



Analysis the Development of Oyster Cultivation (*Crassostrea sp.*) on Coastal Communities's Income

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Abstract. This study aims to determine the effect of cultivation on the income of the coastal community of Alue Naga Village, Syiah Kuala District, Banda Aceh City, which was carried out with mentoring, cultivation and technology variables. Seeing the extent of the contribution, the impact of mentoring on oyster cultivation on people's incomes. The research method used is descriptive quantitative, with data processing method using Statistical Packag For The Sociences (SPSS). The population in this study is the entire community of Alue Naga who cultivate oysters from 4 hamlets namely Musafir, Bunot, Kuntara and Podiamat hamlets totaling 164 people with a sample of 62 people. The results showed that the income contribution was 37.47% (assistance) and the income contribution was 23.72% (without assistance) with the difference in the value of income per individual, the difference was Rp. 639,000 thousand rupiah per month. From these results simultaneously mentoring and technology variables have a positive and significant effect on income, while the cultivation variable has no (negative) and insignificant effect on income, for more details it has been presented in this study.

Keywords: cooperative performance, modernization, people's economic condition

Abstrak. Pada penelitian ini tujuannya untuk mengetahui pengaruh budidaya terhadap pendapatan masyarakat pesisir Desa Alue Naga Kecamatan Syiah Kuala Kota Banda Aceh, yang dilakukan dengan variabel pendampingan, budidaya dan teknologi. Melihat sejauhmana pengaruh kontribusi, dampak adanya pendampingan pada budidaya tiram terhadap pendapatan masyarakat. Metode penelitian yang digunakan deskriptif kuantitatif, dengan metode pengolahan data menggunakan Statistical Packag For The Sociences (SPSS). Populasi dalam penelitian ini adalah seluruh masyarakat Alue Naga yang melakukan budidaya tiram dari 4 dusun yaitu Dusun Musafir, Bunot, Kuntara dan Podiamat berjumlah 164 orang dengan sampel 62 orang. Hasil penelitian menunjukkan kontribusi pendapatan sebesar 37,47 % (pendampingan) dan kontribusi pendapatan sebesar 23,72 % (tanpa pendampingan) dengan perbedaan nilai pendapatan per individu, selisih sebesar Rp.639.000 ribu rupiah per bulan. Dari hasil tersebut secara simultan variabel pendampingan dan teknologi berpengaruh positif dan signifikan terhadap pendapatan, sedangkan variabel budidaya tidak berpengaruh (negatif) dan tidak signifikan terhadap pendapatan, untuk lebih lengkapnya telah disajikan dalam penelitian ini.

Kata Kunci: AHP, Budidaya Perairan, Perikanan.

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1. Introduction

The coastal area which existed in Indonesia have many potential sources of nature that consists of plant and animal lived around the coastal. In this moment, the potential of nature source effort have been existed around the coastal were not used optimally to the coastal communities especially to increase economic income and the district development. According [1] the most potential sector of marine must be able to give the contribution throughout prosperity of upgrading Indonesia citizenry yet the reality of coastal communities were still lived in poverty as if cultural and structural. The majority of people lived in that area working as fisherman, they are really dependence with the usage of source effort coastal as fulfillment life necessary, source of establishment, and district development.

It was done by communities who lived in the coastal area of Aceh province, which is located at the Western tip of Sumatera region which makes Aceh become the most strategic position. The area of Aceh is 57.956,00 km² of land area, 29,611,11 km² of ocean area and consists of 663 islands along with 3 (three) archipelagos those are Banyak island cluster, Simeulue and Pulo Aceh. Aceh's coastal are are located in 4 cities and 13 districts, namely Banda Aceh, Sabang, Lhokseumawe and Langsa whereas the district ranging from Pidie, Pidie Jaya, Bireuen, Aceh Utara, Aceh Timur, Aceh Tamiang, Aceh Jaya, Aceh Barat, Nagan Raya, Aceh Barat Daya, Aceh Selatan, Singkil and Simeulue.

Each coastal area in the district or city has different resource characteristics, such as the city of Banda Aceh consisted of 9 sub-district and 90 villages. One of the sub-districts that has characteristics of potential coastal areas is Syiah Kuala district, precisely in Alue Naga village. The majority source of income Alue naga villagers as fisherman and oyster farmer (as like as sea shell). The outcomes they get from selling the oyster do not cover their daily life's necessary. Usually the fisherman only got a daily pay of Rp. 200.000 to 300.000 thousand once they return to sea.

It usually costs the operational not yet including boat oils, foods, and other equipments, because of the most fisherman do not have their own boats but those are belong to Boss (or Toke in Acehness) and the outcome of fish catching determined by an agreement with the boss before their departure. If it is calculated the average of Alue Naga fisherman's communities income around Rp.100.000–150.000 thousand Rupiah per week, however the income of their communities do not fulfill the National income standart, therefore they included in the group of poor people. The uniqueness of this village is majority of fishing profession carried out by men aged 17 to 60 years old, for women farmers around aged 15 to 68 years old. This profession had divided into their necessary of life, when their husband departure to the sea its not mean they will

bring their atch home, cause of that to anticipate some wives go to pond around the village by looking for oysters with their children.

The activity has been carried out by them before Tsunami disaster until now on, it becomes a hereditary profession of Alue naga communities. The interpretation way is still ver traditional system, the oysters should be submerged in water during 2 to 4 hours in a day and pry the oysters which ling in a wood or on tire-used around the river flow of Alue Naga Village. After they bring that home, the oysters's meat taken by its shells and put into in the plate or placed in plastic containers and sold. Otherwise. However, not all oysters sell well in the market, due to the small size of the oysters, which makes it less flavorful when cooked. Oyster's farmers began to look for solutions so that it will be harvested and sould out in the market and increased demand. So the farmers began to cultivate oysters by making ponds, the goal is to produce large size oysters, gived a good taste when processed into special dishes such as oyster peppers, oyster curry and fried oysters. During the cultivation process, the farmers were given assistance by Natural Food Aceh on how to develop oysters today without having to soak in water for a long time.

The assistancy program taught about creativity, the cultivation's way, the processing to be some snacks such as oysters chip, nuggets, sausages, increasing the productivity and working management. So, the oysters potential can be used optimally and the cultivation also can develop from Traditional into Modern so it will give the good harvest result to market demand. Now on, the oyster farmers only get a profit about Rp.50.000–100.000 thousand rupiah once they sell it after harvested, the farmers expect that there will be an increase after assistance, cultivation with technology in order to increase income.

Oysters are a type of sea shellfish in the form of a bit limp/mushy and its meat contains vitamin A, the high nutritional meat in it makes oysters as the most popular sea food in Banda Aceh city and even outside Aceh Province till abroad. With the potential for Oysters in Alue Naga Village, a private agency, Natural Food Aceh, is interested in creating a long-term mentoring program so that the productivity of farmer's oysters continue to increase. The mentoring program is provided to the community as cultivation development, skill improvement and utilization of local potential as an economic source and making Alue Naga Village as the best oyster-producing village in Aceh province. The method provided by the companion makes oyster farmers interested, hopefully that will increase the community incomes and make Alue Naga village into a center for oyster marine resources.



Figure 1. Oyster village Alue Naga

1.1 Research Question

According to overview above, the researcher comes up with the following three research questions:

1. How is the contribution of oyster cultivation toward coastal communities's income?
2. Is there an impact with assistance carried out on the coastal communities's income?
3. Are there some factors through assistance, cultivation and technology affect the communities's income?

1.2 The aims of Research

The aims of this research are:

1. To analyze the contribution of oyster cultivation through coastal communities's income,
2. To analyze the impact through coastal communities's income,
3. Analyzing the influence of assistance, cultivation and technology on coastal communities's income.

2. Method

This research method used is descriptive quantitative, it is a systematic scientific research in the part and phenomena along with connection with this research. The research was conducted in Alue Naga village, Syiah Kuala district, Banda Aceh city. It's because of this village famous with its marine resources, namely oysters and their communities were still in poverty line. The focus of research was on the communities especially women and fishermen's children which become the oyster's farmer. The population of research was an entire of Alue Naga communities who cultivate oysters from 4 hamlets there were Musafir, Bunot, Kuntara and Podiamat hamlets totalling 164. The sample is a part of number and characteristic possessed by the population [2]. Next, the sample will be calculated using the Slovin formula as follows:

$$n = \frac{N}{1 + N(e)^2} \qquad n = \frac{164}{(1) + 164 \times 0,01} \qquad n = \frac{164}{2,64} = 62,12$$

After calculating the number of samples obtained as much as 62,12 then rounded up to 62. The number of samples will be divided to two, those are 31 people who were assisted by Natural Food Aceh company as 31 samples and rest of them carried out by individual cultivation.

2.1 The impact analysis using (Unpaired Sample T-Test)

To examine the differences of two samples which interconnected but differences treatment of cultivation with assistance and individuals, so that a t-test must be carried out, it used to evaluate a certain (treatment) on the same samples of two difference observation period. According to [3], paired sample t-test is one of testing-method used to assess the effectiveness of treatment, marked by differences between the average before and after being given treatment. The basis for making an acceptance or rejection decisions of H_0 in this test as follows:

1. If $t \text{ count} > t \text{ table}$ and probability (Asymp.Sig) $< 0,05$, then H_0 is rejected and H_a is accepted.
2. If $t \text{ count} < t \text{ table}$ dan probability (Asymp.Sig) $> 0,05$ then H_0 is accepted and H_a is rejected.

So, it is calculated by the formula.

$$t = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Description :

t = value of communities's income

S_1^2 = value of communities's income

S_2^2 = value of second variance

\overline{X}_1 = First sample

\overline{X}_2 = Second sample

N_1 = Number of first sample

N_2 = Number of second sample

3. Result & Discussion

3.1 Reability Test

Reability testing was carried out by the *Cronbach's Alpha* statistical test measuring instrument. A certain or variable said to be reliable if the value of *Cronbach's alpha* $> 0,60$. The results of reliability can be seen in the Table 1 as follows:

Table 1. Results of Reability test

Variable	Cronbac'h Alpha	Description
Assistence	0,880	Reliable
Cultivation	0,923	Reliable
Technology	0,929	Reliable
Communities Income	0,900	Reliable

From the description of table 1 above, it can be seen that each variable has *Cronbac'h Alpha* $> 0,60$. Thus the variable (assistence, cultivation, technology, communities's income) are said *reliable*.

3.2 Auto Correlation

This test aims to determine the linear regression model, whereas there is correlation or no., according to (Gujarati: 2003) it is called auto correlation because the context/correlation between members of a series observation ordered by time or space, this test is carried out using the Durbin-Watson (DW-test) with a significance level of 0,05.

Table 2. Result of auto correlation

Model	Change Statistic					Durbin-Watson
	R Square Change	F Change	df1	df2	Sig. F Change	
1	.866	124.764	3	58	.000	1.818

The results in the Table 2 above show that the statistical processing assisted by SPSS program appointing a Durbin-Watson value of 1,818 Comparison with a significant value of 5%, the number of sample is 62 (n) and the independent variable is 3 (k=3). Therefore, the value of DW is greater than 1 smaller than 4 or $1 > 1,818 < 4$, so there is no auto correlation.

3.3 Paired Samples Test

3.3.1 The impact of Mentoring towards Income of Coastal communities

Table 3. Results of Output Paired Samples Test

		Mean	N	Std. Deviation	Std. Error Mean
Pretest (without assistance)	Assistance	9.10	31	3.078	.562
	Income	11.40	31	2.513	.459
Protest (Assistance)	Assistance	32.47	31	6.842	1.249
	Income	16.23	31	3.421	.625

It is known that the mean value of variable without assistance smaller than the mean value of assistance which means this test is accepted. This can be seen in Table 3 without assistance Mean value is 9.10 with a sample of 31 people, Std. Deviation 3.078 with Std. Error mean 0.562 and the income without assistance Mean value is 11.40, number of sample 31 Std. Deviation 2.513 and Std. Error mean 0.459. meanwhile, for those who use assistance Mean value is 32.47 with a sample of 31 people, Std. Deviation 6.842 with Std. Error mean 1.249 and the income which done by assistance Mean is 32.47, number of sample are 31 people, with Std. Deviation 6.842 and Std. error mean 1.249. Based on the mean results, a value of mean with assistance is greeter than without assistance, so the test is accepted.

3.3.2 Paired Samples Correlations

Table 4. Result of Output Paired Samples Correlation

		N	Correlation	Sig.
Pretest	Income	31	.222	.038
Protest	Income	31	1.000	.638

According to results on Table 4 that the correlation value in between variable (protest) on income has a correlation value of 0.222 with a significant value of 0.038 which means that a correlation without assistance affect negatively toward income. Meanwhile, the correlation value between variable (protest) on income has a correlation value of 1.000 with a significant value of 0.638 means that a correlation with assistance affect positively toward Income. The following is mentioned in Table 5, as follows:

	Paired Differences				T	df	Sig. (2-tailed)	
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower				Upper
Pretest - Income	2.300	2.515	.566	3.613	5.987	3.584	.021	
Pretest - Income	16.233	3.421	.791	14.956	17.511	25.992	.183	

It is known that the mean without assistance is 2.300, that shows the difference value between mean of assistance on income at the range of 3.613 to 5.987 (lower and Upper values) with a significant value of 0.021 it is less than 0.05 while t-count value is 3.584 and t-table (df-1=30) is 2.04227 that means H₀ rejected and H_a accepted. For mean in assistance towards income 16.233, it shows the difference value of mean toward income at the range of 14.956 to 17.511 (lower and Upper values). The significant value of 0.183 greater than 0.05 while a value of t-count is 25.992 and t-table (df-1=30) is 2.04227 means that H₀ accepted and H_a accepted, so the differences income between assistance and without assistance show a greater differences by significant value of 0.183.

The result is the comparison between income with assistance and without assistance show the difference greater value, in using assistance with a value of 0.183

4.3.3 Result of T-Test

By doing t-test, it will be known whether the variables of assistance, cultivation and technology have some effects on people's income. Testing by comparing t-table with t-count. looking for t-table with criteria = 5% (0,05), df = n - k (62 - 3 = 59). The amount of t-count for each variable can be seen in Table 6, as follows:

Table 6. T-Test

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	.202	.917		.220	.826
Assistance	.687	.115	.657	5.951	.000
Cultivation	-.069	.104	-.063	-.667	.507
Technology	.350	.147	.346	2.385	.020

From the regression results in Table 6 above, it can be explained that the results of empirical assistance test (X₁) on people's income (Y) show a t-count value is 5,951 > t-table 2.000 (α 0,05) and a probability value (Sig.) is 0,000 which under alpha 5%. Mean that a variable X₁ has positive and significance effect toward people's income (Y). The result of cultivation test (X₂) on people's income (Y) show a t-count value is -0.667 < t-table 2.000 (α 0,05) and a probability value (Sig.) is 0,507 up to alpha 5%. Because of a value is greater than (0,05) the basic stipulation of partial cultivation test (X₂) has negative and no significance effect toward people's income (Y). The result of empirical technology test (X₃) on people's income (Y) show a t-count value is 2.385 > t-table

2.000 (α 0,05) and a probability value (Sig.) is 0,020 under alpha 5%. Because of a value is lower than (0,05) the basic stipulation of partial technology test (X3) has positive and significance effect toward people's income Y). The result is "Analysis of the development Oyster Cultivation (*Crassostrea sp.*) towards communities's income of Alue Naga village, Syiah Kuala district, Banda Aceh City", known as regression equation model obtained is: $Y = 0.202 + 0,687X_1 + -0,069 X_2 + 0,350 X_3$

The constant value is 0.202. If variable of people's income, then assistance, cultivation and technology will move up by 0.202. From the multiple linear regression equation, it can be concluded that income variable has an influence on the mentoring variable, technology and has no effect on the cultivation variable.

The coefficient of communities's income influence a mentoring is amount of 0,687; and the coefficient of communities's income influence the cultivation is amount of -0,069, and coefficient of communities's income influence a technology is amount of 0,350

4. Discussion

4.1 The effect of Mentoring on Incomes

The mentoring is a way used by company, agency and government in order to empower a limited resource in agriculture, fisheries and animals husbandry in assisting individuals/groups in achieving their goals and it is usually tied to a system of cooperation that is mutually beneficial to both parties. Directorate of Social Affairs RI, mentoring is a strategy that will determine success of community empowerment programs, in accordance with the principle of helping people. According to Sumodiningrat, mentoring is an activity that is believed to encourage the empowerment of poverty optimally.

This is also accordance with [4] under the title "The effect of fisherman's income towards Economic improvement in Wewanggriu village, Malili district, East Luwu Regency, South Sulawesi. The aim of research is to find whether the fisherman's income affect through economic activities of the community. The variables used are fisherman's income (X) and economic improvement (Y) the result achieved is fisherman's income have positive and significant effect on economic activities carried out by the local community.

After doing research on the effect of mentoring, cultivation and technology on people's income, the results of statistical processing assisted by SPSS program show that the R square (R^2) coefficient test is $0,866 = 86,6 \%$. This means that an independent variable (assistance, cultivation and technology) are able to explain the dependent variable (community's income) amount of 86,6 %, while the remaining 13,4 % is explained in other variables not included in this study. Based on T-count value amount of 5.951 (positive) and probability calculated is $0.00 < 0,05$ of the specified probability.

Based on these results, it can be concluded that the independent variable is partially able to explain changes in independent variable or the model is declared feasible or suitable in influencing the improvement of communities's Income of Alue Naga village. In accordance with previous research related to this study, the reference [5], namely assistance of coastal communities in seaweed cultivation during the covid-19 pandemic in tira village, sampolawa district, south button regency, aims to find out the implementation of assistance to coastal communities to increase economic income and survive the wve season situation which adds to the burden on the local community. The Conclusion obtained is that mentoring activities on alternative coastal-based cultivation that encourages community welfare. The results obtained by providing assistance to the people of alue naga village:

1. Oyster farmers can process raw materials into finished material such as crackers, nuggets and oyster peppers.
2. The way of packing finished oyster, become more modern and accepted in the market,
3. The price of processed oyster is higher in the market,
4. Demand for oyster is increasing,
5. Open new job oportunities.

4.2 The Effect of Cultivation on the Household's Income

According to [6] cultivation is a development carried out by the community in order to get results that are able to meet basic human needs. According to the KBBI (Big Indonesian Dictionary) cultivation is a useful and profitable business. In Government Regulation number 18 of 2010 concerning cultivation business, it is one of the development and utilization activities of natural resources carried out by humans by using capital, technology or other resources to produce a product in the form of goods that can meet human needs.

The next independent variable (independent) is cultivation which is included in testing its effect on income, the results show a t-count value of -0.667 (negative) and a probability value (Sig.) of 0.507 which is above alpha 5%. Because the value is greater than (0.05) then the basic provisions of the partial test of cultivation (X2) have no effect and are not significant on people's income (Y).

Previous research was also conducted [7] Income Analysis of Broiler Farmers in the Partnership System in Gunung Pati District, Semarang City, where the effect of the length of maintenance (cultivation) is not significant, due to the pattern of rearing carried out by broiler farmers in Gunung Pati not so similar depending on the needs of the company. [8] entitled The Relationship Between Business Scale And Income To Broiler Farmers Who Do Partnerships in Maros Regency stated that the results of the tests carried out showed that the results of business scale did not affect the income of breeders who partnered with PT. Satwa Indo Perkasa, it means that the larger the scale of broiler farming business that is managed by the breeder, the greater the income earned by the breeder in partnership with PT. Ciomas, Adisatwa Maros Regency According [9] states

that aquaculture is a form of human intervention in increasing water productivity. Furthermore, according to [10] Cultivation is an activity to produce and develop biota (organisms) in a controlled environment in order to gain profit.

The results obtained with cultivation are not significant to people's income, this is due to:

- 1.The size of the resulting oyster is larger, but the selling value remains the same
- 2.The yields obtained did not meet the expectations of farmers
- 3.The basket as a container for developing oyster seeds is limited in size, so the number of harvests is small,
- 4.Overloading causes not having a gallon as a container to hold the weight of the oyster in the basket, so it sinks to the bottom of the water and causes the oyster to die before harvest

4.3 The effect of technology on Income

According to [11], besides that, the term technology is widely understood by ordinary people as machines. If it is concluded that technology is a tool created to facilitate access to human life. Technology always has a system that has been programmed to help solve problems in humans and make it easier to get something.

Technology as a simple understanding is artificial goods, use and knowledge of tools, techniques, crafts, systems or methods and management. The term technology comes from the Greek word Tehnologia, techne means art/craft and logia is something or a branch of scientific discipline [12]. Technology is also referred to as a tool that helps human work to be more accurate, faster and reduce errors.

The test results have an influence caused by technology on income in the form of empirical test results of technology (X3) on people's income (Y) showing the t-count value of 2,385 (positive) and the probability value (Sig.) of 0.020 which is below alpha 5% or 0 ,05.

Because the value is smaller than (0.05), the basic provisions of the partial test of technology (X3) have a significant effect on the income of the coastal community (Y) of Alue Naga Village. In line with the research of Zainura et al. (2016) entitled Study of Oyster Enlargement (*Crassostrea* sp) through a different layout design, this study uses an experimental method with vertical, horizontal layout of oysters and placing oyster seeds on the bottom of the water with a rock substrate, with the help of bamboo tools, rope nets and wood. The results obtained that different position positions greatly affect the enlargement of oysters, length of oyster size, oyster weight, shell thickness and development of oysters.

This is in line with the research conducted by Junaidi et al. (2021) entitled Increasing the Productivity of Floating Net Cages with Integrated Pearl Shell Cultivation System in North

Lombok Regency. This research was conducted using the technology transfer method with pre-arranged stages carried out according to the community service program (PKM).

The results obtained using this technology produce, two functions of floating net cages (KJA), firstly as a developer of pearl shells and lobsters and fish. The purpose of doing this is to improve the quality of life and increase people's financial resources. And also the technology used, can cultivate 2 (two) habitats, namely lobster and clams in one floating net cage (KJA).

5. Concluision

It can be concluded that the technology discussed is the tool used in developing, the more environmentally friendly, flexible and modern the tool is, the easier it is for farmers to harvest oysters.

1. The frame is made of iron, it is not waterproof so that every harvest farmers have to pay to replace the frame,
2. A lot of oysters stick to the used tires in the first harvest, when the next harvest decreases because the oysters don't stick to the surface of the tires that have been pasted with oysters
3. The cost of equipment maintenance is greater than the selling value of the oyster harvest
4. Farmers are less skilled in installing the tools needed at the cage location, thus requiring additional service fees for builders.

References

- [1] Kusnadi, 2002, Konflik Sosial Nelayan, Kemiskinan Dan Perebutan Sumber Daya Perikanan , LKis, Yogyakarta.
- [2] Sugiyono, 2008. Metode Penelitian Kuantitatif Kualitatif dan R & D. Bandung : Alfabeta.
- [3] Widiyanto, 2013. Statistika Terapan, Jakarta : PT Elex Media Komputindo
- [4] Nurbaya, 2009. Pengaruh Pendapatan Nelayan Terhadap Peningkatan Ekonomi Di Desa Wewangriu Kecamatan Malili Kabupaten Luwu Timur Sulawesi Selatan. Skripsi. Makassar. Program Studi Ilmu Ekonomi Studi Pembangunan Fakultas Ekonomi Dan Bisnis Universitas Muhammadiyah Makassar.
- [5] Rudi A, 2021. Pendampingan Masyarakat Pesisir Dalam Budidaya Rumput Laut Pada Masa Pandemi Covid-19 Di Desa Tira, Kecamatan Sampolawa Kabupaten Buton Selatan. Jurnal Altifani. Vol. 1 No. 2.
- [6] Sun, Li, Chanchai Bunchapattanasakda. 2019. Employee Engagement: A Literature Review. International Journal of Human Resource Studies. Vol. 9.
- [7] Ratnasari, R. W Sarengat, Setiadi A. 2015. Analisis Pendapatan Peternak Ayam Broiler Pada Sistem Kemitraan Di Kecamatan Gunung Pati Kota Semarang. *Animal Agriculture Journal* 4(1): 47-53.
- [8] Siregar, Baldric, Bambang Suropto, Dodi Hapsori. dkk. 2014. Akuntansi Biaya. Edisi 2. Jakarta: Salemba Empat.

- [9] Saparinto C, 2008. Panduan Lengkap Gurami. Jakarta. Swadaya.
- [10] Setiyawan B. 2016. Pengembangan budidaya air tawar rekreatif di Karanganyar[skripsi]. Surakarta (ID) : Universitas Muhammadiyah Surakarta.
- [11] Bambang W. (2008) Teknologi Pembelajaran: Landasan & Aplikasinya, Jakarta: Rineka.
- [12] Kuswana W.S. 2013. Filsafat Pendidikan Teknologi, Vokasi dan Kejujuran. Bandung, Alfabeta