Classes	56.07	Keep
Collaborative Vehicle	57.18	Keep
Production Unit	67.10	Keep
Sum	22649.583	

The results obtained from the group's role as a learning class, cooperation vehicle, and a production unit in using tofu pulp are in the medium category. This means that the group has carried out its function. Still, efforts are required to improve and strengthen it so that it can later have a more significant impact on improving its members' skills, economy, and independence. Based on the results of the research in **Table 3**, the role of KWT in the use of tofu pulp in KWT Lestari Maju through the assessment of three main aspects, namely learning classes, cooperation vehicles, and production units, can be seen in each indicator as follows:

1.2.1 Learning Class (X1)

The role of the group as a learning class, calculated from the questionnaire, has 5 answer choices: very often, often, sometimes, rarely, and never. Furthermore, it is categorized into 3 categories, namely high, medium, and low with the frequency distribution of the highest category learning class level is 15,625% with the highest questionnaire recapitulation at the learning class level, namely interest in participating in group meetings every month to discuss utilization of tofu pulp in KWT Lestari Maju. Therefore, the results obtained align with the research [31] The effectiveness of the learning class in a KWT group will increase if it is supported by practical training, mentoring, and the strengthening of household-based production institutions. The role of KWT as a learning class is relatively moderate, with the enthusiasm of KWT Lestari Maju members in participating in the meeting. Still, technological weaknesses need to be addressed in appropriate assistance so that the learning class can become a center for knowledge transformation for tofu pulp processing..

1.2.2 Cooperation Vehicle (X2)

The role of the group as a vehicle for cooperation was measured based on a questionnaire consisting of 5 answer choices, namely very often, rarely, sometimes, never, and never. Next, the results are categorized into 3 levels: high, medium, and low. Based on the results of the distribution of the highest category frequency in the cooperation vehicle of 57.18%, with the highest questionnaire indicator in the role of the cooperation vehicle was found in the frequency of KWT Lestari Maju establishing partnerships with government agencies, such as the Agriculture Office, BPP, and Kalurahan.

The support provided makes KWT members enthusiastic and motivates them to utilize tofu pulp because it is equipped with basic processing facilities and infrastructure. However, the shortcomings that are still encountered are that there is no further training on processing tofu pulp into products with selling value and products with a long shelf life, such as crackers. Therefore, innovation and product variety are needed today by KWT Lestari Maju.

This research is in line with [32], highlighting that the role of the Women Farmers Group (KWT) as a collaborative platform and production unit has a significant influence, especially with the support of institutions such as the agricultural office and local government programs. KWT Lestari Maju, which collaborates with the Department of Agriculture, Agricultural Extension Center (BPP), and the village government (Kalurahan), not only provides facilities such as soybean grinding machines but also encourages members to actively participate in the process of converting tofu dregs waste into crackers.

Collaboration helps accelerate innovation adoption and strengthens the institutional capacity of KWT in agricultural product processing. As a result, the activity of processing tofu dregs, initially discussed in group forums, has begun to develop into a productive, business-oriented endeavor. The collaborative platform also contributes to changing members' behavior to become more innovative and independent through information sharing and inter-institutional collaboration, serving as a pathway for KWT members to learn how to turn tofu dregs waste into value-added products such as crackers.

1.2.3 Production Unit (X3)

The role of the group as a production unit was measured based on a questionnaire consisting of five answer choices: very often, often, occasionally, rarely, and never. The results were then categorized into three levels: high, medium, and low. Based on the frequency distribution, the highest category in the collaboration platform was 67.10%, with the highest questionnaire indicator in the production unit found in the frequency of business continuity that could be utilized for processing tofu dregs into crackers. This indicates that the members of the KWT Lestari Maju have a strong interest in and intention to make production activities sustainable and innovative economic activities. This aligns with the findings of [33], which states that tofu waste has economic value, considering that it can be processed into economic products such as chips and crackers. However, the main challenge lies in the limited labor and time availability among members of KWT Lestari Maju, most of whom also work as market vendors, run food stalls, are elderly, or have other responsibilities, making it difficult to carry out production processes that require consistent time and effort.

According to Ref. [31], the empowerment of KWT as a production unit in processing local products requires proper facilities, time management, and support in production equipment to ensure business sustainability. This means that the training provided aligns with the needs of KWT members. Although members of KWT Lestari Maju show high interest in processing tofu dregs into crackers, their involvement in production remains limited. Therefore, it is essential to adjust the production system and training schedule so that production activities can continue despite members having other responsibilities outside the group.

Household-based production units can be strengthened by dividing the processing tasks according to time slots or using a rotating system. In this way, the production activities for developing tofu dregs into crackers can be carried out sustainably and efficiently.

3.3. Utilization of Tofu Waste (Y)

The utilization of tofu production by-products has an average percentage of 41.328%, which falls into the moderate category. The results from questions regarding the types of processed tofu pulp show that 52.5% of respondents have utilized tofu pulp more than once, also categorized as moderate. Utilization in the form of products such as crackers, nuggets, and sausages remains relatively low, with each reaching only 25.625%, 21.255%, and 21.875%, respectively. Many members still lack experience or have not yet processed tofu pulp into various types of products.

In terms of the amount of tofu pulp that has been utilized, 53.125% of members have used tofu pulp in processing activities, which is considered a moderate category. Meanwhile, the percentage of failures in processing, which could be a potential obstacle, is 36.875%, lower than the number of members who have engaged in processing. The lower failure rate is since not many members have attempted to process tofu pulp into food products, resulting in minimal failure occurrences, thus categorized as low.

3.4. The Influence of Group Roles in the Utilization of Tofu Waste

The influence of group roles on the utilization of tofu waste was analyzed using multiple linear regression analysis, namely through simultaneous testing (F), partial testing (t), and the coefficient of determination (R^2), as shown in Table 3 below:

3.3.1 Simultaneous (F)

The results of multiple linear regression analysis of the role of the Women's Farmer Group (KWT) as a learning class (X1), a means of cooperation (X2), and a production unit (X3) simultaneously on the success level of tofu waste utilization (Y) can be seen in **Table 4.**

Table 4. Results of Simultaneous Test (F)

ANOVA[a]					
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	215987769.719	3	71995923.240	7.513	.001[b]
Residual	268316207.781	28	9582721.706		
Total	484303977.500	31			

a. Dependent Variable: The Utilization of Tofu Pulp Y

b. Predictors: (Constant), Production Unit X3, Cooperation Platform X2, Learning Class X1

Table 4 shows that the Women's Farmer Group (KWT) role as a learning class, platform for collaboration, and production unit is significant, with an F-value of 7.513 and a significance of 0.001. Since the significance value is <0.05, it can be concluded that these factors simultaneously significantly affect the utilization of tofu waste. Therefore, the three variables support optimizing tofu waste utilization in the activities of KWT Lestari Maju. This study aligns with the findings of [34], which emphasized the importance of training and learning activities in processing tofu waste into economically valuable products, such as crackers and chips, thus increasing the community's income. This shows that the existence of a learning class, a platform for collaboration, and a production unit provides knowledge, skills, and practical cooperation to the members of KWT Lestari Maju in utilizing tofu waste.

3.3.2 Partial (t)

The multiple linear regression resulteds regarding the role of KWT in the utilization of tofu waste as crackers (X1) learning class, (X2) cooperation platform, and (X3) production unit, and the utilization of tofu waste (Y), can be seen in **Table 5.**

Table 5. Partial Test Results (t-Test)

Coefficients[a]					
	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
(Constant)	2616.167	5749.601		.455	.653
Learning Class X1	.303	.107	.439	2.844	.008
Collaboration Platform X2	-.184 .192		-.143	-.955	.348
Production Unit X3	.260	.111	.382	2.329	.027

a. Dependent Variable: Utilization of Tofu Waste Y

The partial test (t-test) shows that it is used to partially determine the effect of each independent variable on the dependent variable. The results obtained from the t-test, based on the coefficients test, indicate that the learning class (X1) has a significance value of 0.008, the cooperation platform (X2) has a significance value of 0.348, and the production unit (X3) has a significance value of 0.027. Therefore, if the hypothesis is accepted, the significance value must be <0.05. It can be concluded that the variables X1 and X3 accept the hypothesis and significantly affect the variable of tofu waste utilization (Y). While X2 has its hypothesis rejected because the significance value is >0.05, meaning it does not significantly affect the tofu waste utilization variable (Y).

Based on the analysis above, the results of the multiple linear regression using SPSS 25 for Windows are as follows:

$$\mathbf{Y = 2616.167 + 0.303X_1 + -0.184X_2 + 0.260X_3 + 5749.601_e}$$

The equation of the multiple linear regression means that: the constant is 2616.167, which means that if the variables of learning class (X1), cooperation platform (X2), and production unit (X3) are considered to be zero, then the variable of the success level of tofu waste utilization (Y) is 2616.167.

3.3.3 Coefficient of Determination R^2

Table 6. Results of R^2 Determination Test R^2

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
.668[a]	.446	.387	3095.597	

a. Predictors: (Constant), Production Unit X3, Collaboration Platform X2, Learning Class X1

The results of multiple linear regression analysis for the coefficient of determination (R^2) show a value of 0.387, which means that 38.7% of the utilization of tofu waste can be explained by three variables: learning class, cooperation platform, and production unit. However, 61.3% is influenced by other factors outside of the learning class, the cooperation platform, and production unit variables. Partially, the learning class and

https://doi.org/10.29165/ajarcde.v9i2.656

production unit have significant values related to the utilization of tofu waste, with values of 0.008 and 0.027, respectively (sig < 0.05). This is because the learning class (X1), with the highest category, has a dominant indicator in the involvement of KWT members in attending monthly meetings to discuss the utilization of tofu waste. The interest of KWT members in processing tofu waste into other products also requires additional support from the government. Not only should tofu-making training be provided, but further training on processing tofu waste into other products should also be conducted, so that the leftover waste is not wasted. This aligns with the research by Ref. [35], which suggests that efforts can be made to establish cooperation with vocational training institutions, conduct regular internal training, and engage experienced human resources in food processing. Meanwhile, the production unit (X3) plays a role in sustaining businesses by utilizing tofu waste. Based on interviews conducted during data collection, the expected processing is that tofu waste would be processed into tempeh (fermented soybean cake) and snacks such as crackers. Crackers are also a popular dry food in Indonesia, with a high starch content [36]. With this consumer interest, it will be easier for KWT Lestari Maju to make snack products, specifically tofu waste crackers.

4. CONCLUSION

It can be concluded that the utilization of tofu pulps in KWT Lestari Maju falls into the moderate category, with an average utilization rate of 41.33%. This indicates that many members of KWT Lestari Maju have not yet optimally utilized tofu dregs as raw material for processed products such as crackers. The role of KWT Lestari Maju as a learning class, a platform for cooperation, and a production unit is categorized as moderate. The role of the group as a learning platform, cooperation, and production unit simultaneously influences the level of tofu dregs utilization in KWT Lestari Maju. Meanwhile, partially, the roles of the learning platform and production unit significantly contribute to the utilization of tofu dregs. Therefore, efforts need to be made to enhance the role of the group, particularly as a learning platform and production unit, to optimize the utilization of tofu dregs into processed products effectively.

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