Sabu Raijua Islands

Baseline Survey and Strategic Plan for GEF SGP Program 2022-2026

2023

Pulau Sabu Raijua

Baseline Survey and Strategic Plan for GEF SGP Program 2022-2026

2023

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I. Program Site Profile

A. Site Selection Considerations

Sabu Raijua is one of the districts in the Province of East Nusa Tenggara (NTT). This regency is a small archipelago located Southwest of Kupang City, with a distance of about 8 hours by sea. The island lies in the south latitude, dominance of gentle slopes (5-15%) with maximum height of 50 meters above sea level and a distance from the waters that is less than 1 hour drive, makes this archipelago a semi-arid climate, which has low rainfall (<1500 mm/year).[1] Not much vegetation can live in this climate, only bushes and thorn trees.

Figure 1. The natural view of Sabu Island is dominated by grasslands, shrubs and thorn trees whose leaves are usually used as fodder and the wood is used as building material.

[1] Dwihatmojo R, Maryanto D. 2015. Mapping of Water Resources Balance in Sabu Raijua Regency, East Nusa Tenggara Indonesia. Geoplanning 2 (2): 124-137.

Small islands like Sabu Raijua are vulnerable to the impacts of climate change. The Seroja Storm that occurred in 2021 caused a lot of losses. Shelters collapsed, crop failures, and loss of plant seeds. Some residents also said that since the storm, agricultural productivity has decreased. The impact of climate change is really felt on the coast. The Intergovernmental Panel on Climate Change states that coastal cities are one of the most vulnerable places to face a climate emergency.[2] Coasts are sensitive to rising sea levels, changes in storm frequency and intensity, increased rainfall, and warmer ocean temperatures.[3] As was the case with Seroja storm, the aftermath of this extreme weather has led to problems with food availability.

Food issues have become a regular problem in NTT. Various mass media reported on food insecurity in NTT during the 2009-2012 period.[4] Data for 2021 even states that NTT is a province with highest numbers stunting nationally. According to the Indonesian Nutrition Status Study (SSGI) report from the Ministry of Health, the prevalence rate reached 37.8%. Among all districts, the prevalence of Sabu Raijua stunting is close to the provincial level, which is 33.9%.[5] The root of this food problem is a combination of climatic conditions, geography, and policy politics. Climate change then exacerbated these conditions.

Not much vegetation can survive in a semi-arid climate. Food crops that can be planted are also limited, they can only be planted during the rainy season due to limited water reserves. The remote island of Sabu Raijua has an impact on food distribution costs, which in turn increases food prices. In fact, before the Indonesian government intervened in the matter of rice, there had never been any record of a food deficit in the region.[6]

Local food mapping in 2013 by the Pikul Foundation stated that Sabu Raijua still has local food plants, some of these plants are still planted as a source of carbohydrates: sorghum and green beans. Rice politics, which began in the Soeharto era, made the Sabu Raijua region dependent on rice. Based on the research results of Rachman (2001) in Saliem et al. (2005), if in 1979 there were only 3 provinces that consumed rice exclusively, then in 1996 it increased to 11 provinces, and currently almost all provinces in Indonesia consume rice exclusively.[7] It's not just a matter of stomach, dependence on rice also exists in the realm of public perception. Many people consider rice to be a first-class food.[8]

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2 Stuart J, Sally Y, Rouleau T. 2020. The Climate and Ocean Risk Vulnerability Index: Prioritizing Areas of Action for Coastal Cities. Diakses di: https://www.jstor.org/stable/resrep30855.4

3 EPA. Climate Impact on Coastal Areas. Diakses di: https://19january2017snapshot.epa.gov/climate-impacts/climate-impacts-coastal-areas_.html

4 Mundita IW. 2013. Local Food Mapping on Sabu Raijua Island, Rote Ndao, Lembata, and Mainland West Timor (Kupang and South Central Timor Regencies).

5 Databox. The National Highest, This is the Prevalence of Stunting Toddlers in East Nusa Tenggara. Accessed at:https://databoks.katadata.co.id/datapublish/2023/01/19/tertinggi-nasional-ini-prevalensi-balita-stunting-di-nusa-tenggara-timur

6 Ngongo Y dkk. 2021. Strengthening Archipelago Food Security and Food Sovereignty in ENT - Indonesia. Reframing Food Sovereignty After Covid-19: Earth and Environmental Science 803 (2021)

7 Mardiharini M. 2013. Analysis of Food Needs to Support the Acceleration of Food Diversification in East Nusa Tenggara and Maluku.

8 Kompas.id. Food Diversification in NTT Faces a Number of Challenges. 23 March 2023. Accessed at:https://www.kompas.id/baca/nusantara/2023/03/23/diversifikasi-pangan-di-ntt-terbentur-sejumlah-tantangan

The Sabu Raijua government pays attention to food security by placing this matter in the development of vision and mission.[9] Even so, the programs do not target the main constraints of agriculture in Sabu Raijua. Local government programs are more about preparing agricultural, plantation and livestock production inputs such as preparing superior seeds produced by factories, other production facilities, and water. The program is considered fine, but often less precise. One of the residents in Eilogo Village, Liyae District, complained that agricultural assistance due to the impact of Seroja Storm was only giving corn seeds, even though other commodities also experienced crop failure.

This baseline survey is based on the considerations above: analyzing the various influences of climate conditions, geography, politics, and the impact of climate change on socio-economic conditions including food availability in Savu Raijua. These four factors were then also taken into consideration in the formulation of a strategic plan on Sabu Raijua Island.

B. Geographic Conditions, Demographics and Location Characteristics

1. Administrative division

Sabu Raijua Regency is an autonomous region resulting from the division of Kupang Regency, East Nusa Tenggara Province based on Law Number 52 of 2008. The position of Sabu Raijua Regency is located between 10025'7,12" LS - 10049'45.83 S and between 121016'10,78" BT - 12200'30.26" E. On the north, east and west sides of Sabu Raijua Regency it is directly adjacent to the Savu Sea and to the south by the Indian Ocean. Sabu Raijua Regency has four islands, namely Sabu Island, Raijua, Wadu Mea and Dana with a total area of 46,104.52 Ha (Perdinanet.al., 2018). Of the four islands, only Sabu and Raijua are inhabited.

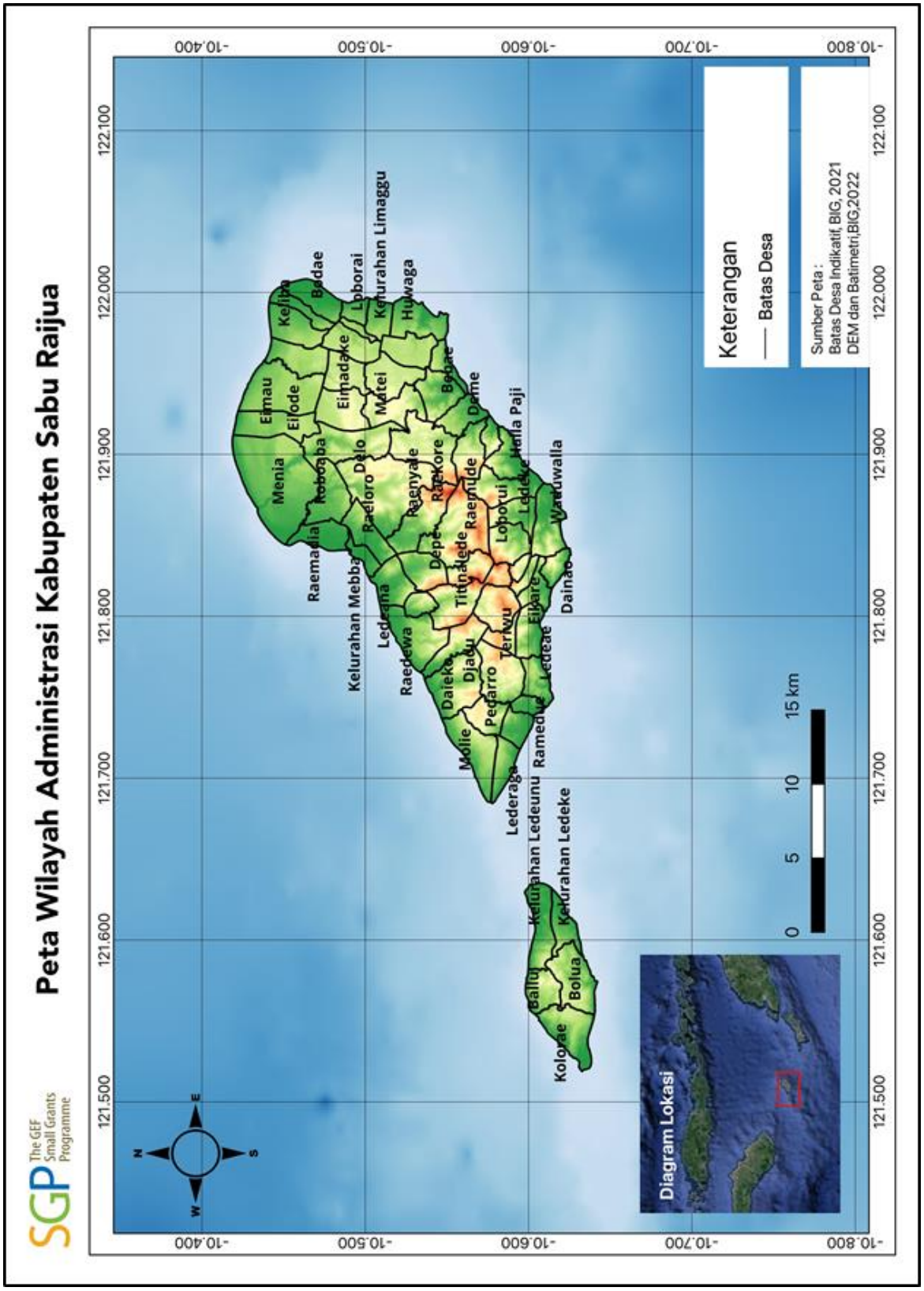
The administrative area of Sabu Raijua Regency is divided into 6 sub-districts, namely Raijua, West Sabu, Hawu Mehara, East Sabu, Sabu Liae and Central Sabu Subdistricts. The government center of Sabu Raijua Regency is in West Sabu Subdistrict with Meina as its capital. Based on the existing sub-districts, it is further divided into 58 villages, 5 sub-districts, 244 hamlets, 503 community units (RW) and 918 neighborhood units (Table 1). Meanwhile, the administrative map of sub-districts in Sabu Raijua Regency is presented in Figure 2.

Table 1. The distribution of sub-districts in Sabu Raijua Regency

Subdistrict	Capital	Amount				
		Village	Ward	hamlet	RW	RT
Sabu Barat	Seba	17	1	71	144	259
Hawu Mehara	Raelado	10	-	46	83	190
Sabu Timur	Bolou	8	2	32	64	92
Sabu Liae	Eilogo	12	-	50	100	200
Sabu Tengah	Eimadeke	8	-	30	62	117
Total		**58**	**5**	**244**	**503**	**918**

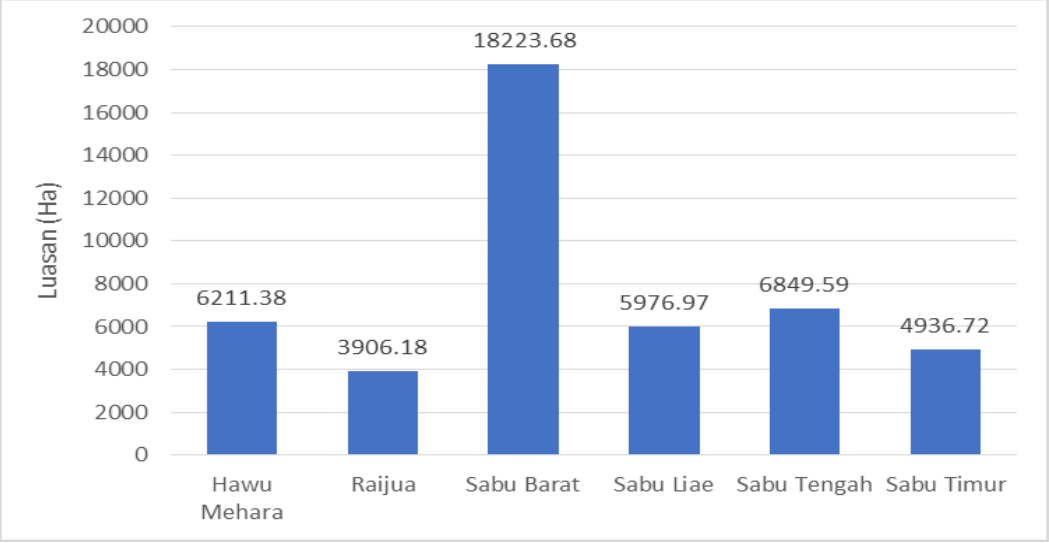
[9] Ratumakin PAK, et al. No years. Local Food Self-Reliance Policy Study in Sabu Raijua District.

Figure 2. Administrative map of sub-districts in Sabu Raijua Regency



Based on the sub district administration map above, West Sabu Subdistrict has the largest area (18,516 Ha) or around 40% of the total area of Sabu Raijua Regency. The comparison of the area of the sub-districts in Sabu Raijua Regency is presented in the graph (Figure 3). As for the village area, the largest village is Meina Village which is the capital of Sabu Raijua Regency with an area of around 2847.54 Ha.

Figure 3. The area of the sub-district in Sabu Raijua Regency (source: Administration Section of the Regional Secretariat of Sabu Raijua Regency in BPS 2017).



The population of Sabu Raijua Regency in 2022 is 92,792 people with a density of 201.91 people/km^2 (Fananda et.al., 2023). The population distribution of each sub-district and the rate of population growth are presented in Table 2. Based on Table 2, West Sabu District has the largest population of around 34,515 or 37.2% of the total population of Sabu Raijua Regency. However, based on the relationship between the number of inhabitants and the area, the sub-district has a population density per km^2 is the District of Hawu Mehara around 306.75 per km^2.

Table 2: Table of distribution of population per sub-district in Sabu Raijua Regency

Subdistrict	Total Population	Population Growth Rate per Year 2020-2022 (%)	Population Percentage	Population density per km^2
Raijua	9.167	1,21	9,88	240,23
Hawu Mehara	19.267	1,60	20,76	306,75
Sabu Liae	11.058	1,57	11,92	191,91
Sabu Barat	34.515	1,92	37,20	186,41
Sabu Tengah	9.144	1,75	9,85	116,31
Sabu Timur	9.641	3,86	10,39	259,1

2. Hydrological aspect

Natural resources are one of the strategic issues in managing an area, whilst development planning looks at the condition and potential of the area (Dwihatmojo & Maryanto, 2015). Knowledge regarding current conditions and predictions on the dynamics of water resources for various activities is urgently needed (Jainet al., 2010). One of the problems faced is poverty and limited resources, especially water, therefore it is necessary to see the potential and utilization of water resources. Mapping the potential and condition of natural resources in an area is needed as a basis for making appropriate planning in the development of a region.

In general, the hydrological conditions in Sabu Raijua Regency consist of springs, groundwater and surface water. From the rainfall data, it can be seen that the amount of rainfall and the amount of rain are relatively small and vary from one month to another.

a. Di wilayah Kabupaten Sabu Raijua terdapat beberapa sumber mata air[10] yang berasal dari daerah perbukitan dengan debit air yang biasanya menurun pada musim kemarau, sehingga kebutuhan air pada musim kemarau merupakan kendala di wilayah ini. Beberapa mata air yang ada di Kabupaten Sabu Raijua antara lain adalah Menia di Desa Menia Kecamatan Sabu Barat, Molie di Desa Molie Kecamatan Hawu Mehara, Lie Madira di Desa Molie Kecamatan Hawu Mehara, mata air di desa Jiwuwu Desa Eimadake dan Desa Bebeae Kecamatan Sabu Tengah, mata air di Desa Depe Kecamatan Sabu Barat serta mata air di Desa Ballu Kecamatan Raijua.

Figure 4. One of the springs in Matei Village.
This spring is never dry even during the dry season

[10] Groundwater that appears to the ground surface, its appearance can be caused because the water-carrying layer is cut off by a sloping ground surface or there are differences in lithology, affected by faults and so on. Temporarily, spring discharge follows a thick pattern of rainfall, which will increase in the rainy season and decrease in the dry season..

b. Groundwater is widely used by residents as a source of clean water for residents in Sabu Raijua Regency area, the plains along the coast. Groundwater potential in Sabu Raijua Regency is categorized into three, namely:

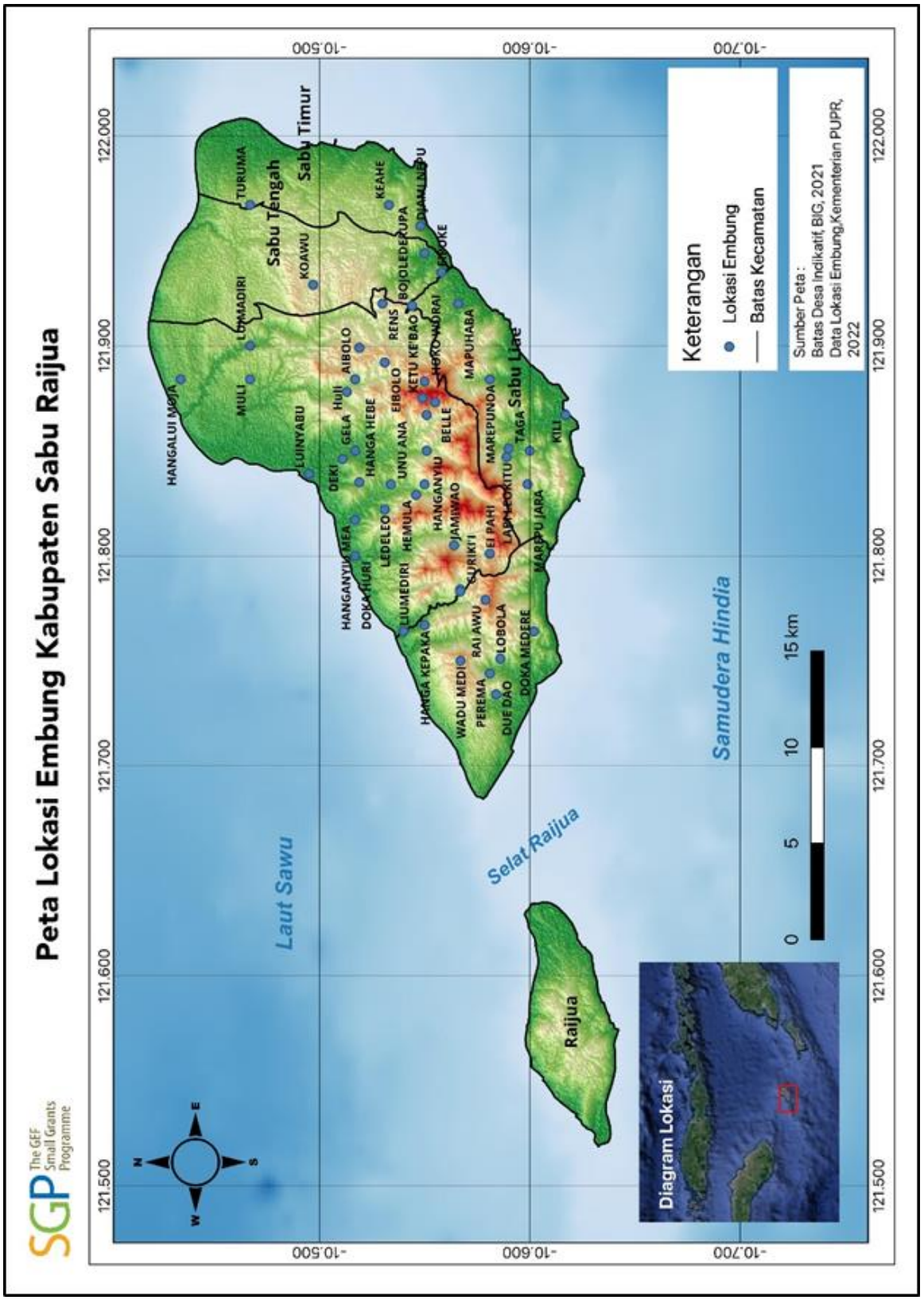
   - High groundwater potential is an area where groundwater sources are easy to obtain (up to 15 meters deep).
   - Moderate groundwater potential is an area where groundwater sources can be obtained (up to a depth of 50 meters) although sometimes it is difficult to find them during the dry season; and
   - Low high groundwater potential is an area where groundwater sources are very difficult to obtain.

c. Surface water, Sabu Raijua Regency flows through many river channels/natural channels, including: Loko Aimadawadu, Loko Raidui, Loko Latamako, Loko Helaba, Loko Roapahi and Loko Pakah as well as Loko Lui and Loko Leba. These rivers are generally seasonal rivers which only have water during the rainy season, whereas during the dry season they are dry or dry. The surface drainage pattern of the rivers on Sabu Island shows that in general the flow flows south to north and north to south following the shape of the landscape (Faddhlan and Intan, 2016). Based on the results of the study, it shows that the average rainfall that occurs throughout Sabu Raijua Regency is included in the Low class (Dwihatmojo & Maryanto, 2015). This condition will affect the potential of water resources both surface and subsurface in Sabu Raijua Regency area, because rainwater is the main source of both types of water potential. Most surface water potential is found in the West Sabu Subdistrict and the least is in the East Sabu Subdistrict.[11]

Sabu Raijua Island is a small group of islands. This has implications for the size of the small watershed (DAS) (RPJMD of Sabu Raijua Regency, 2021 -2026). There are around 21 watersheds spread across the Sabu Raijua area with a very small watershed size. With a very small watershed that functions as a management of rainwater input, it is estimated that the problem of availability and continuity of water availability is one of the inhibiting factors in regional development in Sabu Raijua. Therefore, soil and water conservation is needed to retain surface water and groundwater as water reserves during the dry season as long as possible. One form of soil and water conservation is the construction of a pond as a water reservoir. The distribution map of the reservoirs in Sabu Raijua is presented in Figure 5.

[11] https://p2k.stekom.ac.id/ensiklopedia/Kabupaten_Sabu_Raijua#cite_note-Sawu-7

Figure 5: Map of the distribution of reservoirs in Sabu Raijua District



The distribution of the reservoirs in Figure 5 was built in the 1997-2018 timeframe (Ministry of PUPR Reservoir Location Data, 2022). The highest number of ponds are located in West Sabu Subdistrict, Hawu Mehara District and Sabu Liae District respectively. The construction of the reservoir is one of the policies pursued by the regional government in an effort to increase land production/productivity.

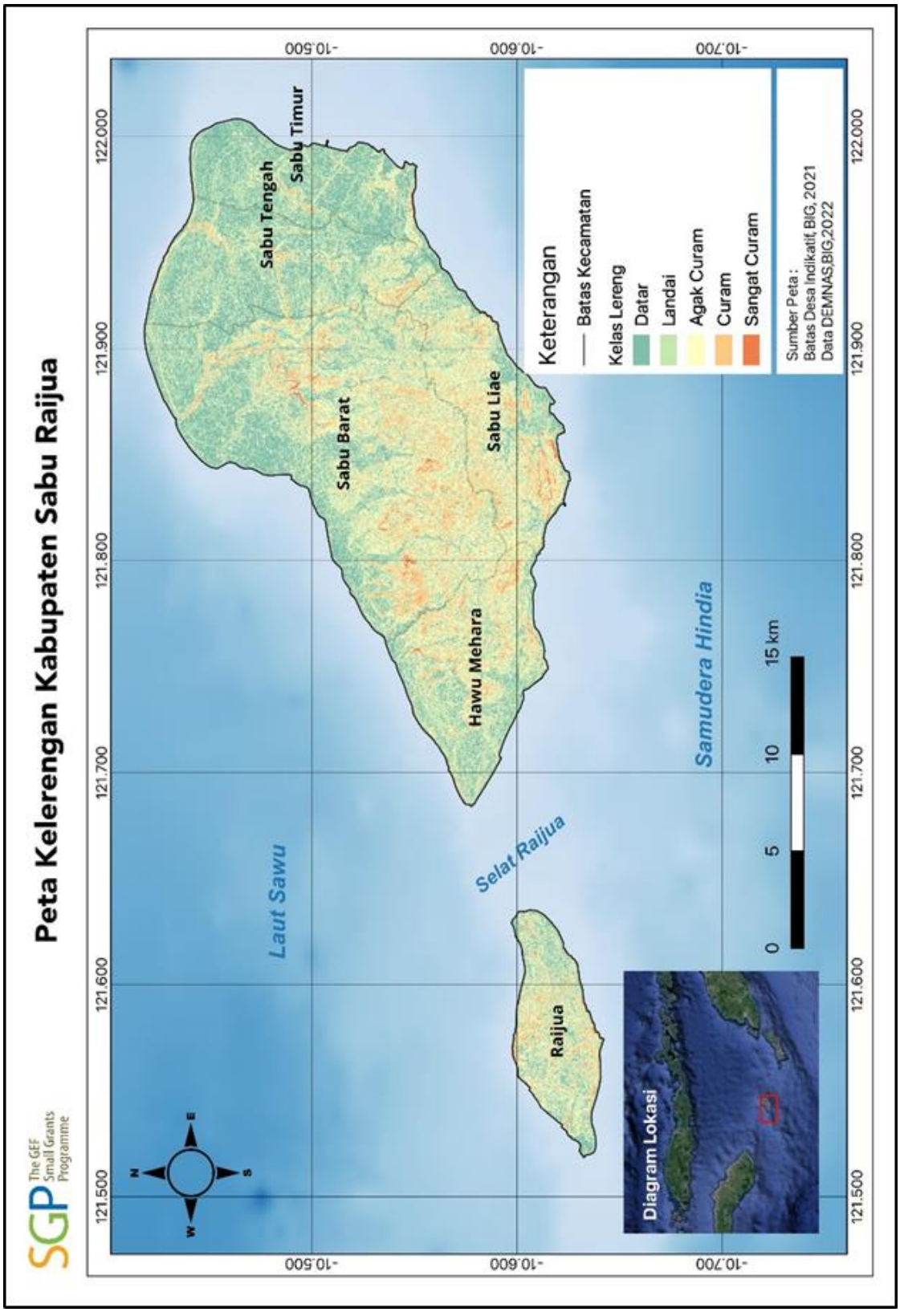
3. Landscape typology

Based on the degree of slope, most of the conditions in the Sabu Raijua area are classified as flat to sloping (Perdinanet.al., 2018). However, there are several areas that have steep to very steep slopes. Table 3. The slope map for the Sabu Raijua Regency area is presented in Figure 6. Based on the data and slope map, there are many areas with steep slopes in the West Sabu and Sabu Liae Districts. Meanwhile, the areas in Central Sabu and East Sabu Subdistricts tend to be flat.

Table 3: Area of slope in Sabu Raijua by District.

Subdistrict	Slope Class Area (Ha)				
	Flat (0-8%)	Ramps (8-15%)	Fairly Steep (15-25%)	Care (25-45%)	Sangat Curam (>45%)
Hawu Mehara	1.359,03	1.867,57	1.961,11	925,98	70,83
Raijua	865,83	1.164,08	1.155,09	535,71	64,43
Sabu Barat	4.706,58	5.280,75	5.278,66	2768,73	163,71
Sabu Liae	1.000,33	1.552,78	2.140,39	1170,52	91,44
Sabu Tengah	2.811,49	2.443,15	1.212,33	347,80	27,15
Sabu Timur	2.514,87	1.665,33	573,89	134,53	23,28

Figure 6. Map of the slopes of Sabu Raijua Regency



In general, the topography on Sabu Island is undulating. This condition creates additional costs for certain constructions in terms of physical development and other infrastructure. Conditions like this are found in almost all sub-districts in the Sabu Raijua Regency area. Topography like this causes physical isolation, economic isolation and social isolation, plus a lack of infrastructure support such as roads and bridges in various districts. Meanwhile, transportation to certain islands is often quite expensive due to the low frequency of transportation facilities to several islands, which of course also affects the prices of goods and services in the district (Perdinan, 2018).

The slope class aspect is one of the determining topographic factors related to the management of agricultural cultivation land which is the dominant sector in the community and regional economy in Sabu Raijua Regency. Apart from affecting the agricultural sector, topographical factors will also affect other land uses in the Sabu Raijua Regency area such as residential locations, office buildings and public facilities and infrastructure. The land cover map in Sabu Raijua Regency is presented in Figure 8.

Figure 7. The sun sets on the east side of Raijua Island

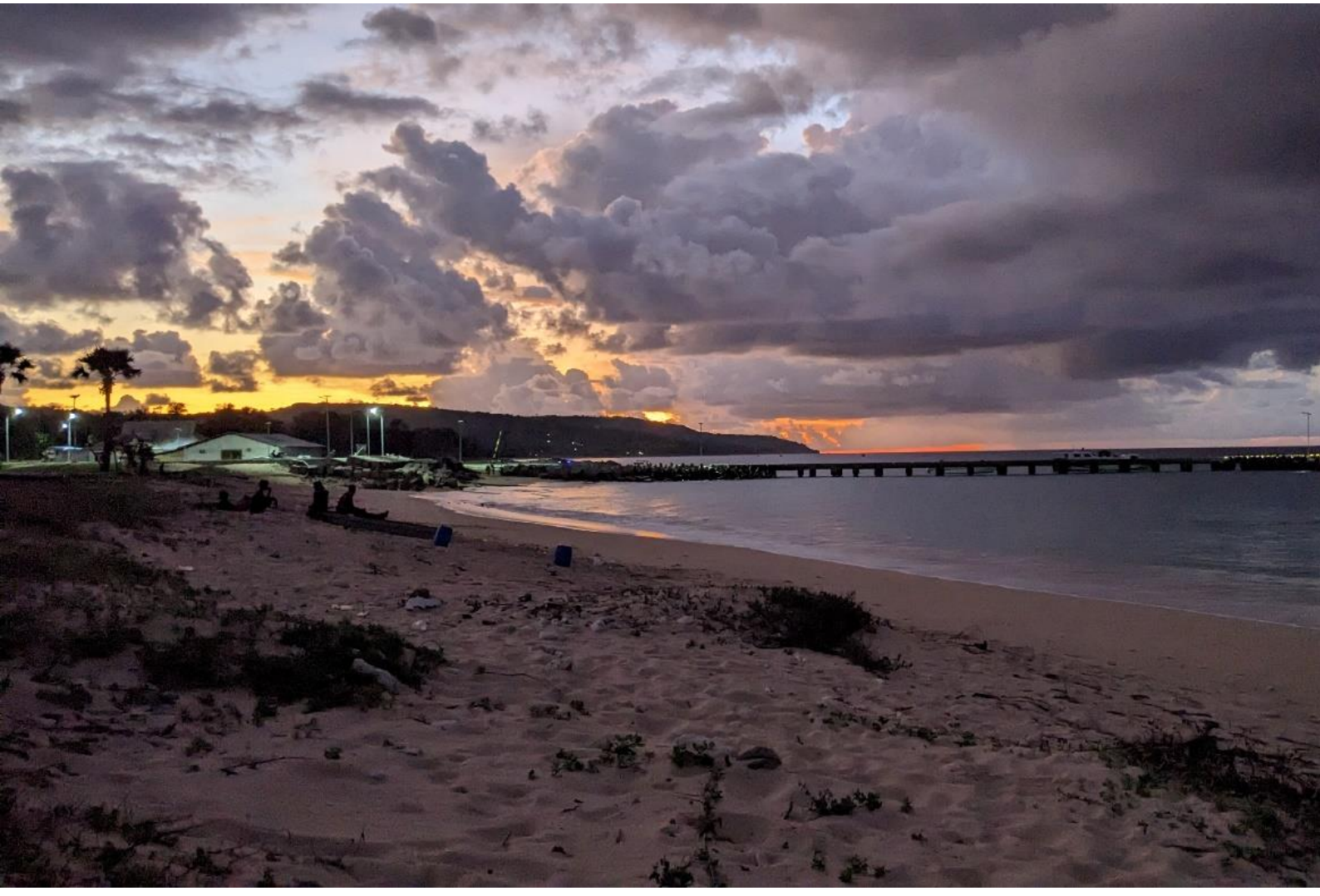
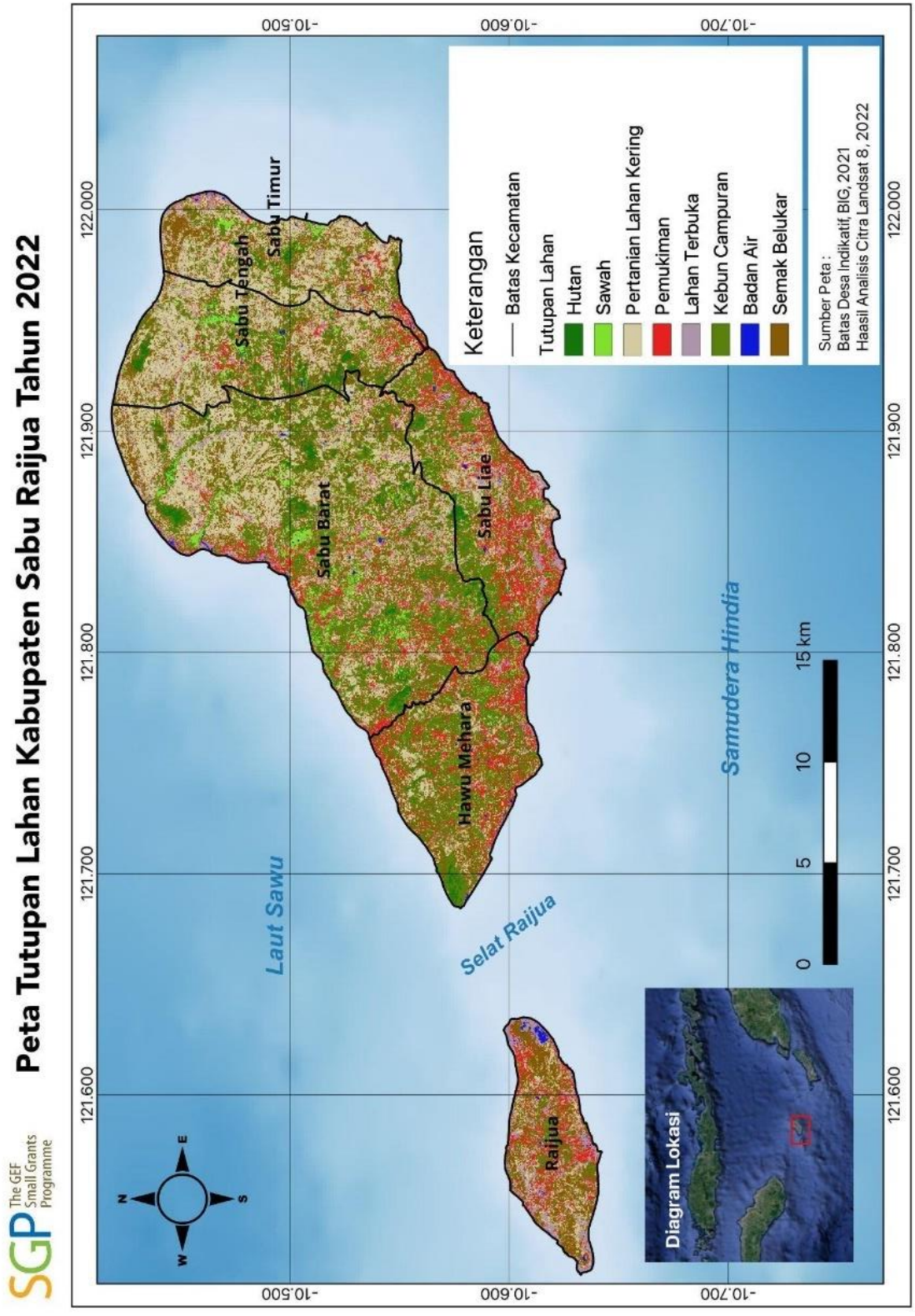


Figure 8. Land cover map in Sabu Raijua District



Climate can change continuously due to interactions between its components and external factors such as volcanic eruptions, variations in sunlight, and some factors caused by human activities such as changes in land use and use of fossil fuels. Climate change is a serious concern because of the consideration of the potential negative impacts that may be caused on various economic sectors. Some of the impacts caused by climate change include high rainfall, prolonged dry seasons, increased water volume due to melting ice at the poles, occurrence of natural wind disasters. tornadoes and reduced water resources. The agriculture and water resources sectors are two sectors that are sensitive to the impacts of climate change.

The dominant soil types in Sabu Raijua Regency are Alluvial Grumosol, Litosol and Mediterranean with fine to coarse soil textures. Apart from that, there are also limestone mountains that stretch along the Sabu Raijua Regency area.

C. Climate and Weather and Their Effects on Land/Water Cover

The climate observation station in Sabu Raijua Regency is located on Sabu Island, namely the Tardamu Sabu observation station. The general observation results show that the rainy season in Sabu Raijua Regency lasts for 4 months (December-March), while the dry season lasts for 8 months (April-November). One of the factors that affect rainfall variability is the ENSO phenomenon. ENSO or El Nino-Southern Oscillation is a sea-atmospheric phenomenon that occurs periodically and irregularly involving surface temperatures in the northeastern Pacific Ocean, and affects most of the tropical and subtropical regions.[12] In Indonesia, the ENSO phenomenon is known as El Nino and La Nina events. During El Nino, various regions in Indonesia will experience lower rainfall, while during La Nina events various regions in Indonesia will experience high rainfall. Shorter rainy seasons and longer dry seasons are projected to occur in various regions in Indonesia which will eventually increase the frequency of floods and droughts.

Table 4: Average monthly temperature in Sabu Raijua Regency

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Agt	Sep	Okt	Nov	Des
2022	28.7	28.3	28.7	29.0	28.7	28.7	26.8	27.8	28.5	29.2	28.7	28.9
2020	29.4	29.7	29.4	29.5	29.0	28.1	27.5	27.8	29.0	29.6	30.7	28.6
2019	28.6	29.0	28.7	28.8	28.5	27.2	26.7	26.8	27.5	28.9	29.8	30.3
2017	29.1	28.2	28.2	28.7	28.7	27.7	27.6	27.8	28.3	29.6	29.6	28.5

Sumber: Data Cuaca Stasiun Cuaca Tardamu (Tutempo.net)

In Sabu Raijua Regency, the peak of the rainy season occurs in January. Sabu Raijua Regency has an annual rainfall ranging from 85-100 mm. The lowest distribution of rainfall is in Raijua District and the highest distribution of rainfall is in West Sabu and Central Sabu Districts. The lowest rainfall occurs in June, July and August while the highest rainfall occurs in December, January and February. The average air temperature in Sabu Raijua Regency for one year ranges from 25.1-26.60C with a dominant temperature of around 260C. The distribution of air temperature in each district is different. Coastal areas that are on the edge of the island tend to have relatively high temperatures compared to areas that are in the middle of the island. East Sabu District has the highest average temperature,

[12] https://maritim.bmkg.go.id/glossaries/64/El-Ni%C3%B1o-Southern-Oscillation-ENSO

while the lowest average air temperature is mostly in the West Sabu District area. This is thought to be related to land cover, especially vegetation cover in West Sabu District which is wider than other areas (Figure 8).

Table 5: Monthly rainfall in Sabu Raijua Regency

Month	Monthly Rainfall(mm)			
	2022	2020	2019	2017
Januari	134,36	152,39	259,59	100,60
Februari	289,07	74,17	67,30	146,06
Maret	162,55	33,02	240,80	205,98
April	10,67	43,43	63,23	80,77
Mei	28,20	18,29	7,61	6,10
Juni	17,02	3,05	0,00	2,03
Juli	2,03	0,00	0,00	1,02
Agustus	0,00	0,00	0,00	0,00
September	5,08	0,00	0,00	0,00
Oktober	116,34	6,09	0,00	4,82
November	309,13	105,16	19,30	63,75
Desember	136,40	421,40	164,60	156,21

Sumber: Data Cuaca Stasiun Cuaca Tardamu (Tutempo.net)

Information on rainy days can be used as a reference for the planting season in Sabu Raijua Regency. The planting season in Sabu Raijua Regency usually starts around December and January to April, when the rainy season starts. During the rainy season, the average rainy day reaches 14 days. The dry season in Sabu Raijua Regency occurs in August, where the average rainy day in the dry season is only about 2 days. The recommended types of plants are the use of plant types and varieties that are more resistant to dry conditions or lack of water. Seasonal crops grown in Sabu Raijua Regency include rice, corn and sorghum. While the types of annual crops that are widely planted are mango, coconut, palm and areca nut.

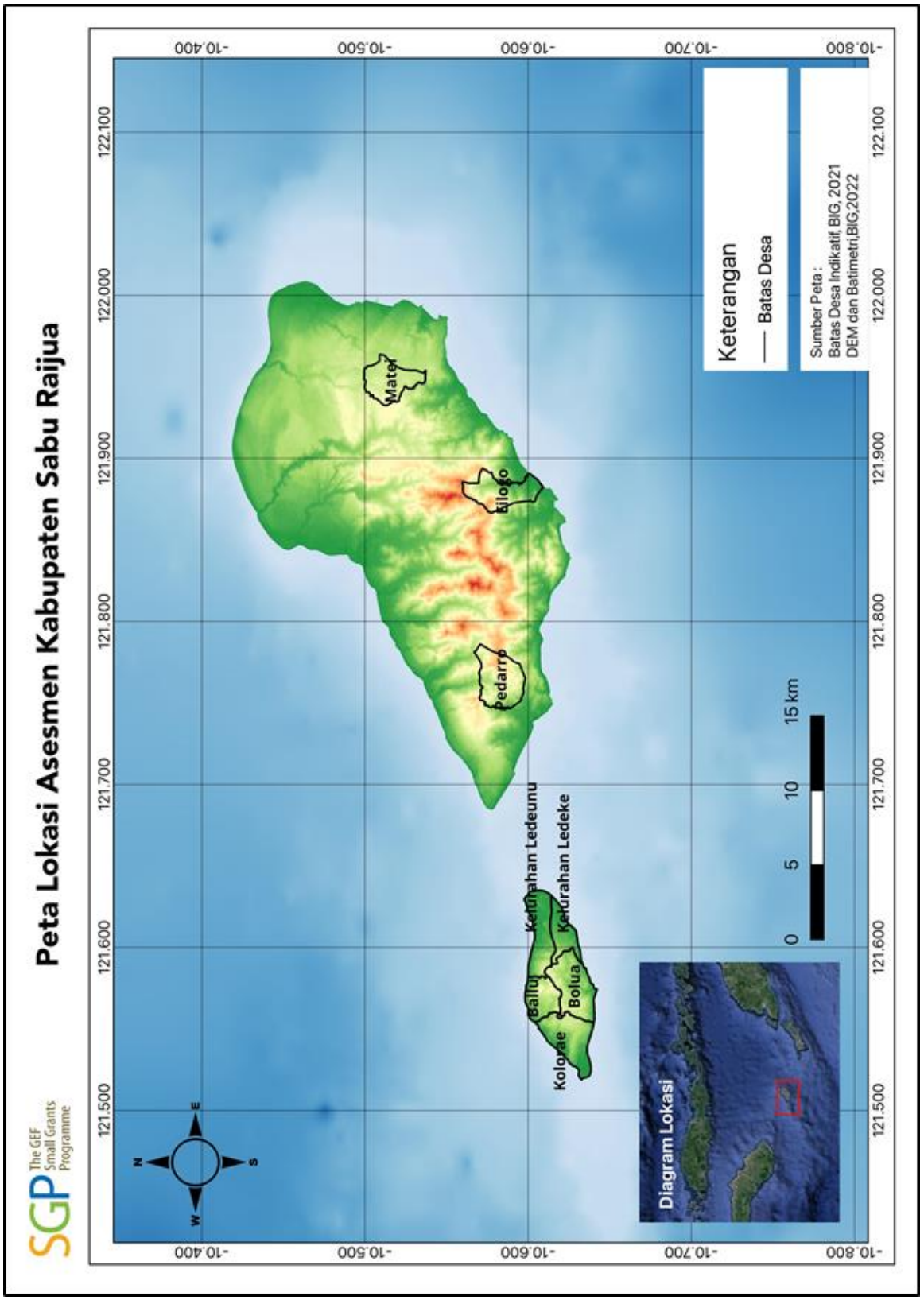
The impact of climate change affects various sectors in Sabu Raijua Regency. The most felt problems are mainly in the areas of water resources, agriculture and industry (salt and seaweed). In the field of water resources, the problem of water availability is a major problem. Limited rainfall conditions are not sufficient for domestic water needs. The uncertainty of information on water availability and best time to plant crops is a major problem in agriculture. Local wisdom factors for planting time need to be collaborated with information from BMKG. In the salt and seaweed industry, the problem is the condition of rainy days and the length of irradiation. Drier conditions are positive for the salt and seaweed industries..

Figure 9. Decommissioned salt ponds on Raijua Island. This government-owned salt processing factory was damaged by the Seroja storm, so far there has been no repair.

D. Baseline Survey Location

The location of the Baseline Survey was determined based on the characteristics of the villages on the island of Savu which still adhere to their customs, the majority grow family staple food from gardens and have traditional weaving skills with natural dyes, namely Eilogo Village, Mate'i Village and Pederro Village (Figure 10). In addition, the village of Eilogo also borders the Sabu protected forest area (Figure 10). For Raijua Island, the chosen location was Ballu Village, which is a village on the coast where the majority of the people cultivate seaweed and catch fish.

Figure 10. Baseline survey location map in Sabu Raijua District

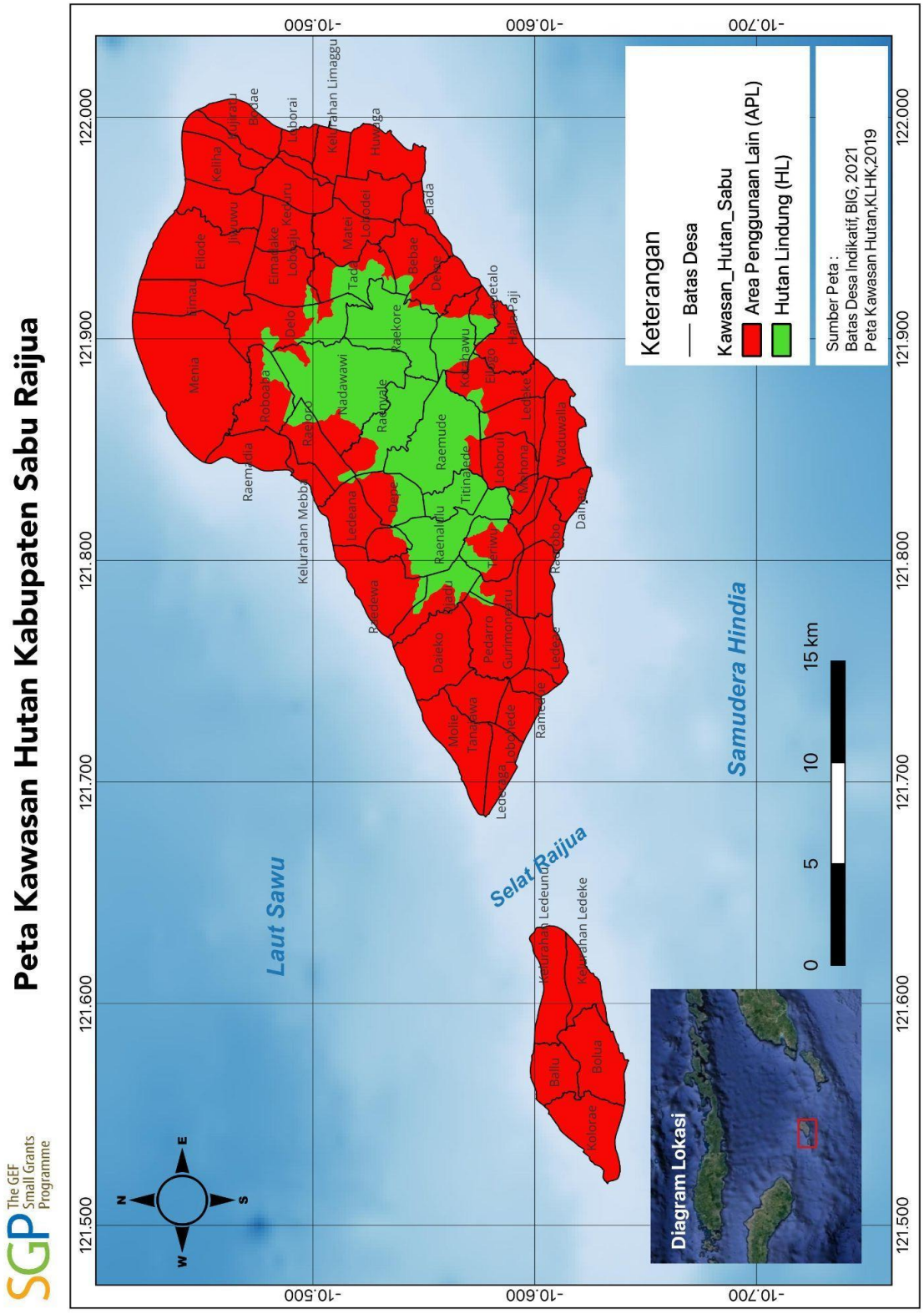


1. Functions of Forest Areas in Village Areas

An overview of forest areas in Sabu Raijua Regency was obtained from a forest area map sourced from the 2019 KLHK forest area map (Figure 12). The function of the forest area on Sabu Island is a protected forest. The overlay between the map of the forest area and the boundaries of the village area is intended to find out how much forest area is included in a certain village area and how it is managed..

Figure 11. Semi-arid forest on Sabu Island

Figure 12. Map of protected forest in Sabu Raijua District



The area of the forest area included in the village area that became the baseline survey location is presented in table 6. The four villages that became the baseline survey location are part of the APL (Other Used Area) and HL (Protected Forest) areas, except for Ballu Village on Raijua Island which does not have a Protected Forest area. Pedarro Village in Hawu Mehara Subdistrict has the largest area that is included in the APL forest area while the village area that is the largest in the Protected Forest area (HL) is Eilogo Village. In Eilogo Village, most of the people know that part of their village is included in a protected forest area. Based on information from the community, the management of protected forests in their village area is not strict and customary sanctions related to protected forests have faded. There are black wood trees in the protected forest area of Eilogo Village.

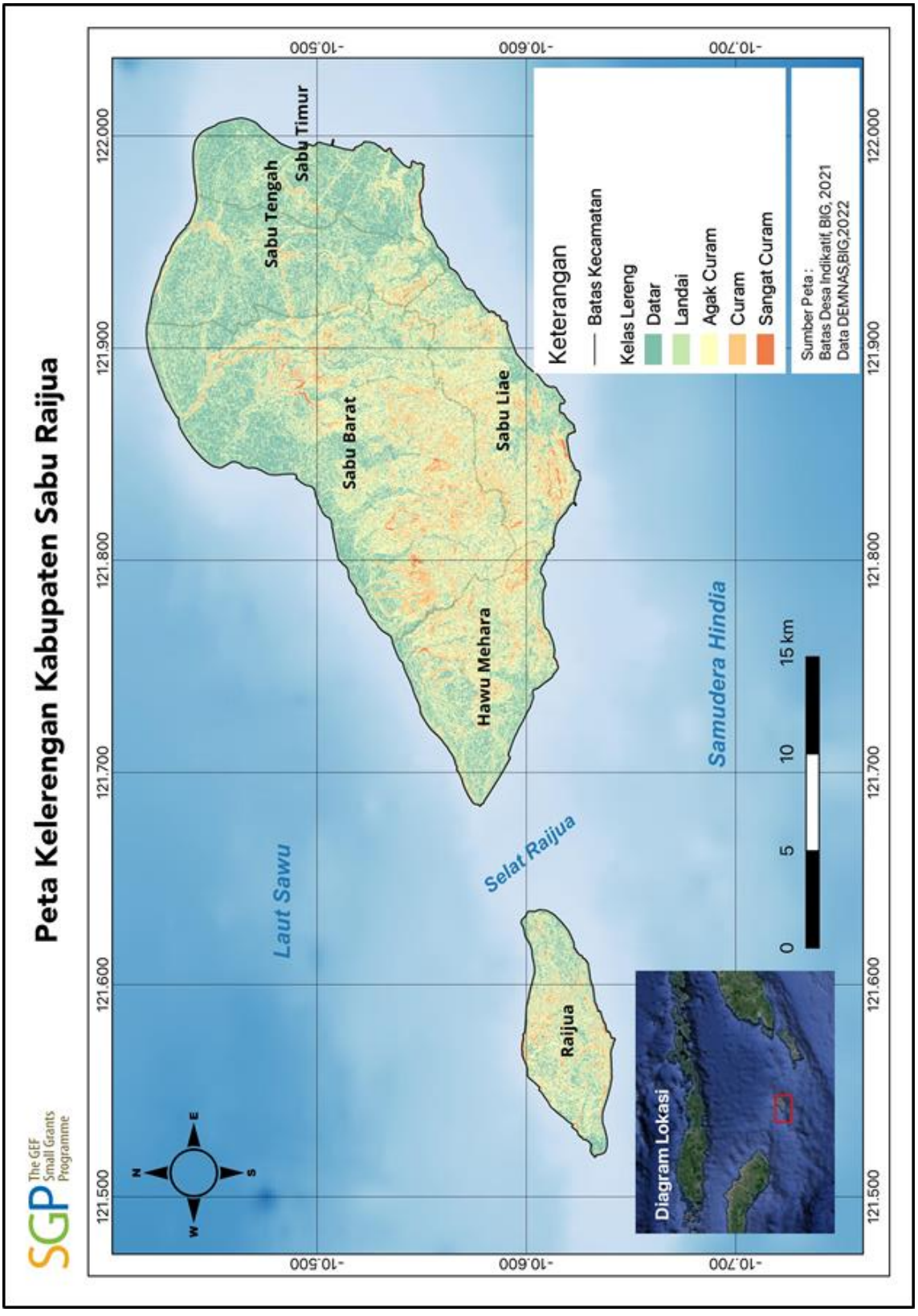
Table 6. Forest area in the baseline survey location

Village Name	Forest Area (Ha)	
	APL	HL
Pedarro	983.45	22.77
Eilogo	779.42	65.08
Matei	786.47	0.05
Ballu	577.59	

2. Altitude and Slope

The slope map of Sabu Raijua Regency was obtained from the National Digital Elevation Model, BIG 2022 data (Figure 13). Based on the slope data, Sabu Raijua Regency has varying degrees of slope, ranging from flat (0-8%) to very steep (>45%). Based on the data on the map, there are many flat and sloping areas in the Central and East Savu regions. Meanwhile, there are many areas that are quite steep to very steep in the West Sabu and Hawu Mehara regions.

Figure 13. Map of the slopes of Sabu Raijua Regency



Slope level data in the baseline survey location villages are presented in table 7. The topography of Pedarro, Eilogo and Ballu Villages is dominated by areas with rather steep slopes (15-25%) with area percentages of 41.5%, 40.4, respectively % and 34.1%. Meanwhile, the topography of the Matei Village area is dominated by flat slopes with an area percentage of 42.4%.

Table 7: Slope area at the baseline survey location

Village Name	Area (Ha)				
	Flat (0-8%)	Ramps (8-15%)	Fairly Steep (15-25%)	Care (25-45%)	Sangat Curam (>45%)
Pedarro	110.71	266.61	417.66	203.12	8.12
Eilogo	117.42	198.34	340.39	180.32	6.53
Matei	333.39	298.95	129.58	24.07	0.52
Ballu	98.02	165.95	195.87	101.99	12.31

3. Land Cover and Its Changes

The description of land cover and land use in Sabu Raijua Regency was obtained based on the supervised classification analysis method from Sentinel-2a satellite imagery data for 2023 (Figure 15). The classification results obtained eight types of land cover, namely forest, paddy fields, dry land agriculture, settlements, open land, mixed gardens, water bodies and shrubs.

Figure 14. Lontar, corn and sorghum fields, as well as the homes of the Savunese people

Figure 15. Land cover map in Sabu Raijua District

The area of land cover types based on the classification results at the baseline survey locations is presented in Table 8. Based on the land cover area data, the area of shrubs dominates in almost every village. Shrubs are land with shrubs that have low-growing woody stems and are less productive land. Productive agricultural land in each village is dry land farming, mixed gardens and paddy fields. Based on the land cover map in Figure 12, there is a correlation between the position of paddy fields and water bodies. Where the existence of rice fields will be adjacent to a body of water. The presence of water is very important in the processing of rice fields.

Table 8: Land cover area at the baseline survey location

Village Name	Area (Ha)							
	Forest	Ricefield	Dryland farming	Settlement	Open field	Mixed Garden	Water body	Check the Bushes
Pedarro	21.25	84.57	218.10	29.63	31.55	256.16	11.74	353.23
Eilogo	12.74	83.15	118.04	30.28	35.67	115.64	11.39	437.45
Matei	1.08	66.09	254.70	18.47	34.61	39.97	2.70	368.90
Ballu	1.29	56.45	151.67	23.36	37.62	74.09	2.08	230.64

The condition of land cover in an area tends to change dynamically based on time. Changes in land cover in Sabu Raijua Regency in the period 1990 - 2022 are presented in Figure 17. While changes in the area of each type of land cover are presented in Figure 17. Based on the graph in Figure 18, there were fluctuations in changes in the area of dry land agriculture, where in 1999 there was an addition the area of dryland agriculture from 1990. After that the area of dryland agriculture decreased in 2009 and increased again in 2022. Meanwhile the area of paddy fields tended to decrease in area from 1990-2022.

Figure 16. One form of paddy rice farming on Sabu Island

Figure 17. Land cover change map in Sabu Raijua District

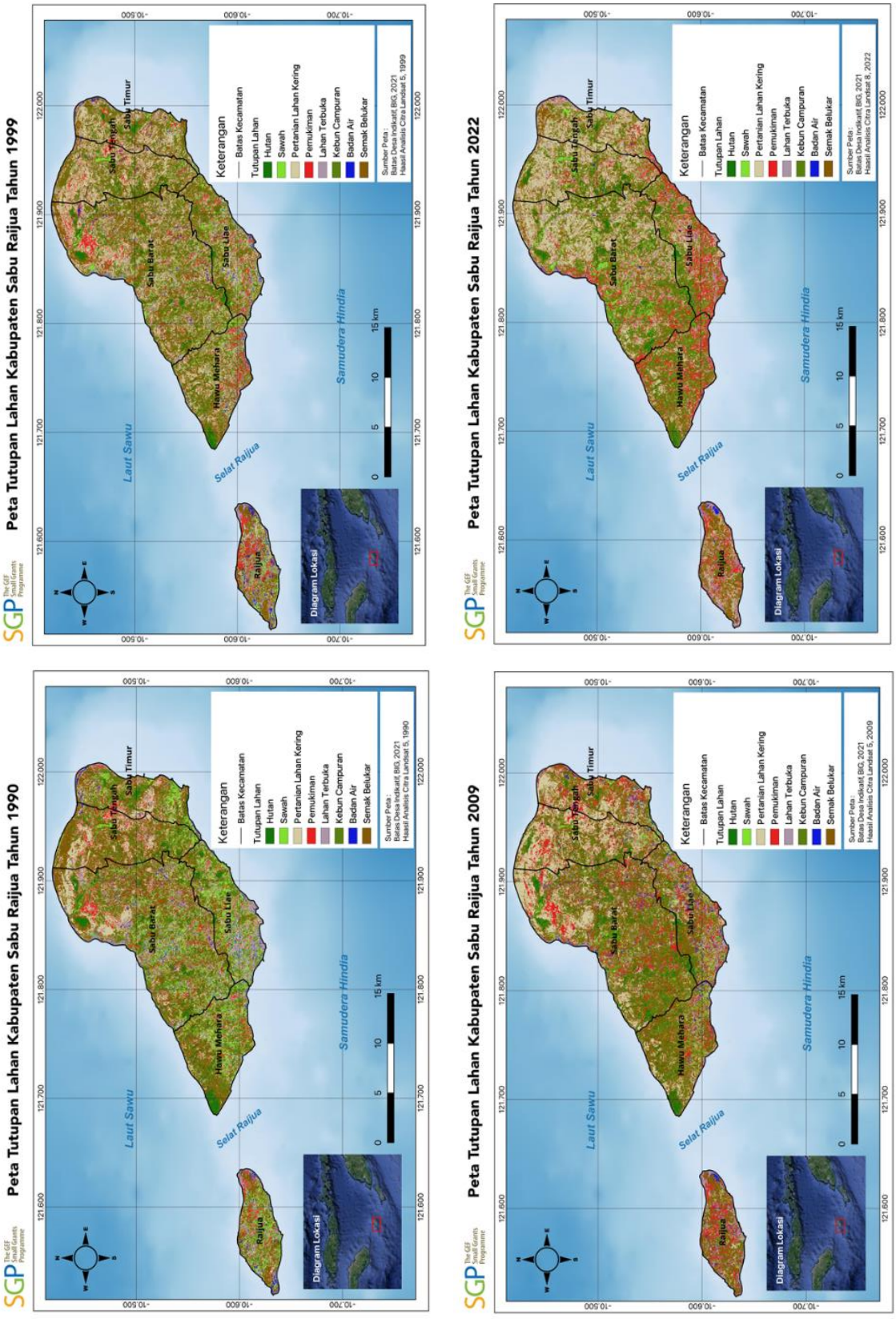
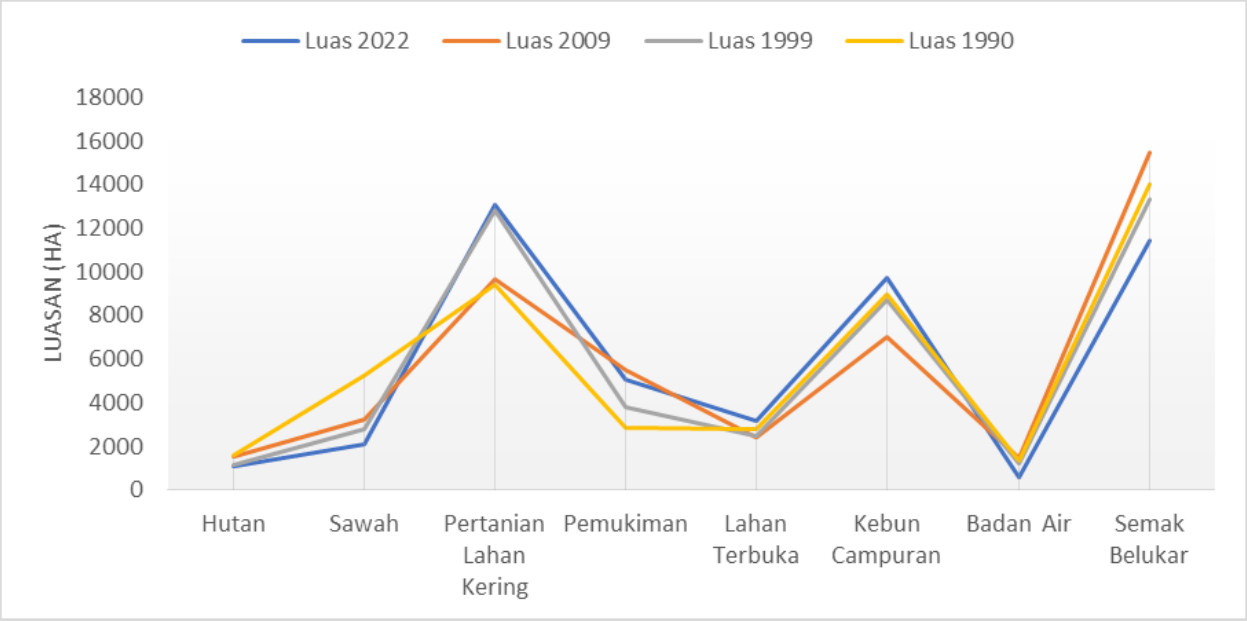


Figure 18. Changes in land cover area over time



Carbon storage in each land cover is calculated using the reference carbon stock in each land cover according to Tosiani (2015)[13]. Settlements, open land and water bodies are not included in the carbon storage calculation. Based on the reference above, carbon storage in each region is as follows:

Table 9: Land-based carbon storage in each land cover.

Rata-rata Cadangan Karbon (ton/ha)	Land Cover					Quantity (tons)
	Forest	Ricefield	Dryland farming	Mixed Garden	Check the Bushes	
	98,84	2,00	10,00	30,00		
Hawu Mehara	16.003,48	984,73	10.459,59	43.308,90	76.219,50	146.976,20
Raijua	1.200,02	526,85	10.543,58	10.397,88	44.895,60	67.563,93
Sabu Barat	51.129,93	3.403,30	35.419,16	114.543,45	214.820,37	419.316,21
Sabu Liae	15.619,39	1.227,67	10.313,62	28.965,42	75.115,26	131.241,36
Sabu Tengah	12.378,52	1.006,81	17.361,62	21.354,24	97.492,89	149.594,08
Sabu Timur	4.703,30	546,60	14.914,75	10.393,56	66.624,84	97.183,05

[13] Tosiani, Anna. 2015. Carbon Absorption and Emission Activity Book. Directorate of Inventory and Monitoring of Forest Resources Directorate General of Forestry Planning and Environmental Management Ministry of Environment and Forestry

4. Social and Economic Conditions

Sabu Raijua became a Regency in 2008. Previously this area was part of Kupang Regency. The Sabu people call themselves Do Hawu, while the island is called Rai Hawu. Hawu is taken from the name Hawu Ga, one of the first people to come to Sabu. After that the name Hawu became Savu due to the arrival of the Portuguese and the Dutch, then it is now known as Sawu or Sabu. Most of the people of Sabu Raijua have embraced Christianity, however, the tradition of the Jingitiu belief is still carried out by most of the people. There is a customary calendar that is used to determine planting times, traditional ceremonies and living conditions related to customs. Jingitiu belief means believing that everything in Rai Wawa or the underworld in the form of humans, sky, plants, sea, animals and earth indirectly comes from God or a Divine Substance called Deo Ama which means God the Father (Soowai, 2021: 42).

To regulate life in the world, the Sabu tribe has a Customary Council which presides over most of the traditional ceremonies and determines the applicable Uku, called the Mone Ama Council. Uku is a custom. There are several that are currently relevant to the life of the Sabu people, namely: Deo Rai, namely the Traditional Head who holds the highest role in Mone Ama and is responsible for leading all traditional ceremonial activities and activities in the rainy season; Pulodo Wadu is responsible for maintaining the Uku of the Sabu tribe, responsible for dry season activities and maintaining soil fertility; Do Heleo is responsible for overseeing the entire Sabu tribal area.

The kinship system of society is dominated by the male lineage. The sub-tribes that controlled the land bequeathed the land only to male descendants. In some places these lands have become private property and can be traded. However, if the status is tribal land, then there are only utilization rights. Often the utilization is also carried out by people from other tribes, after obtaining permission from the elected tribal chief, and there is a kind of tax that must be deposited for each harvest. However, at present, there is potential for conflict in the recognition of land tenure, because many of the descendants of tribal chiefs live outside Sabu Raijua. However, the kinship ties of the people of Sabu Raijua are very strong. This also causes, at a certain level, based on information, it is difficult for the community to set up businesses such as food stalls or kiosks, because if a family owes money, it will be inconvenient to collect. However, in reality there are also a small number of people who are successful in business, but usually they are still related to the families of the landlords from the big tribes.

Figure 19. A woman in Pedarro village is seen weaving cloth under her house. This woven fabric is a source of income for the people of Sabu Raijua. One sheet of woven cloth can cost IDR 500,000 - IDR 750,000, this price will be even higher if you use natural dyes.

Sabu Raijua Regency has several products from agriculture, plantations and the sea coast. However, what is very significant is the seaweed, which appeared in the early 2000s. Seaweed cultivation used to be the backbone of the Sabu Raijua people's economy, but in the last 5 years seaweed production has greatly decreased due to disease called ice-ice which have not resolved yet. Seaweed seeds have just been imported from the islands of Rote and Sumba, but they still cannot be cultivated optimally due to another disease. Apart from seaweed, most of the community's fish production is eaten alone as a side dish. Sabu Raijua fishermen do not have modern fishing methods or ships that can sail more than 3 kilometers to produce large volumes of fish catch. While most of the agricultural products are eaten, except for some commodities with economic value, such as shallots, peanuts. Plantation products that are quite high in number are coconuts, bananas, cashews and several types of fruit. Savu sugar is also a typical product of Sabu which is often sold to Kupang, Sumba and Sulawesi. In addition to products from nature, many Savu women have weaving skills. They weave every day except during planting and harvesting seasons or during traditional events. Usually the money from the sale of cloth is used for living expenses in the dry season, because there is nothing to plant in the garden.

One of the burdens for the economy of the people in Sabu Raijua is the high cost of living because almost all the products used by the people come from outside the island, so the prices there are much higher. As an illustration, pertalite gasoline is sold for 25,000 rupiah per 1.5 liter (a large bottle of mineral water) by retail sellers because official gas stations are not always open. This price is still considered normal. When the price had reached 60,000 rupiah per 1.5 liter, people still bought it because it was necessary. In addition, family financial management in Sabu Raijua is challenged by gambling activities, both cockfights and dice. This cockfighting gamble originates from the Tali Manu Dabba tradition, the cockfighting ceremony which is carried out 2 days according to the traditional calendar. This ceremony is to replace the war between tribes that used to take place. However, it seems that many Savu and Raijua men are already obsessed with this activity and risk a number of small to large amounts of money. Therefore, one way for some families to survive is to divide the income per person. So if there is a family doing seaweed cultivation, then the income will be divided per person who works, not the family. For example, father, mother, teenagers each holding the money separately. That way if the men take part in a cockfight and lose, moms will still have money for daily expenses.

Table 10: Production of Fruits, Vegetables and Plantation in Sabu Raijua Regency in Kwintals

Plant Type	2020	2021
Mango	304	
Banana	142	142
Pawpaw	566	
Coconut	8.070	
betel nut	470	
Cashew nut	2.700	
Lontar (possibly Shabu sugar)	279	

Sumber: Diolah dari Kabupaten Sabu Raijua dalam Angka 2022

Table 11: Production of Marine Fisheries in Sabu Raijua Regency in Tons

Type of Fish	2020
Flying fish	201,09
Tembang fish (fringe scale sardines)	109,62
Escaping fish (bluestripe snapper)	88,15
Flying fish (scads)	71,00
Nipi fish	140,70
White snapper (barramundi)	118,10
Giant trevally fish	94,64
Groupers	89,34
Seaweed	11.985.379,00

Sumber: Diolah dari Kabupaten Sabu Raijua Dalam Angka 2022

II. Situation Analysis

A. Initial Assessment

1. Sabu Island

Sabu Island is the largest island on the mainland of Sabu Raijua Regency besides two other islands namely Raijua Island and Dana Island. The capital of Sabu Raijua Regency is located on Sabu Island, precisely in Meina. On the north, east and west sides, Sabu Raijua Regency is directly adjacent to the Savu Sea and to the south by the Indian Ocean. Sabu Island is divided into five districts, namely: West Sabu, East Sabu, Central Sabu, Sabu Liae, and Hawu Mehara. Based on the existing sub-districts, it is further divided into 55 villages, 5 sub-districts, 229 hamlets, 453 neighborhood associations (RW) and 858 neighborhood associations (RT). Based on the characteristics of the villages on the island of Savu which still adhere to their customs, the majority grow family staple food from gardens and have traditional weaving skills with natural dyes, three villages were selected as the baseline survey locations, namely: Pedarro, Eilogo and Matei Villages.

Figure 20. Sabu Island Beach Area

Figure 21. Illustration of Productive Agricultural Land with Irrigation in Sabu Raijua

The topological condition of Sabu Island is mostly undulating with varying degrees of slope ranging from flat to very steep. Based on the land use cover map, agriculture on Sabu Island is dry agricultural land and mixed gardens and a small part of it in some areas has paddy fields. On Sabu Island there is a forest area consisting of Protected Forest (HL) and Other Use Areas (APL). There are several villages that are included in a protected forest area or some of their village areas are included in a protected forest area. Apart from agriculture, on Sabu Island there are coastal villages whose livelihoods are fishermen and seaweed cultivators.

Based on the results of the assessment using resilience indicatorsSocio-Ecological Production Landscapes and Seascapes (SEPLS) (Table 12), on the aspect of diversity and protection of landscape and seascape ecosystems (category I), Sabu Island is included in the medium category with no changing trend. This indicates that the diversity of landscapes and protected areas in Savu is not too great, and from the past until now there have been no significant changes. However, in the village of Eilogo there is information that there are several areas in the sea that are protected, namely at several points of the coral reefs: Loboae, Loboliwu, Haiae are routinely closed for 1 month, starting on 7 days after the full moon in February. Meanwhile, according to the community, the forest in Eilogo Village has never been cut down because it belongs to a certain tribe. If needed, they can take dead trees, for example to build a house. It seems that the status of the state forest area is not really recognized by the community. However, because the forest belongs to the tribe according to custom, it is maintained.

In the aspect of biodiversity, Sabu Island is included in the moderate category with no changing trend. The community considers plant biodiversity in Savu to be moderate, including agricultural diversity, with a steady trend. If there are changes, the changes are small so they are not too significant. Most of the Savunese People in the mainland are farmers, both men and women. Commodities grown for staple food are sorghum, green beans, corn, bananas, cassava, sweet potatoes, pumpkin and coconut. Bulbs that grow wild in the forest/garden and are now starting to be hard to come by arekerogohiwu, a large tuber with a unique shape. In addition, lontar, which grows naturally throughout the island, is a plant that is very important for the diet of the Savunese people. Sabu sugar, which is produced from palm sap, is an important staple food for the Savunese people, and is a helper during the long dry season.

Figure 22. A sorghum orchard between the lontar trees in front of the Pedarro residents' houses.

For sorghum, there are several types such as white (terrai pudi), red, black, and yellow. Sorghum in Savu is only planted during the rainy season. Sorghum planting time is around 4-5 months and it can be stored for years. Sorghum has been the staple food of the Savunese people for a long time and began to shift to rice when rice was planted and then rice was easy to obtain, especially when it was massively brought to Sabu Island by Bugis (Makassar) and Kupang traders. However, in Pederro and Eilogo villages, sorghum and peanuts are still grown by the community and used as staple food alternately with rice. For large livestock, the Savunese people have buffalo, cows and horses. Meanwhile small livestock such as sheep, goats, pigs and poultry. Sabu's native livestock are buffalo and goats. Therefore, usually goats are used as animals that are slaughtered when there are traditional rituals.

Table 12: SEPLS assessment results for the Sabu Island baseline survey location

Category	Mark	Trend				Conclusion
		No changes	Decrease	Increased	No value	
I	2.88	18	2	4	8	moderate, trending Unchanged
II	3.56	9	3	3	9	moderate, trending Unchanged
III	2.29	13	6	2	11	low, trending Unchanged
IV	3.04	14	4	0	14	moderate, trending Unchanged
V	2.43	11	3	8	18	low, trending Unchanged

Information:

Category I : Diversity and protection of landscape and seascape ecosystems
Category II : Biodiversity (including agricultural biodiversity)
Category III : Knowledge and Innovation
Category IV : Governance and social equity
Category V : Livelihoods and well-being

Local knowledge on Savu should have a high value because some areas still adhere to traditions. However, what the team found was that there was a gap in knowledge between men and women, as well as between traditional leaders and ordinary people. The SEPLS rating given is low, with a steady trend. With the customary council, the community is used to following the rules, from planting season to harvest. Very few people can explain how the planting season is determined because this is the authority of Deo Rai. If anyone can explain, then usually he is a person with a fairly high position such as the head of the village. The women they met were unable to tell at all about determining the planting season, natural signs that are usually known by farmers. It is not yet certain whether there really is an enormous gap in knowledge between traditional administrators and ordinary people, or between men and women, or for matters that fall under Deo Rai's authority that women feel it is inappropriate to talk about it. The calculation of when Deo Rai usually determines the planting season differs from several people. Meanwhile, Deo Rai (in Eilogo) is difficult to communicate with due to the language barrier. According to references[14] communication between land and sea creatures greatly influences the determination of planting time rituals and closing the sea, because it must be regulated so that they do not interfere with each other. For example, when it rains on the first day, you have to wait until it rains on the 9th day to start doing the ritual so that all pests and disturbances that will attack the plants have been gone. Closing the sea, for example, is done when green beans start to flower, so that whatever is in the sea would not crawl up to the garden. However, not all villages still perform rituals. Mate'i Village, which is located in Central Sabu, has not performed a ritual led by Deo Rai for a long time, because it is too far from the Ritual (Adat) House. Previously Central Sabu is part of East Sabu. The people in Mate'i only rely on rain. If it starts to rain, they start planting. As simple as that.

Knowledge of weaving motifs is also not always available to female weavers. Most of them are only able to make motifs that have been taught by their mothers. But has no knowledge of the story behind that motive.

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[14] Sooai, Ivana P., Syifa Naufal Qisty, Jingitiu Religion and Belief System in Sabu Raijua Regency, 2021, Tornare - Journal of Sustainable Tourism Research, Vol 3 No. 1, Master of Communication Science, Padjadjaran University, Bandung

Figure 23. Rice being harvested in Mate'i Village, Central Sabu.

Innovations for agriculture as well as fishing and seaweed cultivation are almost non-existent. Farmers have known chemical fertilizers for a long time but are too expensive to be purchased by the public. Meanwhile, weed-killing herbicides just entered in 2018. The use of these herbicides has actually affected the tradition of cleaning up gardens, which is usually done collectively during the preparation for the planting season. The desire for innovation also seems low, because people tend to be resigned. The results of the SEPLS assessment on the aspects of governance and social equality are moderate with no change in trend. Men and women farmers used to go to the fields together on foot. If the farm is far away, they walk for about 1-2 hours and bring food from home. They work together from clearing the fields, planting, tending to harvesting. It is suspected that the people of Savu began to recognize rice since Sabu Island came under the rule of the Majapahit Kingdom in the 14th - 15th centuries, Sabu farmers planted rice. Hybrid rice and field rice are planted. There is a rice variety that has disappeared, namely black rice (are ku'u) which is long-lived, according to local residents, it was last planted in the 1970s. Most of the agricultural products are for self-consumption, which are sold including cashew nuts and crystal methamphetamine (palm sugar). Apart from farming, they also raise livestock such as buffalo, sheep and goats.

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In general, water to irrigate agricultural land comes from rivers, ponds and springs. As for drinking and cooking needs are obtained from rivers and wells. Women are assisted by children who usually carry water from the river or well to their homes. Some residents who have wells have to dig very deep, even up to 20 meters and during the dry season, the well water remains dry. Only during the rainy season, the well has water.

Savunese People are attached to palm juice and crystal methamphetamine. Collecting palm tree water or known as iris tuak is done during the dry season, usually determined by Pulodo Wadu, customary elders for matters of dry season activities and agricultural soil fertility. The men do iris tuak and the women cook it for three hours in a wood-fired stove to become Savu sugar. Almost every family has a palm tree. Savu sugar is sold for IDR 130-150 thousand per jerry can. People consume Savu sugar mixed with water every day, even from infancy. They usually drink it in the morning and at night. During the day they eat solid food such as sorghum mixed with green beans, just like that without any other side dishes, or add moringa or sweet potato leaves.

Regarding aspects of government policy in terms of environmental governance, natural resources and climate change, the Government of Sabu Raijua Regency has carried out planning in the 2021-2026 Medium Term Development Plan, which includes green open spaces per unit area, Availability of Regional Regulations regarding Spatial Planning, Handling of arable land disputes through mediation, Regency Environmental Quality Index (IKLH), Increasing clean water and greenery in the Sabu Raijua area, Determination of MHA rights related to PPLH in the Region / Regency, Percentage of Waste Management. In 2023, policies related to the protection /conservation of water, forest and sea resources are included in the Second Priority, namely the development of infrastructure and transportation networks that connect between parts of the region and or centers of economic and tourism growth by taking into account Spatial Planning and Environment aspects with target of Increasing Sustainable Environmental Quality.

Commitment related to climate change is carried out through the establishment of the 2019-2021 Climate Change Adaptation Regional Action Plan as a direction for climate change adaptation action for various cross-regional OPDs. The Regional Action Plan - Climate Change Adaptation (RAD-API) which is expected to be the first step in harmonizing the development of Sabu Raijua Regency with controlling the negative impacts of climate change, which has a negative impact on various sectors of people's lives, such as water resources, as well as coastal resources, and agricultural resources.

The existence of a forest area in Sabu Raijua Regency, acknowledged by Bapelitbangda and the Environmental Service, there are still community lands that are included in the forest area. So that the Central Government's programs related to forest protection and rehabilitation in Sabu Raijua Regency, especially through planting saplings and reforesting forest areas, have not been maximized. Efforts to establish forest areas are in progress but have experienced some resistance from the community. This cannot be separated from the ethnic/custom-based land management model in Sabu Raijua.

The Savunese People are divided into tribes who still carry out their customary traditions. Each tribe is led by a tribal chief (Bengu'udu) and has a traditional house (ketita). Tribes own their own tribal lands with boundaries using ebony or other natural boundaries. Tribal land is managed by the tribal lord and management rights are conferred by the tribal lord based on lineage and given to men. Residents who do not own land, can rent land by paying using the harvest, for example, 10 sacks of harvest, then 1 sack is given to the owner of the land.

According to Riwu, P.F., Lattu, I.Y.M., and Pilakoanu, R.T. (2020) that the group of descendants of the Savunese People from the matrilineal line of two sisters is called hubi (meaning Palm tree flower). Big sister's lineage is named Hubi Ae while the little sister lineage is called Hubi Iki. Based on the old story told by the Savunese People, the division of the two groups was caused by a fight between the two sisters during a weaving competition, as a result, marriage between the two descendant groups was prohibited.

Savu women, such as those in the villages of Pedarro, Eilogo and other villages, have a tradition of weaving. Weaving knowledge is passed down from parents. Weaving motifs can clearly distinguish between women and men from both Hubi Ae and Hubi Iki groups. Apart from that, the color of the woven cloth also gives its own meaning, for example a lighter color symbolizes warmth, rectangles motifs in odd numbers as a marker of identification of Hubi Ae group. While darker colors symbolize coldness, circular motifs in even number indicates Hubi Iki. In addition, based on a mutual agreement, a motif called Worapi was also created. This motif is neutral, and can be used either by people from the lineage of brothers or sisters (Genevieve, 2009).

**Figure 24. Yarn being sun-dried after being soaked in dye.
Natural dyes are usually colorednavy & red, which comes from indigo leaves
(Indigofera dye) & noni root (Morinda citrifolia L).**

Weaver mothers who are old usually still use threads with natural dyes, while many young weavers use chemical dyes. Young weavers usually make woven ikat. To make woven cloth, on average it takes up to two months. Weaving results besides being used alone are also sold. The money from selling weaving is used to meet household needs such as buying rice, oil, soap, and others. Almost every day women weave except when there is a planting or harvesting season. Since the existence of smart phones, the young weavers started selling their weaving clothes online. In Raijua, the weaving motifs are different from Sabu weaving. There are only a few that retain the original motifs and in the sub-district town, there are already many woven motifs that follow the patterns from shop woven fabrics.

Most of the Savu women have never been involved in village-level deliberation forums. Several women who are representatives of the PKK and weaving groups have participated in the village Musrenbang (a village meeting to make village plan) and proposed budget to purchase yarns. The proposal was realized once and there was no continuation. Women who receive PKH assistance admit that they have been invited to meetings at the village office several times to discuss PKH issues. Most of the other female residents have never been invited to a village meeting and some were invited but did not attend.

The Eilogo Village Traditional House Complex does not yet have electricity, because it is located quite far from residential areas. The Deo Rai family who live there use kerosene lamps for lighting. Kerosene is bought for Rp 45 thousand per jerry can. If you entrust a motorcycle taxi, you have to pay Rp. 100,000 for a motorcycle taxi fee because the distance is quite far.

Ratings for Livelihoods and Welfare categories are low and the trend is steady. Most of the people of Sabu Raijua live a semi-subsistence life. Most of the garden plants are consumed by the family, the rest are just sold. Lucky if you have a coconut garden or other fruit plants. On Sabu, every family outside the city of Seba is usually active in making Sabu sugar. For people who live on the coast, there is the possibility of cultivating seaweed, apart from being able to catch fish. However, recently seaweed cultivation has also been abandoned due to disease. Other income is from wages as harvest workers or going abroad to work as palm wine slicing workers, such as to Sumba. In addition, the production of methamphetamine sugar can be used as a fermented drink such as sopi which can be sold more easily at a higher price. The young generation of Sabu Raijua rarely still wants to slice palm wine. The reason is because it is difficult and afraid of falling.

Figure 25. Sorghum and mung bean are ground as a source of daily carbohydrates for the Savabu people.

For health facilities and markets, although they are still very simple and some villages are still relatively far away, they already exist. Even though the market building exists, it is inferior to the attractiveness of the shocked market which is usually held in conjunction with cockfighting gambling activities. Schools also exist, at least at the junior high school level, but from a number of villages, school locations are still considered very far away. Especially if school children have to walk to get to school. Electricity can also be enjoyed in all villages on Sabu, except in huts built for seaweed cultivation and far from settlements. Roads for motorized vehicle access have also connected all villages in Sabu. The most important thing to continue to improve is access to clean water so that it can be closer to home and it is hoped that this will continue throughout the year.

2. Raijua Island

Raijua Island is included in the administrative area of Sabu Raijua Regency. Raijua Island is only divided into one sub-district administrative area, namely Raijua District with five villages/wards, namely Ledeunu, Ledeke, Ballu, Bolua and Kolorae. The landscape on Raijua Island consists of highlands (top) and lowlands in the coastal area (bottom). All villages in Raijua District are bordered by the sea. The division of the upper and lower regions affects the livelihoods of the people of Raijua Island. Communities living at the top tend to make a living as farmers, while the people at the bottom who are in coastal areas tend to make a living as fishermen and seaweed cultivators.

Figure 26. Illustration of rain farming in Sabu Raijua

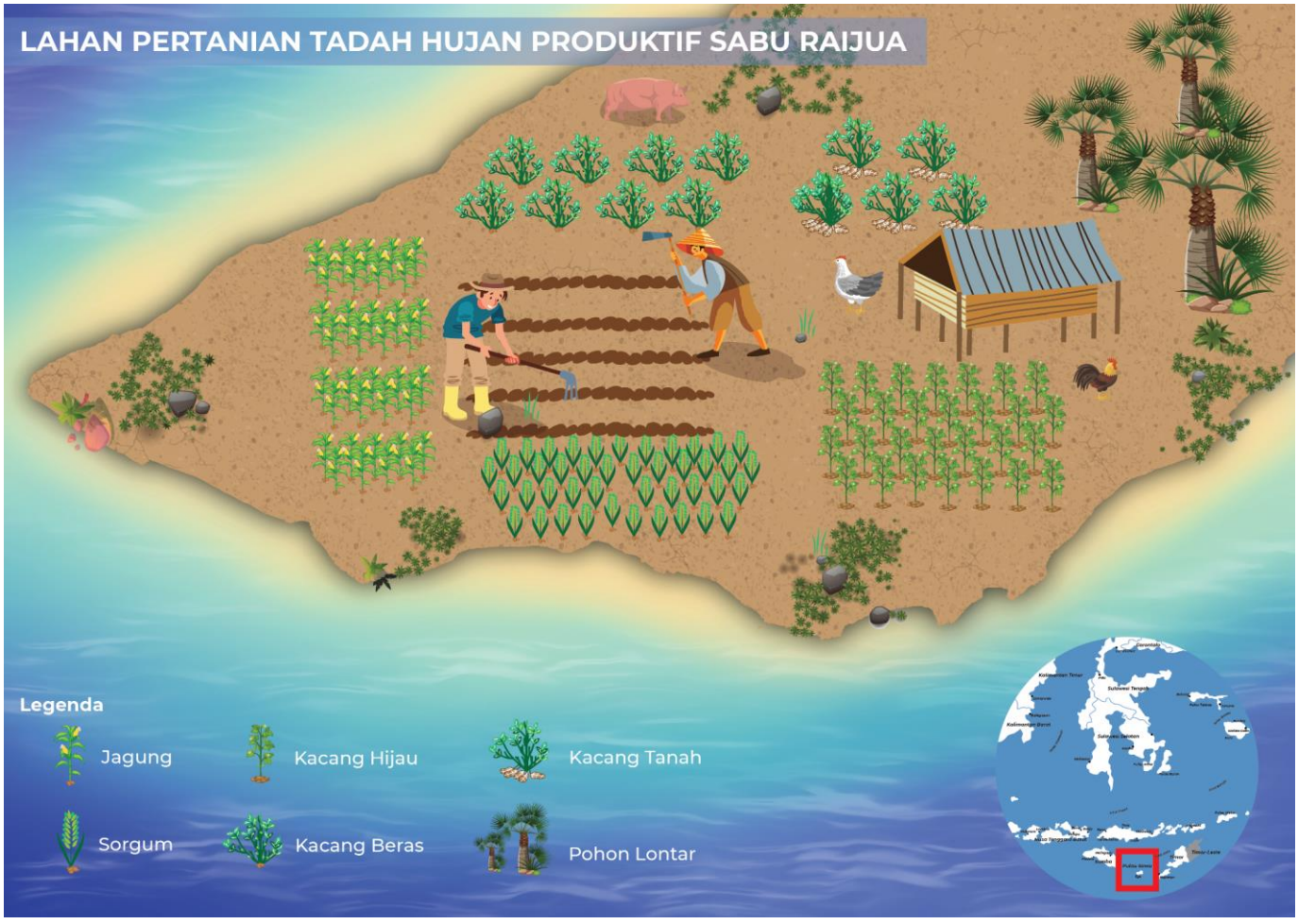

Table 13, based on the diversity of landscapes and seascapes (category I), Raijua Island is in the medium category with no changing trend. This indicates that the condition of the ecosystem and landscape on Raijua Island has not changed much. The condition of the coastal waters ecosystem on Raijua Island tends to be stable because there are no contaminants that enter the waters. Fishing efforts carried out by fishermen also tend to be environmentally friendly by using fishing rods and nets. Exploitation of natural resources on Raijua Island tends to be low, they use natural resources for their daily needs and if there is anything new they sell it.

Based on the biodiversity category (category II), Raijua Island is included in the medium category with no changing trend. This indicates that biodiversity, including agricultural biodiversity, has not changed much over time. Local people tend to maintain types of food crops from local seeds that are suitable for the conditions of their agricultural land. Types of food crops grown by farmers include: sorghum, rice, corn, black beans. The percentage of sorghum in Raijua is still lower than Sabu. A lot of land is abandoned because people prefer seaweed cultivation because it makes money.

Table 13: SEPLS assessment results for the Raijua Island baseline survey location

Category	Mark	Trend				Conclusion
		No changes	Decrease	Increased	No value	
I	3,13	8	0	0	0	moderate, trending Unchanged
II	3,00	4	1	0	1	moderate, trending Unchanged
III	2,50	4	2	1	1	low, trending Unchanged
IV	3,00	2	1	2	3	moderate, trending Unknown
V	3,10	2	1	4	3	moderate, with an increasing trend

Information:

Category I : Diversity and protection of landscape and seascape ecosystems
Category II : Biodiversity (including agricultural biodiversity)
Category III : Knowledge and Innovation
Category IV : Governance and social equity
Category V : Livelihoods and well-being

Fishermen on Raijua Island catch fish not far from the coast using small boats (ketinting), so that the types of fish caught are mostly reef fish. The catch of fish is for self-consumption and if there are a lot of catches it can be sold. The type of seaweed cultivated by fishermen is Eucheuma cottonii which is a type of seaweed that produces carrageenan as a raw material for the pharmaceutical and cosmetic industries. Other than fish, the people of Raijua are also familiar with the protein from Nyale worms (sea worms) which can only be obtained at certain times (Nyale are also found on the coast of Sabu). Based on information from interviews, this year Nyale only came out in March. According to references, the discharge of these Nyale worms is also usually preceded by a ritual, the conditions of which include: women who are menstruating or pregnant are not allowed to attend. The people in Raijua raise livestock of the same types as those in Sabu.

Raijua's assessment of the knowledge and innovation category, was considered low and there was no change. Because in Raijua the interviews focused on coastal communities, the following descriptions are more representative of the coastal communities.

Fishermen, who are generally men, usually go out to sea in canoes or ketinting and catch fish with nets (behavior). Fishermen also used to use arrows to catch fish between the seaside rocks. There are some women who can catch fish between the rocks when the sea water recedes using kepayohuru, sharpened iron that resembles a fork. The women can go twice a day to catch fish with the iron fork. The fish are prioritized for family consumption, and if they still have fish left, they can sell the rest. Those who sell fish are generally men (husbands) and the money from selling fish is given to women (wives) to buy petrol (for the boat), rice, vegetables, cooking oil and other cooking needs. When the husband is going to buy cigarettes, he will ask his wife for money. Although sometimes they can make cigarettes by hand-rolling palm leaves taken from the garden. On average, the fish caught by Raijua fishermen are reef fish because most of them are coastal fishermen, who take a boat not too far. Map of fishing locations (fishing ground) on Raijua Island is presented in the figure below.

Figure 27. Fish catchment map (fishing ground) on Raijua Island

For seaweed cultivation, there is hope for innovation to be able to produce seeds that are healthy and can survive in the waters of Sabu Raijua. Because seaweed cultivation can be a source of income for people, especially those living on the coast. However, the existence of this seaweed cultivation also made the tradition of iris tuak and made Savu sugar slowly disappear in Raijua. It's very difficult to find Savu sugar in Raijua. Along the coastal road the lontar trees look smooth, there are no signs of artificial steps to climb. It is ironic since Savu sugar is one of the keys to food security for the Sabu Raijua people.

Raijua women, apart from being seaweed farmers, also cultivate corn, kale, long beans, and bananas. Usually the harvest is for self-consumption. Together with the men, the women make Savu sugar. The man takes sugar palm and the woman cooks Savu sugar. Since infancy, the average Raijua people have been used to drinking Savu sugar.

The governance and social equity categories are rated low with no change in trend. The community thinks that governance is not being taken care of properly, because Raijua's status is only a sub-district and it is far from the district government center. Meanwhile in Raijua, water problems are more severe than Savu so efforts to prioritize food security should be top of the agenda. What makes the main difference is that people in Raijua depend more on marine coastal resources. Agriculture still exists, but most of it is only done to meet the food needs of the family, which is admittedly still insufficient.

Raijua society is divided into tribes. There are about 7 to 11 tribes and the largest is the Nadaibu. Traditional elders are called Deo Rai. The people of Raijua know the mention of 'upper tribe' and 'lower tribe' so that Deo Rai known as Upper Deo Rai and Lower Deo Rai. All customary rules related to Jingitiu (local belief). When there are residents who convert to another religion, then the customary rules are starting to fade. Traditional elders and traditional leaders must be men and customary rules are concentrated on men, meaning that women know little about customary rules, and almost no woman can even explain customary rules. It seems that only men have rights and roles over institutions as well as customary rules.

In lower Raijua, it seems that Deo Rai's role is starting to erode. From interviews, information was obtained that this year, the planting time for Raijua farmers was brought forward from what had been set by Deo Rai, based on government negotiations. This is because the community considers the time for planting Raijua to be very slow, fearing that the rainy season will not be long enough to pour the crops. So finally the planting date was set for January 1, 2023, while Deo Rai determined January 18, 2023.

Livelihood and welfare categories are rated low and have not changed since the past. The main livelihood of the people in Raijua comes from the sea, namely seaweed cultivation and fishing. Several years ago there was still work as a cultivator for salt ponds owned by the district, but now the operation has been stopped. It is likely to be re-operated and managed by the private sector. With the frequent failure of seaweed harvests and the cessation of salt pond operations, many people in Raijua have been affected. Seaweed cultivation still exists, although a little, but it can no longer be a flagship commodity like it was a few years ago. Looking for fish in the sea also depend on the weather because the fishing equipment is still using traditional one.

Seaweed cultivation is usually carried out by the family: father, mother and children who are old enough, the practice is still traditional using stakes attached to the seaside with ropes to hold the seaweed from being carried away by the waves. Adult women and men usually do this method and harvest the seaweed together. Seaweed is usually sold to middlemen that sell it to Makassar. In good condition the seaweed harvest can reach 100 kg per family and sold for IDR 30,000 per kg. Some people think that the activity of iris tuak was greatly reduced when seaweed began to be carried out around 2008, because it usually coincides with the dry season. With a significant income from seaweed, the community chooses to focus on seaweed and only works on the garden when the rainy season arrives.

Figure 28. Seaweed drying on the coast of Raijua, Ballu Village.

There is no electricity network at the location of the fishermen's and seaweed huts on the beach in Ballu Raijua village because it is not an old settlement and some of the huts are semi-permanent, but some are already using solar panels with low power. Usually used to charge cell phone batteries. However, road access for motorized vehicles is quite good in Raijua, there are only a few sections that are in a state of disrepair. The condition of health facilities and schools is almost the same as on the island of Savu. Due to the small number of agricultural products in Raijua, a surprise market is usually held when a ship from Ende brings vegetables, fruits and other goods.

B. Ecological Problems and Threats and Consumption Production

1. Ecological Problems and Threats

a. The problem of water shortage in the dry season

The problem of water shortages during the dry season is caused by the limited area of the watershed that can store water during the rainy season. There are around 21 watersheds spread across the Sabu Raijua area with a very small watershed size. With a very small watershed that functions as a management of rainwater input, it is estimated that the problem of availability and continuity of water availability is one of the inhibiting factors in regional development in Sabu Raijua. Therefore, soil and water conservation is needed to retain surface water and groundwater as water reserves during the dry season as long as possible. Habitat degradation due to the Seroja storm disaster which hit the coastal area of Sabu Raijua Regency, especially the southern region

The Seroja tropical cyclone storm disaster resulted in damage to ecosystems in coastal areas. One of the degraded coastal ecosystems is the mangrove forest ecosystem in the coastal area. The existence of mangrove forests in coastal areas provides many benefits, including protecting coastal areas from coastal abrasion, preventing seawater intrusion into the mainland and being a habitat for several marine biota, especially larvae and juveniles as a nursery area.nursery ground). One effort to improve the condition of mangrove forests is to replant mangroves in degraded locations

The local knowledge of the community in terms of farming and fishing does not seem to have increased even though the natural situation has changed a lot. Relying on existing traditions, although there is a positive side, you still have to ensure that adaptation practices to the environment must also be pursued. After being hit by the Seroja storm in 2021, many people ended up relying on the aid that came to fulfill their food needs because many had not had time to harvest when the storm came. The position of Sabu Raijua Island which is in the high seas and prone to bad weather requires more effort to be able to have resilience in facing possible disasters, especially those that occur as a result of climate change, for example drought, too much rainfall, storms etc.

b. Diseases that attack seaweed cultivation plants

Seaweed cultivation is one of the main livelihoods of the people of Sabu Raijua. Seaweed cultivation in Sabu Raijua has experienced its heyday. However, this ended after the last two years, the seaweed cultivated by Sabu Raijua fishermen experienced a suspected disease (ice ice) attack which causes diseased seaweed to decompose and then break. Based on information from local fishermen, until now there has been no specific treatment related to the disease that attacks the cultivated seaweed. One possible effort to overcome this problem is the use of new seaweed seeds that are resistant to disease.

c. **Seaweed farmers have not been able to properly manage the production cycle and use of seeds efficiently, so that there is often a scarcity of seaweed seeds.**

The problem of scarcity of seaweed seeds in Sabu Raijua is caused by a lack of techniques for managing the production cycle and using seaweed seeds properly. In the grass cultivation cycle, at the time of harvest the farmer must be able to prepare good seaweed seeds for the next cycle. The technique of preparing and sorting good seaweed seeds needs to be mastered by fishermen who cultivate seaweed. Handling this problem can be overcome by providing training to cultivating fishermen regarding sustainable seaweed cultivation techniques.

2. Problems and Threats of Production and Consumption

The people of Sabu and Raijua are currently in a transition from a society that consumes its own products to a society that depends on products from outside the island. This is the impact of easier transportation access from outside to Sabu Raijua and vice versa. The Savunese people who used to survive only by consuming Sabu sugar, vegetables (such as moringa leaves, cassava), nuts and tubers, can now try to buy rice to eat daily. However, in certain villages people still consume food from what they grow. It's just that the amount alone cannot meet the needs of the family, so they still have to buy rice or other food ingredients. People's diet patterns have begun to shift, requiring more solid carbohydrate source foods, even though Sabu sugar remains. From several villages visited on Sabu and Raijua, the eating pattern of average village people is twice Sabu sugar and once heavy meal during the day (sorghum, beans, vegetables, rice, corn). But in other parts, people have eaten 3 times a day and have to eat rice. So that in the not too distant future, if the food production and consumption system is not improved, Savu Raijua will become a vulnerable area in terms of food security.

The consumption pattern of the people of Sabu Raijua is closely related to the management of the family economy. When the level of spending is higher, people's activities are focused on those that can generate more and faster money. There are 2 activities that are considered to generate significant amounts of money in Sabu Raijua, namely seaweed cultivation and gambling (which can be in the form of cockfights or dice gambling). When seaweed cultivation failed many times, the choice was to do other jobs, such as harvesting laborers, working outside the island, or trying their luck through gambling. But actually gambling is not a momentary activity if needed. This is about a hobby that becomes so addictive that it can only stop when there is nothing else at stake. Efforts to increase income have never been made through increasing agricultural products, for example, or increasing fishing activities, because the results are not very significant. Appropriate innovations for the management of agricultural and coastal marine resources are needed to be able to meet the changing needs of society. Innovations that can have an impact on energy and time efficiency so that they can carry out various productive activities are needed by the people of Sabu and Raijua today.

The ability to weave that has been passed down from generation to generation by women in Sabu Raijua can actually become a productive income generating tool. However, it is currently still facing marketing problems. Besides, traditionally, fewer and fewer weavers still use natural dyes, especially those who still use cotton yarn. In addition to the long manufacturing process, cotton raw materials are difficult to get. Several cotton planting programs have been carried out, especially in the Mesara area, but this has never been successful, because the small plants are eaten by released animals. Livestock are only tied up during the growing season at the beginning of the rainy season, until harvest, which is only 4-6 months. As for cotton plants or other perennial crops, it takes years for the stems to grow tall and strong.

C. A Situation of Social Equality, Gender Responsiveness, and Inclusivity of the Young Generation

1. Overview and Situation Analysis regarding Social Equality, Especially for Young Women from Various Classes

The landscape of Sabu Island consists of dry land agriculture, mixed gardens and a small amount of paddy fields. So most of the people of Sabu Island are farmers, both men and women. Men and women farmers generally work on their agricultural land together, from the stage of clearing the fields, planting, tending to harvesting. Commodities planted include sorghum, green beans, corn, bananas, lontar and coconut. However, decision-making for land management is dominated by men. Meanwhile, the people of Raijua Island are mostly pond farmers and fishermen. Pond farmers both men and women with seaweed commodities. There are more fishermen than men although there are women who can catch reef fish, not far from the beach.

Some areas in Sabu Raijua are still quite attached to traditional traditions, such as in Pedarro Village, Ledeke, Eilogo. Agricultural activities are also inseparable from traditional rituals, such as the ritual before planting where the planting time is also determined by the traditional Sabu calendar, namely warru haba koó rai. Sabu Raijua traditional figures who have traditional knowledge and lead the Sabu Raijua people in traditional rituals are men. Women are only involved to help carry out traditional rituals and do not have traditional knowledge. The women of Sabu Raijua felt that this was not their domain, so they just followed the directions from traditional leaders.

One of the traditional traditions that is still carried out by women is weaving. Since childhood, Sabu Raijua women have been taught by their mothers to weave. In general, the motifs made are in accordance with the motifs that have been passed down from generation to generation, as well as the colors. Even though young women now use more colored yarns from the factory, that means they don't use natural dyes like their old mothers. Apart from being used for personal use, the weaving is also sold and the money is used to meet household needs

Sabu Raijua women play more roles in domestic activities, namely the role of reproduction at home. They are responsible for raising children, providing food and water, cleaning the house, and other caring roles for the entire family. Public activities outside the home are dominated by men, including selling crops at the market. The money from the sale is then given to the woman (wife) to spend on household needs. When there is an invitation to attend a village meeting, the man will be the representative for the family. So most of the Sabu Raijua women have never been involved in village-level deliberation forums.

Several Sabu Raijua women who are representatives of the PKK, weaving groups, and KWT (Women Farmer Group) have participated in the village musrenbang. Women who receive PKH (Family of Hope Program, initiated by the Government) assistance admit that they have been invited to meetings at the village office several times to discuss PKH issues. Most of the other female residents have never been invited to a village meeting and some were invited but did not attend. This absence is more of a feeling of awkwardness, lack of confidence, and a feeling that their "voice" has been represented by men or other women's representatives who are present.

2. Capacity of Women and Young Generation

In general, space for capacity building for women and young people on Sabu Raijua is still limited. The only formal institution is the PKK and only in recent years has the KWT. In 2021, KWT members who manage house yards through the Sustainable Food Yard (P2L) program will increase to 535 people (Sabu Raijua Agriculture and Food Security Service, 2021). These women cultivate various types of crops such as sorghum and green beans and raise chickens and catfish. However, the room for capacity building, even for KWT members, is still limited. They still need capacity building, for example in the manufacture of biological fertilizers and horticultural crop cultivation techniques that are suitable for the agro-climatic conditions of the Sabu Raijua region.

Capacity building is also needed for weavers, who are still weaving sarongs and blankets, such as those in Mehara District, Pedarro Village and Raijua District. Young weavers usually make woven ikat. To make woven cloth, on average it takes up to two months. Almost every day women weave except when there is a planting or harvesting season. There are only a few that retain the original motifs and in the sub-district town, there are already many woven motifs that follow the patterns from shop woven fabrics.

Figure 29. High school students on Raijua Island walk together after school.

3. Basis and Relevance of Involving Women and Young People in the Governance of Natural Resource Management

Presidential Instruction No. 9 of 2000 concerning Gender Mainstreaming in Development stipulates that planned development must be responsive to the often different needs of men and women. So the Presidential Instruction instructs all government agencies to integrate a gender perspective in institutional development, policies and work programs, including in the design and implementation of policies, programs, monitoring and evaluation, as well as collaboration with internal and/or external parties. These steps are prepared based on insights, critical awareness and data obtained from gender analysis (UNDP, 2013). Gender analysis is needed to determine the complexity of the situation of women and men in certain areas so that the formulation of a gender mainstreaming strategy can be in line with this situation.

This mandate is strengthened through Law (UU) No. 17/2007 concerning the 2005-2025 National Long-Term Development Plan (RPJPN) as outlined in the National Medium-Term Development Plan (RPJMN) for the 2004-2009 period. until the period 2020-2024. Presidential Decree No. 18/2020 concerning the 2020-2024 National RPJM also specifically pays attention to gender equality and social inclusion, especially towards the younger generation, where it states that "...reducing the gap between men and women in accessing and controlling resources, participating in all processes development and decision-making, and benefit from development". This means that women, like men, need to be involved in the process of preparing village development plans, program implementation, up to monitoring and evaluation.

In particular, the 2020-2024 National RPJM emphasizes the importance of providing space for participation for women and the younger generation as a way to achieve Indonesia's 2020-2024 medium-term development goals.

"Indonesia's 2020-2024 development is aimed at forming quality and competitive human resources, namely human resources who are healthy and intelligent, adaptive, innovative, skilled and with character. To achieve this goal, human development policies are directed at population control and strengthening population governance, fulfillment of basic services and social protection, improving the quality of children, women and youth, poverty alleviation, and increasing labor force productivity and competitiveness" (BAPPENAS, 2019, page IV-2)

In order to accelerate the implementation of Gender Mainstreaming, in 2012 a National Strategy for Accelerating Gender Mainstreaming through Gender Responsive Planning (Stranas PPRG) was proclaimed through a Circular Letter of the Minister of National Development Planning/Head of Bappenas, Minister of Finance, Minister of Home Affairs, and Ministers of State PP and PA.

Law No. 6/2014 on Villages also mentions the importance of PUG in village development and governance. This law stipulates that the Village Head and the Village Consultative Body must carry out a democratic life and gender equality. Furthermore, Government Regulation (PP) Number 43 of 2014 Article 121 Paragraph 1 (as implementing regulations of Law Number 6 of 2014) states that the implementation of village development activities is determined by taking into account gender equity.

The younger generation is a special group for national medium-term development, with a youth development index target of 57.67. On a national scale, it is known that only 6.7 percent of youth have ever provided suggestions/opinions in meeting activities and only 6.4 percent are actively involved in organizational activities, as explained by BAPPENAS (2019). Even though Law No. 40 of 2009 concerning Youth states that the goals of youth development are empowerment, leadership development, entrepreneurship and youth leadership. This means that the youth development space in Sabu Raijua will be able to contribute to the 2020-2024 National RPJM target.

D. Policies related to Environmental Governance, Natural Resources and Climate Change

1. National Context

Since the Government of Indonesia co-signed the 2016 Paris agreement, national climate change conservation and mitigation policies have continued to be encouraged. With the "Indonesia's Forestry and Land Use (FOLU) Net Sink 2030" program, the Government of Indonesia through the Ministry of Environment and Forestry intends to halt the increase in the earth's temperature rate below 1.5 degrees Celsius. In addition, Folu Net Sink 2030 is Indonesia's guide in carrying out climate change mitigation and adaptation actions. The operational form of FOLU Net Sink 2030 is by reducing the rate of deforestation, reducing the rate of forest degradation, regulating the development of plantation forests, sustainable forest management, social forestry, rehabilitation, management of peat restoration, improvement of peat water systems, repair and conservation of mangroves, conservation of diversity biodiversity and its ecosystem, as stated by the Minister of Environment and Forestry when inaugurating the Forest and Other Land Uses Operation and Collaboration Center (FOLU COLL) Office on 22 December 2022.

Regulations and policies related to climate change at the national level already exist, starting from laws and implementing regulations at the practical level. A list of regulations and policies related to climate change can be seen at the following link Policy - Directorate General of Climate Change Control (menlhk.go.id).

2. Regional Context

Local governments (provinces/regencies/cities) have the same obligations as the central government in mitigating and adapting to climate change. Based on Presidential Regulation Number 98 of 2021, Governors/Regents/Mayors are given the task of making climate change mitigation and adaptation policies.

In Sabu Raijua Regency, the government has a commitment related to climate change by establishing the 2019-2021 Climate Change Adaptation Regional Action Plan as a direction for climate change adaptation action for various cross-regional OPDs. The Regional Action Plan - Climate Change Adaptation (RAD-API) which is expected to be the first step in harmonizing the development of Sabu Raijua Regency with controlling the negative impacts of climate change, which has a negative impact on various sectors of people's lives, such as water resources, as well as coastal resources, and agricultural resources.

In 2013, the Indonesian government and the East Nusa Tenggara provincial government in collaboration with international agencies launched a project called "Strategic Planning and Action to Strengthen the Climate Resilience of Rural Communities in East Nusa Tenggara" otherwise known as SPARC (2013-2016). The United Nations Development Program (UNDP) with support from the Global Environment Facility (GEF) facilitated the implementation of the SPARC program. MoEF is the implementing partner at the national level and the Regional Planning Agency (BAPPEDA) of NTT Province, is the partner in charge at the provincial level. The SPARC program focuses on strengthening the resilience of rural communities to the impacts of climate change, especially in three sensitive sectors: agriculture, water resources and livelihoods. For pilot locations, three districts in the province of NTT, namely: East Sumba, Manggarai, and Sabu Raijua.

The Sabu Raijua Regency RPJMD document 2021-2026, which contains a five-year development plan, mentions efforts to increase community access through the provision of reliable infrastructure, equal distribution of territory, and guaranteeing sustainable development (Mission IV). This document is quite complete containing plans and targets for the current year. Several aspects of its coverage include green open space per unit area, Availability of Regional Regulations on Spatial Planning, Handling of arable land disputes through mediation, Regency Environmental Quality Index (IKLH), Increased clean water and greenery in the Sabu Raijua area, Determination of MHA rights related to PPLH located in the Region / Regency, Percentage of Waste Management.

The escalation of increasing attention to local food which is regulated in the form of local government policies has begun to be seen in the 2016-2021 RPJMD and will be continued in the 2021-2026 RPJMD by incorporating aspects of protecting water sources, forests and the sea.

Interviews with Bapelitbangda Sabu Raijua Regency also obtained information that in 2023 policies related to the protection/conservation of water, forest and marine resources are included in the Second Priority, namely**Development of infrastructure and transportation networks that connect between parts of the region and or centers of economic and tourism growth with due observance of spatial planning and environmental aspects** with a target**Increasing the Quality of a Sustainable Environment**.

The implementation of current activities to support the intended development mission and goals includes planting sea pandanus in coastal locations that are prone to abrasion, in collaboration with the Sabu Raijua National Marine Protected Area Agency to plant mangroves. Apart from that, in order to deal with critical land, the government of Sabu Raijua Regency also planted trees by providing merbau, bamboo, and cherry tree saplings on degraded land. Discussions with the Head of the Sabu Raijua Regency Environmental Service obtained the same information related to this activity.

The main problem that is currently happening in Sabu Raijua is abrasion, so the policy taken is to provide understanding through socialization to the community of illegal sand miners and to settle community complaints regarding coastal damage due to mining without a permit.

The RPJMD of Sabu Raijua Regency also includes aspects of increasing the yield of food crop agriculture. Mission II mention**Ensuring the adequacy of food, water and energy as well as increasing competitiveness regional economy with the tourism sector as the prime mover**, with the aim of ensuring the adequacy of food and energy.

Bapelitbangda stated that for 2023, policies related to increasing agricultural food yields are included in the first priority, namely**Strengthening the tourism-based community economy and increasing productive, stable and equitable MSMEs through the utilization of competitive regional economic potential,**one of which is in the Agriculture and livestock sector, through Optimizing the production of agricultural commodities with a focus on food adequacy through the Sustainable Food Movement, utilization of irrigation networks and reservoirs through the opening and expansion of agricultural land, increasing diversification of agricultural businesses, processing of produce and increasing added value at the farm level supported by product marketing facilitation and community empowerment in diversifying food consumption aimed at realizing food security and local food self-sufficiency. Optimizing the production of agricultural and livestock commodities through:

a. Food crops in the form of rice, corn and sorghum as well as horticultural crops such as shallots, peanuts and green beans and other plants;
b. Efforts to optimize production are carried out through the opening and expansion of agricultural land, increasing the diversification of agricultural businesses, facilitating technology, seeds and fertilizers;
c. Efforts to optimize plantation production are carried out through the provision of production facilities and infrastructure, utilization of appropriate technology and business capital assistance;
d. Efforts to optimize livestock production are carried out through the provision of livestock seeds, fodder, provision of vaccines and medicines.

Ratumakin et al. (2018) who conducted a study of local food self-sufficiency policies in Sabu Raijua District, stated that there were no policies that specifically provided protection and maintained the preservation of agroecology-based local food systems. In addition, the Sabu Raijua District government's policies related to local food self-sufficiency are still very general and non-specific, especially when analyzed using the 10 agroecological principles from FAO. This study also highlights the high dependence on foreign food products and the limited role of women in managing natural resources.

In relation to the existence of a forest area in Sabu Raijua Regency, Bapelitbangda and the Department of the Environment admit that there are still community lands that are included in the forest area. So that the Central Government's programs related to forest protection and rehabilitation in Sabu Raijua Regency, especially through planting saplings and reforesting forest areas, have not been maximized.

The Ministry of Environment and Forestry through Ministerial Decree No: SK. 6615/MENLHK-PKTL/KUH/PLA.2/10/2021 concerning the Map of the Development of Forest Areas for the Nusa Tenggara Province up to 2020 contains overlapping forest areas under community control. In its development, the Minister of Environment and Forestry Letter dated October 21 2021 stated that for Sabu Raijua Regency, approval was given for 2,144.73 hectares of forest area for Settlement of Land Tenure in Forest Areas.

This stipulation experienced some resistance from the community because the community did not want their area to be made into a forest area. Minimal socialization is allegedly the cause of this problem. As is well known, land in Sabu Raijua is owned and managed through a tribal/customary system. The existence of a social forestry program, which includes a customary forest scheme, should be one of the efforts to resolve this problem.

So far, many greening efforts carried out by the Sabu District Envitonment Agency have not received much interest from the community. In addition to the forest area aspect, the long-term orientation of the reforestation activities is the cause. Not to mention technical reasons such as dry, hot natural conditions and the difficulty of getting water.

The pattern of rearing livestock using the wild release model is also one of the causes that inhibits the success of reforestation. Regional Regulation No. 11 of 2013 concerning controlling livestock is considered not working. Even though it was stated by the Environment Agency that this regulation had been translated into a village regulation.

3. Factual Conditions of Rules and Policies in the Village

Many aspects can be arranged according to the needs in the village which can support efforts to protect and manage the environment in a sustainable manner. Problems that arise in villages such as the use of chemical fertilizers, use of water/springs, sustainable agricultural land management, environmental protection and management are everyday problems in villages that need to be regulated. Arrangements at the village/village level do not all have to be made in the form of village regulations, but can also be made by village head rules, group rules or local customary rules. Matters that are general in nature and apply to all villagers may need to be regulated by Village/Kampung Regulations. Meanwhile, rules that are specific in nature, for example in farmer groups, can be by mutual agreement which can be written or unwritten.

4. Pattern of Village Policies/Regulations

Based on the GEF-SGP tracking results, the Village Governments surveyed always have village regulations regarding the Village RPJM and Village RKP, because these are conditions for disbursing village funds. In addition, there are village regulations regarding the formation of BUMDES. However, it is still difficult to obtain information that there are village regulations governing environmental protection, waste and waste management, land/forest fire control, chemical fertilizer control, sustainable natural resource management, sustainable agriculture, agricultural control on mountain slopes, water management. and water sources. In fact, at the same time, this is a daily problem faced by the community and the village government.

5. Village Orderly Practices from a Community Perspective

The legal culture in Indonesian society is heavily influenced by traditional values and local wisdom. Such as the value of gotong royong, shame to make mistakes, mutual respect. In addition, religious values also influence the behavior of society, such as sin when acting badly and harming others. Community order based on traditional, customary and religious values is actually social capital if the village government wants to make rules according to the conditions of the problems in the village. Customary values (or norms), habits, can be used as a source of law in making village regulations, apart from of course higher state regulations (Perda, Ministerial Regulations, Presidential Regulations, Government Regulations, Laws).

Village regulations whose contents are more or less in direct contact with the good habits of the community will increase the effectiveness of implementing village regulations, compared to village regulations whose contents are not "known" or "understood" by the community. The rest are new things that are regulated in Village Regulations but are not yet understood by the community, must be given an introduction and explanation. For example about environmental conservation, water conservation, the impact of climate change due to forest conversion, the long term impact of chemical fertilizers, and so on.

6. Problems in Documenting Rules in the Village

In the process of collecting data on regulations during the survey, there were difficulties in obtaining information regarding existing regulations in the village because they were not well documented in the village. Administration of village regulations is still weak. Even though officially it has been regulated in regional regulations regarding the formation of village regulations.

Village regulations are actually not only needed by local villagers, but also for outsiders who will enter or be in the village for a certain period of time. Including the village regulation document in a facility that can be accessed by the public will help anyone who wants to know the rules that apply in the village. This can also help prevent people from taking actions that are prohibited/shouldn't be done in the village or attract the attention of people who want to come/work together (tourists, investors, local government, etc.) with the village because they see good order in the village.

7. Village Regulation Effectiveness

Village regulations are often constrained by the effectiveness of their implementation. Community perceptions of the effectiveness of this regulation were frequently raised, including in the phase-7 GEF-SGP survey. The effectiveness of a regulation is very dependent on the process of forming the regulation. If the top-down process, the contents of regulations are not relevant to the actual conditions in society, the effectiveness will be low. In addition, the legal culture of society also determines the effectiveness or failure of regulations and policies. Therefore, to increase the effectiveness of regulations, it is necessary to increase public and government understanding in the process of forming effective regulations using the ROCCIPI method and the Formation of Regulations with a Strategic Approach.

8. Village Regulation Formation Capacity

The lack of Village Regulations is strongly influenced by the capacity of the village administration (Village Government and BPD). The task of increasing capacity in forming regulations rests with district governments through Bimtek activities, however, financial constraints and the large number of areas that must be accommodated have resulted in a slow process of village capacity building. In addition, methods for capacity building that are monotonous (less innovative) do not encourage motivation to learn from the village government and BPD. The formation of village regulations is not just compiling article sentences. The main and most important thing is to understand the problem and the root of the problem in the village, so that the rules made respond to the problem they want to solve. In addition, it is very important to explore the social, economic, cultural, institutional, natural and human resource modalities in the village as a basis for

formulating village capacity-based solutions. Finally, village regulations must have measurable goals. For what and how long will this village regulation achieve the goals set by all components of the village community.

If the three raw materials for forming regulations have been identified, compiling village regulation articles is the final step which is easier to do because there is already a standard format prepared by the government. Support for developing the capacity to formulate village regulations is a necessity in order to support the GEF-SGP program in managing the Balantieng watershed buffer zone. This capacity building can be collaborated with extension workers and drafters of regional regulations at the Provincial Legal and Human Rights Regional Office as well as the legal department at the district regional secretariat.

9. The Use of Rules in the Village to Support the SGP Program

Environmental conservation initiatives and innovations, agricultural businesses and the community's economy will be stronger if supported by regulations at the village level such as regulations regarding environmental protection, waste and waste management, control of chemical fertilizers, sustainable management of natural resources, management of water and water sources, etc. With the existence of rules in the village through village regulations, the village government can participate in developing these innovations by including them in the RPJMDes and RKP Desa so that there is a supporting budget that can be used from DD and ADD funds. In addition, for GEF-SGP policy support at the village level will assist this program during implementation and after the program is implemented. The support for the continuity of the GEF-SGP program can be continued by the village government. With the existence of related village regulations, the village government can continue the program with the support of village funds.

III. Issues and Strategic Planning

A. Strategic Issues

1. The ineffectiveness of policies (customary/legal) and practices for protecting forest cover including mangroves and water sources, which are aimed at sustaining biodiversity and water for the community.
2. There is no water management system, including effective water storage and distribution in Sabu Raijua to be able to retain water as long as possible so that it can meet water needs throughout the year.
3. There is no practice of using or saving energy effectively to reduce household living costs.
4. Agricultural technology, fisheries and seaweed cultivation which have not been able to meet the food needs of Savu and Raijua.
5. The role of women and young people in managing natural resources is still limited, especially in encouraging the processing of palm sap and the manufacture of weaving with natural dyes
6. The lack of local human resources to be able to assist the community in implementing community development programs in the village

B. Strategic Planning

1. There is a program that ensures the practice of protecting forest land cover, including mangroves and water sources for the sustainability of community life

    a. There is a customary agreement between land owners (tribal chiefs) to protect forest areas, palmyra palm plantations, banyan forests, eucalyptus including mangroves and water sources, within their territory.

    b. To take advantage of Social Forestry schemes (eg customary forest) or other schemes that exist in community traditions in order to ensure sustainability.

    c. There is a program to plant water-storage trees around springs and ponds..

2. Developing Sabu and Raijua water resource governance with the following programs:

    a. Maintain and maintain the existence of the ponds that have been built and make greening efforts around the ponds.

    b. Develop simple water storage practices that can be carried out around wells, or in every household (biopores, reservoirs, water trap holes, etc.).

    c. Strive for the distribution of water to productive agricultural lands and settlements.

    d. Developing a simple water-saving watering technology so that it can be utilized by more farmers.

    e. Developing a simple technology for using household wastewater for yard gardens.

    f. Conducting action research for the most effective method of water harvesting and in accordance with the conditions of Sabu Raijua, for example rain harvesting and using electrolysis technology so that it can be consumed immediately

3. Development of the use of solar energy and saving the use of non-renewable energy

    a. Distribution of water to productive agricultural land or to households using pipes with the help of solar pumps.

    b. Developed a special energy-saving stove for Savu sugar makers..

4. Development of technological innovations in agricultural practices, fishing and seaweed cultivation that are effective and environmentally friendly.

    a. Development of plans for agriculture that can meet family food needs and increase income.

    b. Re-identification of knowledge about seasons including natural signs for agriculture, fisheries and disasters such as hurricanes, integrated with modern knowledge such as weather forecasts at BMKG to be able to manage existing resources

    c. Collection and provision of local food seeds as well as collection of local food sources that are not cultivated (such as sea vegetables, tubers, etc.): staple food plants, vegetables and herbs. Taking into account the types of plants that are able to adapt to the climate of Sabu Raijua (eg:perennial crop, succulent). There are suggestions for the development of papaya fruit plants, because they are easy to grow.

    d. Development of natural fertilizers and pesticides from local materials to optimize agricultural output and secure water storage and prevent heavy metal pollution into rivers/seas.

    e. The existence of effective and environmentally friendly livestock farming practices, ensuring that there is regulation of livestock mobility, for example by uniting livestock collectively in certain locations while practicing effective feeding by growing fodder plants that are suitable for dry land conditions such as turi. The development of livestock farming practices can be done in collaboration with the Sheep Foundation in Mate'i Village.

    f. Capacity building for fishermen expertise and innovation of fishing equipment that can adapt to the weather conditions of Sabu Raijua waters.

g. Recovery of seaweed cultivation activities after disease (ice ice) that attacks seaweed cultivation activities, by developing the purification of disease-resistant seaweed seeds and improving cultivation skills for seaweed cultivating fishermen. This program is suggested to work together with YKAN which is also working on the development of seaweed cultivation in Sabu.

h. Increase in the value of post-harvest products (agricultural crops, fish and seaweed).

5. Capacity building for local communities, especially women and young people both in terms of skills (weaving, farming, slicing palm wine/making Cabu sugar, animal husbandry, seaweed, etc.) as well as ensuring women have knowledge about history, traditions, and can express their opinions

   a. Increasing learning spaces for women and young people as a medium for capacity building and knowledge exchange (for example knowledge related to weaving, family financial management, marketing of woven products, women's rights and others).

   b. Encourage the involvement of women and youth from various social groups in village-level decision-making processes.

   c. Develop techniques for extracting palm sap (sliced palm wine) that can be adopted from other regions/countries to make it easier and more effective.

   d. Developing a variety of natural dye woven products supported by innovative marketing.

   e. Strengthening women's and youth groups in natural resource management (water treatment and household waste for agriculture, post-harvest processing of agricultural and fishery products)..

6. Capacity building and supporting facilities for field extension workers (agriculture, fishery, animal husbandry) so that they can provide optimal assistance to the community:

   a. Creating a learning space for field extension workers to learn the latest things related to agricultural, animal husbandry, fishery and seaweed innovations both from training and field visits

   b. Ensuring sufficient operational costs to be able to provide optimal community assistance.

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