Jurnal Planologi
Vol. 22, No. 2, Oktober 2025
Available: http://jurnal.unissula.ac.id/index.php/psa

E-ISSN: 2615-5257
P-ISSN: 1829-9172

Co-Creation as a Response to Functional Complexity in Slum-Prone Coastal Areas: The Case of Oeba, Kupang City

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ABSTRACT

This study discusses the complexity of overlapping functions in the Oeba Coastal Area due to the lack of proper planning and governance. The slum problems occurring in the Oeba Coastal Area are not only caused by physical problems but are also related to the economic and social problems of the local community. This research employs a qualitative descriptive method to understand the condition of the area through a participatory approach. In each stage of the research, four co-creation stages are used to facilitate collaboration among stakeholders, starting from problem identification, discussion sessions, formulation of planning alternatives, to the design stage. In its implementation, it was found that the main cause of urban decay in the Oeba Coastal Area is social aspects, which then affect the economic and environmental aspects of the area. The behavior of the surrounding community and the government's lack of firmness in managing the area have led to a decline in environmental quality. The use of the co-creation method has proven effective in involving the community in every stage of planning, resulting in a more contextual and inclusive design.

Keywords: Co-Creation, Functional Complexity, Kupang City, Participatory Planning, Slum Area

ABSTRAK

Studi ini membahas kompleksitas fungsi yang saling tumpang tindih di Kawasan Pesisir Oeba akibat tidak adanya perencanaan dan tata kelola yang baik. Permasalahan kekumuhan yang terjadi di Kawasan Pesisir Oeba tidak hanya disebabkan oleh permasalahn fisik, tetapi juga terkait permasalahan ekonomi dan sosial masyarakat setempat. Penelitian ini menggunakan metode deskriptif kualitatif untuk memahami kondisi kawasan dengan pendekatan partisipatif. Dalam setiap tahapan penelitian digunakan 4 tahapan co-creation untuk menjembatani kolaborasi antar stakeholder, mulai dari identifikasi permasalahan, sesi diskusi, perumusan alternatif perencanaan, hingga tahap desain. Dalam pelaksanaanya, ditemukan utama kekumuhan di Kawasan Pesisir Oeba disebabkan oleh aspek sosial yang kemudian mempengaruhi aspek ekonomi dan lingkungan kawasan, dimana perilaku masyarakat sekitar dan ketidaktegasan pemerintah dalam tata kelola kawasan menyebabkan penurunan kualitas lingkungan. Penggunaan metode co-creation terbukti efektif dalam melibatkan masyarakat dalam setiap tahapan perencanaan, sehingga menghasilkan desain yang lebih kontekstual dan inklusif.

Kata kunci: Co-Creation, Kawasan Kumuh, Kompleksitas Fungsi, Kota Kupang, Perencanaan Partisipatif

1. INTRODUCTION

Urbanization is a global phenomenon that has not only positive impacts, but also negative impacts, one of which is slums. Slum areas are often found in urban areas with uncontrolled growth, particularly in urban coastal areas. The population in coastal areas is generally composed of people who predominantly work in the informal sector, resulting in unstable incomes. In essence, informal areas have high economic potential, often referred to as "gold dust," which refers to areas with untapped resource potential (Prayitno, 2016). This is also the case in Kupang City, particularly in the Oeba Coastal Area.

According to the 2016 Kupang City Spatial Plan Regarding Spatial Patterns, the Fatubesi sub-district is designated as an informal sector activity area, which essentially has high resource potential in Kupang City, but is not being utilized properly, resulting in uninhabitable conditions. Based on the Kupang Mayor's Decree No. 220 of 2014, the Oeba Coastal Area was designated as one of 13 slum areas in Kupang City. The slum issues in the Oeba Coastal Area are basically caused by the complexity of the area's functions, where there are many building functions in the area, causing each function to overlap. This is due to the local government's lack of firmness in enforcing spatial planning regulations, which has led to conflicts over land use and created various problems such as overcrowding, lack of basic infrastructure, sanitation systems, and others, resulting in slum conditions in the Oeba Coastal Area. The complexity of these issues has led the Oeba Coastal Area to be designated as one of the priority areas for slum upgrading by the local government. However, the efforts to address slum conditions that have been undertaken so far have not yet been optimal.

Basically, low community involvement in the area management process has several negative impacts, such as a low sense of ownership, efforts that do not meet community needs, and resistance to the programs being implemented. This phenomenon is evident in the Oeba Coastal Area, where the inaccuracy in determining the priorities of interventions carried out is partial and fails to address the root causes of the area's issues. By involving the community in the planning, implementation, and monitoring processes, consensus can be achieved in realizing justice that aligns with the community's aspirations (Tauhid, 2013).

According to UN-Habitat (2020), slum upgrading requires not only physical improvements to the area, but also social and economic improvements to ensure that the transformation is sustainable. According to Takeuchi, et al., (2006), the factors that influence slum conditions in an area cannot be separated from economic, social, and environmental factors. These three aspects are the main pillars of area planning that are interrelated and influence one another. Slum area planning is not only about improving the physical conditions

of the area but also requires a design intervention that considers the interconnection between the three aspects of development: economic, social, and environmental. These three aspects are interconnected to create a livable area. Therefore, resolving slum conditions is not only about area planning but also involves economic and social interventions that are participatory in nature.

A participatory approach in the planning process can increase the effectiveness of development projects. Community involvement can also increase the community's sense of ownership and responsibility for maintaining conditions after the implementation of area management programs. However, community participation programs often face obstacles in the form of limited resources and capacity among the surrounding community. Communities in slum areas are dominated by people who are less active, innovative, and responsive to their surroundings (Prayitno, 2016). Therefore, the use of the co-creation method is an appropriate approach to address these challenges. The co-creation method is a participatory method that positions the community and other stakeholders more equally, thereby enabling joint decision-making and strengthening a sense of ownership (Mačiuliene & De Araujo, 2017; Florian, 2023). The co-creation method not only focuses on environmental improvement but also on human resource development. This method involves the community in every planning process and emphasizes collaboration between the community and local government (Mačiuliene, 2017).

This research contributes to the development of knowledge by using the Oeba Coastal Area as a case study that has problems of slum areas with overlapping functional complexities. The objective of this study was to transform the Oeba Coastal Area into a more livable area using the co-creation method so that the transformation efforts could be more holistic and in line with the needs of the community. To achieve the objectives of this study, the researchers conducted several stages of analysis, beginning with identifying the conditions and factors causing the slum area. The co-creation method was used to strengthen the planning process in order to produce solutions based on the needs of the community.

2. METHOD

In this study, a qualitative descriptive method was used to examine the conditions and factors that influence slum areas in the Oeba Coastal Area, as well as to describe the existing conditions of the area by gathering information from various sources. The qualitative descriptive method enables the implementation of co-creation, from problem identification

and analysis to solution formulation. To facilitate the research process, several variables were used as benchmarks for the research object, as shown in Table 1:

Table 1 Research Variable

No	Variable	Source
1.	**Economy**	
	a. Types of occupation	(Surtiani, 2006)
	b. Total income	Central Berau of Statistics
	c. Number of dependent	Minister of PUPR Regulation No. 14/PRT/2018
	d. Land ownership status	(Surtiani, 2006)
2.	**Social**	
	a. Education level	(Surtiani, 2006)
	b. Demographic status	(Surtiani, 2006)
3.	**Environment**	
	a. Land use	Minister of PUPR Regulation No. 14/PRT/2018
	b. Building density	Minister of PUPR Regulation No. 14/PRT/2018
	c. Green open space availability	(Surtiani, 2006)
	d. Clean water availability	Minister of PUPR Regulation No. 14/PRT/2018
	e. Wastewater management	Minister of PUPR Regulation No. 14/PRT/2018
	f. Waste management	Minister of PUPR Regulation No. 14/PRT/2018
	g. Environment road quality	Minister of PUPR Regulation No. 14/PRT/2018
	h. Drainage condition	Minister of PUPR Regulation No. 14/PRT/2018

Source: Authors, 2025

The variables listed in Table 1 will be used as a reference in collecting data related to the condition of the Oeba Coastal Area as a basis for co-creation. The analysis of factors affecting the condition of the area was conducted using the Delphi method. This stage was carried out so that the resulting design interventions could be more targeted.

Location

The Oeba Coastal Area is in Fatubesi Village, Kota Lama District, Kupang City, East Nusa Tenggara Province. Administratively, the Oeba Coastal Area consists of 11 RT and 3 RW, with a total area of approximately 27 hectares. According to the 2016 Kupang City Spatial Planning Master Plan on Spatial Pattern Planning for Areas, Fatubesi Village is designated as an area for informal activities. Meanwhile, based on the 2010 Kupang City Mayor's Decree on Slum Areas, Fatubesi Village is classified as a low-level slum area and is one of three priority areas for slum management in Kupang City, but it has a high level of management difficulty.

Figure 1 Map of Oeba Coastal Area
Source: Authors, 2025

Sampling Technique

Research respondents were selected using purposive sampling, which involved several participants, including local communities, local government, academics, and practitioners. The number of participants was determined based on their direct involvement with the area and their relevance to the planning process.

Co-Creation Process in the Development of the Oeba Coastal Slum Area

The co-creation process in this study was carried out in several stages, including: 1) identifying stakeholders and analyzing problems based on environmental observations; 2) conducting discussions with stakeholders regarding issues in the area; 3) discussing recommendations or solutions that can be implemented according to user needs; and 4) the design process by conceptualizing ideas from stakeholders and selecting design alternatives. Each stage was carried out with the involvement of stakeholders directly related to the observation area. Figure 2 shows stakeholder involvement in the development of the Oeba Coastal Area, while (Figure 3) shows the co-creation stages in the development of the area.

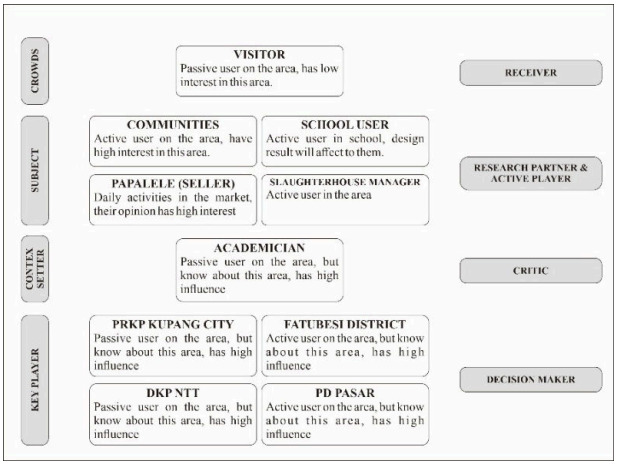

Figure 2 Stakeholder Mapping
Source: Authors, 2025

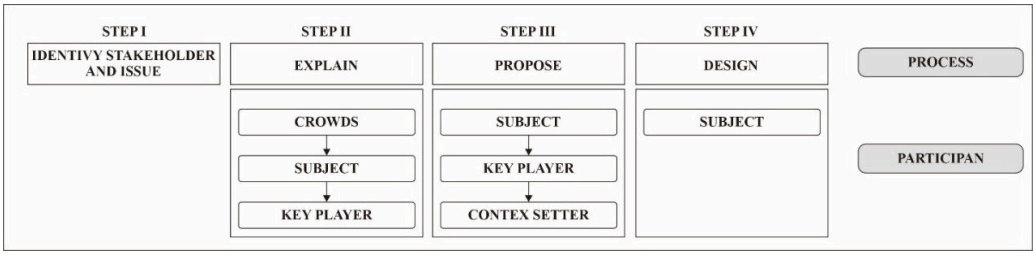

Figure 3 Stages of co-creation method in structuring the area
Source: Authors, 2025

There are the following of co-creation stages in area planning:

1. Identify stakeholders and issues through observation and initial interviews.
2. Discuss using FGD techniques to determine area issues.
3. Formulate solutions using a second FGD technique to analyze ideas and solutions according to user needs (alternative compilation).
4. Conceptualize designs according to the selected alternatives.

3. RESULT AND DISCUSSIONS

Site Overview

The Oeba Coastal Area is essentially an area designated for informal activities located in a coastal area, so that most of its population consists of migrants with various specific interests, leading to uncontrolled population growth in the Oeba Coastal Area. The Oeba Coastal Area is classified as highly dense, with a total of 120 people per hectare. This high population density is the result of uncontrolled urbanization and limited availability of suitable land. Urbanization, coupled with the absence of spatial planning, has led to overlapping functions within the area, thereby affecting the environmental quality of the Oeba Coastal Area.

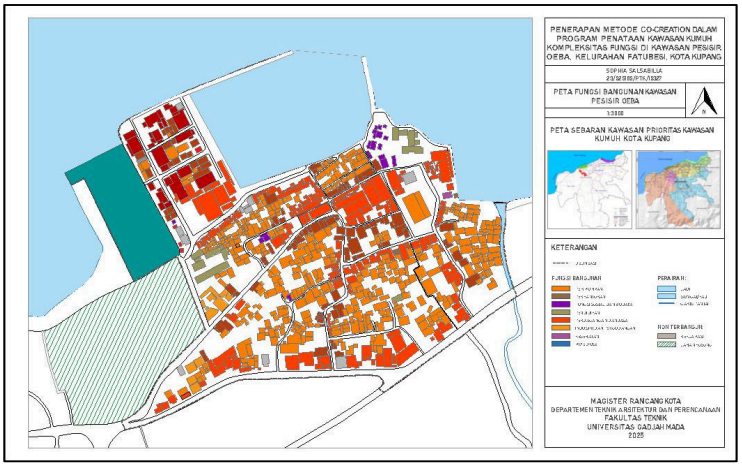

Figure 4 Map of spatial functions in Oeba Coastal Area
Source: Authors, 2025

Figure 5 *Oeba Coastal Area Condition*
Source: Authors, 2025

Figure 4 shows that the Oeba Coastal Area is essentially a residential area that has developed into an informal area, causing significant irregularities in spatial functions. In theory, spatial planning should be based on the integration of spatial functions as outlined in the Kupang City Spatial Plan for 2011-2031. However, the existing conditions reveal that the complexity of functions and spatial irregularities have resulted in overlapping spatial functions, thereby reducing the quality of the area. Figure 6 shows the spatial planning map for the Oeba Coastal Area:

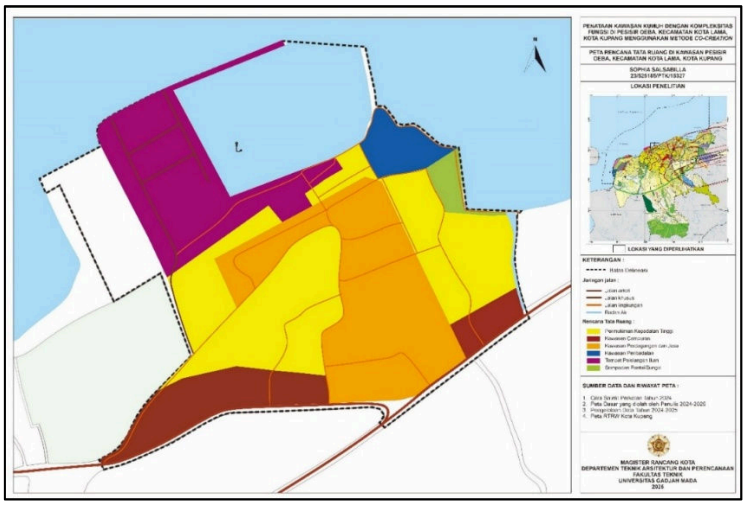

Figure 6 Spatial pattern plan map of Oeba Coastal Area based on RTRW Kupang City
Source: Authors, 2025

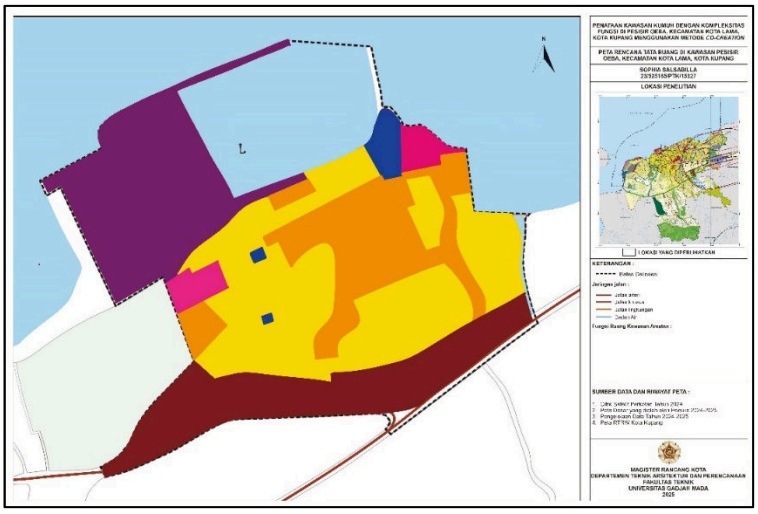

Figure 7 Analysis of existing spatial patterns
Source: Authors, 2025

As can be seen Figure 6, this is a spatial planning map of the area based on the 2011-2031

Kupang City Spatial Plan (RTRW) data. However, as shown in Figure 7, the existing spatial planning pattern in the Oeba Coastal Area does not align with land use designations, as the area is dominated by high-density residential zones followed by commercial and service zones. As shown in Table 2, this is the data on the area and percentage of land use functions in the area.

Table 2 Area and percentage of function space

Land use	**Are (ha)**	**Percentage**
Settlements	6,5	32,7%
Trade and service area	5,06	19,1%
Fish auction site	3,47	17,4%
Mixed use area	3,8	10,4%
Green open space	-	-
Education area	0,31	1,6%
Worship area	0,76	3,8%
Coastal/riverine buffer	-	-

Source: Authors, 2025

Table 2 shows the results of the spatial pattern analysis of the area, where the observation area is dominated by residential areas with a total of 32.7%, followed by commercial and service areas with 19.1%. Based on the spatial pattern of the area, the development of commercial and service areas in the observation area tends to be scattered along the roadside, creating new variables of problems. Meanwhile, the functions of open green spaces and coastal/river buffer zones within the area were not detected.

Conditions and Factors Affecting Poverty in the Oeba Coastal Area

In determining the factors that influence slum conditions in the Oeba Coastal Area, the Delphi analysis technique was used. This analysis was conducted through interviews

with influential stakeholders who understand the conditions of the observation area. This technique was applied until a consensus was reached regarding the stakeholders' opinions on the factors influencing pollution in the study area. There are 4 respondents from 'key player' and 'contex setters', where they have high ability and interests in the region. The following Table 3 shows the selected respondents in the Delphi analysis, including:

Table 3 Delphi analysis respondets

Respondents	Delegation	Symbol
Bapak John Bell	Dinas PRKP Kota Kupang	R1
Bapak Anak Agung G.S.M.P	Fatubesi Village	R2
Bapak Maxi Nomeni	PD Pasar Kota Kupang	R3
Dr. I Gusti Ngurah W. Hardy, ST., M.ST	Academics	R4

Source: Authors, 2025

In practice, researchers conducted discussions related to the conditions of the area based on an analysis of the findings presented in tabular form. Respondents then decided on their opinions regarding the results of the field findings analysis. During the interview process, researchers explained the results of the analysis of the conditions in the Oeba Coastal Area, followed by a discussion of the field findings. After that, the researchers allowed the respondents to select the factors causing slum conditions in the Oeba Coastal Area based on the available variables. The following Table 4 shows the results of the Delphi exploration:

Table 4 Results of Delphi analysis round I

No.	Parameters	Variables	Respondents			
			R1	R2	R3	R4
1.	Economy	Types of occupation	A	A	A	A
		Total income	A	A	A	A
		Number of family dependent	DIS	A	A	A
		Land ownership status	A	DIS	DIS	DIS
2.	Social	Education level	A	A	A	A
		Demographic status	A	A	A	A
3.	Environment	Land use	A	A	A	A
		Building density	A	A	A	A
		Green open space availability	A	A	A	A
		Clean water availability	A	A	A	A
		Wastewater management	A	A	A	A
		Waste management	A	A	A	A
		Environmental road quality	A	A	A	A
		Drainage condition	A	A	A	A

Source: Authors, 2025

Keterangan:

A : Agree
DIS : Disagree
: Variable has not reached consensus

Table 4 shows the results of interviews with stakeholders regarding factors affecting slum conditions in the Oeba Coastal Area. Based on the Delphi analysis results shown in Table 5, there are still two variables that have not reached consensus, namely the number of dependents and land ownership status. This is due to differences of opinion regarding these two variables.

Regarding the land ownership status variable, R1 believes that it does not significantly influence slum conditions, as the most influential factor is population density. However, other respondents consider land ownership status to play a significant role in influencing slum conditions in the area, as nearly all the land in the study area is government-owned. Regarding the number of dependents variable, some respondents felt that it does not significantly influence the area because the number of dependents of the household heads living in the study area does not overly burden the family's economic conditions. Therefore, a second Delphi analysis was conducted to achieve a consensus. The following are the results of the second Delphi analysis:

Table 4 Results of round II Delphi analysis

Parameters	**Variabel**	**Responden**			
		R1	**R2**	**R3**	**R4**
Economy	Land ownership status	A	A	A	A
	Number of family dependent	DIS	DIS	DIS	DIS

Source: Authors, 2025

The results of the second round of Delphi analysis showed that all variables had reached consensus, with the number of dependents not included as a factor influencing poverty in the Oeba Coastal Area. These results were obtained by reconfirming the respondents' opinions so that they could reconsider the results of the previous round. Table 6 shows the consensus results of the analysis of the research area conditions in the Oeba Coastal Area:

Table 5 Recapitulation of the results conditiion analysis of the Oeba Coastal Area

Variable	**Condition Analysis of Oeba Coastal Area**
Types of occupation	The area is dominated by people with informal jobs. Based on the analysis of the area's conditions, 56% of the people in the Oeba Coastal Area are in the lower class, 41% are in the middle class, and the remaining 3% are in the upper class.
Total income	Part of the community is dominated by low-income people, with an average income below the minimum wage in Kupang City. This is due to many people working in the informal sector with uncertain incomes.
Land ownership status	The Oeba coastal area is dominated by government-owned land, both municipal and provincial. People who do not live on their own land often do not pay attention to the condition of the area and there is no planning.
Education level	The level of education among the people in the Oeba Coastal Area is predominantly low, which influences the behavior of the local community in

Variable	Condition Analysis of Oeba Coastal Area
	terms of their habits, low awareness of environmental hygiene, and lack of initiative in maintaining public facilities.
Demographic status	The Oeba coastal area is dominated by migrants living on government-owned land, so they do not have strong ties to the surrounding environment. As a result, the local community tends to be passive in protecting the environment.
Land use	The spatial planning inconsistencies listed in the Kupang City Spatial Plan are caused by the government's lack of firmness in managing the area, resulting in overlapping spatial functions.
Building density	The Oeba Coastal Area is classified as densely populated, but in its current condition it appears to be highly congested due to informal activities and street vendors on the roadside causing traffic jams.
Green open space availability	There are no functional green spaces, but there are private green spaces that are vacant or undeveloped land.
Clean water availability	The Oeba Coastal Area is an area with potential for clean water that has spring water sources. However, the quality of Oeba's groundwater has declined due to RPH and TPI. In addition, the topography of the area, which is located at a low elevation and in a coastal area, means that the groundwater produced is brackish and therefore undrinkable.
Wastewater management	Waste pollution in the area is caused by the absence of a waste management system before it is discharged into drainage channels, as well as by several public facilities such as TPI, Pasar, and RPH not having a waste management system, which has an impact on the surrounding area.
Waste management	The waste management system in the Oeba Coastal Area is currently limited to collection and disposal, without any sorting, recycling, or other processes.
Environmental road quality	The condition of roads in the Oeba Coastal Area is classified as poor, with almost all of them cracked and potholed, causing water to pool. This condition hinders mobility in the area and even causes traffic jams.
Drainage condition	The drainage conditions in the Oeba Coastal Area are quite poor, with almost all drainage channels blocked, either by trash or by vendors who permanently close the channels with concrete. In addition, the concave contour of the land makes water flow in the area difficult.

Source: Authors, 2025

Based on the results, it can be concluded that the slum problem in the Oeba Coastal Area is not only an environmental problem, but also caused by economic and social problems. The following (Table 7) is a summary of the findings on the condition of the Oeba Coastal Area:

Table 7 Findings on the condition of Oeba Coastal Area summary

Aspect	Description
Economy	Informal economic activities dominate public spaces and encourage irregular land use. This phenomenon is in line with the theory of urban informality in Asia (UN-HABITAT, 2020), which highlights the dominance of the informal sector in coastal areas of developing cities.
Social	The Oeba Coastal Area has a high population density with semi-permanent dwellings and limited land. Land ownership status is not privately owned, so the community tends not to pay attention to housing conditions, especially in terms of cleanliness and maintenance. This phenomenon is in line with Tauhid's (2013) research, which states that the unclear status of land ownership contributes to the emergence of slums.

Aspect	Description
Environment	The conditions of drainage, waste management, clean water quality, and so on indicate that ecological aspects cannot be separated from economic and social aspects. This is in line with Ostrom's (2019) socio-ecological system theory, which emphasizes the interrelationship between communities and ecosystems. This study found that the complexity of functions in the Oeba Coastal Area has deteriorated due to economic activities in the coastal area.

Source: Authors, 2025

The Implementation of Co-Creation in the Development of the Oeba Coastal Area

As explained in the previous discussion, there are four stages of co-creation applied in this study. The first stage is aimed at identifying the basic conditions of the area and determining the stakeholders who will participate in the study. The second stage is aimed at discussing issues in the observation area according to the stakeholders. In this second stage, no definitive decisions are made, as the initial discussion process allows researchers to give stakeholders time to get to know one another and share the challenges they face before making decisions. The outcomes of the discussions among stakeholders are interconnected.

Figure 8 *Discussion process with stakeholders*
Source: Authors, 2025

The third stage involves discussions regarding the ideas or solutions provided. At this stage, the subjects will discuss their needs with each other. After discussing with the subjects, discussions will then be held with the key players. The key players will provide feedback on the solutions provided by the subjects. After that, discussions will be held with the context setters, namely academics, to provide input on the solutions that have been provided. The discussion with the context setters is conducted so that they can assess whether the proposed solutions are feasible or not. After discussing with the stakeholders, the researcher will conceptualize the ideas and input provided into several alternative designs. The recommendations will be categorized in such a way as to become several alternative designs.

In this study, there are three design alternatives, namely: 1) rehabilitation alternative, focusing on infrastructure improvement, without any changes to the spatial layout; 2) redevelopment alternative, an effort to improve the quality of the area's functions; 3) mixed

alternative, a combination of the two alternatives that are adjusted so that they do not overlap. The selection of alternatives is carried out by the subject through the distribution of questionnaires because this party plays an important role as they are active users of the area, so the design to be implemented will have a significant impact on the subject. Based on the results of the alternative selection, the mixed alternative is the chosen alternative by the community because it is considered to the meetest user needs and believed to be able to solve the problems in the area. The fourth stage is the design phase of the selected alternative, where the conceptual framework of the selected alternative design focuses on improving the area's facilities and spatial planning, relocating functions that have a prolonged negative impact on the area.

Results of Oeba Coastal Area Planning Using the Co-Creation Method

After completing several stages of area planning, a final design was produced that responded to environmental issues and met user needs. The focus of development was on improving physical issues related to economic and social aspects of the community. The following

is the master plan for the Oeba Coastal Area based on the results of community selection:

A. School side garden
B. SD Negeri 3 Oeba
C. Fish Auction Place
D. Oeba Market Center
E. Parking pocket 1
F. Parking pocket 2
G. Oeba Flats
H. Sabu Street Corridor
I. New flats
J. *Waterfront* Oeba
K. Oeba Open Space
L. Oeba Night Market
M. Timor Raya Street Corridor

Figure 9 *Oeba Coastal Area Masterplan*

Source: Authors, 2025

Figure 10 Result of design area condition
Source: Authors, 2025

1. Land Use and Density

Land use planning aims to optimize the function of space to reduce area density. Based on discussions with stakeholders, there are several design strategies to improve the utilization of space, including: 1) relocating street vendors from the roadside to reduce density and congestion; 2) regulating residential areas in buffer zones to be converted into public spaces; 3) establishing micro-scale zoning with consideration for land efficiency. As shown in (Figure 10), this is the land use plan for the area based on community recommendations:

Table 8 Area and percentage od existing and planned area

No.	Guna Lahan	Eksisting		Planning	
		Area (ha)	Percentage	Area (ha)	Percentage
A.	Settlements	6,5	32,7%	6,07	30,5%
B.	Mixed use areas	3,8	19,1%	3,8	19,1%
C.	Trade and service areas	3,47	17,4%	2,65	13,31%
D.	Fish auction place	5,06	25,4%	4,9	24,62%
E.	Green Open Space	-	-	1,25	6,3%
F.	Educational area	0,31	1,6%	0,31	1,6%
G.	Worship area	0,76	3,8%	0,76	3,8%
H.	Waterfront area	-	-	0,16	0,8%

Source: Authors, 2025

Land use optimization as shown in Table 7 is adjusted based on recommendations and solutions from stakeholders who consider regional integration. Based on the solutions provided, spatial function optimization shows a decrease in the intensity of residential areas by 2.2%, commercial and service areas by 4.09%, and fish markets by 0.78%.

2. Accessibility and Circulation Planning

Based on the recommendations of stakeholders in response to accessibility and circulation issues in the area, the circulation routes were reorganized and the physical condition of the roads, which were the main problems, were improved. The circulation in the area was made one-way and circulation routes were provided to ensure the comfort and safety of road users. The change in circulation patterns is aimed at reducing vehicle congestion, which causes traffic jams

and has the potential to damage road infrastructure. Additionally, the provision of parking lots is another solution offered to enhance circulation comfort in the area. As shown in Figure 11 below, this illustrates the recommended accessibility and circulation plan for the area.

Figure 12 Accessibility and circulation plan map
Source: Authors, 2025

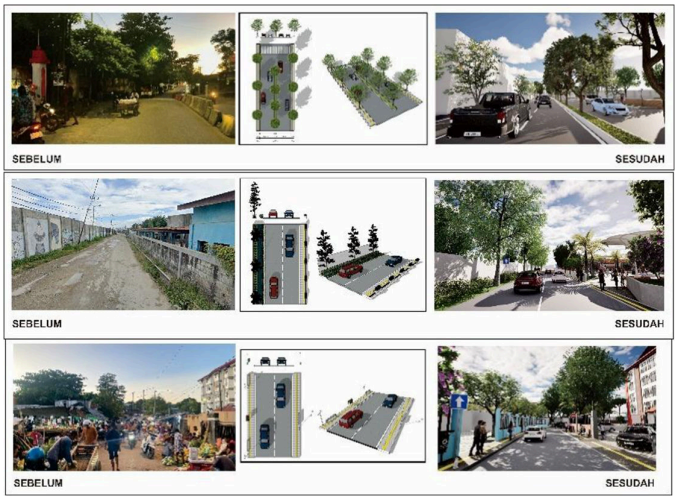

Figure 13 Hasil perencanaan jalan
Source: Authors, 2025

3. Regional Infrastructure and Utilities Planning

Based on stakeholder recommendations and ideas, basic infrastructure and utility planning for the area was carried out in response to issues related to waste, garbage, clean water, and drainage in the area. The following Table 9 shows the results of stakeholder recommendations:

Table 9 Infrastructure and utility recommendations plan for Oeba Coastal Area

Variable	Design Strategy
Wastewater management	Providing biopori holes use 10 cm diameter pipe
	Waste processing system development that pays attention to environmental health.
Waste management	Relocation the TPS to reclamation area
	Improvement of the waste processing system according to SNI

Variable	Design Strategy
	Trash bank provision
Clean water management	Increasing clean water network services to reach all areas, using plumbing pressure system
	Using tandon and infiltration wells in open space areas as a backup water source of the area.
	Relocation the animal slauhter house
Drainage	Using sump pump in the flooded prone area
	Tilting drainage up to 2% towards a water agency
	Improvement the drainage system to avoiding to flooded

4. Green/Public Open Space Planning

The arrangement of green/public open spaces in the area serves not only an ecological function, but also as an educational tool in community empowerment efforts. There are several design interventions in the arrangement of open spaces, two of which are green spaces that support the development of community talents in various fields. The facilities provided are designed according to the needs of the community, whether economically or socially.

Figure 14 Green/Public open space plan of Oeba Coastal Area

4. CONCLUSION

This study shows that the problems of slum areas in the Oeba Coastal Area are caused by the complexity of the area's functions, which are not accompanied by good planning and poor governance, where these problems are inseparable from the economic and social factors of the community. These findings challenge conventional approaches to area planning that focus only on physical improvements without exploring the root causes of the area's problems. Social factors, influenced by the education level and demographic status of the Oeba Coastal Area community, are the main determinants that influence behavior, participation, and other aspects related to area formation.

The application of the co-creation method in this study contributes to the development of a more inclusive and contextual area planning model, where the resulting design is based on

equal contributions from various parties, including the community, academics, and relevant agencies. This approach successfully produces an area design that not only focuses on visual aesthetics but also considers aspects of social empowerment and environmental quality improvement.

Theoretically, this research demonstrates that slum area planning is not solely based on physical interventions but must address the root causes of the area's issues. This finding also reinforces the argument that co-creation is not merely a participatory method but a transformational approach that is 'bottom-up' in nature. Practically, co-creation can serve as a reference for participatory planning in Indonesia, where it is deemed capable of producing more holistic, adaptive, and community-accepted solutions.

This study also acknowledges the limitations in the application of co-creation, where community capacity in planning requires more time and resources. Additionally, the success of co-creation is influenced by the commitment of local governments, both in planning and in the consistent enforcement of spatial planning policies.

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