

An Empowerment Model for Traditional Pitalah Duck Farmers in Riau Province-Indonesia

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Received July 16, 2022; Revised October 27, 2022; Accepted November 14, 2022

Cite This Paper in the Following Citation Styles

(a): [1] Kiagus Muhammad Zain Basriwijaya, Dwi Sunarti, Titik Ekowati, Wulan Sumekar, "An Empowerment Model for Traditional Pitalah Duck Farmers in Riau Province-Indonesia," *Universal Journal of Agricultural Research*, Vol. 10, No. 6, pp. 651 - 659, 2022. DOI: 10.13189/ujar.2022.100606.

(b): Kiagus Muhammad Zain Basriwijaya, Dwi Sunarti, Titik Ekowati, Wulan Sumekar (2022). *An Empowerment Model for Traditional Pitalah Duck Farmers in Riau Province-Indonesia*. *Universal Journal of Agricultural Research*, 10(6), 651 - 659. DOI: 10.13189/ujar.2022.100606.

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Abstract The purpose of this research is to create a model to enable traditional duck farmers to increase their income. The data in this study consisted of primary and secondary data. Primary data were collected through a questionnaire about farmer's attitude toward livestock business and income of the business of Pitalah ducks. Secondary data were collected from libraries and official sources related to the research. Respondents were 180 Pitalah duck breeders from 7 sub-districts. The research data were analyzed using Multiple Linear Regression after a Classic Assumption Test was performed to meet the criteria of BLUE (*Best Linear Unbiased Estimator*). The lowest revenue received from the business is Rp.10,647,082 while the highest revenue received is Rp. 24,852,811. This range of revenue is due to differences in the revenue received from the sale of eggs (including those consumed) and the final value they have. Real revenue is received from selling Pitalah Duck's eggs. The results of the regression analysis showed that X1 (knowledge) and X2 (attitude) did not affect the level of income. The value of X3 affected the level of income because of the efforts to increase the income of the farmers, to select the seeds produced, to provide feed and drink, to be responsive whenever there is sick cattle, and to accept new technology in order to increase the income of farmers.

Keywords Pitalah Ducks, Interest, Empowerment, Model, Traditional Farmer

1. Introduction

Livestock is one of the agricultural sub sectors that has an important role in providing animal protein. *Ducks commodity is a lot of cattle maintained by farmers on a scale people through production of eggs and meat*. Pitalah duck is one of the genetic resources of poultry that needs to be developed [1]. Pitalah duck is a livestock commodity which has potential to be developed due to their high yield of eggs production (180 – 200 eggs/year/head) with egg's weight around 60-70 g/gram, while the weight of a mature free-range duck is around 1464±246 g/head [2]. Pitalah Duck farming business will have big potential if the farmers can make its maintenance pattern more intensive, and if there is support from the local government [3].

The population of Pitalah duck is 248,919 [4], partly centralized in Rokan Hulu Regency, one of the new expanded districts (since 1999) in the Province of Riau. The people of Rokan Hulu are still a relatively traditional community, and most of them run a Pitalah duck farming business as a side business to increase their income [5,6]. Various studies have stated that the national duck farming business run by farmers has still not been able to contribute a maximum income [7] for the farmers [8]. The traditional scale in running the business has created obstacles in production, processing, capital, marketing, business climate, and human resource capabilities [9]. This issue is a challenge to increase Pitalah duck farming business in Rokan Hulu [10,11].

It is necessary to create an empowerment model in order to optimize small-scale duck farming business [12]. The model can have a positive impact on the income of Pitalah duck farmers. Therefore, it is necessary to research the attitude of the farmers of small-scale Pitalah duck farming in order to create a model of empowerment that can lead to increased income [13].

2. Research Methodology

This research was conducted in Rokan Hulu Regency, Riau Indonesia from February to July 2021. The respondents were 180-layer phase duck farmers from 7 districts. The research location was determined intentionally or purposively, while the farmers were selected randomly.

The data consisted of primary and secondary data. The data were collected through surveys, interviews, questionnaires, and field observation. Primary data were collected from respondents through a questionnaire covering the attitude of farmers regarding livestock

business and income of the Pitalah ducks farming Business. Secondary data were obtained from BPS and the Livestock Service Office of Rokan Hulu Regency.

Data Analysis

After the Classical Assumption Test was performed on the data in order to meet BLUE (*Best Linear Unbiased Estimator*) criteria, the data were then analyzed using Multiple Linear Regression by applying the following mathematical model:

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + e$$

- Y = Farmer's income
- a = Independent variable regression constant
- b = Coefficient
- X₁ = Knowledge
- X₂ = Farmer's Attitude
- X₃ = Skill
- e = Standard Error

The significance test was carried out partially (t-test), and simultaneously (F test), using the SPSS 20 program.

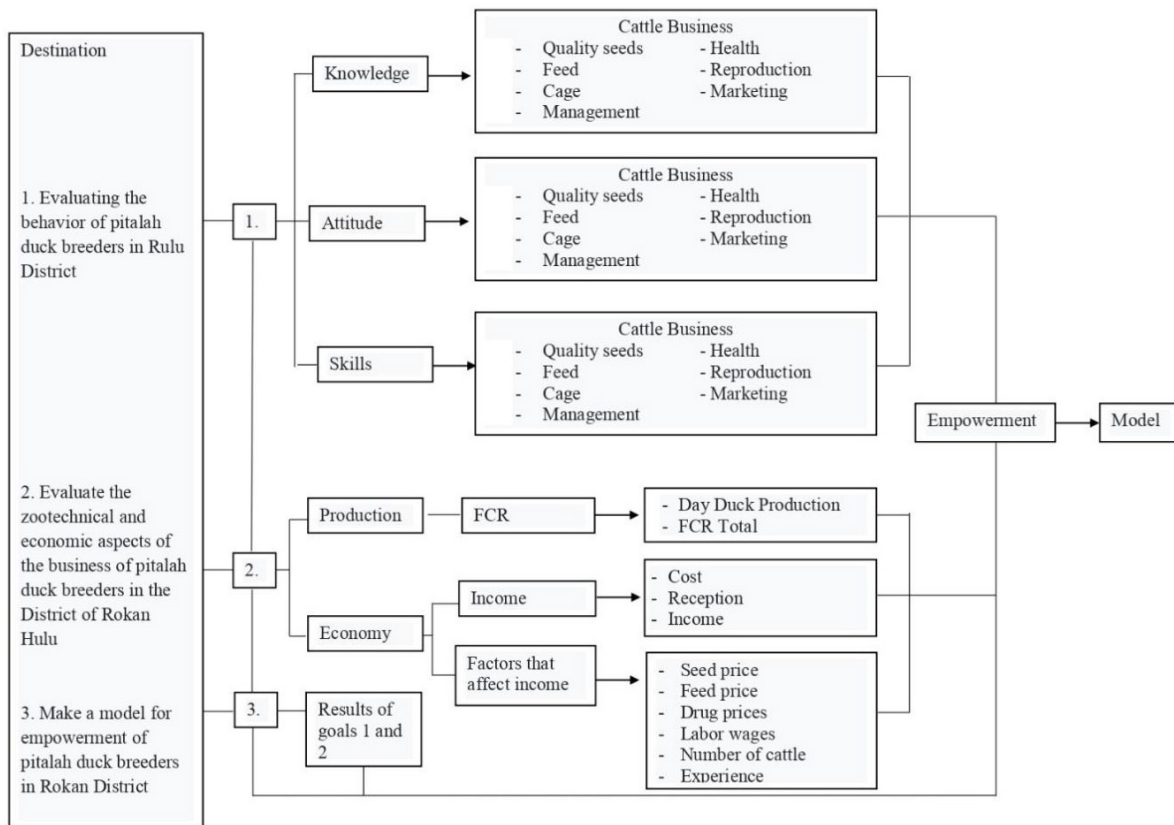


Figure 1. Framework

3. Results and Discussion

General Condition

Rokan Hulu is a regency in Riau Province, which is in the Northwest of Sumatra Island at 100° 0'-101° 52' East Longitude and 0° 15' -1° 30' North Latitude with an area of 94,622.60 ha. Rokan Hulu topographical features consist of undulating and hilly land with an average height of 636 m above sea level (asl). The air temperature in Rokan Hulu ranges from 21° - 31°C with an average rainfall of 3949 mm/year. The economy of Rokan Hulu Regency is dominated by the agricultural, forest, fisheries and manufacturing industry sector.

The large agricultural area in Rokan Hulu Regency supports the development of Pitalah duck farmings. The

population of ducks in 2016-2019 increased by 2.89% per year and in 2019 the population of Pitalah duck was 35,451 heads (BPS, 2020). The population increase in the number of pitalah ducks is not aligned with the increase in the production of productive eggs. According to the data from BPS, the egg production in 2016-2019 only increased by an average of 1.62% per year and the number of egg production in 2019 was 30,039,838 eggs.

Farmer Characteristics

The characteristics of the Pitalah Duck breeders in Rokan Hulu Regency describe the condition of the breeders related to their involvement in managing livestock business. The characteristics of breeders are presented in Table 1.

Table 1. Characteristics of Pitalah Duck Farmers

No	Farmer Identity	Total Farmer	
		People	percentage
1	Age		
	- < 30 years old	8	4.40
	- 30 – 55 years old	136	75.60
	- > 55 years old	36	20.00
2	Education		
	-Primary School	121	67.20
	- Junior High School	34	18.90
	- High School	21	11.70
	- Diploma	2	1.10
	-Bachelor Degree	2	1.10
3	Family Dependents		
	<4 people	127	70.60
	4-6 people	52	28.90
4	> 6 people	1	0.50
	Jobs		
	Farmer	81	45.00
	Duck Farming	59	32.80
	Farm Worker	14	7.80
	Government Employees	5	2.80
	Businessman	5	2.80
	Other	16	8.90
	Experience		
	< 5 year	62	34.40
	6-10 year	63	35.00
6	> 10 year	55	30.60
	Total of Livestock		
	< 50 ducks	70	39
	50-100 ducks	72	40
	> 100 ducks	38	21

The age of Pitalah duck breeders in Rokan Hulu Regency ranges from 20 to 78 years old. Most breeders were between the age of 30 and 55 years old, which was 91.10%. The younger the breeder's age (productive age 20-45 years old) is, the higher the interest they have in technology [14].

In terms of educational level, 67.20% of Pitalah duck breeders in Rokan Hulu Regency finished elementary school, and 18.90% finished junior high school. Only 2.20% finished high school. The level of education of the farmers is still categorized as lower middle class. The low education level of farmers may affect the adoption of technology [15]. States that education will increase knowledge, develop attitudes, and grow the interests of farmers, especially in dealing with changes. A low level of education is a factor inhibiting a person's progress. A [16] high level of education means a higher attitude and skill in accepting and implementing innovations [17].

The results showed that 70.60% of the farmers supported family < 4 family members while 28.90% of them supported 4-6 family members. Only 0.50% of the farmers supported > 6 family members. The number of family members the farmers have can be an advantage in terms of labor. This means that the easier it is for farmers to do business [18,19]. According to [20] on the dependency in family, the number of family dependents will affect the farmers' income.

The result of the study showed 35% of the farmers had less than 10 years of experience, and 60% had more than 10 years of experience. Livestock experience is an important factor that a farmer must have. This experience will help farmers make decisions related to all the policies to be implemented. Experience affects success, including in trying to decide to use capital sources, and, this experience influences decisions on livestock [21]. Every decision made is expected to be based on experience, whether it is your own experience or of others' [22].

Most livestock owners had fewer than 50 heads of Pitalah ducks, which accounted for 73.90% of the farmers. 40% of the farmers had more than 100 heads of Pitalah

ducks. Meanwhile, breeders who had 50-100 ducks were only 21.70%. The low number of livestock kept is because most of the farmers use livestock as savings or side business. The availability of time supported with high work productivity will affect the scale of livestock ownership (business scale) owned by farmers [23].

Behavioral Analysis

Zootechnical data on knowledge, attitudes, and skills of raising Pitalah ducks include knowledge of seeds, cages, feed, health, management, reproduction, and marketing. The zootechnical indicators were measured quantitatively using a Likert scale.

Farmer Knowledge on Zootechnics of Raising Pitalah Duck

Zootechnical data on knowledge of raising Pitalah ducks include the knowledge of seeds, cages, feed, health, management, reproduction, and marketing. The zootechnical indicators were measured quantitatively using a Likert scale. Table 2 shows that the zootechnical knowledge of Pitalah duck breeders is still low in all indicators. The knowledge of seeds, cages, feed, health, management, reproduction, and marketing is low. This poor knowledge is improved by implementing the aspects of the *Sapta Usaha* (The Seven Principles of Business) [24].

This study shows that the implementation of *Sapta Usaha* as a guide for Pitalah duck farmers still needs to be improved through outreach [25]. The role of a mentor is very important because a mentor can also become a source of information for farmers, who mostly only have secondary school education (67.20%). The outreach activities are not carried out by the mentor. The mentors of the outreach will come to the group if invited, or they will come because they have an interest in the livestock of a certain farmer group [25]

Table 2. Zootechnical Knowledge

No	Indicator	Score	Information
1.	Seeds	15	low
2.	Cage	17	low
3.	feed	16	low
4.	Health	16	low
5.	Management	15	low
6.	Reproduction	12	low
7.	Marketing	16	low
	Amount	107	low

Zootechnical Attitude of Pitalah Duck Farmer in Rokan Hulu Regency

A score of 192 on the assessment of the zootechnical attitude of Pitalah duck Farmer indicates the level of attitude of the sapta business (seedlings, cages, feed, health, management, reproduction, and marketing) of Pitalah duck breeders was good. The rating is on a good scale. The zootechnical attitude of the Pitalah duck breeders in the Regency is good. The evaluation of Sapta Usaha was classified as good, and only a little was classified as fairly good. The data are presented in the Table 3.

Based on the results of this assessment, it can be stated that the attitude of livestock farmers to Sapta Usaha as a guide for raising Pitalah ducks is in line with the expectations. Breeders have an independent attitude and believe that what they do in their business of Pitalah ducks is correct, and that they can cope and develop their business as they wish [25].

Livestock Breeder Skills of Zootechnics of Raising Pitalah Ducks

The score of 147 on the assessment of the zootechnical attitude of raising Pitalah ducks indicates that the level of Sapta Usaha skills (covering skills of seedlings, cages, feed, health, management, reproduction, and marketing) of Pitalah duck breeders is quite good. An assessment of 147 was obtained from the sum of the average values of each aspect of Sapta Usaha. In terms of skills, the skill level of Sapta Usaha (seedlings, cages, feed, health, management, reproduction, and marketing) of Pitalah duck breeders is very good. This score was obtained from the sum of the average values for each aspect of Sapta Usaha. The data are presented in the Table 4.

Based on the results of this assessment, it can be stated that the farmers' skills of Sapta Usaha, as a guide for Pitalah ducks farming business, vary even though there are no outreach activities. Livestock farmers have the skills

and independence. They believe that what they have done in the business is on the right track [26].

Income Analysis

From the analysis of Pitalah duck farmers' income, the average income/year of duck breeders in Rokan Hulu Regency is presented in the table 5.

The product of Pitalah Duck farming is eggs. The average sales revenue of Pitalah Duck eggs is based on the selling price of eggs varying from the lowest selling price of an average of Rp. 2,541/item to the highest price of Rp. 2.810/item. The total revenue received by Pitalah Duck breeders varies widely, ranging from the lowest revenue of Rp. 10,647,082 to the highest revenue of Rp. 24,852,811. This is due to differences in revenue from the sale of eggs (including those consumed) and the final value gained by farmers. Real revenue is gained from the cash of selling Pitalah Duck eggs. Real revenue is cash sales of the livestock business. Real revenue is the amount of income received from selling the products while the calculated revenue comes from the added value of livestock. On average, eggs are sold through traders who come to villages, and some of the eggs are sold directly outside the village or island in case of urgent need, such as when there are defects in the eggs, or when the farmers need immediate funds [27].

Factors Affecting Income

The independent variables in this study consisted of Knowledge (X1), Attitude (X2), and Skills (X3) and their influence on income. The research data were analyzed using multiple linear regression analysis (F test and T-test) which previously tested using the classical assumptions (normality, heteroscedasticity, multicollinearity) to meet the requirements of the BLUE (*Best Linear Unbias Estimator*).

Table 3. Zootechnical Attitudes

No	Indicator	Score	Information
1.	Seeds	28	Well
2.	Cage	26	Well
3.	feed	28	Well
4.	Health	28	Well
5.	Management	28	Well
6.	Reproduction	28	Well
7	Marketing	26	Well
	Amount	192	Well

Table 4. Zootechnical Skills

No	Indicator	Score	Information
1.	Seeds	42	Enough
2.	Cage	41	Enough
3.	feed	20	Enough
4.	Health	21	Enough
5.	Management	22	Enough
6.	Reproduction	21	Enough
7	Marketing	50	Enough
Amount		147	Enough

Table 5. Average Income/Year

No	Cost/Year	Total Cost (IDR/Year)	Average (IDR/Year)
1	Production cost	12,116,076	8,881,135
2	Reception	24,852,811	17,437,074
3	Income	9,201,760	9,162,232

Table 6. Linear Regression Analysis

Variable	Regression Coefficient	t-Count	Significance
Y = Income	-50179933.37	-1.972	0.056
X1 = Knowledge	-585107.306	-,562	0.577
X2 = Farmer's Attitude	286541,400	0.197	0.845
X3 = Skill	310319,382	2,657	0.012
R = 0.470			
R Square = 0.221			
Adjusted R Square = 0.158			
F- Count = 3.493			
F- Table = 2.85			
Sig F = 0.05			
t- Table = 2.026			
Sig t = 0.05			

Source: Primary data processed using SPSS 20 (2021)

As presented in Table 6, the values listed are used to describe the following regression equation:

$$Y = -50179933,37 + -585107,306 X_1 + 286541,400 X_2 + 310319,382 X_3 + e$$

Where:

Y = Income (Rp)/Year

a = Constant

b₁ = Knowledge Variable Regression Coefficient (X₁)

b₂ = Regression Coefficient of Farmer Attitude Variable (X₂)

b₃ = Skill Variable Regression Coefficient (X₃)

X₁ = Knowledge (score)

X₂ = Farmer Attitude (score)

X₃ = Skill (Score)

e = Standard Error

The contribution of the independent variable to the dependent variable in multiple linear regression should use an adjusted R square or written Adjusted R Square because it is adjusted to the number of independent variables used. Based on the results of the coefficient of determination test, it can be seen that the value of the coefficient of determination in Adjusted R Square is 0.158 which means Knowledge (X₁), Farmer Attitude (X₂), and Skills (X₃) can simultaneously affect the 15.8 % of Income variable (Y) while the remaining 84.2% of income is influenced by other variables that are not included in the model such as education level, breeder age, number of dependents and

other variables.

The results of the regression analysis show that X1 (knowledge) and X2 (attitude) did not affect the level of income because the farmers are used to implementing the same farming method they learned from their predecessors. They also do not get used to new things such as innovations. Therefore, the results obtained were less satisfactory. Breeders did not attend the outreach sessions regularly, did not play an active role, did not want to ask information related to good duck raising methods, did not properly care and take care of the ducks [28]. X3 value affects income levels because there have been efforts to increase farmers' income, to select the best seeds for production, to provide feed and drink, and to be responsive whenever there is sick, as well as having the ability to accept new technology to increase the income of farmers. By selecting good quality seeds, breeders can produce superior ducks with good quality egg [29].

Empowerment Model

The results of the regression showed that skills affect the level of income. Therefore, to further increase the level of income, an empowerment model is necessary to improve farming skills. The empowerment models include:

a. Seeds

The empowerment model for Pitalah seed selection skills is a zootechnical indicator of raising Pitalah ducks with the ability to determine the selection of seeds used. Breeders, in determining the selection of Pitalah duck seeds, are still based on their instinct or a belief that what they do is what is expected [30].

b. Cage

The empowerment model for cage selection skills indicates that the skills possessed about housing are not all good [31]. Most of the cages owned by breeders are still attached to the houses they live in and are usually placed behind the house or close to the kitchen, resulting in a less convenient production process and supervision [30].

c. Feed

The empowerment model for feed selection skills indicates that the skills related to forage that farmers possess are very good. Pitalah duck breeders have the knowledge that the feed given to Pitalah ducks must meet the nutrition requirement. The feed provided is forage and concentrate feed. Forage feed is given twice a day, in the afternoon and evening without weighing how much forage is given [32].

d. Health

The empowerment model for Pitalah duck's health management skills includes zootechnical indicators of raising Pitalah ducks that affect egg production and affect the farming activities of Pitalah ducks. The health of the

Pitalah ducks is highly dependent on the environmental conditions and the participation of Pitalah duck breeders in the care of their livestock [33]. Health management skills are realized through direct activities conducted by Pitalah duck breeders regarding the health of their livestock [34].

e. Management

The empowerment model for Handling Business Management skills in relation to the health of Pitalah Ducks according to breeders requires special attention. Pitalah ducks are living things that produce eggs every day. Pitalah ducks must be managed properly, and their health must be well taken care of [35]. Skills have to do with a person's knowledge and attitudes. A low level of knowledge with low attitudes towards the business in which they are engaged results in low skills. The management skills also include the maintenance of the cage and the surrounding environment in order to keep its cleanliness [36,37].

f. Empowerment models for Reproductive skills of Pitalah duck breeders do not include how to further process reproduction. They have never gained knowledge about how to handle mating. The skills to perform reproduction on the ducks are limited only to the handling of fertile eggs. It is the role of the outreach mentors to provide knowledge about how to improve skills to perform the reproduction of Pitalah ducks [37].

g. Marketing

Empowerment models for marketing skills according to Pitalah duck breeders are limited to selling eggs and selling compost [37]. The marketing skills possessed by farmers are not carried out through education. These skills are learned by doing. They follow the legacy of their parents. Breeders who are included in the livestock group have the convenience of marketing their Pitalah duck eggs [31].

4. Conclusions

Based on the results of the research conducted, it can be concluded as follows:

The assessment score of 147 of the zootechnical attitude of Pitalah duck farmers indicates that the level of *Sapta usaha* skills (skills of seedlings, managing cages, feeding, managing health, management, reproduction, and marketing) of Pitalah duck breeders is high. The results of the regression analysis show that X1 (knowledge) and X2 (attitude) did not affect the level of income because the farmers only rely on old way farming methods which have been passed through generations and the fact that they are not used to new things such as innovations. Thus, the results obtained are less satisfactory. Breeders did not attend outreach sessions regularly, did not play an active role, did not want to seek information related to good duck

farming methods, did not care for and take care of ducks properly [28]. X3 value affects income levels because there have been efforts to increase farmers' income, to select productive seeds, to provide feed and drink, and to be responsive whenever there is any duck that is sick, and also there has been the ability to accept new technology leading to the increase in farmer income.

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