

## COMMUNITY PARTICIPATION ON WASTEWATER TREATMENT PLANT DEVELOPMENT IN BAJERA VILLAGE

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### ABSTRACT

The concept of community-based wastewater management is currently considered an appropriate concept in carrying out a sanitation facility development program, especially domestic wastewater treatment facilities. Therefore, through the Community-Based Total Sanitation program by constructing communal wastewater treatment plants (WWTP) using the Community Based Participatory Research pattern, it is hoped that the pattern of handling sanitation problems in Bajera Village can be more optimal, from planning, development to management and monitoring. The objective to be achieved in this research is to formulate a participatory Communal WWTP development strategy in accordance with the level of community needs in Bajera Village. This research design uses qualitative methods by involving field participants and validation participants. Data collection techniques using open questionnaires, semi-structured interviews, and FGD. After analyzing the data using the Interpretative Phenomenological Analysis (IPA) method, the strategies carried out through social engineering are: (1). Conduct education through integrated outreach by involving relevant regional authorities. (2). Involving traditional leaders, religious leaders, youth leaders, women leaders, and migrant communities starting from the planning, development, management, and monitoring stages. (3). Make *awig-awig* and village regulations on wastewater management which are then used as the basis for regularity in community life so that a clean and healthy environment is formed.

**Keywords** : *strategy, treatment, wastewater, communal ipal, cbpr*

### Introduction

To provide facilities and infrastructure for residential wastewater for low-income communities in densely populated, slum, and sanitation-prone environments, community-based environmental sanitation (SLBM) activities are introduced. Sanitation is a preventive health effort that focuses on activities on the health of the human environment (Rejeki, 2015). This activity is an initiative to promote the provision of infrastructure and facilities for community-based wastewater in settlements with a needs-responsive approach (Ministry of Public Works and Public Housing, 2016).

Rachmaddianto, 1992 explained that SLBM also uses the principle of self-selection, sanitation technology options, participatory, and empowerment. The concept of community-based wastewater management (Community Based Management) is currently considered an appropriate concept in carrying out the sanitation facility development program, especially domestic wastewater treatment facilities (Afandi, 2013). Sanitation is very important to maintain the health of an environment in an effort to

prevent health problems due to environmental factors that can potentially harm health (Supriadi, 2018). The results of the study (Prihandrijanti, 2011) show that a centralized/communal management system is more suitable to be applied in cities in Indonesia because besides being more profitable in terms of operation and maintenance, it is also a solution for areas with high-density levels.

The pattern of handling sanitation problems in Tabanan Regency has long been carried out through financial assistance from various parties, both the Central and Local Governments. However, community-based development activities that are truly participatory in which the involvement of the people living around the sanitation facilities being built are not maximally absorbed.

Based on the Decree of the Regent of Tabanan Number: 180/460/02 / HK & HAM / 2015 concerning Amendments to the Decree of the Regent Number 180/367/02 / HK & HAM / 2014 concerning the Determination of the Location of Slum Housing and Slum Settlements

in Tabanan Regency. The locations of housing and slum settlements are scattered in seven sub-districts, namely Tabanan, Kediri, Marga, Kerambitan, Baturiti, Selemadeg, and Pupuan districts. The biggest concentration is located in Dauh Peken Village, Delod Peken Village, Dajan Peken Village, Kediri Village, Banjar Anyar Village, Pupuan Village, Pujungan Village, Kerambitan Village, and Bajera Village.

There are three main factors that cause the emergence of slum areas (Wijaya, 2016), namely population density, limited land, and a large number of groups with low economic levels making it difficult to access a decent standard of living. Based on the profile of Bajera Village in 2019, the total population is 2941 people from 907 families with ownership of 2 (two) public toilets and 640 family toilets. Ownership of family latrines, which is still very low, which is only around 66%, of course, has a negative impact on environmental hygiene and health.

Based on the description above, the construction of a Communal Wastewater Treatment Plant (IPAL) based on community participation using the Community Based Participatory Research (CBPR) pattern, it is hoped that the pattern of handling sanitation problems in Bajera Village can be more optimal, starting from planning, development to management and maintenance. Based on this background, the authors are interested in conducting research with the title "Community Participation-Based WWTP Development Strategy in Bajera Village".

## RESEARCH METHOD

This research design uses a qualitative approach that describes, describes, and describes the object under study (Arikunto, 2006: 11). Qualitative research is defined as a methodology that provides tools in understanding the meaning in depth associated with complex phenomena and processes in social life practices (Brady, 2015). Another definition is also expressed by (Strauss, 2017) that qualitative research is a type of research whose findings are not obtained through statistical procedures or other forms of calculation. Furthermore (Oun, 2014) said that the qualitative method is a method for testing and answering questions about how, where, what, when, and why someone acts in certain ways on specific problems. Furthermore, the qualitative method is also defined as a research method in

describing phenomena based on the informants' point of view, finding various realities and developing a holistic understanding of a phenomenon in a particular context (Hilal, 2013). In line with this opinion, Almalki (2016) mentions qualitative methods as a method usually used in describing inductively, with assumptions based on the social reality construct, variables that are difficult to measure, complex and interrelated, and the data collected contains different points of view. depth of informants.

The approach used is CBPR, research that focuses on individuals and groups, to create collective knowledge, build social competences, empower individuals and groups, and combine research and action (Ronzi, et al. 2016).

Qualitative research is research that intends to create descriptions or descriptions to understand the phenomena experienced by research subjects such as behavior, perceptions, motivation, actions, and others (Moleong, 2010: 6). This method is used in accordance with the research objectives, namely to formulate a participatory WWTP development strategy in accordance with the level of community needs in Bajera Village.

This research was conducted in Bajera Village, Selemadeg District, Tabanan-Bali Regency starting from August to December 2019. Participants involved in this research were field participants and validation participants. Participants in the field were selected based on purposive sampling in accordance with the research objectives so that they were expected to be able to answer the communal WWTP development strategy in Bajera Village.

The selection of participants in the field came from three bureaucratic elements, namely the Head of the Settlement Division at the Public Works Office for Housing and Settlement Spatial Planning, Tabanan Regency, the Head of the Development, and Settlement Management Section, and the Technical Implementing Officer for Sanitsai Activities. Meanwhile, from the community elements, there were four people, namely the Bajera Village Chiefs Officer, the Regional Head of the Bajera Kaja Region, the Technical Facilitator for Sanitation Activities, and the Community Empowerment Facilitator.

The validation participants involved in this study were the Supervisors and fellow MP2WL class 12A students who conducted research using the CBPR method. Mutual learning

in this study was carried out on a commitment from all validation participants. Validation participants also provide strong support, resources, and also involvement in the research process in order to produce a more representative WWTP Communal development strategy in Bajera Village.

Data collection was carried out by conducting a preliminary survey, observation, then conducting intensive interviews via the participant WhatsApp Group. Research data can also be obtained through the implementation of Focus Group Discussion (FGD) three times using a semi-structured questionnaire for interviews; photos, videos, voice recordings, logbooks, and narrative documents for social media and focus group discussions.

The instruments used in this study were: (1). An open questionnaire, namely initial data in the form of photos of environmental conditions in the Bajera Village environment. (2) Semi-structured interview guidelines, namely answer to questions on coded initial data from field participants. The coded answers were discussed in depth through FGD together with field participants. FGDs were conducted three times until a strategy was formulated for the construction of a communal IPAL in Bajera Village.

Data validation refers to various primary, new, and relevant reference sources, then the data generated was consulted with participants. The validity was done by using triangulation techniques including; triangulation between researchers; and triangulation of data sources, as shown in Figure 1.



Figure 1. Source Triangulation and Method Triangulation Combination Design Model.

Data analysis was carried out by

interpreting the data that had been collected from each participant's answers through open questionnaires, semi-structured interviews, and FGDs. The collected data were analyzed using the Interpretative Phenomenological Analysis (IPA) technique. Bayir, 2016, there are several stages in science, namely: (1) reading and re-reading, (2) initial noting, (3) developing emergent themes, (4) searching for connections across emergent themes, (5) moving the next cases, and (6) looking for patterns across cases.

### DESCRIPTION OF THE RESEARCH LOCATION

Geographically, Bajera Village is one of the villages located in Tabanan Regency at the longitude coordinates 115.005159 and latitude coordinates -8.487161, including in the Selemadeg District, Tabanan Regency. The topography of Bajera Village is located at an altitude of 0-500 meters above sea level with an area of 78.8 hectares consisting of 51.22 hectares of moor/field, 19.68 hectares of yards, and 7.9 hectares of village rice fields. The boundaries of Bajera Village include north bordering Bajera Utara Village, south bordering Antap Village, west side bordering Tukad Yeh Otan, east bordering Berembeng Village.

Administratively, Bajera Village is divided into (6) six Dinas Banjar, namely: 1. Banjar Dinas Bajera Kaja, 2. Banjar Dinas Bajera Tengah, 3. Banjar Dinas Bajera Kelod, 4. Banjar Dinas Bajera Jero, 5. Banjar Dinas Bajera Sari, 6 Banjar Dinas Saraswati, (Bajera Village Profile, 2019).

The boundaries of Bajera Village include north bordering Bajera Utara Village, south bordering Antap Village, west side bordering Tukad Yeh Otan, east bordering Berembeng Village. Bajera village map can be seen on page Figure 2.



Figure 2. Map of Bajera Village (Source: Google map) Insert Map of Bali Island.

The total population of Bajera Village based on the 2019 Village Profile is 4475 people

consisting of 2314 men and 2161 women. Demographically, the population of Bajera Village can be seen in Table 1 below.

Table 1. Total Population of Bajera Village in 2019.

No	Banjar Dinas	Bajera villagers		
		Male	Female	Total
1	Banjar Dinas	799	790	1589
	Bajera Kaja			
2	Banjar Dinas	256	250	506
	Bajera Tengah			
3	Banjar Dinas	323	311	634
	Bajera Kelod			
4	Banjar Dinas	277	225	502
	Bajera Jero			
5	Banjar Dinas	352	298	650
	Saraswati			
6	Banjar Dinas	307	287	594
	Bajera Sari			
	Total	2314	2161	4475

Source: Bajera Village Profile, 2019

The most religious adherents in Bajera Village are Hinduism, with 3,692 people, followed by Islam as many as 739 people, Christian and Catholic as many as 39 people, and Buddhism as many as 5 people. Table 2 shows that there is a tendency for the proportion of women more per religion to be higher than that of men except for Hindus who have fewer women than men.

Table 2. Number of Religious Adherents

Religion	Male	Female
Islam	314 person	425 person
Kristen	5 person	7 person
Katholik	15 person	12 person
Hindu	1974 person	1718 person
Budha	2 person	3 person
Jumlah	2.310 person	2.165 person

Source: Profiles of Bajera Village in 2019

## RESULTS AND DISCUSSION

Initial data is in the form of photos of environmental conditions through field observations, then shared and commented on by all field participants. Environmental conditions in Bajera Village can be seen in Figure 3.

Figure 3. Environmental conditions in Bajera Village, (1. Densely populated housing, 2. Wastewater stagnating in the ditch, 3. Sewage

pipes entering the sewer).



Based on the three photos above, the writer asks 3 (three) questions to all participants. These questions are: (1). How do you view photos 1, 2, and 3? (2). What problems do you see from the three photos above? (3). What should be done to solve this problem? Field participant comments can be seen in Table 3.

Table 3. Field participant comments that have been coded and validated by the validation participants.

Field Participants	Comment Questions 1	Comment Questions 2	Comment Questions 3
Participants 1	Very dirty, affects health, the drainage is very dirty, the pipes are piped into the sewers	The house is shabby, public awareness is very lacking	Cultivate awareness, coordination
Participants 2	Stagnant water in drains, throwing wastewater into drains, is not good for hygiene and health	Cause various kinds of diseases.	Wastewater treatment, individually or in groups
Participants 3	Waste is not dumped directly into sewers	Disposal of waste into sewers, damaging and polluting the environment	The special waste storage is individual, group
Participants 4	Impressed slum, sewer looks very dirty	Lack of arrangement for the environment	Coordination between the community

			Environment and government			environment.	
Participants 5	The environment is not well ordered	Development of various diseases	Environmental hygiene activities remain clean and healthy.	Member 3	The environment is not habitable	Social problems, lack of attention from the apparatus	Improvement of construction quality, healthy housing standards, community involvement
Participants 6	The people are less concerned with the environment	It looks very dirty.	The environment must be well organized	Member 4	The wastewater disposal is not yet organized	Supervision from the village, disposal of wastewater into sewers	Household waste must be filtered, channeled into a storage tank
Participants 7	The people are less fortunate, the sewers are not clean, the wastewater is discharged into the ditch	The community does not pay attention, the smell is unpleasant, the environment is less clean	It needs to be empowered, water is no longer stagnant	Conclusion	community wastewater is discharged directly into the environment	the environment becomes dirty so that it can cause various diseases.	it is necessary to build a wastewater treatment plant involving the surrounding community

In addition to the comments above, participants in the field also gave comments and then coded and validated them. The coding and initial data validation by validation participants can be seen as presented in Table 4.

Table 4. Coding and validation of the initial data from participants of the validation

Participants Validation	Comment Questions 1	Comment Questions 2	Comment Questions 3
Member 1	People's behavior, throwing their wastewater into a drainage, disturbs health	Disorganized wastewater disposal makes waste disposal feasible	Making wastewater storage
Member 2	The environment is not good, throwing waste into sewers, polluting the environment	Wastewater disposal has not been an organized, dirty / slum	Waste storage, an active role of the community

From the results of coding and initial data validation carried out, the problem in Bajera Village is that there is still a lot of community waste water that is discharged directly into the environment without going through any treatment first. This of course will be very influential for cleanliness and dangerous for environmental health. To overcome this problem, it is necessary to build a wastewater treatment plant involving the surrounding community

The results of the validation and coding of participants' initial data comments were further discussed with field participants by holding three FGDs. The results obtained in each FGD are as follows: FGD I. A Community Participation Based WWTP Development Strategy Should Be Made in Bajera Village. Results of FGD II Identification of Community Participation-Based WWTP Development Strategies in Bajera Village. FGD III produced a Community Participation-based WWTP Development Strategy in Bajera Village. The following is the documentation during the FGD I.



Figure 4. Situation during FGD I at the Bajera Workshop, September 24, 2019



Figure 5. Implementation of FGD II at Warung Segara, 12 October 2019



Figure 6. The situation of FGD III implementation in the Bajera Kaja environment continued at Warung Segara, October 30, 2019

From the results of data collection through three FGDs conducted together with participants, the formulation of strategies produced in participatory WWTP

development research is in accordance with the social conditions of the community, the involvement of leaders, and the rules that are used as references in overcoming the problem of wastewater. The strategy includes: conducting education through integrated extension by involving relevant regional officials to influence community behavior so that they can manage household wastewater properly and correctly. Involve traditional leaders, religious leaders, youth leaders, women leaders, and migrant communities from the planning, development, management, and monitoring stages. Making awig-awig and village regulations on wastewater management. This is in accordance with the empowerment theory put forward by (Arnstein, 1969) that the Bajera Village community is a Partnership.

The advantages and uniqueness of this research is because it uses the learning method between participants. The study was carried out to determine a communal IPAL development strategy to overcome environmental problems due to household wastewater pollution in Bajera Village.

The results of this study are almost similar to the research conducted by (Venny, 2015) on Community Participation in Urban Sanitation Development in Rowosari Village, Tembalang District, Semarang City. The sanitation development program in Rowosari Village involves community participation, where the community plays a role and is involved during the program. The community participates in the socialization stage, the implementation stage, as well as the control stage in supporting sanitation improvement.

The more interesting thing from the research on the Community Participation-Based Community Wastewater Treatment Plant Development Strategy in Bajera Village is that it is clearer to mention the participation of each of the figures in Bajera Village.

When referring to the form of communal participation in research conducted by (Andini, 2014) on Whose Decisions? Communal Participation in the Implementation of the Sanimas Program in Kadipiro Village, Surak City. What is fulfilled include the decision to accept the program initiative, the decision to allocate community resources, and the decision to distribute maintenance tasks.

Important decisions in implementing the Sanimas program in Kadapiro Village were made based on information from several people in the community and were made in forums that were not fully open.

In line with the research conducted (Friedman, 2009) regarding the Legal System in the Perspective of Social Sciences, the function of law is as social engineering which is then used as the basis for social control in social life to create an order in social life.

The development strategy of the Communal WWTP in Bajera Village certainly prioritizes openness between the community, traditional and religious leaders, youth leaders, women leaders, migrant residents, the Village Government, and the District Government. Another uniqueness that makes this research more interesting is when wastewater management is made *awig-awig / perarem* which is characteristic of the customary rules that are applied in Balinese society in general.

The limitations of this study are only at the action plan stage considering: (1). The research was conducted in Bajera Village, Selemadeg District, Tabanan Regency, using the CBPR method with purposive sampling. So that this research still cannot be generalized to provide an overview of the community participation-based WWTP development strategy. For this reason, it is deemed necessary to have other researchers in different areas. (2). The research time is relatively short, which is about three months, so the results obtained are still not optimal.

Seeing the existing limitations, it is hoped that the next researchers will be able to carry out social engineering research to increase public awareness and participation in the construction of Communal WWTPs to overcome wastewater problems.

## CONCLUSION

The community participation-based strategy for the construction of a communal wastewater treatment plant in Bajera Village, Selemadeg District, Tabanan Regency will work well if collective action is carried out with social engineering, namely: (1). Conducting education through integrated extension services by involving relevant regional officials to influence community

behavior so that they can properly and properly manage household wastewater. (2). Involve traditional leaders, religious leaders, youth leaders, women leaders, and migrant communities from the planning, development, management, and monitoring stages. (3). Making *awig-awig* and village regulations on wastewater management are the main tool of social engineering results which is then used as the basis for regularity in social life so as to form a clean and healthy environment.

In order to optimize the formulation of strategies generated from this research, it is advisable for policy makers to map the problems before carrying out physical development.

In order to optimize the formulation of strategies generated from this research, it is advisable for policymakers to map the problems before carrying out physical development. The most important things to consider are: (1). The district government is expected to pay attention to the condition of the surrounding community in building the communal IPAL and not only refer to the technical instructions and implementation instructions from the central government which sometimes are not in line with the real conditions in the field. (2). The role of the leaders is expected to be more active in providing understanding and inspiring the Bajera Village community to take an active part in the construction of the Communal IPAL starting from the planning, development, management and monitoring stages. (3). Future researchers are expected to carry out social engineering research to increase public awareness and participation in the construction of Communal WWTPs to address wastewater problems.

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