The Performance of Extension Workers toward the Success of Rural Aquaculture Development Program in the East Sumba Regency, East Nusa Tenggara

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ABSTRACT

The Performance of Extension Workers Toward the Success of Rural Aquaculture Development Program in The East Sumba Regency, East Nusa Tenggara

The success of the aquaculture farming group in the development of rural aquaculture is highly determined by the cooperation and the commitment of the entire farming group, technical team, and extension institutions, particularly government employee and contract fishery assisting extension workers. The present study aimed to analyze the effects of extension workers' performance and direct community assistance on the success of the Rural Aquaculture Development Program (Pengembangan Usaha Mina Perdesaan Perikanan Budidaya – PUMP-PB) in the East Sumba Regency. Data was analyzed using a descriptive qualitative and partial least square (PLS) method. Data collection was carried out by interview, observation, and documentation. Meanwhile, a census sampling method was employed to select a total of 102 respondents from 17 groups, from which 6 persons were selected (3 persons in management and 3 persons as members). Results show that: 1) extension workers' performance have a highly significant influence on the success of the Rural Aquaculture Development Program in the East Sumba Regency, with facilitating the strengthening of Pokdakan agencies as a dominant extension workers performance indicator; 2) the direct community assistance from the Rural Venture Development of Aquaculture have a significant impact on the success of Rural Aquaculture Development Program in the East Sumba Regency, with distribution of direct community assistance as a dominant extension workers performance indicator; 3) collectively, both the extension workers' performance and the direct community assistance of PUMP-PB variables appears to have a significant influence on the success of the PUMP-PB program, with a coefficient of determination (R^2) value of 27.90%. The study suggests that it is imperative to increase the performance of extension workers in rural aquaculture development program in the East Sumba Regency, as it has been proven to have a positive impact on the success of the program. It is also necessary to extend the provision of direct community assistance, which has played a significant role in the success of the rural aquaculture development program. Further research is needed to determine other factors that may influence the success of the rural aquaculture development program in the East Sumba Regency.

Key words: performance, extension workers, success of the Rural Aquaculture Development Program

Background

The central government of Indonesia has named the East Nusa Tenggara Province (NTT) as one of the seaweed producing province in Indonesia. The province has become a producing area beacause it has a vast coastline, suitable for seaweed cultvation. The Bank Indonesia reported that in 2008 the NTT province produce 40% of the national seaweed demand. To date, the province is the third largest seaweed producer in the country. Within the province, producing areas include Flores islands, Timor, Rote, Sabu, and Sumba.

In general, the East Sumba Regency has 3,772 ha potential seaweed cultivating area, that comprise of 2,613 ha of potential fixed off-bottom system cultivating area, and 1,159 ha of potential raft long line cultivating area. From this total capacity, only 220 ha (8.4%) has been utilized for seaweed cultivation, in which 1,371 farm households are involved, distributed throughout 7 districts (Ministry of Marine Affairs and Fisheries for East Sumba, 2012).

The East Sumba Ministry of Marine Affairs and Fisheries (2012) reports that there are a number of issues that restrict the optimalization of the local capacity to cultivate seaweed. These include the limited number of skilled human resources that are involved in seaweed cultivation, the low work ethics of the seaweed cultivators, limited capital to purchace necessary equipments for seaweed cutivation (such as nylon rope, stakes, etc), supporting production means (rafts), post harvest means (drying rack/loft), insufficient infrastructure in the coastline, and disease contagion (such as the *ice ice* disease).

The afermentioned issues has been addressed by establishing a marine vocational school that provides a seaweed cultivation study program. This school aimed to increase and develop local skills in seaweed cultivation, through training and group assisstance, meeting with existing seaweed cultivators and field visits, and recruiting assissting extension workers. With regard to addressing the financial issue faced by seaweed cultivators in East Sumba, the local government, banks, and other stakeholders involved in the cultivation established a better coordination through meetings that encourage the achievement of common understanding and commitments.

Moreover, apart from existing financial institutions, seaweed cultivators are able to obtain capital from social funds, and government funds such as provided by the Indonesian Ministry of Marine Affairs and Fisheries through the National Community Empowerment Program for Marine Affairs and Fishries (*Program Nasional Pemberdayaan Masyarakat Mandiri – Kelautan dan Perikanan*- PNPM – MKP) since 2009, and the Rual Aquaculture Development (*Program (Pengembangan Usaha Mina Perdesaan Perikanan Budidaya*- PUMP – PB) since 2011 (Ministry of Marine Affairs and Fisheries for East Sumba, 2012).

The Rural Aquaculture Development Program, established by the Ministry of Marine Affairs and Fisheries, in its operations is integrated with the National Community Empowerment Program. This development program is a form of financial support provided for farmers or cultivators and laborers involved in fisheries, and are organized into a farmers' group.

The success of farmers' groups in the Rural Aquaculture Development Program is influenced by the performance and commitment of the entire farmers' group, technical team, and extension institutions, particularly government employee and contract fishery assisting extension workers. As such, it is thought that the success of

the program will be obtained when extension workers play their role well. However, little has been known about the influence of extension workers' performance on the success of the Rural Aquaculture Development Program in East Sumba Regency.

Research Questions
Given the above background, the present study considers the following research questions:
1. How does extension workers' performance influence the success of the Rural Aquaculture Development Program in the East Sumba Regency, East Nusa Tenggara?
2. How does direct communicty assisstance influence the success of the Rural Aquaculture Development Program in the East Sumba Regency, East Nusa Tenggara?
3. How does extension workers' performance and direct community assisstance collectively influence the success of the Rural Aquaculture Development Program in the East Sumba Regency, East Nusa Tenggara?

Research Objectives
The present study aims to:
1. To measure the influence of extension worker's perfomance on the success of the Rural Aquaculture Development Program in the East Sumba Regency, East Nusa Tenggara.
2. To measure the influence of direct community assisstance on the success of the Rural Aquaculture Development Program in the East Sumba Regency, East Nusa Tenggara.
3. To measure the collective influnce of extension workers' performance and direct community assisstance on the success of the Rural Aquaculture Development Program in the East Sumba Regency, East Nusa Tenggara.

Literature Review
The Definition of Performance
The work performance concept has been explained by numerous experts, such as Hasibuan in Yamin (2010), who define work performance as a result that one achieves by executing the tasks assigned to them, based on skills, experience, and seriousness.

Agricultural Extension
The task of an agricultural extension worker is to encourage farmers to change their way of thinking, their way of working, and their way of life in a manner that is more in line with the development of their role as educators, leaders, and advisors (Kertasapoetra, 1994).

Farmers' Group
The Indonesian Ministry of Agriculture (2008) define farmers' group as a farmers' organization that is established on the basis of shared interests, environmental conditions (social, economy, and resources), and the need to enhance and expand the business of their members. A farmers' group generally has a leader and would consist of 20-25 members, depending on the community and farming enterprise.

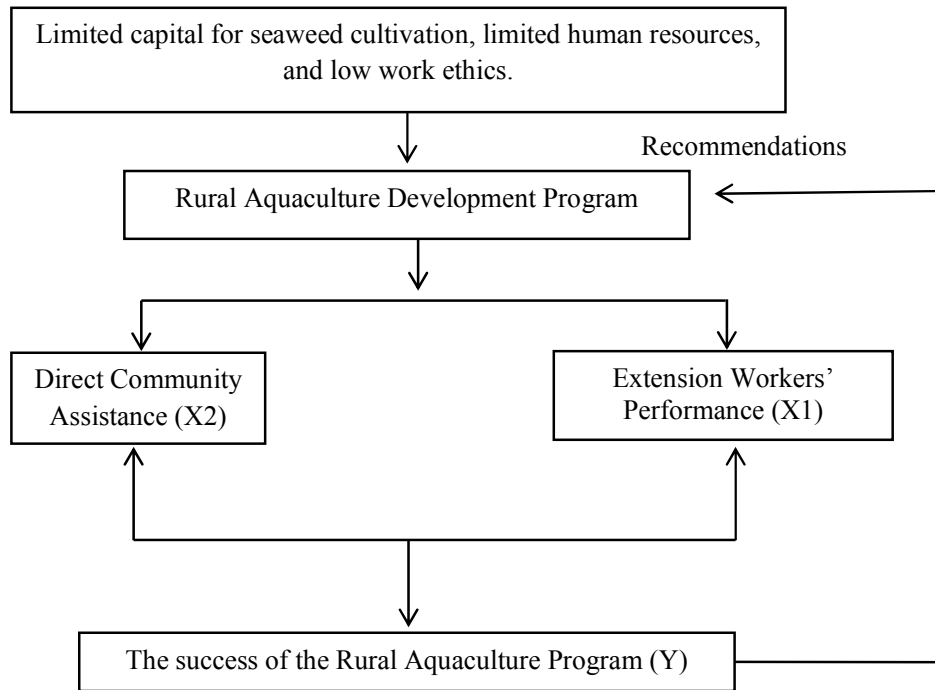## Research Framework and Hypotheses
Research Framework

Figure 1.
Research Framework for the Perfomance of Extension Workers toward the
Success of the Rural Aquaculture Development Program in East Sumba Regency

Hypotheses
As a basis for this study, the following hypotheses is considered:
1. The performance of extension workers has a positive and significant influence on the success of the Rural Aquaculture Development Program in East Sumba.
2. Direct community assistance has a positive and significant influence on on the success of the Rural Aquaculture Development Program in East Sumba.
3. The performance of extension workers and the direct community assistance has a positive and significant collective influence on the success of the Rural Aquaculture Development Program in East Sumba.

Research Methods
Research Design
The present study employed an explanatory research design approach, though conducting surveys, to test hypotheses on the relationship between independent and dependent variables (Singarimbun, 2006). The present study explored the effects of extension workers' performance on the success of the Rural Aquaculture Development Program in East Sumba Regency. To test the hypotheses on the relationship between dependent and independent variables, a partial least square (PLS) model was developed.

Population and Sample

Seaweed farmers' groups who received funds from the Rural Aquaculture Development Program in 2012-2013 were selected as sample for the study. From each groups, 6 members were selected as respondents, making a total of 102 respondents. These respondents were determined using the purposive sampling method, considering that 3 people in management and 3 members were selected from each group.

Data Analysis

Descriptive Analysis Approach

Data were analyzed descriptively, to explore and interpret the influence of extension workers' performance on the success of the Rural Aquaculture Develoment Progeam in East Sumba Regency.

Metode analisis deskriptif

Partial Least Square Analysis

In order to explore the effects of extension workers' perfomance and direct community assistance on the success of the Rural Aquaculture Development Program, data was analyzed using the partial least square method, 2.0 M3 version.

Farmers' income is measured from the difference between revenue and costs (Soekartawi, 2002), with the follwing formula

$$FI = TR - TC$$

Where:

FI = Farmers' Income

TR = Total Revenue

TC = Total Cost

Results and Discussion

Farmers' Characteristics

The present study involved a total of 102 respondents, from 17 farmers' group, who received assistance from the Rural Aquaculture development Program. Based on the survey conducted, the following section put forward a discussion on farmers' characteristics such as agr, education, and sex.

Age

Age may have a significant influence on farming activities, particularly the adoption of new technologoes. It is assumed that older the farmers are more reluctant to innovations and generally conduct their farming activities in the same manner as those in the are (Mardikanto, 1993). Table 1 summarized the age distribution of farmers in this study.

Tabel 1. Distribution of Respondents Based on Age

No	Age (year)	Number of Respondents	Percentage (%)
1	16 – 25	5	4.90
2	26 – 35	37	36.27
3	36 – 45	41	40.19
4	46 – 55	16	15.69
5	56 – 65	3	2.95
	Total	102	100

Source : Analyzed primary data (2015)

From Table 1, it can be seen that the majority of farmers are between the age of 36 and 45 (40.19%). Meanwhile, the oldest age group is between 56 and 65, comprising of 3 farmers. This implies that most farmers are in the productive age.

Education

It is assumed that education level will influence the ability of farmers in implementing a certain technology and policy established by the government. Results in Table 2 show that the majority of farmers (70.59%) only completed their formal education up to the elementary level. Only 9.80% of respondents completed their secondary education (senior secondary school). Simanjuntak (1985) asserts that education and training is one of the most important factors in developing human resources, because education and training will enhance one's knowledge and skills in work. In turn, this will influence one's productivity.

Tabel 2. Distribution of Respondents Based on Education

No	Education Level	Number of Respondents	Percentage (%)
1	Kindergarten	0	0
2	Elementary School	72	70.59
3	Junior Secondary School	20	19.61
4	Senior Secondary School	10	9.80
	Total	102	100

Source : Analyzed primary data (2015)

Sex

Table 3. summarizes the distribution of respondents based on their sex.

Tabel 3. Distribution of Respondents Based on Sex

No	Sex	Number of Respondents	Percentage (%)
1	Male	89	87.25
2	Female	13	12.75
	Total	102	100

Source : Analyzed primary data (2015)

Results from Table 3 show that the respondents in the present study comprises of 87.38% male and 12.62% female. This implies that there are opportunities for women to have a role in farming activities.

Income Analysis for Seawwed Cultivation

Seaweed farmers' income is calculated by subtracting total production costs from total revenue. Prior to intervention (assistance), farmers received Rp 360,123.74 from cultivating seaweed using the long line system. After receiving assistance, farmers obtained Rp 822,938.06. Meanwhile, farmers who employ the off-bottom system received an income of Rp 2,696,778.39 and Rp3,766,801.46 prior and post intervention respectively. Table 4 summarizes farmers' income from seaweed production during one production period.

Tabel 4. Farmers' income from Seaweed Production for One Production Period

No	Production	Total Revenue (Rp)	Total Costs (Rp)	Income (Rp)
1	SLLA	1,956,225.00	1,596,101.26	360,123.74
2	SLLP	2,522,820.00	1,699,881.94	822,938.06
3	SLDA	5,167,275.00	2,470,496.61	2,696,778.39
4	SLDP	6,716,215.00	2,949,413.54	3,766,801.46

Source : Analyzed primary data (2015)

The Performance of Extension Workers

The performance of extension workers (X_1) is an independent variable that comprises of 8 indicators. The highest performance of extension workers is demonstrated by the X1.8 indicator, that is assisting farmers' groups in developing a progress report. This indicator received a high score of 4.33. Meanwhile the lowest perfomance is demonstrated by the X1.4 indicator, which represents the effort to provide access to capital, production means, technology, and market to farmers' groups. This indicator scored 3.81, which falls under the 'good' category. The average perfomance of extension workers obtained a score of 4.12, under the 'good' category.

Based on this average cumulative score, it can be implied that the extension workers have executed their tasks well in providing assisstance for the Rural Aquaculture Development Program in the East Sumba Regency. Extension workers' perfomance in providing assistance for farmers' group in developing a progress report is received well. This is due to the fact that extension workers are available to assist farmers' group in contructing progress and monthly reports, to be submitted to the Ministry of Marine Affairs and Fisheries for East Sumba.

The role of extension workers in providing farmers' group with access to capital, production means, technology, and market is seen to be limited. This is demonstrated by the lack of access to alternative financial sources for farmers' groups, limited use of new technologies in seaweed cultivation, and seaweed market that is determined by the local government.

Direct Community Assistance

The direct community assistance (X_2) is an independent variable that is measured by 3 indicators. The highest scores were achieved by the beneficiaries requirements (X2.1) and direct community assistance distribution (X2.2) indicators, at the value of 4.21. The lowest score was obtained by the direct community assistance utilization indicator (X2.3), at the value of 4.20. On average, the direct community assistance variable received a score of 4.21, which falls under the 'very good' category.

Beneficiaries requirements and the distribution of direct community assistance is well received by the farmers' group. This can be said as the government has provided the community with useful information prior to proposing for the direct community assistance funds. Farmers' groups also report that they did not experience any major difficulties in fulfiling the beneficiary requirements.

The Success of the Rural Aquaculture Development Program

The success of the rural aquaculture development program (Y) is a dependent variable, measured by 1 inidcator. The success outcome of the program is categorized to be 'medium', with a score of 3.19. This result is supported by the results from the

income analysis, showing that farmers experience an increase in their incomes, for both long-line and off-bottom seaweed production systems.

To date, the presence of extension workers to assist farmers in farming activities is still needed to increase production. Results from analysis on the success of the Rural Aquaculture Development Program and farmers' income show that extension farmers play a significant role in increasing production and farm returns. This is in line with a study conducted by Subarna (2013), which concluded that the assistance of extension workers is highly needed at present. Mawardi (2005) and Subarna (2013) also assert that face-to-face extension contributes significantly to the increase of agricultural production.

However, there are 4 out of 10 indicators of successful outcome for the Rural Aquaculture Development Program that fall under the 'unsuccessful' category. These include the parameter that measures the ability of farmers' group to sell their produce and the ability to establish a partnership with potential partners or companies. This may be caused by the seaweed marketing zone set by the Ministry of Marine Affairs and Fisheries for East Sumba that restricts the farmers' ability to market their produce beyond this zone. This zone is comprised of 3 clusters, namely the seaweed farmers/cultivators, the local collectors, and the companies.

Other 'unsuccessful' indicators include the post-harvest processing of seaweed by farmers' group and the ability for the group to develop an on-farm enterprise. These may be caused by the limited skills of the human resources and insufficient production technologies.

The Relationship Between Extension Workers' Perfromance and Direct Community Assistance in the Success of the Rural Aquaculture Development Program

Data was analyzed using the Smart PLS program, version 2.0 M3. The data used are the average of all indicators within the variable. Values were held at average for variables that represents the perfromance of extension workers (X_1), direct community assistance (X_2), and the success of the Rural Aquaculture Development Program (Y). Table 5 summarizes the results of the analysis.

Tabel 5. Coefficient and Structural Path

Variable Relationship	Path Coefficient	*t-statistic*	Description
Perfromance of Extension Workers (X_1) ->The Success of the Rural Aquaculture Development Program	0.372	3.903	Positive and Highly Significant
Direct Community Assistance (X_2)->The Success of the Rural Aquaculture Development Program	0.209	2.235	Positive and Significant

Source : Analyzed primary data (2015)

Based on results dispyed in Table 5, the following structural equation can be constructed:

$Y = 0.372 (X_1) + 0.209 (X_2)$

Deriving from the results, hypotheses testing for each path are as follows:

1. Performance of extension workers (X_1) is proven to have a positive and highly significant influence on the success of the Rural Aquaculture Development Program (Y). This is demonstrated by the positive value of the path coefficient (0.372), with a t-statistic valueof 3.903 (t-statistic> 2.62).
2. Direct community assistance (X_2) is proven to have a positive and significant influence on the success of the Rural Aquaculture Development Program (Y). This is demonstrated by the positive path coefficient (0.209), with a t-statistic value of 2.235.
3. Collectively, performance of extension workers and direct community assistance have a positive and significant influence on the success of the Rural Aquaculture Development Program, with a coefficient of determination (R^2) value of 0.279. This implies that the variance of performance and direct assistance is able to explain 27.9% variance in the success of the Rural aquaculture Development Program. Meanwhile 72.1% of variance is explained by variables that were not included in the model such as farmers' characteristics, attitude, motivation, entrepreneurship of managers, leadership, knowledge of extension workers, and the support of local policies.

Figure 2 displays the structural model of the influence of extension workers' perfromance and direct community assistance on the success of the Rural Aquaculture Development Program. pendamping dan bantuan langsung
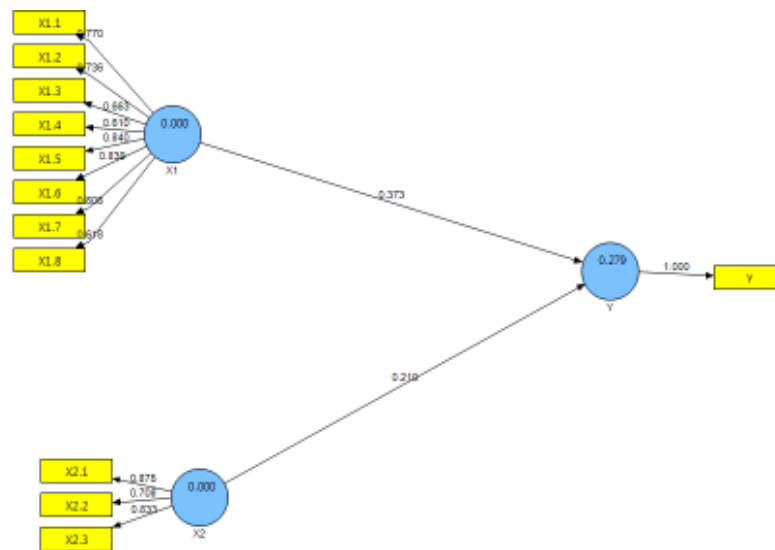

Figure 2. Structural Model

Conclusion and Recommendations

Conclusion

Based on the results discussed in previous sections, it can be concluded that:

1. Performance of extension workers have a significant influence on the success of the Rural Aquaculture Development Program in the East Sumba Regency, with facilitating the empowerment of farmers' organization as a dominant indicator of performance.

2. Direct community assistance has a significant influence of the success of the Rural Aquaculture Development Program in the East Sumba Regency, with the distribution of direct community assistance as a dominant indicator.
3. Collectively, performance of extension workers and direct community assistance has a significant influence on the success of the Rural Aquaculture Development Program, with a coefficient of determination (R^2) value of 27.90%.

Recommendation

Based on results from the present study, the following recommendations can be made:
1. It is imperative to increase the performance of extension workers in rural aquaculture development program in the East Sumba Regency, as it has been proven to have a positive impact on the success of the program.
2. It is necessary to extend the provision of direct community assistance, which has played a significant role in the success of the rural aquaculture development program.
3. This study has its limitations, and as such further research is needed to determine other factors that may influence the success of the rural aquaculture development program in the East Sumba Regency. Future research can be conducted particularly to explore the dynamics of the farmers' groups, the provision of infrastructure, and marketing process.

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