

Influence of Livelihoods on Coastal Settlement Patterns in Kampung Padang in Indonesia

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Abstract

Livelihood is important for a person to carry on with one's life. In fact, Livelihoods determine the location and shape of the settlement patterns. In the formation of settlement patterns in Kampung Padang, Selayar Islands district, cannot be separated from the influence of population growth and activities from year to year. This has come about because the population of the local community is increasing. It thus affects the settlement patterns both in terms of facilities and infrastructure, and social aspects: economy and (livelihoods) in the residential area itself. In fact, some residents are now starting to have other livelihoods besides fishing. These can provide added values to the economy in supporting their daily needs.

This paper examines the characteristics of the Kampung Padang settlement pattern and how people's livelihoods affect the settlement pattern. It uses both qualitative and quantitative methods. Data was collected through direct observation, interviews, and questionnaires.

The findings show that the shape of the settlement pattern is clustered. Moreover, it shows a relationship or correlation between the livelihoods and the settlement patterns.

Keywords: Coastal, Livelihoods, Settlement patterns, Kampung Padang, Selayar

Introduction

Settlements are housing with all contents and activities in it. Housing is a physical container, while settlements are a combination of containers and their contents, namely people who live in a society with cultural and environmental elements (Syarifuddin, 2005). At the same time, the pattern of settlements gives an impression of the distribution and density of the population. Therefore, settlements can be interpreted as a place (space) or an area where residents gather and live together using the local environment to maintain, and develop their lives (Oktaviani, 2018). Furthermore Kuswanto (1997) says that Settlements are a form of life order which contains physical elements in the sense that settlements are a place for activities where communities meet to interact with people socially. According to Wardiyatmoko (2006), several factors influence the pattern of distribution of settlements in cities and villages, including soil conditions, water systems, topography, and the availability of natural resources in certain villages.

Selayar Islands Regency is one of the 24 regencies/cities in South Sulawesi Province, located at the southern tip and extends from the North to the South. It is one of the regencies that rely on the maritime sector as a source of regional income. It is influenced by

geographical conditions, consisting of a group of islands surrounded by water. One area that relies on the potential of this sector is Kampung Padang.

Kampung Padang is one of the areas located on the coast of Bontoharu District, Selayar Islands, which was originally a settlement that developed into a village. Along with the growth of the population living in the Padang village, the fulfillment of the need for a place to live is increasing in such a way that the occupancy continues to increase and fills the village's residential area.

The formation of a settlement pattern in Kampung Padang, Selayar Islands district, cannot be separated from the influence of population growth and activity from year to year. This has come into being because the local population is starting to become denser. Indeed, it affects the settlement patterns both in terms of facilities and infrastructure, and socio-economic aspects in a residential area itself. Along with the development of time, people's lifestyles and needs are starting to develop, from the socio-economic aspects to education. Judging from the livelihood aspect of the people of Padang, some residents are now starting to have other livelihoods besides fishing. These new livelihoods can provide added values to the economy in supporting their daily needs.

In general, this settlement is inhabited mostly by people who work as fishermen who have access to and close ties with the water area as a place for them to seek a source of livelihood. However, with the times, and also with the influence of the interaction of the urban environment of Selayar, people of Kampung Padang have begun to acquire new livelihood systems, such as being traders, fishermen, civil servants, and laborers. These new livelihoods have certainly greatly influenced the settlement pattern in Kampung Padang. It is in line with the statement that a community settlement can be formed due to professional, economic, rights and obligations groupings that are community products formed naturally and differ from one another (Aliya, 2004). Moreover, Tunner (1972) argues that by choosing an appropriate environment, people can live well to meet their needs.

According to the opinions of several experts, one of the factors that shape the pattern of population settlements is the livelihood sector of the population. Livelihood is one of the human activities in obtaining a decent standard of living which varies from place to place according to the level of ability of the population and demographic conditions (Daldjoeni, 1987). The tendency of residents to choose residential areas that support their livelihoods results in the concentration and distribution of settlements in an area in such a way that most settlements often arise near rivers, beaches, agricultural areas, public facilities, and industrial areas.

In this context, this research examines the characteristics of the Kampung Padang settlement pattern and how the residents' livelihoods affect the settlement pattern. Its aim is to understand the relationship between settlement patterns and livelihoods.

Its objectives are as follows.

1. To identify the characteristics and forms of settlement patterns that have emerged in Kampung Padang
2. To establish the extent to which livelihoods influence the settlement patterns.

Theoretical Framework

A settlement refers to a group of dwellings in which its residents formally and informally agree with each other to form a community (Sangalang & Adji, 2014). In another sense, a settlement is a place (space) or an area where residents gather and live together using the local environment to maintain and develop their lives (Oktaviani, 2018).

The formation of a settlement pattern is influenced by several elements. According to Constantinos A. Doxiadis (1968), the five essential elements of settlement are Nature, Man, Society, Shells, and Networks.

Furthermore Syarif (2016) explains that road patterns, building shapes, and land use influence the shape and development of cities. The characteristics of the road network are boundary zones, and the shape of buildings is the history and characteristic of an area. In contrast, the layout of buildings and public facilities is the characteristic of land use. Yasmira, (2019), in looking at development patterns, says that they can be seen based on human factors, human activity factors, and movement patterns. Furthermore, according to Rapoport (1996), the formation of an environment can be studied based on two factors: the primary socio-cultural factors, that include beliefs, family structure, social organization, and livelihoods, and secondary modifying factors, that include climatic conditions, construction methods, materials, and technology.

Syarif, (2016) points out that settlement patterns and settlement layouts can be divided into three forms as follows.

1. Clustered patterns: These patterns grow unplanned and uncontrolled;
2. Spread patterns or Scattered patterns: They follow central growth. Activities
3. Elongated patterns: These patterns are on the water's edge so that settlements grow, tend to follow the banks of rivers, beaches, and lakes.

According to Bintarto (1983), determining or finding settlement patterns can be measured using the 'Nearest Neighbor Analysis,' or NNA, which will produce values that show settlement patterns based on categories. These patterns are divided into three parts: a clustered pattern with a value range of $T= 0-0.7$, a random pattern with a value range of $T= 0.8-1.4$, and a uniform pattern with a value range of $T= 1.5-2.15$.

As Triana, (2021) demonstrates, the definition of a settlement pattern has a very close relationship with the nature of settlement distribution, where settlement distribution talks about whether or not there are settlements in an area. In contrast, a settlement pattern is the nature of distribution, usually more related to economic, historical, and cultural factors.

In general, livelihoods are human activities that help people obtain and improve a decent standard of living, which varies from one region to another according to the capabilities of the population and demographic conditions (Daldjoeni, 1987). In other definitions, livelihoods can be divided into two: primary and side. Basic livelihoods are all activities that utilize existing resources daily and are the main activity carried out in fulfilling the daily needs. On the contrary, side livelihoods are outside the main activities carried out to earn a living (Susanto and Astrid, 1993).

However, forming a settlement pattern cannot be separated from the influence of the location of the livelihood itself. A settlement can be understood as an area used as a place to live by a group of people. This place is often used to work and earn a living to meet one's living needs. According to Mardanas (1985), realization of settlement patterns in villages is closely related to the places of livelihood work of the residents. In Indonesia, they are known as pakajja villages (fishermen's villages) and palloan villages (farmers' villages). The best villages were always close to each other, with one's place of work or livelihood being close to the place of living.

Bertrand (1972) says that the pattern of residential distribution can be linked to the location of the people's livelihood. It can be divided into three parts.

1. Nucleate Agricultural Village Communities: This pattern can be seen in the residents' houses which are located clustered in specific locations,
2. Line Village Communities: This pattern is in the form of a row extending from either side of the road or river so that the residents arrange their residences following the path of the road or river which is a cross-section of the watershed and forms a row of housing and an open country.
3. Trade Center communities: This settlement pattern is spread out, and is formed because the existence of a crossing route as a connecting route is usually good for trading purposes and therefore businesses can be developed.

Review of Literature

Several studies related to organizational patterns exist. According to them, each organization has different characteristics, especially the form and character it produces. In this connection, Idawarni (2013) examining the relationship between work and the organizational pattern of Aeng Batu fishermen, illustrates that work is a significant factor in determining the organization's location and design. Paddiyatu and Pradoto (2015) looking at the socio-economic characteristics of the community regarding organizational patterns show that there is a form of linear organizational pattern in river and land orientation. Features are socio-economic and environmental. Only ethnic and topographic factors show a clustered pattern; the function of trading spaces dominates the building typology. This reflects the socio-economic situation of the community, which is more focused on the reasons for living: in other words, being close to the place of work.

Point (2021) examines the influence of socio-cultural characteristics, and discusses the socio-cultural aspects consisted of language systems, living equipment, technology systems, economic systems, livelihoods, social organizations, science, arts and beliefs. They all have a significant influence on the formation of a settlement pattern. The data has found that social characteristics vital in forming settlement patterns are the economic systems and livelihoods, social organization and the beliefs. In fact, a pattern formed is a combined settlement pattern, namely a clustered pattern and an elongated pattern. Londar (2016) offers a correlation of community livelihood patterns with land use patterns in Sifnane village, West Southeast Maluku Regency. He points out that, the unidirectional relationship between livelihoods and land use patterns is very high, and that there are changes in the livelihood patterns and land use patterns which impact land narrowing due to regional developments.

The studies of settlement patterns provide an overview by identifying residential blocks to form a particular pattern. In this connection, Suwarlan (2020) provides an overview related to the creation of two settlement patterns, namely the elongated pattern and the cluster pattern with connected residences form free spaces. Aldi, Trisnandari, and Ikaputra (2019) have looked at the characteristics and patterns of villages and have found that the formation of a settlement pattern cannot only be seen from the spatial side but also from the social side, such as culture, the main livelihood and livelihood of the residents, the role of the family and social values. Thus, they form a spatial component with the need for a place to live.

At the same time, Suryaningsi (2016) has studied fishermen's settlement patterns by observing that those occupied by who earn a living as fishermen have the character of a grid-shaped design that intersects and meets at a certain point. However, on the other hand, the house models that are formed are grouped for the reason that it makes it easier for them to carry out their activities as fishermen. Sarman and Wijaya (2018) have also studied the coastal settlement patterns of Talaga 1 and 2 villages. They have found that the average settlement pattern formed was linear or elongated. This happens because people prefer to build coastal areas by ignoring the dangers of residential developments on the coast. Thus, the sites tends not to be well-integrated.

Moreover, Wiraprama (2014) has studied the settlement pattern of Ngibikan Yogyakarta hamlet community behaviour and has found an irregular way; this is closely related to the theory of linear settlement patterns. The formation of this pattern cannot be separated from the presence of residents who are closer to the places where they work. Purwantiasning (2018) says that the common thread in forming settlements and residential patterns in Balinese villages can be linked to social, economic and cultural aspects. Zuraida (2015) adds to this and says that there is an influence of livelihoods on the spatial patterns of villages and settlements. He says that the use of spatial patterns may change due to differences in livelihoods. This implies that livelihood factors are critical in influencing these patterns.

As a result, the use of spaces in houses differentiate the way people use spaces. In this connection, Taherong (2023) examines the forms of adaptation of the Bajo Tribe Community to Settlement Space Patterns. He describes the transformations of settlement space patterns due to differences in living habits at the sea and on the land from both the social and economic aspects.

This review of the literature reveals several similarities in the influence of livelihoods as one of the factors forming settlement patterns. However, on the other hand, they cannot be seen from just one aspect. Indeed, it must be viewed from various angles so that the differences in settlement patterns can be well understood. From the research findings above, it is clear that the relationship between work tends to form clustered, grid and elongated residential patterns due to the comfort in occupying space in close proximity to the locations from where people's daily livelihoods can be generated.

Research Methods

Research Sites

This research was conducted in Kampung Padang, Selayar Islands Regency, South Sulawesi province.



Fig. 1: The location of the Selayar Regency research location

Source: Author, 2023

Kampung Padang is a settlement in South Sulawesi Province, which is part of the Selayar Islands Regency. The position of the village is shown in the image above. The hamlet of Benteng City, which is comprised of multiple sub-districts, is an integral element of the capital city of Selayar Regency. This hamlet is located in the Bontoharu subdistrict, exactly at the southernmost point of Benteng city. Its borders are as follows: to the north, they are Kahu-kahu Island; to the east, they are the Selayar Strait; to the south, they are the Selayar Strait; and to the west, they are the Haji Aroepala airport.

Data Collection Technique

Data collection was carried out in several ways: through direct observations, interviews, and questionnaires. Sampling was carried out using the simple random sampling

method (Sugiono, 2012). The standard percentage allowance used to avoid sampling errors is 10%. The research sample calculation is: $298/1+298(0,1)^2 = 75$ respondent.

The data obtained at the data collection stage is then arranged and grouped, where the data obtained is in the form of test data and drawings in the form of sketches. Analysis of the data presentation can be described as follows.

1. Presentation in the form of sketches of residential areas when the data was obtained through observation. This sketch data is presented as an image showing the studied area.
2. Describing the data in narrative form, which includes data regarding the formation of settlement patterns in terms of settlement conditions. This data is later arranged based on categories. They are obtained from interviews with informants who could provide an overview of the area.
3. Data in the form of area maps obtained from Google Earth and related agencies.

Methods and Data Analysis

This research was conducted using a combination of qualitative and quantitative methods. Qualitative methods are used to describe the characteristics of settlements, and to find out settlement patterns that are formed. A calculation method is employed, namely 'Nearest Neighbor analysis.' This analysis produces values that indicate settlement patterns based on their categories. Furthermore, people's livelihoods are determined by calculating statistical data that has been collected in the field. Quantitative methods use descriptive statistics, and the presentation of the data uses graphs and tables. In addition, descriptive techniques can also be used to determine the strength of the relationship through correlation analysis. The correlation analysis used the SPSS (Statistical Package for Social Sciences) application, which can determine the level of closeness of the relationship.

Findings and Discussion

The physical condition of the area

The location of Kampung Padang is administratively located in the coastal area of the Selayar Islands Regency. It is divided into 3 (three) neighborhoods: North Padang, Central Padang and South Padang. The entire area of Kampung Padang is 9.7 Ha, with a population of 1371 people with a need for housing of ± 298 houses. Concerning Kampung Padang's geography, some houses are above the water and on flat land.

Characteristics of the residents of Kampung Padang (Community)

a) Community behavior system

The habits of the people of Kampung Padang also influence settlement patterns, where in their daily activities, the habit of gathering with family and neighbors is seen in just interacting with one another.

In their daily life, they see the habit of gathering; they use the space under the house by making platform-shaped seating from bamboo or planks, which in the Selayar language is called (Bale-bale). This Bale-bale is similar to a bench used as a bench a place for several people to sit. Usually, people use it as a gathering place with family and neighbors to interact with each other. They don't infrequently use the road to hold weddings, celebrations, or parties and as a place to dry fish.

The livelihood of the residents of Kampung Padang is generally fishing, while the rest are traveling traders, civil servants, mechanics, and laborers. The people of Kampung Padang typically have a high level of cooperation and like to gather, and usually, decision-making is still done through deliberation. As for the cultural customs carried out today, some people still carry out the tradition of pilgrimage to the Anchor and Old Meriam museums; this is still considered sacred and is done to avoid danger in the future. Usually, people make this

pilgrimage when they want to build a house, at a wedding party, or other event. Other events to show gratitude for what he has achieved.

b) Kinship system

Residents in Kampung Padang are generally natives of Selayar Regency and have lived for generations. The kinship system that still applies is bilateral (parental) kinship. Therefore, kinship can be traced through two channels, namely birth and marriage.

Characteristics of Kampung Padang settlements

Kampung Padang is generally divided into three neighborhoods: North Padang, Central Padang and South Padang. Each neighborhood has one citizens Association and one neighborhood Association. Generally, people build houses in groups. The residents' houses are located between neighborhood roads and footpaths, and some are located irregularly. The following will describe settlements based on their division

a) North Padang Group of Houses



Fig. 2: Layout of the northern Padang group of houses
Source: Author analysis (2023)

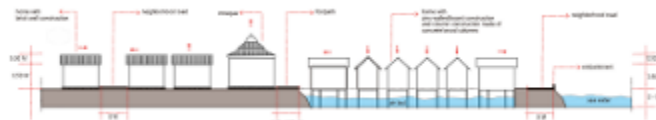


Fig. 3: A sectional view of the North Padang group of houses.
Source: Author, 2023

Table 1: Orientation

Source: Author

No	Orientation	Number of Houses	%
1	North	22	14.67
2	East	43	28.67
3	South	22	14.67
4	West	63	42.00
5	Total	150	100

This group of houses is on the North side and is limited by the middle Padang house group. This group of houses has one citizens Association and one neighborhood Association. The area is 419000 m² (4.19 ha). The shapes of the buildings generally consist of stilt houses standing above the water and on land with wall construction in corrugated iron or boards and wooden columns or concrete columns. However, several houses are also made of brick walls (permanent houses). Most of the houses have a main function, namely as a residence, and only a few have a dual function, namely as a residence and a kiosk. The community in this

house group is still very close to family ties. Judging from the structural pattern of the building layout, it is opposite, back-to-back and layered with the dominant house orientation facing the West. When viewed from the existing road structure, the main road and footpaths that stretch North and East are some of the factors that influence the orientation of the building because homeowners will look for the easiest access to reach the house from the nearest road.

b) Central Padang Group of Houses



Fig. 4: Layout of the central Padang group of houses
Source: Author, 2023

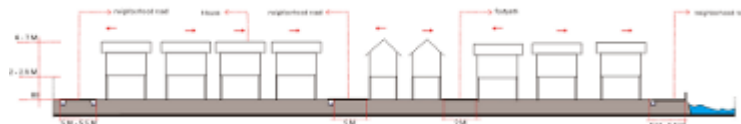


Fig. 5: Section & orientation of the central Padang group of houses
Source: Author, 2023

Table 2: Orientation

Source: Author

No	Orientation	Number of Houses	%
1	North	6	7.89
2	East	34	44.74
3	South	6	7.89
4	West	30	39.47
5	Total	76	100

This group of houses is in the middle of the area bounded by the North Padang and the South Padang house groups. The area is 28500 m² (2.85 ha). The buildings in this area are stilt, and only a few are permanent houses. The community is homogeneous and still very close to family ties. Most of the livelihoods are being fishermen. Access is through a road in the form of an asphalt road with a width of 5 meters and concrete footpaths with a width of 2 meters. In addition, this group of houses can be reached via water transportation. Access from house to house is through 2 meters wide footpaths. The buildings are dominated by stilt houses with a structure facing each other, back-to-back and sideways, with the dominant house orientation facing East. Composition of the buildings is irregular (spreading) and is bounded by roads and footpaths.

c) South Padang Group of Houses



Fig 6. Layout of the South Padang group of houses
Source: Author, 2023

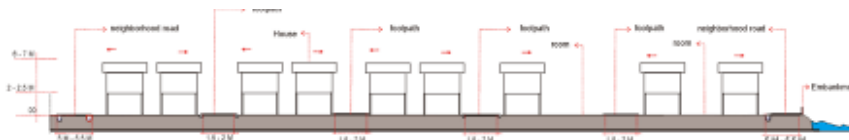


Fig 7. View of the section & orientation of the South Padang group of houses
Source: Author, 2023

Table 3: Orientation
Source: Author

No	Orientation	Number of Houses	%
1	North	7	9.72
2	East	24	33.33
3	South	6	8.33
4	West	35	48.61
5	Total	72	100

This group of houses is located in the South and borders Padang Tengah. The area is 2.7500 m² (2.75 ha). Previously this area was still included in the Central Padang zone. However, after experiencing developments, the government expanded by dividing the residential zones between North Padang, Central Padang and South Padang. The community is homogeneous and still is very close to family ties. The most common source of livelihood in this group is being fishermen. The houses can be accessed through the environmental roads of the North and Central Padang group of houses.

Meanwhile, the achievement from house to house can be through footpaths with a width that varies between 1.2 and 2 meters, as seen in the sketch. The buildings are stilt houses, built on land, although some are built on the water with wood or concrete column constructions. The structural pattern of the building layout is partly facing, backing, and sideways with the dominant house orientation facing west.

Residential Characteristic Analysis

From the field data obtained, the conditions of the settlements in Kampung Padang, can be grouped into two types of dwellings: dwellings on land and dwellings above the water.

a) Occupation on Land / above ground



Fig. 8: A dwelling on land
Source: Author, 2023

Based on the observations in the field, it is noted that the buildings formed in the land area are buildings directly related to the land. People find out that buildings with the type of stilt houses with building construction in the form of local foundations/pedestals, columns made of selected wood that support the construction of the house and walls. Above, it is made of boards with a roof in the form of zinc. Part of the house is on stilts, and the lower part is used as an additional room or as a place of business, such as a shop. Usually, the walls are made of bricks or boards. This additional space occurs due to the increasing number of residents or family members who occupy the house.

b) Dwelling on Water

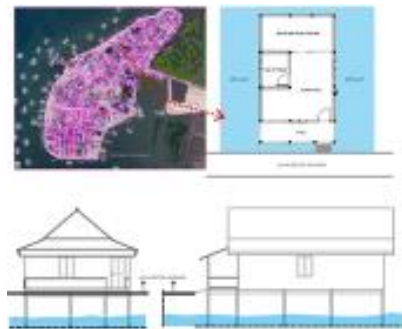


Fig. 9: A dwelling on water
Source: Author, 2023

Residential conditions in the area above the water are almost the same as those of buildings on land; the difference is only in the use of the column construction of the house where people build houses on water using wooden columns or concrete columns planted in the water. People who use wooden columns are made of selected wood because of the type of designation that is above the water. For the walls, zinc or boards are used.

In general, buildings that are above the water or on land have a building area ranging from 36-60 m² with several occupants between 4-5 people with a building distance of 1-2 m with a building height that varies quite a lot. These range from 2-4 m. The existing building layout generally has an orientation towards the road with a confluence of circulation paths. These circulation paths make it easier for the community to carry out their daily activities

Characteristics of the Settlement Pattern

A settlement pattern analysis in Kampung Padang was conducted using the 'Nearest Neighbor Analysis' approach to determine the formed settlement pattern. According to Bintarto (1983) in determining settlement patterns, several things need attention, namely determining area boundaries, determining settlement blocks then turning them into points, measuring the distance between the nearest neighbor points, and calculating the parameter value of T where T is with the formula:

$$T = j_u / j_h$$

Information:

T = distribution index of nearest neighbors

j_u = Average distance measured between one point and the nearest neighboring point

j_h = the number obtained from the number of points divided by the area.

$$j_h = 1/2\sqrt{P}$$

P = point density

$$P = A/N$$

A = area

N = number of dots

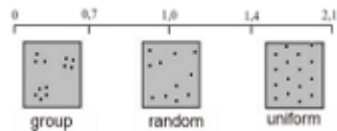


Fig. 9: Assessment criteria for settlement patterns

Source: Bintarto, 1983

a) North Padang Settlement Pattern



Fig. 10; Distribution of the dwellings for the North Padang group of houses

Source: Author, 2023

Table 4: Distance measurement data between North Padang houses

Source: Author

Home group	Measuring point	Measuring distance (m)	Measuring point	Measuring distance (m)
	1-2	2	71-72	1.2
	3-4	1.2	73-74	1.3
	5-6	1.3	75-76	1.2
	7-8	1.2	77-78	1.5
	9-10	1.4	79-80	1.3
	11-12	2	81-82	1.2
	13-14	2	83-84	1.2
	15-16	1.2	85-86	1.2

North Padang	17-18	1.3	87-88	1.3
	19-20	2	89-90	2
	21-22	1.2	91-92	1.1
	23-24	1.3	93-94	1.2
	25-26	1.3	95-96	1.2
	27-28	2	97-98	1.3
	29-30	4	99-100	2
	31-32	1.2	101-102	1.3
	33-34	2	103-104	2
	35-36	1.3	105-106	2
	37-38	1.3	107-108	1.2
	39-40	1.2	109-120	1.2
	41-42	1.2	121-122	2
	43-44	3	123-124	2
	45-46	1.2	125-126	1.2
	47-48	2	127-128	3
	49-50	2	129-230	2
	51-52	1.3	131-132	2
	53-54	1.3	133-134	4
	55-56	1.3	135-136	3
	57-58	2	137-138	3
	59-60	2	139-140	1.2
	61-62	1.2	141-142	2.2
	63-64	1.2	143-144	4
	65-66	1.2	145-146	2
	67-68	1.2	147-148	3
69-70	1.3	149-150	3	
	Number of measuring distances	123.3	Average measurement	1.7

Calculations were carried out using the data from measuring the distance between houses above to determine the North Padang settlement pattern, presented in table form below.

Table 5: Measurement results of the Northern Plains
Source: Author

No	Information	Results
1	North Plains Area	41900 m ²
2	Number of dots	150
3	The total distance to the house	123.3 m
4	Ju = (average distance)	1.7m
5	Jh = (number obtained from the number of points/area). $Jh = 1/2\sqrt{P}$	$1/2\sqrt{279.3}=8.62$ m
6	P = (area/number of points)	41900/150 = 279.3 m ²
7	T = average distance (Ju) / number obtained from the number of points divided by the area (Jh). $T = ju/jh$	$T=1.7/ 8.62=0.19.7$

Based on the results of the calculation of the value (T) above, it can be seen that the index of distribution of houses in North Padang is 0.197. Thus, it can be concluded that the settlement patterns in the North Padang house group belong to the clustered settlement pattern where the T value ranges from 0-0.7.

b) Central Padang Settlement Pattern

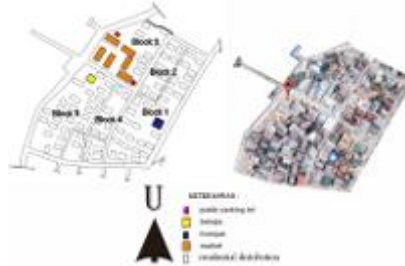


Fig. 11. Housing distribution of the North Padang group of houses
Source: Author, 2023

Table 6: Distance measurement data between Central Padang houses
Source: Author

Home group	Measuring point	Measuring distance (m)	Measuring point	Measuring distance (m)
Central Padang	1-2	1.3	39-40	1.2
	3-4	1.2	41-42	2
	5-6	2.8	43-44	1.3
	7-8	1.9	45-46	1.4
	9-10	1.2	47-48	2.3
	11-12	1	49-50	1.2
	13-14	1.4	51-52	1.3
	15-16	2.3	53-54	1
	17-18	1.2	55-56	4.8
	19-20	1	57-58	2.2
	21-22	1.2	59-60	1.7
	23-24	1.4	61-62	1.3
	25-26	2.2	63-64	1.2
	27-28	2	65-66	1.5
	29-30	4.2	67-68	1.3
	31-32	1.2	69-70	3.8
	33-34	1	71-72	3.5
	35-36	3.3	73-74	1.2
37-38	1.8	75-76	1.4	
	Number of measuring distances	69.1	Average measurement	1.8

Calculations were carried out using the data from measuring the distance between houses above to determine the Central Padang settlement pattern, presented in table form below.

Table 7. Measurement results of the Central Plains

Source: Author

No	Information	Results
1	Central Plains Area	28500 m ²
2	Number of dots	74
3	The total distance to the house	69.1m
4	Ju = (average distance)	1.8m
5	Jh = (number obtained from the number of points/area). Jh = $1/2\sqrt{P}$	$1/2\sqrt{385.1}=9.81$ m
6	P = (area/number of points)	$28500/74 = 385.1$ m ²
7	T = average distance (Ju) / number obtained from the number of points divided by the area (Jh). T = ju/jh	T=1.8/9.81=0.183

According to the calculations of the value (T) above, it can be seen that the magnitude of the distribution index of residents' houses in Padang Tengah is 0.183. Thus, it can be concluded that the pattern of settlement that occurs in the North Padang group of houses belongs to the clustered settlement pattern where the T value ranges from 0-0.7

c) South Padang Settlement Pattern

**Fig. 12.** sketch of the distribution of the South Padang group of houses

Source: Author, 2023

Table 8: Distance measurement data between South Padang houses

Source: Author

Home group	Measuring point	Measuring distance (m)	Measuring point	Measuring distance (m)
South Padang	1-2	1.7	37-38	1.2
	3-4	2.8	39-40	1.1
	5-6	1.2	41-42	1.1
	7-8	1.3	43-44	1.2
	9-10	2.2	45-46	1.8
	11-12	1.3	47-48	1.5
	13-14	5.5	49-50	0.9
	15-16	2.8	51-52	2.4
	17-18	1.6	53-54	1.3
	19-20	1.9	55-56	1.3
	21-22	3.2	57-58	0.9
	23-24	1.5	59-60	0.9
	25-26	1.4	61-62	1.2
	27-28	1.8	63-64	1.2
	29-30	1.6	65-66	2.7

	31-32	1.4	67-68	2.5
	33-34	2.3	69-70	1.5
	35-36	2.4	71-72	2.5
	Number of measuring distances	65.1	Average measurement	1.8

Calculations were carried out using the data from measuring the distance between houses above to determine the South Padang settlement pattern, presented in table form below.

Table 9. Measurement results of the Southern plains

Source: Author

No	Information	Results
1	South Plains Area	27500 m ²
2	Number of dots	72
3	The total distance to the house	65.1 m
4	Ju = (average distance)	1.8m
5	Jh = (number obtained from the number of points/area). $Jh = 1/2\sqrt{P}$	$1/2\sqrt{381.9}=9.77$ m
6	P = (area/number of points)	$27500/72 = 381,9$ m ²
7	T = average distance (Ju) / number obtained from the number of points divided by the area (Jh). $T = ju/jh$	$T=1.8/9.77=0.184$

Based on the results of the calculation of the value (T) above, it can be seen that the magnitude of the distribution index of residents' houses in South Padang is 0.183, so it can be concluded that the pattern of settlement that occurs in the North Padang group of houses belongs to the clustered settlement pattern where the T value ranges from (0-0.7).

Characteristics of People's Livelihoods

In the daily life of the people of Padang, most of them depend on their economic life on utilizing marine natural resources around the area as a basic need. However, the livelihoods of the residents of Kampung Padang vary greatly apart from being fishermen; some are engaged in trading services and others. These can be seen in the table below.

Table 10. Classification of livelihoods in Kampung Padang

Source: Author

No	Livelihood	Number of people)	percentage (%)
1	Fisherman civil	47	62.67
2	servant	7	9,33
3	pond	5	6.67
4	Trader	9	12.00
5	Laborer / Builder	7	9.33
Total		75	100

According to the table, it can be seen that the level of livelihood classification of the people living in Kampung Padang is as fishermen. They account for 62.67%. The rest are civil servants 9.33%, traders 12%, fish farmers 6.67%, and laborers/carpenters 9.33%. The most dominant community work as fishermen.

Analysis of livelihood linkages and settlement patterns

From 75 household head respondents in Kampung Padang, data were collected regarding the level of livelihood classification, and it will be identified whether there is a relationship/correlation between settlement patterns. Based on the analysis carried out in Padang village, Selayar Islands Regency, the settlement patterns formed can be seen in the grouping of calculation results below in the tables. The classification of livelihoods can be seen in the Table 10.

Table 11: Calculation results of Kampung Padang settlement pattern

Source: Author

No	Location	Index value (t)	Informasion
1	North Padang	0.197	group
2	Central Padang	0.183	group
3	South Padang	0.184	group

A correlation test was conducted from the two data tables above between the settlement patterns (table 11) and the livelihoods (table 10). Following results of correlation calculations show the relationship between the settlement patterns and the livelihoods.

Table 12: Degree of the relationship between the settlement patterns and the livelihoods

Source: Author

Correlations			
		Settlement pattern	Livelihood
Settlement pattern	Pearson Correlation	1	.984
	Sig. (2-tailed)		.116
	N	3	3
Livelihood	Pearson Correlation	.984	1
	Sig. (2-tailed)	.116	
	N	3	5

The table above shows a correlation between the settlement patterns and livelihoods with a value of 0.984. In the Rank Spearman correlation analysis above, it is stated that there is a significant relationship between residential patterns and livelihoods, with a significant level at an alpha value of 0.116, less than the R table 5% value of 0.9969.

Field data and correlation analysis show that there is a significant relationship between the settlement patterns and livelihoods. Thus, it can be said that the process of forming settlement patterns can also be influenced by existing livelihoods in the area. It is supported by the opinion of Mardanas (1985) who says that the embodiment of the settlement patterns in the settlements is much related to the places of work (livelihoods) of the inhabitants. Therefore, they were known as fishing villages and farming villages, and the best village was close to their place of work or their livelihood.

The formation of settlement patterns in Kampung Padang cannot be separated from its socio-economic characteristics and livelihoods. Communities that are commonly found in this research location include people who work as fishermen. The community said that living close to the beach made activities run smoothly, there was easier access to boat berth areas, and the availability of economic facilities in settlements in the form of fish auction, markets, and docks could facilitate work. The grouping of residences contributes to form of good social relations between communities for that last for. Thus, it becomes a form of welfare for people who tend to live in groups. This clustering pattern cannot be separated from the influence of space requirements and the distribution of the resulting residential units. The tendency of this pattern causes the community to choose to group settlement units around something that is considered important and binds the groups. Indeed, this necessitates the

desire for closeness to family, the availability of economic facilities (fish auction, markets, and docks), fish management rooms, and fish drying rooms, which are then used as centers of activities by the local people.

Below, we will present map data on the distribution of house placements based on livelihoods based on the results of observations and interviews.



Fig. 13. Map of the distribution of population livelihoods

Source: Author, 2023

The map of the distribution of population livelihoods above illustrates the pattern of residential distribution. This forest pattern was formed and spread throughout the Padang area. The distribution of the population's livelihoods can determine the settlement pattern.

The distribution and pattern of housing units based on their livelihoods can be seen on the attached map 32. From the analysis of the map above, one can find houses in a clustered pattern of people who work as fishermen, and where one can see the residents', houses are close to each other. This aligns with the theory put forward by Betran (1985), which states that the residents' livelihoods can shape the distribution pattern of settlements. Furthermore, he says that payments with a clustered design or, in other words (Nucleate Agricultural Village Communities) could be seen in residents' houses, which are clustered in specific locations and close to each other. Furthermore, above findings are supported by theoretical calculations carried out previously, namely by using the Nearest Neighbour Analysis calculations by Bintarto (1983). The analysis obtained once were residential patterns with clustered categories.

Furthermore, there is also a widespread residential pattern; this pattern is formed by people who work as civil servants, fish farmers, traders and labourers. This pattern is created because the houses are far from each other.

Why people occupy their residential locations is seen in the table below.

Table 13: Reasons for the placement of residential locations in the formation of spatial patterns

Source: Author, 2023

No	Reasons for the placement of residential locations in the formation of spatial patterns	Response	Amount	percentag
1	Closeness to family	yes	65	86.7 %
		No	10	13.3 %
		Total respondents	75	100 %
2	Professional equality	Yes	69	92 %
		No	6	8 %
		Total respondents	75	100 %
3	Ease of controlling family members/coming home from work	Yes	54	72 %
		No	21	28 %
		Total respondents	75	100 %
4	Ease of reaching the work location	Yes	70	93.3 %
		No	5	6.7 %
		Total respondents	75	100 %
5	Ease of property control	Yes	48	64 %
		No	27	36 %
		Total respondents	75	100 %
6	Ease of controlling sea tides	Yes	68	90.7 %
		No	7	9.3 %
		Total respondents	75	100 %
7	Close to facilities (fish auction place and market)	Yes	72	96 %
		No	3	4 %
		Total respondents	75	100 %
8	Ease of sanitation	Yes	43	57.3 %
		No	32	42.7 %
		Total respondents	75	100 %

Based on the field data in the table above regarding the reasons why people choose residential locations, it can be seen that almost all of the percentage values produced are pretty high, indicating that the tendency of people to select residential areas is because of their employment factors. For Padang people who work as fishermen, there are several essential points in choosing and occupying a site, including;

1. Suitability of the residential location to the main occupation where this location has a unique character, such as directly adjacent to the beach,
2. Distance from the settlement to the workplace; in this case, the payment is close to the fishing location to economic facilities such as fish auctions and markets.
3. Availability of facilities that can facilitate work in the form of fish auction places and docks.
4. Proximity between families where people tend to build houses close together because of the family element.
5. Similarity of professions.

From the points above, the settlements in Kampung Padang cannot be separated from their socio-economic characteristics (livelihoods). The community said that living close to the beach makes activities run smoothly, and it is easier to access the area where boats dock and the availability of economic facilities in the settlement (fish auction places, markets and docks), which can facilitate work. The grouping of residences in these settlements is a form of good social relations between communities that have lasted for years, so it becomes a form of welfare for people who live in groups. This pattern tends to cause the community to group residential units into something necessary. It binds the group, such as the desire to be close to family and the availability of economic facilities, which the local community uses as centres of activity.

Conclusions

Based on the discussion above, this research concludes that settlement patterns have a relationship or correlation with livelihoods, with a correlation value of 0.984. The existing building form is dominated by the stilt type, with the mass structure of the building facing to the side and back and the dominant house orientation facing West and East. It creates a grouping pattern with a grid-shaped road structure that can facilitate the community in carrying out their daily activities.

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