International Journal of Sustainable Development and Planning
Vol. 20, No. 6, June, 2025, pp. 2365-2377
Journal homepage: http://iieta.org/journals/ijsdp

Mapping Island Village Typology Based on Spatial and Socio-Economic Characteristics in Maluku Province, Indonesia

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https://doi.org/10.18280/ijsdp.200609

Received: 22 May 2025
Revised: 23 June 2025
Accepted: 27 June 2025
Available online: 30 June 2025

Keywords:
village typology, archipelago, Maluku, PCA, K-Means Clustering

ABSTRACT

Development in archipelagic regions requires a more specific approach that addresses the objective challenges faced by these areas. Therefore, mapping village typologies—particularly based on geographic similarities, spatial characteristics, and socio-economic conditions—is essential. This is especially important considering the diverse potentials and challenges faced by villages scattered across different islands or island clusters. This study was conducted in Maluku Province, an archipelagic region in Eastern Indonesia characterized by thousands of islands, including large islands, small islands, and outermost islands. The province comprises 1,233 villages, 118 sub-districts, and 11 districts/cities. The analysis employed a combination of Principal Component Analysis (PCA), K-Means Clustering, and ArcGIS 10 to produce a Village Typology Map. The results identified four principal components that formed five distinct village typologies: (1) "Coastal" Typology, comprising 298 coastal villages; (2) "Non-Coastal" Typology, comprising 137 inland villages; (3) "Outer/Border" Typology, comprising 522 outermost villages; (4) "Urban Zone" Typology, comprising 116 urban villages; and (5) "Small Islands" Typology, comprising 160 villages located on small islands. The implication of these findings is that village typologies—constructed based on geographic, spatial, and socio-economic aspects—serve as an entry point for implementing targeted and contextually relevant development strategies to accelerate development in the archipelagic regions of Maluku Province, Indonesia.

1. INTRODUCTION

Archipelagic regions are characterized by their unique, complex, and diverse nature, where each island often faces relatively distinct challenges—not only in terms of geographical conditions but also regarding connectivity, population distribution, socio-economic aspects, and the availability of natural resources [1, 2]. This diversity in characteristics contributes to disparities in access to resources, infrastructure, and economic opportunities, which in turn results in unequal distribution of development benefits [3-6].

One of Indonesia's prominent archipelagic regions is Maluku Province, where approximately 92% of its area consists of marine territory, and only 7% is land, comprising 1,388 islands of varying sizes and natural resource potentials [7]. As an archipelagic region, Maluku faces several fundamental challenges, most notably limited connectivity and accessibility. These limitations restrict economic activities and hinder regional development. Furthermore, development policies implemented in Maluku have largely followed a "continental-centric" approach, often failing to accommodate the specific needs of island regions. As a result, many policy interventions do not adequately address the root causes and urgent development priorities [8].

One of the consequences of this policy misalignment is the persistently high poverty rate in Maluku, especially on islands with minimal infrastructure, basic services, and limited access to economic opportunities. As of 2022, statistical data indicate that Maluku ranked as the fourth poorest province in Indonesia, with a poverty rate of 16.42% [9].

To formulate more accommodative and measurable development policies for Maluku, it is essential to map the typology of its archipelagic regions based on their physical, geographical, and socio-economic characteristics. Such typological classification supports more targeted development planning, enables the formulation of affirmative policies, and facilitates more efficient resource and budget allocation in line with actual needs—thereby promoting more effective and sustainable development outcomes [10-12].

Based on these considerations, this study aims to address the research question: how can village typologies be defined based on the spatial characteristics of island regions and the socio-economic conditions in Maluku Province?

In the context of an archipelagic region, village typology

analysis is crucial, given that villages scattered across various islands or island clusters face distinct challenges and possess unique potential. Villages located on large islands encounter different development issues compared to those on small islands; likewise, coastal villages have different socio-economic dynamics than those in mountainous or inland regions. This also applies to remote, outermost, and border-area villages.

2. METHODS

2.1 Data collection and location of the study sites

The study was conducted in Maluku Province, Indonesia, encompassing 1,233 villages (including urban administrative units or *kelurahan*) distributed across 11 districts/ municipalities and 118 sub-districts (Figure 1). Socio-economic data were sourced from the Village Development Index (*Indeks Pembangunan Desa*, IPD) provided by Statistics Indonesia (Badan Pusat Statistik, BPS) and the Village Development Index (*Indeks Desa Membangun*, IDM) published by the Ministry of Villages, Development of Disadvantaged Regions, and Transmigration of the Republic of Indonesia. Spatial data were obtained from the Village Administrative Boundary Map provided by the Geospatial Information Agency (Badan Informasi Geospasial, BIG), the Land Cover Map issued by the Ministry of Environment and Forestry, as well as regulatory documents related to coastal areas, small islands, and outermost and border islands.

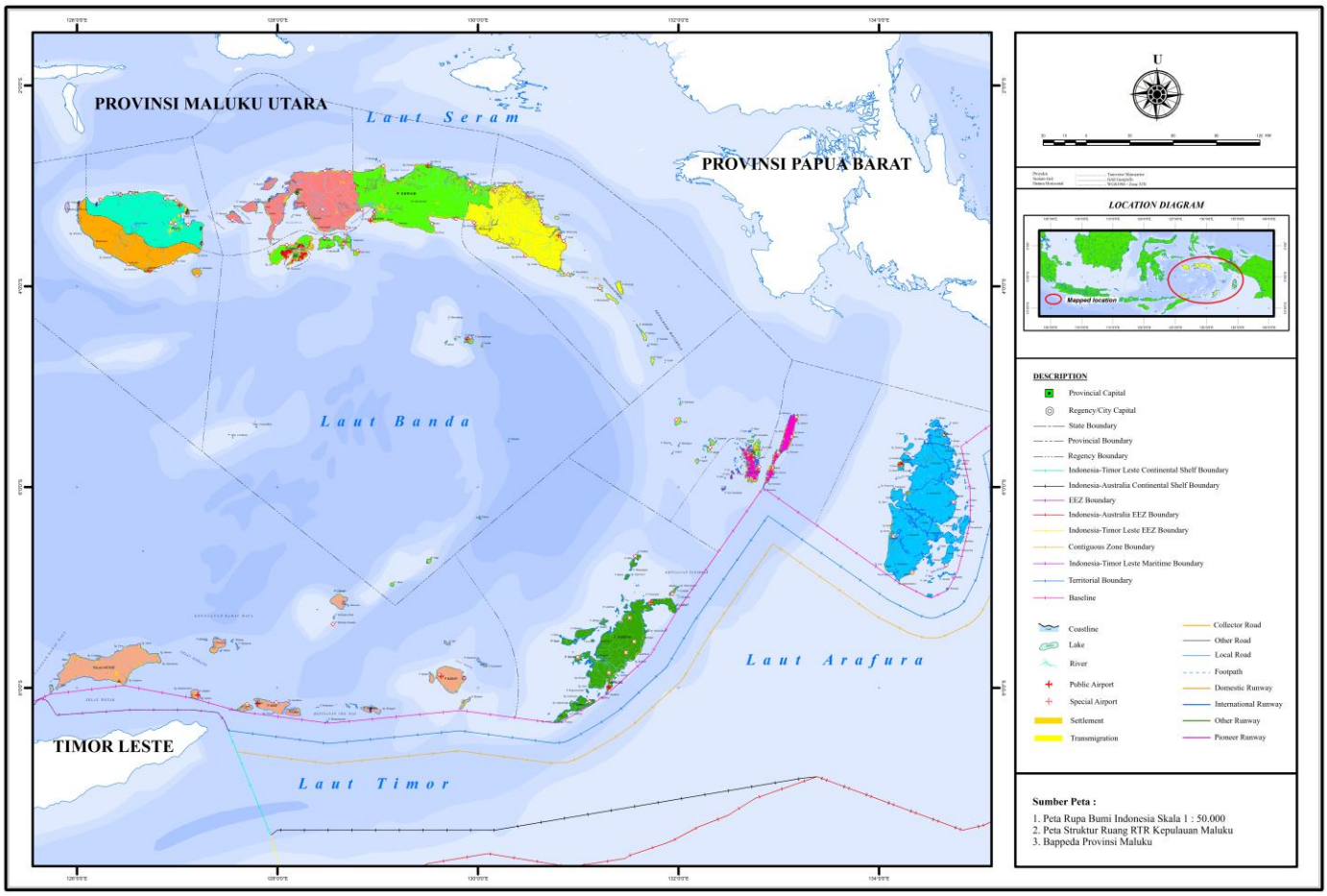

Figure 1. Map of study sites

2.2 Data analysis

There are 3 methods applied, namely: 1) Principal Component Analysis (PCA); 2) K-Means Clustering; and 3) Regional Typology Analysis which is visualized in the form of a map. This study employed 11 input variables, namely: (1) population density; (2) percentage of built-up area; (3) availability of urban facilities; (4) outermost status; (5) distance from the national border; (6) island size; (7) island category; (8) marine resource utilization; (9) direct adjacency to the sea; (10) absence of coastline; and (11) location within forest areas. These variables were selected as they are considered to represent the geospatial characteristics of island regions and the socio-economic conditions of villages in Maluku Province, and because relevant data are available.

2.2.1 PCA

PCA method was employed to classify villages based on regional characteristics and multidimensional poverty indicators, including economic aspects, socio-cultural conditions, geographical challenges, and several spatial indicators relevant to archipelagic areas. This method transforms the original dataset linearly into a new coordinate system that maximizes variance, without significantly altering the intrinsic properties of the data. Smaller, transformed datasets are generally easier to explore, visualize, and analyze.

Technically, dimensionality reduction in PCA is guided by the proportion of variance explained by the principal components. First, if the cumulative variance of the original data exceeds 70% or the eigenvalue (λ) of a component is greater than 1, then the analysis is considered sufficient up to

that component. The PCA process was carried out in five main steps as follows:

Step 1. Data standardization, to produce data of the same scale. Data standardization is carried out with the following equation:

$$Z_{ap}\frac{x_{ap}-\overline{x_p}}{S_p} \quad (1)$$

where,

Z_{ap}: standardized data

x_{ap}: a data on the p variable

$\overline{x_p}$: average data of the p variable

S_p: standard deviation of the p variable

Step 2. Calculating the covariance matrix based on correlation coefficients, which are derived using the following equation:

$$rz_p, z_q = \frac{n\left(\sum_{a=1}^{n} z_{ap}\, z_{aq}\right) - \left(\sum_{a=1}^{n} z_{ap}\right).\left(\sum_{a=1}^{n} z_{aq}\right)}{\sqrt{\left(\sum_{a=1}^{n} z_{ap}^2\right) - \left(\sum_{a=1}^{n} z_{ap}\right)^2}.\sqrt{\left(\sum_{a=1}^{n} z_{aq}^2\right) - \left(\sum_{a=1}^{n} z_{aq}\right)^2}} \quad (2)$$

Step 3. Calculating the eigenvalues and eigenvectors of the covariance matrix using the following equations:

$$Eigenvalue: |\lambda I - R| = \vec{0} \quad (3)$$

$$Eigenvector: (R\vec{v} = \lambda\vec{v}) \quad (4)$$

Step 4. Determining the number of principal components (PCs) based on the criterion of eigenvalues greater than or equal to 1, and constructing the component loading matrix, which represents the correlations between the original variables and the component scores, using the following equation:

$$r_{X_p, PC_t} = \overrightarrow{v_{at}}\sqrt{\lambda_t} \quad (5)$$

Step 5. Calculating the transformed dataset resulting from PCA dimensionality reduction, using the following equation:

$$PC_{at} = \overrightarrow{v_{1a}}Z_1 + \overrightarrow{v_{2a}}Z_2 + \cdots + \overrightarrow{v_{ap}}Z_p \quad (6)$$

Step 6. Interpretation of components was conducted using the Rotated Component Matrix to identify the dominant variables in each component. The interpretation was based on the factor loadings, or the highest correlation values between variables and components.

2.2.2 K-Means Clustering

The PCA results were further analyzed using clustering techniques, which involve grouping objects into several clusters based on the similarity of their data characteristics. In general, clustering methods are divided into two types: hierarchical clustering (structure-based) and partitional clustering (non-hierarchical). Considering the relatively large dataset, this study employed a partitional clustering method, in which the data were grouped into a predefined number of clusters without a hierarchical structure. Each cluster has a central point (centroid) that minimizes the dissimilarity distance between all data points and their respective cluster centers.

The stages of the K-Means Clustering analysis are as follows:

Step 1. Determine the dataset to be clustered in the form of a matrix X with dimensions $n \times m$ (where n is the number of samples and m is the number of attributes per data point);

Step 2. Specify the number of clusters (c), fuzzification coefficient or exponent (w), maximum number of iterations (*maxiter*), the desired minimum error (ε), the initial objective function value ($P_0 = 0$), and the initial iteration ($t = 1$);

Step 3. Generate random numbers μ_{ik}, where $i = 1, 2, 3, \ldots, n$ and $k = 1, 2, 3, \ldots, c$, as elements of the initial partition matrix U, which represent the degree of membership of each data point to a cluster.

Step 4. Calculate the center of the k-th cluster V_{kj}, where $k = 1, 2, \ldots, c$ and $j = 1, 2, \ldots, m$.

$$V_{kj} = \frac{\sum_{i=1}^{n}\left((\mu_{ik})^w \times X_{ij}\right)}{\sum_{i=1}^{n}(\mu_{ik})^w} \quad (7)$$

Step 5. Calculates the objective function on the t-iteration, Pt, which describes the total distance of the data to the center of the cluster.

$$Pt = \sum_{i=1}^{n}\sum_{k=1}^{c}\left(\left[\sum_{j=1}^{m}\left(X_{ij} - v_{kj}\right)^2(\mu_{ik})^w\right]\right) \quad (8)$$

where,

P_i: Objective function

X_{ij}: element X row i, column j

V_{kj}: Cluster Centers

Step 6. Calculate partition matrix changes:

$$\mu_{ik} = \frac{\left(\left(\sum_{j=1}^{m}\left(X_{ij} - V_{kj}\right)\right)^2\right)^{\frac{-1}{w-1}}}{\sum_{k=1}^{c}\left(\left(\sum_{j=1}^{m}\left(X_{ij} - V_{kj}\right)\right)^2\right)^{\frac{-1}{w-1}}} \quad (9)$$

where,

i: 1,2,…, n

k: 1,2, ..., c

X_{ij}: the i-th data sample for the j-th variable

V_{kj}: the center of the k-th cluster for the j-th variable

w: the weighting exponent (fuzzification coefficient)

Step 7. Check the stopping condition:

•If $|P_t - P_{t-1}| < \varepsilon$ *or* $(t > maxiter)$, then the algorithm terminates.

•If not, set $t = t + 1$ and repeat step 4.

Step 8. Melakukan Validate the cluster results using the Davies-Bouldin Index (DBI), calculated using the following equation:

$$DBI = \frac{1}{k}\sum_{i=1}^{k} max_{i\neq j}\left(R_{i,j}\right) \quad (10)$$

where,

DBI: Davies-Bouldin Index

$R_{i,j}$: The ratio of comparison values between the i-th cluster and the j-th cluster

k: The number of clusters used

Step 9. Interpret the best clustering results based on the smallest Davies-Bouldin Index (DBI) value.

2.2.3 Regional typology analysis

The clustering results generated through the K-Means method were further processed using ArcGIS 10.4 and visualized in the form of thematic maps. This process began with importing the clustering data into ArcGIS, stored in compatible formats such as .csv, .shp, or other tabular formats. The dataset included geographic coordinates (latitude and longitude) along with cluster labels as additional attributes indicating the classification outcomes.

The next step involved integrating the clustering data with spatial maps. If the data lacked direct geographic coordinates, the integration was performed based on relevant attributes—such as administrative region IDs—using corresponding spatial data like administrative boundary shapefiles.

Once the data were merged, visualization was conducted using several techniques. Symbology settings were applied to assign different colors to each cluster, facilitating visual interpretation. Additionally, thematic maps were employed to depict regions using colors or symbols that represent their respective clusters.

The final stage encompassed the analysis and interpretation of the resulting maps. This involved identifying specific spatial patterns, recognizing distinct geographic distributions, and characterizing each cluster based on the clustering outcomes. As such, the spatial visualization provided a deeper understanding of the structural and geographic distribution of the data.

3. RESULTS

Based on the Principal Component Analysis (PCA) conducted using SPSS version 27, the extraction reduced the original 11 variables into only 4 components. This reduction is indicated by the total initial eigenvalues greater than 1, as presented in Table 1.

Table 1. Principal component extraction result

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	3.726	33.876	33.876
2	2.593	23.573	57.450
3	1.963	17.850	75.299
4	1.506	13.694	88.993
5	0.425	3.863	92.857
6	0.344	3.123	95.980
7	0.301	2.740	98.720
8	0.064	0.579	99.299
9	0.046	0.421	99.720
10	0.031	0.280	100.000
11	-1.249E-16	-1.135E-15	100.000

Components with initial eigenvalues greater than 1 are considered to contribute significantly to the total variance of the data, whereas components with eigenvalues less than 1 are regarded as less informative and can be disregarded. In general, the larger the eigenvalue of a component, the greater the proportion of variance it explains. An eigenvalue greater than 1 indicates that the component accounts for more variance than a single original variable [13]. This conclusion is further supported by the scree plot presented in Figure 2.

It can be observed that the scree plot displays a steep decline from components 1 to 4, while components 5 and beyond show a more gradual slope after the elbow point. According to the scree plot criterion, only components 1, 2, 3, and 4 are considered to represent the data structure [14, 15]. To determine which variables load onto each of these four principal components, the Rotated Component Matrix is used, as presented in Table 2.

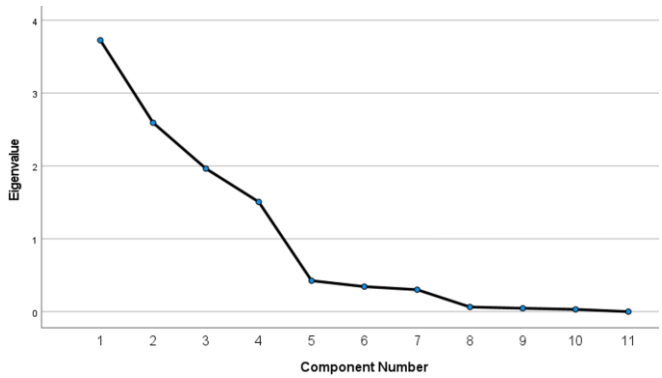

Figure 2. Scree plot

Table 2. Rotated component matrix

Rotated Component Matrix[a]				
Variable	Principal Component (PC)			
	1	2	3	4
Population density	0.006	0.874	0.007	0.018
Built-Up area percentage	-0.036	0.969	-0.044	0.015
Urban facilities	0.009	0.941	0.010	-0.014
Outermost region	-0.006	-0.011	0.992	-0.022
Distance from National Border	-0.031	0.010	-0.989	-0.066
Island size	0.217	0.010	0.021	0.964
Island category	0.198	0.010	0.024	0.967
Marine utilization	0.817	-0.006	0.006	0.227
Directly Adjacent to the Sea	0.961	-0.012	0.008	0.116
Without a Coastline	-0.961	0.012	-0.008	-0.116
Village Location within Forest Areas	-0.823	-0.006	-0.012	-0.085

a. Rotation converged in 4 iterations.

The Rotated Component Matrix illustrates how the original variables are projected onto the principal components after the rotation process. This rotation aims to facilitate the interpretation of components by producing a clearer and more distinct loading pattern across variables. In this matrix, each element represents a loading value ranging from -1 to 1, which indicates the extent to which a variable contributes to a given component. The greater the absolute value of the loading—whether positive or negative—the greater the contribution of that variable [16, 17].

Table 2 shows that the highest loading values for Principal Component 1 (PC-1) are found in the variables "Directly Adjacent to the Sea" (0.961), "Marine Utilization" (0.817), "Without a Coastline" (-0.961), and "Village Location within Forest Areas" (-0.823). For PC-2, the three variables with the highest loadings are "Population Density" (0.874), "Built-up Area Percentage" (0.969), and "Urban Facilities" (0.941). In PC-3, the highest loadings are observed in the variables "Outermost Region" (0.992) and "Distance from National Border" (-0.989). Lastly, for PC-4, the variables with the highest loading values are "Island Size" (0.964) and "Island Category" (0.967).

Subsequently, the naming of the principal components was conducted to assign attributes to each component. The naming

was done purposively to represent each component based on the characteristics of the grouped variables. Accordingly, Component 1 was labeled "Coastal," Component 2 as "Urban," Component 3 as "Outermost/Border," and Component 4 as "Small Islands." These component names and groupings are further detailed in Table 3.

Table 3. Principal component

Variable	Principal Component	Name
Marine utilization Directly Adjacent to the Sea Without a Coastline Village Location within Forest Areas	PC-1	Coastal
Population density Built-Up area percentage Urban facilities	PC-2	Urban
Outermost region Distance from National Border	PC-3	Outermost / Border
Island size Island category	PC-4	Small Islands

Based on the interpretation of the principal components, clustering was subsequently performed using the K-Means method with five clusters. The number of clusters was determined using the Elbow Plot, which showed a sharp decline in the Within-Cluster Sum of Squares (WSS) from the second to the fifth cluster. Beyond the fifth cluster, the decrease in WSS became marginal, indicating that adding more clusters would no longer be efficient. This is further illustrated in the Elbow Plot shown in Figure 3.

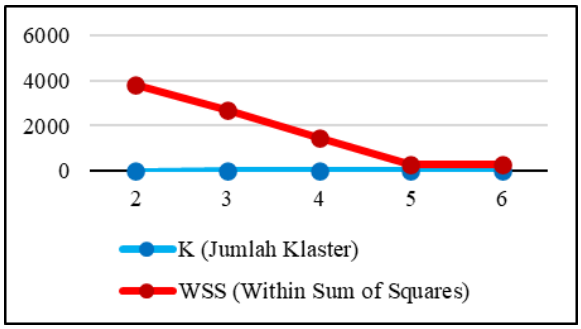

Figure 3. Elbow plot for determining the number of clusters

The results are presented through the Final Cluster Centers, as shown in Table 4.

Table 4. K-Means Clustering results from principal components

	Cluster	Principal Component			
		Coastal	Urban	Outermost / Border	Small Islands
Final Cluster Centers	1	0.871	-0.319	-0.993	-1.053
	2	-2.536	-0.259	-1.000	-0.307
	3	-0.010	-0.320	1.111	-0.021
	4	0.028	2.907	0.041	-0.042
	5	0.518	-0.269	-0.929	2.296
ANOVA	F	3743	2413	18038	11000
	Sig	0.000	0.000	0.000	0.000

The interpretation of Table 4 is as follows:

Cluster 1 shows a positive final cluster center value of 0.871 for the *Coastal* component, while the values for the other three components are negative. This indicates that Cluster 1 primarily consists of villages located in coastal areas, but not in urban zones, outer/border areas, or small islands.

Cluster 2 exhibits negative final cluster center values across all four components. This suggests that the villages in this cluster are not coastal, not located in urban settings, not positioned in outer/border regions, and are not situated on small islands—essentially representing *non-coastal and non-urban* settlements with minimal spatial distinctiveness.

In Cluster 3, the highest and only positive final cluster center value is observed in the *Outermost/Border* component, with a score of 1.111. This clearly indicates that Cluster 3 is composed of villages situated in the outermost or border regions of the country.

Cluster 4 is characterized by a highly positive final cluster center value in the *Urban* component (2.907), while the values in the remaining components are negligible or negative. This reflects that Cluster 4 consists of villages located within urban zones.

Lastly, Cluster 5 shows its highest positive score in the *Small Islands* component (2.296), indicating that the villages grouped in this cluster are primarily located on small islands.

Furthermore, the ANOVA test results demonstrate statistically significant differences across the clusters for all four principal components, as evidenced by the significance values ($p = 0.000$). This confirms that the clusters are meaningfully distinct from one another in terms of their underlying spatial and typological characteristics.

In summary, the five resulting clusters represent five distinct village typologies in the Maluku Province, namely:

Coastal Typology, consisting of villages located in coastal areas;

Non-Coastal Typology, consisting of inland villages not characterized by specific spatial features;

Outermost/Border Typology, composed of villages located in the outermost or border areas of the country;

Urban Zone Typology, comprising villages situated within urban areas; and

Small Islands Typology, representing villages located on small islands.

The spatial distribution and classification of these five village typologies in Maluku Province, derived from Principal Component Analysis and K-Means Clustering, are visually illustrated in Figure 4.

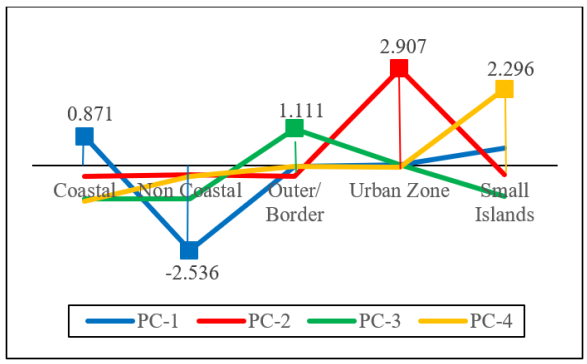

Figure 4. Profile plot based on PCA and K-Means Clustering

The village typologies in this study refer to the classification of villages based on similarities in specific characteristics, particularly spatial, geographic, and socio-economic attributes. Each group or cluster consists of villages that share

common features, while these features are distinct and differentiable across clusters.

Table 5 presents the number of cases in each cluster, which is an essential part of the K-Means Clustering output, indicating the number of villages assigned to each cluster. In this table, a total of 1,233 villages in Maluku Province are distributed into five distinct groups or clusters, forming village typologies based on spatial characteristics, geographic positioning, and socio-economic aspects of each village.

Table 5. Number of cases in each cluster

Cluster	Number of Members	
	Village	Percent (%)
Coastal	298	24
Non-Coastal	137	11
Outer/ Border	522	42
Urban Zone	116	10
Small Islands	160	13
Valid	1233	100
Missing	0	0

The clustering process above resulted in five village typologies based on their characteristic attributes. These typologies are not solely determined by geographic proximity or administrative boundaries, but also by similarities in spatial patterns, configurations, and socio-economic aspects. Consequently, villages located far apart geographically may belong to the same cluster if they share similar characteristics. Conversely, villages that are geographically close or located within the same administrative region may fall into different clusters if their typological features differ.

Table 6 summarizes the village typologies in relation to the similarity of features or characteristics associated with each typology, along with the number of administrative regions (districts/regencies) represented within each cluster or typology.

Table 6. Aspects of typology and number of district

Cluster/ Typology	Aspects	Number of District
Coastal	Spatial pattern	6
Non Coastal	Spatial pattern	6
Outer/ Border	Geographic location	5
Urban Zone	Socio-economic	11
Small Islands	Spatial form	4

It is evident that the village typologies transcend administrative and geographic boundaries. The *Urban Zone* typology, for instance, spans all 11 regencies/municipalities in Maluku Province. This indicates that villages classified under the Urban Zone typology are not concentrated in a single area but are distributed across the entire province. Similarly, other typologies also extend across multiple administrative regions: the *Coastal* typology covers 6 regencies, *Non-Coastal* typology spans 6 regencies, *Outermost/Border* typology includes 5 regencies, and the *Small Islands* typology is represented in 4 regencies.

Figure 5 illustrates the spatial distribution of village typologies across the archipelagic territory of Maluku Province. With the assignment of codes to each typology, code C is the Coastal, code NC is the Non-coastal, code OB is Outer/border, code U is Urban and code SI is small island.

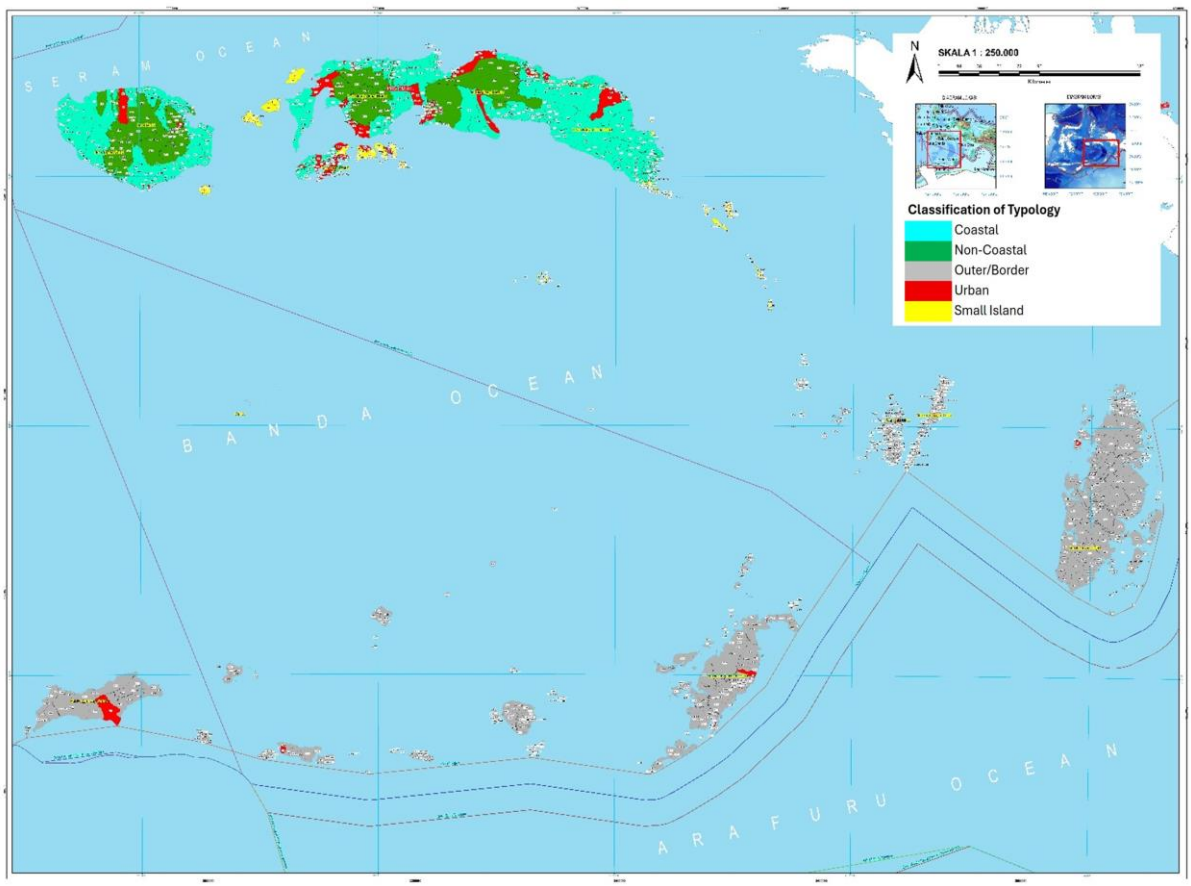

Figure 5. Map of village typology in Maluku, Indonesia (Appendix Table 1 Part A-G)

4. DISCUSSION AND CONCLUSIONS

The regional clustering that resulted in the five village typologies in this study differs from the existing "Island Cluster" concept previously adopted in Maluku Province, which classifies the region into 12 island clusters. The basis for that classification is primarily geographical, where islands located in close proximity within defined geographic boundaries are grouped into one cluster, and subsequent groups are formed based on successive geographic boundaries—resulting in a total of 12 clusters. However, this approach does not adequately account for the diversity of spatial characteristics or the socio-economic conditions within each cluster. In principle, this form of regional classification is not significantly different from administrative divisions such as regencies/municipalities or sub-districts. In fact, in several clusters, it is difficult to distinguish between the boundaries of the island cluster and those of existing administrative regions. As a result, the practical implementation of the Island Cluster concept in more targeted policy frameworks has proven difficult, particularly in addressing the specific and objective challenges faced by island communities.

In contrast, the typology model developed in this study is more scientifically robust and policy-relevant, as it incorporates the multi-dimensional nature of island regions—encompassing geographic, spatial, and socio-economic dimensions. This approach aligns with findings from prior research that emphasize the importance of combining spatial and socio-economic indicators to construct meaningful classifications of rural and island settlements [18-20]. Furthermore, by focusing the unit of analysis at the village level, the typologies produced in this study offer greater precision and practical utility, as supported by Li et al. [21], who emphasized the need for high-resolution spatial and functional categorization in rural planning.

In this study, each area was grouped based on similarities in these attributes, resulting in five typologies collectively referred to as *Island Village Typologies*, namely:

Coastal Typology, comprising villages located in coastal areas

Non-Coastal Typology, consisting of inland villages not adjacent to the sea

Outermost/Border Typology, including villages situated in the outermost regions or national border zones

Urban Zone Typology, consisting of villages located in urban settings

Small Islands Typology, representing villages located on small islands.

The identification of these five *Island Village Typologies* is expected to support policymakers in formulating more precise, equitable, and sustainable development strategies. For instance, development strategies appropriate for the *Non-Coastal Typology* may differ significantly from those required in the *Coastal Typology* or the *Small Islands Typology*. Likewise, policies designed for urban village development cannot be uniformly applied to villages within the *Outermost/Border Typology*. Each typology has its own unique characteristics, necessitating distinct policy approaches aligned with their specific potentials, needs, and development challenges.

Ultimately, it is hoped that the findings of this study will contribute to the enrichment of knowledge and understanding regarding the typologies and characteristics of island regions and their inherent diversity. Practically, this research is expected to serve as a useful reference for designing various programs, policies, and regional development strategies—particularly those targeting village development in archipelagic regions.

Villages classified under the *Coastal* typology require policies that emphasize strengthening coastal resilience through the protection of erosion-prone areas, the development of marine and fisheries-based economies, as well as improved market access and supporting infrastructure such as cold storage facilities and fishing ports.

While *Non-Coastal* villages clearly demand greater attention to improving road infrastructure, access to basic services, and the promotion of sustainable agricultural practices.

For villages categorized as *Small Islands,* policy focus should be directed toward enhancing inter-island connectivity, providing access to renewable energy, fostering environmentally sustainable economic development, and increasing access to essential services such as education and healthcare.

Villages within the *Urban Zone* typology also face their own unique challenges, including land conversion, high population density, and increased demand for services. Therefore, appropriate policies should focus on spatial planning, public service digitalization, and the development of service sectors and creative industries.

Meanwhile, the *Outer/Border* typology requires a strategic policy approach, as these villages represent the frontline of the nation's territory, yet often remain marginalized and underdeveloped. In addition to strengthening territorial defense and security functions, there is a pressing need for basic infrastructure development, improved connectivity, and the provision of integrated public services.

Ultimately, it is hoped that the findings of this study can contribute to a broader understanding of the types and characteristics of island regions and their diversity. Practically, the results may serve as a valuable reference for the formulation of programs, policies, and development planning strategies, particularly for village development in archipelagic regions.

5. RESEARCH LIMITATIONS

This study has several limitations that should be acknowledged to clarify the scope of the analysis and to encourage caution in interpreting the findings. These limitations are outlined as follows:

Temporal Scope: This study is based on data from the year 2021. Therefore, all conclusions drawn are descriptive of that particular period and do not reflect temporal dynamics or changes in village typologies over time.

Unit of Analysis: The unit of analysis used is the village. While spatial granularity at the village level provides a strong advantage in capturing local diversity, it also presents challenges related to data gaps or incompleteness for certain indicators. As such, variable selection and observation units were carefully chosen to ensure representativeness and reliability.

Geographical Scope: The scope of this study is explicitly limited to Maluku Province. The resulting classification and typological characteristics of villages are not intended to be generalized to other provinces, especially those with significantly different geographical conditions.

Methodological Approach: This study employs exploratory statistical methods, namely PCA and K-Means Clustering. These methods were selected to identify latent typological structures based on geospatial and socio-economic variables in a data-driven manner. However, due to limited availability and completeness of ideal variables at the village level, the selection of variables was guided by considerations of data availability and consistency. This may influence the scope of indicators included in the classification model.

Nature of the Typology: Although the resulting clusters show meaningful spatial differentiation, the classification should not be regarded as final or absolute. The typology produced is indicative in nature. Therefore, further policy validation or field studies are needed to confirm the relevance and accuracy of the classifications.

By acknowledging these limitations, this study is expected to serve as an initial foundation for formulating archipelagic village typology-based policies, while leaving room for refinement through expanded datasets and more advanced analytical approaches.

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APPENDIX

Appendix Table 1. Village typology in Maluku Province- part A

NO.	VILLAGE	CODE	NO.	VILLAGE	CODE	NO.	VILLAGE	CODE	NO.	VILLAGE	CODE
1	Abat	OB118	51	Aran	SI74	101	Batuasa	C227	151	Disuk	OB353
2	Abean	OB334	52	Arewang	SI75	102	Batugajah	OB227	152	Doka Barat	OB12
3	Abio Ahiolo	NC99	53	Argam	SI76	103	Batugoyang	OB6	153	Doka Timur	OB13
4	Aboru	SI10	54	Ariate	C169	104	Batuley	OB7	154	Dosimar	OB14
5	Abubu	SI11	55	Arma	OB128	105	Batumiau	OB228	155	Dosinamalau	OB15
6	Abulate	C215	56	Armada	SI77	106	Bebar Timur	OB229	156	Dreamland Hills	NC126
7	Abusur	OB220	57	Arnau	OB223	107	Bellis	C228	157	Dudunwahan	OB354
8	Ad Ngurwul	OB335	58	Aroa Kataloka	SI78	108	Beltubur	OB8	158	Dulak	SI84
9	Ad Ohoiwaf	OB336	59	Arso	OB338	109	Bemo	C229	159	Dullah	OB194
10	Ad Wear Aur	OB337	60	Artafela	NC124	110	Bemo Perak	C230	160	Dullah Laut	OB195
11	Adabai	C216	61	Aruan Gaur	C223	111	Bemun	OB9	161	Durjela	OB16
12	Adar	SI69	62	Arui Bab	OB129	112	Benjina	OB10	162	Duryar Rumoy	SI85
13	Adaut	OB119	63	Arui Das	OB130	113	Benjuring	OB11	163	Dwiwarna	U66
14	Adodo Fordata	OB120	64	Arwala	OB224	114	Benteng	U22	164	Effa	SI86
15	Adodo Molu	OB121	65	Asilulu	C103	115	Besi	C104	165	El Ralang	OB355
16	Afang Defol	C217	66	Atiahu	C224	116	Biloro	C46	166	Elaar Lamagorang	OB356
17	Afang Kota	C218	67	Atubul Da	OB131	117	Bitorik	C231	167	Elaar Let	OB357
18	Ahanari	OB221	68	Atubul Dol	OB132	118	Boinfia	C232	168	Elaar Ngursoin	OB358
19	Ahusen	U16	69	Awear	OB133	119	Boiyauw	SI14	169	Elara	SI1
20	Ainena	C219	70	Awear Rumngeur	OB134	120	Bomaki	OB136	170	Elat	OB359
21	Air Besar	C100	71	Awilinan	C2	121	Bombay	OB342	171	Elemata	NC60
22	Air Buaya	C1	72	Babiotang	OB225	122	Booi	SI15	172	Elfule	C47
23	Air Nanang	C220	73	Bala-bala	C41	123	Buan Kataloka	SI81	173	Eliasa	OB137
24	Air Ternate	C40	74	Balatan	OB3	124	Buano Hatuputih	SI57	174	Elnusa	C237
25	Airkasar	C221	75	Balbalu	NC1	125	Buano Selatan	SI58	175	Elo	OB231
26	Akatfadedo	SI70	76	Balpetu	C42	126	Buano Utara	SI59	176	Elpaputih	C170
27	Aketernate	C101	77	Banda Baru	NC59	127	Bula	U111	177	Elsulith	OB232
28	Aki Jaya	NC123	78	Banda Efruan	OB339	128	Bula Air Fatolo	C233	178	Ema	NC56
29	Akoon	SI12	79	Banda Eli	OB340	129	Bululora	OB230	179	Emguhen	C48
30	Algadang	OB1	80	Banda Suku Tigapuluh	OB341	130	Bumey	U65	180	Emplawas	OB233
31	Allang	C102	81	Banggoi	C225	131	Buria	NC100	181	Englas	C238
32	Allang Asaude	C168	82	Banggoi Pancorang	C226	132	Combir Kasestoren	SI16	182	Eray	OB234
33	Alusi Batjasi	OB122	83	Bara	C3	133	Dada Kataloka	SI82	183	Erersin	OB17
34	Alusi Bukjalim	OB123	84	Bardefan	OB4	134	Daftel	OB343	184	Erwiri	C49
35	Alusi Kelaan	OB124	85	Bas	SI79	135	Danama	C234	185	Etaralu	SI87
36	Alusi Krawain	OB125	86	Basada	OB5	136	Danar Lumefar	OB344	186	Eti	U102
37	Alusi Tamrian	OB126	87	Basalale	NC2	137	Danar Ohoiseb	OB345	187	Evu	OB360
38	Amahai	U63	88	Basarin	SI80	138	Danar Ternate	OB346	188	Faa	OB361
39	Amahusu	U17	89	Bati Kilwouw	NC125	139	Dangarat	OB347	189	Faan	OB362
40	Amantelu	U18	90	Batlale	NC3	140	Dava	NC4	190	Fakal	NC39
41	Amarlaut	SI71	91	Batu Boy	C4	141	Dawang	C235	191	Fako	OB363
42	Amarsekaru	SI72	92	Batu Gajah	U19	142	Day	SI83	192	Fangamas	OB364
43	Amarwatu	SI73	93	Batu Jungku	C5	143	Debowae	NC5	193	Fanwav	OB365
44	Amdasa	OB127	94	Batu Kasa	C43	144	Debut	OB348	194	Fatlabata	OB18
45	Ameth	NC58	95	Batu Layar	C44	145	Dender	SI17	195	Fatmite	C50
46	Ameth	SI13	96	Batu Meja	U20	146	Denwet	OB349	196	Fattolo	C239
47	Ampera	U64	97	Batu Merah	OB226	147	Depur	OB350	197	Fatural	OB19
48	Analutur	OB222	98	Batu Merah	U21	148	Dian Darat	OB351	198	Feer	OB366
49	Angar	C222	99	Batu Putih	OB135	149	Dian Pulau	OB352	199	Feruni	OB20
50	Apara	OB2	100	Batu Tulis	C45	150	Dihil	C236	200	Fiditan	OB196

Appendix Table 1. Village typology in Maluku Province- part B

NO.	VILLAGE	CODE	NO.	VILLAGE	CODE	NO.	VILLAGE	CODE	NO.	VILLAGE	CODE
201	Finualen	OB197	251	Hatuolo	NC62	301	Ilpokil	OB244	351	Kampung Baru	C248
202	Fogi	C51	252	Hatusua	C172	302	Ilputih	OB245	352	Kampung Baru	U70
203	Foket	OB21	253	Haya	C109	303	Ilwaki	U60	353	Kampung Baru	SI2
204	Funa Naibaya	C240	254	Herlau Pauni	C110	304	Ilway	OB246	354	Kampung Baru	SI93
205	Fursuy	OB138	255	Herley	OB235	305	Imroing	OB247	355	Kampung Gorom	C249
206	Gah	C241	256	Hertuti	OB236	306	Irloy	OB32	356	Kampung Tengah Wermaf	SI94
207	Gaimar	OB22	257	Hiay	OB237	307	Iso	OB385	357	Kampung Wailola	U113
208	Galai Dubu	U8	258	Hila	OB238	308	Issu	NC64	358	Kanara	OB200
209	Galala	U23	259	Hila	U68	309	Itawaka	SI23	359	Kandar	OB142
210	Gale-gale	C105	260	Hirit	OB198	310	Jabulenga	OB33	360	Kanikeh	NC68
211	Garara	OB367	261	Hitulama	C111	311	Jakarta Baru	NC127	361	Karang Jaya	NC8
212	Gardakau	OB23	262	Hitumessing	C112	312	Jambu Air	OB34	362	Karang Panjang	U29
213	Geser	U112	263	Hoat	OB376	313	Jamilu	C8	363	Karangguli	OB48
214	Goda-Goda	OB24	264	Hokmar	OB31	314	Jelia	OB35	364	Karatat	OB143
215	Gogorea	NC6	265	Hoko	OB377	315	Jembatan Basah	NC128	365	Karawai	OB49
216	Goha	SI88	266	Hoko	OB378	316	Jerili	NC65	366	Karay	C250
217	Gomar Meti	OB25	267	Hollat	OB379	317	Jerol	OB36	367	Karbubu	OB251
218	Gomar Sungai	OB26	268	Hollat Solair	OB380	318	Jerusu	OB248	368	Karey	OB50
219	Gomo-Gomo	OB27	269	Hollay	OB381	319	Jerwatu	OB37	369	Kariu	SI26
220	Gomsey	OB28	270	Hollo	U69	320	Jikumerasa	C9	370	Karkarit	OB386
221	Gorar	OB29	271	Honipopu	U27	321	Jirlay	OB38	371	Karlokin	SI95
222	Grahwaen	C52	272	Honitetu	NC101	322	Jorang	OB39	372	Karlomin	SI96
223	Grandeng	NC7	273	Hoor Islam	OB382	323	Juring	OB40	373	Karlutu Kara	C116
224	Guliar	SI89	274	Hoor Kristen	OB383	324	Jursiang	OB41	374	Kartutin Kartenga	SI97
225	Guli-Guli	C242	275	Horale	C113	325	Kabalsiang	OB42	375	Kase	C54
226	Gulili	OB30	276	Hote	C53	326	Kabalukin	OB43	376	Kasieh	C177

227	Gunak	C243	277	Hote	C246	327	Kabauhari	NC66	377	Kataloka	U114
228	Gusalaut	C244	278	Hualoy	C173	328	Kabauw	SI24	378	Kawa	C178
229	Haar Ohoimel	OB368	279	Huaulu	NC63	329	Kabiarat	OB140	379	Keffing	SI98
230	Haar Ohoimur GPM	OB369	280	Huku Kecil	NC102	330	Kabufin	OB44	380	Kehli	OB252
231	Haar Ohoimur RK	OB370	281	Hukuanakota	NC103	331	Kaforing	SI92	381	Kelaan	OB144
232	Haar Ohoiwait	OB371	282	Hukurila	C92	332	Kahilin	OB249	382	Kelaba	C251
233	Haar Renrahantel	OB372	283	Hulaliu	SI20	333	Kaibobo	C176	383	Kelang Asaude	SI60
234	Haar Wassar	OB373	284	Hulung	C174	334	Kaibolafin	OB45	384	Kelangan	SI99
235	Halong	U24	285	Hunisi	C114	335	Kaiely	C10	385	Kelanit	OB387
236	Hangur	OB374	286	Hunuth/Durian Patah	U28	336	Kailolo	SI25	386	Keldor	SI100
237	Harangur	OB375	287	Hutumury	C93	337	Kaimear	OB199	387	Kelibingan	SI101
238	Haria	SI18	288	Iblatmuntah	OB239	338	Kairatu	U103	388	Kellu	SI102
239	Haruku	SI19	289	Ibra	OB384	339	Kaitetu	C115	389	Ker Ker	SI103
240	Haruru	U67	290	Iha	C175	340	Kaiwabar	OB46	390	Keta	C252
241	Hatalai	NC57	291	Iha	SI21	341	Kaiwatu	OB250	391	Keta Rumadan	C253
242	Hatawano	C6	292	Ihamahu	SI22	342	Kaki Air	C11	392	Ketsoblak	U56
243	Hative Besar	U25	293	Ilath	C7	343	Kalar-Kalar	OB47	393	Ketty	OB253
244	Hative Kecil	U26	294	Ilbutung	OB240	344	Kaloa	NC67	394	Kian Darat	C254
245	Hatu	C106	295	Ilih	OB241	345	Kamal	U104	395	Kian Laut	C255
246	Hatu	C107	296	Ilili	SI90	346	Kamar	C247	396	Kilalir Kilwouw	SI104
247	Hatuhenu	NC61	297	Ilili	SI91	347	Kamarian	U105	397	Kilang	C94
248	Hatuimeten	C245	298	Ilmamau	OB242	348	Kamatubun	OB141	398	Kilbat	C256
249	Hatumete	C108	299	Ilmarang	OB243	349	Kamlanglale	U6	399	Kilbon Kway	C257
250	Hatunuru	C171	300	Ilngei	OB139	350	Kampung Baru	C12	400	Kilbutak	SI105

Appendix Table 1. Village typology in Maluku Province- part C

NO.	VILLAGE	CODE	NO.	VILLAGE	CODE	NO.	VILLAGE	CODE	NO.	VILLAGE	CODE
401	Kilean	SI106	451	Kurwara	SI115	501	Leinitu	SI29	551	Luang Barat	OB273
402	Kileser	NC129	452	Kuwaos	C264	502	Leiting	OB66	552	Luang Timur	OB274
403	Kilfura	SI107	453	Kwarbola	OB62	503	Lekloor	OB265	553	Luhu	C183
404	Kilga Kilwouw	C258	454	Kwawor Besar Ena	SI116	504	Leksula	C55	554	Luhuely	OB275
405	Kilga Watubau	C259	455	Kwawor Besar Witau	SI117	505	Lektama	C56	555	Luhutuban	SI61
406	Kiliwouw	SI108	456	Kwawor Kecil Mata Ata	SI118	506	Leku	C57	556	Lumahlatal	C184
407	Kilkoda	SI109	457	Kwawor Kecil Mata Wawa	SI119	507	Lelang	OB266	557	Lumahpelu	C185
408	Kilmasa	OB145	458	Laar	OB390	508	Lele	NC10	558	Lumasebu	U10
409	Kilmoy	C260	459	Labelau	OB260	509	Lelingluan	OB153	559	Lumoli	NC107
410	Kilmury	C261	460	Labetawi	OB201	510	Lemanpoli	NC11	560	Lumoy	SI3
411	Kilobar	OB146	461	Labobar	OB148	511	Lena	C58	561	Lurang	OB276
412	Kiloon	OB147	462	Labuan	C118	512	Ler Ohoilim	OB394	562	Lutur	OB71
413	Kilotak	SI110	463	Labuang	U7	513	Lermatang	OB154	563	Maar	OB398
414	Kiltay	SI111	464	Lafa	C119	514	Lesane	U75	564	Madak	NC130
415	Kiltufa	SI112	465	Laha	C120	515	Lesluru	NC71	565	Madwat	OB399
416	Kilwair	OB388	466	Laha	U31	516	Letman	OB395	566	Maekor	OB72
417	Kilwaru	SI113	467	Laha Kaba	C121	517	Letmasa	OB267	567	Magat	SI124
418	Kilwat	OB389	468	Lahema	SI120	518	Letoda	OB268	568	Mahaleta	OB277
419	Klis	OB254	469	Laimu	C122	519	Letsiara	OB269	569	Mahu	SI31
420	Klishatu	OB255	470	Laininir	OB63	520	Letwaru	U76	570	Mahuan	OB278
421	Kobadangar	OB51	471	Lairngangas	OB391	521	Letwuan	OB396	571	Maijuring	OB73
422	Kobamar	OB52	472	Laitutun	OB261	522	Letwurung	OB270	572	Makariki	U79
423	Kobasel Fara	OB53	473	Lala	C13	523	Lewah	OB271	573	Makatian	OB159
424	Kobasel Timur	OB54	474	Lalasa	SI121	524	Lian Tasik	C266	574	Makububui	NC108
425	Kobi	C117	475	Lamahang	C14	525	Liang	NC40	575	Malaku	C127
426	Kobimukti	U71	476	Lamdesar Barat	OB149	526	Liang	U77	576	Maloang	C186
427	Kobisonta	U72	477	Lamdesar Timur	OB150	527	Liang	U78	577	Mamala	C128
428	Kobraur	OB55	478	Langgiar Haar	OB392	528	Liliama	C267	578	Mamur	SI125
429	Kobror	OB56	479	Langgur	U100	529	Liliboy	C125	579	Maneo Rendah	C129
430	Koijabi	OB57	480	Langhalau	OB64	530	Limumir	U115	580	Maneoratu	C130
431	Kokroman	U73	481	Lapang Kampung Jawa	SI122	531	Lingada	OB155	581	Mangeswaen	NC41
432	Kokwari	OB256	482	Lapela	C265	532	Lingat	OB156	582	Mangga Dua	U35
433	Kolaha	OB58	483	Larat	OB393	533	Lisabata	C181	583	Manggis	C268
434	Kolamar	OB59	484	Larike	C123	534	Lisabata Timur	C126	584	Manglusi	OB160
435	Kolser	U99	485	Latalola Besar	OB262	535	Lodar El	U57	585	Manjau	OB74
436	Kompane	OB60	486	Latalola Kecil	OB263	536	Lohiasapalewa	NC105	586	Manusa	NC109
437	Kota Lama	SI9	487	Latdalam	OB151	537	Lohiatala	NC106	587	Manusela	NC73
438	Kota Sirih	OB522	488	Latea	C124	538	Lokki	C182	588	Manuweri	OB279
439	Kroing	OB257	489	Lateri	U32	539	Loko	SI123	589	Maraina	NC74
440	Kuaimelu	OB258	490	Latta	U33	540	Lokwirin	OB202	590	Marantutul	OB161
441	Kubalahin	NC9	491	Latu	C180	541	Lola	OB67	591	Marasahua	NC75
442	Kudamati	U30	492	Latuhalat	U34	542	Lolotuara	OB272	592	Marfenfen	OB75
443	Kufar	C262	493	Laturake	NC104	543	Longgar	OB68	593	Marfun	OB400
444	Kulugowa	SI114	494	Lau-Lau	OB65	544	Lonthoir	SI30	594	Mariri	OB76
445	Kulur	C179	495	Lauran	OB152	545	Loon	OB397	595	Maririmar	OB77
446	Kulur	SI27	496	Lautang	SI28	546	Loping Mulyo	NC72	596	Marlasi	OB78
447	Kumelang	C263	497	Lawawang	OB264	547	Lorang	OB69	597	Marsela	OB280
448	Kumul	OB61	498	Layeni	U74	548	Lor-lor	OB70	598	Masapun	OB281
449	Kumur	OB259	499	Leahari	C95	549	Lorulun	OB157	599	Masarete	C15
450	Kuralele	NC69	500	Leaway	NC70	550	Lorwembun	OB158	600	Masawoy	SI4

Appendix Table 1. Village typology in Maluku Province- part D

NO.	VILLAGE	CODE	NO.	VILLAGE	CODE	NO.	VILLAGE	CODE	NO.	VILLAGE	CODE

601	Masawoy	SI62	651	Nakupia	NC78	701	Nuniali	C192	751	Osong	C273
602	Masihulan	NC76	652	Nalahia	SI33	702	Nura	OB288	752	Otademan	SI137
603	Masnana	C59	653	Nalbessy	C61	703	Nurkat	OB166	753	Ouw	SI36
604	Masrum	U58	654	Nama Andan	SI134	704	Nurnyaman	OB289	754	Paa	C136
605	Mastur	OB401	655	Nama Lena	SI135	705	Nuruwe	C193	755	Pandan Kasturi	U39
606	Mastur Baru	OB402	656	Namaelo	U81	706	Nusaniwe	C97	756	Papakula	OB88
607	Mataholat	OB403	657	Namalean	SI136	707	Nusaniwe	U38	757	Paperu	SI37
608	Matakus	OB162	658	Namar	OB412	708	Nusantara	U83	758	Parbulu	NC14
609	Matapa	C187	659	Namara	OB85	709	Nusarua	NC44	759	Pasahari	C137
610	Matwair	OB404	660	Namasina	U82	710	Nusiata	OB290	760	Pasanea	C138
611	Mepa	C60	661	Namlea	U1	711	Nuweletetu	NC81	761	Pasinalo	C194
612	Merdeka	SI32	662	Namlea Ilath	C16	712	Nuwewang	OB291	762	Pasir Putih	SI5
613	Meror	OB79	663	Namrinat	NC42	713	Ohilahin	NC13	763	Passo	U40
614	Mesiang	OB80	664	Namsina	C17	714	Ohoibadar	OB427	764	Patahuwe	C195
615	Mesidang	OB81	665	Namtabung	OB165	715	Ohoider Atas	OB428	765	Patti	OB294
616	Messa	NC77	666	Namto	NC79	716	Ohoidertawun	OB429	766	Pela	C18
617	Meyano Das	OB163	667	Nanali	C62	717	Ohoidertom	OB430	767	Pelauw	U84
618	Meyano Das	OB164	668	Nania	U36	718	Ohoidertutu	OB431	768	Perik Basaranggi	SI138
619	Mida	SI126	669	Naumatang	OB286	719	Ohoiel	OB432	769	PIliana	NC82
620	Miran	SI127	670	Nayet	C271	720	Ohoifaruan	OB433	770	Piru	U107
621	Miran Gota	SI128	671	Neath	NC43	721	Ohoifau	OB434	771	Pohon Batu	C65
622	Miran Keledar	SI129	672	Negeri Lama	U37	722	Ohoijang Watdek	U101	772	Poka	U41
623	Miran Kilian	SI130	673	Negeri Lima	C133	723	Ohoilean	OB435	773	Polin	C274
624	Miran Manaban	SI131	674	Nekan	C272	724	Ohoililir	OB436	774	Ponom	OB89
625	Miran Rumuar	SI132	675	Neniari	NC111	725	Ohoilim	OB437	775	Popjetur	OB90
626	Mising	C269	676	Nerong	OB413	726	Ohoiluk	OB438	776	Porto	SI38
627	Moain	OB282	677	Ngabub	OB414	727	Ohoilus	OB439	777	Pota Besar	OB295
628	Mohongsel	OB82	678	Ngadi	OB203	728	Ohoimajang	OB440	778	Pota Kecil	OB296
629	Moning	OB283	679	Ngafan	OB415	729	Ohoinangan	OB441	779	Pulau Ay	SI39
630	Morekau	NC110	680	Ngaibor	OB86	730	Ohoinangan Atas	OB442	780	Pulau Hatta	SI40
631	Morella	C131	681	Ngaiguli	OB87	731	Ohoinol	OB443	781	Pulau Panjang	SI139
632	Morokai	U80	682	Ngan	OB416	732	Ohoira	OB444	782	Pulau Rhun	SI41
633	Mosso	C132	683	Ngat	OB417	733	Ohoiraut	OB445	783	Pupliora	OB297
634	Mugusinis	SI133	684	Ngayub	OB418	734	Ohoiren	OB446	784	Purpura	OB298
635	Mun Essoy	OB405	685	Ngefuit	OB419	735	Ohoirenan	OB447	785	Rahangiar	OB452
636	Mun Kahar	OB406	686	Ngefuit Atas	OB420	736	Ohoitahit	OB205	786	Rahareng	OB453
637	Mun Ngurditwain	OB407	687	Ngilngof	OB421	737	Ohoitel	OB206	787	Rahareng Atas	OB454
638	Mun Ohoiir	OB408	688	Ngurdu	OB422	738	Ohoituf	OB448	788	Raheriat	NC15
639	Mun Ohoitadiun	OB409	689	Ngurko	OB423	739	Ohoiwait	OB449	789	Rajawali	SI42
640	Mun Werfan	OB410	690	Ngursit	OB424	740	Ohoiwang	OB450	790	Rambatu	NC113
641	Murai	OB83	691	Ngurwalek	OB425	741	Ohoiwirin	OB451	791	Rarat	SI140
642	Murnaten	C188	692	Ngurwul	OB426	742	Oirata Barat	OB292	792	Rat	OB455
643	Musihuwey	C189	693	Niela	OB204	743	Oirata Timur	OB293	793	Rebi	OB91
644	Nabaheng	OB411	694	Nikulukan	C190	744	Oki Baru	C63	794	Regoha	OB299
645	Nabar	OB284	695	Niniari	NC112	745	Oki Lama	C64	795	Renfaan GPM	OB456
646	Nafar	OB84	696	Niwelehu	U106	746	Olilit Raya	OB167	796	Renfaan Islam	OB457
647	Nafrua	NC12	697	Nolloth	SI34	747	Olong	C134	797	Renfan	OB458
648	Naiwel Ahinulin	C270	698	Nomaha	OB287	748	Oma	SI35	798	Rerean	OB459
649	Nakarhamto	OB285	699	Nua Nea	NC80	749	Ondor	U116	799	Rewav	OB460
650	Naku	C96	700	Nukuhai	C191	750	Oping	C135	800	Reyamru	OB461

Appendix Table 1. Village typology in Maluku Province- part E

NO.	VILLAGE	CODE	NO.	VILLAGE	CODE	NO.	VILLAGE	CODE	NO.	VILLAGE	CODE
801	Ridool	U11	851	Saparua	U86	901	Siri Sori Islam	SI47	951	Tasinwaha	OB101
802	Rijali	U42	852	Sare	OB464	902	Sitniohoi	OB470	952	Tawiri	U46
803	Riring	NC114	853	Sariputih	NC84	903	Siwa Lima	U9	953	Tayando Langgiar	OB212
804	Ritabel	U12	854	Sathean	OB465	904	Siwar	SI7	954	Tayando Ohoiel	OB213
805	Roho	NC83	855	Sather	OB466	905	Siwatlahin	NC45	955	Tayando Yamru	OB214
806	Rohomoni	SI43	856	Saumlaki	U13	906	Siya	OB98	956	Tayando Yamtel	OB215
807	Romdara	OB300	857	Saumlaki Utara	U14	907	Skikilale	NC17	957	Tehoru	U92
808	Romean	OB168	858	Saunulu	C145	908	Slealale	NC46	958	Tehua	C153
809	Romnus	OB169	859	Savana Jaya	C21	909	Soahuku	C151	959	Teineman	OB175
810	Rotnama	OB301	860	Sawa	C22	910	Sofyanin	OB174	960	Tela	OB309
811	Ruku Ruku	SI141	861	Sawai	U87	911	Sohuwe	C201	961	Telalora	OB310
812	Rukun Jaya	NC131	862	Seakasale	C198	912	Soin	OB471	962	Telemar	OB311
813	Ruma Durun	SI142	863	Sehati	C146	913	Soindat	OB472	963	Telutih Baru	C154
814	Rumaat	OB462	864	Seilale	C99	914	Soinrat	OB473	964	Tenbuk	OB478
815	Rumadian	OB463	865	Seith	C23	915	Solang	C284	965	Tengah Tengah	C155
816	Rumah Tiga	U43	866	Seith	C147	916	Solath	OB308	966	Teor	SI152
817	Rumahkay	C196	867	Sekat	C66	917	Sole	SI63	967	Tepa	OB312
818	Rumahlewang Besar	OB302	868	Selamon	SI45	918	Solea	NC85	968	Terkuri	C69
819	Rumahlewang Kecil	OB303	869	Selasi	SI6	919	Solea	NC117	969	Tetoat	OB479
820	Rumahsalut	OB170	870	Selayar	OB467	920	Somlain	OB474	970	Themin	OB176
821	Rumahsoal	NC115	871	Selibata-bata	OB94	921	Soya	U45	971	Tiakur	U61
822	Rumahsokat	C139	872	Selilau	OB95	922	Sukaraja	C202	972	Tial	C156
823	Rumahwey	C140	873	Selmona	OB96	923	Suli	U90	973	Tiflen	OB216
824	Rumanama Kotawouw Kataloka	SI143	874	Selor	C280	924	Sumbawa	C285	974	Tifu	C70
825	Rumberu	NC116	875	Selwadu	NC16	925	Sumber Agung	NC133	975	Tifu	NC18
826	Rumeon	SI144	876	Semawi	OB468	926	Sumeith Pasinaro	NC118	976	Tihu	U47
827	Rumfakar	C275	877	Sepa	C148	927	Suru	C286	977	Tihuana	NC87
828	Rumkisar	OB304	878	Sera	OB305	928	Taa	C287	978	Tihulale	U108
829	Rumngeur	OB171	879	Sera	SI146	929	Taar	OB209	979	Tikbary	C71
830	Rumoga	NC132	880	Seriholo	C199	930	Tabarfane	OB99	980	Tinarin	SI153
831	Rumoin	OB207	881	Serili	OB306	931	Tahalupu	SI64	981	Tiouw	SI49
832	Rutah	C141	882	Sermaf	OB208	932	Tala	C203	982	Titawaai	SI50

833	Rutong	C98	883	Seruawan	C200	933	Tam Ngurhir	OB210	983	Tobo	C290
834	Sabuai	C276	884	Sesar	C281	934	Tamangil Nuhuten	OB475	984	Tomalehu	C205
835	Sagey	SI145	885	Sesar	C282	935	Tamangil Nuhuyanat	OB476	985	Tomalehu Barat	SI65
836	Sahulauw	C142	886	Seti	C149	936	Tamedan	OB211	986	Tomalehu Timur	SI66
837	Salagor Air	C277	887	Sewer	OB97	937	Tamher Timur	SI148	987	Tomliapat	OB313
838	Salagor Kota	C278	888	Siahoni	C24	938	Tamher Warat	SI149	988	Tomra	OB314
839	Salamahu	C143	889	Siatele	C150	939	Tamilouw	C152	989	Tonu Jaya	SI67
840	Salarem	OB92	890	Sifluru	U88	940	Tana Soa	SI150	990	Tounussa	NC119
841	Salas	C279	891	Sifnana	U15	941	Tanah Baru	SI151	991	Tounwawan	OB315
842	Saleman	C144	892	Sikaro Kataloka	SI147	942	Tanah Merah	NC86	992	Trana	NC88
843	Samal	U85	893	Sila	SI46	943	Tanah Miring	OB100	993	Trukat	NC47
844	Samalagi	C19	894	Silale	U44	944	Tanah Rata	SI48	994	Tual	U59
845	Samang	OB93	895	Silohan	C283	945	Tananahu	U91	995	Tubir Wasiwang	NC134
846	Sameth	SI44	896	Simi	C67	946	Tanimbar Kei	OB477	996	Tuburlay	OB480
847	Sanahu	C197	897	Sinairusi	OB307	947	Taniwel	C204	997	Tuburngil	OB481
848	Sangliat Dol	OB172	898	Siopot	C68	948	Tanjung Karang	C25	998	Tubyal	OB217
849	Sangliat Krawain	OB173	899	Sirbante	OB469	949	Tansi Ambon	C288	999	Tuha	SI154
850	Sanleko	C20	900	Siri Sori Amalatu	U89	950	Taruy	C289	1000	Tuhaha	SI51

Appendix Table 1. Village typology in Maluku Province- part F

NO.	VILLAGE	CODE	NO.	VILLAGE	CODE	NO.	VILLAGE	CODE	NO.	VILLAGE	CODE
1001	Tulehu	U93	1051	Waefusi	C72	1101	Wafol	OB494	1151	Waplau	C37
1002	Tum	C291	1052	Waegeren	NC21	1102	Wahai	U95	1152	Waprea	C38
1003	Tumbur	OB177	1053	Waeha	C73	1103	Wahangula-Ngula	OB106	1153	Wapsalit	NC35
1004	Tunas Ilur	SI155	1054	Waehaka	C74	1104	Wahaolon	NC54	1154	Warabal	OB112
1005	Tungu	OB102	1055	Waehata	NC22	1105	Wahayum	OB107	1155	Waraka	C162
1006	Tunguwatu	OB103	1056	Waekasar	U2	1106	Waifual	OB108	1156	Waraloin	C213
1007	Tuniwara	SI68	1057	Waekatin	NC49	1107	Waihaong	U51	1157	Warasiwa	C163
1008	Tunsai	C292	1058	Waekeka	C75	1108	Waihatu	U109	1158	Waras-Waras	C295
1009	Tutrean	OB482	1059	Waeken	NC50	1109	Waiheru	U52	1159	Warbal	OB498
1010	Tutukembong	OB178	1060	Waekerta	NC23	1110	Waihoka	U53	1160	Waria	OB113
1011	Tutukey	OB316	1061	Waekose	C27	1111	Waiketam Baru	NC136	1161	Warialau	OB114
1012	Tutunametal	OB179	1062	Waelana-lana	NC24	1112	Wailay	OB109	1162	Warjukur	OB115
1013	Tutuwaru	OB317	1063	Waelapia	C28	1113	Wailoping	U96	1163	Warkar	OB218
1014	Tutuwawang	OB318	1064	Waeleman	NC25	1114	Wailulu	C159	1164	Warloy	OB116
1015	Uat	OB483	1065	Waelihang	NC26	1115	Waimital	U110	1165	Waru	C296
1016	Ubung	C26	1066	Waelikut	C76	1116	Waimusal	NC90	1166	Waru	U97
1017	Udar	OB484	1067	Waelo	NC27	1117	Waimusi	NC91	1167	Warwut	OB499
1018	Uf	OB485	1068	Waelo	NC51	1118	Wain	OB495	1168	Wasarili	OB324
1019	Uhak	OB319	1069	Waemala	C77	1119	Wain Baru	OB496	1169	Wasbaka	NC36
1020	Ujir	OB104	1070	Waemangit	C29	1120	Wainitu	U54	1170	Wasi	NC37
1021	Ulahahan	C157	1071	Waemasing	C78	1121	Waipirit	C208	1171	Wasia	C214
1022	Ulima	SI8	1072	Waematakabo	NC135	1122	Waiputih	NC92	1172	Waspait	C39
1023	Ullath	SI52	1073	Waemite	NC28	1123	Waisalan	SI159	1173	Wassu	SI56
1024	Undur	C293	1074	Waemiting	C30	1124	Waisamet	NC137	1174	Watidal	OB183
1025	Uneth	NC48	1075	Waemorat	C31	1125	Waisamu	C209	1175	Watkidat	OB500
1026	Upuhupun	OB320	1076	Waemulang	C79	1126	Waisarisa	C210	1176	Watlaar	OB501
1027	Ur	OB486	1077	Waenalut	C80	1127	Waitila	NC93	1177	Watludan	NC95
1028	Ur Pulau	OB487	1078	Waenamaolon	NC52	1128	Waitonipa	NC94	1178	Watmasa	OB184
1029	Uraur	NC120	1079	Waenetat	U3	1129	Wakal	C160	1179	Watmuri	OB185
1030	Ureng	U94	1080	Waenibe	C32	1130	Wakarleli	U62	1180	Watngil	OB502
1031	Urimessing	U48	1081	Waenono	C81	1131	Wakasihu	C161	1181	Watngon	OB503
1032	Urimessing	U49	1082	Waepandan	C82	1132	Wakol	OB497	1182	Watsin	OB504
1033	Uring Tutra	SI53	1083	Waeperang	C33	1133	Wakolo	C211	1183	Watu Watu	C297
1034	Uritetu	U50	1084	Waepotih	C34	1134	Wakpapapi	OB322	1184	Watuar	OB505
1035	Urung	SI156	1085	Waepure	C35	1135	Wakua	OB110	1185	Watui	NC122
1036	Usliapan	NC89	1086	Waer	OB492	1136	Walakone	C212	1186	Waturu	OB186
1037	Ustutun	OB321	1087	Waer	SI54	1137	Walang Tenga	C294	1187	Watuwei	OB325
1038	Usun Kataloka	SI157	1088	Waerat	OB493	1138	Walbele	C87	1188	Waur	OB506
1039	Utta	SI158	1089	Waereman	NC29	1139	Walerang	OB182	1189	Waur Tahit	OB507
1040	Uwat	OB488	1090	Waereman	NC53	1140	Wali	C88	1190	Way Asih	NC96
1041	Uwat Reyaan	OB489	1091	Waesala	C207	1141	Walling Spanciby	SI55	1191	Wayame	U55
1042	Uwat Wear	OB490	1092	Waesili	C83	1142	Walunghelat	NC55	1192	Wearlilir	OB508
1043	Uwen Pantai	C206	1093	Waetawa	C84	1143	Wamana Baru	NC33	1193	Weduar	OB509
1044	Uweth	NC121	1094	Waeteba	C85	1144	Wamkana	C89	1194	Weduar Fer	OB510
1045	Waai	C158	1095	Waetele	NC30	1145	Wamlana	U4	1195	Weer Frawaf	OB511
1046	Wab	OB491	1096	Waetina	NC31	1146	Wamsisi	C90	1196	Weer Ohoiker	OB512
1047	Wabar	OB180	1097	Waeturen	C86	1147	Wanakarta	U5	1197	Weer Ohoinam	OB513
1048	Wabloy	NC19	1098	Waeura	C36	1148	Wanareja	NC34	1198	Welora	OB326
1049	Wadankou	OB181	1099	Wafan	OB105	1149	Wangel	OB111	1199	Welutu	OB187
1050	Waedanga	NC20	1100	Waflan	NC32	1150	Wanuwui	OB323	1200	Werain	OB188

Appendix Table 1. Village typology in Maluku Province- part G

NO.	VILLAGE	CODE	NO.	VILLAGE	CODE	NO.	VILLAGE	CODE
1201	Weratan	OB189	1212	Wolu	C164	1223	Yafila	NC98
1202	Werinama	C298	1213	Wonosari	U98	1224	Yainuelo	C165
1203	Werka	OB514	1214	Wonreli	OB329	1225	Yaltubung	OB331
1204	Wermaf	OB515	1215	Wotay	NC97	1226	Yamalatu	C166
1205	Wermatang	OB190	1216	Wowonda	OB191	1227	Yamluli	OB332

1206	Werwaru	OB327	1217	Wulmasa	OB192	1228	Yamtel	OB519
1207	Wewali	C91	1218	Wulur	OB330	1229	Yamtimur	OB520
1208	Widit	NC38	1219	Wulurat	OB517	1230	Yapas	OB219
1209	Wiratan	OB328	1220	Wunin Eldedora	SI160	1231	Yaputih	C167
1210	Wirin	OB516	1221	Wunlah	OB193	1232	Yatoke	OB333
1211	Wokam	OB117	1222	Yafavun	OB518	1233	Yatwav	OB521

*Note: C = Coastal, NC = Non Coastal, OB = Outer/Border, U = Urban, SI = Small Island