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Research Article

Innovational Communication Strategy for Sustainable Farming Fisheries Development Bogor District

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ABSTRACT

Identify the frequency, direction, content, communication channels, characteristics and stages of adoption of innovations for cultivators and development of sustainable aquaculture in Bogor Regency and analyze the effect of frequency, direction, content, communication channels on the stages of adoption of innovations for catfish enlargement cultivators in Bogor Regency. This study uses a pragmatic paradigm with a mixed approach or method because the innovation communication strategy for the development of sustainable aquaculture is not enough to answer only by measuring the influence between variables in a post-positivist manner, but needs to be traced through the process of communication of innovation between cultivators as actors. Data collected based on data sources consist of primary data and secondary data. Primary data is data obtained directly from respondents at the time the research was conducted, while secondary data is supporting data that is already available at the research location obtained from the Livestock and Fisheries Service of Bogor Regency, data available to extension workers and data available to extension workers. catfish rearing group. Research Results Based on the test results related to whether or not the influence of the independent variable on the dependent variable can be seen based on t count and significant value. From the table above, the ttable value is 13.843 > 2.042 (ttable obtained by finding df and looking at ttable, df = number of correspondents - 2 and a significance value of 0.00 <0.05. Based on these measurements, the R value is obtained at 0.930, and after interpretation it is known that there is a very high relationship between the variables x and y.The R Square test (R2) is used to determine how much influence the value of the regression coefficient (R) states there is a correlation between the independent and dependent variables.

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Introduction

Data on decreased capture fisheries production in 2020 from 2018 for each country are offset by data on increased aquaculture where fishery production is still dominated by developing countries in meeting the need for employment and food security as well as meeting high demand (Eriksson, 2018). Green economy, poverty alleviation and institutional development are the main issues of future development of marine and fisheries that are economically, socially and environmentally oriented to ensure sustainable livelihoods between generations (Heide et al., 2018). Indonesia's position is in 4th place for world aquaculture production (van Ruler, 2018) but does not yet have competitiveness. Competitiveness of human resources, contribution to the national economy, resource sustainability and good governance are the goals as well as the main indicators of sustainable marine and fisheries development (Zerfass et al., 2018).

Data on the contribution of the aquaculture sector shows 2.83 percent for the economy, 54 percent contributing animal protein to the national food security system (Pretty et al., 2020). Aquaculture fishery in still water ponds contributed 17.28 percent nationally (2nd position after seaweed) and West Java Province (BPS, 2019) contributed 11.9 percent (Directorate General of Fisheries) Cultivation, 2014. Efforts to increase the production and management quality of aquaculture in accordance with the National Industry Standard (SNI) 8228.4 for freshwater fish must continue to be carried out so that they have competitiveness that meets food safety standards through the use of several innovative technologies as alternative solutions to problems that develop in freshwater fish farming. BSN RI Regulation Number 14 of 2019 (Morton, 2020).

Innovation and investment quality are the main capital to encourage an increase in the added value of the agro- fishery industry in the management of water resources through increasing the capacity of human resources as actors (RPJMN Bappenas 2020-2024) because the concept of sustainable fisheries development is HR management (Chaudhuri et al., 2021). Dhuri stated that when fisheries management was still carried out traditionally on a micro and small business scale, it did not meet the requirements for export (kkp.go.id 2020) so that innovative technology was needed (kkp.go.id 2022). An important innovation for the development of sustainable aquaculture that is competitive according to the marine and fisheries development mission (de Gennaro & Forleo, 2019).

Fish farming innovations that have been adopted by some catfish cultivating groups are programs from the central government (KKP), including biofloc and Yumina bumina as fish rearing techniques related to increasingly narrow land problems and water quality, alternative maggot (flies) feed technology and azolla (plants) to overcome the problem of difficulties and high prices for feed which are still imported, not yet sustainable, only limited to groups that receive innovation assistance grants. Innovations in aquaculture are accommodated in Good Fish Hatchery Methods (CPIB) for hatchery cultivators and Good Fish Breeding Methods (CBIB). Good Fish Cultivation Practices (CBIB) is a way of raising and/or raising fish and harvesting the results in a controlled environment so as to guarantee food safety from grow-out cultivators by paying attention to sanitation, feed, fish medicine, and chemicals, as well as biological materials (Yanfika et al., 2020a).

The CPIB and CBIB criteria refer to the Indonesian National Standards stipulated in the Regulation of the National Standardization Agency (BSN) of the Republic of Indonesia Number 14 of 2019 which includes 1) technical aspects (location, infrastructure, production processes, application of biosecurity), 2) management aspects (organization, documentation, food safety), and 3) environmental aspects (water sanitation, cleaning equipment) for CPIB. CBIB criteria include aspects of location, water sources, design and layout, equipment, seeds, selection of species and stocking density,

feed, health management, water management, cleanliness and location, harvest and post-harvest, waste management, and the environment. Aquaculture management based on CPIB and CBIB according to the Indonesian National Standard (SNI) criteria is proven by cultivator certification both individually and in groups (Giagnocavo et al., 2022).

CBIB innovation needs to be informed to all cultivators on a sustainable basis, especially small-scale ones, to change conventional cultivation patterns to be more innovative so that they have product competitiveness. Increasing innovation depends on collective dissemination from one network context to another and the success of innovation is based on the integration of ideas (technological and other) and insights from users, intermediaries and other social agents (Ravazzoli et al., 2021). Sumardjo et al (2020) confirms if changes carried out with innovation communication in a non-participatory direction (from outsiders into a community), the benefits are not felt by the community, conversely if the change is made through participatory innovation communication it is more beneficial for those who make or experience the change. Local communities must be positioned as development subjects who are involved in communication from planning to program evaluation so that they become the main force of rural development (Triste et al., 2020). A communication strategy is needed for behavior change through more intensive interpersonal communication, mass media and community and cultural networks including the involvement of traditional leaders in the local area as agents of change (Zambon et al., 2019). The network approach can provide information on the position of actors in the social structure as a means of making changes (Das & Ansari, 2021).

Social learning and engagement can support the development of innovation, as a means of gathering information between groups (Oliveira et al., 2019). Good communication between members supports the development of aquaculture and the lack of internal communication networks is a major weakness of the community development process (Adenle et al., 2019). The ability to communicate strategically has become the most critical determinant of international competitiveness (Saleh et al., 2021). The sustainable development of aquaculture in Bogor Regency is still constrained by a lack of knowledge and technology, weak communication between cultivators and the market community and institutional activities in outreach are not yet optimal The fact that catfish cultivators in Bogor Regency have not been adaptive to innovation is caused by differences in perceptions between farmers towards innovation so that the implementation of innovation has not been sustainable. Innovation is seen as a set of techniques, ideas and knowledge that is new to those who use it, so that novelty lies in the perception of its users (Sobariah, 2021). Empirical support was stated by Hikmah and Purnomo (in Budiasa & Amaral, 2022) which stated that aquaculture fisheries in Bogor Regency still had limited quality and human resource skills, innovation utilization, access to marketing, capital and financing for cultivators, especially small-scale farmers so they did not yet have competitiveness. The diversity of cultivator perceptions of innovation (Sarma et al., 2022), as well as the strain effect of adopting innovation requires facilitation and communication (Horton et al 2016) due to limited institutional reach of technical implementing units, competence of managing human resources, and management that is not yet comprehensive will be an inhibiting factor in the development of sustainable fisheries. Competitiveness and regeneration need to be developed for sustainable innovation and development of aquaculture (Syamsari et al., 2022).

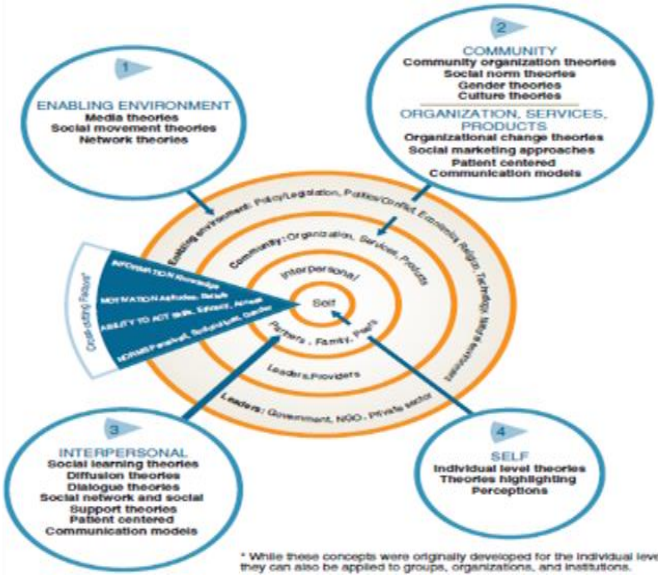

Figure 1. Theoretical basis for the socioecological model

The socioecological model describes several levels of influence to find effective ways of social change, namely 1) The level of analysis consisting of individuals who are closest to the problems that occur, as well as interpersonal / groups and communities that affect individuals, 2) Cross-sectoral factors that affect each actor and structure not only information, but motivation, ability to act, and norms (Gusti, 2021). To achieve change, humans need information that is timely, accessible and relevant to problems, as well as motivation that is determined by attitudes, beliefs, or perceptions about the benefits, risks, or seriousness of problems, as well as norms in the form of group and/or community values. in general and social expectations about behavior consisting of perceived norms (which individuals believe, adhered to by others, socio-cultural norms or gender norms (views about the behavior of men and women) (Budi Priatna et al., 2021).

Previous research in the field of aquaculture has mostly discussed aspects of aquaculture management and policy in several countries (Sjaf et al., 2021). A communication strategy is needed for behavior change through more intensive interpersonal communication, mass media and community and cultural networks including the involvement of traditional leaders in the local area as agents of change (Setiyowati et al., 2022). Research on communication and media strategy that has been conducted (Yanfika et al., 2020b) is limited to one-way persuasive strategies. Only one literature review study was conducted by Jofre (in Dharmawan et al., 2021) with the review literature using a socio-ecological model with the result that technology transfer became the dominant approach for aquaculture innovation, multi-dimensional studies, technical integration, biophysical, political, and institutional, but studies that analyze between actions between levels remains scarce, so interdisciplinary research is needed on aquaculture innovation to support the development of a resilient and sustainable aquaculture sector.

Methods

This study uses a pragmatic paradigm with a mixed approach or method because the innovation communication strategy for the development of sustainable aquaculture in Bogor Regency is not enough to answer only by measuring the influence of inter-variables in a post-positivist way, but it is necessary to explore the process of communication of innovations between cultivators as actors. The sequential explanatory used as a method in this study is a research design that is carried out using a quantitative approach first then a qualitative approach as an explanation to answer what and how (Anwarudin & Dayat, 2019).

A quantitative approach was taken to obtain mapping data on the frequency, direction, channel and content of innovation communication, characteristics and stages of cultivator innovation adoption as well as opinions and practices of sustainable aquaculture development from cultivators as subjects in this study.

Data collected based on data sources consist of primary data and secondary data. Primary data is data obtained directly from respondents at the time the research was conducted, while secondary data is supporting data that is already available at the research location obtained from the Livestock and Fisheries Service of Bogor Regency, data available to extension workers and data available to enlargement cultivator groups catfish. The use of a mixed approach in this study contributed to the type of data collected, so that the type of data collected consisted of quantitative data and qualitative data.

Figure 2. Map of Research Locations

Qualitative primary data consists of farmer's explanatory data written on a questionnaire which acts as an explanation of answers which include the farmer's arguments in answering explanatory questions related to understanding, the use of cultivation innovations (Dharmawan et al., 2022).

The instruments used in this study are:

a. Semi-open questionnaire, a list of statements from research variables in quantitative terms of choice and opportunities for open answers that can be filled in by respondents as qualitative data to complement data that requires further explanation.
b. B interview guidelines, a detailed list of questions or statements related to the required data that cannot be presented in the form of options on the questionnaire as a guide for researchers in obtaining qualitative data.

The population in this study were catfish rearing cultivators in Bogor Regency which were still active and spread across several subdistricts with a total of 130 cultivators located in several sub -districts.

Quantitative data collection was carried out by distributing semi-open questionnaires to respondents as a selected sample. Qualitative data were obtained by conducting in-depth interviews with respondents who were selected as informants with inclusion criteria who were directly involved in the communication of catfish enlargement cultivator innovations in the communication network.

Table 1. Data Analysis Techniques

No	Aim	Analysis Techniques
1	Cultivator Characteristics Mapping	Descriptive statistics of frequency and percentage distributions
2	identify	
	a. messages, channels, communication processes, stages of innovation adoption	Descriptive statistics of mean scores and communication network analysis
	b. development of sustainable aquaculture (economic, social and environmental aspects)	Descriptive statistics of mean scores Rapfish/MDS Sustainability Analysis
3	Analyze influence:	
	a. messages, channels, communication processes on the stages of innovation adoption	R test inferential statistics By using PLS SEM
	b. characteristics of the stages of innovation adoption	
	c. stages of adopting cultivator innovations towards the development of sustainable aquaculture	
	d. messages, channels, cultivator communication processes towards the development of sustainable aquaculture	Effect test inferential statistics (R)
4	Formulate a communication strategy model	Network analysis and PLS SEM

The data collection procedure is carried out in the following order:

a. Provide informed concern in the form of research explanations and treatment procedures for related research subjects, benefits, risks and treatment of research subjects (time, type of questions) in accordance with research ethical requirements (respect for subjects, benefits and fairness).
b. Sign the consent form as a respondent voluntarily.
c. Guarantee of the confidentiality of the research subject's identity by the researcher
d. Distribute questionnaires to be filled in directly by cultivators to obtain quantitative data.
e. Conducting interviews and observations to obtain qualitative data.

Results and Discussion

Quantitative Analysis

Questionnaire Validity Test

Validity test is a measure that shows the validity level of an instrument. The validation test was carried out to find out whether the instrument used had a good match with the research objectives being carried out. The instruments used were 31 questionnaires for the variable x and 15 questionnaires for the variable y which were tested on 32 respondents. After the questionnaire was given to the respondents, it was followed by a validity test using SPSS Version 25 with the following validity criteria:

$$\mathbf{r} = \frac{n\sum - \sum x(\sum y)}{\sqrt{\{n\sum x^2 - (\sum x)^2\}\{n\sum y^2 - (\sum y)^2\}}}$$

1. If r count > r table then the item is valid.
2. If r count < r table then the item is invalid

Table 2. Test the Validity of Questionnaire Variable X

No	R	R table	Sig	Information
1	0.470	0.349	0.007	Valid
2	0.571	0.349	0.001	Valid
3	0.210	0.349	0.249	Invalid
4	0.657	0.349	0.000	Valid
5	-0.190	0.349	0.297	Invalid

No	R	R table	Sig	Information
6	0.587	0.349	0.000	Valid
7	0.300	0.349	0.095	Valid
8	0.401	0.349	0.023	Valid
9	0.175	0.349	0.339	Invalid
10	0.420	0.349	0.017	Valid
11	0.565	0.349	0.001	Valid
12	0.495	0.349	0.004	Valid
13	0.497	0.349	0.004	Valid
14	0.388	0.349	0.028	Valid
15	0.524	0.349	0.002	Valid
16	0.268	0.349	0.138	Invalid
17	0.212	0.349	0.245	Invalid
18	0.088	0.349	0.634	Invalid
19	0.544	0.349	0.001	Valid
20	.442	0.349	0.011	Valid
21	0.201	0.349	0.271	Invalid
22	0.455	0.349	0.009	Valid
23	0.471	0.349	0.006	Valid
24	0.298	0.349	0.097	Invalid
25	0.465	0.349	0.007	Valid
26	0.579	0.349	0.001	Valid
27	0.329	0.349	0.066	Invalid
28	0.477	0.349	0.006	Valid
29	0.438	0.349	0.012	Valid
30	0.548	0.349	0.001	Valid
31	0.173	0.349	0.344	Invalid

Based on the table it was found that there were 20 valid questionnaires and 11 invalid ones. Valid questionnaires can later be used as research instruments, while invalid questions will be discarded.

Table 3. Test the Validity of the Y Variable Questionnaire

No	R	R table	Sig	Information
1	0.588	0.349	0.000	Valid
2	0.676	0.349	0.000	Valid
3	0.526	0.349	0.002	Valid
4	0.526	0.349	0.002	Valid
5	0.427	0.349	0.015	Valid
6	0.566	0.349	0.001	Valid
7	0.453	0.349	0.009	Valid
8	0.515	0.349	0.003	Valid
9	0.422	0.349	0.016	Valid
10	0.016	0.349	0.931	Invalid
11	0.450	0.349	0.010	Valid
12	0.164	0.349	0.370	Invalid
13	0.449	0.349	0.010	Valid
14	0.162	0.349	0.376	Invalid
15	0.431	0.349	0.014	Valid

Based on the Table, 12 valid and 3 invalid questionnaires were obtained. A valid questionnaire can later be used as a research instrument, while an invalid questionnaire will be discarded

Test reliability

The reliability test was carried out after the validity test was completed. The reliability test is used to see the ability of the questions that have been provided to describe confidence in the test. To find out the level of confidence, this will be done using the SPSS version 25 program, with the criteria for measuring the instrument said to have acceptable reliability if the test value (Cronbach alpha) is 0.70 or more.

Table 4. Reliability Test

Reliability Statistics	
Cronbach's Alpha	**N of Items**
0.833	32

Based on the reliability test results seen in the table above, a Cronbach alpha value of 0.833 was obtained. This concluded that the instrument questionnaire used had very high item reliability.

Data Analysis

Descriptive Statistics of Frequency and Percentage Distributions

Table 5. Descriptive Statistics

Statistics			
		X	**Y**
N	Valid	32	32
	missing	0	0
Means		65,91	40,31
Median		70.00	41.50
Mode		70	41 [a]
std. Deviation		9,623	5,306
Variances		92,604	28,157
Range		40	25
Minimum		35	22
Maximum		75	47
sum		2109	1290

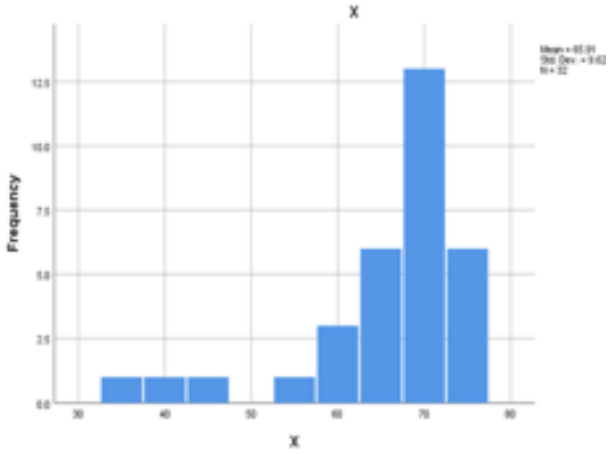

Figure 3. Variabel X

Based on the results of the research that has been done, data is collected through test instruments. This test uses linear regression analysis to determine the effect of (X) on (Y). Based on the determination of the research variables above, data analysis will then be carried out using the linear regression analysis method using SPSS version 25.

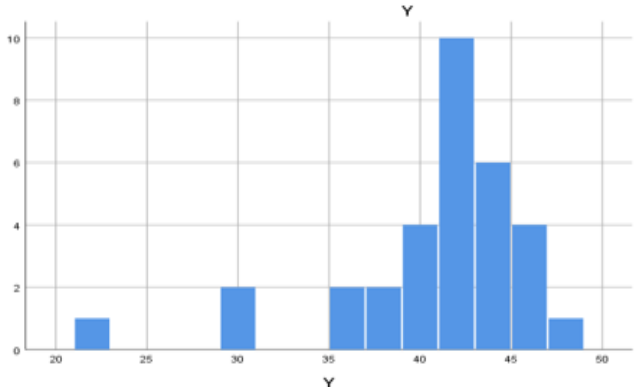

Figure 4. Variable Y

Normality test

The normality test is carried out with the aim of testing whether the data is normally distributed or not. The normality test can be seen from the Significance Kolmogorov-Smirnov Test. The principle of data normality testing is that if the significance value is greater than 0.05, it can be said that the data is normally distributed.

Table 6. Research Data Normality Test

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residuals
N		32
Normal Parameters [a,b]	Means	0.0000000
	std. Deviation	2095,11993396
Most Extreme Differences	absolute	0.071
	Positive	0.043
	Negative	-0.071
Test Statistics		0.071
asymp. Sig. (2-tailed)		**.200** [c,d]

Based on the results of the normality test on the normality level of the research data in the regression model, a Significance value of 0.200 is obtained which is greater than 0.05. Based on these results, it can be concluded that the research data is normally distributed.

Homogeneity Test

The normality test is carried out with the aim of testing whether the data is normally distributed or not. The principle of homogeneity testing is when the sig. > 0.05 then the data can be declared homogeneous. Meanwhile, if the sig. value < 0.05 then the data can be declared not homogeneous.

Table 7. Research Data Homogeneity Test

Test of Homogeneity of Variances					
		Levene	df1	df2	Sig.
Results	Based on Means	2,586	1	62	**0.113**
	Based on Median	1.427	1	62	**0.237**
	Based on Median and with adjusted df	1.427	1	51,182	**0.238**
	Based on trimmed mean	1,975	1	62	**0.165**

From the homogeneity test that has been carried out, a significance value of 0.113 is obtained which is greater than 0.05. Based on these results it can be concluded that the data obtained in this study are homogeneous.

T test (T-test)/ simple regression test

After the conditions for conducting the t test, namely the normality test and homogeneity test, have been carried out and normal and homogeneous data have been obtained, the T test is then carried out. The t test basically shows how far the influence of an individual independent variable has on the dependent variable. The statistical test on the linear regression equation model in this study is the t test which is an individual (partial) test. The t test is carried out by comparing the tcount value with the ttable value, with a 95% confidence level (a = 0.05).

Table 8. T test

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	6,520	2,466		2,644	0,013
	X	0,513	0,037	0,930	13,843	0,000

Based on the test results related to whether or not the influence of the independent variables on the dependent variable can be seen based on the t count and the significance value. From the table above, the value of ttable is 13.843 > 2.042 (ttable is obtained by finding df and looking at ttable, df = number of correspondents - 2 and a significance value of 0.00 <0.05. This indicates that statistically, problem based instruction-based learning methods have an effect on the disciplinary character of students which means that H0 is rejected and H1 is accepted. This means that there is a significant influence.

Correlation coefficient and determination

The correlation coefficient is used to see how the strength and relationship between variable x and variable y is. The value of the regression coefficient (R) indicates a correlation between the independent and dependent variables. The following are the interpretation criteria for the correlation coefficient. The table data will be used as comparative data for the R value obtained through the SPSS Version 25 test. The following is the output of the R measurement (correlation coefficient):

Table 9. Correlation coefficient

Summary Model [b]			
Model	**R**	**Adjusted R Square**	**std. Error of the Estimate**
1	**.930** [a]	0.860	1,985

Based on these measurement results, an R value of 0.930 was obtained, and after interpretation it was found that there was a very high relationship between the x and y variables. The R Square test (R2) is used to determine how much influence the value of the regression coefficient (R) states there is a correlation between the independent and dependent variables. To find out the value of the determinant coefficient (R2) of the research model, the SPSS (Statistical Product and Service Solution) version 25 For Windows tool was used. The results of the test for the coefficient of determination show that the R-Square (R2) of the regression model is 0.865. This value will be made in percent form, meaning that the model has an effect of 86.5% (very related).

Discussion

Development Communication and Social Change

The reconceptualization of development communication builds on the main concepts of development through a strategic intervention approach and the role of development activists (Squires, 2022) Communication for development and social change (development communication) is knowledge sharing aimed at reaching agreements to take action that takes into account the interests, needs and capacities of all interested parties, with the aim of sustainable development at all different stages of society so that information media and information technology and communication (ICT) is not the only tool in achieving social change, but interpersonal and traditional communication and group media must also play a fundamental role. Previously, Figueroa et al Pratiwi & Susiyanto, (2021) argued that the principle of communication of social change and behavior should be horizontal empowerment that encourages people as agents of change, promotes dialogue, debate and negotiation, emphasizing processes of interaction, knowledge sharing and collective action according to norms, culture for sustainable change within communities and between individuals. Development communication practitioners recognize four key facts of human behavior namely 1) People give meaning to information based on the context in which they live, 2) Culture and networks influence people's behavior 3) People cannot always control the issues that determine their behavior and 4) Societal decisions about health and well-being compete with other priorities. Social and behavioral change communication is a process of looking at problems from various sides by analyzing individual, social, and environmental factors to identify and overcome obstacles to change both as social norms embedded in policies, laws, cultural identities, and behavior and group pressures so change can be sustainable. Social and behavioral change communication is an interactive, careful, planned, strategic process with the aim of changing individual behavior and social conditions. (Lubis & Sulistiawati, 2021) explains that development communication must lead to changes in target behavior which always emphasize changes in actions by having rational skills and awareness to obtain added value, is a science and art of communication between humans that can be applied (ontologically), has a body of knowledge, methods research as well as ethics and law (epistemological), have goals and contain values (axiology).

Communication for development and social change as a social process because it is the development of knowledge aimed at creating a consensus of action that takes into account the interests, needs and capacities of all parties who have the ultimate goal of sustainable development at different levels of society (Servaes, 2020). To realize social change, development communication has approaches, strategies, and objectives. Communication planning and strategies are needed in the development process in order to create effective communication (Wijaya, 2015).

Participatory Communication

The participation paradigm no longer focuses on political economy but is more oriented towards cultural development in accordance with millennial development goals, namely community sustainability and participation. The participation paradigm believes that shifting the focus of development from economic growth to a social dimension is necessary to ensure long-term results in line with millennial development goals, so that sustainability and

participation are key elements. Ryanto Budiana et al., (2016) state that identification of participatory development communication problems includes 1) formulation of local community development, 2) dialogue (symmetrical two-way communication), 3) orientation to changes in community stages and individual needs, 4) conflict recognition, 5) media access local, 6) self-assessment as a motivation for sustainable collective action.

Communication Strategy, Participatory Communication and Sustainable Development

Communication strategy and participatory communication are interrelated. Sustainability and participation are key elements of sustainable millennial development that the World Bank recognizes as an important part of a sustainable development strategy so that participation needs to be based on the application of two-way communication principles (Diouf, 2019). The strategic approach as well as the participatory approach are both possible communication tools for successful development and social change. The direction of the approach and development communication process that is oriented towards social change requires an approach that is historically dominant as a persuasive communication that also involves the role of development activists and social change at the lower stages who will encourage and motivate social movements from below that act as partners, for example opinion leaders. , senior community leaders who can be personally invited as agents of change in socializing innovations so as to generate public confidence in the innovations to be adopted.

Resistance to change can occur individually or in organizations and even social systems. Rivera et al., (2020) regarding individual sources of resistance which include adoption, personality, habits, threats and influence of power, fear of the unknown, and economic reasons, while in organizations including organizational forms and culture, limited resources , fixed investment, and inter-organizational agreements. Optimization of participation strategies can be used to reduce resistance individually and organizationally (Linser & Lier, 2020).

A participatory communication strategy, going against the mainstream, especially commercial media and the cultural industry, and supporting the development of a critical, independent society and alternative media, be it local radio, video production or print media. The communication strategy is designed to address and solve problems at the grassroots stage by utilizing the findings of a rural participatory communication assessment that starts with people, methods, techniques and communication media (Rivera et al., 2020). Communication strategies in development communication for social change can be understood through understanding the social meaning of social change, namely what and how. What shows the many dimensions of society that are subject to change in norms, attitudes, socio-economic structures, policies, beliefs, information, behavior, social processes, where people come together to define problems, identify solutions, and carry out actions, are very important in the study of collective action, social movements, and political participation. Social change reflects the activation of institutions and social networks to promote transformation in individuals and structural communities, so that each change process requires the development and activation of formal and informal communication networks (Waisbord in Wilkins et al 2014).

Sustainable Development

Principles of sustainable development are the management and conservation of natural resources that are technology-oriented and institutional change for the well-being of today's people and future generations known as the 3 P's (people, planet and prosperity), namely people, earth and prosperity Battersby, (2017) which hereinafter become the 5 P in Sustainable Development Goals (SDGs), namely people, planet, prosperity, peace and partnership, peace and partnership are the targets of sustainable development. Sustainable development is the management and conservation of natural resources, the basis and orientation of technology and institutional change in such a way as to ensure the achievement of the sustainable satisfaction of human needs for present and future generations.

Baumgartner, (2019) in his scientific oration said that "sustainable marine development (sustainable marine development) is an effort to utilize natural resources and environmental services contained in coastal and marine areas for human welfare, especially stakeholders, in such a way (level) utilization of the said natural resources and environmental services does not exceed the carrying capacity of the coastal and marine areas to provide them". profitable, fair, and sustainable. Aspects that must be considered include (1) the potential and suitability of the area for aquaculture commodities, (2) the capabilities and aspirations of the local community in adopting and implementing aquaculture technology, (3) an integrated aquaculture business system approach, and (4) conditions and achievement of results aquaculture development.

One of the basic procedures for managing sustainable aquaculture development is better monitoring and control. Monitoring and control can be defined as a set of rules, institutions, and other factors related to environmental and resource exploitation, evaluation and analysis of problems and opportunities, acceptable and prohibited behavior, and rules and prohibitions related to the distribution and profit taking of resources. Nature.

Togo & Gandidzanwa, (2021) evaluates the level of sustainability of pond cultivation in economic, socio-territorial, environmental aspects through the IDAqua method, which is an analytical method consisting of indicators of fish farming sustainability that aims to diagnose fish farming activities related to socioeconomic, environmental and social sustainability. health (sanitation). The IDAqua method consists of 11 economic indicators, 10 socioterritorial indicators and 14 environmental indicators through the study of fish farmers' opinions. The economic aspect consists of the effectiveness dimension with labor productivity indicators, fish productivity, seed quality and profits, the independence dimension with financial indicators, the sustainability dimension with salary adequacy indicators, the ability to return business capital, resilience to economic risks, resilience to selling price risks, dimensions openness and consumer protection with indicators of information and communication, processed product variations. The socioterritorial aspect includes the dimensions of relations with other actors with indicators of network density, inter-regional integration, the involvement of professionals, the dimensions of human resource protection and development with indicators of daily work and quality of work, the dimensions of spatial organization with indicators of the level of association and the existence of sectoral organizations, the dimensions of local development with indicators of fish farming business trends, implications for local life, tourist orientation. Environmental aspects include the dimension of environmental protection with indicators of regulation & control of fish seed supply, impact studies, compliance with environmental norms, land conversion index, pond conversion index, fish protection dimension with indicators of water hygiene management, environmental hygiene/ health institutions, use of antibiotics and practices treatment.

Conclusion

The novelty that will be found in this study is the multidisciplinary theory and concepts used, namely the communication of social change and behavior with a socioecological model that places humans as the subject of change at individual, group and social stages. The research method that will be used is a mixture (sequential explanatory) to enrich the aquaculture issue. Multiple data analysis techniques explanatory descriptive analysis (SEM-PLS), intact network analysis (UCINET) and sustainability analysis (Rapfish/MDS). Development of an innovation communication strategy model with a participatory communication perspective.

Based on the results and discussion that has been done, it can be concluded that based on the test results relating to the presence or absence of the influence of the independent variables on the dependent variable can be seen based on the t count and its significance value. From the table above, the ttable value is 13.843 > 2.042 (ttable obtained by finding df and looking at ttable, df = number of correspondents - 2 and a significance value of 0.00 <0.05. Based on

these measurements, the R value is obtained at 0.930, and after interpretation it is known that there is a very high relationship between the variables x and y.The R Square test (R2) is used to determine how much influence the value of the regression coefficient (R) states there is a correlation between the independent and dependent variables.

References

Adenle, A. A., Wedig, K., & Azadi, H. (2019). Sustainable agriculture and food security in Africa: The role of innovative technologies and international organizations. *Technology in Society*, *58*, 101143. https://doi.org/10.1016/j.techsoc.2019.05.007

Anwarudin, O., & Dayat, D. (2019). The Effect of Farmer Participation in Agricultural Extension on Agribusiness Sustainability in Bogor, Indonesia. *International Journal of Multicultural and Multireligious Understanding*, *6*(3), 1061. https://doi.org/10.18415/ijmmu.v6i3.1028

Battersby, J. (2017). MDGs to SDGs–new goals, same gaps: the continued absence of urban food security in the post-2015 global development agenda. *African Geographical Review*, *36*(1), 115–129.

Baumgartner, R. J. (2019). Sustainable Development Goals and the Forest Sector—a Complex Relationship. *Forests*, *10*(2), 152. https://doi.org/10.3390/f10020152

Budi Priatna, W., Santoso, H., & Moenawar, M. G. (2021). The Strength of Sociopreneurs in Nurturing the Rural Socioeconomic Conditions. *E3S Web of Conferences*, *232*, 01035. https://doi.org/10.1051/e3sconf/202123201035

Budiasa, I. M., & Amaral, N. P. A. (2022). STRATEGY FOR DEVELOPMENT OF ORGANIC FERTILIZER BUSINESS IN EFFORTS TO INCREASE COMPETITIVENESS AND SUSTAINABLE AGRICULTURE. *International Journal of Applied Science and Sustainable Development (IJASSD)*, *4*(2), 55–63.

Chaudhuri, S., Roy, M., McDonald, L. M., & Emendack, Y. (2021). Reflections on farmers' social networks: a means for sustainable agricultural development? *Environment, Development and Sustainability*, *23*(3), 2973–3008. https://doi.org/10.1007/s10668-020-00762-6

Das, U., & Ansari, M. (2021). The nexus of climate change, sustainable agriculture and farm livelihood: contextualizing climate smart agriculture. *Climate Research*, *84*, 23–40. https://doi.org/10.3354/cr01648

de Gennaro, B. C., & Forleo, M. B. (2019). Sustainability perspectives in agricultural economics research and policy agenda. *Agricultural and Food Economics*, *7*(1), 17. https://doi.org/10.1186/s40100-019-0134-8

Dharmawan, L., Muljono, P., Hapsari, D. R., & Purwanto, B. P. (2021). Digital information development in agriculture extension in facing new normal era during COVID-19 pandemics. *Journal of Hunan University Natural Sciences*, *47*(12). https://doi.org/https://doi.org/10.1088/1755-1315/403/1/012127.

Dharmawan, L., Muljono, P., Hapsari, D. R., & Purwanto, B. P. (2022). Communications of Innovation for Supporting Farmer Empowerment and Productivity in The Digital Era. *RUSET 2021: Proceedings of the 2nd International Conference on Rural Socio-Economic Transformation: Agrarian, Ecology, Communication and Community Development Perspectives, RUSET 2021, 14-15 September 2021, Bogor, West Java, Indonesia*, 1.

Diouf, G. (2019). Millenium development goals (MDGs) and sustainable development goals (SDGs) in social welfare. *International Journal of Science and Society*, *1*(4), 17–24.

Eidt, C. M., Pant, L. P., & Hickey, G. M. (2020). Platform, Participation, and Power: How Dominant and Minority Stakeholders Shape Agricultural Innovation. *Sustainability*, *12*(2), 461. https://doi.org/10.3390/su12020461

Eriksson, M. (2018). Lessons for Crisis Communication on Social Media: A Systematic Review of What Research Tells the Practice. *International Journal of Strategic Communication*, *12*(5), 526–551. https://doi.org/10.1080/1553118X.2018.1510405

Giagnocavo, C., de Cara-García, M., González, M., Juan, M., Marín-Guirao, J. I., Mehrabi, S., Rodríguez, E., van der Blom, J., & Crisol-Martínez, E. (2022). Reconnecting Farmers with Nature through Agroecological Transitions: Interacting Niches and Experimentation and the Role of Agricultural Knowledge and Innovation Systems. *Agriculture*, *12*(2), 137. https://doi.org/10.3390/agriculture12020137

Gusti, I. R. A. (2021). INNOVATION AND TRANSFORMATION OF PRODUCTION COST CONTROL IN IMPROVING THE QUALITY OF AGRICULTURE RESOURCES AS AN ACCELERATION

SOLUTION TO SUPPORT BUSINESS SECTOR AGRICULTURE DURING THE COVID 19 PERIOD IN INDONESIA. *International Journal of Social Science*, *1*(4), 361–372. https://doi.org/10.53625/ijss.v1i4.513

Heide, M., von Platen, S., Simonsson, C., & Falkheimer, J. (2018). Expanding the Scope of Strategic Communication: Towards a Holistic Understanding of Organizational Complexity. *International Journal of Strategic Communication*, *12*(4), 452–468. https://doi.org/10.1080/1553118X.2018.1456434

Linser, S., & Lier, M. (2020). The contribution of sustainable development goals and forest-related indicators to national bioeconomy progress monitoring. *Sustainability*, *12*(7), 2898.

Lubis, D., & Sulistiawati, A. (2021). *Digital Inequality and Development: Using Short Message Service for Agricultural Development in Indonesia*. *48*(10).

Morton, L. W. (2020). Working toward sustainable agricultural intensification in the Red River Delta of Vietnam. *Journal of Soil and Water Conservation*, *75*(5), 109A-116A. https://doi.org/10.2489/jswc.2020.0304A

Oliveira, M. de F., Gomes da Silva, F., Ferreira, S., Teixeira, M., Damásio, H., Ferreira, A. D., & Gonçalves, J. M. (2019). Innovations in Sustainable Agriculture: Case Study of Lis Valley Irrigation District, Portugal. *Sustainability*, *11*(2), 331. https://doi.org/10.3390/su11020331

Pratiwi, D. A. G., & Susiyanto, D. (2021). Dimensions of Social Development in the Era of Regional Autonomy. *Indonesian Journal of Social …*, *5*(1), 60–76.

Pretty, J., Attwood, S., Bawden, R., van den Berg, H., Bharucha, Z. P., Dixon, J., Flora, C. B., Gallagher, K., Genskow, K., Hartley, S. E., Ketelaar, J. W., Kiara, J. K., Kumar, V., Lu, Y., MacMillan, T., Maréchal, A., Morales-Abubakar, A. L., Noble, A., Prasad, P. V. V., … Yang, P. (2020). Assessment of the growth in social groups for sustainable agriculture and land management. *Global Sustainability*, *3*, e23. https://doi.org/10.1017/sus.2020.19

Ravazzoli, E., Dalla Torre, C., Da Re, R., Marini Govigli, V., Secco, L., Górriz-Mifsud, E., Pisani, E., Barlagne, C., Baselice, A., Bengoumi, M., Dijskhoorn-Dekker, M., Labidi, A., Lopolito, A., Melnykovych, M., Perlik, M., Polman, N., Sarkki, S., Vassilopoulos, A., Koundouri, P., … Nijnik, M. (2021). Can Social Innovation Make a Change in European and Mediterranean Marginalized Areas? Social Innovation Impact Assessment in Agriculture, Fisheries, Forestry, and Rural Development. *Sustainability*, *13*(4), 1823. https://doi.org/10.3390/su13041823

Rivera, M.-L., Hermosilla, P., Delgadillo, J., & Echeverría, D. (2020). The sustainable development goals (SDGs) as a basis for innovation skills for engineers in the industry 4.0 context. *Sustainability*, *12*(16), 6622.

Ryanto Budiana, H., Sjoraida, F., Mariana, D., & Priyatna, C. (2016). *Proceeding of The 3 rd Conference on Communication, Culture and Media Studies The Use of Social Media by Bandung City Government in Increasing Public Participation*. *August*, 63–70.

Saleh, A., Surahman, M., Purwono, Sugiyanta, Hamzah, Zamzami, A., Desrial, & Wetik, J. D. (2021). Rice estate areas: a sociocultural and institutional model for lowland rice farming. *IOP Conference Series: Earth and Environmental Science*, *694*(1), 012008. https://doi.org/10.1088/1755-1315/694/1/012008

Sarma, M., Hidayati, N., Nanere, M., Trebilcock, P., & Ratten, V. (2022). Entrepreneurial Marketing and Its Relationship on Business Competitiveness in Footwear and Agro Industries of Small and Medium Industries. In *Stakeholder Entrepreneurship* (pp. 19–44). Springer Singapore. https://doi.org/10.1007/978-981-16-7091-6_3

Setiyowati, H., Nugroho, M., & Halik, A. (2022). Developing a Blue Economy in Depok West Java, Indonesia: Opportunities and Challenges of Neon Tetra Fish Cultivation. *Sustainability*, *14*(20), 13028. https://doi.org/10.3390/su142013028

Sjaf, S., Kaswanto, K., Hidayat, N. K., Barlan, Z. A., Elson, L., Sampean, S., & Gunadi, H. F. F. (2021). Measuring Achievement of Sustainable Development Goals in Rural Area: A Case Study of Sukamantri Village in Bogor District, West Java, Indonesia. *Sodality: Jurnal Sosiologi Pedesaan*, *9*(2). https://doi.org/10.1038/s41893-020-0555-0.

Sobariah. (2021). Financial analysis of catfish cultivation feeding with black soldier fly (maggot) at fish-farmers' group TPS3R Kayumanis, Bogor, West Java, Indonesia. *E3S Web of Conferences*, *322*, 05012. https://doi.org/10.1051/e3sconf/202132205012

Squires, A. P. L. R. L. (2022). Examining social media in the online classroom: postsecondary students' Twitter use and motivations. *International Journal of Social Media and Interactive Learning Environments*, *6*(4).

Syamsari, S., Ramaditya, M., Andriani, I., & Puspitasari, A. (2022). Selecting Priority Policy Strategies for Sustainability of Micro, Small, and Medium

Enterprises in Takalar Regency. *Sustainability*, *14*(23), 15791. https://doi.org/10.3390/su142315791

Togo, M., & Gandidzanwa, C. P. (2021). The role of Education 5.0 in accelerating the implementation of SDGs and challenges encountered at the University of Zimbabwe. *International Journal of Sustainability in Higher Education*, *22*(7), 1520–1535. https://doi.org/10.1108/IJSHE-05-2020-0158

Triste, L., Vandenabeele, J., Lauwers, L., & Marchand, F. (2020). Strategies for expansive learning in sustainable farming initiatives: a CHAT analysis of a Dutch case. *International Journal of Agricultural Sustainability*, *18*(5), 392–409. https://doi.org/10.1080/14735903.2020.1787619

van Ruler, B. (2018). Communication Theory: An Underrated Pillar on Which Strategic Communication Rests. *International Journal of Strategic Communication*, *12*(4), 367–381. https://doi.org/10.1080/1553118X.2018.1452240

Yanfika, H., Rangga, K. K., Viantimala, B., Listiana, I., Mutolib, A., & Rahmat, A. (2020a). Evaluation of the Success of Programs and Strategy for Sustainable Coastal Community Development in Tanggamus Regency. *Journal of Physics: Conference Series*, *1467*(1), 012026. https://doi.org/10.1088/1742-6596/1467/1/012026

Yanfika, H., Rangga, K. K., Viantimala, B., Listiana, I., Mutolib, A., & Rahmat, A. (2020b). Evaluation of the Success of Programs and Strategy for Sustainable Coastal Community Development in Tanggamus Regency. *Journal of Physics: Conference Series*, *1467*(1), 012026. https://doi.org/10.1088/1742-6596/1467/1/012026

Zambon, I., Cecchini, M., Mosconi, E. M., & Colantoni, A. (2019). Revolutionizing Towards Sustainable Agricultural Systems: The Role of Energy. *Energies*, *12*(19), 3659. https://doi.org/10.3390/en12193659

Zerfass, A., Verčič, D., Nothhaft, H., & Werder, K. P. (2018). Strategic Communication: Defining the Field and its Contribution to Research and Practice. *International Journal of Strategic Communication*, *12*(4), 487–505. https://doi.org/10.1080/1553118X.2018.1493485