Design visioning in a slum upgrading program: Case study of Ambulu Village, Cirebon Regency, Indonesia

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Abstract. Design visioning is an approach to formulating the development objective for a planned area. It is based on the input from multiple analyses which results in a clear vision statement. This vision acts as a framework for planning and designing physical interventions. To accomplish the Ministry of Public Works and Public Housing’s directive of “transforming the kampongs’ face” in its slum upgrading program, visionary goal-setting is needed to look beyond physical interventions in infrastructure planning. In fact, the eradication of all slum indicators should not be viewed as an end goal but as a way to improve kampongs’ socio-economic conditions by creating more liveable and sustainable settlements. Using contextual analysis, followed by SWOT analysis and site analysis, this paper generates general development strategies. The study found that the economic and ecological setting of Ambulu Village in Cirebon Regency has the potential to be promoted into a new maritime-themed tourism destination. The paper presents a vision statement for “Ambulu Eco Fishing Village” as the basis for a set of design principles for developing a slum upgrading masterplan.

1. Introduction

Urbanization is one of the challenges humanity faces as the world’s urban population continues to increase. World Bank data from year 2018 estimates that about 4.2 billion people or 55% of the world’s population currently reside in urban areas. This trend is expected to increase continuously to reach 68% in 2050 with the addition of 2.5 billion urban dwellers [1]. Meanwhile, approximately 30% of the world’s urban population in 2014 still lives in slum conditions. Specifically, about 21.8% of the urban population in Indonesia was estimated to live in slums in the same period [2].

Many previous studies on the social, economic and physical aspects of slums found that slums in Indonesia are not related directly to economic factors. This can be proven by data from Statistics Indonesia (BPS) which shows that urban poverty in Indonesia per March 2018 was about 7.02%. Meanwhile, Java, Indonesia’s most populous island, had 6.82% urban poverty in the same period [3]. This highlights the misconception that people living in slums are poor. Therefore, understanding the unique context of each slum location is crucial in slum alleviation efforts to develop sustainable settlements.

Indonesia has a long history of slum upgrading programs that can be traced back to the Dutch colonial era [4]. After Indonesia’s independence, the country’s slum upgrading programs started with...
the Kampung Improvement Program in 1970, leading up to the current Kota Tanpa Kumuh program (Cities without Slums), abbreviated as “Kotaku”. Unlike its predecessor, PNPM Mandiri Perdesaan/Perkotaan, which focused on community-based poverty eradication, Kotaku addresses the development of social and human factors. This is a response to the failure of the past approach to slum eradication that emphasized only physical upgrading when the goal should be social integration through settlement transformation [5]. Regional-scale slum upgrading programs through Kotaku should coordinate all efforts and resources on slum alleviation by developing an integrated program to revitalize slum areas through infrastructure development. A masterplan is needed to guide developments to transform the community through economic, social and environmental improvements.

Some examples from Europe show attempts to transform urban conditions using the green economy strategy. Improvements in urban landscapes and green areas are integrated into urban development policies. In turn, these physical improvements will increase economic values by making the area into a new destination for recreation and social activities [6]. In the case of O Portiño, A Coruña, Spain, urban space was developed into a new destination and meeting point [6]. The 57 hectares area construction consists of a spacious recreation area, outdoor recreation, and natural sightseeing facilities that include major reforestation, parks, public facilities, a large botanical garden, a boardwalk, alongside improved access and parking provisions [6]. This approach is suitable for locations that have valuable natural and social capital [7]. In fact, designing and implementing sustainable policies can foster environmental and social improvements by providing new urban green spaces that are designed to promote social interactions between the inhabitants [6].

Slum upgrading has been carried out many times around the world. Recent studies have proposed some solutions for handling slums. Firstly, building infrastructure before securing the secure tenure, to empower the community to create community wellbeing [8]. Specifically, slum upgrading programs can increase community wellbeing by using local knowledge of infrastructure needs [9]. Next, government agencies collaborating with the community can increase the effectiveness of top-down policies for slum areas while community support can increase participation through bottom-up policies [10]. In addition, the use of geospatial data can improve the effectiveness of slum upgrading as netizens upload updates of slum areas [11]. Furthermore, there are three keys aspects of successful slum upgrading, i.e., inclusive leadership, diffusing political tensions, and slum-policy frameworks [12]. Lastly, another alternative solution to the slum problem could be by following the basic concept of physical slum upgrading in riverside areas, which has three steps, i.e., arranging street networks, developing public utility systems, and providing common spaces and amenities [13].

Design visioning is one aspect of the urban design process to create a vision for an area [14]. As a process of “placemaking” and deploying the skills and resources to realize the vision, urban design could help low-income communities to achieve sustainable development [15][14]. An environmentally sustainable design could be achieved by acknowledging the existing ecosystem and implementing compatible technology on design strategies, while social sustainability could be achieved by providing spaces for people to interact in-person and, in turn, strengthen the community’s social capital [16][17].

This study examines how a design approach in a slum upgrading program could be used to achieve sustainable development and provide a broader sense of purpose for the community in Ambulu Village. In doing so, the study formulates a vision statement and design principles for a slum upgrading masterplan.

2. Background
2.1. Case study area
Ambulu is a village administratively located in Losari District, Cirebon Regency, West Java with an area of 19.11 ha. This village, is a compound of two dusun (smaller villages), i.e., Dusun Manis and Dusun Pahing. In 2017, Ambulu had a population of 3,069 of whom 2,775 residents were considered to live in slum conditions. The village is enclosed by an extensive area of milkfish ponds managed by the locals. Moreover, mangrove trees are lined alongside the river from the village to the estuary.
Ambulu sits on a lowland riverbank exposed to the sea. This makes Ambulu prone to seasonal tidal flooding. A combination of geographical features and ineffective drainage leads to a substantial 50 cm height of flooding during the rainy season.

Originally, Ambulu has been one of the fishermen’s settlements on Cirebon Regency’s northern coast. The fishermen utilize a 6-meter wide 500-meter long canal, named Kali Bulu that cuts through the middle of the village, as access to the Java Sea 3 km to the north. Despite the recent variety in livelihoods and professions, Ambulu still retains its character as a fishing village. The fisheries sector in Ambulu consists of fishermen, milkfish farmers, and salt ponds. It remains the most popular occupation for 44.65% of Ambulu’s households. However, there is a growing number of jobs in the commerce and services sector that employ 37.83% of households.

The last decade has seen a decline in Ambulu’s population. Data shows that from 2013 to 2017, Ambulu’s population growth was negative at -8.44% [18]. Many of Ambulu’s inhabitants chose to leave their village to move to urban areas. This form of urbanization is typical for much of the Indonesian countryside driven by economic factors [19]. A significant share of Ambulu’s young population works as domestic workers in South Korea, which has also contributed to the population decline. The presence of some job-training institutions suggests that this line of work is attracting growing interest. Several newly renovated houses of migrant workers’ relatives are evidence that this line of work is fruitful. If this trend continues, Ambulu will face a shortage of young workforce in the coming years.

![Figure 1. The study location of Ambulu Village, as shown in Regent Decree on Slum Housing and Slum Settlement Locations in Cirebon Regency.](image)

2.2. Kotaku regional-scale infrastructure planning and construction

Cirebon’s Regent Decree in 2014 stated that Dusun Manis and Dusun Pahing in Ambulu Village are slum housing and slum settlement areas with a “high” slum category. This category requires priority
interventions including road improvements and repair; drainage construction; running water provision; waste management; the improvement of uninhabitable houses; and the provision of sanitation [20]. This decree forms the basis for the Action Planning Program to Prevent and Improve the Quality of Urban Slums (Prevention Plans and Improving Urban Slum Quality/RP2KPKP).

RP2KPKP of Cirebon Regency, as part of the Kotaku program, determined Dusun Manis-Pahing is a priority location to receive Kotaku Regional-Scale Infrastructure Planning and Construction aid from the central government. To be approved to receive central government aid, the proposed location should fulfill several criteria, i.e., the conformity of legal aspects, the effectiveness of the infrastructure plan, and the readiness of technical documents [21]. Design aspects, represented by the masterplan are one of the components of the infrastructure plan.

The masterplan should promote six principles, i.e., it should include slum alleviation interventions with collaborative efforts; have a “development theme” conform to the spatial plan; improve the interconnection of access and infrastructure; have a recognizable physical transformation through architectural intervention; and lastly, contain local wisdom and offer opportunities for local socio-economic development [21]. Formulating a design that achieves all these principles is proven to be a difficult task to accomplish. By the end of 2018, only 12 out of 94 cities/regencies are ready for construction or at least for preparing Detailed Engineering Design (DED) documents. Meanwhile, more than 80 cities are still revising their conceptual plan [22]. This means that around 85% of the proposed locations are still working on their development vision.

Figure 2. Updating slum profile based on the survey, slum data processing, and field verification from Kotaku of Ambulu Village.

In 2018, Ambulu has received assistance from the Kotaku program of more than IDR 2 billion for several infrastructure improvements [23]. However, these programs are carried out based on the slum indicators’ baseline rather than a masterplan framework. Whereas, the presence of a masterplan could guide every infrastructure improvement program to achieve the region’s vision.
3. Theory and methodology

3.1. Design visioning

Formulating goals and objectives, which is part of the synoptic planning method, could be considered as the end phase of planning and the first stage of the design process [24]. Goals and objectives should be based on facts, resulting from rigorous analysis, rather than the designer’s subjectivity [24]. However, the problems in urban design are often neither clearly defined nor obvious so it is hard to agree on solutions to ‘fuzzy’ problems. Consequently, the design approach is dialectically situated between problems and solutions [25]. Understanding the context of issues and problems is the key to produce a good design. Yet, failing to understand these problems could result in the rejection of the proposed solutions or could generate proposals that are too generic and achieve nothing [24].

One way to avoid rejection or to design generalist proposals is by applying participatory methods through a design charette or workshop program. Community involvement could manifest in one or all of these stages: data gathering, design collaboration, and technical collaboration [26]. In this case, the community involvement is mostly needed to build some form of consensus about the overall slum upgrading “vision” [14]. A “vision” should be able to project future challenges, set long-term objectives, and - at some stage - attempt to realize dreams through innovative and radical approaches [27]. This phase of “visioning” is a platform for developing the “initial concept” that leads to a masterplan [14].

A good vision statement should be induced from one or multiple data analyses that formulate goals and objectives. Yet, sometimes an experienced architect/designer can internalize this process and come up with a vision statement based on observations and creativity [24]. The vision statement should be translated into a more operable form of development strategies. In the urban design process, development strategies act as a framework that translates a literal vision statement into spatial and physical interventions. These development strategies or urban design frameworks are then broken down into a set of design elements and design principles. Shirvani’s urban design elements are the most common design elements used in creating the design plan [24]. The division of the design plan into design elements on a public project help clarify which agency should contribute to which work.

![Diagram](image)

**Figure 3.** The process from a vision statement into formulating design principles.

In the case of Ambulu, a contextual analysis was deduced from multiple hierarchical spatial planning regulations and development policies. This analysis aimed to examine the location context in terms of its positioning, role, and development potential. A site visit was conducted to understand the physical and socio-cultural aspects of the location. At this stage, a series of unstructured interviews with
stakeholders were held to uncover community aspirations and important issues. Moreover, the previous slum alleviation policy document (RP2KPKP) was used to examine the slum condition of the site. The document contains numerical baseline assessments of 7+1 slum indicators, i.e., roads, drainage, running water, waste management, uninhabitable houses, sanitation, fire protection, and open space. This baseline became a guideline for physical interventions and design priorities.

Next, contextual and site analyses were combined to formulate a vision statement. The vision statement should address not only slum eradication goals but also future development goals that visualize a transformation. The vision statement is broken down into design elements that correspond to the 7+1 slum indicators. This method ensures that the consistency between development goals and physical interventions for slum upgrading could be checked. In the implementation stage, the design principles of every element will be specified in a Detailed Engineering Design (DED).

![Figure 4. Design methodology for Ambulu slum upgrading program.](image)

3.2. Analysis
Conformity with spatial regulations is one of the criteria for the slum upgrading program to receive Kotaku Regional-Scale Infrastructure Planning and Construction Aid from the central government [21]. Therefore, the relevant regulations were analysed to understand the development directions for the planned area. Every goal and objective in spatial planning documents from national to municipal levels were catalogued as well as from other policies for tourism and environmental conservation. The resulting inventory was then used as an input for SWOT analysis to formulate a general development strategy.

To understand the regional positioning and proximity to growth centres, a contextual appreciation was conducted with a qualitative measurement. This analysis attempted to assess the potential development values of the location in the urban structure constellation of the surrounding area. By comprehending location context, the present and future roles of the area could be envisioned and then become a starting point for formulating the “vision statement”.

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The inventory of regulations and policy analysis along with the contextual analysis needed to be structured and formulated in a more strategic direction. Therefore, the SWOT analysis was used because of its ability to dissect the properties and potential of the planned area [25]. The SWOT analysis, adjusted for slum criteria [28], resulted in more workable output in the form of the urban design framework, and program and design principles for developing the masterplan.

4. Results and discussion

4.1. Regional positioning

Ambulu Village’s significance in the macro context of West Java Province is because of its location in Java’s economic corridor. This is marked by the designation of Strategic Growth Centre (PPS) 4 Ciayumajakuning which crosses the national arterial road of Cirebon-Semarang. Ambulu Village is surrounded by various strategic areas of various types of interests, such as environmental functions, economy, and industry. Ambulu Village can take part in the advancement of the region by planning well-defined functions that are complementary to other strategic areas. Its proximity to the Losari district centre, which is designated as a neighbourhood growth centre (PKL), will increase the accessibility to public services for Ambulu's residents.

Figure 5. Regional positioning of Ambulu Village in a contextual analysis of the surrounding area.

4.2. Vision statement and development strategy

A series of discussions with stakeholders were held to find a vision statement for Ambulu. Generally, the respondents wanted Ambulu to be a healthy and resilient fishermen village. This vision was then translated as “Ambulu Eco Fishing Village”. This vision statement translates as a village with a strong fishermen and fisheries culture that is environmentally aware. After conducting observations and site analysis, an inventory of issues was made. These issues were then categorized into “strengths and opportunities” and “weaknesses and challenges” to generate a general development strategy as can be
seen in Table 1. These strategies will direct any design decisions to ensure their compliance with the vision.

**Table 1.** The inventory of issues was analysed using the SWOT method to formulate general development strategies.

| Strengths and Opportunities | Weaknesses and Challenges | Development Strategy |
|-----------------------------|---------------------------|----------------------|
| • Located along mainland and sea transportation lines on the northern coast of Java. |
| • Development of coastal settlements to support local economic activity. |
| • Fisheries, seafood processing, and salting are major economic activities. |
| • Development of settlements as tourism object. |
| • Active involvement of community organizations. |
| • Presence of mangrove vegetation along the river to the sea. |
| • Potential riverbank development. |
| • An adequate amount of open space. |
| • A clear circulation pattern in the settlement area. |
| • Prone to tidal floods. |
| • Illegal settlements on riverbanks. |
| • Garbage disposal in canals & public open space. |
| • Considerably high density. |
| • Increase understanding and public awareness of the importance of coastal area settlements. |
| • Transform slum village to become part of the marine industry. |
| • Increase understanding and public awareness of the importance of protecting the environment. |
| • Increase understanding and public awareness of disaster mitigation. |
| • The initial focus is on tackling slum problems. |
| • Empowering the local community organizations to tackle slum problems. |
| • Optimizing Kali Bulu as part of flood prevention infrastructure. |
| • Directing the slum upgrading project to support the marine-themed tourism area. |
| • Synergy with socio-economic assets and the natural environment as a tourist attraction. |
| • Development of tourism supporting facilities in the future. |
| • Preparing communities to support tourism activities. |
| • Incorporate disaster mitigation aspects in design development. |

4.3. **Design principles**

In spatially translating the development strategies, it was found that the development plan can be divided into four development segments. The first segment is a settlement which is focused on basic infrastructure provision to tackle slum conditions and to increase the quality of life. The second segment is the Kali Buluthat which is focused on rehabilitation from waste contamination, creating retention ponds for flood mitigation and creating a green corridor along the riverbank as an attractive public space. The third segment is a mooring dock which is focused on developing a tourism spot. The fourth segment is the mangrove park which is focused on natural preservation and eco-tourism.

The design principles will direct the physical interventions in every segment to assess specific issues and concerns. The design principles should answer how the vision statement will be manifested. The principles are broken down into design elements that accommodate slum upgrading program indicators as shown in Table 2.
Table 2. Design principles for “Ambulu Eco Fishing Village” by design elements.

| Design Elements | Design Principles |
|-----------------|-------------------|
| Buildings       | • Establishing a mooring dock to be the village’s centre of activity with tourism and commerce  
                  • Using local materials and local architectural values (e.g. stilt structures) in refurbishing the substandard houses. |
| Roads           | • Establishing a neighbourhood road as the main access to the mooring dock  
                  • Designing roads and bridges to be pedestrian-friendly to accommodate residents and tourist alike  
                  • Designing an entrance gate to represent the village’s image and identity |
| Drainage        | • Integrating the drainage system with flood mitigation, domestic waste management, and public spaces  
                  • Developing Kali Bulu into an ecological and visually attractive green open space |
| Clean water     | • Accessible communal freshwater sources should be provided as an alternative to the public water utility (PDAM) |
| Sanitation      | • Providing public toilets  
                  • Providing green communal septic tanks |
| Waste management| • Providing waste management for domestic and small industries alike  
                  • Preventing unprocessed grey and blackwater to be flushed to Kali Bulu  
                  • Providing adequate waste collector units  
                  • Providing “Reduce, Reuse, Recycle” garbage processing |
| Disaster mitigation | • Providing a neighbourhood fire response unit to put out fires in the dense area  
                      • Providing adequate fire hydrants  
                      • Providing an early warning system for tidal floods and tsunamis |
| Green open space| • Developing green open spaces as ecological and educational facilities  
                      • Revitalising the neighbourhood park and pocket parks  
                      • Restoring Kali Bulu’s riparian zone into its ecological state as a wetland  
                      • Developing mangrove plantations alongside Sungai Bulu as a tourist attraction |

4.4. Discussion

Design visioning in “Ambulu Eco Fishing Village” is a design approach to the slum upgrading project. The professional assistance from a competent architect and/or urban designer is crucial because of the nature of the project, where visual presentation and simulation are main communication tools. Translating the analyses into a vision statement is an important part of the designer’s internalization process [20]. Yet, some degree of creativity and experience is essential to deliver the right vision statement.

Due to limitations in the scope of this research, more analysis is needed before entering the phases of Detailed Engineering Design and construction. Additional analyses need to address flood levels and volume, mangrove ecological analysis and supply chain analysis of the local economy. Ambulu Village has seen recent developments in the mangrove park segment that will improve the village’s potential as a tourist destination. Specifically, the village’s own enterprise (Bumdes) has built 125 meters of boardwalk from a target of 2.7 km to facilitate riverwalk tourism. This boardwalk has solicited some positive responses and could spur the development of Ambulu Village to become a new tourist destination.

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