Slum Structuring Strategy With Collective Housing Concept

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Abstract.

Telaga Tujuh Village, located at the tip of Aceh's eastern coast, in West Langsa Sub-district, Langsa City, faces the problem of very high population density, with a density category between 250-400 people/ha. In addition, the village suffers from limited basic infrastructure. Telaga Tujuh Village is categorised as a severe slum area, with an average slum level of 100% based on seven criteria: building regularity, environmental road network, environmental drainage, drinking water needs, wastewater management system, waste management facilities and infrastructure, and fire protection facilities. The purpose of this research is to identify structuring needs in the slum area of Telaga Tujuh Village and design the structuring design, the method used in this research is Collective Housing which consists of 5 indicators, namely: On Site Upgrading, On Site Reblocking, On Site Reconstruction, Land Sharing and Relocation. These five indicators were selected using the Analytical Hierarchy Process (AHP) method with a value of CR = 0.098 so that On Site Reconstruction was selected which is the Do Minimum Strategy. The settlement pattern in this area after On Site Reconstruction is in the form of Iron Grid by dividing the area into Main Centres, namely the construction of facilities such as places of worship, balairung, auxiliary health centres (pustu), and village offices as government centres and community services, Sub Main Centres, namely education and the environment by providing public open space.

Keywords: *Slum Area, Collective Housing, Area Arrangement Design and Civil Engineering.*

I. INTRODUCTION

Slum areas are one of the serious challenges faced by many cities in Indonesia, including Langsa City. Telaga Tujuh Village is one of the areas in Langsa City that has problems related to inadequate physical and social conditions. Problems such as poor infrastructure, inadequate sanitation, and limited access to public facilities characterize this slum area. Slum upgrading is not just a matter of physical improvement but also requires a comprehensive and sustainable strategy. (Acioly, 2021; De Araújo et al., 2018). Research results (Solehati et al., 2017), Telaga Tujuh Village is classified as a severely degraded slum settlement, characterized by a lack of 100% building regularity, insufficient environmental road network coverage of 80%, absence of environmental drainage systems, unmet minimum drinking water requirements, non-compliance of wastewater systems with technical standards, and inadequate fire protection facilities and infrastructure.

The study delineated the attributes of the Gampong Telaga Tujuh slum in Langsa City and proposed the necessity for alternative solutions to the identified issues through a structuring model, thereby concentrating on formulating strategies utilizing the Collective Housing structuring model.Collective housing offers a solution by creating residences equipped with shared facilities, which can encourage social interaction, improve land use efficiency, and provide a more livable environment (Gradinaru et al., 2013; Pexas et al., 2020). The application of this concept is expected to be an effective strategy in organizing the slum area of Telaga Tujuh Village.

II. OVERVIEW

Slums

Regulation (Kementerian PUPR, 2016; Zulaikha, 2016) on Quality Improvement of Slum Housing and Slum Settlements, states that housing is a collection of houses as part of settlements, both urban and rural, equipped with infrastructure, facilities, and public utilities as a result of efforts to fulfill livable housing. Regulation (Kementerian PUPR, 2016) on Quality Improvement of Slum Housing and Slum

Settlements, states that the aspects and criteria of slum housing and slum settlements can be seen in the following table:

Table 1. Aspects and Criteria of Slum Housing and Slum Settlements

No	Criteria	Description
1.	Building Condition	a. Building irregularity b. Building density c. Building quality does not meet requirements
2.	Neighborhood Road Condition	a. Neighborhood road access coverage b. Neighborhood road surface quality
3.	Condition of Drinking Water Supply	a. Unavailability of access to drinking water b. Unmet drinking water needs
4.	Environmental Drainage Condition	a. Inability to drain water runoff Unavailability of drainage b. Unconnectedness to urban drainage system c. Unmaintained drainage Quality of drainage construction
5.	Wastewater Management Condition	a. Wastewater management system does not comply with technical standards b. Wastewater management infrastructure and facilities do not comply with technical requirements
6.	Waste Management Condition	a. Waste infrastructure and facilities are not in accordance with technical requirements b. Waste management systems that are not technically appropriate c. Waste management facilities and infrastructure are not maintained.
7.	Fire Protection Condition	a. Unavailability of fire protection infrastructure b. Unavailability of fire protection facilities

Sumber: (Kementerian PUPR, 2016)

Collective Housing

The strategy of structuring slum areas with the Collective Housing concept can be adjusted by decision makers based on the problems faced and the capabilities of local communities. (Ledent, 2022). In determining the selection of strategies for structuring slum areas, a comprehensive analysis must be carried out based on the characteristics of the location, the level of slums, the socio-economic characteristics of the community, as well as institutions and support from stakeholders. Structuring strategies with the Collective Housing concept include On-site Upgrading, On-site Reblocking, On-site Reconstruction, Land Sharing and Relocation (Acioly, 2021; Syafitri et al., 2022; Zain et al., 2018).

Settlement Pattern

The settlement pattern is the scope of the distribution of residential areas according to certain geographical (physical) conditions, such as settlements along the coast, rivers and roads which are usually linear in shape (Chairuman et al., 2023; Niswan et al., 2023). The pattern of settlement development is supported by the circulation pattern in the settlement which is a determining factor for further settlement development. According (Heriyanto et al., 2019; Roziqin & Kusumawati, 2017) that settlement patterns are divided into 2 parts, namely:

1. **Scattered pattern**

   Generally a farming village where people live on their own farms to get closer to work.
2. **Group pattern has several patterns.**
   a. Grid pattern, characterized by a network of streets that form a grid or square. Organized and easy to navigate, it allows for efficient distribution of space.
   b. Linear pattern: in this pattern, settlements are located along lines or roads, often following geographical features such as rivers, coasts, or highways. Settlements form long lanes, creating good connectivity between locations.
   c. Cluster pattern: settlements in this pattern are concentrated in specific groups or clusters, with open spaces or vacant land between the groups**.**
3. **Amorphous pattern**

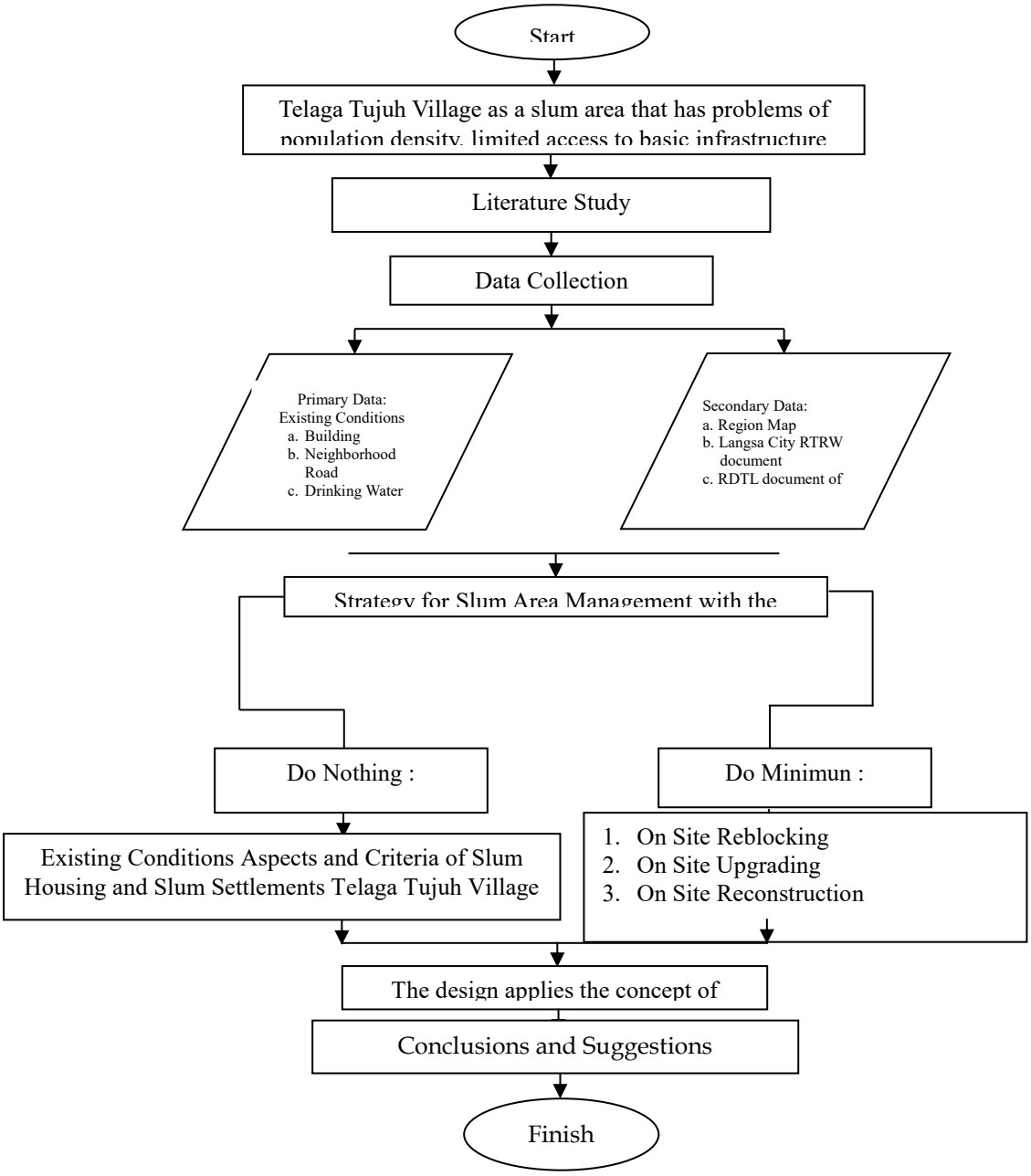
This pattern does not follow an irregular shape or structure. Settlements are scattered randomly, without a clear pattern. This pattern reflects adaptation to irregular environmental conditions and can create a natural impression.

Analitycal Hierarchy Process (AHP)

The Analytic Hierarchy Process (AHP) method was developed by Thomas Lorie Saaty of Wharton Business School in the early 1970s, which is used to rank or prioritize various alternatives in solving a problem (Darko et al., 2019; Zhao et al., 2020). Problem solving based on AHP relies on intuition as its main input, but intuition must come from decision makers who are well-informed and understand the decision problem at hand (Sun et al., 2013; Xiulin & Dawei, 2014; Zhao et al., 2020). AHP is generally used with the aim of prioritizing complex or multi-criteria. With the increasing demands related to transparency and participation, the Analytic Hierrchy Process (AHP) will be very suitable for prioritizing public policies that demand transparency and participation. (Saputra et al., 2020).With hierarchy, a complex problem can be broken down into its groups which are then organized into a form so that the problem will appear more structured and systematic (Badruddin et al., 2022; Tambunan et al., 2024)

III. METHODS

Research Flow Chart



Research Indicators

In this research, there are five indicators of the concept of collective housing, namely:

Table 2. Research Indicators

Code	Indicator
X1	On Site Upgrading
X2	On Site Reblocking
X3	On Site Reconstruction
X4	Land Sharing
X5	Relocation

Population and Sample

This research employs deliberate sampling or judgmental sampling to get data needed to answer concerns concerning the notion of community housing that is acceptable for the Telaga Tujuh Village slum arrangement scheme. Where the sample utilized is all members of the population because intentional sampling is one of the non-probability sampling approaches where the sampling procedure is based on particular factors (Sophia Smit, 1998; Wasley, 2013).

Data and Data Collection Process

The data needed in this study are the Langsa City RTRW Document, the Langsa City RDTL Document, the Population of Telaga Tujuh Village, and the Langsa City RP2KPKP Document.

Data Analysis

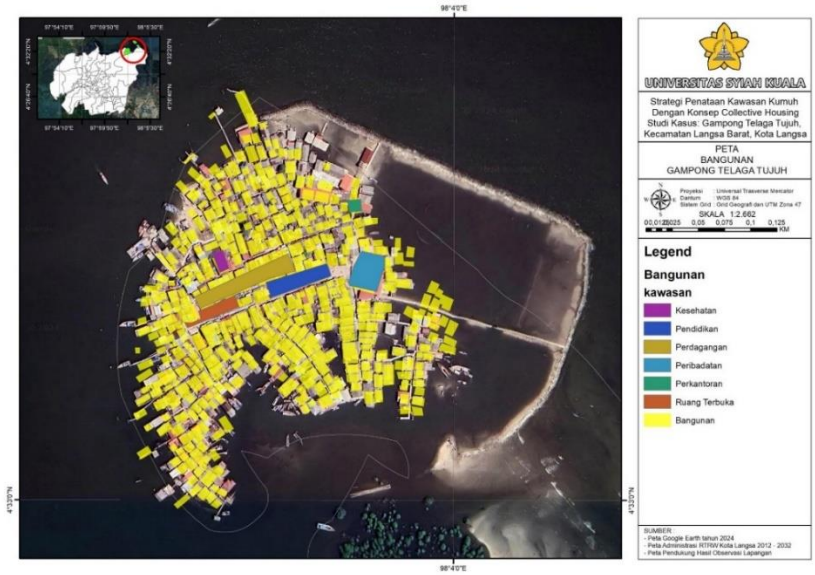
The current state of Telaga Tujuh Village will be observed directly in this study, and the ideal communal dwelling arrangement concept for the slum area of Telaga Tujuh Village will be determined by analysis utilizing the Analytical Hierarchy Process (AHP). Software like AutoCAD and SketchUp are also used for organizing design development.

IV. RESULTS AND DISCUSSION

Aspects and Criteria of Slum Housing and Slum Settlements in Telaga Tujuh Village

The slum conditions of Telaga Tujuh Village indicate serious problems in affordable housing. Houses are built from makeshift materials without strong foundations and in an irregular layout. Basic infrastructure such as clean water, sanitation and electricity is lacking, and the high residential density and irregularity of public spaces worsen the environment. Without drainage systems and disaster protection, the area is increasingly vulnerable to health and safety issues (Blake et al., 2011; Matthews & Matthews, 2022; Sohn et al., 2020).

Building Condition



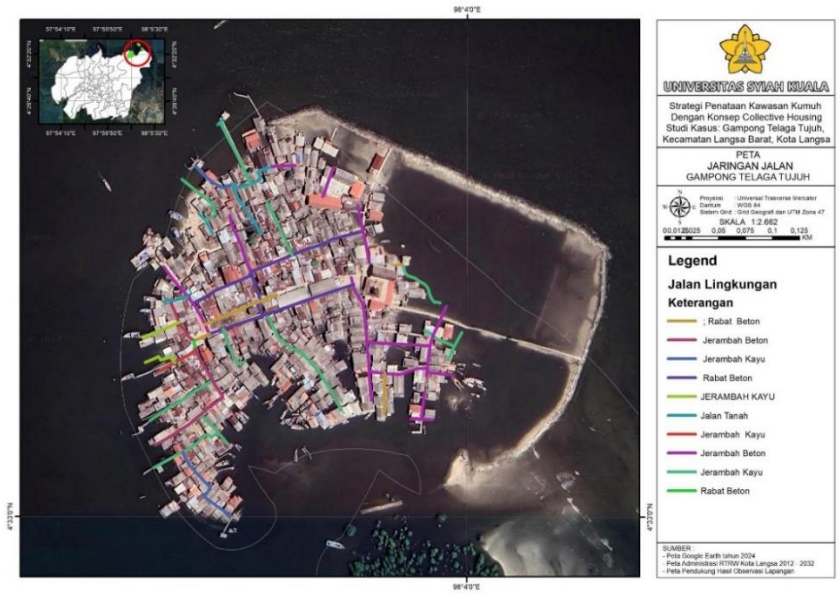
Source: Research Results

Fig 1. Building Map of Telaga Tujuh Village

The condition of buildings in the slums of Telaga Tujuh Village reflects the challenges of coastal communities with limited resources. Buildings are generally unplanned and constructed using simple materials such as wood, bamboo, or zinc. Many houses on stilts are structurally unstable, with unstable foundations.

Neighborhood Road Condition

Based on observations, practically all neighborhood roads have hardened construction; the remainder are still in place. Wooden roads and bridges connect homes to one another, but they are barely 1-2 meters wide.

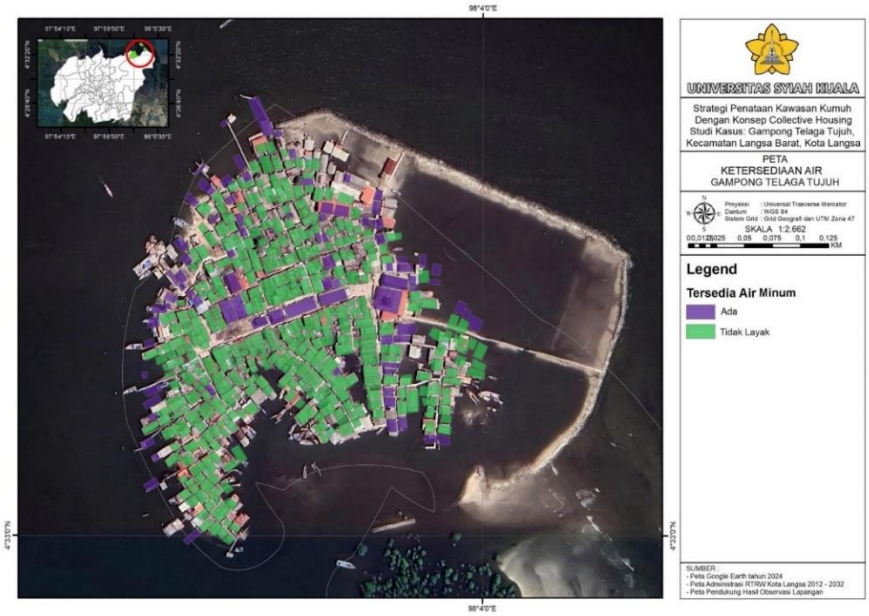


Source: Research Results

Fig 2. Neighborhood road condition

Drinking Water Condition

Telaga Tujuh Village does not have direct piped access to homes. The community obtains clean water by buying perdiregen, which is transported from the water reservoir to each house with a wheelbarrow. In addition, rainwater is collected by the community for their daily needs.

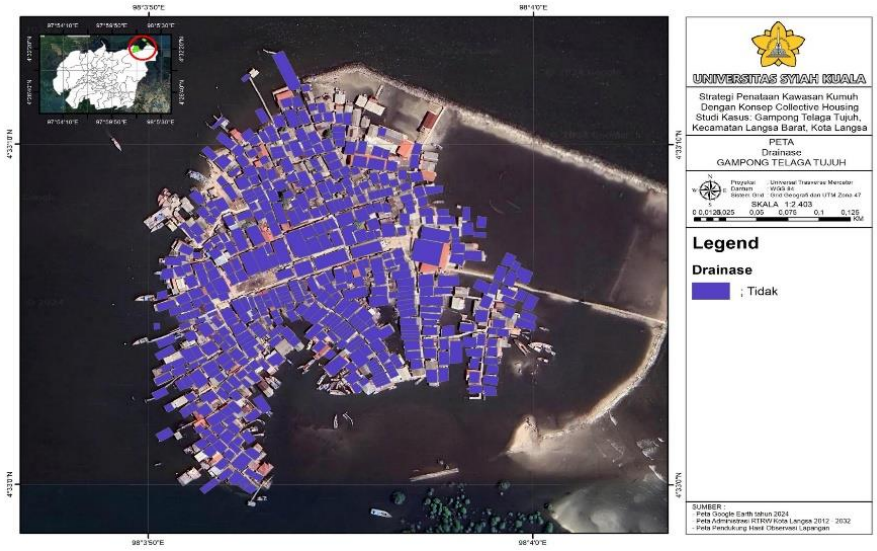


Source: Research Results

Fig 3. Drinking water availability

Environmental Drainage Condition

Direct observation in the slum area of Telaga Tujuh Village shows that the absence of an adequate drainage system is a serious problem. Houses in the area stand above the water surface with simple construction, without good water planning. Wastewater from daily activities is directly discharged into the sea, causing pollution and accumulation of garbage around the settlement.

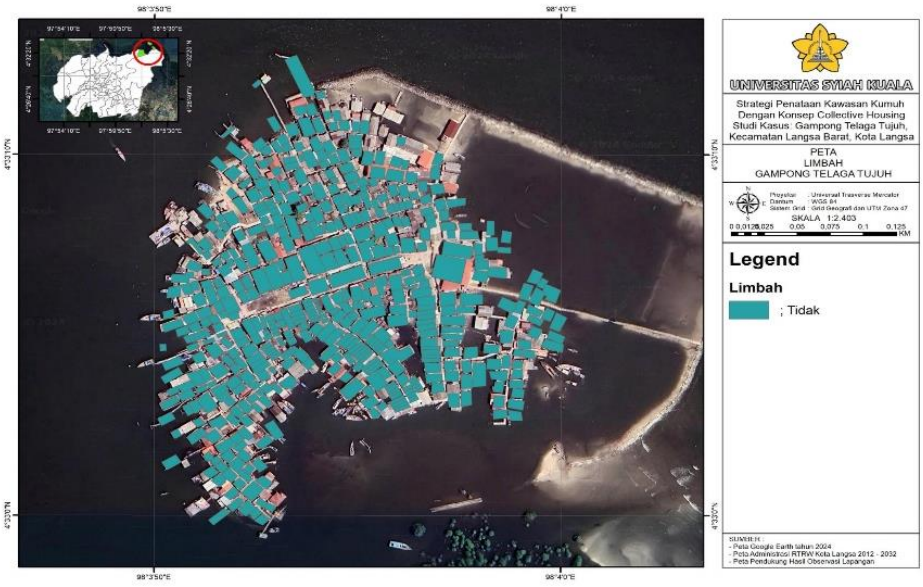


Source: Research Results

Fig 4. Environmental Drainage Condition Map

Wastewater Management Condition

Based on direct observation, the condition of waste disposal or toilets in the Gampong Telaga Tujuh community is very inappropriate. There are still many houses that do not have private toilets (90%), most people use public toilets for their daily needs.

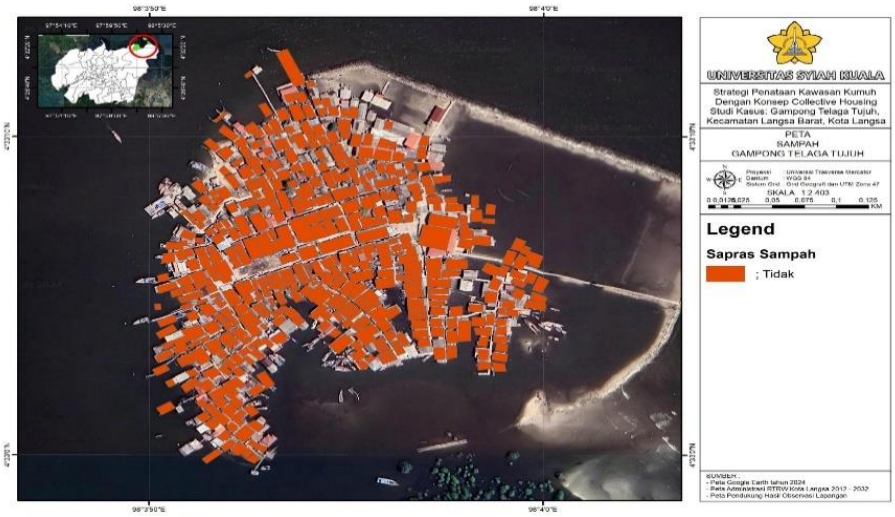


Source: Research Results

Fig 5. Wastewater Management Condition Map

Waste Management Condition

The condition of waste management in the Gampong Telaga Tujuh residential area is still very bad, some people process waste by burning, while most people still throw garbage directly into the sea.

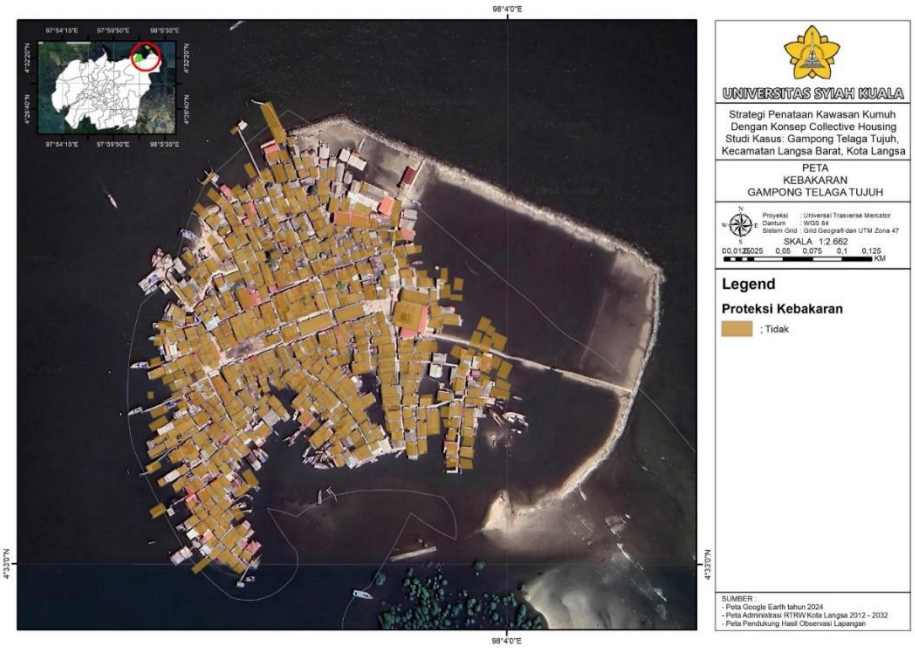


Source: Research Results

Fig 6. Wastewater Management Condition Map

Fire Protection Condition

After direct observation in the slum area of Telaga Tujuh Village, it was found that there was no adequate fire protection in the area. The densely populated houses were built with flammable materials such as wood and plywood. This condition is very concerning, considering the great potential for disaster in such a dense and less organized environment.



Source: Research Results

Fig 7. Fire Protection Condition

Telaga Tujuh Village Arrangement Strategy

The strategy for structuring Telaga Tujuh Village uses the concept of collective housing, to find one of the concept indicators that is in accordance with the characteristics of Telaga Tujuh Village, the Analytic Hierarchy Process (AHP) method is used. This method uses respondents' answers based on filling out questionnaires in determining the level of importance of the collective housing concept that is suitable for the Telaga Tujuh Village slum structuring strategy, obtained answers based on the rating scale given in the questionnaire form.

a. Pairwise Comparison Matrix

The Pairwise Comparison Matrix in AHP (Analytic Hierarchy Process) analysis is a tool for comparing elements within criteria in pairs, in order to determine the relative priority of each element. By

filling in this matrix, priority weights can be calculated through the normalisation process, helping decision-making systematically and objectively. This table organises subjective judgements into a more structured format for more in-depth analysis.

Table 3. Pairwise Comparison Matrix

	X1 =	X2	X3	X4	X5
X1 = On Site Upgrading	1.000	0.926	0.891	0.685	0.893
X2 = On Site Reblocking	0.926	1.000	1.180	0.335	1.368
X3 = On Site Reconstruction	0.891	1.180	1.000	1.651	2.164
X4 = Land Sharing	0.685	0.335	1.651	1.000	0.410
X5 = Relocation	0.893	1.368	2.164	0.410	1.000
Jumlah	**18.200**	**16.507**	**19.563**	**3.917**	**3.708**

Source: Research Results

b. Normalisation

Normalisation is performed after the pairwise comparison matrix is populated, this normalisation process allows for the calculation of priority weights that are easier to compare, which are then used in decision making to determine which elements take precedence in achieving the desired goal.

Tabel 4. Normalization

	On Site Upgrading	On Site Reblocking	On Site Reconstruction	Land Sharing	Relocation	Synthesis Weight	Priority Weight	Eigen	Consistency
X1 = On Site	0.228	0.193	0.129	0.168	0.153	0.870	0.174	0.885	5.081
Upgrading	0.211	0.208	0.171	0.082	0.234	0.907	0.181	1.012	5.579
X2 = On Site	0.203	0.245	0.145	0.405	0.371	1.369	0.274	1.365	4.987
Reblocking	0.156	0.070	0.240	0.245	0.070	0.781	0.156	0.876	5.612
X3 = On Site	0.203	0.284	0.314	0.102	0.171	1.074	0.215	1.275	6.935
Reconstruction	1.000	1.000	1.000	1.000	1.000	5.000	1.000		27.194
X4 = Land Sharing									
X5 = Relocation									
Total									

Source: Research Results

c. Calculating the Hierarchy Consistency Value

Calculating the Hierarchy Consistency Value is the process of ensuring that the judgements made in the pairwise comparison matrix are consistent and do not conflict. If the CR is smaller than 0.1, then the judgement is considered consistent; if it is larger, then revisions need to be made to the judgement in order to achieve better consistency. This process is important to improve the reliability of decisions made based on Analytic Hierarchy Process (AHP) analysis.

Table 5. Calculation of Hierarchy Consistency Value

Calculation of λmax	**Consistency Index (CI) Calculation**	**Consistency Ratio (CR) Calculation**
λmax = Average Consistency value in the normalisation table λmax = 5.439	CI = (λmax - n) / (n-1), n = 5 CI = (5.439 - 5) / (5 - 1) CI = 0.110	CR = CI/RI (RI value for n=5 is 1.12) CR = 0.110 / 1.12 CR = 0.098
CR value <0.1 means CONSISTENT.		

From the normalisation table, the Priority Weight value is obtained as follows:

Table 6. Prioritisation Score of Structuring Strategy Concepts

X3 = On Site Reconstruction	0.274
X5 = Relocation	0.215
X2 = On Site Reblocking	0.181
X1 = On Site Upgrading	0.174
X4 = Land Sharing	0.156

Table 4 shows that the concept of structuring strategies that are prioritised in the slum area of Telaga Tujuh Village, Langsa City are X3 = On Site Reconstruction and X5 = On Site Relocation.

Illustration of Slum Area Management Design of Telaga Tujuh Village

The design of the slum area arrangement in Telaga Tujuh Village that establishes the concept of On Site Reconstruction using a radial settlement pattern aims to create a more structured and efficient area, while maintaining the same geographical position for residents. This radial pattern divides the area into several zones with a main centre in the middle that serves as a focal point for social, economic, and government activities, and residential centres around it. The design maximises connectivity between areas within the village, with main roads leading from the main centre to residential areas and other public facilities.In the On-Site Reconstruction concept, a village that was previously a slum area with inadequate building and infrastructure conditions will be rebuilt in the same location, with improvements to the physical quality of buildings and infrastructure. This process involves demolishing damaged or uninhabitable buildings and replacing them with houses and facilities that are more resilient to disasters and more in line with decent housing standards. The development also includes the repair or rebuilding of basic infrastructure such as roads, drainage systems, water supply, and sanitation, all of which will be integrated with the radial pattern design.

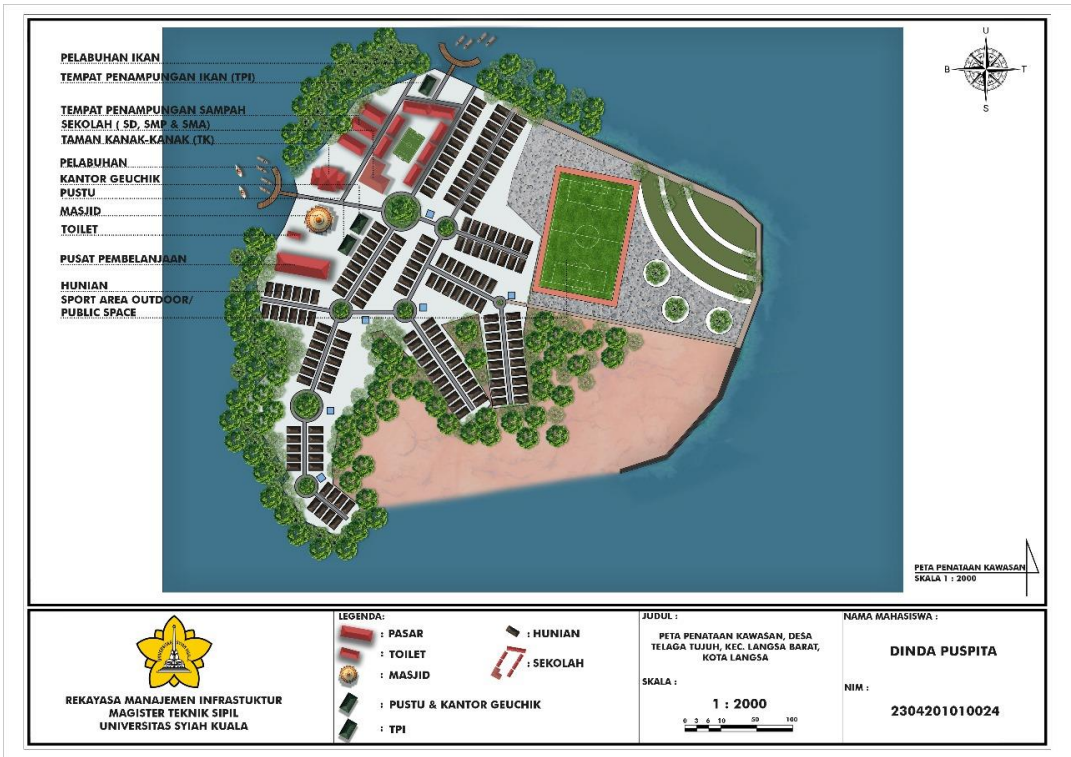


Fig 8. Design of Slum Area Management in Telaga Tujuh Village

V. CONCLUSIONS AND SUGGESTIONS

Conclusions

The results show that the most suitable collective housing concept for slum upgrading in Telaga Tujuh Village is a combination of the two selected collective housing concept priorities, namely on-site reconstruction and relocation. In this scheme, out of a total of 373 houses in the area, 155 houses are retained in their original locations. Meanwhile, for houses that cannot be maintained due to limited land and unfavourable environmental conditions, a relocation approach is applied.The arrangement design uses a Radial pattern that divides the area into two main areas. The first area is the Main Centre, which includes important facilities such as education, economic centres, places of worship, auxiliary health centres, and the village office that functions as the centre of government and community services. The second area is the Residential Centre, which is focused on building houses for the community to live in, to create a structured and sustainable settlement.

VI. ADVICE

The suggestions made based on this research are as follows:

1. Implementation of the on site Reconstruction Strategy: The government and relevant stakeholders are advised to implement the On Site Reconstruction strategy that has been designed, focusing on the construction of public facilities and basic infrastructure.
2. Basic Infrastructure Development: Improvements need to be made to basic infrastructure such as drainage systems, waste water management, fire protection and the provision of clean water to support the quality of life of the community.

REFERENCES

[1] Acioly, C. (2021). Street-led citywide slum upgrading: connecting the informal and the formal city through area-based planning and infrastructure improvement. In *Advances in 21st Century Human Settlements*. https://doi.org/10.1007/978-981-13-7307-7_2

[2] Aguswin, A. (2021). Penataan Kawasan Permukiman Kumuh Desa Sukajaya Kecamatan Cibitung Kabupaten Bekasi. ***Jurnal IKRAITH-TEKNOLOGI*** *Vol 5 No 3 November 2021*, *5*(3).

[3] Badruddin, S., Achmad, A., & Fadhly, N. (2022). Model Klasterisasi Wilayah Kota Berdasarkan Indeks Infrastruktur Untuk Perencanaan Struktur Ruang Berkelanjutan. ***Jurnal Arsip Rekayasa Sipil Dan Perencanaan***, *5*(3). https://doi.org/10.24815/jarsp.v5i3.26749

[4] Bahri, M. I., Sirojuzilam, S. S., Rujiman, R. R., & Kismawadi, E. R. (2021). The Influence of Youth in Regional Development Through the Management of Aceh's Special Autonomy Fund in Langsa City. *E-Mabis:* ***Jurnal Ekonomi Manajemen Dan Bisnis***, *22*(1). https://doi.org/10.29103/e-mabis.v22i1.650

[5] Blake, S., Walker, R., & Walker, R. (2011). Potable water issues during disaster response and recovery: Lessons learned from recent coastal disasters. *Solutions to Coastal Disasters 2011 - Proceedings of the 2011 Solutions to Coastal Disasters Conference*. https://doi.org/10.1061/41185(417)67

[6] Chairuman, M., Wihadanto, A., & Rusdiyanto, E. (2023). Perubahan penggunaan lahan Perkotaan dan fenomena urban heat island di Kota Tangerang Selatan. *ULIN:* ***Jurnal Hutan Tropis***, *7*(2). https://doi.org/10.32522/ujht.v7i2.10375

[7] Darko, A., Chan, A. P. C., Ameyaw, E. E., Owusu, E. K., Pärn, E., & Edwards, D. J. (2019). Review of application of analytic hierarchy process (AHP) in construction. ***International Journal of Construction Management***, *19*(5). https://doi.org/10.1080/15623599.2018.1452098

[8] De Araújo, R. P. Z., Moura, A. C. M., & Nogueira, T. D. A. (2018). Creating collaborative environments for the development of slum upgrading and illegal settlement regularization plans in Brazil: The maria tereza neighborhood case in belo horizonte. ***International Journal of E-Planning Research***, *7*(4). https://doi.org/10.4018/IJEPR.2018100102

[9] Dinda Puspitaa, Ellida Novita Lidya, Firdasari, & M Irvanni bahri. (2022). Analysis Of Successful Factors In The Halal Tourism Facilities Development Project. *IHTIYATH :* ***Jurnal Manajemen Keuangan Syariah***, *6*(2). https://doi.org/10.32505/ihtiyath.v6i2.5187

[10] Gradinaru, T., Codreanu, M., & Cozma, L. (2013). Semi-collective housing, optimal development forms of an ecological Urban habitat. *International Multidisciplinary Scientific GeoConference Surveying Geology and Mining Ecology Management, SGEM*. https://doi.org/10.5593/SGEM2013/BF6/S27.026

[11] Gusmal, G., & Irianto, A. (2022). Integration Strategy of Green City Development With the Indragiri Rokan River Flow Area in the Capital Area of Solok Regency "Arosuka." ***Journal Research of Social, Science, Economics, and Management***, *1*(7). https://doi.org/10.36418/jrssem.v1i7.68

[12] Heriyanto, D. W., Pratiwi, N. N., & H., F. R. (2019). Pengaruh Unsur-Unsur Budaya Terhadap Pola Permukiman Di Kota Singkawang. *JeLAST*, *6*(2).

[13] Harahap, Arman ,2018, Macrozoobenthos diversity as bioindicator of water quality in the Bilah river, Rantauprapat, Medan. J. Phys.: Conf. Ser. 1116 052026.

[14] A. Harahap, P. Hrp, N.K.A.R. Dewi, Macrozoobenthos diversity as anbioindicator of the water quality in the River Kualuh Labuhanbatu Utara, International Journal of Scientific & Technology Research, 9(4), 2020, pp. 179-183.

[15] Harahap, et, all, Macrozoobenthos diversity as anbioindicator of the water quality in the Sungai Kualuh Labuhanbatu Utara, AACL Bioflux, 2022, Vol 15, Issue 6.

[16] Harahap, A. 2020. Species Composition & Ecology Index Of The Family Gobiidae At The Mangrove Belawan Of Sicanang Island International Journal of Scientific & Technology Research Volume 9, Issue 04, April 2020.

[17] Harahap, A., et all (2021), Monitoring Of Macroinvertebrates Along Streams Of Bilah River International Journal of Conservation Sciencethis link is disabled, 12(1), pp. 247–258.

[18] Kementerian PUPR. (2016). Lampiran Iii Peraturan Menteri Pekerjaan Umum Dan Perumahan Rakyat Nomor 02/PRT/M/2016 Tentang Peningkatan Kualitas Terhadap Perumahan Kumuh Dan Permukiman Kumuh. In *Revista Brasileira de Ergonomia*.

[19] Ledent, G. (2022). Size matters. How does the number of dwellings affect housing co-production? ***Journal of Housing and the Built Environment***, *37*(2). https://doi.org/10.1007/s10901-021-09863-8

[20] Matthews, E. C., & Matthews, J. C. (2022). Impacts of emergencies on water and wastewater systems in congested urban areas. *Waterlines*, *41*(1). https://doi.org/10.3362/1756-3488.13-007OA

[21] Muryanto, F., Sukristyanto, A., & Juliswara, V. (2022). Examining The Policy Narrative and The Role of the Media in the Policy Response to the Covid-19 Crisis in Indonesia. International Journal of Science, Technology & Management, 3(5), 1295-1306. https://doi.org/10.46729/ijstm.v3i5.599

[22] Niswan, N., Oktaviani, C. Z., & Achmad, A. (2023). Perubahan Temporal Pola Permukiman Transmigrasi Tahun 1982-2020 Kecamatan Jagong Jeget Kabupaten Aceh Tengah. ***Jurnal Arsip Rekayasa Sipil Dan Perencanaan***, *6*(3). https://doi.org/10.24815/jarsp.v6i3.27816

[23] Pexas, G., Mackenzie, S. G., Wallace, M., & Kyriazakis, I. (2020). Environmental impacts of housing conditions and manure management in European pig production systems through a life cycle perspective: A case study in Denmark. ***Journal of Cleaner Production***, *253*. https://doi.org/10.1016/j.jclepro.2020.120005

[24] Roziqin, A., & Kusumawati, I. (2017). Analisis Pola Permukiman Menggunakan Data Penginderaan Jauh di Pulau Batam. *IRONS: 8th Industrial Research Workshop and National Seminar Politeknik Negeri Bandung*.

[25] Saputra, N. A., Perwira, A., Tarigan, M., & Nusa, A. B. (2020). Penggunaan Metode AHP dan GIS Untuk Zonasi Daerah Rawan Banjir Rob di Wilayah Medan Utara. In *Media Komunikasi Teknik Sipil* (Vol. 26, Issue 1).

[26] Sohn, W., Brody, S. D., Kim, J. H., & Li, M. H. (2020). How effective are drainage systems in mitigating flood losses? *Cities*, *107*. https://doi.org/10.1016/j.cities.2020.102917

[27] Solehati, D., Irwansyah, M., & Caisarina, I. (2017). Identifikasi Karakteristik Permukiman Kumuh Gampong Telaga Tujuh, Kota Langsa, Aceh. ***Jurnal Teknik Sipil Universitas Syiah Kuala***, *2*(7).

[28] Sophia Smit, H. (1998). *Self-Actualization And Acculturation Amongst Black Personnel Practitioners By Master Of Commerce in the subject*.

[29] Sun, Z. H., Pan, L., Wang, Y. Y., & Zhang, D. H. (2013). The purchase house choice research based on the Analytic Hierarchy Process (AHP). *19th International Conference on Industrial Engineering and Engineering Management: Assistive Technology of Industrial Engineering*. https://doi.org/10.1007/978-3-642-38391-5_95

[30] Syafitri, R. A. W. D., Sukri, M. F., & Hakim, D. N. (2022). Typology of Manggarai slum area: The strategy of resilient city to fencing pandemic. *IOP Conference Series: Earth and Environmental Science*, *1015*(1). https://doi.org/10.1088/1755-1315/1015/1/012013

[31] Tambunan, A. A., Purwoko, A., Rambe, W., & Bahri, M. I. (2024). *Strategi Pemberdayaan Masyarakat Melalui Pengembangan Desa Wisata Kampoeng Lama* (Vol. 08, Issue 01).

[32] Wasley, K. (2013). *Pre-disaster Recovery Planning: Lessons from Japan*.

[33] Xiulin, S., & Dawei, L. (2014). An improvement analytic hierarchy process and its application in teacher evaluation. *Proceedings - 2014 5th International Conference on Intelligent Systems Design and Engineering Applications, ISDEA 2014*. https://doi.org/10.1109/ISDEA.2014.45

[34] Zain, D. P., Salman, D., & Baja, S. (2018). Model of slum area management based on socio-spatial approach. The case of Baubau City, Indonesia. ***Journal of Settlements and Spatial Planning***, *9*(2). https://doi.org/10.24193/JSSP.2018.2.03

[35] Zhao, K., Dai, Y., Ji, Y., & Sun, J. (2020). Analytic Hierarchy Process (AHP) in Portfolio Selection Based on Information Granularity. *Proceedings of the 32nd Chinese Control and Decision Conference, CCDC 2020*. https://doi.org/10.1109/CCDC49329.2020.9164421

[36] Zulaikha, S. (2016). Peraturan Menteri Pekerjaan Umum Dan Perumahan Rakyat Republik Indonesia Nomor 02/Prt/M/2016 Tentang Peningkatan Kualitas Terhadap Perumahan Kumuh Dan Permukiman Kumuh. *Revista Brasileira de Ergonomia*, *9*(2).