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Analysis of Farmers' Response and Suitability of Innovation to the Use of Coffee Processing Units in Post-Couplet Equipment Central Lombok District, Indonesia

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Abstract. This research aims to know the response of farmers to the application of postharvest tools for coffee processing units in Central Lombok Regency, see the level of suitability of coffee processing technology as an innovation in farmer groups/farmers in Central Lombok Regency and know the relationship between the suitability of innovation and farmer responses to the use of postharvest coffee tools in Central Lombok Regency. The research results show that the reaction of farmers to the use of postharvest equipment for coffee processing units is in the "Good" category or knowing but not in detail, as evidenced by the acquisition of a combined mode score of 105 from an interval score of 89-109 obtained from the overall measurement results through indicators of knowledge (cognitive aspect), attitude (affective aspect) and ability to apply (psychomotor aspect). With the assessment results in the "Good" category, respondents have knowledge, attitudes, and skills with good understanding and ability but do not have detailed knowledge of postharvest coffee processing tools. These factors support in terms of education, human resources, communication, experience in farming and especially the needs of farmers in improving socio-economic conditions with modern innovations as a substitute for traditional methods, namely as one of the efforts that are expected to achieve increased added value and competitiveness and farmers' income through proper and correct postharvest handling. From a non-technical perspective, covering socio-economic and socio-cultural aspects, respondents felt a positive influence. Still, from a socio-cultural perspective, the community felt the direct and indirect impacts as positive things, including increasing the economy in their environment. Still, there are also adverse effects, namely the noise of machines due to modern processing methods and air pollution, which can interfere with breathing. There is a relationship between farmers' responses and the suitability of innovation in their use of postharvest equipment for coffee processing units, seen from the value of $r_s = 0,949$, which is included in the robust category and has a positive value, namely the higher the farmer's response to the use of the postharvest equipment for the coffee processing unit, the higher the suitability of the innovation of the postharvest tool for the coffee processing unit in the government assistance program in Central Lombok Regency. On the other hand, the lower the response of farmers to the use of postharvest equipment for coffee processing units, the lower the suitability of innovations for postharvest equipment for coffee processing units in government assistance programs in Central Lombok Regency.

Keywords: farmer response; coffee; postharvest tools.

INTRODUCTION

Coffee is a plantation commodity that is widely traded in international markets. Indonesia is the world's fourth-largest coffee-producing country after Brazil, Vietnam and Columbia. Coffee is a commodity that generates foreign exchange and is a source of income for farmers, creating jobs, driving agribusiness and agro-industry, and regional development.

The current condition of development, especially coffee plants, in West Nusa Tenggara (known with NTB) Province has an area of 11,389.42 ha of coffee plantations with coffee production of 6,713.51 tonnes and an average production of 824.12 kg/ha and several coffee farmers reaching 12,787 spread across all districts in NTB Province. From the total area planted with coffee in the Province of West Nusa Tenggara, it can be judged that coffee is a superior commodity in other plantation crops such as cocoa, cashew and coconut [1].

Postharvest agricultural products are all activities carried out from the process of handling agricultural products to the process that produces semi-finished products (intermediate products). Postharvest handling aims to reduce yield losses and damage levels and increase commodity shelf life and usability to obtain added value [2]. Improper postharvest handling will result in yield loss, both weight and product quality, especially for the rainy season harvest.

The application of postharvest technology for agricultural products is still uneven, partly because information about postharvest technology has not been carried out massively. The government's attention to increasing the added value of agricultural products in rural areas has been relatively small compared to efforts to increase agricultural production through crop cultivation. Therefore, the development of postharvest handling is still slow and not as expected. Related to the information and problems above, this paper focuses on the difficulties encountered in developing postharvest coffee technology.

Central Lombok Regency is one of ten regencies/cities in the province of West Nusa Tenggara, which has a coffee plantation area that produces hundreds of tons of coffee annually. It is located between 116°05' to 116°24' east longitude and 8°24' to 8°57' South Latitude and in the middle of Lombok Island. The regional capital is Praya District, with an area of 1,095.03 km² and

a population of 1,059,042 people. Central Lombok Regency produces 579.40 tons of robusta coffee annually, with an average production of 745.27 kg/ha. The number of farmers is 1,378 households, with a total coffee planting area of 1,270.58 ha. The production of coffee plants in a sustainable manner with processing results that are still limited so that it can be ascertained that coffee farmers need guidance, outreach and continuous intensive attention from the provincial and district governments, especially in efforts to increase the processing of coffee plants. North Batukliang District has an area of 181.96 (Km²); according to Central Lombok Regency resources data, it is 11,453.10 ha. Data from the NTB Province Forestry and Environment Service, until 2016, permits for managing Community Forests covering an area of 2,179.50 ha had been issued.

In practice, the farmer groups receiving the post-harvest equipment for the coffee processing unit received various responses during different periods according to the year of acquisition and the technological conditions of the postharvest coffee processing equipment. Until now, it is known that some are still operating, sometimes operating and not operating. This can be due to several reasons, namely due to technical factors in the form of technological complexity of postharvest equipment, such as operational capabilities and non-technical factors consisting of economic aspects, namely capital, relative profits, and production costs, which are more expensive than profits. On the sociocultural aspect, namely various community assessments of coffee processing technology, some are supportive, and some are not because technological developments can affect the environment, including air pollution, causing noise, vibration, and poorly managed waste. However, the response of farmers and the suitability of the innovations of recipients of postharvest coffee processing assistance need to be studied in more depth.

METHOD

The data in the study were taken using the descriptive method, which systematically describes the facts and characteristics of the object or subject being studied precisely and as they are. The selection of all respondents in this study was carried out deliberately (purposive sampling and proportional random sampling). Respondents from farmer groups were determined by purposive sampling. Then, the respondent members of

the farmer group were selected by proportional random sampling, so the number of respondents in this study was 60 farmers.

The analysis used is mixed method analysis, which results from collecting qualitative and quantitative data. The method used to obtain results is by conducting research using a scale. From the results of the scale assessment, the outcomes and objectives achieved will be accepted, namely the response of farmers and the suitability of innovation to use postharvest equipment for coffee processing units. The analysis is as follows.

Farmer Responses to Postharvest Tools for Coffee Processing Units in Central Lombok District. An analysis was carried out using a descriptive study with a Likert scale to find out the farmers' response to postharvest equipment for coffee processing units in Central Lombok Regency. The scores for each respondent's indicator are combined. Then, the combined score mode is calculated to see whether the combined scores achieved include score intervals in the categories of knowing well, knowing well enough, understanding enough, knowing a little, and not knowing. The details of the combined minimum and maximum scores for each indicator can be seen in Table 1.

Table 1 – Minimum and Maximum Scores of Each Indicator on Farmer Response Variables to Coffee Processing Unit Postharvest Tools

Farmer Response Indicator	Score	
	Min	Max
Knowledge	9	45
Attitude	9	45
Skills	8	40
Combined	26	130

Then, based on the score of each indicator in the variable, the interval will be calculated concerning the cumulative score and can be estimated using the following formula:

$$Interval = \frac{\text{Combined Maximum Score} - \text{Minimum Score}}{\text{Number of categories}} \quad (1)$$

$$Interval = \frac{130 - 26}{5} = 20$$

Based on these intervals, it is known that the combined score interval in measuring the re-

sponse of farmers to the use of postharvest equipment in the coffee processing unit is as follows.

Table 2 – Combined Measurement Score Intervals of Farmers' Responses to Postharvest Tools for Coffee Processing Units in Central Lombok Regency

Category	Combined Score Interval
If the respondent knows in detail	110-130
If the respondent knows but is not too detailed	89-109
If the respondent knows enough	68-88
If the respondent answered knowing little	47-67
If the respondent does not know at all	26-46

Then, to determine the category of indicator measurement, the partial mode score value is determined through an interval score of the farmer's response to the use of postharvest equipment for coffee processing units in Central Lombok Regency, presented in the following table:

Table 3 – Determination of the Categories of each Indicator on Farmer Responses to the Use of Postharvest Equipment for Coffee Processing Units in Central Lombok Regency

Farmer Response Indicator	Score Intervals	Partial Score Mode Value	Category
Knowledge	37-45	5	Very knowing
	28-36	4	Know
	19-27	3	Enough to know
	10-18	2	Not knowing
	0-9	1	Do not know
Attitude	37-45	5	Perfect fit
	28-36	4	In accordance
	19-27	3	Quite appropriate
	10-18	2	Not suitable
	0-9	1	Do not know
Skills	33-40	5	Very skilled
	25-32	4	Skilled
	17-24	3	Skilled enough
	9-16	2	Less skilled
	0-8	1	Not skilled

Level of Conformity of Postharvest Tool Innovation for Coffee Processing Units in Central Lombok Regency. To find out the suitability of postharvest tool innovation for coffee processing units in Central Lombok Regency, a descriptive analysis with a Likert scale was conducted. The scores on each respondent's indicator are combined. Then, the combined score mode is calculated to see whether the combined score achieved is included in the score interval in the categories of knowing very well, knowing quite well, knowing enough, knowing little, and not knowing at all. The details of the combined minimum and maximum scores for each indicator can be seen in Table 4.

Table 4 – Minimum and Maximum Scores of Each Indicator on the Suitability Variable of Postharvest Tool Innovation for Coffee Processing Units in Central Lombok Regency

Farmer Response Indicator	Score	
	Minimum	Maximum
Complexity (complexity)	7	35
operational capability	7	35
Economic aspect	7	35
Sociocultural aspects	6	30
Combined	27	130

Then, based on the score of each indicator in the variable, the interval will be calculated concerning the cumulative score and can be estimated using the formula (1).

$$Interval = \frac{130 - 27}{5} = 20.$$

Based on these intervals, it is known that the combined score intervals for measuring the suitability of innovation for the use of postharvest equipment for coffee processing units in Central Lombok Regency are as follows:

Table 5 – Combined Score Intervals for Measuring the Suitability of Farmers' Innovations for the Use of Postharvest Equipment for Coffee Processing Units in Central Lombok Regency

Category	Combined Score Interval
If the respondent knows in detail	111-131
If the respondent knows but is not too detailed	90-110

Category	Combined Score Interval
If the respondent knows enough	69-89
If the respondent answered knowing little	48-68
If the respondent does not know at all	27-47

Then, to determine the category of indicator measurement, the partial mode score value is determined through an interval assessment of the suitability of innovation scores for using postharvest equipment for coffee processing units in Central Lombok Regency, presented in tabular form as follows.

Table 6 – Determination of categories for each indicator of conformity of innovation to the use of postharvest equipment for coffee processing units in Central Lombok Regency

Conformity Indicator	Score Intervals	Partial Score Mode Value	Category
Hassle	29-35	5	Very understanding
	22-28	4	Understand
	15-21	3	Understand
	8-14	2	Lack of understanding
	0-7	1	Do not understand
Operational Capability	29-35	5	Expert
	22-28	4	Control
	15-21	3	Enough mastery
	8-14	2	Less master
	0-7	1	Not master
Economic Aspect	29-35	5	Very good
	22-28	4	Good
	15-21	3	Pretty good
	8-14	2	Not good
	0-7	1	Not good
Sociocultural Aspects	21-25	5	Very good
	16-20	4	Good
	11-15	3	Pretty good
	6-10	2	Not good
	0-5	1	Not good

Relationship between Farmers' Responses to the Suitability of Innovation on the Use of Postharvest Equipment in Coffee Processing Units. The Spearman rank correlation test was carried out to determine the relationship between these two variables. Spearman's rank correlation test is a data

analysis technique to define the relationship between one another. It usually analyses regular data on an ordinal and nominal scale, which states levels. This study uses Spearman's rank correlation test analysis via SPSS. The Spearman rank correlation formula is as follows:

$$\rho = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}$$

ρ – Spearman correlation coefficient value; d_i – Difference of each ranking pair; n – number of observations.

Then, based on the P-value, it will be measured with a qualitative approach, which refers to the magnitude of the coefficient value. Correlation shows the direction of the relationship where the

indicator is the sign on the correlation coefficient obtained. If the correlation coefficient is negative, then it has a direction of relationship. If one variable increases, the other variable will decrease and vice versa. However, if the correlation coefficient is positive, the different variables will increase and vice versa.

RESULTS AND DISCUSSION

Farmers' Responses to the Use of Coffee Post-harvest Tools in Central Lombok District. Farmers' responses to using postharvest equipment for coffee processing units in North Baktukliang District, Central Lombok Regency, are presented in Table 7.

Table 7 – Distribution of Respondents by Category and Farmers' Responses to the Use of Postharvest Equipment for Coffee Processing Units in Central Lombok Regency

Response Indicator	Spread		Score intervals	Combined Score Mode	Partial Score Mode	Category
	Number of people	%				
Knowledge	45	75.0	28-36	36	4	Good
Attitude	43	71.6	28-36	34	4	In accordance
Skills	40	66.6	33-40	35	5	Very skilled
Amount				105	14	

Based on Table 7, it is known that the acquisition of the number of respondents to the farmer's knowledge response indicator obtained a total of 45 respondents or (75%) with partial mode four, which was included in the "Good" category then the farmer's attitude response indicator obtained a total of 43 respondents or (71.6%) with a partial mode value of 4 which was included in the "Appropriate" category while from the farmer's skill response indicator obtained a total of 40 respondents or (66.6%) with a partial mode value of 5 which was included in the "Highly Skilled" category. From the overall assessment of the farmers' response variables to the use of postharvest equipment in the coffee processing unit in Central Lombok Regency, a combined score of 105 was obtained from an interval score of 89 - 109. It means farmers' response to using postharvest equipment for coffee processing units in Central Lombok Regency is in the "Good" category, or farmers know but are not too detailed based on an overall assessment of knowledge, attitudes, and skills indicators.

Farmer response indicators related to learning, attitudes and abilities are explained as follows.

Knowledge (Cognitive Aspect). Based on the results of research with farmers' response variables to the use of postharvest equipment in coffee processing units with indicators of measurement in terms of knowledge (cognitive aspects) of coffee farmers as respondents, in this study, the assessment was based on statements from 60 respondents as active coffee farmers. From the evaluation results through distributing questionnaires, the measurement results obtained through the indicator criteria with the most acquisition with a mode value of 5 in the "Very good" category get a total of 4 indicator criteria. The acquisition of a mode three value in the "Good enough" category gets a total of 4 indicator criteria. Finally, a mode four value in the "Good" category gets one indicator criterion.

For more details, the assessment results based on indicators of knowledge (cognitive aspects) with the results of measurements on the indicator criteria are presented in Table 8.

Table 8 – Distribution of Respondents based on Indicators of Knowledge of the Use of Coffee Processing Equipment in Central Lombok Regency

Indicator Criteria	Spread		Combined Score	Partial Score Mode	Category
	Number of people	%			
Tool Use	27	45,0	36	5	Very knowing
Tool components	20	33,3	36	5	Very knowing
How the tool works	20	33,3	36	3	Enough to know
Tool maintenance	31	51,6	36	3	Enough to know
Dry processing method	27	45,0	36	4	Know
Wet processing method	20	33,3	36	5	Very knowing
Lack of technical and non-technical	21	35,0	36	5	Very knowing
Technical and non-technical advantages	20	33,3	36	3	Enough to know
Tool Repair	27	45,0	36	3	Enough to know

Based on Table 8, it is known that 27 respondents or (45%) obtained a partial score mode score of 5 including the "very knowledgeable" category, 20 respondents or (33.3%) tool components included in the very knowing category, 20 respondents or (33.3%) how to work the tool included in the "know enough" category, 31 respondents or (51.6%) tool maintenance included in the quite knowing category, 27 respondents or (45%) dry processing methods included in the "know" category, 20 respondents or (45%) wet processing method (33.3%) included in the category "Very knowledgeable", technical and non-technical deficiencies were 21 respondents or (35%) contained in the category "very knowledgeable", technical and non-technical advantages were 20 respondents or (33.3%) included in the "know enough" category and 27 respondents or (45%) repaired tools included in the "know enough" category.

Attitude (Affective Aspect). Based on the results of research with farmers' response variables to the use of postharvest equipment in coffee processing units with measurement indicators in terms of attitudes or affective aspects of coffee farmers as respondents, the results of attitude measurements on most indicator criteria were obtained for partial mode three scores which were included in the "Quite appropriate" category found in the number of measurements with five indicator criteria. The acquisition of a partial score mode score of 5 was included in the "Very appropriate" category found in the number of measurements with three indicator criteria. Then, acquiring a partial mode score of 3 was contained in the "Appropriate" category found in the number of measurements with one indicator criterion. For more details, the results of measurement assessments based on attitude indicators or affective aspects in the indicator criteria are presented in Table 9.

Table 9 – Distribution of Respondents Based on Attitude Indicators towards the Use of Coffee Processing Equipment in Central Lombok Regency.

Indicator Criteria	Spread		Combined Score	Partial Score Mode	Category
	Number of people	%			
Tool Use	21	35,0	34	5	Perfect fit
Tool components	20	33,3	34	3	Quite appropriate
How the tool works	20	33,3	34	5	Perfect fit
Tool maintenance	33	55,0	34	3	Quite appropriate
Dry processing method	29	48,3	34	4	In accordance
Wet processing method	20	33,3	34	5	Perfect fit
Lack of technical and non-technical	21	35,0	34	3	Quite appropriate
Technical and non-technical advantages	21	35,0	34	3	Quite appropriate
Tool Repair	20	33,3	34	3	Quite appropriate

Based on Table 9 it is known that in the attitude indicator on the use of the tool as many as 21 respondents or (35%) obtained a partial score mode score of 5 including in the category "Very appropriate" in the attitude regarding the component of the tool as many as 20 respondents or (33.3%) including the category "quite appropriate" in how the tool works as many as 20 respondents or (33.3%) including the category "very suitable for tool maintenance as many as 33 respondents or (55%) included in the category "quite appropriate" in the dry processing method as many as 29 respondents or (48.3%) including the category "appropriate" "In the wet processing method, 20 respondents or (33.3%) were included in the category of "very suitable" for technical and non-technical deficiencies, 21 respondents or (35%) included in the "quite appropriate" category for technical and non-technical advantages as well as for repair of tools by 20 respondents or (33,3%) fall into the category of "quite appropriate"

Skills (Psychomotor Aspect). Based on the results of research with the variable response of farmers to the use of coffee processing equipment with indicators of measurement in terms of skills or psychomotor through direct practice with coffee farmers as respondents, in this study, the assessment was based on the number of respondents 60 active coffee farmers, from the results of the evaluation, the most skill indicator measurements were obtained on the acquisition of partial score mode five which included in the category "Very Skilled" found in measurements with a total of 5 indicator criteria, then the acquisition of partial mode score three which had in the "Quite Skilled" category was discovered in the measurement with a total of 2 indicator criteria. The acquisition of partial mode score four was included in the "Terrible" category is found in the number of measurements with one indicator criterion. For more details, the results of the measurement assessment based on indicators of skills or psychomotor aspects on the 7 criterion indicators are presented in Table 10.

Table 10 – The distribution of respondents based on skills or psychomotor aspects of using coffee processing equipment in Central Lombok Regency

Indicator Criteria	Spread		Combined Score	Partial Score Mode	Category
	Number of people	%			
Tool Use	22	36,7	35	3	Skilled enough
Tool operation	21	35,0	35	5	Very skilled
How the tool works	29	43,3	35	3	Skilled enough
Tool maintenance	21	35,0	35	5	Very skilled
Selection of dry processed raw materials	28	46,7	35	4	Skilled
Selection of wet-processed raw materials	24	40,0	35	5	Very skilled
Time and energy management	21	35,0	35	5	Very skilled
Tool repair method	21	35,0	35	5	Very skilled

Based on Table 10, it is known that as many as 22 respondents or (36.7%) with a partial score mode of 3 included in the category "Quite skilled" in measuring the skills of respondents on how to use coffee processing tools, 21 respondents or (35%) included in the category "Very skilled" in how to operate the tool, 29 respondents or (43.3%) contained in the category "Quite skilled" in how the tool works, 21 respondents or (35%) included in the category "Very skilled" in how to maintain tools, 28 respondents or (46.7%) had category "Skilled" in the method of selecting dry processing raw materials, 24 respondents or (40%) included in the category "Very Skilled" in the method of choosing wet processed raw mate-

rials, 21 respondents or (35%) contained in the category "Very Skilled" in managing time and labour during processing, and 21 respondents or (35%) belong to the "Very skilled" category in how to repair tools.

Level of Conformity of Postharvest Tool Innovation for Coffee Processing Units in Central Lombok Regency. The suitability of modern innovations for using postharvest equipment for coffee processing units in North Batukliang District, Central Lombok Regency, has been compiled based on the table from the results of research conducted on four farmer groups with 60 active farmers as respondents. In the following, the mode value obtained from the distribution of

respondents is based on the overall score of the suitability of innovation for the use of postharvest equipment for coffee processing units with two indicators, namely technical, complexity and

operational capability indicators, then non-technical, namely economic aspects and sociocultural aspects, presented in Table 11.

Table 11 – Distribution of Respondents by Category and Suitability of Innovation for Using Postharvest Equipment for Coffee Processing Units in Central Lombok Regency

Conformity Indicator	Spread		Score intervals	Combined Score Mode	Partial Score Mode	Category
	Number of people	%				
Technical nature						
Hassle / Complexity	36	60	29-35	32	5	Very understanding
Operational Capability	41	68	29-35	32	5	Expert
Non-technical						
Economic Aspect	33	55	29-35	33	5	Very knowing
Social-Cultural Aspects	35	58	16-20	19	4	Know
Amount				116	19	

From the overall assessment of the suitability of modern innovation variables for using postharvest equipment for coffee processing units in Central Lombok Regency, a combined score of 116 was obtained from an interval score of 111-131. This means that the suitability of innovation for using postharvest equipment for coffee processing units in Central Lombok Regency is included in the "Very good" category, or farmers know the overall assessment of technical and non-technical indicators in detail.

The research results for each indicator of the suitability of innovation for coffee processing equipment are presented in detail as follows.

Complexity. Based on the results of research with the innovation suitability variable for the use of postharvest equipment in coffee processing units

with measurement indicators in terms of complexity or complexity of tools on coffee farmers as respondents, the results of measurements through with the highest acquisition of partial mode score five which are included in the category "Very understand" get the number of measurements on 5 indicator criteria, then the acquisition of partial mode score 4 which is included in the "Understanding" category is found in measurement 1 indicator criterion and the acquisition of partial mode score 3 in the category "Understanding enough" which is included in the measurement of 1 indicator criterion. For more details, the assessment results based on indicators of complexity or complexity with the measurement results on the indicator criteria are presented in Table 12.

Table 12 – Distribution of Respondents based on the Complexity or Complexity of the Tool for the Suitability of Innovation in the Use of Coffee Processing Equipment in Central Lombok Regency

Indicator Criteria	Spread		Combined Score	Partial Score Mode	Category
	Number of people	%			
Specs for each tool	21	35,0	32	5	Very understanding
Operation of tool components	21	35,0	32	5	Very understanding
How the tool works	21	35,0	32	5	Very understanding
How to care for the tool	29	48,3	32	3	Simply understand
Dry processing method	22	36,7	32	4	Understand
Wet processing method	21	35,0	35	5	Very understanding
Tool repair method	21	35,0	35	5	Very understanding

In the results of the first measurement assessment, namely on the spec indicator for each tool,

21 respondents or (35%) obtained a partial score mode score of 5 including in the category "Very

understand", as many as 21 people or (35%) included in the category "very understanding" in the complexity of the operation of the tool components, as many as 21 respondents or (35%) contained in the category "Very understand", in the complexity of how the tool works, as many as 29 respondents or (48.3%) included in the category "Enough understanding" in the complexity of how to maintain the tool, as many as 22 respondents or (36.7 %) contained in the "understand" category in dry processing methods, as many as 21 respondents or (35%) included in the "Very understand" category in the complexity of wet processing methods and as many as 21 respondents or (35%) contained in the "Very understand" category in the complexity of tool repair methods.

Operational Capability. Based on the results of the study with the innovation suitability variable for the use of coffee processing equipment on the operational capability indicator of the tool on coffee farmers as respondents, the results of the assessment through direct practical activities obtained the measurement results with the highest acquisition in the partial score mode score five indicating the category "Very masterful" contained in the five indicator criteria then the acquisition of the partial score mode four were included in the category "Mastering" held in the measurement 1 criterion indicator and the acquisition of a partial score mode four indicated in the "Quite a mastery" category contained in the measurement of 1 indicator criterion. For more details, the assessment results based on operational capability indicators are included in the seven indicator criteria presented in Table 13.

Table 13 – Distribution of Respondents based on Operational Capability on the Suitability of Innovation in the Use of Coffee Processing Equipment in Central Lombok Regency

Indicator Criteria	Spread		Combined Score	Partial Score Mode	Category
	Number of people	%			
Basic use of tools	21	35,0	32	5	Expert
Tool components	21	35,0	32	5	Expert
Raw material adjustment	21	35,0	32	5	Expert
Tool maintenance	37	61,7	32	3	Enough mastery
Dry processing method	31	51,7	32	4	Control
Wet processing method	21	35,0	32	5	Expert
Tool repair method	21	35,0	32	5	Very understanding

In the results of the first measurement assessment, as many as 21 respondents or (35%) obtained a partial score mode score of 5, including in the category "Very masterful of operational abilities based on tool use, as many as 21 people or (35%) included in the category of "Very masterful" of operational capabilities regarding tool components, as many as 21 respondents included in the category of "very proficient" in operational abilities in adjusting raw materials, as many as 37 respondents or (61.7%) included in the "Quite a mastery" category in operational capabilities regarding how to maintain equipment, as many as 31 respondents or (51.7%) included in the "Mastery" category in the operational capability of the dry processing method, as many as 21 respondents or (35%) were included in the "Very Mastery" category in the wet processing method, and as many as 21 people or (35%) fall into the category of "Very understand-

ing" of the operational ability of how to repair tools.

Economic Aspect (Relative Advantage). Based on the results of research on non-technical innovation suitability variables in the use of coffee processing equipment with measurement indicators on the economic aspect of the suitability of modern coffee farmer innovations as respondents, in this study, the assessment was based on distributing questionnaires with a total of 60 active coffee farmers as respondents. From the results of the appraisal with 7 measurements through the distribution of questionnaires, the highest number of acquisitions was obtained with a partial score mode value of 5 included in the category "Very knowledgeable" found in 6 indicator criteria, then with a partial score mode value of 3 included in the category "Know enough" found in the assessment of 1 indicator criteria.

Table 14 – Distribution of Respondents Based on Economic Aspects of the Suitability of Innovation in the Use of Coffee Processing Equipment in Central Lombok Regency

Indicator Criteria	Spread		Combined Score	Partial Score Mode	Category
	Number of people	%			
Tool benefits	21	35,0	33	5	Very knowing
Revenue gain	22	36,7	33	5	Very knowing
Economic improvement	36	60,0	33	3	Enough to know
Tool loss	21	35,0	33	5	Very knowing
Comparison of time and labour in modern and traditional ways	38	63,3	33	5	Very knowing
Comparison of modern and traditional income	21	35,0	33	5	Very knowing
Government policy on modern innovation	38	63,3	33	5	Very knowing

Assessment of the indicator criteria obtained by 21 respondents or (35%) included in the category "Very knowledgeable" with a partial score mode score of 5 on the economic aspect regarding the benefits of the tool, as many as 22 respondents or (36.7%) included in the category "Very knowledgeable" included in the category "Very knowledgeable" on the economic aspect regarding income gains, as many as 36 respondents or (60%) contained in the category "Know enough" on the financial aspects regarding economic improvement, as many as 21 respondents or (35%) included in the category "Very aware" on the monetary element regarding equipment losses, as many as 38 respondents or (63.3%) is contained in the category of "Very knowledgeable" on the economic aspect regarding the comparison of time and energy in modern and traditional ways, as many as 21 respondents or (35%) belong to the category "Very knowledgeable" on the economic aspect regarding the comparison of

modern and traditional ways of income and as many as 38 respondents or (63.3%) are included in the category "Very knowledgeable" on the economic aspect regarding government policies on modern innovation.

Sociocultural Aspects. Based on the results of research with innovation suitability variables that are non-technical in the use of coffee processing equipment through measurement indicators on sociocultural aspects, From the results of the assessment with five measurements through the distribution of questionnaires, the highest number of acquisitions is obtained with a partial mode score of 5 included in the "Very Knowing" category found in 3 indicator criteria, then with a partial score mode value of 4 including the "Knowing" category found in the assessment of 2 indicator criteria. For more details, the non-technical assessment results from the sociocultural aspects are contained in the seven indicator criteria presented in Table 15.

Table 15 – Distribution of Respondents Based on Sociocultural Aspects of the Suitability of Innovation in the Use of Coffee Processing Equipment in Central Lombok Regency

Indicator Criteria	Spread		Combined Score	Partial Score Mode	Category
	Number of people	%			
Positive influence on society	21	35,0	19	5	Know
Application of modern innovation programs	36	60,0	19	4	Know
The direct impact of modern innovation	21	35,0	19	5	Very knowing
Indirect impact	21	35,0	19	5	Very knowing
Increased added value	37	61,7	19	4	Know

The assessment of the first indicator criteria, namely regarding the sociocultural aspects of positive influence on society, was obtained by 21 respondents or (35%), with a partial score mode score of 5 included in the "Knowing" category, then as many as 36 respondents or (60%) contained in the "Knowing" category on sociocultural aspects regarding the implementation of modern innovation programs, 21 respondents or (35%) included in the "Very Knowing" category, in the sociocultural aspects regarding the direct impact of contemporary innovation, 21 respondents or (35%) included in the "Very Knowing"

category on sociocultural aspects regarding indirect impacts, as well as 37 respondents or (61.7%) are contained in the "Knowing" category on the sociocultural aspects regarding increasing added value.

Relationship between Farmer Responses and Innovation Appropriateness in the Use of Postharvest Equipment for Coffee Processing Units. The research results show a relationship between farmer responses and the suitability of innovation in using postharvest equipment for coffee processing units. More details can be seen in Figure 1.

Correlations				
			Respon Petani terhadap inovasi Alat Pascapanen Kopi	Kesesuaian Inovasi Modern Alat Pascapanen Kopi
Spearman's rho	Respon Petani terhadap Inovasi Alat Pascapanen Kopi	Correlation Coefficient	1,000	,949**
		Sig. (2-tailed)		0,000
		N	60	60
	Kesesuaian Inovasi Modern Alat Pascapanen Koi	Correlation Coefficient	,949**	1,000
		Sig. (2-tailed)	0,000	
		N	60	60

** . Correlation is significant at the 0.01 level (2-tailed).

Figure 1 – Results of Spearman's Rank Correlation Test regarding the Relationship between Appropriateness of Innovation and Farmer Responses in Their Use of Postharvest Coffee Processing Tools in Central Lombok Regency in 2023

Based on Figure 1, the Spearman rank correlation test results obtained a coefficient value (r_s) of 0.949, which is in the range of coefficient values from 0.75 to 1.00, so the results in a powerful category are obtained. This means there is a solid relationship between farmer response to the innovation of postharvest tools for coffee processing units and the suitability of modern innovations for postharvest tools for coffee processing units, namely 0.949. In addition, r_s is positive, which means that the higher the farmer's response to modern innovations for postharvest tools for coffee processing units, the higher the suitability of modern innovations for postharvest tools for coffee processing units, conversely the lower the response of farmers to modern innovations for postharvest tools for coffee processing units, the lower the suitability of modern innovations for postharvest tools for coffee processing units.

This clarifies that the farmer's response to modern innovations in postharvest equipment for coffee processing units and the suitability of contemporary innovations in postharvest equipment for coffee processing units is a complex relationship, especially in terms of several measurement aspects, namely, knowledge (cognitive aspect), attitude (affective aspect), ability to apply (psychomotor aspect), complexity (complexity), operational capability as well as economic and sociocultural factors.

Based on previous research, according to [3] regarding the policy of providing postharvest coffee technology and its development, the government has launched various postharvest coffee development policies. However, they are still running slowly and not in line with expectations. The government's attention to increasing added value and the competitiveness of agricultural products in rural areas has been relatively small

compared to efforts to increase agricultural production through crop cultivation. Limited means of postharvest handling and product processing, farmer knowledge, and the absence of attractive price incentives cause farmers not to follow the recommended postharvest handling and processing methods.

Judging from the availability of postharvest technology, Indonesia can improve the quality of coffee. The problem that needs attention is the institutional problem, especially for empowering farmer groups in the development of postharvest technology. Other factors that need attention to spread the use of alsintan, especially postharvest tools with good quality and affordable prices for alsintan by farmers.

CONCLUSIONS

The experience of farming and especially the needs of farmers in improving socio-economic with modern innovations as a substitute for traditional methods.

The suitability level of modern technological innovation in the form of postharvest equipment for coffee processing units in Central Lombok Regency is in the category of "Very good" or very knowledgeable in detail, as evidenced by the acquisition of a combined mode score of 116 from the score interval 111-131 obtained from the overall measurement results through technical indicators regarding complexity or operational capability, as well as from a non-technical perspective on economic and sociocultural aspects, from a technical point of view, the complexity and complexity of postharvest processing equipment for coffee processing is not an obstacle to modern technological innovation. So, the better the understanding of the complexity of the tools, the more suitable modern innovations will achieve the main goal, namely, one of the efforts expected to increase added value and competitiveness and farmers' income through proper and correct postharvest handling. From a non-technical perspective, covering socio-economic and sociocultural aspects, respondents felt a positive influence. Still, from a sociocultural perspective, direct and indirect impacts were touched by the community as positive things, including in-

creasing the economy in their environment, but the negative impact also affected, namely the sound of machine noise due to modern processing methods, as well as air pollution that can interfere with breathing.

There is a relationship between farmers' responses to the suitability of innovation in their use of postharvest equipment for coffee processing units, seen from the value of $r_s = 0.949$, which is in a powerful category and has a positive value, namely the higher the farmer's response to the use of postharvest equipment for coffee processing units, the higher the suitability of innovation for postharvest equipment for coffee processing units in the government assistance program in Central Lombok Regency. On the other hand, the lower the response of farmers to the use of postharvest equipment for coffee processing units, the lower the suitability of innovations for postharvest equipment for coffee processing units in government assistance programs in Central Lombok Regency. 949, which is included in the robust category and has a positive value, namely the higher the farmer's response to the use of the postharvest equipment for the coffee processing unit, the higher the suitability of the innovation of the postharvest tool for the coffee processing unit in the government assistance program in Central Lombok Regency. On the other hand, the lower the response of farmers to the use of postharvest equipment for coffee processing units, the lower the suitability of innovations for postharvest equipment for coffee processing units in government assistance programs in Central Lombok Regency. 949, which is included in the robust category and has a positive value, namely the higher the farmer's response to the use of the postharvest equipment for the coffee processing unit, the higher the suitability of the innovation of the postharvest tool for the coffee processing unit in the government assistance program in Central Lombok Regency. On the other hand, the lower the response of farmers to the use of postharvest equipment for coffee processing units, the lower the suitability of innovations for postharvest equipment for coffee processing units in government assistance programs in Central Lombok Regency.

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