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Study and Mapping of Mamar Potential as Local Wisdom in Kupang Regency – East Nusa Tenggara Province

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Abstract: *This research aims to study and map the potential of Mamar as wisdom in the Kupang district - East Nusa Tenggara Province. The sampling method used in this study was purposive with the consideration that the area is a dominant dry land area and has a specific farming system, namely Mamar. Data collection techniques used in this study are observation techniques, interview techniques and GIS analysis. The results showed that the potential of mamar as a traditional agricultural system that has a conservation function (ecological) in maintaining the sustainability of the spring ecosystem, an economic function for the community/mamar farmers, and a social function, namely the presence of the main plant as a means and springs as a place/container. Unifying and resolving conflicts in society. While the area of the marsh area varies between 5-10 ha, in the upstream area (water catchment) it is used as a conservation area/cover area (core area) for a spring protection system with a low plant density level, and in the future it is necessary to develop a mamar that can be integrated. With the development of tourism into agro-tourism so that in the end it is a multiplayer effect to increase people's economic income.*

Keywords: *Study, Mamar Potential Mapping. Kupang Regency Local Wisdom*

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I. Introduction

Kupang Regency is one of the areas in East Nusa Tenggara Province which has a very large potential for agricultural land. The area of agricultural land reaches 203,609 ha. Of the total land area, 89.2% or 181,632 ha is dry land and 10.8% (21,977 ha) is wet land (BPS NTT, 2013). Taking into account the potential of the land, various kinds of Kupang district government programs have also been rolled out to improve food security and the income of rural farming communities in both the food crops sub-sector and the livestock sub-sector. However, the development of these programs has not contributed significantly to efforts to support food security. This is due to various problems that become obstacles in the management of dry land farming, including: (1) technical factors of cultivation which are relatively simple as a result of very high dependence on climatic factors, especially rainfall; (2) The farming pattern of dry land farmers is still dominated by seasonal food crops. (3) On the other hand, dry land farming patterns are generally carried out partially or separately between components of food crops and annual crops as well as animal feed crops. The impact is that the dry land farming that is cultivated is not effective and efficient, which can be seen from the low productivity of dry land farming.

The strategic effort that can be done is through the application of an integrated farming system based on local potential that combines plant and livestock components in one system. The application of an integrated farming system will produce an agro-ecosystem with its diversity, so that it can guarantee higher farming success (Rodriguez and Preston 1997 in Matheus et al, 2017).

Functional diversity can be achieved by combining plant and livestock species that have complementary properties and are related in synergistic and positive interactions, so that not only stability can be improved, but also productivity of agricultural systems with lower inputs.

Mamar is a farming system that is developed on a stretch of land around a spring or a certain zone with fertile land conditions, and in it there are various types of long-lived plants, seasonal crops, livestock and forest product sources that are managed wisely and wisely by the community. local customary holders (vetors). The most dominant tree species in mamar are areca nut, betel and coconut. From this understanding, the mamar system is known by all people in the West Timor region, both the Dawan tribe scattered in North Central Timor Regency (TTU), South Central Timor Regency (TTS), Kupang Regency and the Tetun tribe in Belu Regency. Mamar is the name of the Dawan tribal community. Mamar is only developed near springs with large discharges, so not all villages develop and have mamar. Generally, each vetorany (consisting of 5-10 villages) only has 1 or 2 mamar, so that each mamar is far from one another. Therefore, of course there are slight differences in terms of area and management model between one mamar and another (Sumu, 2011).

Mamar as an agricultural system that has a relatively balanced ecosystem (almost the same as a forest ecosystem) in its management has a fairly wise and wise layout and division of zones. The division of zones and layout is seen from the interests of socio-cultural and customary structures/institutions. The division of zones is the full authority of the Emperor / King and Vetor. The division of zones is adjusted to the potential and land conditions of each mamar location. Each mamar must have a different management zone (Sumu, 2011).

Mamar as a form of farming, has very broad functions and benefits for the surrounding community, both ecological aspects, namely for spring conservation, economic benefits, economically Mamar provides a significant and sustainable income contribution because it can provide varied product results. and socio-cultural benefits, namely maintaining local wisdom and religious values that can unite all ethnic groups.

One of them is the traditional agricultural model that has taken root in the people of Kupang district in particular. Mamar is a form or system of farming that is developed on a stretch of land around a spring or a certain zone with fertile land conditions, and in it there are various types of long-lived plants, seasonal crops, livestock and forest product sources that are managed wisely and effectively. wisely by local customary holders (vetors). The most dominant tree species in mamar are areca nut, betel and coconut. Mamar also has a strategic meaning because it has a function and makes a very large contribution to society, including economic, social and ecological functions. The problem is that mamar productivity is unstable and continues to decline due to the high level of vegetation density and management patterns or commodity management in Mamar, which is still lacking, as well as the lack of farmer intervention in increasing mamar productivity.

It seems that conventional productivity is currently being maintained because there is no comparison or model of technology adoption that describes the advantages and disadvantages of the productivity aspect. For this reason, an in-depth study is needed regarding the potential as a specific form of sustainable farming, so that it remains sustainable and more productive.

II. Theoretical Framework

An integrated agricultural system is a system that combines components of plants, livestock and fisheries as well as all agricultural activities in one system (Nurhayati et al., 2008). An integrated farming system is a management system (business) that combines agricultural components, such as plants, animals and fish into a unified whole. Another definition states, SPT is a system of managing plants, livestock and fish with their environment to produce an optimal product and tends to be closed to outside inputs (Preston, 2000).

This system has a significant impact and meets the criteria for sustainable agricultural development because it is organically based and developed/directed based on local potential (local resources). The purpose of implementing the agricultural system is to minimize external inputs (low inputs) so that the negative impacts as mentioned above can be avoided as much as possible and sustainable (Supangkat, 2009).

The general model of the Agricultural System referred to above, as described by Preston (2000) as shown in Figure 1. The principle of integration in the SPT that must be considered, namely: (1) Highly diverse agroecosystems that provide higher guarantees for farmers in a sustainable manner ; (2) Functional diversity is needed which can be achieved by combining plant and animal species that have complementary properties and are related in synergistic and positive interactions, and not only improved stability, but also productivity of agricultural systems with lower inputs; (3) In implementing sustainable agriculture, it is necessary to support human resources, knowledge and technology, capital, product and consumer relations, as well as the problem of balancing the mission of agriculture in development; (4) Utilization of functional diversity to the maximum extent that results in a complex and integrated agricultural system that uses existing resources and inputs optimally; (5) Determine the combination of plants, animals and inputs that lead to high productivity, production security and conservation of resources that are relatively in accordance with the limitations of land, labor and capital.

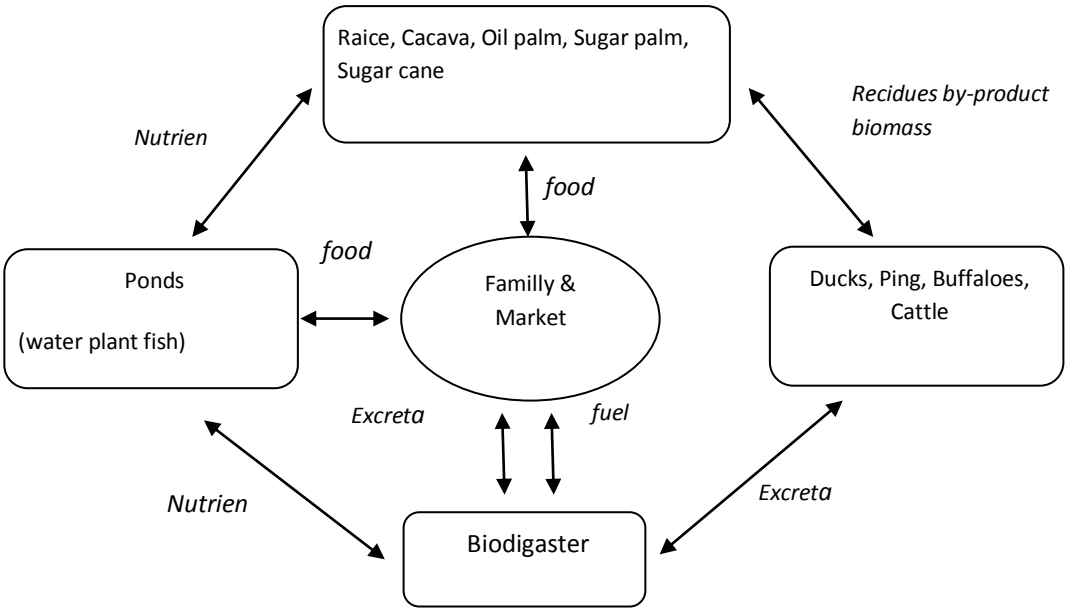

Figure 1. General Model SPT (Preston, 2000)

This system forms a massive agroecosystem. This high diversity of agroecosystems will guarantee higher farming success. Functional diversity can be achieved by combining plant and animal species that have complementary properties and are related in synergistic and positive interactions, so that not only stability can be improved, but also productivity of agricultural systems with lower inputs. The advantages of this system include minimal or even unnecessary external input due to the existence of waste cycles among the constituent organisms in the system, increased biodiversity especially with the use of local resources, increased nitrogen fixation, higher resistance of plants to pests and by-products of biogas fuel. for households (Rodriguez and Preston 1997 cit. Preston, 2000).

It is also said that the SPT has advantages in both ecological and economic aspects. The advantages in question are more adaptive to change (more stable habitat), environmentally friendly (North/environmentally friendly farming), energy saving (no wasted energy), high biodiversity, more resistance, more diversified business (relative failure risk), higher product diversification, healthier products (minimization of hazardous compound residues), better farming sustainability, better and sustainable labor absorption (Sutanto, 2002; Supangkat, 2009).

Various research results conclude that SPT is able to improve farm productivity. For example, lowland rice production on farmer's land, if usually only 5-6 tons/hectare, can increase to 7.6-8 tons/hectare (Agus, 2006). Big chili productivity can be increased from 0.5 kg/plant to 0.7 kg/plant (Nurcholis et al., 2010). SPT will be more reliable if the constituent components are local resources so that sustainability is more guaranteed. For example, plant components are sourced from local varieties because these varieties are more responsive to their growing environment so they do not require high energy input from the outside and are more resistant or better able to adapt to environmental changes that occur (physical, chemical, biological and economic). Meanwhile, hybrid seeds/seeds have weaknesses, including not being able to adapt optimally to the local agro-climate, lowering vigor in pure crosses, often engineered seeds are not free from pests and diseases and creating dependence on farmers to factory-made seeds every growing season (Goering , 1993 in Salikin, 2003). SPT is more familiar with local culture considering that this system has actually been developed conventionally by Indonesian farmers in general. Therefore, the application of this system culturally does not experience obstacles. In general, the application of SPT based on local potential will be able to support the sustainability of sustainable agricultural development both at the micro, meso (district/province) and macro (national) levels. The positive impact of implementing this system is more dominant than the negative impact, both in terms of economic, social and environmental aspects because this system is in line with the concept of conserving while using (Suprodjo, 2009).

The integrated farming system is basically a farmer's response to the risk factors that must be faced, given the existence of various uncertainties in farming (Soedjana, 2007). At a time when trade competition is increasing and sustainable development issues are a concern, an integrated farming system needs to be developed because in addition to reducing fertilizer costs for crops and reducing feed costs for livestock businesses, it can also repair damaged land due to excessive use of chemical fertilizers. Such an agricultural

system is known as a sustainable agricultural system with low external input technology (Low External Input Sustainable Agriculture; LEISA).

The concept of integrated agriculture has been applied in Indonesia since farmers were familiar with agriculture. In the 1970s, an integrated farming system was introduced based on the results of studies/research and then gradually the terms cropping pattern (Cropping pattern) emerged, farming system (Cropping system) until finally the term farming system (Farming system). and finally came the term crop-livestock system (Crop-livstoc system, CLS (Marwan. 1989)

The stability of these natural nutrients is obtained, both by weathering of pruned leaves and the role of tree roots because they are rescue nets and nutrient pumps as well as as a supply of nitrogen available to the roots of annual plants, either through weathering of roots that die during growth or through fixation of N-free from the air. Hairiah et al. 2009).

Terraces or swales that are formed can turn sloping or steep land into flat because steep mountain slopes are converted to flat so that they can help maximize water absorption (Sampul Pertanian, 2018). This will certainly make the land more productive to be planted with various agricultural crops or other crops needed

Determination of planting paths in the development of a planting area, especially in applying the agroforestry farming model, is very decisive for land productivity. To obtain optimal land productivity, the principles and processes of photosynthesis for each plant need to be a concern. This is because the characteristics of each plant in responding to light or carrying out the photosynthesis process are different for each type of plant. There are plants that can grow in limited light conditions or often called tolerant plants and there are plants that cannot grow in limited light conditions or intolerant plants (Wiraatmaja, 2017). In addition to the response to light, plant productivity is also largely determined by the availability of water and nutrients from the soil

The appropriate irradiation for areca nut ranges from 6-8 hours/day. The effect of sunlight on areca nut plants as follows: 1). The stem segment is shorter than the protected plant, 2). Plants don't get tall fast, 3). Physical plant is stronger, 4). The percentage of flowers to become fruit is bigger (Mhdsyukur, 2018).

Mamar and Its Role in Food Security Mamar is a farming system that is developed on a stretch of land around a spring or a certain zone with fertile land conditions, and in which there are various types of long-lived plants, seasonal crops, livestock and forest product sources that managed wisely and wisely by local customary stakeholders (vetors). The most dominant tree species in mamar are areca nut, betel and coconut. From this understanding, the mamar system is known by all people in the West Timor region, both the Dawan tribe scattered in North Central Timor Regency (TTU), South Central Timor Regency (TTS), Kupang Regency and the Tetun tribe in Belu Regency. Mamar is the name of the Dawan tribal community. Mamar is only developed near springs with large discharges, so not all villages develop and have mamar. Generally, each vetorany (consisting of 5-10 villages) only has 1 or 2 mamar, so that each mamar is far from one another. Therefore, of course there are slight differences in terms of area and management model between one mamar and another (Sunu, 2011).

Mamar as a form of farming, has very broad functions and benefits for the surrounding community, both ecological aspects, namely for spring conservation, economic benefits, economically Mamar provides a significant and sustainable income contribution because it can provide varied product results, and socio-cultural benefits, namely maintaining local wisdom and religious values that can unite all ethnic groups.

III. Research Methodology

3.1. Method and Location

The method used is a descriptive research method which aims to systematically describe the facts of the object or subject being studied appropriately. This research was conducted in Kupang Regency. The location of this research was chosen purposively with the consideration that the area is a dominant area of dry land with a dry climate and has a specific farming model, namely Mamar. The study sites were determined in the sub-districts of Fatuleu, West Fatuleu, Central Fatuleu, Taebenu and Amabi Oefeto.

3.2. Time and Data Collection Techniques

This research was conducted from July to November 2018. The data collection techniques used in this study were observation techniques, interview techniques and library searches. The data analyzed in this research is focused on the agroecosystem approach, which is a scientific concept and method that examines the dynamics of the agroecosystem in an integrated and functionally interrelated way between the components of the system and is also related to the ecological resilience, capability and stability of the dryland agroecosystem.

3.3. Analysis (GIS)

Analysis of the data used in this study is the Geographic Information System (GIS) software analysis procedure.

IV. Results and Discussion

4.1. Kupang Regency's Mamar Distribution Profile

Mamar is a farming system that is developed on a stretch of land around a spring or a certain zone with fertile land conditions, and in it there are various types of long-lived plants, as well as forest plants that are managed wisely and wisely by local customary stakeholders. veterans). The most dominant tree species in mamar are areca nut, betel and coconut, as well as mango and jackfruit, as well as banana and forest plants. From this understanding, the mamar system is known by all people in the Kupang district and even in the West Timor region in general. Mamar is the name of the Dawan tribal community. Mamar is only developed near springs, so almost all villages have mamar. The distribution of mamar in Kupang district is presented in Figure 2. below.

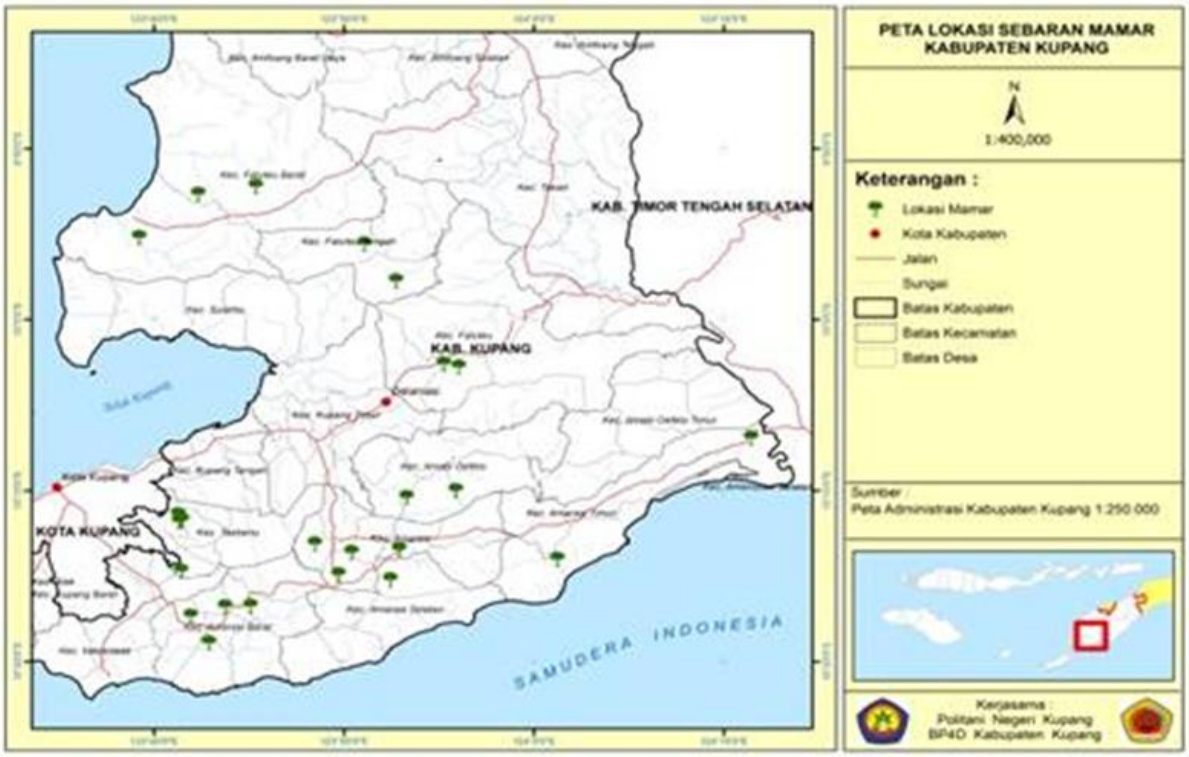

Figure 2. Map of Mamar Distribution in Kupang Regency

Mamar management model as local wisdom in Fatuleu, Central Fatuleu, West Fatuleu Taebenu and Amabi Oefeto sub-districts in the Kupang district, NTT Province as follows:

4.2. Mamar Potential in Fatuleu Kecamatan District

In general, the mamar in Fatuleu sub-district is one of the sources of life for the local community. There are two villages that are the research target locations, namely Oebola Dalam Village and Camplong I Village.

i). Inner Oebola Village/Naunu

Oebola Dalam village has a 20 ha mamar located in the area of hamlet 1 and hamlet 2. This Mamar is located at the coordinates E: 1230 56'06.07" S: 100 02'45.10", which is located exactly in the residential part of Oebola Dalam village, namely in hamlets I and 2. Inside the mamar location there is a spring that is quite adequate and flows throughout the year. The water source in the Mamar is used for mainum water needs, and also for agricultural needs including irrigating the staple crops in the Mamar location. The following map of mamar in the village of Oebola Dalam/Naunu is presented in Figure 3 below.

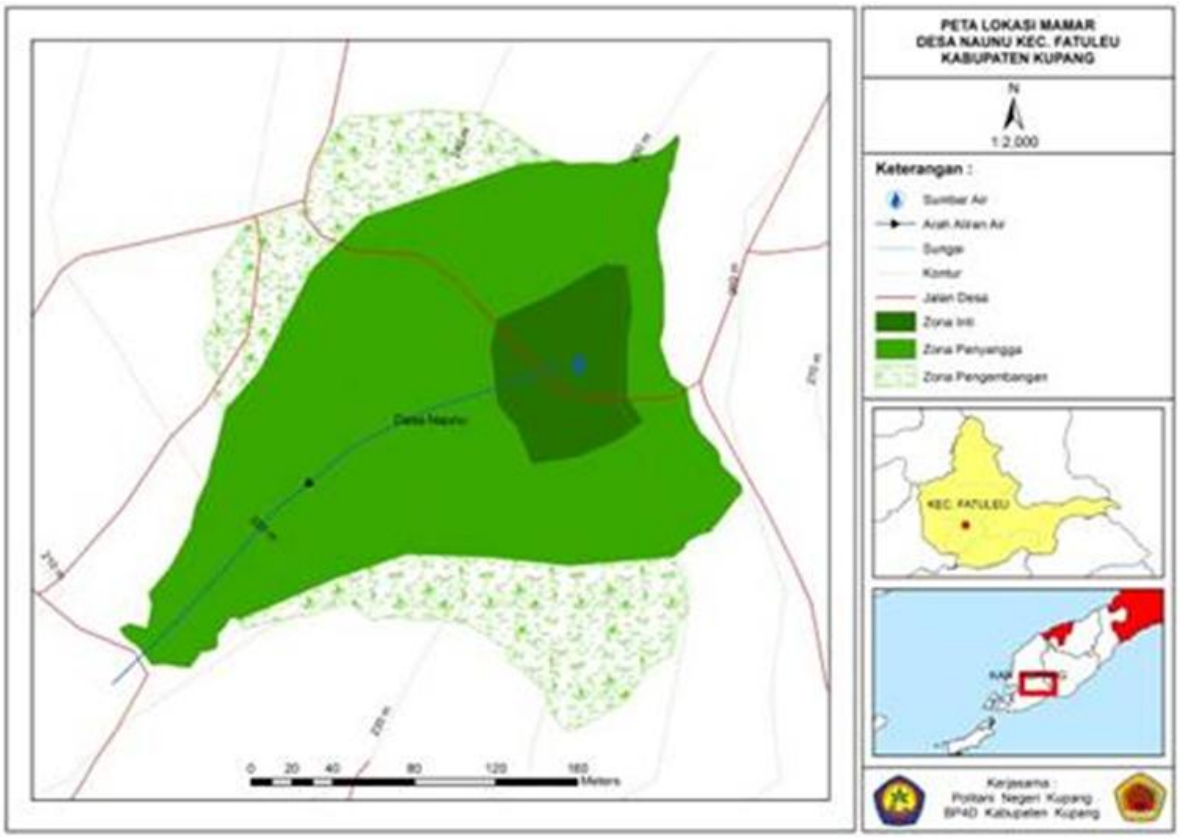

Figure 3. Map of Mamar in Oebola Dalam/Naunu Village, Fatuleu District

Mamar in Oebola Dalam/Naunu village is a legacy from previous parents whose age is tens or even hundreds of years, now mamar is in Oebola village. The condition of the water discharge in the mamar in Oebola/Naunu Village In the span of two years starting from 2016 and 2017 it continued to decline, this was felt by the pemik mamar farmers after not carrying out traditional ceremonies at the location of the springs. The springs contained in the marshland are named the Oebola springs. The types of plants in the mamar are long-lived plants, especially: Coconut, Areca nut, Siri, and banana and forest plants. In terms of productivity, mamar in Oebola village In terms of crop production in mamar is quite good, this also has an impact on the income received by mamar farmers. if mamar is managed and developed wisely, and required with adequate technological touch.

ii). Camplong I Village

Camplong I Village has an area of ± 2 ha which is located in the area of Rt.09/Rw.05 km45. This Mamar is located at the coordinates of E: 1230 55'14.30" S: 100 02'34.88", Inside the Mamar location there is a spring that is quite adequate and flows throughout the year. The water source in Mamar is used for agricultural needs, including irrigating staple crops in the Mamar location.

Mamar in Camplong I Village is a legacy from previous parents whose age is tens or even hundreds of years, currently Mamar is in Camplong I Village. The condition of the water discharge in Mamar in Camplong I Village continues to decline, this is felt by farmers who think bruised. The types of plants in Mamar are long-lived plants, especially: Coconut, Pinag, Siri, and bananas and fruit trees. The following map of Mamar in Kelurahan Camplong I is presented in Figure 4 below.

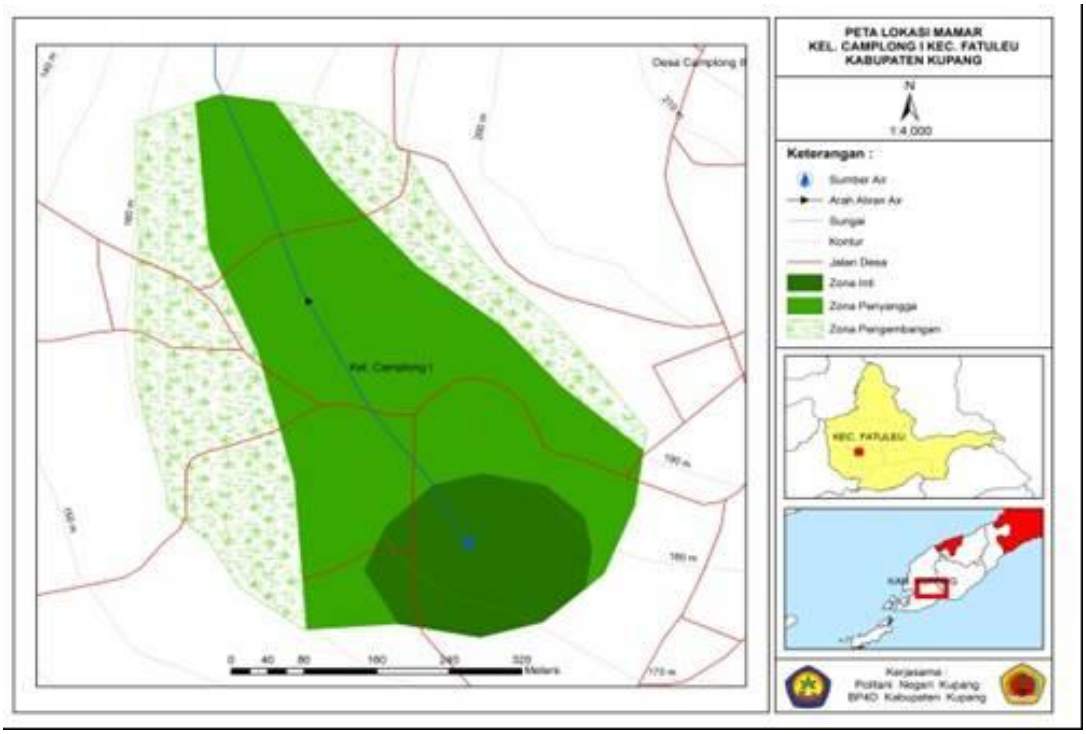

Figure 4. Map of Mamar in Camplong I Village, Fatuleu District

In terms of productivity, Mamar in Camplong I Village, the production of plants in Mamar is quite good, that Mamar is a potential source of financial income. This financial income is believed to be able to increase, if mamar is managed and developed wisely, and is needed with an adequate touch of technology.

4.3. Mamar Potential in Central Fatuleu District

There are two villages that became the research target locations, namely Oelbitneno and Nunsaen. Access to Oelbiteno and Nunsaen villages is very easy because it is connected to the district road.

i). Oelbitneno Village

Mamar in the village of Oelbitneno is mamar Oenael. Oelnael's Mamar is located at the coordinates: E: 1230 51" 04.11' and S: 090 55" 36.04' is a Mamar inherited from his parents who is currently controlled by the Koinmanas clan. The area of the marsh reaches 10 ha. The distance from the village to the location of mamar is very close to settlements. Mamar has a spring, namely the Oenaet spring which can flow throughout the year. The following map of mamar in the village of Oelbitneno is presented in Figure 5 below.

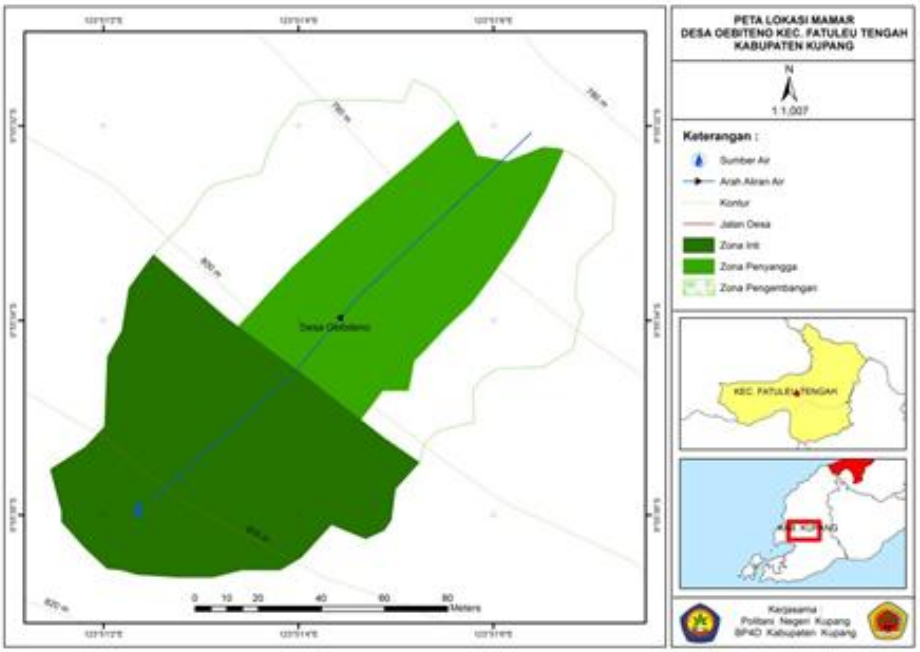

Figure 5. Map of Mamar in Oelbitneno, Central Fatuleu District

The use of water in the Mamar is for drinking water and for irrigating the plants in the Mamar. The types of plants in the mamar, namely coconut, areca nut, siri and banana and fruit trees, are planted in a mixed and irregular manner, with a very dense vegetation density.

Mamar contributed a sizeable financial income. If the existence of mamar in Oelbitneno Village is still managed well, it can produce relatively good results. Mamar productivity can still be increased if managed properly and wisely by mamar owners.

ii). Nunsaen Village

Mamar in Nunsaen village, namely Mamar Nunapa. Mamar nunapa in Nunsaen village is located at the coordinates: E: 1230 52" 47.33' and S: 090 57" 7.05'. Mamar Nunapa has been cultivated since 1930 by the Suan Oe Nunu tribe, and until now it is still being passed down from generation to generation to the Suan Oe Nunun Tribe family. Mamar area reaches 16 ha. The following map of mamar in Nunsaen village is presented in Figure 6. below.

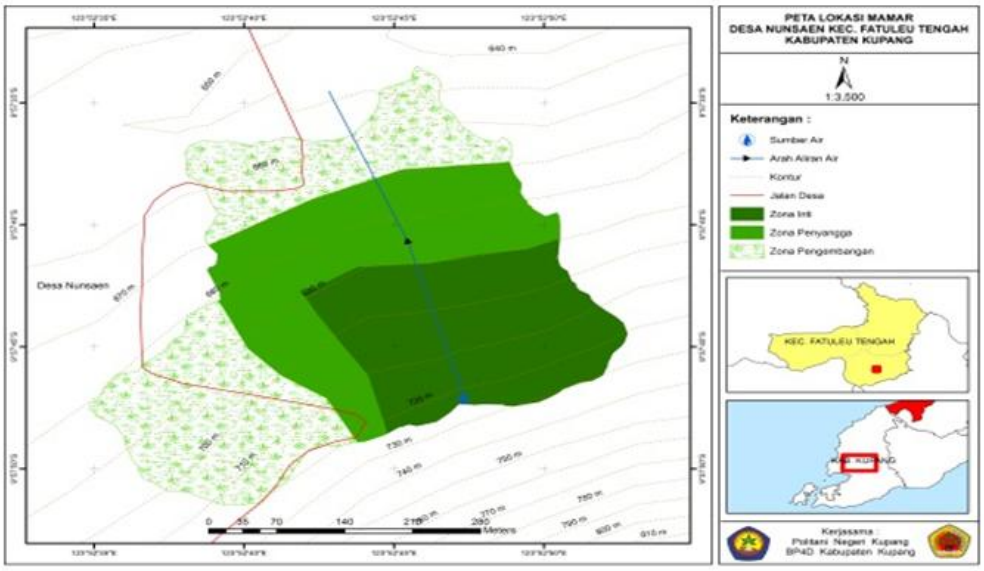

Figure 6. Map of Mamar in Nunsaen, Central Fatuleu District

Types of plants that exist in Mamar, consist of coconut, betel nut, banana series, fruit trees and forest plants and cattle. Mamar Nunapa's productivity in Nunsaen village also continues to decline.

4.4. Mamar Potential in West Fatuleu District

West Fatuleu is one of the sub-districts in the Kupang district. This district has 5 villages. Each village has a mamar as an additional source of income. There are two villages that are the research target locations, namely Poto Village and Naitae Village.

The villages of Poto and and Naitae are villages that were formed around the 1980s, which were moved from the old villages which were generally located in the interior. Access to Poto and Naitae villages is very easy because they are connected to the district road.

i). Poto Village

Mamar in Poto village is located at the coordinates point. E: 1230 39" 203' and S: 090 55" 185' are mamar belonging to the Hanas tribe which is currently controlled by Mr. Yakob Hanas, and his family. The area of the mamar reaches 3 ha, which lies in the southern part of the village of Poto, with the distance from the village to the location of the mamar about 0.7-1 km, and can only be reached by foot. This Mamar has a water source called the Oelanenu spring which has a small discharge and can flow throughout the year. The use of water in the Mamar is still limited to efforts to irrigate the plants in the Mamar and also for drinking water. The following map of Mamar in Poto village is presented in Figure 7 below.

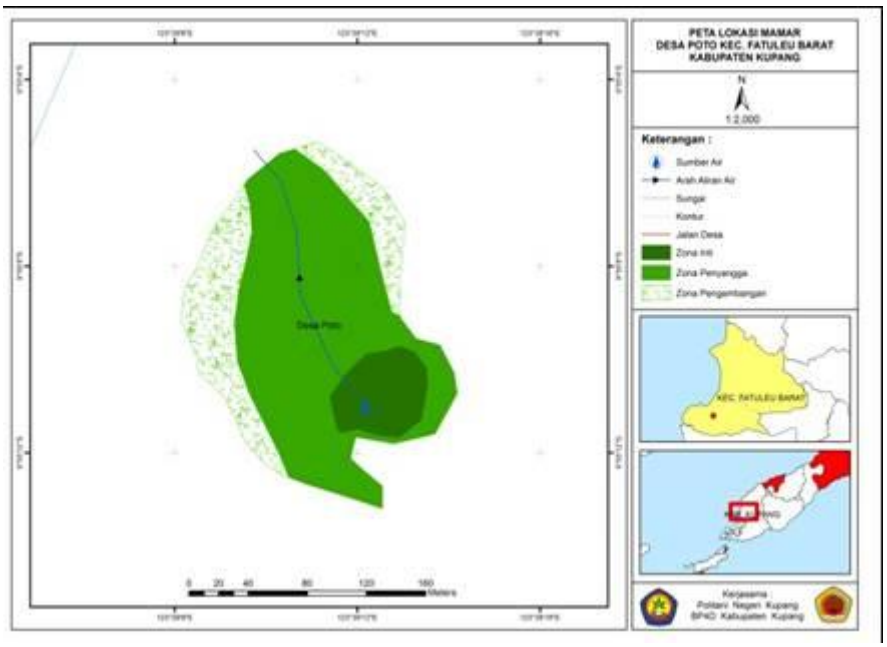

Figure 7. Map of mamar in Poto village, West Fatuleu sub-district

The plants in the mamar include coconut, areca nut, siri and banana and fruit trees (jackfruit, mango, water guava, and forest plants which are planted in a mixed and irregular way, with a very dense vegetation density, as well as cattle). Mamar productivity in this village also continues to decline from year to year. Production data at the Mamar Poto location are presented in Table 5. The data presented is the average data taken from three respondents who are mamar owners in Poto village. The existence of mamar in Poto is managed properly, of course it will increase the income of farmers who own mamar.

The management of mamar in Poto village is still bound by customary rules, especially in terms of taking results in mamar. Tua adat who is also the owner of the mamar who first held a ceremonial event at the spring to feed the ancestors first and then proceeded with taking the produce by the other owners. Harvesting for coconut and areca nut is usually done once a year.

ii). Naitae Village/Nuataus

Mamar in the village of Naitae/ Nuataus is located at the coordinates: E: 1230 42" 324' and S: 090 52" 663' located in the old village which is approximately 7 - 9 km from the center of Naitae village. The area of the mamar reaches 2.7 ha, and its management is controlled by several tribes or clans, namely the Ate clan, Nuju Laome Nifu. The following map of mamar in the village of Naitae/ Nuataus is presented in Figure 8 below.

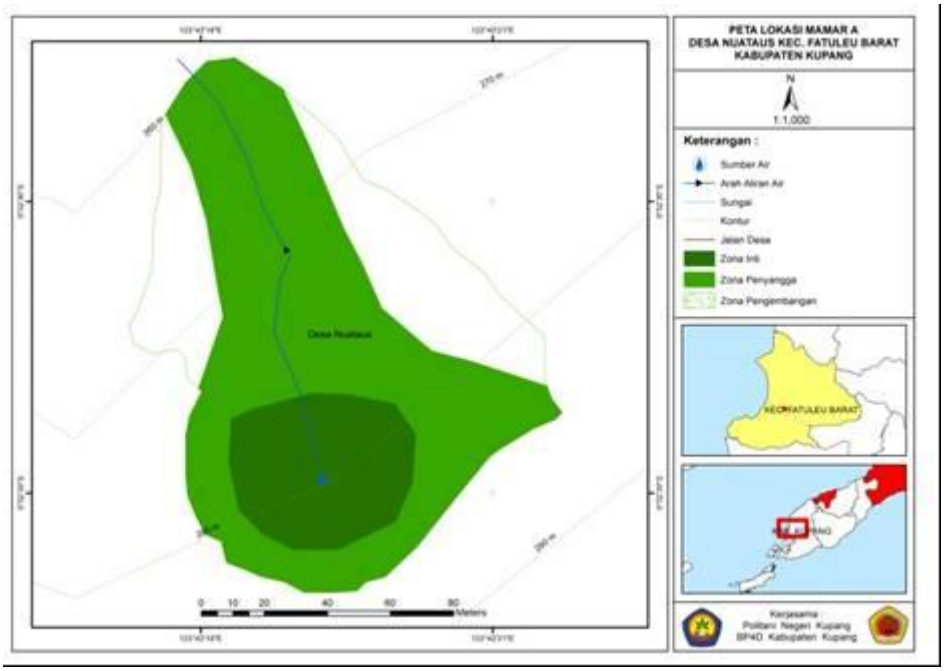

Figure 8a. Map of mamar in Naitae/ Nuataus village, West Fatuleu sub-district

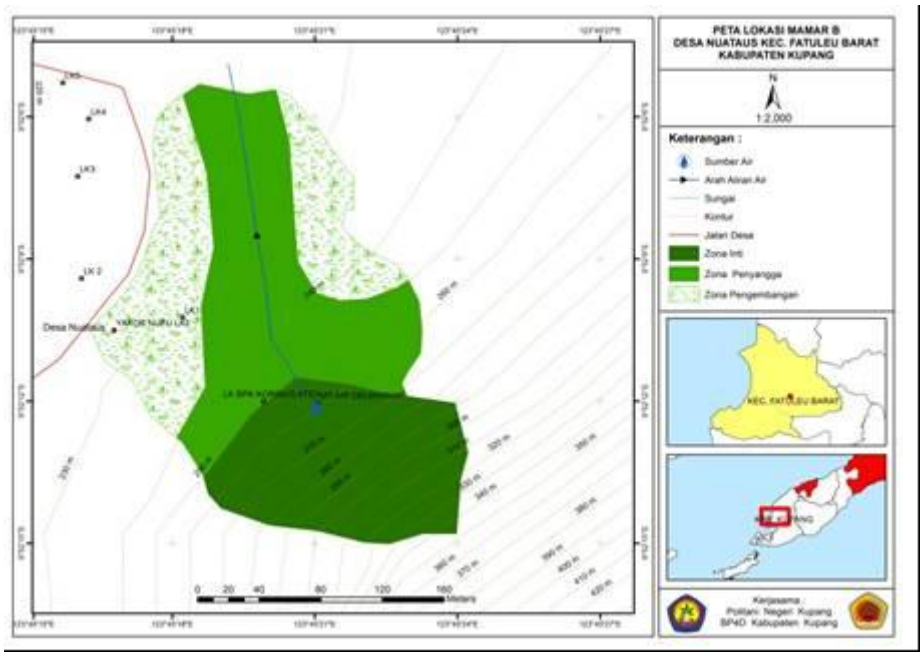

Figure 8b. Map of Mamar in Naitae/ Nuataus, West Fatuleu District

Mamar Oelmaman has springs that flow all year round. This Oelmaman spring is used for the drinking water needs of the community as well as to irrigate the plants in Mamar. The owner's intervention in the management is very low, meaning that the owner only comes to collect the proceeds of the marriage. Mamar management rules are still strong, especially in harvesting the results, the adat elders determine when to enter to collect the results in the mamar, even though it belongs to them. Mamar productivity in Naitae village also continued to decline.

4.5. Mamar Potential in Taebenu District

This district has 8 villages. Each village has a mamar as an additional source of income. There are three villages that became the research target locations, namely Baumata, East Baumata and North Baumata.

i). Baumata Village

Baumata Village has a Baumata Mamar, this Mamar is located at the coordinates: E: 1230 41" 19.40' and S: 100 12" 00.48'. Access to Mamar Baumata is very easy because it is close to the city center and Mamar and Baumata Springs are also tourist attractions for the people of Kupang.

Mamar Baumata is a mamar controlled by several tribes, namely the Table tribe, Humau and several other tribes. Mamar Baumata, apart from being included in the administrative area of Baumata Village, is also included in the North Baumata and East Baumata areas. Mamar area is quite wide reaching 12 ha, which stretches in the western part of Baumata Village to the eastern part of North Baumata Village. The following map of mamar in the villages of Baumata, North Baumata and East Baumata is presented in Figures 9, 10 and 11.

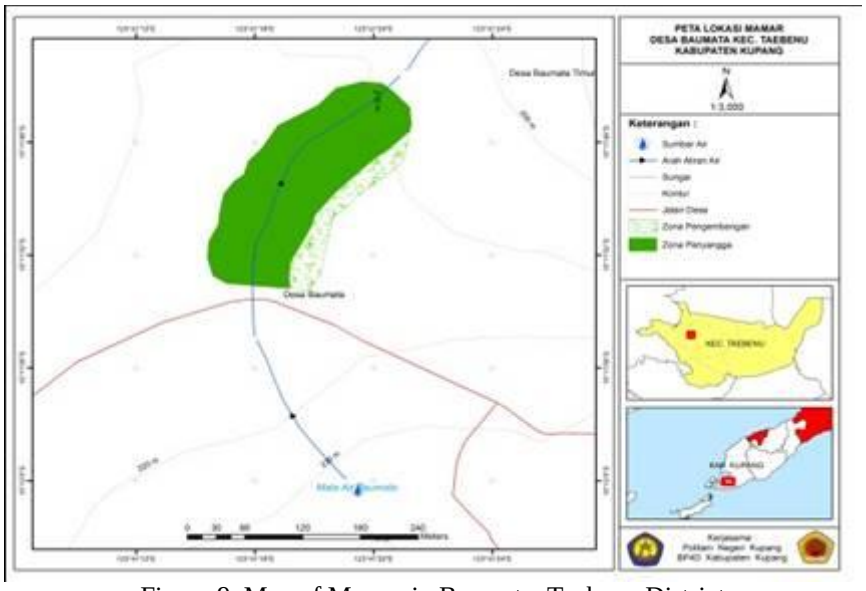

Figure 9. Map of Mamar in Baumata, Taebenu District

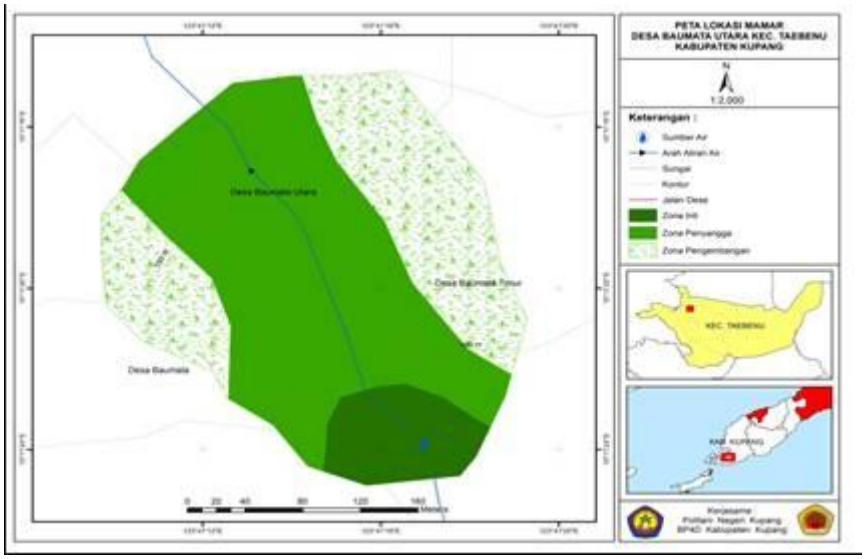

Figure 10. Map of Mamar in North Baumata, Taebenu District

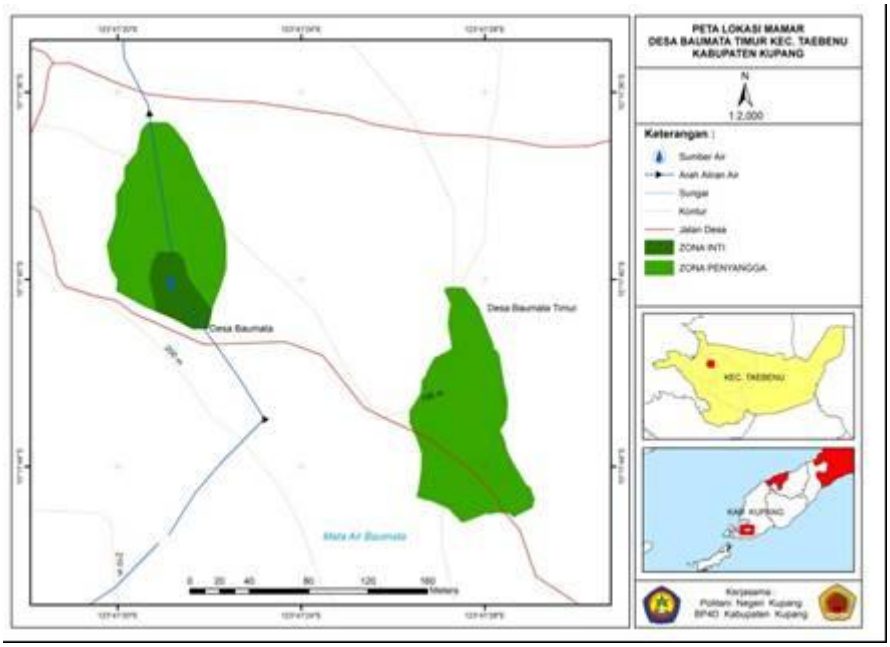

Figure 11. Map of Mamar in East Baumata, Taebenu District

Mamar has a water source that can flow throughout the year. The use of water in the Mamar is as a source of drinking water and to irrigate the plants in the Mamar, and other agricultural businesses. The types of plants in the mamar, namely coconut, areca nut, siri and banana and fruit trees, are planted in a mixed and irregular manner, with a very dense vegetation density.

4.6. Mamar Potential in Amabi Oefeto Kecamatan District

In general, the mamar in Amabi Oefeto sub-district is a source of life for the local community. There are two villages that became the research target locations, namely Kairane Village and Fatukanutu Village.

i). Kairane Village

Kairane Village has a mamar covering an area of ± 7 ha which is located in the area of hamlet 1 and hamlet 2. This Mamar is located at the coordinates E: 1230 55'52.78" S: 100 09'52.95" stretching from south to north, which is exactly located in the residential part of Kairane village, namely in hamlets I and 2. Inside the mamar location there is a spring that is quite adequate and flows throughout the year. The water source in Mamar is used for mainum water needs, and also for agricultural needs, including irrigating staple crops in the Mamar location. The following map of mamar in the village of Kairane is presented in Figure 12 below.

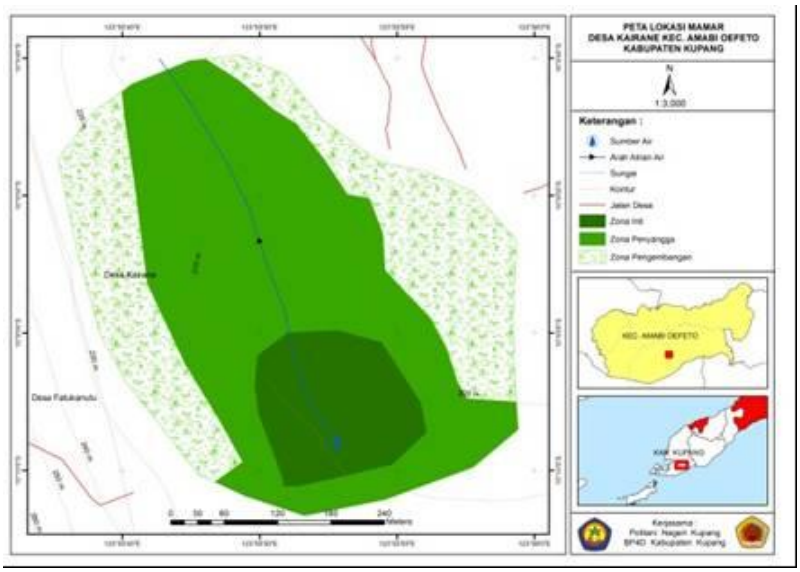

Figure 12. Map of mamar in Kairane village, Amabi Oefeto sub-district

Mamar in the village of Kairane is a legacy from his previous parents who are tens or even hundreds of years old, which is currently managed by the 4th generation. This Mamar is not an individual property, but a common property controlled by the tribe, namely the Taek tribe and the Beis tribe.

The mamar system in Kairanr village and other areas still persists despite the pressure of formal regulations from the government and the condition of water discharge that continues to decline from year to year which can affect the existence of mamar in an area. The existence of mamar in Kairane village is still running well because customary institutions are still strong, mamar rules are formalized in village regulations and the water flow is stable from year to year because the water catchment area is a forest cover area.

The types of plants found in mamar are long-lived plants, especially: Coconut, Pinag, Siri, and bananas as well as forest plants. In terms of productivity, mamar in the village of Kairane produces quite good crops in mamar, this also has an impact on the income received by mamar farmers.

ii). Fatukanutu Village

Fatukanutu village has a 2 ha area of land which is located in the hamlet area of 1 Rt. 01. This Mamar is located at the coordinates of E: 1230 53'17.49" S: 100 10'23.19". Inside the Mamar location, there is the Oenaef spring. These springs are quite adequate and flow throughout the year. The water source in the Mamar is used for mainum water needs, and also for agricultural needs including irrigating the staple crops in the Mamar location. The following map of mamar in Fatukanutu village is presented in Figure 13 below.

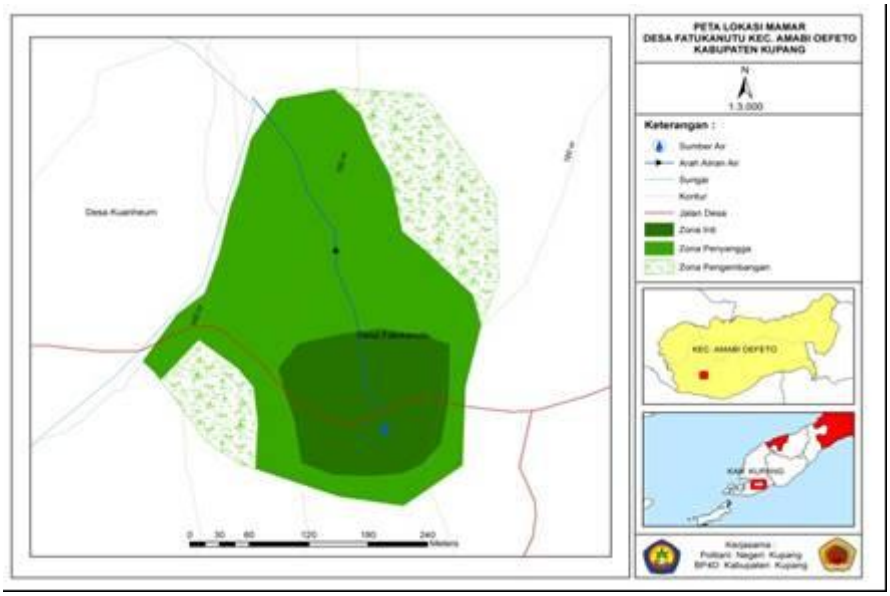

Figure 13. Map of mamar in Fatukanutu village, Amabi Oefeto sub-district

Mamar in Fatukanutu village is a legacy from previous parents whose age is tens or even hundreds of years, which is currently managed by the descendants of the Benu Tribe. This Mamar is not an individual property, but a common property controlled by the tribe, namely the Benu tribe. The mamar system in Fatukanutu village and other areas still persists despite pressure from formal regulations from the government and the condition of water discharge that continues to decline from year to year which can affect the existence of mamar in an area. The existence of mamar in Fatukanutu village is still running well because customary institutions are still strong, mamar rules are formalized in village regulations and the water flow is stable from year to year because the water catchment area is a forest cover area. The types of plants in Mamar are long-lived plants, especially: Coconut and Pinag and forest plants.

V. Conclusions

Based on the results of data analysis spread over five sub-districts, namely Fatuleu, Central Fatuleu, West Fatuleu, Taebenu and Amabi Oefeto sub-districts, Kupang district, it can be concluded as follows:

1 Mamar as a traditional agricultural system that has a conservation (ecological) function in maintaining the sustainability of the spring ecosystem, a large economic function for the community/mamar farmers, and a social function, namely the presence of main plants as facilities and springs as a place/a unifying forum and conflict resolution in society, has proven its reliability.

2 Mamar farming system is easy to develop because this system has become an agricultural culture for local communities so it does not require an adaptation period and only needs technical assistance for technical improvement of cultivation to make it more productive and economical.
3 All villages surveyed have mamar with an area that varies between 5-10 ha, in the upstream area (water catchment) it is used as a conservation area/cover area (core area) for a spring protection system with a plant density level that is still low.
4 The cool and wet microclimate in the area around Mamar is very supportive for plant diversification by introducing new types of plants that have high economic value, both plantation crops such as coffee, cocoa and vanilla as well as horticultural crops such as ramboutan, durian, longan, etc.
5 Mamar development can be combined with tourism development into agro-tourism so that in the end it has a multiplayer effect to improve the community's economy.

References

[1]. Agus, dkk. 2006. Analisis Kelayakan Usahatani Padi Pada Sistem Pertanian Organik di Kabupaten Bantul [Jurnal]. Sekolah Tinggi Penyuluhan Pertanian Magelang, Yogyakarta.
[2]. Hairiah K, Suprayogo D, Noordwijk Mv. 2009. Interaksi Antara Pohon – Tanah – Tanaman Semusim: Kunci Keberhasilan atau Kegagalan Dalam Sistem Agroforestri. Bahan Ajar 2. http://www.worldagroforestrycentre.org. Diunduh 2 Desember 2009.
[3]. BPS NTT. 2013. Nusa Tenggara Timur dalam Angka. Kupang.
[4]. BPS Kupang. 2017. Kabupaten Kupang dalam Angka. Kupang
[5]. Matheus, 2017. Peta Zona Agroekosistem Lahan Kering. Penelitian Pengembangan Sistem Pertanian terpadu sebagai Model Pengelolaan Pertanian lahan Kering Berkelanjutan di Tingkat Petani. Laporan Penelitian Unggulan jurusan MPLK. Tahun kedua (2017)
[6]. Matheus, R.; Noldin. A. Bolla; M. Basri; Maria K. Salli; dan Antonius Jehemat, dan Rampon, M. 2017. Penerapan Sistem Pertanian Terpadu Sebagai Upaya Peningkatan Produktivitas Lahan Kering: Kajian pada dua zona agroekosistem lahan kering di Timor. Proseding Seminar Nasional Politeknik Pertanian negeri Kupang ke-1, Kupang 7 September 2017, hal 16-26.
[7]. Mhdsyukur. Teknik Budidaya Pinang https://mhdsyukur.wordpress.com. Diunduh 14 Desember 2018.
[8]. Nurhidayati, I., Pujiwati, A., Solichan, Djuharu dan A. Basit. 2008. Pertanian Organik: Suatu Kajian Sistem Pertanian Terpadu Berkelanjutan. Program Studi Agroteknologi, Fakultas Pertanian Universitas Islam, Malang
[9]. Preston, T.R. 2000. Livestock Production from Local Resources in an Integrated Farming System; a Sustainable Alternative for the Benefit of Small Scale Farmers and the Environment.
[10]. Nurcholis, M. dan G. Supangkat., 2010. Pengembangan Integrated Farming System Untuk Pengendalian Alih Fungsi Lahan Pertanian. Prosiding Seminar Nasional Budidaya Pertanian Urgensi dan Strategi Pengendalian Alih Fungsi Lahan Pertanian | Bengkulu 7 Juli 2011 ISBN 978-602-19247-0-9
[11]. Nurcholis, M., G. Supangkat dan D. Haryanto. 2010. Pengembangan Sistem Pertanian Terpadu untuk mendukung mendukung kemandirian Desa Banjararum, Kecamatan Kalibawang, Kabupaten Kulon Progo. Laporan Pengabdian Masyarakat Iptek bagi Wilayah (IbW) DP2M. Ditjen Dikti Depdiknas tahun 2010.
[12]. Preston, T.R. 2000. Livestock Production from Local Resources in an Integrated Farming System; a Sustainable Alternative for the Benefit of Small Scale Farmers and the Environment.
[13]. Salikin, K.A. 2003. Sistem Pertanian Berkelanjutan. Kanisius, Yogyakarta.
[14]. Sampulpertanian, 2018. Manfaat Terasering atau Sengkedan
[15]. Soedjana, T.D. 2007. Sistem Usahatani Terintegrasi Tanaman Ternak Sebagai Respons Petani Terhadap Faktor Risiko. Jurnal Litbang Pertanian 26 (2) : 82-87.
[16]. Sunu, Pramudya, Melindungi Lingkungan dengan Menerapkan ISO 14001, Jakarta: PT Grasindo, 2011.
[17]. Supangkat, G. 2009. Sistem Usaha Tani Terpadu, Keunggulan dan Pengembangannya. Pengembangannya. Workshop Pengembangan Sistem Pertanian Terpadu. Dinas Pertanian Provinsi Daerah Istimewa Yogyakarta, tanggal 14 Desember 2009.
[18]. Suprodjo, S.W. 2009. Konservasi Ekosistem. Disampaikan pada Kuliah Perdana Program Studi Ilmu Lingkungan tanggal 21 Desember 2009, Fakultas Geografi UGM, Yogyakarta.
[19]. Wiraatmaja I.W, 2017. Cara Tanaman Beradaptasi Terhadap Cekaman Fisiologis. Bahan Ajar Program Studi Agroekoteknologi Fakultas Pertanian Universitas Udayana 2017.

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