Evaluation of empowerment program to increase production capacity of fishery processing business in Semarang City, Indonesia

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Abstract. This study aims to evaluate the empowerment program to increase the production capacity of fishery product processing. Empowerment program was the implementation and utilization of science and technology in the area (IPTEKDA) LIPI Indonesia for Higher Education. Activity carried out in 2016 on fish processing industry "Lumintu Group". Implementation of activities includes the transfer of technology to increase production capacity, business capital assistance in the form of production equipment, production assistance, and business management. This study uses qualitative, descriptive analysis, data collection with observation, interviews, and questionnaires. The results showed that the total number of active members was 24 people, 50% of the members specially cultivated the smoked fish that is the type of Catfish (*Arius thalassinus*) and Stingray (*Dasyatis sp*), while 45.83% of members processed boneless milkfish, and 4,17% produce salted fish. Increased average production scale of 31.82% in smoked fish business, 12.4% in boneless milkfish and 38.89% in salted fish business. Willingness to return capital in the good category, meaning that all members were able to carry out the schedule of relative payback on time. Approximately 83.3% of the group members felt that the program that followed had greatly assisted in increasing the scale of business but hoped to improve skills in terms of processing and marketing.

Keywords: *empowerment, capital, improvement, production, fish processing*
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1. Introduction

One of the regional economic resources is the fishery sector. Increased population along with increased public incomes and increased appreciation of healthy food, which encouraged increased consumption of white meat [1]. Fish is the cheapest source of animal protein [2]. Utilization of fish resources will not produce benefits and high economic value if not followed by good business processing and marketing activities. Small and medium scale enterprises (SMEs) are generally regarded as the engine of economic growth and equitable development in developing economies [3].

The high level of public consumption of fish makes the business processing opportunities also more open. Processing can be defined as the method applied to the product from harvest to consumption period [4]. Processed fish products that are known among them are smoked fish, abon, salted fish, meatballs, nuggets, and skin crackers. Fish harvesting, handling, processing, and distribution provides the livelihood for many countries [5]. Fish is a perishable food material and its flavor and texture changes rapidly during storage after death. If fish is not sold fresh, preservation methods should be applied to extend it shelf-life. These include freezing, smoking, drying and beat treatment (sterilization, pasteurization, etc). The processing and preservation of fish were very important when top quality, maximum yield and highest possible profits are to be achieved [6]. Smoke fish is one way of processing fish that serve to preserve and give the aroma with a distinctive taste [7].

Fish processing industry is generally still done traditionally and small scale. Variations of processed fish in the year 2013-2014 the amount of production is increasing. The growth of processed fishery products in Semarang City during the period of 2010-2014 (Table 1).

Table 1. Processed Fishery Product Data of Semarang City (2014) in kilogram.

PROCESSED PRODUCTS (kg)	Year				
	2010	2011	2012	2013	2014
Bone-pulls Milkfish	-	26,788	27,591	49,920	37,800
Boneless Milkfish	-	-	878,623	944,660	2,107,918
Grilled fish cake	-	21,353	22	35,424	35,940
Smoke Fish	3,898	-	-	7,063,566	6,969,156
Fish boiled spice	679	2,243	2,310	2,400	2,400
Salted	38	49,837	51,332	306,528	2,434,728
Grilled marinade	-	36,365	37,520	48,108	44,760
Shrimp paste	1,267	-	-	903,936	862,200
Peeled shrimp	97,200	-	-	1,056,780	1,046,000
Others	1112	10855	10181	308496	224138

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Empowerment program aims to improve the independence of fisheries processing business actors. Associated with investment capital has been programmed during the year 2016 through empowerment program of the Application of Application and Utilization of Science and Technology In Regional (IPTEKDA) LIPI for Higher Education. The purpose of this program is to strengthen the performance of Micro Small and Medium Enterprises (MSMEs) sector in order to increase productivity and competitiveness through science and technology support scheme, capital, and entrepreneurship. Characteristics of this program are educational or not charity, science and technology oriented, and institutional strengthening of technology intermediation transfer group (KIAT) and sustainability in accordance with the local wisdom of each region.

Despite the fact that the fishery sub-sector accounts for a high enough percentage of Gross Regional Domestic Product of Central Java [8], most of the fish farmers including poor people and small-scale fish processing business operate with limited capital, traditional production methods. So, the empowerment program through technology transfer becomes important in order to improve the methods and management of production to improve business productivity. Even though, development of a universal measure of individual empowerment may not be a worthy or appropriate goal, because empowerment differs between individuals, context and time [9]. Individual empowerment measurements can give different results because empowerment can manifest in various forms of perception, behavior, competence, and action, and moreover, it may fluctuate over time [10].

One fish processing center is located in West Semarang District, especially in Krobokan Village. The fish process craftsmen in this village have formed a production group called Lumintu Group. In this group the production of preserved fish consists of smoked fish, soft-bone milkfish and salted fish. Types of fish that are usually preserved by fumigation are catfish (*Arius thalassinus*) and stingrays (*Dasyatis sp*). Milkfish especially processed to boneless milkfish and bone pulls milkfish, although sometimes produced grilled fish cake they called "*otak-otak*". Like most home industries is the scale of small businesses. Business scale is slow growing because business actors are constrained by the production equipment, such as refrigerator, high pressure cooker, and working capital. The purpose of this study is to evaluate the empowerment program to increase the production capacity of fishery product processing in Krobokan Village, Semarang Barat Sub-district, Semarang City.

2. Material and Mathod

This research was conducted from July to December 2016 in Krobokan Village, Semarang Barat Subdistrict, Semarang City. The method used in this research is the case study [11]. Census respondent collecting was done at Lumintu Group fish processing. The number of respondents was 24 people. Data Collection was obtained directly through interviews to the respondents by using questionnaire.

Methods of data analysis determine the response to the implementation of the program and perceptions of respondents to business continuity. Analyzed data was used the descriptive method. A five point Likertscale was used to elicit information on the level of responses to empowerment programs and perception of the respondents. The respondents were required to indicate the extent to which they agree or disagree with carefully constructed statements. The scale was indicated as follows: Strongly agree=5, agree=4, indifferent=3, disagree=2 and strongly disagree=1.

3. Result and Discussion

3.1. Socio-economic characteristics of respondents

Results presented in Table 1 illustrate the socio-economic characteristics of fish processors at Lumintu Group in Semarang city. The results showed that the mean age of respondents was 47.1 year. The implication is that the fish processors in the study area is constituted potential labor force[8]. As it is evident from the significantly high frequency of involvement of women in fish processing business, this implies that fish processing business is female dominated in the study area. About 66.7% of the respondents were female while only 33.3% was male. This is in agreement with [12] and [13], that woman were primarily responsible for post-harvest activities in fishery sector.

3.2. Effect of empowerment on production scale

Empowerment program whose main purpose is to increase production and productivity so that additional income can be achieved for family welfare. Table 2 shows that empowerment program has been able to increase business-scale of smoked fish business by 31.8%, 12.4% in boneless milkfish business and 38.89% in salted fishery business. Increased production is supported by technology transfer activities included in the empowerment program. Better technology makes fresh fish can be stored for the desired period without significant loss of quality. High-quality products and customer satisfaction can be achieved by fulfilling processing parameters ranging from operating to the storage and distribution of the final product. [14] and [15] have been noted that people not only adopt the technology as it is available to them. Even when technology is available and appropriate, decisions to adopt or not be influenced by personal and socio-cultural.

Table 2. Socio-economic characteristics of respondents

Variables	Frequency	Percentage	Mean
Age (year)			
Less than 40	6	25	47.1
40-49	5	20.83	
50-59	8	33.33	
>60	5	20.83	
Gender			
Male	8	33.3	
Female	16	66.7	
Educational Status			
No formal education	4	16.67	
Primary education	5	20.83	
Secondary education	4	16.67	
Tertiary education	8	33.33	
High education	3	12.50	
Processing fish experience			18.5
<10 Year	4	16.67	
10 -20 Year	8	33.33	
21-30 Year	10	41.67	
>30 Year	2	8.33	
Family Member			4.04
2-3 person	7	29.17	
4-5 person	14	58.33	
>5 person	3	12.50	

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The results of the evaluation showed that 50% of the members specially cultivated the smoked fish that is the type of Catfish (*Arius thalassinus*) and Stingray (*Dasyatis sp*), while 45.83% of members processed boneless milkfish, and 4.17% produce salted fish.

Table 3. Effect of empowerment on production scale.

Producers	Production		
	Before	After	Growth
Smoke fish	52.46	69.14	31.80
Boneless milkfish	21.29	23.93	12.40
Salted fish	10.8	15	38.89

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3.3. Constrain faced by fish processing producers

Of the perceived constraints to raise fish processing business (Table 3), the inadequate capital was the most severe (100%), which confirmed the findings of [3] and [16]. All of the respondents felt that high cost of fresh fish was the major constraint. Aliyah et al. [17] had noted that supply raw material was always a problem because producers were not able to afford the high cost of fresh fish.

Innovation and skills became a problem for 91.7% of respondents. The condition of fish processing in Semarang city with the level of mechanization of fish processing is still traditional and limited production. This condition is also reported by [18].[19] suggests appropriate processing technologies to enable maximum use of raw materials so as to contribute to improving economic. Research [20]on coastal community empowerment (fisherman processing) shows the condition of processed fish with the scale of micro/small and medium enterprises are still relatively powerless in obtaining economic access. In addition [21], explaining their business situation has a low level of empowerment.

Table 4. Constraint faced by fish processing producers.

Perceived Constraints	Frequency	Percentage	Percentage Rank
Inadequate capital	24	100	1
High cost of fresh fish	24	100	2
High cost innovation	22	91.7	3
Poor managerial skill	22	91.7	4
Lack of technical skill	22	91.7	5
Poor extension service	20	83.3	6
Poor transport facility	20	83.3	7
High cost of labor	18	75	8
Poor marketing structure	12	50	9
Water scarcity	6	25	10
to repay the installment of capital	4	16.7	11

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Willingness to return the installment of capital in a good category, meaning that all members are able to carry out schedule of relative payback on time. Approximately 83.3% of the group members felt the program that followed had helped a large scale increase of business, but hoped to improve skills in improving the quality of processing and marketing.

4. Conclusion

Based on the findings in this study, it is concluded that the implementation and utilization of science and technology in the area (IPTEKDA) LIPI Indonesia for Higher Education for empowerment program can increase the production capacity of fishery product processing. The fish processor has the will to implement the training program and complete the installment procedure as agreed in the activity. Support for the development of resources and production technology and innovation constraints is needed to increase the production of Indonesian fishery products..

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