A study of community response and determination of priority areas for the application of integrated coconut agroindustry system through the revitalization of coconut plantation and local wisdom for the community of West Muna District

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Abstract. The purpose of this study was: a) to Analyze the policies of the West Muna Regency government towards the development of integrated coconut agroindustry; b) Establish the priority of the coconut plantation revitalization area and the development of integrated coconut agroindustry and; c) Analyzing the response of coconut farmers to efforts to develop and manage coconut trees by implementing integrated coconut agroindustry systems. The study method used was the Focus Group Discussion and the Exponential Comparative Method. The results of the study shown that the policy of the West Muna Regency government regarding land use has existed. But it has not been focused and has not been realized in the form of commodity zoning designed to the integrated development of agro-industry with the Farmer's positive response as evidenced by the proportion of coconut farmers who agree and strongly agree to the revitalization of the coconut. Plantations and the development of integrated coconut agroindustry supported by several traditional uses of coconut plants in the form of local wisdom such as utilization coconut leaves in traditional wedding ceremonies and various products including rice steamer (Muna regional language called \textit{KANTOFI}).

1. Introduction

Some of the current factual conditions regarding the development of coconut plantations and their processing, especially in Southeast Sulawesi, are as follows:

The people of Southeast Sulawesi, especially farmers, have cultivated coconut plants that are conventionally carried out and are inherited from generation to generation in an area of the scale of business on average less than one hectare/person with the ability of farmers' capital, which in this article is called "Kelapa Rakyat";

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The average age of smallholder coconut plants has now exceeded 30 years, especially on Muna island including in the West Muna Regency with an area of 1217 hectares which is no longer productive [1], while rehabilitation efforts are insignificant and even smallholder coconut trees tend to be abandoned with oil palm companies owned by large (private) companies;

The past coconut cultivation system is more "Top Down", so it is not based on land suitability studies, the coconut cultivation area of each farmer is not designed according to the minimum economic scale so that farmers live properly with their coconut cultivation, and also design the construction is not projected as a single system by processing in the form of downstream products (processed products). As a result the People's Coconut farmers remain marginal and tend to leave and are not interested in cultivating coconut plants. This is reinforced by data showing that in 2011 the number of farmers was 467,200 people (45.51%) from the total workforce in Southeast Sulawesi to 402,377 people (41.53%) in 2013 [1].

Another fact, the company that cultivates large-scale oil palm has entered in Southeast Sulawesi, which has been driven by large entrepreneurs. This fact, on the one hand in macro terms can bring and increase Regional Original Income and foreign exchange. In the other hand, it is very micro-threatening to the sustainability of the People's Coconut farmers, who so far have also contributed to Regional Original Income and foreign exchange.

There are a number of results of the study that found that the integrated design of agro-industry management systems is far more beneficial than the conventional management system [2]; integrated agro-industry management system to apply in the strategic agroindustrial coconut development [3]; integrated management system to apply in the regional economic development system base on local resources capacity [4], integrated management system to develop agroindustry base on local resources through system approach, focus and sustainable. [5], the study of integrated coconut agroindustrial model with apply value chain method [6], similarly, the integrated Sago Industrial Development system [7].

The results of technological engineering of coconut processing into various products ranging from the technology of processing coconut meat, coconut fiber, coconut water to coconut shells, whose application is still limited to large entrepreneurs, but the benefits have not touched the welfare of smallholder coconut farmers.

Based on these facts, the more in-depth study is needed for the application of integrated smallholder coconut agroindustry systems (one raw material - multi-product and from on-farm to off-farm). It is by considering all aspects of industrial design including harmonized aspects of community coconut plantation revitalization with regional conformity and local wisdom of the local community especially the response of the community to process coconuts with integrated agroindustry systems.

The purpose of this study is:

- Analyze the policies of the West Muna Regency government towards the development of integrated coconut agroindustry based on commodity priority and regional scale;
- Establish the priority of the coconut plantation revitalization area and the development of integrated coconut agroindustry based on multi-criteria;
- Analyzing the response of coconut farmers to efforts to develop and manage coconut trees with integrated agroindustry systems.

2. Method

Method employed in the study were method of Focus Group Discussion (FGD) to find out the policy of the local government of West Muna in term of the development of coconut agroindustry, Method of Exponential Comparison (MEC) based on multi alternative and multi-criteria used to define the priority of the revitalization of the areas of the development of coconut agroindustry [8]. The procedures done in defining the decision supported is by the method of MEC were: (1) making an alternative decision; (2) compilation of decision criteria to be studied, determination of the relative importance of each decision criterion by using a particular scale of conversion according to the wishes of decision makers, (4) determining the relative importance of each alternative decision and (5) rating...
the values obtained from each alternative decision. In line with this, in this study the sub-district consisting of 11 sub-districts was used as an alternative to revitalizing coconut plantations and the development of coconut agroindustry while the criteria used are the potential of coconut development land, the actual condition of the current coconut plant, the actual condition of household coconut processing, and the availability of facilities and infrastructures. In calculating the score for each alternative in the MEC method through the following formulation:

$$TN_i = \sum_{i=1}^{n} \sum_{j=1}^{m} NK_{ij} B_{Kij}$$

$TN_i$ is the Final Total score from the alternative area of the county -i;
$NK_{ij}$ is the importance value of the alternative area of the county of –i to the criterion of the revitalization of coconut plant and the development of coconut agro-industry of –j
$B_{Kij}$ is the level of Interest from alternative sub-districts in the i on criteria for revitalizing coconut gardens and developing the integrated coconut agro-industry

Descriptive methods are used to assess trends in community response and the value of local wisdom towards revitalizing coconut gardens and developing integrated coconut agroindustry.

3. Results And Discussion

3.1. Analysis of public policies on regional territories of plantation commodities and coconut agro-industry development

National and regional agricultural development policies, with the regional approach, are outlined in the form of the Commodity Regional Policy. Commodity territory is a very important tool in securing the productivity of strategic commodities, given the increasing intensity of competition between commodities and competition between development sectors. This is in line with the results of a study that shows that all respondents (100%) in West Muna District stated that commodity territories are significant in the framework of optimizing the production and productivity of plantations, especially the people's coconut plants, and their processing.

Table 1. The average values and priority of consideration factors in formulating the agricultural and plantation in regional policies based on respondents

| No. | Factors of consideration in formulating the policies of of regional of agriculture and plantation | Averages *) | Priority factors |
|-----|-------------------------------------------------------------------------------------------------|-------------|-----------------|
| 1   | Political factors in broaden sight                                                             | 4,9         | 5               |
| 2   | Administration and organization feasibility                                                     | 5,7         | 6               |
| 3   | Competitiveness in increasing the Economic / Financial value to the community and the region   | 1,7         | 2               |
| 4   | Factors of Availability of Production Technology from Upstream to Downstream                    | 1,3         | 1               |
| 5   | Social, culture, and religion factors                                                          | 3,3         | 3               |
| 6   | Defence and security factors, particularly food security                                         | 4,0         | 4               |

Information: *) the minimum score shows the scale of priority
Table 1 shows that the availability of production technology factors from upstream to downstream is the main priority expected by respondents in formulating regional commodity policies. This is very reasonable because production technology includes the availability of land and its suitability to be cultivated for certain commodities, the availability of production facilities and infrastructure that are easily accessible by the community is a trigger to get the production as expected. The second priority is competitiveness in improving economics and finance to the community and the region. This is very related to the priority, for example, if the availability of production technology is easily accessible, it will reduce the cost of procurement of production inputs relatively, if plant cultivation is carried out by the land suitability study, it will minimize production input costs. Thus, the respondents' expectations of the results of their efforts will have competitiveness, which will ultimately have implications for Original Income in West Muna Regency.

3.2. Priority analysis of coconut plantation revitalization areas and integrated coconut agro-industry development

The results showed that all respondents stated that a coconut planter farmer in a sub-district in West Muna district currently had coconut on average ranging from only 1 to 50 coconut trees/farmers. This fact indicates that the existing coconut plantations are only byproducts that are relatively less empowering the economy of the farmers, even though farmers actually have land that is relatively wide and sufficient for the development of coconut. Based on this paradoxical fact, on the one hand, the farmers planted coconut only as a side crop, and on the other hand, the farmers had potential land for the development of coconuts with competitive coconut production value, efforts were needed to revitalize coconut gardens and the development of their processing industries.

In regional development or relating to regional development, careful planning is needed, so that there is a match between the region and its utilization. One method used is the Exponential Comparison Method based on index weight values. In line with the method in this study, it was used for the determination of the priority of the revitalization area of coconut development and its processing by approaching the administrative district area consisting of 11 sub-districts within the area of West Muna Regency. The criteria used are the potential of coconut development land, the actual condition of the current coconut plantation, the actual condition of coconut processing at home industry scale, the availability of production facilities and infrastructure. Based on these criteria, the results are as shown in Table 2 below:

Table 2. The priority of the district areas for the revitalization of the coconut plantation integrated to coconut agroindustry development in the regency of West Muna

| No. | The Alternative area/county for the revitalization of the coconut and the development of coconut agroindustry | The evaluation criteria |
|-----|---------------------------------------------------------------------------------------------------------------|
|     | The land potential of the development of coconut (weight 0,35) | Recent condition of the plantation of coconut (weight 0,15) | The actual condition of the coconut processing for Home Industry scale (weight 0,20) | The availability of the infrastructure (weight 0,30) | Total | Priority order |
| 1   | Kecamatan Barangka. | 1,75 | 0,6 | 0,8 | 1,2 | 4,35 | 3 |
| 2   | Kecamatan Kusambi. | 1,75 | 0,75 | 1 | 1,2 | 4,7 | 1 |
| 3   | Kecamatan Lawa. | 1,4 | 0,45 | 0,6 | 1,2 | 3,65 | 6 |
In Table 2 shows that the priority of sub-districts for revitalizing coconut plantations and developing integrated coconut agro-industries in succession is the first priority Kusambi sub-district, second priority Napano Kusambi sub-district, Barangka sub-district and Sawerigadi sub-district, respectively the third priority while other sub-districts are at priority fourth to ninth priority.

3.3. Community response to coconut plantation revitalization and integrated coconut agro-industry development

Before the development of coconut agroindustry and revitalization of coconut plantations was programmed and operationalized, the important step that needed to be done first was to find out the response of the community besides the technical factors of production. This is very reasonable because program failure is not uncommon due to negative community responses to a program. In this study, it was found that the public response to integrated agro-industry development and revitalization of coconut plantations was responded positively. This is supported by results that show that the value of the community response is 72% strongly agree and 28% agree to develop integrated coconut agroindustry while not the community does not agree. Likewise, the community's response to the revitalization of coconut plantations was 64%, strongly agreed and 36% agreed to revitalize their coconut gardens.

The proportion of the community response to the development of integrated coconut agroindustry and the revitalization of coconut plantations is clearly presented in Figure 1 below.
Furthermore, in the effort to revitalize coconut plantations, community support is needed in the form of their response when the coconut plantation revitalization program will be realized. This is very necessary because there were programs launched by the government that was not responded positively by the people who eventually failed. To minimize this risk, this study wants to find out the community response to several scenarios of coconut plantation revitalization in the form of intercropping plants and also a comparison of their responses to the possibility of developing other commodities. In connection with this matter, the alternative revitalization scenario offered to coconut farmers is overlapping coconut with cacao, coconut intercropping with coffee, coconut intercropping with patchouli, and comparative alternative scenarios for the development of other commodities in the form of monocultures namely oil palm, sugar cane, cocoa, and patchouli.

Based on the alternative scenario of coconut plantation revitalization, it was found that the scenario that received a high and positive community response was intercropping of coconut with cocoa and coconut intercropping with coffee each receiving a response value of 76% strongly agree and 34% agreeing while the coconut intercropping scenario with patchouli get the response value 88% agree and 12% disagree. As a comparable plant that is possible for plantation development, it was found that the community's response to the development of monoculture cocoa and patchouli plants attracted farmers with the community response value of 88% each agreed and 76% agreed to be developed. Revitalization of coconut plants is in demand and approved by the community because coconut plants not only provide financial benefits but are also supported by local wisdom values related to the use of coconut plants. The local wisdom of the community in the West Muna district is related to the utilization of coconut plants in the form of the use of young coconut leaves in traditional wedding ceremonies, utilization of young coconut leaves in making ketupat and lapa-lapa, especially on Eid days and events involving many families, utilization of young coconut fruits and roots of coconut plants as medicines for several diseases. The use of old coconut leaves woven into various products includes rice steamer (Muna regional language called KANTOFI). This makes the coconut plant very meaningful to the community from the point of view of the value of local wisdom. On the other hand, for oil palm commodities and sugar cane commodities, they received a negative response from the
community to be developed with a response value of 36% each disagreeing and 64% disagreeing that they develop oil palm plants, 24% disagree and 64% disagree and 12% very not agreed to develop sugar cane plants. The distribution of the proportion of community response to the scenario of the revitalization of coconut plantations and the commodities that are possible for plantation development is presented in Figure 2 below.

![Figure 2](image_url)

**Figure 2.** The response of the community to the scenario of the revitalization of coconut plantations and the other commodities that are possible for plantation development

In the end, the study expected that the local government of West Muna would consider the result of the study as one point in making the policy.

4. **Conclusions**

The Regency of West Muna government’s policy regarding land use has existed but has not been focused and has not been realized in the form of commodity zoning designed to develop agro-industry simultaneously.

Regional priorities for coconut plantation revitalization and agro-industry development based on potential land development criteria for cultivation, current actual land conditions, coconut processing conditions at home industry scale and availability of facilities and infrastructure the priority is Kusambi sub-district, second priority is Napano Kusambi sub-district, and priority to three are Barangka sub-district and Sawerigadi sub-district.

Farmers' response to efforts to revitalize coconut cultivation was strongly agreed and agreed while farmers' response to integrated coconut agro-industry development showed strongly agreed and no one refused (disagreed).

The positive response of farmers is evidenced by the percentage of coconut farmers who agree and strongly agree to the revitalization of coconut plantations and the development of integrated coconut agroindustry. It is not only related to the prospect of financial benefits but also supported by several traditional uses of coconut plants in the form of local wisdom such as the utilization of young leaves coconuts in wedding ceremonies, utilization of young coconut leaves in making ketupat and lapa-lapa, especially on Eid days and events involving many families, utilization of young coconuts and roots of...
coconut plants as medicines for various types of diseases, utilization of woven old coconut leaves into various products including rice steamer (Muna regional language called KANTOFI).

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