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## **Foreword from Editor-in Chief**

Praise be to our gratitude to pray for the presence of Almighty God, for His permission we can publish International Journal of Regional Innovation (IJORI) Volume 2 Number 3, August 2022.

Along with the increasing advancement of technology and science and human resources, the results of research and scientific refutations of innovation need to be published and can be accessed easily and quickly by readers.

This edition presents 5 (five) journals which include: (1) Integrated Ultra Low Invasion–Nanoparticles Drilling Fluid (ULIN): Drilling Additives with Low Environmental Impact as Innovation to Solve Common Drilling Issues, (2) The Influence of Brand Image, Price and Packaging Design on thePurchase Decision of Pixy Brand Cosmetics (Study on Users in Bandar Lampung), (3) Ecology-Based Coastal Community Empowerment Innovation in Batu Beriga Village, Central Bangka Regency, (4) The Effect of Online Customer Review and E-Service Quality on Consumer Purchase Decisions on the Marketplace Shopee in Bandar Lampung, (5) Public Service Innovation as a Strategy for Increasing Regional Innovation in Probolinggo City.

Our gratitude goes to the researchers and other functionalities who have participated in submitting papers for the continuity of this journal. We do not forget to thank peer-review who have helped to make this journal published.

We look forward to suggestions and criticism for the improvement of future publications, and hopefully the ongoing cooperation can be improved.

Bandung, August 2022

Redaction

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Sasa Aulia (Gadjah Mada University, Bulaksumur, Caturtunggal, Sleman Regency, Special Region of Yogyakarta 55281)

Integrated Ultra Low Invasion–Nanoparticles Drilling Fluid (ULIN): Drilling Additives with Low Environmental Impact as Innovation to Solve Common Drilling Issues

*INTERNATIONAL JOURNAL OF REGIONAL INNOVATION, August 2022, vol 2, no 3, p.1-7, 0 ill, 0 tab, 10 ref*

Drilling issues is extremely costly and a smart additives selection could be one of the ways to cope with these issues. Integrated Ultra Low Invasion–Nanoparticles Drilling Fluid (ULIN) purpose to overcome common drilling problems such as formation instability, differential sticking, lost circulation, and clay swelling by minimizing the invasion through environmentally safe drilling fluid additives. Ultra Low-Invasion produces a thin, deformable, yet robust shield that serves as the foundation for a low-permeability barrier at the formation's face, temporarily sealing pore throats. This seal forms after only a few seconds of invasion and has been demonstrated in laboratory experiments to be exceedingly effective at essentially inhibiting future fluid invasion or pressure transmission. On the other hand, nanoparticles drilling fluid inhibiting shales by either plugging pore in shales, viscosifying water in drilling fluids, and or osmotically dehydrating shales. It has a very high surface area to volume ratio resulting in improved physical and chemical sensitivity, boosting their performance efficiency. ULIN has exceeded the original oil production with an additional 1,800 BOPD produced by 11 wells. It also reduces the formation damage up to 93% from 64.3% to 4.5% in Naricual Formation. ULIN is safe for the environment while it can inhibit the reactive montmorillonite shales, declining rheology dropping back, controlling fluid loss amount and lubricity enhancement. Parameter of the feasibility of establishing a factory

using economic analysis with an annual sales of 37,449,000 USD, and ULIN get a profit before tax of 23,108,266.89 USD and a profit after tax of 14,340,733.11 USD with a parameter calculation is a positive NPV, IRR of 40.01% including the cash flow and present value start to be positive in the 3rd year when the system starts operating. ULIN has a payback period of 4.3 years. From the result of the analysis, it can be concluded that ULIN has good prospects and deserves to be implemented.

(author)

Keywords: economic analysis, environmentally safe drilling, nanoparticles drilling fluid, oil recovery, ultra low-invasion.

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Melda Suryani, Mahrinasari MS (Lampung University, St. Prof. Dr. Ir. Sumantri Brojonegoro No.1, Bandar Lampung City, Lampung 35141)

The Influence of Brand Image, Price and Packaging Design on the Purchase Decision of Pixy Brand Cosmetics (Study on Users in Bandar Lampung)

*INTERNATIONAL JOURNAL OF REGIONAL INNOVATION, August 2022, vol 2, no 3, p.8-13, 0 ill, 0 tab, 17 ref*

In the increasingly competitive body care and cosmetic industry, the desire to use cosmetic products has fueled competition. Currently, various types of products are circulating in the market, both those produced domestically and abroad. The diversity of cosmetic products circulating in the market will clearly influence consumer decisions in choosing cosmetic products that are suitable for their skin, and there is no risk or harmful effect on skin health. This increasingly competitive market condition makes producers compete in creating products that are most in demand by consumers and must be more creative in reading market wants and needs.. One of the most popular cosmetic brands based on Top Brand Index data is Pixy. The data used in this study is primary data obtained from the results of respondents' answers which were collected with the help of a questionnaire. The number of samples in this study were 170 respondents. The sampling method used purposive sampling, which is a technique to determine the sample with the appropriate criteria determined by the researcher. The analytical method used in this research is validity test, reliability test,

analysis stage using multiple linear regression, hypothesis test, namely t test and hypothesis test, namely F test, with the help of the IBM SPSS 26 application program for windows. The results of this study indicate that the variables of Brand Image, Price and Packaging Design have a positive effect on the Purchase Decision Variable

(author)

Keywords: Brand Image, Price, Packaging Design, Purchase Decision, Business Marketing, Pixy Cosmetics

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Ecology-Based Coastal Community Empowerment Innovation in Batu Beriga Village, Central Bangka Regency

*INTERNATIONAL JOURNAL OF REGIONAL INNOVATION, August 2022, vol 2, no 3, p.14-28, 0 ill, 0 tab, 53 ref*

The coastal area is a part that is rich in the potential of marine and coastal resources that can be developed properly. Talking about the coast can not be separated from the existence of people living in coastal areas, since long ago people have also depended on the use of natural resources around the coast and the sea. Over time, the lives of coastal communities have deteriorated and until now coastal communities are identically known as marginalized communities. This condition is accompanied by coastal communities who have not been able to manage marine and coastal resources optimally. This is because the touch of knowledge about the use of resource development in coastal areas is very minimal, As a result, the community does not know how to manage the potential of marine and coastal resources that are more effective and innovative. Therefore, the active role and concern of the government can certainly reduce the powerlessness of coastal communities with the limited capabilities that the community has so far so that coastal communities can get out of the state of powerlessness. which is characterized by the condition of marginalized society. The purpose of this research is to analyze how the form of ecological-based coastal community empowerment is, as well as to find out the implications of ecological-based coastal community empowerment programs, and identify what are the opportunities and challenges in

ecological-based coastal community empowerment in Batu Beriga Village, Central Bangka Regency. This study uses the concept of empowerment by Jim Iffe as the basic foundation of the research. Regarding the concept of empowerment, according to Jim Iffe, with regard to community empowerment, it is providing resources, opportunities, and knowledge to residents to improve their abilities. Empowerment is defined as an effort to provide power (empowerment) and strengthening (strengthening) to the community. This concept has a close relationship with two main concepts, namely (power) which means power and (disadvantaged) which means inequality. The method used in this research is descriptive qualitative with the primary data source coming from unstructured interviews with 15 informants. The informants consisted of 3 village officials, 5 community members, 3 tourism awareness groups in Batu Beriga Village, 2 staff from the Environment and Forestry Service (DLHK) of the Bangka Belitung Islands Province, 2 staff from the Ministry of Environment and Forestry (KLHK) of the Bangka Belitung Islands Province. The results of this study indicate that the empowerment of the Batu Beriga Village community is carried out based on environmental care. The form of community empowerment based on ecology is a manrove planting labor-intensive program. The implication of the program is that it can have a positive impact on social, economic, and environmental aspects, opportunities that occur The results of this study indicate that the empowerment of the Batu Beriga Village community is carried out based on environmental care. The form of community empowerment based on ecology is a manrove planting labor-intensive program. The implication of the program is that it can have a positive impact on social, economic, and environmental aspects, opportunities that occur The results of this study indicate that the empowerment of the Batu Beriga Village community is carried out based on environmental care. The form of community empowerment based on ecology is a manrove planting labor-intensive program. The implication of the program is that it can have a positive impact on social, economic, and environmental aspects, opportunities that occur namely opportunities for mangrove ecosystem rehabilitation and economic recovery opportunities. However, there are challenges such as conflicts of interest, lack of public awareness, and low human resources (HR).

(author)

Keywords: Empowerment, Coastal Communities, Marginal, Based, Ecology

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The Effect of Online Customer Review and E-Service

Quality on Consumer Purchase Decisions on the Marketplace Shopee in Bandar Lampung

*INTERNATIONAL JOURNAL OF REGIONAL INNOVATION, August 2022, vol 2, no 3, p.29-33, 0 ill, 0 tab, 15 ref*

The phenomenon of online shopping in the modern era continues to increase, so it is not surprising that business people need to pay attention to the importance of online customer reviews and provide the best quality e-service for customers to purchase products in the marketplace. One of the marketplaces that can be used is Shopee. The type of data used in this study is primary data obtained from the results of respondents' answers which were collected with the help of a questionnaire. The number of samples in this study were 120 respondents. The sampling method used purposive sampling, which is a technique to determine the sample with the appropriate criteria determined by the researcher. The analytical method used in this research is validity test, reliability test, analysis stage using multiple linear regression, and hypothesis testing, namely t test and coefficient of determination test (R<sup>2</sup>), with the help of the IBM SPSS 26 application program for windows. The results of this study indicate that the online customer review variable has a positive and significant effect on the purchasing decision variable. The e-service quality variable also has a positive and significant effect on the purchasing decision variable. In this study, the independent variable was able to explain the dependent variable by 49.8% while the rest was influenced by other variables outside the variables in this study.

(author)

Keywords: Online Customer Review, E-Service Quality, Purchase Decision, Marketplace, Consumer Behavior

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Public Service Innovation as a Strategy for Increasing Regional Innovation in Probolinggo City

*INTERNATIONAL JOURNAL OF REGIONAL INNOVATION, August 2022, vol 2, no 3, p.36-47, 0 ill, 0 tab, 27 ref*

This research is about innovation in the field of public services carried out by the City of Probolinggo. This research is important and relevant to be discussed because it. This innovation can solve problems from the aspect of limited funds for sanitation and technology development which are considered complicated and the introduction of the SIBER-PAM strategy that can guarantee an increase in the quality of services for the community. Thus, the two innovations gave rise to various strategies that offer convenience in the use of public services. And can be an inspiration for other regions in order to overcome the same problem. The population in this study is in areas that have implemented policies or innovation in the field of public services. While the sample in this study is innovations carried out by the Probolinggo City government are called Si Inol Aja innovations (Innovation System for Arisan Services / Latrine Installments) and innovations Easier Access Based on "SIBER-PAM" (Socialization of Information Based on People's Education - Drinking Water Company). The results of this study indicate that Si Inol Aja has proven to be one of the most effective ways to eradicate open defecation (BABs), namely people have healthy latrines with technological convenience, namely a direct cast system on the spot, having healthy latrines is not difficult and inexpensive, people have a latrine faster healthy without having to wait for help from the government, strengthen participation and community self-reliance, provide new skills for craftsmen who can expand their job opportunities in the surrounding area, and grow a synergistic partnership between the government, the community and the business world to realize better sanitation. Meanwhile, the introduction of the SIBER-PAM strategy can guarantee an increase in the quality of services for the community. The presence of SIBER-PAM can provide education to the public, especially customers of PDAM Kota Probolinggo and the means of socializing the services provided at this time have innovated to become more modern. Thus, through this strategy, conveniences in the use of public services will be offered.

(author)

Keywords: Innovation, Public Service, Sanitation, PDAM, Community, Local Government.

## ARTICLE

# Integrated Ultra Low Invasion–Nanoparticles Drilling Fluid (ULIN): Drilling Additives with Low Environmental Impact as Innovation to Solve Common Drilling Issues District)

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## OPEN ACCESS

**Citation:** Sasa Aulia. Integrated Ultra Low Invasion–Nanoparticles Drilling Fluid (ULIN): Drilling Additives with Low Environmental Impact as Innovation to Solve Common Drilling Issues. *Ijori Journal Vol. 2 No. 3 (2022): 1-7*. <https://doi.org/10.52000/ijori.v2i3.58>

e-ISSN : 2775-7641

Accepted: August 30<sup>th</sup>, 2022

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**Abstract:** Drilling issues is extremely costly and a smart additives selection could be one of the ways to cope with these issues. Integrated Ultra Low Invasion–Nanoparticles Drilling Fluid (ULIN) purpose to overcome common drilling problems such as formation instability, differential sticking, lost circulation, and clay swelling by minimizing the invasion through environmentally safe drilling fluid additives. Ultra Low-Invasion produces a thin, deformable, yet robust shield that serves as the foundation for a low-permeability barrier at the formation's face, temporarily sealing pore throats. This seal forms after only a few seconds of invasion and has been demonstrated in laboratory experiments to be exceedingly effective at essentially inhibiting future fluid invasion or pressure transmission. On the other hand, nanoparticles drilling fluid inhibiting shales by either plugging pore in shales, viscosifying water in drilling fluids, and or osmotically dehydrating shales. It has a very high surface area to volume ratio resulting in improved physical and chemical sensitivity, boosting their performance efficiency. ULIN has exceeded the original oil production with an additional 1,800 BOPD produced by 11 wells. It also reduces the formation damage up to 93% from 64.3% to 4.5% in Naricual Formation. ULIN is safe for the environment while it can inhibit the reactive montmorillonite shales, declining rheology dropping back, controlling fluid loss amount and lubricity enhancement. Parameter of the feasibility of establishing a factory using economic analysis with an annual sales of 37,449,000 USD, and ULIN get a profit before tax of 23,108,266.89 USD and a profit after tax of 14,340,733.11 USD with a parameter calculation is a positive NPV, IRR of 40.01% including the cash flow and present value start to be positive in the 3rd year when the system starts operating. ULIN has a payback period of 4.3 years. From the result of the analysis, it can be concluded that ULIN has good prospects and deserves to be implemented.

**Keywords:** Economic Analysis, Environmentally Safe Drilling, Nanoparticles Drilling Fluid, Oil Recovery, Ultra Low-Invasion

## 1. Preliminary

In the last few decades, the oil and gas business has seen a revolutionary transformation. From exploration to drilling, production treatment, and refining, petroleum engineers have used technology to improve the oil and gas business in every way possible to assure efficient, safe, and cost-effective operations. Drilling operations are a vital stage because they are hampered by numerous problems that demand precision, expertise, and intelligence to overcome. Common drilling issues such as formation instability, differential sticking, lost circulation, and clay swelling are extremely costly (Arnold et al., 2016). While there are a variety of reasons for drilling issues, the majority of them are related to the drilling fluid, whose characteristics and

optimization can aid in preventing/mitigating a variety of problems that may arise during drilling and saving a significant amount of money (Hassan, 2018).

Many of the most serious difficulties in well construction are caused by fluid invasion during drilling and finishing operations (Reid et al., 2003). Invasion in the payzone can result in formation damage as well as a reduction in the quality of log data and fluid samples. It can also cause differential sticking and encourage mud and cement circulation loss. Besides, when water absorbs into shale, it causes the clay swelling, increasing its tension and volume. The formation tension is reduced as tension is increased. Finally, it causes issues such as drill trapping, laminated drilling pipe entrapment, and drilling pipe trapping (Steve, 2011). In consequence, drilling fluid additives that require low invasion and prevent clay swelling are desired.

Therefore, as an innovative we propose the technology namely Integrated Ultra Low Invasion–Nanoparticles Drilling Fluid (ULIN), as a result, ULIN ability to reduce drilling invasion, the lowest possible finishing and rework fluid levels bring many benefits, including fewer formations breakdown, less differential attachment and prevention some kind of mechanical instability.

In this paper, we briefly discuss Integrated Ultra Low Invasion–Nanoparticles Drilling Fluid (ULIN) technology as a form of innovation in this energy and environmentally friendly on energy transition period. We then explain some examples of fields where sludge has been successfully reduced wellbore instability and reduce or eliminate induced losses. We will also give an example of a much reduced fluid invasion to permeable sand: in reservoirs, this can help limit formation damage and hence increase well productivity. We then explain an economic analysis of ULIN technology based on the parameters of NPV, IRR and payback period.

#### **A. Description of the Integrated Ultra Low Invasion–Nanoparticles Drilling Fluid (ULIN) Technology**

Ultra low invasion fluid is developed with patented chemistry that generates flexible “shields” in the drilling fluid system. It is a mix of non-ionic polymers with a variety of hydrophilic-lipophilic balancing values and solubilities in water and oil (Reid et al., 2003). The additive works equally well in oil and synthetic-based muds as it does in water-based muds because of the range of oil and water solubilities in the blend. Another added values of using ultra low invasion are the fact that it accommodates deformable particles with an adequately broad size distribution to seal a variety of

microfracture openings, forms a very low permeability seal as rapidly as possible to avoid damaging numbers of fluid entering the microfractures, have low formation damaging characteristics, and meet expected health, safety, and environmental requirements. Then ULIN system also incorporates the use of nanoparticles, the additive is a type of drilling fluid additive that consists of nanoparticles where the size is between 1 – 100 nm. The nano size of this additive which is not higher than one-third of the pore throat makes it easier to penetrate to low permeability formation such as shale in unconventional resources (Suri & Sharma, 2004). It can inhibit shales by either plugging pore in shales, viscosifying water in drilling fluids, and/ or osmotically dehydrating shales. Because of their nano-sized particles, it has a very high surface area to volume ratio (Ikram et al., 2021). As a result, nanoparticles may have improved physical and chemical sensitivity, boosting their performance efficiency.

#### **B. Limit Fluid and Pressure Invasion**

Invasion of the mud balance pressure into the rock matrix will increase the pore pressure. If pore pressure increase, it will unable to bleed fast enough (e.g. if stones very low permeability as in dense shale or siltstone), effective stress is reduced, bringing the stress state of the rock towards collapse. This can cause the rock to collapse and cause wellbore instability (Herdes et al., 2017).

If the pressure and fluid invasion can be stopped completely when drilling in the overbalance, it is clear that a lot of drilling trouble will never happen and most of the formation the damage associated with mud and supplementary fluids is removed. However, currently nothing is established technology that can completely prevent both forms of invasion and therefore, the industry is focusing on reducing it to the lowest possible level possible. By substantially reducing the invasion it is possible to remove, or at least reduce, the above problem: this will reduce unproductive time, make it more efficient operations and increase well productivity.

#### **C. Wellbore Reinforcement**

Ultra low invasion fluid additives have been used by one operator in more than 45 wells were drilled offshore in the Gulf of Mexico with data well can be seen in Table 1. Here, the big one most application have been in the reverse oil slurry where ultra low invasion fluid is used in the intermediate bore section to raise fracture gradient and reduce induced mud losses. Typical problems faced by operators in this region are that the fracture gradient is lower than the

mud weight required to provide effective well and borehole control stability. In many wells, inflows are drawn or cavings are observed but when the weight of the mud is raised to combat this problems, large losses are induced: in some wells more than 25,000 barrels of oil sludge have been lost. This uncontrolled loss can result in subsurface kicks/losses a situation that can take days to resolve. Wells often need switch or set the case earlier.

## 2. Research Methods

### Technical Description

ULIN system design consists of two main additive components which are Ultra low invasion with nanoparticles drilling fluid. These two additives will be added to Oil Based Mud (OBM) as it is illustrated in Figure 1.

The first additive, ultra low invasion fluid is added to provide ultra-low invasion in drilling. When a ultra low invasion fluid product is added to an oil-based liquid, same mechanism operates but now more hydrophilic components that make up the aggregate. These aggregates are the key to formation of a very low permeability barrier at rock surface with matrix permeability. This seal forms after only a few seconds of invasion and has been demonstrated in laboratory experiments to be exceedingly effective at essentially inhibiting future fluid invasion or pressure transmission (Herdes et al., 2017). Ultra low invasion fluid produces a thin, deformable, yet robust shield that serves as the foundation for a low-permeability barrier at the formation's face, temporarily sealing pore throats. With very wide particle size distribution, easy to see how the same ultra low invasion fluid additive can seal different matrix pore size and small fractures. The mechanism of action of ULIF is shown pictorially in Figure 2.

The second additive, nanoparticles, is added so it can penetrate into shale formation which usually makes up to 75% of the formation to avoid clay swelling and maintain wellbore stability. It will form a more even thin filter cake which blocks the entry of fluids. When these two additives are combined, it will provide a wide range of particle size from nano size to aggregates. Furthermore, these two additives offer a strong sealing capacity that protects the formation by limiting pressure transmission, enhancing pressure bearing capability, and decreasing fluid interaction between the borehole and the formation, so it protects the reservoir and improves the hole stability. The drilling fluid industry faces a new challenge in

developing creative, high-performance, and cost-effective drilling fluids, and ULIN provides a solution to this problem.

## 3. Results and Discussion

### Extra Oil Recovered

The sealing capacity that supplied by ULIN is success to prevent invasion and losses of oil. Invasion is prevalent in drilling resulting a reduction in the economic life of gas wells, that is why the prevention of invasion could lead to enhanced production. In Field, it is proven that 11 wells there yielded an extra 1,800 barrels of oil produced per day (Herdes et al., 2017). The extra oil recovered are shown in Figure 3.

### Reduction of Formation Damage

The substantially decreased formation damage with ULIF is remarkable and it illustrates the technology's exceptional performance under tremendous pressure. Table 2 depicts the retained permeability test. It shows that ULIF has decreased formation damage up to 93% from 64.3% to 4.5% when differential pressure is increased until 2500 psi. Further evidence of the ability of ultra low invasion products to protect and strengthen the weak formation provided by them success in the difficult Nahr Umr Shale in the Middle East, and in using the ultra low invasion approach to drill 500 feet horizontal section of coal seams in North America.

### Economic Result

Economic analysis is performed to assess the economic feasibility of the system. This study considered net present value (NPV), internal rate of return (IRR), fixed capital (FC), and payback period (tpayback) as the economic performance indicators. These indicators are calculated by developing cost functions of each component in the system along with the assumptions as mentioned in Table 3 based on literature studies of the research by Bachtiar et al. (2021), Mwangomba (2016), and Kesieme et al. (2013).

A project or system is feasible if the NPV is positive. NPV is formulated below (Bachtiar et al., 2021), where  $i$  is the discount rate,  $t$  is the project life in years, and  $CF_t$  is the cash flow in the  $T$ -th year:

$$NPV = \sum_{T=0}^T CF_T / (1+i)^T \quad (1)$$

IRR is the discount rate that makes total present value equal to fixed capital (Achinis & Euverink, 2019). A project is feasible if the IRR is equal to or higher than the expected return. Fixed capital consists of equipment costs and additional costs, such as

construction and project management costs, which are assumed to be 65% of total equipment cost. The payback period calculation includes construction duration, FC, additional net power output after implementing the proposed system (Wadd), OPEX, tax, and the sales income which are formulated as follows (modified from Noroozian et al., 2017):

$$t_{\text{payback}} = t_{\text{construction}} + \frac{FC}{(Sales - OPEX) \times (100\% - TAX\%)} \quad (2)$$

$$Sales = m_{\text{oil}} \times C_{\text{oil}} \quad (3)$$

This study performed an economic analysis for the proposed system to assess its feasibility from the economic point of view. From the economic analysis, the fixed capital, NPV, IRR, and payback period of the proposed system are obtained as can be seen in Table 4. These economic parameters are used to decide whether the system is economically feasible. In addition, the cumulative cash flow profile of the proposed system can be seen in Figure 4, which is used as the basis of calculation of NPV and IRR.

The amount of fixed capital needed to develop the proposed ULIN system is USD 10,755,549.83. The project yields a positive NPV of USD 56,160,800 with the IRR of 40.01%. Furthermore, the payback period is 4.3 years calculated since the beginning of the project or 2 years after finishing the construction phase. The positive NPV, high IRR, and short payback period show that the proposed system is economically feasible to implement.

#### 4. Conclusion

The ability to reduce fluid invasion and pressure into formation to a very low level will bring benefits in terms of reduce mud loss, reduce formation damage, lower risk better differential attachment and wellbore stability in many types of formations are potentially unstable. Use of the ULIN approach is a simple and effective method of providing wellbore reinforcement in the transition energy era.

We present some results to demonstrate the benefits of using ULIN technology:

- ULIN has exceeded the original oil production with an additional 1,800 BOPD produced by 11 wells.
- ULIN also reduces the formation damage up to 93% from 64.3% to 4.5%.
- Economic analysis showed that the NPV and IRR of the proposed system are USD 10,755,549.83 and 40.01%, respectively, with a payback period of 4.3 years. The positive NPV, high IRR, and short

payback period indicates that the proposed system is economically feasible to implement.

#### 5. Acknowledgements

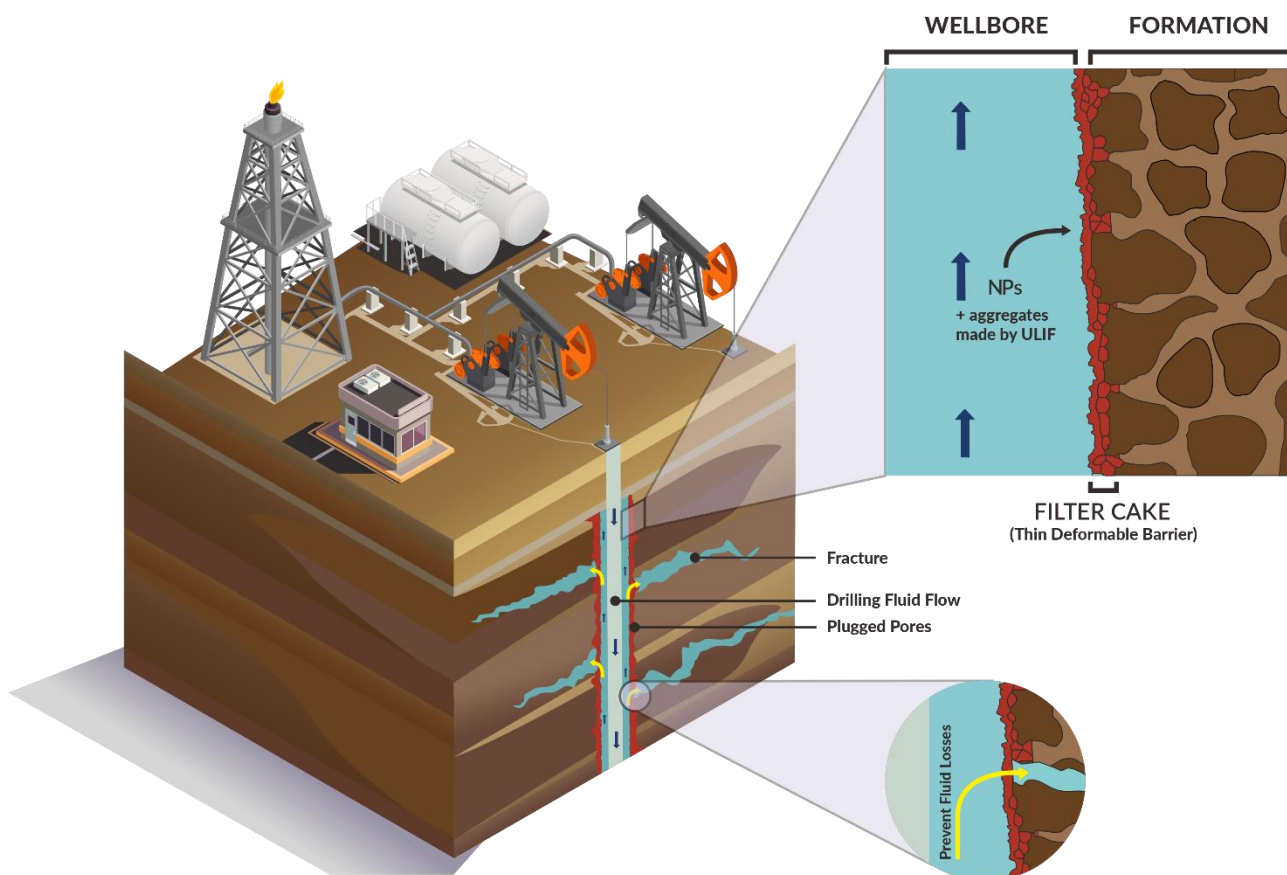
Would like to thank Ir. Jarot Setyowiyoto, M.Sc., Ph.D., IPU., ASEAN.Eng. (Univesitas Gadjah Mada) for the technical discussion regarding the unconventional research topics and the improvement of the writing of this paper for the advice about the selection of methodology used in this study.

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Tables and Figures

Figure 1. ULIN Design System

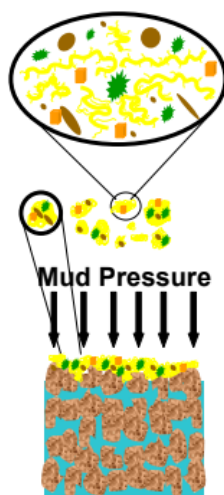


Figure 2. A schematic representation of the ultra low invasion fluid polymers and solids forming aggregates in solution.

Table 1. Summary data of offshore Gulf of Mexico

Well	Offset Well	Unit
Interval	6630-16142	feet
Feet drilled	9512	feet
Mud Volume Lost to Formation	3164	barrels
Days on Location	154	days
Rig Day Rate	39,500	USD
Interval Rig Cost	6,083,000	USD
Cost of Sidetrack	180,000	USD
Cost of Fluids	1,137,000	USD
Interval Cost	7,400,000	USD

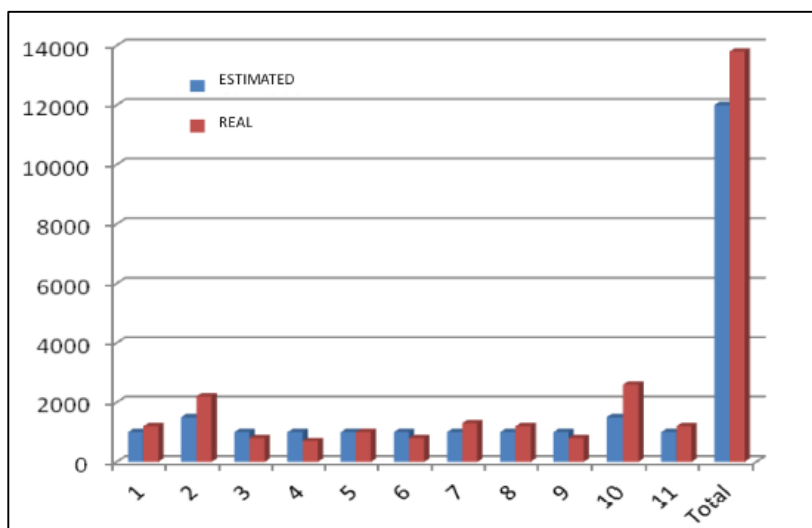


Figure 3. Well production in Fields drilled with Ultra low invasion exceeded expectations.

Table 2. Retained permeability test with and without Ultra low invasion

Parameters	Base OBM	OBM with ULIFT	Base OBM	OBM with ULIFT
ULIFT (lb/bbl)	0	4.5	0	7
Differential Pressure (psi)	1000	1000	2500	2500
Injection Rate (mL/min)	0.5	0.5	4.0	4.0
Filtrate (mL)	12	10	0.2	0
Lift-up Pressure (psi)	150	100	NR	NR
Retained Permeability (%)	82.87	83.33	35.7	95.5
Formation Damage (%)	17.13	16.67	64.3	4.5

Table 3. Basic financial assumptions used for economic analysis.

Parameter	Value	Unit
Project duration	20	Year
Discount	10	%
Tax	25	%
Construction duration	3	Year
Fixed capital distribution for construction phase first, second, and third year	20/30/50	%
Operating expenditure (OPEX)	50	% modal
Rig Day Rate	39,500	USD
Interval Rig Cost	6,083,000	USD
Cost of Sidetrack	180,000	USD
Cost of Fluids	1,137,000	USD
Interval Cost	7,400,000	USD
Cost of Oil (C <sub>oil</sub> )	60	USD/bbl

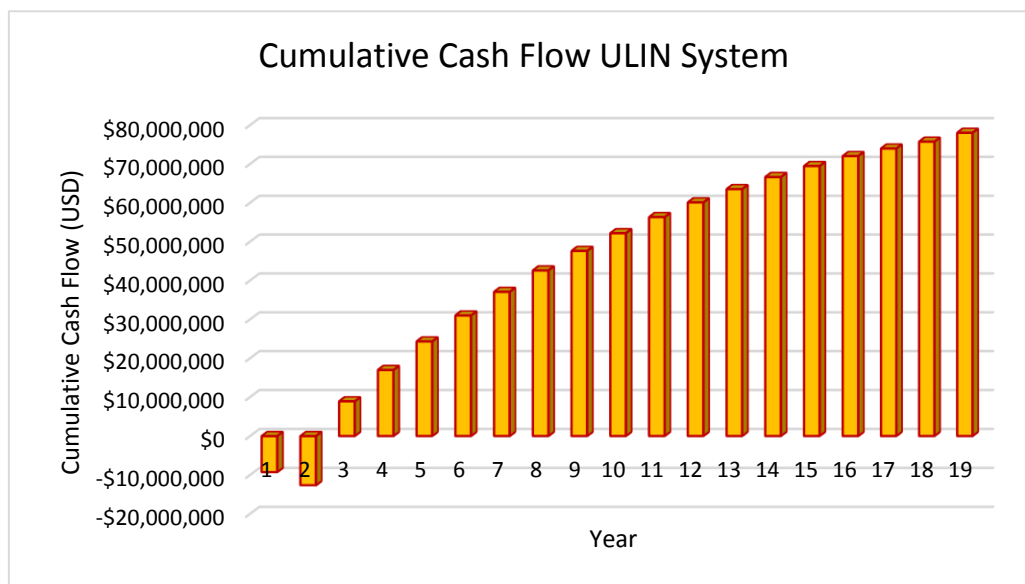


Figure 4. Cumulative cash flow of the proposed system.

Table 4. Results of economic analysis.

Economic parameter	Unit	Value
Fixed capital	USD	10,755,549.83
NPV	USD	56,160,800
IRR	%	40.01
Payback period	Year	4.3

## ARTICLE

# The Influence of Brand Image, Price, and Packaging Design on the Purchase Decision of Pixy Brand Cosmetics (Study on Users in Bandar Lampung)

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## OPEN ACCESS

**Citation:** Melda Suryani and Mahrinasari MS. The Influence of Brand Image, Price, and Packaging Design on the Purchase Decision of Pixy Brand Cosmetics (Study on Users in Bandar Lampung). *Ijori Journal Vol. 2 No. 3 (2022): 8-13.*  
<https://doi.org/10.52000/ijori.v2i3.61>

e-ISSN : 2775-7641

Accepted: August 30<sup>th</sup>, 2022

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**Abstract:** In the increasingly competitive body care and cosmetic industry, the desire to use cosmetic products has fueled competition. Currently, various types of products are circulating in the market, both those produced domestically and abroad. The diversity of cosmetic products circulating in the market will clearly influence consumer decisions in choosing cosmetic products that are suitable for their skin, and there is no risk or harmful effect on skin health. This increasingly competitive market condition makes producers compete in creating products that are most in demand by consumers and must be more creative in reading market wants and needs.. One of the most popular cosmetic brands based on Top Brand Index data is Pixy. The data used in this study is primary data obtained from the results of respondents' answers which were collected with the help of a questionnaire. The number of samples in this study were 170 respondents. The sampling method used purposive sampling, which is a technique to determine the sample with the appropriate criteria determined by the researcher. The analytical method used in this research is validity test, reliability test, analysis stage using multiple linear regression, hypothesis test, namely t test and hypothesis test, namely F test, with the help of the IBM SPSS 26 application program for windows. The results of this study indicate that the variables of Brand Image, Price and Packaging Design have a positive effect on the Purchase Decision Variable.

**Keywords:** Brand Image, Price, Packaging Design, Purchase Decision, Business Marketing, Pixy Cosmetics.

## 1. Preliminary

The business competition environment in Indonesia is currently getting tighter because all manufacturers are competing to produce products that are most in demand by consumers. This increasingly competitive market forces producers to be more creative in anticipating market wants and needs. One of the growing industries is the beauty industry. According to the Ministry of Industry, the Indonesian beauty industry is growing by encouraging an increase in Indonesian people's purchasing power for beauty products.

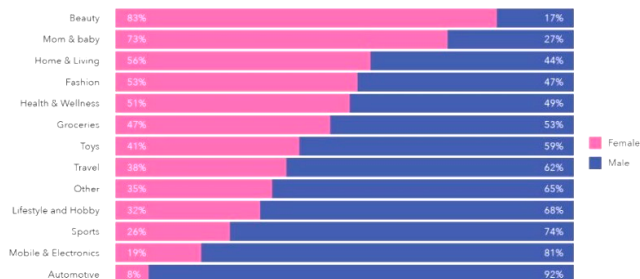


Figure 29 Most popular categories Indonesians shop for online depending on gender. e-commerceIQ E-Marketplace Indonesia Survey

Figure 1.1 The Most Popular Online Shop Categories in Indonesia by Gender

Source: (dailysocial.id, 2020)

Figure 1.1 shows that the “Beauty” category ranks at the top of the chart for the most popular Online Shop category in Indonesia by gender with a percentage of 83% which is dominated by women.

Women are the main consumers in beauty products, therefore women have a higher desire to buy. Every beauty product has a variety of choices for all skin types. Usually consumers choose products that suit their facial skin. In the increasingly competitive body care and cosmetic industry, the desire to use cosmetic products has fueled competition. Currently, there are many brands of cosmetic products on the market, including Pixy, Maybelline, Wardah, Revlon and Viva. Of the various product brands, the author conducted research on a cosmetic product called Pixy from PT Tancho Indonesia. Judging from the Top Brand Index of cosmetic products, the Pixy brand is one of the consumer's choices in choosing the desired cosmetic product. Top Brand Award can be said as a measure of a brand nationally with its segment.

Table 1. Top Brand Index for Cosmetic Product Category in 2021

Lipstick		Sow Face Powder		Compact Face Powder	
Wardah	31.9% TOP	Marks	20.6% TOP	Wardah	26.7% TOP
Maybelline	11.6% TOP	Wardah	20.3% TOP	<b>Pixy</b>	<b>10.80% TOP</b>
Revlon	7.50%	Make Over	8.1%	Make Over	7.80%
<b>Pixy</b>	<b>5.60%</b>	Viva	5.50%	Maybelline	7.40%
Viva	3.30%	<b>Pixy</b>	<b>5.00%</b>	Caring	6.70%

Source: Top Brand Index in 2021

Viewed from Table 1, it shows that Pixy's product ratings vary according to the type of product. For the type of lipstick product, Pixy is in rank 4, for face powder product Pixy is ranked 5 and for compact face powder product Pixy is ranked 2. If we look at the table, Pixy is quite superior in the type of face powder product but not enough, excels in the types of lipstick and face powder products.

In this context, the cosmetic market is growing. This forces manufacturers to create new innovations to offer new and valuable products to customers. One of them is the product brand. According to Kotler and Keller (2012:263-264), consumers are given ideas and based on what they hear and feel and what they feel. According to Kotler and Armstrong (2006:158), a product marketing can influence purchases and generate a response from consumers, encouragement in marketing consists of several factors in consumer purchasing decisions, including product, price, place, and promotion. This shows that price is one of the most important factors influencing purchasing decisions. You can find a price comparison for Pixy products in the table below.

Table 2. Price Comparison per Product in 2021

Product	Price
Revlon	IDR 19,000 – IDR 196,100
Maybelline	IDR 18.000 – IDR 125,000
<b>Pixy</b>	<b>IDR 15,000 – IDR 120,000</b>
Wardah	IDR 10,000 – IDR 102,500
Viva	IDR 9,000 – IDR 87,500

Source: pricepanda.co.id

Table 2 above shows the product prices of each brand from the lowest to the highest. It can be seen that the Pixy brand ranks third as an affordable product out of the five products. According to Sukirno (2006:76), price is usually associated with demand, which can be seen from the law of demand, which says that the lower the price of an item, the greater the demand for that price. On the other hand, the higher the price of an item, the lower the demand for that good. With so many competing products, consumers are faced with more choices, forcing companies to innovate. If the product is no different from competitors' products, value creation is meaningless. Differentiation is done for the survival of the company. One of the differences between the products can be seen in the product packaging. Packaging is the most impressive thing that catches the attention of consumers.

Like the black Pixy lipstick packaging which has a mysterious impression. Companies distribute products in different packaging to create curiosity and interest in the minds of consumers.

## LITERATURE REVIEW

### Brand Image

According to Kotler and Keller (2012: 263-264), brand image is that consumers store the same feelings and beliefs about the knowledge of a product and place it in the consumer's own understanding.

According to Tingkir (2014) Brand image is a set of perceived understandings shared by what consumers often mean about the brand.

#### Brand Image Indicator

According to Dewi et al (2012), brand aspiration has several indicators, namely as follows:

1. The brand is very familiar.
2. Ease of obtaining products.
3. Product variations.

### Price

According to Sumarni (2000:281), price is the amount of money needed to obtain a combination of goods and services. Businesses need to set the right price in order to be successful in marketing their product or service. Price is the only element of the marketing mix given as a company, while the other three elements (product, distribution, and promotion) contribute to costs.

According to Ofela et al (2016) price indicators are as follows:

1. An affordable price
2. Alignment between price and product quality
3. Price competitiveness
4. Price match with benefits

### Packaging Design

According to Klimchuck (2006:1) Product packaging design is a creative business where elements of form, material, color, image, and design can be combined with product descriptions so that the product can be marketed.

According to Dhurup et al (2014) there are several indicators on the packaging which are described as follows:

1. The materials used are relatively not easily damaged
2. Materials that are able to maintain the contents of the packaging.
3. A logo containing information about the product should be printed on the packaging so that consumers can easily find the product and provide complete information.
4. Labels containing product information should be

5. Color is one of the things that consumers respond to the fastest

6. The size of the package is usually adjusted to the contents of the package such as the size for the length, width or thickness of the package itself

7. The attractiveness of product design, design and packaging must not only balance form and function, but also appeal to consumers.

### Buying decision

According to Kotler and Armstrong (2012:157) Purchase decision is the final buying behavior of consumers, individuals and households who buy goods and services for personal consumption. From this definition it can be concluded that purchasing decisions are actions taken by consumers to buy the goods and services they need.

According to Kotler (2012) there are three indicators in determining purchasing decisions, namely:

- a. Stability on a product
- b. Habits in buying products
- c. Speed in buying a product

## 2. Research Methods

The survey was conducted in the city of Bandar Lampung. This study uses primary data by distributing questionnaires to Pixy cosmetic users. The sampling approach in this study used a purposive sampling method, which is a method where the researcher selects the sample to be used based on the selected sampling method, namely consumers and the number of samples for this study was 170 respondents. The data analysis technique used in this research is descriptive analysis, statistical analysis, validity test, reliability test, multiple regression analysis, hypothesis testing using t-test and F-test.

## 3. Results and Discussion

### 3.1. Results

#### Multiple linear regression analysis

This study analyzes the effect of three independent variables, namely Brand Image, Price, Packaging Design which affect Purchase Decision (Y).

Table 3. Multiple Linear Regression Test Results

Model	Unstandardized coefficients		Standardized coefficients	t	Sig
	B	Std.Error	Beta		
(Constant)	1.495	1.100		1.360	.176

Table 3 shows that the constant value is 1.495, brand image is 0.143, price is 0.378, packaging design is 0.197. Based on these values, the following regression equation is obtained:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + e$$

From the Multiple Linear Formula Equation obtained:

$$Y = 1.495 + 0.143X_1 + 0.378X_2 + 0.197X_3$$

Based on the results of the regression coefficient owned by the brand image variable ( $X_1$ ) of 0.143, meaning that the brand image variable has a positive effect on purchasing decisions, the regression coefficient of the price variable ( $X_2$ ) is 0.378, meaning that the price variable has a positive effect on purchasing decisions. The result of the regression coefficient of the packaging design variable ( $X_3$ ) is 0.197, meaning that the packaging design variable has a positive effect on purchasing decisions.

Table 4.13 F Test Test Results

Model		Sum of Squares	df	Mean Square	Sig
1	Regression	240.012	3	80.004	.000
	Residual	452.041	166	2.723	
	Total	692.053	169		

Based on the table of analysis results above, it is known that the degrees of freedom ( $df$ ) =  $n - k - 1 = 170$  or ( $df$ ) =  $170 - 3 - 1 = 166$  and the value ( $\alpha$ ) =  $5\% = 0.05$  so that the F table results are 3.05. Thus the F test test obtained a calculated F value of 29.379 which means  $>$  from the predetermined f table value, which is 3.05. So from the above analysis it can be concluded that simultaneously the variables of Brand Image, Price and Packaging Design have a significant effect on the Purchasing Decision variable.

### 3.2. Discussion

The results of the research that researchers have done by looking at the frequency of respondents' answers indicate that brand image, price and packaging design have a positive effect on purchasing decisions as discussed in detail, below.

#### A. The influence of Brand Image on the purchasing decision of Pixy Brand cosmetics.

Based on the results of testing the first hypothesis, it shows that the answers to the questionnaire filled in

by respondents on the brand image variable, the indicator that has the most dominant influence is product variation with the statement 'buying Pixy products because it has many variations', amounted to 84.7% which means that with many choices of Pixy products, consumers are interested in buying them. While the indicators that need to be considered by the Pixy company are the brand is very familiar with the statement 'interested in buying Pixy products because the brand is already known by many people by 3.5% which means that there are still consumers who are not interested in buying Pixy products even though the brand is already well known. The results of this study support previous research conducted by Sannya et al., (2020) which states that brand image has a positive influence on purchasing decisions.

#### B. Effect of Price on purchasing decisions for Pixy brand cosmetics

Based on the results of testing the second hypothesis, it shows that the answers to the questionnaire filled in by respondents on the price variable are obtained, the indicator that has the most dominant influence is price affordability with the statement 'interested in buying Pixy products because of the affordability of the prices offered by these products', by 80.6% which means that with affordable prices, consumers are interested in buying Pixy products. While the indicators that need to be considered by the Pixy company are price competitiveness with other products with the statement 'choose Pixy products because these products offer cheaper prices compared to other cosmetic products', by 8.2% which means that there are still consumers who disagree that the products offered by Pixy are more affordable compared to other products. The results of this study support previous research conducted by Sipakoly et al., (2022) which states that price has a positive influence on purchasing decisions.

#### C. The Effect of Packaging Design on the purchasing decision of Pixy brand cosmetics

Based on the results of testing the third hypothesis, it shows that the answers to the questionnaire filled out by respondents on the packaging design variable, the indicator that has the most dominant influence is the size of a package with the statement 'feel comfortable carrying Pixy products anywhere because the packaging size is easy to carry,' by 72.4% which means that consumers feel

comfortable with the size of the Pixy product packaging, easy to carry anywhere. While the indicator that needs to be considered by the Pixy company is the color of the packaging with the statement “buy Pixy products because the color of the packaging is easy to remember.” 15.8% which means that there are still consumers who disagree with the easy-to-remember Pixy packaging color. The results of this study support previous research conducted by Salem et al., (2018) which stated that Packaging Design has a positive influence on purchasing decisions.

#### 4. Conclusion

Based on the analysis that has been obtained, the conclusions are as follows:

- The test results (F), indicate that brand image, price and packaging design simultaneously have a positive effect on purchasing decisions for Pixy products to users in Bandar Lampung. So it can be concluded that the better the brand image, price and packaging design, the better the purchasing decisions for Pixy brand cosmetics users in Bandar Lampung.
- Partially, brand image has a positive effect on purchasing decisions for Pixy brand cosmetics users in Bandar Lampung. So it can be concluded that the better the brand image by the company, the more purchasing decisions made by Pixy product users in Bandar Lampung. Price has a positive effect on purchasing decisions for Pixy brand cosmetics users in Bandar Lampung. So it can be concluded that the better the price set by the company and the better the match between price and product quality, the more purchasing decisions made by Pixy product users in Bandar Lampung. Then, partially packaging design has a positive effect on purchasing decisions for Pixy brand cosmetics users in Bandar Lampung. So it can be concluded that the better and more attractive the packaging design created by the company will increase the occurrence of purchasing decisions made by Pixy product users in Bandar Lampung.

#### 5. Acknowledgments

To enhance innovation in the company's brand image, the company should add a more complete variety of products to adapt to the current developments so that consumers are more interested in making purchases then, the company must maintain prices that are affordable for consumers and improve product quality so that consumers benefit from using

Pixy products. The company is not enough just to provide good quality products, but the company must also develop packaging designs that have characteristics such as the physical shape and color of the product packaging so that it is easy for consumers to remember. If the shape, size and color of the Pixy packaging are easy to recognize, consumers will be interested in buying it.

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## ARTICLE

# Ecology - Based Coastal Community Empowerment Innovation in Batu Beriga Village, Central Bangka Regency

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## OPEN ACCESS

**Citation:** Fitriana, Ibrahim, and Ranto. Ecology - Based Coastal Community Empowerment Innovation in Batu Beriga Village, Central Bangka Regency. *Ijori Journal* Vol. 2 No. 3 (2022): 14-28. <https://doi.org/10.52000/ijori.v2i3.54>

e-ISSN : 2775-7641

Accepted: August 30<sup>th</sup>, 2022

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**Abstract:** The coastal area is a part that is rich in the potential of marine and coastal resources that can be developed properly. Talking about the coast can not be separated from the existence of people living in coastal areas, since long ago people have also depended on the use of natural resources around the coast and the sea. Over time, the lives of coastal communities have deteriorated and until now coastal communities are identically known as marginalized communities. This condition is accompanied by coastal communities who have not been able to manage marine and coastal resources optimally. This is because the touch of knowledge about the use of resource development in coastal areas is very minimal, As a result, the community does not know how to manage the potential of marine and coastal resources that are more effective and innovative. Therefore, the active role and concern of the government can certainly reduce the powerlessness of coastal communities with the limited capabilities that the community has so far so that coastal communities can get out of the state of powerlessness. which is characterized by the condition of marginalized society. The purpose of this research is to analyze how the form of ecological-based coastal community empowerment is, as well as to find out the implications of ecological-based coastal community empowerment programs, and identify what are the opportunities and challenges in ecological-based coastal community empowerment in Batu Beriga Village, Central Bangka Regency. This study uses the concept of empowerment by Jim Ife as the basic foundation of the research. Regarding the concept of empowerment, according to Jim Ife, with regard to community empowerment, it is providing resources, opportunities, and knowledge to residents to improve their abilities. Empowerment is defined as an effort to provide power (empowerment) and strengthening (strengthening) to the community. This concept has a close relationship with two main concepts, namely (power) which means power and (disadvantaged) which means inequality. The method used in this research is descriptive qualitative with the primary data source coming from unstructured interviews with 15 informants. The informants consisted of 3 village officials, 5 community members, 3 tourism awareness groups in Batu Beriga Village, 2 staff from the Environment and Forestry Service (DLHK) of the Bangka Belitung Islands Province, 2 staff from the Ministry of Environment and Forestry (KLHK) of the Bangka Belitung Islands Province. The results of this study indicate that the empowerment of the Batu Beriga Village community is carried out based on environmental care. The form of community empowerment based on ecology is a manrove planting labor-intensive program. The implication of the program is that it can have a positive impact on social, economic, and environmental aspects, opportunities that occur. The results of this study indicate that the empowerment of the Batu Beriga Village community is carried out based on environmental care. The form of community empowerment based on ecology is a manrove planting labor-intensive program. The implication of the program

is that it can have a positive impact on social, economic, and environmental aspects, opportunities that occur. The results of this study indicate that the empowerment of the Batu Beriga Village community is carried out based on environmental care. The form of community empowerment based on ecology is a mangrove planting labor-intensive program. The implication of the program is that it can have a positive impact on social, economic, and environmental aspects, opportunities that occur namely opportunities for mangrove ecosystem rehabilitation and economic recovery opportunities. However, there are challenges such as conflicts of interest, lack of public awareness, and low human resources (HR).

**Keywords:** Brand Image, Price, Packaging Design, Purchase Decision, Business Marketing, Pixy Cosmetics.

## 1. Preliminary

Innovation is the process of thinking and implementing an idea that has elements of novelty and usefulness. In community empowerment activities, innovation means the process of thinking about and implementing an activity by assistants or the manager of a policy to meet the interests of the community that has elements of novelty and benefit.

The manager of a policy or empowerment who has served in the community for a long time certainly needs nature that can stimulate his way of thinking in order to find new and useful things for the benefit of the community. External support is instrumental input that is very useful in formulating a policy, for example events in the community, needs, problems and potential of the community, campus elements, NGO activists, other civil society groups, and so on are potential factors that play a role in assisting the formulation of the formulation. good and useful policy.

Thus, strengthening innovation is one of the most important factors in community empowerment in order to build the community's economy and increase the competitiveness of the region itself.

Thus the empowerment of coastal communities can be said as a formal and informal activity that is carried out systematically and involves various components of government, private, and other organizations. In addition, community empowerment is also an activity to provide strength and ability to the community and its environment.

In line with this problem, community empowerment, in this case, is an effort to increase the

dignity of groups of people who are in a powerless condition, so that they can escape the trap of poverty and underdevelopment. The basic pattern of empowerment mandates the need for power and suppresses partiality to groups that are powerless. In conditions like this, the role and policies of the government are very important in alleviating poverty by restoring the economy of coastal communities. But also governance that touches the management of public resources. So that people living in coastal areas have a good level of welfare (Suharto in Ustratul Hasanah 2005:58). Public policy is a step taken by the government in carrying out its government duties, the result of the political process that runs in the administration of the state (Anggara, 2014). According to Dunn (2003), the stages of public policy include agenda setting, policy formulation, policy adoption/legitimacy, and policy assessment/evaluation. Policy evaluation is not only carried out at the final stage. the result of the political process that runs in the administration of the state (Anggara, 2014). According to Dunn (2003), the stages of public policy include agenda setting, policy formulation, policy adoption/legitimacy, and policy assessment/evaluation. Policy evaluation is not only carried out at the final stage. The result of the political process that runs in the administration of the state (Anggara, 2014). According to Dunn (2003), the stages of public policy include agenda setting, policy formulation, policy adoption/legitimacy, and policy assessment/evaluation. Policy evaluation is not only carried out at the final stage.

Therefore, every implementation of community empowerment needs to be based on certain work strategies for its success to achieve the desired goals. Strategy in this case is defined as certain steps or actions that are carried out in order to achieve a program. Therefore, local government policies emerged in this case, especially in the Bangka Belitung Islands Province to restore the economy of coastal communities through the National Economic Recovery (PEN) programs of mangrove planting as an alternative and the best strategy in an effort to empower coastal communities in order to restore the economy of communities experiencing hardship and loss of income. When talking about the living conditions of coastal communities, namely as one of the areas that is the most synonymous with poverty, it is left behind so that it cannot be said to be prosperous. So empowerment, human resource management, income distribution, poverty alleviation, and economic growth

are very important to pay attention to in order to minimize the opportunity for problems in the community's ability to mobilize and restore their economy.

Management of coastal and marine resources in Batu Beriga Village is one of the small factors in the problem of poverty and underdevelopment that is rarely realized by many people. The marine sector which is a good economic opportunity can be said to have failed in providing welfare for coastal communities who depend their lives on the potential of these natural resources whose access is still open. Whereas the marine sector is a good and strategic economic potential for people living in coastal areas. When viewed based on the value of the natural potential of the coastal area in Batu Beriga Village, Central Bangka Regency, the coastal community there can live a prosperous life, with an area that has a wide potential of marine water resources, and is famous for coastal tourism. Central Bangka Regency also has good mangrove tourism potential, if managed and utilized optimally. However, the low level of human resources has an impact on the weak level of community knowledge in managing the existing coastal and marine potentials. This condition is accompanied by deteriorating economic conditions and very limited selling power of marine products, causing the economic activity of coastal communities in this area to decline, it can even be said that the community is powerless in the midst of current conditions with limited ability and knowledge in producing and managing resources that are scarce. exist, making the economic conditions of coastal communities decline and become difficult. when managed and utilized optimally. However, the low level of human resources has an impact on the weak level of community knowledge in managing the existing coastal and marine potentials. This condition is accompanied by deteriorating economic conditions and very limited selling power of marine products, causing the economic activity of coastal communities in this area to decline, it can even be said that the community is powerless in the midst of current conditions with limited ability and knowledge in producing and managing resources that are scarce. exist, making the economic conditions of coastal communities decline and become difficult. when managed and utilized optimally. However, the low level of human resources has an impact on the weak level of community knowledge in managing the existing coastal and marine potentials. This condition is accompanied by

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Based on this problem, the deteriorating economic conditions due to the impact of the COVID-19 pandemic that has hit the world in recent years have made it increasingly difficult for the people of Batu Beriga Village to earn income. Therefore, the regional government of the Bangka Belitung Islands Province together with related agencies carries out ecological-based coastal community empowerment, namely the mangrove planting program as a form of policy implementation, as well as environmental awareness with opportunities for mangrove ecosystem rehabilitation and economic recovery opportunities for people living in coastal areas. In this regard quoting from [babelprov.go](http://babelprov.go).

In general, the Mangrove Planting Intensive Program is an empowerment program for the underprivileged and unemployed or who have lost their income due to the impact of the pandemic. This activity

involves the community in a sustainable development process, in this case the aim is to provide cash assistance in the form of labor wages to the community. In addition, this program is also greatly utilized as a reforestation effort in coastal areas in Bangka Belitung, in this case, especially in Batu Beriga Village, Central Bangka Regency. This activity is a form of government concern for environmental conditions with environmental conservation efforts through mangrove rehabilitation, so that coastal ecosystems are maintained. Because in essence environmental problems are not considered separate from other problems. Thus, environmental problems are as important as solving social, economic, and political problems which are interrelated with each other. Therefore, with this program, the government fully hopes that the role and participation of the community will be so that the objectives of the program can be achieved.

However, the Padat Karya program in Batu Beriga Village has not been fully realized evenly, this is because there are several challenges and or obstacles that occur in it, namely due to a conflict of interest between the program manager and the empowered community, and human resources (HR). Batu Beriga Village community is still relatively low, besides the lack of public awareness in participating in the implementation of the Mangrove Planting Intensive Program, so that empowerment in this case is considered slow to achieve success.

The essence of community empowerment here is to build the ability to empower the community towards a better direction in a sustainable manner. Therefore, empowerment or development of coastal communities in particular, is an effort to provide choices to the community so that people are able to choose something that is useful for themselves, for that every empowerment is directed to increase dignity. So as to make a society that is advanced in various aspects, through the Mangrove Planting Intensive Community Empowerment program, the goal is to make the community more prosperous, independent, create a sense of caring for the environment, able to work well together and can reduce unemployment, and poverty rates according to the hope.

Thus, empowering coastal communities through an approach to the community is also very important, in this case, by providing a series of debriefing processes through socialization to the community in order to provide insight into the importance of the Mangrove Planting Intensive Program and make the

community understand the importance of maintaining a sustainable environment. After that, a process of grouping people who want to carry out a mangrove planting program is carried out according to the location and type of mangrove planting activity, as well as providing knowledge about the care of the planting results carried out and conducting mentoring (Assistance) and monitoring (Monitoring) of the planting results which aims to ensure condition of mangroves, so that it can measure the success and objectives of the program being carried out.

Based on the explanation above, the researchers also conducted a study related to Ecology-Based Coastal Community Empowerment in Batu Beriga Village, Central Bangka Regency. Looking at the form of ecological-based coastal community empowerment, then what are the implications of the ecology-based empowerment program for the community, as well as what are the opportunities and challenges in ecological-based community empowerment in Batu Beriga Village, Central Bangka Regency.

## **2. Research Methods**

### **Types of research**

In this study, the use of a descriptive qualitative research design is considered relevant for conducting studies on ecological-based coastal community empowerment. According to Martono (2015: 212), qualitative research is research that seeks to analyze social life by describing the social world from the point of view or interpretation of individuals (informants) in a scientific setting. In other words, descriptive qualitative research is analyzing, describing, and summarizing data from field findings in the form of interviews or observations about the problems studied.

### **Research Time and Place**

The time in this study is from March 2022 to April 2022. The location of the research that will be carried out by researchers is in Central Bangka Regency, which is precisely in Lubuk Besar District and the location is in Batu Beriga Village to make it easier for researchers to go out into the field.

### **Target/Research Subject**

The subjects in this study are people, places (villages or places related to the title of the researcher). The subjects of this research are parties related to Ecology-Based Coastal Community Empowerment, Village Heads, Communities, and also the Regional Government of the Bangka Belitung Islands Province. The technique in determining the informants themselves aims to make it easier for researchers to

determine informants and not to make the whole community as informants.

### Procedure

Informants themselves are people who can provide information about the situation and conditions related to the title of the researcher, namely Ecology-Based Coastal Community Empowerment in Batu Beriga Village, Central Bangka Regency. After that, to obtain the informants, the researcher conducted through purposive sampling in accordance with the title of the researcher. Data collection researchers used data collection in the form of observations, interviews, and documentation.

#### A. Deep interview

Data collection techniques using in-depth interviews are data collection techniques in which researchers conduct questions and answers to informants. So it is hoped that the results of the interviews with various parties will get relevant results and have been tested for the truth of the data. In this study, the purpose of the interview was so that the questions asked were correct and could be easily reprocessed by the researcher.

Winterview. Martono (2015:362), defines interview as a data collection technique which is done by asking questions orally to someone (informant). Based on this definition, the interview technique referred to in this study is in the form of a question and answer process that the researcher conducted with informants consisting of the Village Apparatus, the Forestry and Environment Service. Life of the Bangka Belitung Islands Province, the Ministry of Environment and Forestry of the Bangka Islands Province Belitung, and Batu Beriga Village community.

#### B. Observation

Data collection technique using observation is a technique that collects data using direct observation and also makes notes that are relevant to Ecology-Based Coastal Community Empowerment in Batu Beriga Village, Central Bangka Regency.

The observation technique in this study is a non-participant observation technique or commonly referred to as a non-participant observation technique. In this regard, the observation referred to in this study is a data collection technique, in which researchers make direct observations of the daily conditions of coastal communities in Batu Beriga Village.

Furthermore, the researchers also looked at how the community responded to the Ecology-Based Coastal Community Empowerment activities.

#### C. Documentation

Data collection techniques in the form of documentation are data collection techniques carried out by collecting various documents related to research problems (Martono, 2015: 80). In this study, documentation refers to data sourced from books, journals, online media, to regional publication documents related to coastal community and environmental issues. The data obtained through this documentation technique are used as secondary data or research supporting data to add data or information in this study.

#### Data, Instruments and Data Collection Techniques

The sources of data or information used for this research are primary data and secondary data. Primary data is a collection of information obtained by researchers directly from the research location through the first source (informants, through interviews) or through observations made by the researcher (Martono, 2015:65). With regard to the explanation, the primary data in this study refers to the results of interviews and direct observations of researchers related to the problems of the fishing community in Sungailiat. In this case, primary data serves as the main data source. Finally, secondary data itself is obtained from supporting sources as well as additional sources such as books, regulatory documents and others related to the title of the researcher, namely Ecology-Based Coastal Community Empowerment in Batu Beriga Village, Central Bangka Regency.

#### Data analysis technique

Of all the data that has been collected by researchers to answer the formulation of the problem. With this, the data that has been collected is analyzed using qualitative techniques which still involve numbers. These steps are data reduction, which is raw data that can be selected and sorted because it is still diverse to be grouped into the main issues according to the research focus. With the aim that the data that has been grouped is easy to observe. Presentation of data is data that has been processed and obtained by researchers in the form of tables, graphs, matrices, graphs and so on. The goal is for researchers to easily learn the data easily. And finally the conclusion is the stage for making decisions on research questions in which the data has been compiled by researchers.

### 3. Results and Discussion

Public policy is a step taken by the government in carrying out its government duties, the result of the political process that runs in the administration of the state (Anggara, 2014). According to Dunn (2003), the stages of public policy include agenda setting, policy formulation, policy adoption/legitimacy, and policy assessment/evaluation. Policy evaluation is not only carried out at the final stage. This is then reinforced by the opinion of Winarno (2013), Winarno said that policy evaluation is carried out to see the extent to which the policies made have been able to solve problems and provide the desired impact.

Based on some of the explanations above, the policies presented in the community empowerment and village development program in this case especially Batu Beriga Village need to be evaluated to find out the desired results and impacts according to the objectives of a policy program, hereby can be used as a reference for public policy making needed the existence of a criterion to measure the success of the public policy. This is as Dunn (2003) said, the evaluation criteria consist of effectiveness, efficiency, adequacy, alignment, responsiveness, and accuracy.

With regard to this opinion, it is to find out the policies of the Regional Government, especially the Province of the Bangka Belitung Islands in implementing the program which is the result of a policy that aims as a form of ecological-based community empowerment, in this case especially in Batu Beriga Village, Central Bangka Regency which is one of the villages located in Central Bangka Regency. in the coastal area with the potential of abundant natural resources, therefore it is very suitable for the development of the village in order to raise the socio-economic life conditions of the people in the region. Therefore,

In connection with this argument, to find out how far a policy program that has been implemented in Batu Beriga Village has been, it can first be seen from the form of an empowerment program, then what are the implications for socio-economic and environmental conditions that can be generated from the implemented policy program. , and what are the opportunities and challenges in the policy program. After evaluating the results of the policy in an empowerment program, it can be seen how far the success and benefits contained in the policy made against the target of a policy. With this, in order to be able to find out the final result of the policy made, whether it is in accordance with the objectives or not

yet can be said to be in accordance with the objectives of the policy.

Thus, to find out the extent of the policies that have been carried out in Batu Beriga Village as a coastal area, it can be seen from the form, implications, as well as opportunities and challenges contained in an ecology-based community empowerment policy as follows:

#### 3.1. Intensive Work Mangrove Planting as a Form of Ecology-Based Coastal Community Empowerment in Batu Beriga Village, Central Bangka Regency



Figure 1. Location of the Mangrove Planting Intensive Program Implementation in Batu Beriga Village

Community empowerment can be linked as a formal and informal activity, which is carried out systematically and involves various organizational components. In addition, community empowerment is also an activity to give strength and ability to the community and the environment.

Therefore, a number of programs and activities are needed, both directly from the community and from the government, which have been taken into account in a policy. Based on the Joint Decree of the four Ministers, namely the Minister of Home Affairs, the Minister of Finance, the Minister of Villages for the Development of Disadvantaged Regions, and the Minister of National Development Planning/Head of the National Development Planning Agency (PPN/Bapennas) Number: 140-8698 of 2017, Number: 954/Kmk. 07/2017, Number: 116 of 2017, Number: 01/SKB/M.PPN/12/2017 concerning the alignment and strengthening of policies to accelerate the implementation of Law Number 6 of 2014 concerning Villages. With the scope of (1) development of villages and rural areas (2) allocation, distribution and implementation of village funds,

In the Ministerial Decree-4 it is stipulated that the Ministry of Villages, Development of Disadvantaged Regions and Transmigration shall: 1) Strengthen professional companions to: a. Assisting the

implementation of cash labor-intensive programs in the village; b. Collaborating with other facilitators for poverty alleviation programs; 2) Refocusing the use of Village Funds on 3 (three) to 5 (five) types of activities according to the needs and priorities of the Village, through coordination with relevant ministries; 3) Facilities in the use of village funds that must be used at least 30% (thirty percent) to pay the wages of the people who participate in the village development process; 4) work wages are paid daily or weekly in the implementation of activities financed by the Village Fund;

In general, the notion of a program is a set or collection of written instructions made by a programmer or an executable part of a software. People who make programs are often referred to as programmers or programmers and the activity of making programs is called programming. According to (Anwar Harjono) a program is a sequence of instructions to run a computation. (Saifuddin Ansari) Program is a detailed list of events and efforts to be carried out.

Cash for work is an activity to empower rural communities, especially the poor and marginal, which is productive in nature by prioritizing the use of local resources, labor, and technology to provide additional wages/income, increase purchasing power, reduce poverty, and at the same time support reduction in stunting. Through the Intensive Work Program, now the Regional Government of the Bangka Belitung Islands Province and related agencies are utilizing the program prioritized by the central government in economic recovery through mangrove planting as an alternative and the best strategy in empowering coastal communities.

### **3.2. Implications of Ecology-Based Coastal Community Empowerment Program in Batu Beriga Village, Central Bangka Regency**

Implications of the National Economic Recovery Program (PEN) in Batu Beriga Village, Central Bangka Regency, has a very large impact and benefit for the community, both direct and indirect benefits. The labor-intensive work of mangrove planting in general, the national economic recovery (PEN) is one of the government programs that prioritizes sustainable development and the economic recovery of coastal communities due to the impact of the corona virus outbreak that hit Indonesia in recent years and caused a weakening of the economy, especially in the Bangka region. Belitung itself.

This then has a direct impact that can be felt by all elements of the Bangka Belitung community with difficult economic conditions and job losses due to the impact of the outbreak, with this the government then tries to overcome the economic problems that experienced a slump by issuing empowerment policies through the national economic recovery program (PEN) as a form of community economic recovery in the midst of current difficult conditions, which is then handed down to local governments as program managers in their respective regions. The impacts that can be generated from ecological-based coastal community empowerment activities are:

- a. Developments in the economic aspect with the existence of an ecological-based coastal community empowerment program in Batu Beriga Village, in this case, can be felt more or less by the community. This can be seen from the existence of community empowerment efforts by providing people with jobs, thus the program directly has an impact on reducing the unemployment rate, besides that the program also provides cash wages to the community, this is certainly an economic income for people who are empowered as a source of income. form of driving force as well as restoring the economic condition of the community.
- b. In terms of socio-political aspects, the implications of the labor-intensive National Economic Recovery (PEN) program for mangrove planting on socio-political conditions are the program in order to implement policies and programs that are prioritized by the central government in seeking to improve social welfare in the community and improve the quality of life. life that can be seen from the increase in knowledge and awareness as well as labor productivity, with the availability of new jobs in the form of rehabilitation of the coastal environment.
- c. Furthermore, the implications of the coastal community empowerment program on environmental aspects can also have a positive impact on the environment obtained from the labor-intensive National Economic Recovery (PEN) program for mangrove planting, namely as a form of concern for the government and the community who are empowered to environmental conditions, due to environmental conditions. A sustainable ecosystem can serve as the main chain of support for the balance of the coastal ecosystem of Batu Beriga Village, this is what the government and managers hope for so that the environment can play

a role as it should. As we all know that the island of Bangka is very famous for its local wisdom, namely the mangrove ecosystem,

### **3.3. Ecology-Based Coastal Community Empowerment Opportunities in Batu Beriga Village, Central Bangka Regency**

#### **A. Land Rehabilitation Opportunities**

The coastal area of Batu Beriga Village is an area that has biodiversity, where there are many organisms that live in it. This area is an area that is heavily overgrown with mangrove plants, as is known in general, coastal areas are very identical with mangrove trees, because coastal areas are sandy places and tend to be muddy, therefore it is very suitable for mangrove ecosystems to thrive. Ecologically, mangroves are marine biota and are spawning grounds for fish that live in the open sea. Besides having a huge impact on the marine environment, mangroves are also very influential on the survival of people living in coastal areas.

This is because when the mangrove ecosystem is preserved, it will certainly benefit the coastal communities in Batu Beriga Village. This is because if the condition of the ecosystem is balanced, it will allow the marine life in it to be abundant, so that it can be utilized by people who mostly work as fishermen to support their daily income.

As it is well known that coastal areas are areas that are often the center for implementing empowerment programs because people living in coastal areas are known as marginalized communities, therefore in this case as stated in the Minister of Forestry Regulation Number 03/MENHUT-V/ 2004 concerning efforts to rehabilitate the function of degraded mangrove forests to conditions that are considered good and capable of carrying out ecological and economic functions.

Forest and land rehabilitation, hereinafter abbreviated as RHL, is an effort to restore, maintain and improve forest and land functions in order to increase their carrying capacity, productivity and role in life support systems. In addition, rehabilitation is also a form of coastal environmental management by preserving mangrove forests damaged by natural and human-induced physical factors. This approach implies that the relationship between humans and the environment is mutually dependent on each other and is very closely related, this is not only the management of natural and cultural communities that are less friendly to the environment by using natural resources excessively and paying less attention to the impacts

generated from the environment. In an effort to support sustainable coastal environmental management, the government hereby prioritizes community empowerment by forming a community empowerment policy by involving the environment as one of the supporters of program implementation. The mangrove planting is carried out in an effort to improve environmental conditions as well as a form of carrying out community empowerment programs in this case, especially in coastal areas. With this program, it is hoped that it can be put to good use for coastal communities. The mangrove planting is carried out in an effort to improve environmental conditions as well as a form of carrying out community empowerment programs in this case, especially in coastal areas. With this program, it is hoped that it can be put to good use for coastal communities. The mangrove planting is carried out in an effort to improve environmental conditions as well as a form of carrying out community empowerment programs in this case, especially in coastal areas. With this program, it is hoped that it can be put to good use for coastal communities.

#### **B. Economic Recovery Opportunity**

In addition to opportunities in the field of ecology, namely the rehabilitation of mangrove ecosystems in the coastal area of Batu Beriga Village which is the basis of an ecology-based community empowerment program, the economic context is also a factor that becomes an opportunity in the community empowerment program living in the coastal area. This will then encourage the growth of new efforts, new approaches in various coastal community empowerment activities, both in terms of direct tourism opportunities carried out by tourism managers and efforts that involve the community in utilizing the potential of the coastal environment in the area. to improve the welfare of coastal communities.

With the condition of the village that has rich natural potential, it can actually lift the economic condition of the people in Batu Beriga Village. However, until now, all existing plans seem to have just silenced themselves without any real implementation. This is due to the low level of public knowledge regarding the management of the natural potentials they possess, so that they cannot be developed and utilized properly. This then raises and encourages new demands that the government should strive for in empowering these conditions which is a belief as well as illustrates that the environment is no longer a problem in social life, However, it can be used to improve the economy in

order to prosper the conditions and living standards of coastal communities. In other words, the environment has an important role in encouraging all levels of society to take advantage of it as an opportunity for recovery and economic improvement of coastal communities.

So that it is hoped that it can encourage all parties to be able to solve the problem of the condition of coastal communities and be able to raise public awareness in participating in various empowerment programs that have been pursued in overcoming poverty and environmental damage problems together.

It can be concluded that the opportunity for economic improvement in the ecology-based community empowerment program can be said to be an impact that can be felt by the community directly and is very promising, where this aspect becomes a space to increase the economic value of the community in Batu Beriga Village. This makes the rehabilitation of mangrove ecosystems in coastal areas an opportunity to empower coastal communities based on ecology with the aim of recovery and economic improvement so promising to be managed and developed optimally considering the natural potential in Batu Beriga Village is very diverse and can be used as an alternative in community development. .

### **3.4. Challenges of Ecology-Based Community Empowerment in Batu Beriga Village, Central Bangka Regency**

#### **A. Conflict of Interest**

A community empowerment is not an easy thing to achieve success, because there are many factors that become obstacles and become a challenge for the managers of the empowerment program and the empowered community. This is in line with the ecological-based empowerment of coastal communities in Batu Beriga Village, Central Bangka Regency. As we all know, when we talk about ecology, we cannot separate from environmental issues, which until now continue to be a problem in life, as is the case with land which is one of the main components in the environment.

The need for land for development often has conflicts of interest, for example, namely: a land that is in very good condition for planting and preserving mangrove ecosystems, but because it is in the interest of getting greater profits and tends to produce and enjoy the results more quickly, the land that should be whether it is used for the process of planting and

preserving the mangrove ecosystem, then the land is used and utilized as a place for illegal tin mining (TI).

Therefore, the challenge for implementing community empowerment efforts through the preservation of mangroves is because there is a conflict of interest between the program pursued by the manager and the community who are the target of empowerment. In general, people often think that programs such as planting trees are activities with uncertain results. So people prefer to work as tin miners. In general, this conflict of interest has the same characteristics, namely the gap between the program manager and the empowered community. In this case, what is meant is when there is a conflict of interest, it cannot be separated from the ethics used in land use. According to Miller (1979) there are 3 (three) ethics in land use, namely (1) economic ethics, which uses land based on economic considerations and is the most profitable, (2) conservation ethics, land use ethics oriented to the preservation of life, and (3) ecological ethics, namely land use oriented to the preservation of life and optimal use. From the three ethics it can be stated that land use with economic ethics tends to exploit land, so that it can reduce environmental quality.

Therefore, the land that should be used as land for the rehabilitation of mangrove ecosystems is used as land to run a business that is more profitable for the community, this is because the community prefers a faster and larger profit, so the land is used as illegal tin mining land (TI). ) which as it is known that mining activities have a major impact on the decline in land quality and the environment. Therefore, in the context of sustainable development, namely development that pays attention to limited natural resources (SDA), then ecological ethics is ethics whose land use is recommended for sustainable development,

In line with this problem, it is important for the community to participate when there is a program that leads to saving the environment, in this case the rehabilitation of mangroves in order to preserve the coastal environment of Batu Beriga Village, the program is not only in order to save environmental conditions but is also an effort by the government and other parties. program managers in restoring the community's economy by involving the community as objects that are empowered to participate in the implementation of the mangrove planting.

## B. Lack of Public Awareness

Community Empowerment through an ecology-based community economic recovery program is an effort made by the government in development to change the condition of the community for the better. According to Rogers (in Aufa, 2019) describing community empowerment is closely related to social development of the environment that changes towards a better social system and makes the community actively participate in every development.

Thus, community empowerment as a development process in increasing the ability and responsibility as well as community participation in managing the programs carried out. In the Law of the Republic of Indonesia Number 6 of 2014 that village development aims to improve community welfare, improve quality of life and reduce poverty by developing local economic potential, utilizing natural resources and human resources through planning, implementation and supervision. Community empowerment by trying to run programs to develop communities in independence. The Mangrove Planting Intensive Program is one of the community empowerment programs that aims to restore the economy of communities affected by Covid-19,

With empowerment, it is possible for the community to participate in various activities, so that it can affect the lives of the people who are the targets of the empowerment program for the better. Therefore, awareness and active participation of the community is very much needed by developing and increasing economic and social independence through activities that have been designed by the government. Community participation is a form of community participation involved starting from planning and implementation in community empowerment programs. Community empowerment in its implementation cannot be separated from community participation which is empowered to achieve the desired development results. Therefore, community awareness and involvement is very helpful in developing policy formulation regarding planning, programming, implementation, evaluation through the activities carried out. Public awareness tends to be lacking as a result, it is very difficult to find culture in the community itself to be developed so that the community can be empowered because the level of participation and public awareness is still lacking. On the other hand, towards an advanced and developing society, awareness and active participation from the community itself is needed. So that the efforts given by

the program manager can achieve the desired results. Public awareness tends to be lacking as a result, it is very difficult to find culture in the community itself to be developed so that the community can be empowered because the level of participation and public awareness is still lacking. On the other hand, towards an advanced and developing society, awareness and active participation from the community itself is needed. So that the efforts given by the program manager can achieve the desired results. public awareness tends to be lacking as a result, it is very difficult to find culture in the community itself to be developed so that the community can be empowered because the level of participation and public awareness is still lacking. On the other hand, towards an advanced and developing society, awareness and active participation from the community itself is needed. So that the efforts given by the program manager can achieve the desired results.

Thus, community involvement in this matter can be carried out in various forms, not only physically but also in contributing ideas and ideas either directly or indirectly. Community participation in empowerment programs is influenced by the willingness or awareness and ability of the community so that it can encourage them to be involved and participate actively, without awareness and willingness from within the community, it is very difficult to participate in running an empowerment program. Through participation in community empowerment, it is the community who takes the initiative and changes the circumstances and conditions for the future (Liyabasari, 2015). Participation can begin in the process of identifying problems from the community's potential and involvement in finding solutions.

In line with this problem, according to Arifah (in Wicaksono, 2017) there are 4 indicators of community participation in development, namely: (1) Planning participation, through the form of attendance and submission of opinions and decisions, (2) Implementation participation, through the involvement of the provision of place, time and personnel in the process of implementing the planned program, (3) Participation in the results of activities, namely in the involvement of the use of the results, (4) Participation in evaluation and monitoring, namely the community involved in monitoring and evaluating the course of development whether it has met the development targets or not. These four indicators will become parameters for how the community participates in the empowerment that is carried out, whether the role and

awareness of the community has been carried out optimally or not. With a lack of awareness from the community, there is very little willingness and active participation in running a program. Therefore, in the planning stage of empowerment or development, it is very necessary to have public awareness and participation in a program.

As it is known together that Batu Beriga Village has a very diverse regional potential, including the potential for coastal areas which are identical to the use of coastal and marine resources, therefore an empowerment program is carried out through the use of local wisdom and the potential of the village environment by involving a number of workers. This activity is an effort to provide knowledge to the community in managing and utilizing the environment and the natural potential of an area, besides that it also provides jobs for people who have lost their income by empowering communities through conservation programs for the potential of their coastal areas. With this the importance of awareness and active role of the community in the implementation of the empowerment program.

### C. Low Human Resources (HR)

In addition to the lack of public awareness, so that it becomes a challenge and obstacle in achieving an empowerment program, there is also a factor of low human resources (HR) which is also a challenge for managers and communities who are empowered in the sustainability of ecological and technology-based community empowerment programs in the community. exploiting the potential of the area. As we all know that coastal areas have a high diversity of natural resource potential and are very important for social, economic and environmental development. Basically, coastal areas are composed of various ecosystems such as mangroves, coral reefs,

The community in this area has been known to be rich in its natural potential, if it is managed and utilized properly it will have a good impact on the living conditions of the community. However, the lack of human resources (HR) in the Batu Beriga Village community has not been able to improve their welfare through the existing marine and coastal potential. Basically, Batu Beriga Village has a very rich natural potential that can be managed and utilized properly, but the challenge is that the human resources (HR) of the community are still relatively low, making it difficult to develop the existing opportunities. With this, it is not

surprising that the people who live there are still said to be powerless.

Limited knowledge and the low quality of human resources (HR) owned by the community greatly affect the slow rate of community welfare. This is of course an impact and a challenge for the manager of the community empowerment program in Batu Beriga Village. One of the factors that cause the low quality of human resources (HR) in Batu Beriga Village is also influenced by the education factor which is still relatively low. Due to the low level of education in the community, there is a lack of knowledge so that community resources (HR) have not been able to manage all the potential that exists in the village environment as a coastal area that will be rich in natural resources.

Therefore, it is not surprising that coastal communities there are difficult to develop and have minimal knowledge of the management and utilization of their natural potential optimally and sustainably.

Conditions like this really show the powerlessness of the community is also influenced by the level of education which is directly related to the quality of human resources in the community. When human resources (HR) in the community are still low, it greatly affects the skills possessed by the community in managing and utilizing existing facilities and potential. Therefore, human resources (HR) and natural resources (SDA) are two important components in a life, because the development of an area requires a basic aspect, namely quality human resources (HR) so that a program can be successful.

## 4. Conclusion

### A. Conclusion

From the research results of researchers with the title "Economy-Based Coastal Community Empowerment in Batu Beriga Village, Central Bangka Regency" which has been described in the previous chapter, it can be concluded that based on the Ecology-Based Coastal Community Empowerment, it can be concluded that the form of ecology-based community empowerment that has been carried out in Batu Beriga Village, namely empowerment through the Mangrove Planting Intensive Program.

The implementation of the empowerment is one form of implementing government policies through the sustainable Mangrove Planting Intensive Program (PKPM) to restore the national economy which is prioritized by the government for people who have lost income and are not working due to the impact of the

Covid-19 pandemic that hit the Bangka Islands Province. Belitung in particular. The empowerment activity does not only provide cash wages, but also provides insight and knowledge on the importance of maintaining the balance of the mangrove ecosystem and marine life in it, as well as providing a sense of environmental care for the community while maintaining environmental sustainability in the rich Batu Beriga Village. the potential of the sea and its coast. Through these empowerment activities, The community is invited to be able to rehabilitate the mangrove ecosystem and protect the environment around the sea coast. With this empowerment program, it is hoped that it can foster a sense of environmental care and good cooperation in supporting government programs in seeking community welfare through the utilization of the existing environmental potential.

Furthermore, the implications of the ecological-based community empowerment program have a positive impact on economic, social, and environmental conditions, directly or indirectly on the community. The economic impact of the implications of the program is to reduce unemployment by creating jobs for coastal communities who have lost their income and are not working during the impact of COVID-19, so that there is a labor-intensive program for planting mangroves along the sea coast by employing people who live in the area. can change the economic conditions of the community directly, namely by providing wages in cash to the people who work on the implementation of the program.

Coastal and marine areas, as well as the community can know the role and function of the mangrove ecosystem and the utilization of existing ecosystems, and cultivate the ability to cooperate well with the community. And the implications of the program on the environment have a good impact on environmental sustainability, by maintaining the balance of the ecosystem in it, as well as reducing the impact of abrasion on the coast that occurs due to tides.

Then the aspect of opportunity in the implementation of the empowerment program is also very large, namely ecosystem and land rehabilitation is an effort to restore, maintain and improve the function of forests and land in order to increase their carrying capacity, productivity and role in life support systems, besides that rehabilitation is also a form of coastal environmental management. by preserving mangrove forests that have been damaged by natural and human-

induced physical factors. In addition to being a rehabilitation opportunity, the empowerment program is also an opportunity to restore the coastal community's economic condition, in the form of remuneration for people who work on the Mangrove Planting Intensive Program which is carried out in the marine area of Batu Beriga Village. In this case when the program has an opportunity aspect,

In addition, the lack of awareness from the community to actively participate in the implementation of empowerment programs is also a challenge in order to achieve a development program, this is also accompanied by the level of quality of human resources (HR) of the Batu Beriga Village community which is still relatively low. So that it becomes a challenge and obstacle in achieving an empowerment program there is also a factor of low human resources (HR) which is also a challenge for managers and communities who are empowered in the sustainability of ecological and technology-based community empowerment programs in utilizing their regional potential.

## B. Suggestion

Regarding the issue of ecological-based coastal community empowerment in Batu Beriga Village, at least it can be minimized by the active role and concern of the government for the condition of the community, especially coastal areas by increasing policies and implementing empowerment programs including counseling and providing knowledge to the community. This is certainly related to maximizing sustainable regional development and socio-economic development of the community in terms of increasing income which is as much as possible adapted to existing community patterns and habits. With this active role and concern by providing programs that can improve

The welfare of coastal communities can certainly reduce their powerlessness with the limited abilities they have so far. As the cause of coastal communities difficult to get out of the problem is often marked with marginal conditions.

Not only that, in the implementation process of course the government must also supervise the implementation of the policy so that it can be used optimally. Most importantly, socialization and provision of knowledge to improve the quality of human resources must be encouraged so that the policies and regulations that have been established can be understood by all coastal communities. This is because

the problems that occur in coastal communities are not only the responsibility of the village head, but also the local government.

## 5. Acknowledgments

The researcher would like to thank those who have contributed to the writing of this journal, so that the research can be completed as much as possible.

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## ARTICLE

# The Effect of Online Customer Review and E-Service Quality on Consumer Purchase Decisions on the Marketplace Shopee in Bandar Lampung

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## OPEN ACCESS

**Citation:** Intan Lidiya Widuri, Mahrinasari MS, and Mudji Rachmat Ramelan. The Effect of Online Customer Review and E-Service Quality on Consumer Purchase Decisions on the Marketplace Shopee in Bandar Lampung. *Ijori Journal Vol. 2 No. 3 (2022): 29-33.*  
<https://doi.org/10.52000/ijori.v2i3.62>

e-ISSN : 2775-7641

Accepted: August 30<sup>th</sup>, 2022

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**Abstract:** The phenomenon of online shopping in the modern era continues to increase, so it is not surprising that business people need to pay attention to the importance of online customer reviews and provide the best quality e-service for customers to purchase products in the marketplace. One of the marketplaces that can be used is Shopee. The type of data used in this study is primary data obtained from the results of respondents' answers which were collected with the help of a questionnaire. The number of samples in this study were 120 respondents. The sampling method used purposive sampling, which is a technique to determine the sample with the appropriate criteria determined by the researcher. The analytical method used in this research is validity test, reliability test, analysis stage using multiple linear regression, and hypothesis testing, namely t test and coefficient of determination test (R<sup>2</sup>), with the help of the IBM SPSS 26 application program for windows. The results of this study indicate that the online customer review variable has a positive and significant effect on the purchasing decision variable. The e-service quality variable also has a positive and significant effect on the purchasing decision variable. In this study, the independent variable was able to explain the dependent variable by 49.8% while the rest was influenced by other variables outside the variables in this study.

**Keywords:** Online Customer Review, E-Service Quality, Purchase Decision, Marketplace, Consumer Behavior

## 1. Preliminary

Changes in consumer behavior in shopping, one of which comes from shopping offline (conventional) switching to shopping online, is caused by the many advantages offered by online shopping sites. Now consumers or prospective buyers are able to get goods through various marketplaces, one of which is Shopee. Online information in shopping in the marketplace is by looking at reviews and looking at the electronic services provided in an online store. Customer Reviews are very crucial for consumers online when making an online purchase. According to Filieri (2014) Online Customer Review is one of the descriptions Word of Mouth Communication on online sales where prospective buyers obtain additional information about products from other consumers who have purchased the product.

Based on the data report (2022), it describes the number of visitors to various websites in Indonesia in early February 2022. Shopee.ID became a marketplace website with 13th monthly visitors after the Tokopedia marketplace with 11th place in February 2022 with an average total visit of 1.44B with visit time 6 minutes 43 seconds. Another phenomenon that can be found from online shopping activities is where prospective consumers are faced with several risks such as the lack of freedom to directly assess an item or service that is offered whether it meets the needs and expectations of consumers.

According to Yan et al. (2021: 180), online customer review or what can be called electronic word of mouth (e-WOM) serves as a tool in the decision-making process in potentially online purchases by waiting and observing other people before making a purchase decision. Prospective buyers will certainly not buy an item that has a bad review. Online customer reviews are not only used as a factor used to improve customer purchasing decisions, there are e-service quality that can be used in the marketplace. E-service quality is assessed as the quality of an online service in digital services such as a marketplace. The success of the marketplace is judged if it has good service when it can provide customer facilities according to their needs with ease in the purchasing process for the products that customers need.

Based on the proliferation of online shopping activities that are growing, it is not surprising that business people need to pay attention to consumer reviews and provide the best quality electronic services so that customers can purchase products at the store. Shopee users in Bandar Lampung are aware that current technological advances provide advantages in using the marketplace as a means of online shopping, both in terms of convenience in transacting the diversity of product types and prices and users can make purchases whenever and wherever different consumers are.

## Literature Review

### Online Customer Reviews

Customer reviews or online customer reviews given online are consumer judgments about a product that has been purchased or various aspects in conveying extra information related to product quality that can help other consumers obtain and receive information about the product. (Mo et al., 2015:420). According to Lee, E.-J and Shin (2014) assume that customer reviews are part of the Electronic Word of Mouth (e-WOM) which means a direct assessment from someone and not an advertisement which is one of the various factors that determine consumer purchasing decisions. So the indicators used in this study use e-WOM indicators. According to Bambauer-Sachse and Mangold (2011:42), e-WOM can be measured using three indicators, namely:

- 1) General Persuasiveness
  - a. Always look at reviews before buying a product.
  - b. Provide reviews related to products that have been purchased.

- 2) General Credibility
  - a. Trust other consumer reviews.
  - b. Trusting product ratings from other consumers.
- 3) Susceptibility to online product reviews
  - a. Read product reviews from other consumers.
  - b. Gather information from reviews before making a purchase.

### E-Service Quality

E-Service Quality or electronic service means assessing the ability of a site to provide an effective and efficient means of shopping activities from the beginning of the buying process, ordering to delivery (Tjiptono 2014:410). Electronic services make it easy for customers to use without any obstacles resulting in a distinct satisfaction in the electronic services of a company or website. According to Suryani, e-service quality indicators can be measured in several ways, namely:

- 1) Website Design
  - a. Have an attractive website design.
  - b. Consumers get information online through the website.
  - c. Ease of operation of the website.
- 2) Reliability
  - a. Shopee maintains consumer privacy.
- 3) Response
  - a. Seller is fast and responsive in serving consumers.
  - b. The seller is patient and friendly in dealing with consumer problems.
- 4) Trust
  - a. Shopee is trusted to provide quality products or brands.
- 5) Personalization.
  - a. Shopee help feature is able to answer consumer complaints.
  - b. Shopee help feature meets the specific needs of consumers.

### Purchasing Decisions

According to Kotler and Armstrong (2016), purchasing decisions are the science of how individuals, groups, and organizations choose, buy, use and dispose of goods, services, ideas or experiences to satisfy their needs and desires. According to Kotler and Keller (2016), purchasing decision indicators can be measured in several ways, namely:

- 1) Stability in a product

- Deciding to make a purchase because the product meets the needs.
- 2) Habits in buying products  
Often make product purchase transactions.
  - 3) Provide product recommendations that have been felt  
Recommend to friends or family to make product purchases.
  - 4) Make repeat purchases.
  - 5) Decided to make a repeat purchase.

### Marketplace

According to Opiidia (2014) marketplace is an internet based online facility where business activities and transactions are carried out between sellers and buyers. Buyers can get as many suppliers as possible using the criteria according to their wishes so that they get prices according to the desired market. While the seller can obtain information related to the wishes of the buyer. Broadly speaking, marketplaces are divided into three types, namely: vertical marketplaces, horizontal marketplaces, and global marketplaces.

### 2. Research Methods

This research was completed using quantitative data by distributing online questionnaires via Google Form to respondents, namely Shopee users in Bandar Lampung. The results of the data obtained are primary data by getting answers directly from respondents through filling out online questionnaires. As for secondary data sourced from journals and other information that helps this research. Shopee users in Bandar Lampung are the population in this study, in determining the sample the researchers used probability sampling with purposive sampling method using the formula Hair et al., (2014) and got 120 consumers as respondents. The data collection method used is the observation of the distribution of online questionnaires and a literature study using information and journals that support this research. The analytical method used is validity test, reliability test, multiple regression analysis, coefficient of determination ( $R^2$ ) and hypothesis testing.

### 3. Results and Discussion

#### 3.1. Results

Partial Test (t Test)

Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	1,719	1,380		1,246	.215
Online Customer Reviews (X1)	.349	.060	.440	5,812	.000
E-Service Quality (X2)	.179	.036	.373	4,932	.000

*Dependent Variable: Purchase Decision*

*Source: Data processed by researchers (2022)*

The table above shows that the constant value is 1.719, Online Customer Review 0.440, E-Service Quality is 0.373. Based on these values, the following regression equation is obtained:

From the Multiple Linear Equation, it is obtained:

$$Y = 1.719 + 0.440X1 + 0.373X2$$

Based on the results of the regression coefficient owned by the online customer review of 0.440, it means that the online customer review has a positive and significant effect on purchasing decisions. This means that the better the reviews given, the more purchases will occur.

Based on the results of the regression coefficient owned by the e-service quality variable of 0.373, it means that the e-service quality has a positive and significant effect on purchasing decisions. This means that the better the e-service quality provided, it will increase the occurrence of purchases.

#### 3.2. Discussion

The development of online shopping activities through the marketplace has become a trend among the public, including consumers in Bandar Lampung. There are several consumer considerations both in terms of the quality of a product because of limitations in observing or assessing directly. Before and after shopping online, consumers can use the review feature in the marketplace. Prospective buyers can see positive or negative reviews given by other consumers to obtain an explanation of product quality and service quality (e-service quality) provided by the store or company. This

study has three variables, namely online customer review, e-service quality and purchasing decisions.

#### A. The Effect of Online Customer Reviews on Purchase Decisions

Based on the test results of the first hypothesis, it shows that the answers to the questionnaires filled out by respondents on the online customer review variable, the indicator that has the most dominant influence is the susceptibility to online product reviews of 91.6% with the statement "collecting product information from reviews given by other consumers.". However, there is still 1.7% in the general persuasiveness indicator that consumers do not provide reviews of products that have been purchased. In this case, the more reviews given by consumers it will help other consumers in getting additional information related to the product. From the results of research conducted shows that consumers collect additional information through reviews before making a purchase. The results of this first test are in line with the results of previous research tests conducted by Na Liu (2020) and Fitra Ramadan et al (2021) showing a positive and significant influence between online customer reviews on purchasing decisions.

#### B. The Effect of E-Service Quality on Consumer Purchasing Decisions

Based on the test results of the second hypothesis, it shows that the answers to the questionnaires filled out by respondents on the variable e-service quality indicator which has the most dominant influence are website design by 91.7% with the statement "easy to operate the Shopee website". However, there is still 2.5% on the personalization indicator that consumers feel the Shopee help feature cannot meet the specific needs of consumers. In this case, the Shopee help feature needs to be improved to help meet needs and overcome consumer dissatisfaction. From the results of research conducted shows that the better the service obtained by consumers, the higher the level of consumer purchasing decisions. The results of this second test are in line with the results of previous research tests conducted by Fitra Ramadan et al (2021) and Apriwati Solihat (2018) which show that there is a positive and significant influence between e-service quality on purchasing decisions.

#### 4. Conclusions

The results of the partial t test indicate that the first hypothesis can be accepted that there is a significant influence of online customer review variables on consumer purchasing decisions through the Shopee marketplace in Bandar Lampung, where the better online customer reviews are carried out, the higher consumer purchasing decisions at the Shopee marketplace in Bandar Lampung.

The results of the partial t test show that the second hypothesis can be accepted that there is a significant influence of the e-service quality variable on consumer purchasing decisions through the Shopee marketplace in Bandar Lampung, where the better the e-service quality is, the more purchases occur at the Shopee marketplace in Bandar Lampung.

#### Suggestions

For the sake of developing innovation in the use of online shopping using the Shope marketplace, it is necessary to increase the importance of:

- a. Maximizing and innovating customer review features, such as providing bonuses or rewards for consumers who provide the best and most trusted reviews, to help other consumers get additional information about the products they have purchased.
- b. Evaluate Shopee's assistance features with the help of reviews that have been given by consumers so that Shopee's customer service provides services with a good response to consumers so that they are satisfied with the services provided.

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## ARTICLE

# Public Service Innovation as a Strategy for Increasing Regional Innovation in Probolinggo City

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**Abstract:** This research is about innovation in the field of public services carried out by the City of Probolinggo. This research is important and relevant to be discussed because it. This innovation can solve problems from the aspect of limited funds for sanitation and technology development which are considered complicated and the introduction of the SIBER-PAM strategy that can guarantee an increase in the quality of services for the community. Thus, the two innovations gave rise to various strategies that offer convenience in the use of public services. And can be an inspiration for other regions in order to overcome the same problem. The population in this study is in areas that have implemented policies or innovation in the field of public services. While the sample in this study is innovations carried out by the Probolinggo City government are called Si Inol Aja innovations (Innovation System for Arisan Services / Latrine Installments) and innovations Easier Access Based on "SIBER-PAM" (Socialization of Information Based on People's Education - Drinking Water Company). The results of this study indicate that Si Inol Aja has proven to be one of the most effective ways to eradicate open defecation (BABs), namely people have healthy latrines with technological convenience, namely a direct cast system on the spot, having healthy latrines is not difficult and inexpensive, people have a latrine faster healthy without having to wait for help from the government, strengthen participation and community self-reliance, provide new skills for craftsmen who can expand their job opportunities in the surrounding area, and grow a synergistic partnership between the government, the community and the business world to realize better sanitation. Meanwhile, the introduction of the SIBER-PAM strategy can guarantee an increase in the quality of services for the community. The presence of SIBER-PAM can provide education to the public, especially customers of PDAM Kota Probolinggo and the means of socializing the services provided at this time have innovated to become more modern. Thus, through this strategy, conveniences in the use of public services will be offered.

**Keywords:** Innovation, Public Service, Sanitation, PDAM, Community, Local Government

## 1. Preliminary

This research is about innovation in the field of public services carried out by the City of Probolinggo. Health is one of the basic human needs, therefore health is a right for every citizen that is protected by law. Every country recognizes that health is the biggest asset to achieve prosperity. Therefore, improving health services is basically an investment in human resources to achieve a prosperous society. In developing countries such as Indonesia, to be able to improve the welfare of the community, it is necessary to have the role of the government through public services to be able to meet the basic needs of its people such as health, education, and other basic needs (Khariza, 2015; Ardinata, 2020).

## OPEN ACCESS

**Citation:** Arwanto Harimas Ginting and Adi Suhendra. Public Service Innovation as a Strategy for Increasing Regional Innovation in Probolinggo City. *Ijori Journal* Vol. 2 No. 3 (2022): 34-47. <https://doi.org/10.52000/ijori.v2i3.66>

e-ISSN : 2775-7641

Accepted: August 30<sup>th</sup>, 2022

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Health development is essentially an effort carried out by all components of the nation that aims to increase awareness, willingness, and ability to live healthy for everyone in order to realize the highest degree of health (Dafitri & Raharjo, 2020). The implementation of development in the health sector is a useful tool in an effort to achieve goals, through the implementation of development an assessment process can be carried out on the achievement of the goals that have been set and the implementation of development can provide an objective assessment in policy making (Laing, 2019). A clean environment also needs to be applied to the community to create a healthy environment. It is necessary to manage and protect the environment to ensure sustainable development to meet the needs of future generations. The responsibility for protecting and managing the environment today is not solely the responsibility of the government or the state. Community involvement or participation is absolutely necessary in maintaining and supervising the environment so that it can be better and healthier (Susila Wibawa, 2019).

Innovation is renewal, the discovery of something new, whether in the form of ideas, methods, tools, products or others (Purba, 2009; Robbins, 1997). While innovation in government is a creative idea in carrying out reforms in the government system in order to improve the performance of the government itself (Rozikin et al., 2020).

Innovation in the public sector is more emphasized on the "improvement" aspect resulting from these innovation activities, namely the government is able to provide public services more effectively, efficiently and of high quality, cheap and affordable according to the needs of the community. Innovation in the public sector is one way or even a "breakthrough" to overcome bottlenecks and organizational needs in the public sector (Eldo & Mutiarin, 2019). As a public servant, the government is responsible for providing the best possible service to the community because basically, the community is a citizen whose rights must be fulfilled without exception (Novaningrum et al., 2018). Public service by the government to the community is a mandate from the constitution, how can the people as the owner of this country's sovereignty have the right to obtain services from government institutions entrusted with the mandate by the people to serve their needs (Muhammad Jamili, 2019).

To achieve the Indonesian Health Development Goals, the Government of Indonesia has also made

various efforts. One of the policies in Chapter II Article 3 Paragraph (2) of the Regulation of the Minister of Health of the Republic of Indonesia Number 03 of 2014 concerning Community-Based Total Sanitation is through the Stop Open Defecation Program as one of the pillars of Community-Based Total Sanitation. Stop Open Defecation is a condition when every individual in a community no longer performs open defecation behavior that has the potential to spread disease (Devia & Aisyah, 2020).

Sanitation is one of the goals of public health problems in Indonesia, which is still characterized by high rates of morbidity and mortality from environmental-based diseases (Savitri, 2020). Indicators that affect the level of effectiveness of a Stop open defecation program according to Duncan (1973) divided into 3 (three), namely the achievement of goals which is a process to determine the objectives of the program running optimally. The integration indicator is a measurement of the triggering officer's ability level in conveying the objectives seen from the procedure and process of socialization to the triggering participants and the adaptation indicator is carried out to see the increase in the triggering participant's ability.

In addition, the problem of access to clean water mainly occurs in areas that do not have clean water sources, for example, peat water or brackish water is available in the area. This market opportunity is a trigger for the clean water technology industry to innovate. The technology used in the treatment of clean water is largely determined by the type of raw water source to be processed into clean water. As an illustration, for raw water sources in the form of unpolluted river water, conventional and simple water treatment technology is sufficient to produce clean water (Laili et al., 2016).

The focus of this research is related to the innovation carried out by the Probolinggo City government called the Si Inol Aja innovation (Innovation System for Arisan Services / Latrine Installments). Si Inol Aja is said to be creative and very innovative due to first, a strange, unusual and unpopular method for healthy latrines. The existing and common arisan / installments in society are for consumptive goods, such as money gathering, motorcycle loans, refrigerators, TVs, household utensils and so on. Second, using a cast system directly on the spot, with a fiberglass septic tank mold, simplifies and speeds up the manufacture of latrines, where the production of this fiberglass septic tank mold is made in-house in Probolinggo City. Not only that, this

research also focuses on the SIBER-PAM innovation which is a new program and is an innovative program because it can streamline and streamline time and energy for both customers and PDAM Probolinggo City employees.

The World Health Organization (WHO) has reported that deaths caused by water-borne diseases have reached 3,400,000 people/year. Diarrhea is the biggest cause of death (1,400,000 people/year) (Kementerian Kesehatan, 2013). The problem of sanitation development is a socio-cultural challenge. Factors related to defecation behavior are knowledge and availability of latrines. Cross-sectoral cooperation is needed to hold meetings between the community so that together they carry out negotiations related to solving the problem of open defecation (Dwiana & Herawaty, 2017).

Winangsih (2018) in his research explains that environmental health problems are influenced by population growth and distribution, the policies of decision makers, the mentality and behavior of the population, and the ability of nature to control pollution. Environmental health emphasizes the dynamics of interactive relationships between community groups and all kinds of changes in environmental components such as various living species, materials, substances, or forces around humans that pose a threat, or have the potential to disrupt public health and efforts to find prevention. This includes housing, human waste disposal, clean water supply, garbage disposal, and others. In implementing clean and healthy living, it can be started by creating a healthy environment. Clean and Healthy Behavior (PHBS) is important because a healthy environment can have an effect on health quality. While a person's health will be better, if the surrounding environment is also good. Vice versa, a person's health will be bad, if the surrounding environment is not good. Disposal of human waste in a healthy home environment must also be a concern because it can cause the spread of several diseases such as typhus, dysentery, cholera, various worms, *schistosomiasis*, and so on.

According to Kusnopranto (2008), latrine is a building that is used to dispose and collect dirt so that the dirt is stored in a certain place and does not cause disease and does not contaminate the surface. A latrine is one of the basic sanitation facilities needed in every house to support the health of its occupants as a human waste disposal facility, which consists of a squatting place or a seat with a goose neck or without a goose neck equipped with a sewage and water

collection unit to clean it (Proverawati & Rahmawati, 2012; Safriani et al., 2020).

The physical and biological environment that meets the health requirements is measured by the availability of clean water, the availability of latrines, the availability of sewerage, the condition of the house and the behavior of the occupants of the house (Abeng et al., 2014). In this case, the Ministry of Health has a Community-Based Total Sanitation (STBM) program of five pillars. One of the pillars is to stop open defecation (BABS). The results of research related to open defecation behavior around the Karang Mumus River, Samarinda showed that most of the people used latrines that did not meet health requirements. People still use floating latrines on the river. In addition, there are still people who have latrines in their homes, but the drains still go to the river (Widhana, 2017). From the results of this study, people do not know and are not aware of proper sanitation behavior in their daily life. Even though poor sanitation can cause various kinds of infectious diseases (Yuningsih, 2019).

It is explained further in the research conducted by Agustyaningsih et al. (2020) that the behavior of residents who are accustomed to open defecation (BABS) is still a sanitation problem in various countries. Indonesia is one of the countries where open defecation is still found. The population in Indonesia in 2016 who still defecated openly was 16,209,333 households out of a total of 67,453,504 households, and 24.03% of the Indonesian population had open defecation behavior. The behavior of open defecation (BABS) can cause harm to public health conditions, because feces is a medium for *E. coli bacteria* to live which has the potential to cause a disease. In addition to diseases that are transmitted from open defecation, it is known as Water-borne disease. Lack of poor environmental sanitation,

This research is important and relevant to be discussed because it. This innovation can solve problems from the aspect of limited funding for sanitation and technology development which are considered complicated. And in the end, it is not only funding problems that find innovative solutions but also other benefits for the government, society and the business world. Besides that, the introduction of the SIBER-PAM strategy can guarantee an increase in the quality of services for the community. The presence of SIBER-PAM can provide education to the public, especially customers of PDAM Kota Probolinggo and the means of socializing the services provided at this time have innovated to become more modern. Thus,

the two innovations gave rise to various strategies that offer convenience in the use of public services. And can be an inspiration for other regions in order to overcome the same problem.

**2. Research Methods**

This study uses a literature review method. According to Efron & Ravid (2018) a literature review is a systematic examination of the scientific literature on one's topic. It critically analyzes, evaluates and synthesizes research findings, theory, and practice by scholars and researchers related to the focus area. The literature review will provide an overview of the development of a particular topic (Cahyono et al., 2019).

This research was conducted by describing the innovations in the City of Probolinggo which were arranged systematically and in accordance with the reality that occurred. The population in this study is in areas that have implemented policies or innovation in the field of public services. While the sample in this study is innovations carried out by the Probolinggo City government are called Si Inol Aja innovations (Innovation System for Arisan Services / Latrine Installments) and innovations Easier Access Based on "SIBER-PAM" (Socialization of Information Based on People's Education - Drinking Water Company).

In this study, data collection was also carried out through searching various sources which were then processed and described in narrative form according to data needs. The data used come from reports, journals, scientific articles, literature reviews containing the concepts studied.

**3. Results and Discussion**

**3.1. Si Inol Aja (Arisan Service Innovation System / Installment Jamban) Kiss The Behavior of "BABS" (Close Defeatives)**

The national target of Universal Access must be achieved 100% in Indonesia by 2019 and the challenges of the City of Probolinggo related to health development, especially in the field of hygiene and sanitation are still very large. There are still many people who behave defecate (BAB) in any place, in the river, on the beach, or in the yard. This happens because the City of Probolinggo is traversed by many rivers, both large rivers and small rivers. The city of Probolinggo is also a coastal city, where many people still defecate on the beach.

STBM-National Secretariat baseline data, (http://www.stbm-indonesia.org/monev), the

population of Probolinggo City is 220,000 people (54,347 families) indicating the sanitation conditions are as follows, namely first, access to permanent healthy latrines (JSP), namely access to latrines that meet health requirements, amounting to 61.2% or 37,370 families (head of Family). Second, access to semi-permanent healthy latrines (JSSP), namely access to latrines that do not meet health requirements, is 2.11% or 958 households. Third, sharing, meaning that they are still riding to a neighbor's healthy latrine, amounting to 3.02% or 1,576 families. And fourth, BABS, meaning open defecation, amounting to 33.67% or 16,121 families.

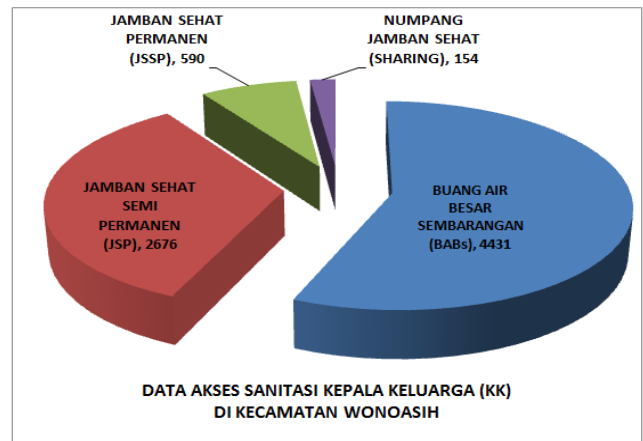


Figure 1. Access to Sanitation Access Data for Family Heads (KK) in Wonoasih District

Wonoasih sub-district with a population of 9,149 families, compared to other sub-districts in Probolinggo City, the ownership of healthy latrines is the lowest, data <http://www.stbm-indonesia.org/monevas> follows:

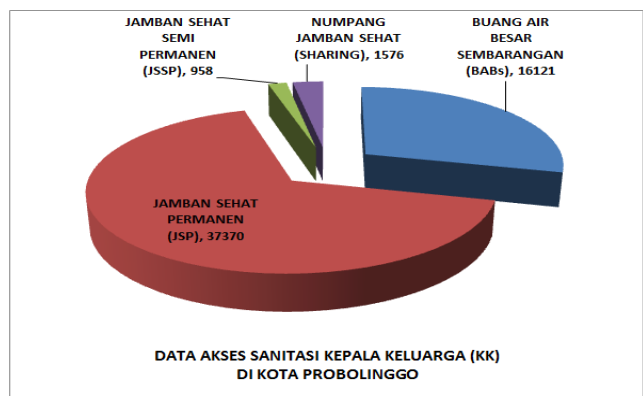


Figure 2. Sanitation Access Data for Head of Family (KK) in Probolinggo City

The following are the reasons why the Wonoasih community still behaves in defecating, namely first, they do not have healthy latrines, so they behave in

open defecation (58.11%). Second, information makes healthy latrines expensive, an average of Rp. 4-5 million. Third, the ability to build healthy latrines is very limited. Fourth, still hope to wait for help from the government. And fifth, it's been hereditary that defecation doesn't have to be in the latrine because the surrounding environment supports it (rivers, gardens, beaches).

For example, each KK (Head of Family) has 2 children, then the Wonoasih community who defecate is (4x4,3117,724 people. Based on Sugiarto (1987), in Dharian

blogspothttp://dhariyan.blogspot.co.id/2012/10/limbah-organik-tinja-yang-hasilkan.html, explained that 1 person produces 0.2 Kg of feces/day/person, so the feces that are disposed of in any place in Wonoasih District alone is 3.6 tons/day. This has the potential to pollute the environment, both water and soil, where many contain pathogenic microbes that can cause disease.

The incidence of diarrhea cases in Wonoasih District with a population of This 9,149 households is quite high, causing the annual family expenditure on health due to poor sanitation to be very large, reaching Rp.128 million/year, this will increase the burden of family expenses and reduce productivity.

The ability of the APBD which in the last two years has decreased and the average APBD is IDR 800 billion per year, if the construction of latrines has to wait for government assistance, funds in Wonoasih District alone are 4,431 families x IDR 4,000,000 = IDR 17,724. 000000 = IDR 17.7 billion. This is very unlikely considering that other development priorities must also be realized.

Thus, Si Inol Aja (Innovation System for Latrine Service/Installation Services) aims to reduce and erode the habits/behavior of people who still defecate openly (BABs).

The basis for this innovation regulation is the Minister of Health Regulation no. 13 of 2015 concerning the Implementation of Environmental Health in Puskesmas and Minister of Health Regulation No. 3 of 2014 concerning Community Based Total Sanitation (STBM).

Based on the conditions above, the main problems related to sanitation need and must be resolved in several ways, including firstly, increasing public knowledge and awareness of the importance of healthy latrines. Second, increasing public access to healthy latrine facilities. Third, providing healthy latrine facilities at affordable prices. And fourth, building

independence in the manufacture of healthy latrine facilities must be realized by the community without having to wait for assistance from the government.

The target community with Si Inol Aja is all people who do not have a latrine, or people who still share or ride to healthy latrines belonging to neighbors or relatives, and also people who have access to Semi-Permanent Healthy Latrine (JSSP) such as the cemplung model or cubluk who do not meet the health requirements. The motivator for Si Inol Aja's activities was Sanitation Officer Sulistyio Triantono Putro and assisted by Si Inol Aja's team

The Si Inol Aja program began to be implemented in the Wonoasih Health Center area in 2012 until now. The strategy of Si Inol Aja's activities includes several things, namely first, raising commitment with relevant stakeholders, namely the government, community leaders, religious leaders and the business world.



**Komitmen dengan stakeholder terkait yaitu pemerintah tokoh masyarakat, tokoh agama dan dunia usaha**

Figure 3. Commitment with Related Stakeholders, namely Government, Community Leaders, Religious Leaders and the Business World

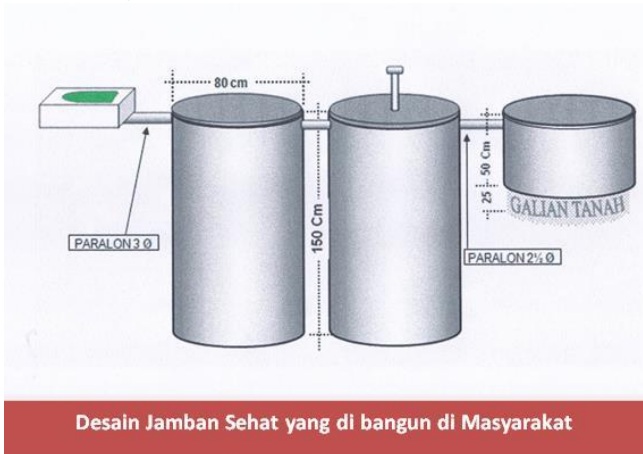
Second, namely triggering which is a method or technique delivered by the facilitator to encourage changes in individual or community hygiene and sanitation behavior on their own awareness by touching the feelings, mindset, behavior, and habits of individuals or communities by means of games. The goal is to trigger the community so that with their own awareness they want to stop the habit of defecating (BAB) in the open and move to a sanitation facility, namely a healthy latrine. The triggers are shame, disgust, fear of pain, fear of sin and a sense of self-worth. The triggering was carried out in a group of Dasa Wisma women, recitation mothers, Muslimat, RT, RW, schools, sub-district PKK and even in Islamic boarding schools.



Kegiatan Pemicuan di Kelurahan Kedung Galeng Kecamatan Wonoasih dan Kelurahan Kedopok Kecamatan Kedopok

Figure 4. Triggering Activities in Kedung Galeng Village, Wonoasih Subdistrict and Kedopok, Kedopok Subdistrict

Third, namely the Use of Appropriate Technology, by carrying out several activities, namely designing healthy latrines that are easy to apply with cheap and easily available raw materials in the City of Probolinggo. Technology options for sanitation facilities (environmental health) are suitable and affordable by the community, namely the system method cast directly on the spot, so that the latrine/septic tank that is made is guaranteed to be impermeable, strong, sanitary at a very affordable price. The direct cast system in this place is actually cheaper when compared to the conventional way of making septic tanks using bricks (red stones). The direct cast system in this place can save the cost of the craftsman, because 1 unit can be done with a short manufacturing time of 1-2 days, the amount of building material is less than using red stone. Construction of a complete latrine with closet, piping, storage tank with a depth of 1.5 meters, infiltration tank with a depth of 1 meter, ventilation holes and drain holes costs Rp. 1,500,000 – 1,900,000/unit.



Desain Jamban Sehat yang di bangun di Masyarakat

Figure 5. Healthy latrine design built in the community

In addition, socializing and transferring knowledge to the community regarding the choice of healthy latrine technology adapted to local conditions. And

carry out direct practice Making healthy latrines is done with a cast system directly on the spot and using a fiber septic tank mold.



Praktek langsung Pembuatan Jamban Sehat yang diikuti oleh Masyarakat

Figure 6. Direct Practice of Making Healthy Latrine Followed by the Community

The direct cast system method on the spot is more practical and economical, using a fiber mold, 2 craftsmen and only 1-2 days to complete.

The funding strategy is carried out in several ways, namely, first, the Arisan Application. If the construction of a latrine is by means of an arisan application, then in 1 group there must be 15 people where each arisan member pays Rp. 25 thousand per week for 4 times, after that 1 unit of latrine was built according to the results of the social gathering lottery, a total of Rp. 1,500,000. Second, the Installment Application. The advantage of this installment application is that the manufacture of healthy latrines is realized immediately without having to wait for 4 weeks like the social gathering application, the way is that people pay an advance of Rp. 300 thousand, then every month in installments of Rp. 100 thousand for 16 months, a total of Rp. 1,900,000. Third, train the community and other health workers as facilitators who can jointly motivate the community to cultivate a clean and healthy way of living behavior by maintaining a clean environment to community leaders, RT heads, RW heads, posyandu cadres to become natural leaders and as the spearhead of the mover in create changes in the behavior of clean and healthy living in the community. As well as training other health workers as facilitators and at the same time being able to replicate this activity in their puskesmas area.

The systems implemented to monitor progress and evaluate activities include, firstly, periodically the Sanitation Officer must report the progress of STBM activities to the Probolinggo City Health Office, and also report to the STBM-National Secretariat website via SMS or with the Android application. Second, periodic meetings with relevant cross-sectors from the government, community leaders, religious leaders and the business world. Third, field visits to the Puskesmas,

namely when carrying out healthy home sanitation inspections and introspective surveys. Fourth, reports on the progress of latrine construction, both from the community and from officers. And fifth, public input through the Probolinggo City Voice Radio Broadcast, in the "Laporo Rek" event as well as public complaints through the Probolinggo City Government website.

The Si Inol Aja program initiative at the Wonoasih Health Center has had a real and extraordinary positive impact on the community, which is explained in more detail in the following table:

Table 1. The Difference Before and After the Si Inol Aja Program Initiative at the Wonoasih Health Center in 2016

Before	After
Public access to healthy latrines is only 41.89%	There is an increase in public access to healthy latrines from 41.89% to 55.19%
Behavior of Open Defecation (BABS) of 58.11%	There is a decrease in the behavior of open defecation (BABS) from 58.11% to 44.81%
The volume of feces that is disposed of in any place and has the potential to cause environmental pollution and the danger of spreading disease is 3.6 tons/day	The volume of feces that are disposed of in any place and has the potential to cause environmental pollution and the danger of spreading disease, there is a decrease of 1.2 tons/day
The funds that must be provided by the Probolinggo City Government are only for the construction of healthy latrines in the Wonoasih District area of Rp. 17.7 billion, is a very large fund considering the ability of the Probolinggo City Budget of Rp. 800 Billion more <a href="http://www.indonesiapost.co/index.php/regional/anggaran-pemkot-probolinggo-turun-jadi-rp-800-miliar-why/">http://www.indonesiapost.co/index.php/regional/anggaran-pemkot-probolinggo-turun-jadi-rp-800-miliar-why/</a>	Gradually the community can build healthy latrines independently so that the City Budget can finance other priority programs according to the RPJMD
People's mindset that the provision of sanitation facilities is the government's task	Growing awareness that the community and the business world can participate in sanitation development programs to accelerate Universal Access in 2019
There is an opinion that building healthy latrines is complicated and requires big funds	The birth of Appropriate Technology based on local conditions in the city of Probolinggo that is affordable by the community and supported by a light funding pattern
Entrepreneurship is from conventional activities such as trading, opening shops etc	The idea of a creative economy emerged as a sanitation entrepreneur. This means that the community is able to seize the opportunities that are around them so that they can be more economically empowered

Before	After
For the community, sanitation does not affect the welfare of the community	The growth of the mindset that a clean environment is the door to a healthy and healthy life is the door to a prosperous life

The target community with Si Inol Aja is all people who do not have a latrine, or people who still share or ride to healthy latrines belonging to neighbors or relatives, and also people who have access to Semi-Permanent Healthy Latrine (JSSP) such as the cemplung model or cubluk who do not meet the health requirements.

Based on observations of conditions in the field and discussions with community leaders and religious leaders as well as the Probolinggo City Health Office, efforts arise to resolve existing problems by exploring the root causes of the problem. The initiator of this Si Inol Aja activity was Sanitation Officer Sulisty Triantono Putro and was assisted by the Si Inol Aja Team.

The collaboration of 3 elements that are closely related, namely: Community elements (community leaders, religious leaders, head of RT/RW, health cadres, Community Empowerment Institutions/LPM), play a role in socializing and inviting healthy living behavior by having healthy latrines while promoting social gathering/installments latrines, elements of the government (Health Department, puskesmas, kelurahan, sub-districts) act as initiators, facilitators and motivators in the Si Inol Aja program and elements of entrepreneurs (building shops, sanitation entrepreneurs, microfinance institutions) play a role in supplying material needs and the process of making healthy latrines .

This innovation solves the problem from the aspect of limited funding for sanitation and technology development which is considered complicated. And in the end, it is not only funding problems that find innovative solutions but also other benefits for the government, society and the business world.

### The Method of Implementing "Si Inol Only" Innovation

Si Inol Aja is said to be creative and very innovative due to first, a strange, unusual and unpopular method for healthy latrines. The existing and common arisan/installments in the community are for consumptive goods, such as money gathering, motorcycle loans, refrigerators, TVs, household utensils and so on. Second, using a cast system directly on the spot, with a fiberglass septic tank mold, making it easier and faster to build latrines. The production of

this fiberglass septic tank mold was made in-house in Probolinggo City.



Figure 7. Use of Appropriate Technology "Fiber Septic Tank Mold"

### Benefits for Regions and Society

Over a period of 4 years, 400 latrine units have been built and the following developments can be directly seen, namely, first, people who have access to healthy latrine facilities (JSP) from 2676 families to 3076 families, the participation of people who have built healthy latrine facilities is 400 units. Second, the cost of making healthy latrines is not expensive, because it uses appropriate technological innovations, namely direct cast systems and fiber septic tank molds. Third, people can have healthy latrines faster without having to wait for help from the government again. Fourth, the community independently has carried out the construction of healthy latrines of 400 units x Rp. 2,000,000 = Rp. 800,000,000. Fifth, when viewed from the volume of feces disposed of in any place, which has the potential to cause environmental pollution and the spread of disease, then there is a decrease of 3.6 tons / day to 2.4 tons / day the volume of feces that are disposed of in any place. Sixth, the increase in revenue from building material stores, the average material requirement per latrine unit is Rp. 550,000 so that with the construction of 400 healthy latrine units through this program, the acceptance of building material stores increased by Rp. 220,000,000 in 4 years. Seventh, the income of sanitation workers is increasing, the cost of the handyman per unit is Rp. 300,000 x 400 units = Rp. 120,000,000. Eighth, the public can consult for free about the Si Inol Aja program to the Sanitation Officer through communication media and social media. Ninth, the birth of new sanitation facilitators from both government officials and the community (photo attached). Tenth, Probolinggo City initiator and Facilitator (Sulistyo Triantono Putro) was recruited by the Ministry of Public Works and Public Housing and NGOs to become resource persons in

other areas (data attached). And eleventh, several districts/cities conducted a reference study on healthy latrine sanitation in Probolinggo City

The resources used for this public service innovation and how these resources are mobilized. The main resource of this innovation is the community where they are involved thoroughly from identifying needs, implementing activities, monitoring and campaigning for expansion of activities in other locations. To realize this innovation, resources are needed in the form of funding from the community itself, so the Si Inol Aja program does not burden the state finances/treasury. The budget required for the Si Inol Aja program initiative is only Rp. 1,500,000 for the social gathering application and Rp. 1,900,000 for installment applications. So, the construction of healthy latrines comes purely from the community and for the community, namely in the form of social gathering and/or installments.

In addition, a collaboration with a financial institution, namely BMT Bina Artha was also formed. The financing for the construction of latrines in the community is carried out by BMT Bina Artha by paying cash to sanitation entrepreneurs, and the community pays to BMT Bina Artha in installments. In collaboration with BMT Bina Artha, the community has two advantages, firstly, the community gets a healthy latrine facility and at the same time a loan for business capital.

Materials for making healthy latrines are also supported by building shops, namely in collaboration with Barokah Shops (Hj. Siti Aisyiyah Misriati), Jl. Ir. Sutami Jrebeng Kidul Probolinggo, with an agreement that the Barokah Shop will provide and simultaneously deliver all the materials needed in the construction of latrines in the community, ordering materials can be done by telephone and payment for material needs can be paid in installments.

The Mayor's support as the highest policy maker is manifested in the form of awarding Si Inol Aja and it is hoped that this can be replicated in other areas in Probolinggo City.

Stakeholders involved in implementation

The parties involved and have contributed to this initiative are:



Figure 8. Sanitation Network: Sanitation Officers Liaise with All Related Elements

The role of the Government in this case is first, the Sanitation Officer as the initiator, facilitator and motivator in the Si Inol Aja program, together with the Innovation Team to facilitate triggering, healthy latrine providers/makers, and promoter of latrine social gathering/installments and build networks with related components as well as drivers changes in environmental health problems in society. Second, giving an example by making an initial unit of healthy latrines so that people can see firsthand the physical form of healthy latrines. Third, strengthening related technical offices to the implementation of Regional Regulation No. 4 of 2015 concerning Probolinggo City Domestic Waste Management and other supporting regulations (socialization and cross-sectoral collaboration). And fourth, publications and campaigns through radio broadcasts, art performances and print media.

While the role of the community, namely, first, PKK mothers, Health Cadres, recitation group mothers, community leaders and religious leaders, LPM plays a role in socializing and inviting healthy living behavior by having healthy latrines while promoting latrine social gathering/installments. Second, if there is a request from the community for the need for a latrine, the cadres together with Sanitation Entrepreneurs form a group, so that they can be coordinated and facilitated with the Si Inol Aja program.

The role of the business world is firstly, building shops and sanitation workers are indispensable and play a role in supplying material needs and the process of making healthy latrines. The more demand for latrine construction by the community, the material needs for latrine construction will increase, so that the wheels of the economy in the community continue to spin, and this will also affect the welfare of material entrepreneurs. Second, the building shop is willing to provide payment facilities in installments and delivery of materials directly to the location. And third, Microfinance Institutions provide soft credit facilities for sanitation entrepreneurs.

The role of Supporting Organizations, namely PNPM-MP, Pokja AMPL provides capacity building and facilitates regional and national networks for facilitators from government agencies and the community.

The obstacles we feel and experience in the field are numerous, however, we view the obstacles or obstacles that occur as challenges, where we use these challenges as opportunities, namely opportunities to be creative and innovate for the benefit and benefit community, then the Si Inol Aja program initiative was born.

The obstacles, obstacles, or challenges to erode, reduce or even eliminate the habit/behavior of open defecation (BABs) are, among others, first, Stop Open Defecation (BABs) is the behavior of individuals in a community so that they no longer carry out defecation behavior. open defecation that has the potential to spread disease. Changing people's behavior requires a process and time that varies, it can be fast or it can even take a long time. The alternative solution is periodic and continuous triggering activities. Then, campaign through radio broadcasts (Suara Kota FM Probolinggo), local television (ProTV) and national (MetroTV) as well as print media (Jawa Pos and Kompas). Then, a wider replication of the Si Inol Aja program in communities in other areas (with LPM,

Second, there are still stuck installments. The alternative solution is to coordinate and cooperate with community leaders (Chairman of RT/RW), health cadres as coordinators in the field and at the same time responsible for the installment process.

Third, there are still few people who are interested in starting a sanitation business using the Si Inol Aja method. The alternative solution is to replicate the Si Inol Aja program which is wider in the community and invites people who have the capital to become Sanitation Entrepreneurs.

Fourth, the funds owned by sanitation entrepreneurs are still limited. The alternative solution is to collaborate with existing microfinance institutions and coordinate with the Probolinggo City CSR Forum so that there are companies that can provide soft loan assistance for the expansion of the sanitation program.

### **3.2. Easier Access Based on "SIBER-PAM" (Socialization of Information Based on People's Education – Drinking Water Company)**

To support the development program within the Probolinggo City Government, PDAM which is part of the Government that specifically provides clean water services, it is necessary to always innovate or new breakthroughs to achieve Good Government within the Probolinggo City Government.

As one of the regional companies, PDAM is also not spared from various problems faced by PDAM Kota Probolinggo in the public service sector, giving birth to innovations and strategies provided by all components of the company in an effort to overcome these problems. The first strategy started in 2013. PDAM Kota Probolinggo is able to provide additional counters that are distributed to customer areas far from the PDAM Kota Probolinggo office. This idea is based on the vision and mission during the Director's fit and proper test and is supported by all employees of PDAM Probolinggo City.

To improve the quality of PDAM services, innovate in terms of checking tariffs, payments, complaints and all information about PDAMs now can be accessed through applications on mobile phones and can be downloaded via the android play store. The target customers for this new strategy are the upper middle class and customers who are accustomed to using online facilities.

The Regional Drinking Water Company (PDAM) of the City of Probolinggo was established based on the Regional Regulation of the Probolinggo City of Dati II Number 13 of 1975 Jo. number 09 of 1983, Jo. Perda number 14 of 1987, Jo. Number 18 of 2002. Decree of the Mayor of Probolinggo Number 43 of 2001 concerning the Organizational Structure and Work Procedure of the Probolinggo City Drinking Water Company.

Since its inception, PDAM is a public service that includes payments, complaints and new installations or house connections (SR) which are done manually, while PDAM customers cover all levels of society, starting from the lower middle class to the upper middle class. According to customer data as of

December 2016 there were 18,252 SRs, with various types of customers as follows, namely General Social: 221, Special Social: 180, Households: 16,834, Agencies: 217, Small Commerce: 729, Big Commerce: 49, Small Industry : 7, and Others : 15.

Various problems that can arise, for example in payment services, customers are required to come to the PDAM office with a water account number and queue for a long time to make payments. As a result, not a few customers often miss the water bill payment period, which makes the company's receivables high. Likewise, for pipe leakage and SR complaints services, customers or prospective customers must take the time and energy to register and report to PDAM officers at the PDAM office located on Jalan Hayam Wuruk No 5 Probolinggo City.

These various conditions in terms of public services make PDAMs make various innovation efforts to solve all problems that occur using SIBER PAM. SIBER PAM is an abbreviation of Information Socialization Based on People's Education about the services provided by PAM, especially by PDAM Kota Probolinggo using online facilities and direct approaches to customers.

The basis for this innovation regulation is the Decree of the Director of the Probolinggo City Drinking Water Company Number 25 of 2015 concerning the Integrated Management System of the Probolinggo City of Regional Drinking Water Company dated 31 December 2015 and the Decree of the Director of the Probolinggo City of Regional Drinking Water Company Number 26 of 2015 concerning Mobile Car Services. Probolinggo City Drinking Water Company Dated December 31, 2015.

The target of this innovation is aimed at all levels of society who live in areas that are far from the counters located at the PDAM office or in other words to facilitate customers who are far from the PDAM's service reach.

It doesn't stop there, in 2013, PDAM provided mobile service car facilities to accommodate customers making payments, receiving complaints and installing new (SR) for customers and prospective customers with ease. This strategy is aimed at customers who are located in residential areas far from the office location and water bill payment counter units.

This online application used by PDAM can guarantee service quality and is easy to use. SIBER-PAM is here by offering various easy access to PDAM services in one centralized application.

The introduction of this online-based service is a new method introduced to customers and employees of PDAM Kota Probolinggo. Therefore, it is necessary to socialize quite often with delivery that is easy to understand and understood by the community. This is done because the media used is a Smartphone (Android) device that requires a special application to operate. For employees themselves, the process of reading meters using Android is also relatively new, which was initially still manual (record on paper), with the transition from manual to the Android system, meter reading officers also needed adjustments and socialization.

With the development of the world of technology and according to needs, PDAM Kota Probolinggo in collaboration with PT. Bima Sakti Sanjaya began in 2013 in the form of meter reading with the Android system. The cooperation agreement developed in various sectors (fields), namely in the form of several things, namely first, BSINFO (Information).BSINFO is to assist in providing information from PDAM/PAM to its customers or the general public. Information is conveyed through an android application that can be downloaded on google play. Second, BSPAY (Payment Counter).The payment counter is a small part of billing at PDAM. This application has the advantage that it can be online and offline. Third, BSBS (Billing System).BS Billing System is an application designed to manage customer data, area data and tariff data. BSBS is also used to manage customer account billing data. Fourth, BSACC (Accounting). BS Accounting is a bookkeeping application specifically designed for the needs of PAM or PDAM, starting from code estimates, reports, journals, ledgers, financial reports, balance sheets and profit and loss reports tailored to the needs of PDAM Probolinggo City. Fifth, BSKEU (Finance). BS Finance is a system for recording financial transactions, where all PAM or PDAM cash income and expenditure activities must be recorded in the form of vouchers as accountability. Sixth, BSWH (Warehouse). BS Warehouse is a warehousing data management application. Regulate the entry and exit of goods and material supplies for PDAM Probolinggo City. Seventh, BSHR (Human Resource) and BSPL (Payroll). BS Human Resource was created to manage staffing data in the PDAM environment, which applies several formulas for calculating allowances and salaries in this application. Eighth, BSPRC (Planning). BS Planning is a new application developed at PDAM, where the function of this application is to make it easier for the planning department to record surveys in the field for

prospective customers, make RAB materials according to conditions in the field. And the ninth, BSHL (Subscription Relations). BSHL is an application designed for the needs of the Subscription Relations Section in PAM or PDAM. This application was created to facilitate the subscription relationship section to provide service to customers. BSHL is an application designed for the needs of the Subscription Relations Section in PAM or PDAM. This application was created to facilitate the subscription relationship section to provide service to customers. BSHL is an application designed for the needs of the Subscription Relations Section in PAM or PDAM. This application was created to facilitate the subscription relationship section to provide service to customers.

In addition to the BS INFO application, mobile car services are also a breakthrough that can improve the quality of service to customers. This is because it can provide convenience for customers to make water account payment transactions and find the latest information on PDAM services. In addition, with a mobile car service, customers can streamline transportation time and costs.

The strategy of using SIBER-PAM in an effort to improve service to customers is carried out in various forms of service methods that have been offered by PDAM Kota Probolinggo. First, the services provided at the time of payment at the Probolinggo City PDAM office starting in 2016, each customer has been provided with a customer card that has been accompanied by a barcode. This card has stored customer information which includes names, addresses, and landline numbers that distinguish one customer from another. It is hoped that this card will eliminate officer errors when making transactions. While the barcode printed on the card will be able to speed up the payment transaction process so that customer queues can be minimized.

The second service is a mobile car service facility for PDAM Kota Probolinggo which serves customer needs, from paying water bills, customer complaints, to providing registration for new installations or house connections. The activities carried out when providing services using mobile car services can be explained as follows. First, the chronology of new installations of prospective customers begins with registering and submitting the file to the officer. Then through the application contained in the smartpan, the data of this new prospective customer can be accessed by officers at the Probolinggo City PDAM office and immediately responded to be followed up. Second, The chronology

of water bill payments is actually not much different from the payment services carried out at the Probolinggo City PDAM office, only with this method customers can streamline transportation time and costs. The customer submits the customer card to the mobile car service officer who then scans the barcode printed on the card to find out the account value and then payment transactions can be made.

As for the operational technicalities of mobile car services, it is explained as follows. Implementation time is carried out every day from Monday to Saturday at 08.00 WIB to 12.00 WIB. Sunday from 05.00 to 09.00 WIB. (Girl Penter Mas activity). The area visited by the Probolinggo City PDAM mobile car service is divided into the

- West Region : Jl. Wijaya Kusuma,
- Northern Region : Kronong Mayangan Market, Alun-Alun,
- East Region : Wiroborang Market, and
- South and Central Region : Maramis Park.

The third service in SIBER-PAM is the use of the BS-INFO (Bima Sakti Information) application. BI-INFO is an android-based application to assist in providing information from PDAM Kota Probolinggo to customers or the general public. This application provides several service features and profiles of PDAM Probolinggo City accurately, transparently and reliably.

The use of the BS-INFO application can be done in the following ways, first, download the BS-INFO PDAM Probolinggo City Application through the Android Play Store. Then, open / click the BS-INFO application that has been installed on the mobile phone device then enter the connection number and customer name. The BS-INFO application has four main menus, namely first, Bills: to find out the amount of the water bill by entering the No. Connection and name listed on the water account (at least 3 letters in a row). Second, Complaints: customers/general public can submit information/complaints related to PDAM Probolinggo City services. Third, Profile: the menu contains the profile of PDAM Probolinggo City and payment locations. And the fourth is News:

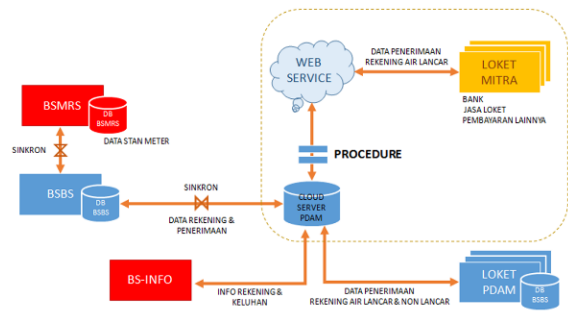


Figure 9. Billing System and BS-INFO Integration System Flow

From the results of meter reading using the android system (BSMRS: Bima Sakti Meter Reading System) the data obtained are in the form of meter numbers and photos, then the data is uploaded to the server. At the end of the month, the data is posted to the Cloud Server for billing and billing information (BS-INFO) using the BSBS (Bima Sakti Billing System) application. The billing data can then be accessed/downloaded by the official counters for the Probolinggo PDAM water account payment including partner counters.

The SIBER-PAM activity strategy has produced several outputs that can be utilized by PDAM Probolinggo City customers. One form of this achievement is the payment of water bills. Prior to the existence of SIBER-PAM, the majority of customers paid their accounts to the Central Counter from the 1st to the 20th of every month, especially when the payment deadline was on the 20th of every month, the condition for paying accounts had a long queue. Because payments after the 20th will be subject to a late fee of 10% of the total bill value, so many customers are competing to pay on the 20th of each month. With the scheduled mobile car service, it can reduce the queue of customers who pay at the central counter or at the assistant counter.

In addition, with the mobile car service, customers who are accustomed to making payments through PPOB will avoid additional bank administration fees when making payments at the mobile car service that has been provided and scheduled by PDAM Kota Probolinggo.

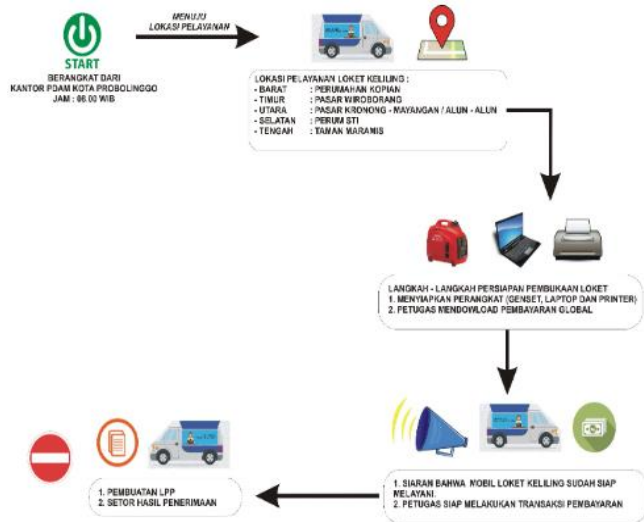


Figure 10. Mobile Counter Service Car Line

Table 2. Probolinggo City PDAM Water Account Receipt Data

MONTH	PAYMENT TRANSACTIONS AT CENTRAL LOKET	PAYMENT TRANSACTIONS IN CAR ROUNDING	TOTAL	%
	(Lbr)	(Lbr)		
JANUARY	17,164	922	18.086	5.37
FEBRUARY	16,904	852	17,756	5.04
MARCH	16,976	985	17,961	5.80
APRIL	16,791	1.015	17,806	6.04
MAY	16,806	1.089	17,895	6.48
JUNE	16,799	1,128	17,927	6.71
JULY	16,408	1,156	17.564	7.05
AUGUST	17,723	1.079	18,802	6.09
SEPTEMBER	16,519	1,152	17,671	6.97

4. Conclusion

Si Inol Aja has proven to be one of the most effective ways to eradicate open defecation (BABs), namely, firstly, people have healthy latrines with technological convenience, namely a direct cast system on the spot. Second, people have healthy latrines that are not difficult and not expensive, because they are paid in installments every month. Third, it is easier for people to have healthy latrines without having to wait for help from the government. Fourth, strengthen community participation and self-help. Fifth, provide new skills for builders who can expand their job opportunities in the surrounding area. And sixth, a synergistic partnership will grow between the government, the community and the business world to achieve better sanitation.

Meanwhile, the introduction of the SIBER-PAM strategy can guarantee an increase in the quality of services for the community. The presence of SIBER-

PAM can provide education to the public, especially customers of PDAM Kota Probolinggo and the means of socializing the services provided at this time have innovated to become more modern. Thus, through this strategy, conveniences in the use of public services will be offered. The first convenience that customers get is that it is easier and faster to access the services provided by PDAM Kota Probolinggo. More effective and efficient in terms of labor, transportation costs and time required in terms of payments, complaints and installation of new connections (SR).

5. Acknowledgments

The researcher expresses his deepest gratitude to the parties who contributed to the writing of this journal, so that the research can be completed to the maximum extent possible.

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