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Analysis on the Development of Pakancupung Agropolitan Area in Kediri District, Indonesia

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Abstract
Regional economic growth can be expressed as an increase in the number of commodities that can be used or obtained in an area. Meanwhile, regional development is one of the development programs that aim to boost the growth rate of a region. Pakancupung agropolitan area is one of the agropolitan areas in Kediri Regency which has good potential of natural resources to be developed. This study aims at identifying the potential and problems of natural physical factors as well as supporting factors that influence the development of Pakancupung agropolitan area in Kediri regency. This study uses Rapid Assessment approach through several analysis techniques including LQ analysis, Growth Share analysis, Linkage System analysis, Institutional analysis, and Agropolitan Subsystem analysis. The results show that Pakancupung area has 3 commodities, namely rice, chilli and shallot, and the main commodities to be developed are rice, organic rice, shallot, red chilli and catfish. The development of agropolitan area in Pakancupung region has close linkages to other sectors, such as the industrial sector, the trade sector and the tourism sector. Overall, the number of supporting facilities and infrastructure for the agropolitan area at Pakancupung is sufficient.
Keywords: Agropolitan, Commodities, Regional Development, LQ Analysis, Growth Share Analysis, Linkage System Analysis
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1. Introduction

Regional development is one of the development programs to accelerate the growth rate of an area, to improve the level of welfare in certain area, and to reduce the growth gap and inequality of welfare among regions. Agropolitan area is an area consisting of one or more activity centers in rural areas as a system of agricultural production and management of certain natural resources, which is indicated by the functional linkages and the spatial hierarchy of units of settlement systems and agribusiness systems . The development of an agropolitan area is aimed at increasing the efficiency of supporting infrastructure and facilities in agricultural activities. The supporting infrastructure and facilities include the needs for pre-production (upstream), production processes, and post-production (downstream).

The stipulation of Kediri Regency to be an agropolitan area is stated in the Regional Regulation of Kediri Regency Number 14 of 2011 on Regional Spatial Plan (RTRW) of Kediri Regency in the period of 2010-2030. This stipulation is in accordance with the main sector of Kediri Regency, that is the agricultural sector which has the largest percentage as the contributor to the Gross Regional Domestic Product (GRDP). Pakancupung has good potential to be developed on its natural resources. It consists of 4 subdistricts, namely Pare Subdistrict, Kandangan Subdistrict, Puncu Subdistrict, and Kepung Subdistrict. It has the area of 30,199.00 ha.

Pakancupung agropolitan area has excellent commodity to be developed. Nevertheless, due to the absence of optimal integration between production activities (on farm) and processing activities (off farm), an effort is needed to increase the production of the main commodities that support income and added value for the region. The purpose of this study is to dig up the big potential of the agricultural sector for increasing the income and welfare of the community and farmers through accelerating regional development and growing the linkages between villages and cities by encouraging the development of competitive, community-based, sustainable and decentralized agribusiness systems and businesses in the agropolitan region.

2. Literature Review

Regional development is a developmental effort to encourage the growth rate of an area which can impact on the improvement of community welfare in an area. Agropolitan consists of two words, namely agro and politan (polis). Agro means agriculture and politan means city, so that agropolitan can be defined as an agricultural city or city in an agricultural or agricultural area in a city area .

An agropolitan area is defined as a rural area that has geomorphological, climatic, topographic condition and institutional supports that promote agribusiness activities in the agropolitan area . The agropolitan concept will be formed if there is integration between agricultural activities and subsystems in agriculture, namely the agro-industry, agribusiness, and agro-tourism .

The agropolitan concept arises from the problem of regional development imbalances between cities as

centers of activity and economic growth and rural areas as centers of underdeveloped agricultural activities . The disparity between urban and rural areas and rural poverty has stimulated development efforts in rural areas.

The development of agropolitan area aims at improving agribusiness activities which add value, grow competitiveness, raise community income, and increase the contribution of agricultural sector to Gross Regional Domestic Product (GRDP). One of the concepts on regional development is the development based on main commodities. This concept emphasizes that the driving force for the regional development is supposed to be on its considered superior commodity at either domestic or international level.

According to the Department of Agriculture, a leading sector is a sector that has high resilience and capability to be used as a hope for economic development. The leading sector is expected to become the hope and driving force for the economy that can become the reflection of economic structure in a region. According to the Agricultural Research and Development Agency, main commodities are primary products that have a strategic position to be developed in an area which is determined based on various considerations both technically (soil and climatic conditions) as well as socio-economically and institutionally (technological mastery, resource capacity, people, infrastructure, and socio-cultural condition).

3. Research Methods

3.1. Research Sites

The research is located on the agropolitan area of Pakancupung, Kediri Regency, East Java, Indonesia. Pakancupung agropolitan area consists of 4 subdistricts, namely Pare Subdistrict, Kandangan Subdistrict, Puncu Subdistrict, and Kepung Subdistrict.

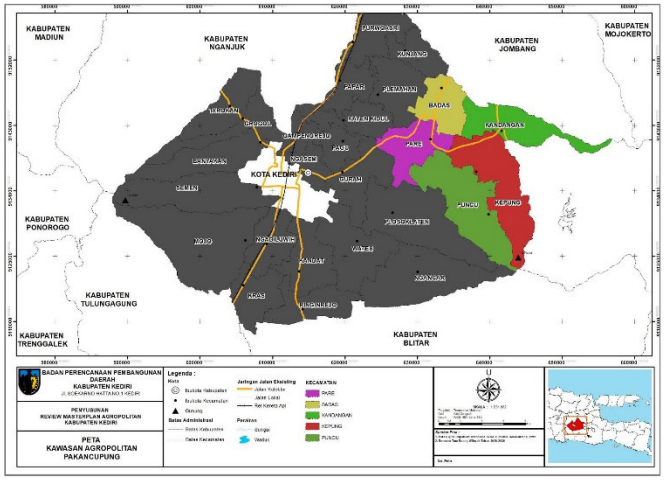

Figure 3.1 Map of the Pakancupung Agropolitan Area

This agropolitan area has an area of 30,199.00 ha. The total harvest area for agricultural food crops developed by the community at Pakancupung agropolitan area is 19,957 ha.

3.2 Data Collection

The data analysis includes primary and secondary data. The primary survey was conducted by direct observation on the field to capture the real condition employing several interview and observation techniques. The secondary survey is a method to collect data indirectly. The data come from the existing data, for example books, agency data, and so on. In this study, the secondary survey was mostly conducted to support research output by reviewing previous studies related to the development of agropolitan areas in Kediri Regency through literature and documentation studies.

3.3 Data Analysis

1. Agropolitan Subsystem Analysis

Agropolitan Subsystem Analysis consists of: (1) Upstream agropolitan analysis; an analysis on industries that produce capital goods for horticultural agriculture, (2) The analysis of the farming subsystem is a descriptive analysis consisting of agricultural production activities which can be reviewed based on commodity development; (3) Analysis of the downstream agropolitan sub-system consisting of human resources to process the agricultural products, facilities and infrastructure of the processing industry, as well as financing and institutional participation; (4) Analysis of the agro-output subsystem and the marketing system is an activity to facilitate the national and international marketing of fresh or processed agricultural commodities, including distribution activities to reinforce the flow of commodities from production centers to consumption centers, promotion, market information, as well as market intelligence; and (5) Descriptive analysis of supporting services is all

activities that provide services to agribusiness, such as financial institutions, research institutions, educational and extension institutions, information and transaction systems, transportation institutions, governmental institutions and non-govermental organizations.

2. Institutional Analysis via Venn Diagram

The Venn diagram is an analysis that aims to identify the relations between community and institutions. In addition, this analysis intends to identify the benefits, roles and involvement of the community in various village institutions.

3. LQ Analysis

LQ (Location Quotient) analysis is used to analyze basic commodities and non-basic commodities in a region. These commodities are determined based on the comparison between commodities in a particular area and commodities in a larger area, at the sub-district level to the district.

$$LQ = (Eij/Ej)/(Ein/En)$$

Information:
Eij: Sector regional variable in region j (district)
Ej: Regional variable in region j (district)
Ein: Regional variable in sector i in region n (province)
En: Regional variable in region n (provincialpro)

The value obtained from the formula is then interpreted according to the following conditions.

1. If the value of LQ<1, then the commodity analyzed is a non-basic commodity in the region and it means that this commodity is not sufficient to meet the needs of the people in the region.
2. If the value of LQ=1, then the commodity analyzed is a non-basic commodity, but the commodity has been able to meet the needs of the people in the region.
3. If the LQ value>1, then the commodity being analyzed is a basic commodity, that is, a commodity that is able to meet the needs of the people in the region and can also be distributed outside the region to meet wider needs (export).

4. Growth Share Analysis

Growth share analysis is employed to determine the production value of commodities in an area. This analysis is also to determine the potential of a commodity and the amount of contribution whether it will increase or decrease in a period of 3 years. Growth is utilized to see the level of productivity growth annually, while Share helps characterize the economic structure of various regions .

$$Growth = (Tn-Tn-1 \times 100)/(Tn-1)$$

Information:
Tn = The number of production in the nth year
Tn-1 = The number of production in the initial year

5. Linkage System Analysis

Linkage system analysis determines the effect of a sector on other sectors through the linkages between forward linkage and backward linkage.

4. Result and Discussion

Pakancupung agropolitan area consists of 4 subdistricts, namely Pare Subdistrict, Kandangan Subdistrict, Puncu Subdistrict, and Kepung Subdistrict. It has an area of 30,199.00 ha. The total harvest area for agricultural food crops developed by the community in Pakancupung is 19,957 ha. Most of the harvested area is land for maize cultivation. The area reaches 9,907 ha, with 30.31% of the land located in Pare Subdistrict (2019).

For horticulture, the harvest area for vegetable commodity in Pakancupung reaches 34,490 ha, meanwhile the total number of fruit commodity reaches 3,124,207 plants. The harvests are mostly pineapples which reach 1,980,000 plants. All of which are located in Puncu Subdistrict (2019). The total of harvested area for food crop plantation commodities at Pakancupung is 5,812.57 ha. Most of the harvested areas are sugarcane cultivation. The area reaches 2,947.57 ha, with 40.71% of the land located in are Subdistrict (2019).

The total number of livestock developed at Pakancupung is 7,976,115 heads. Most of them are layer chickens. Layer livestock reaches 4,221,349 heads, with 39.96% of livestock located in Pare Subdistrict (2019).

1. Analysis of Agropolitan Facilities and Infrastructure

Agropolitan supporting facilities and infrastructure in Kediri Regency consist of 14 regional markets, which are spread over 10 districts. In addition, there are 34 units of Farmers' Cooperatives, 31 units of Agricultural Service Business (UPJA), and 32 units of Agricultural Saprodi (Saprotan) Kiosk. For livestock production, there are additional facilities, namely KUD and Non KUD with a total of 7 and 12 units, respectively. The following is a table of the distribution of supporting facilities and infrastructure in Pakancupung area. Based on the analysis of the distribution of supporting facilities and infrastructure, the overall number of supporting facilities and infrastructure for the agropolitan is sufficient.

2. Institutional Analysis via Venn Diagram

The institutional analysis in Pakancupung area involved 9 parties, including: Agriculture and Plantation Service, Fisheries Service, Animal Husbandry and Food Security Service, Cooperative and Micro Business Service, Tourism and Culture Office, Agricultural Extension Agency (BPP), GAPOKTAN, BPD and Regional Governments. Based on the institutional analysis in Pakancupung area, the institutions that have a big influence on farmers are the Agriculture and Plantation Office, the Agricultural Extension Center (BPP), and Gapoktan. The amount of influence is presented in the image below.

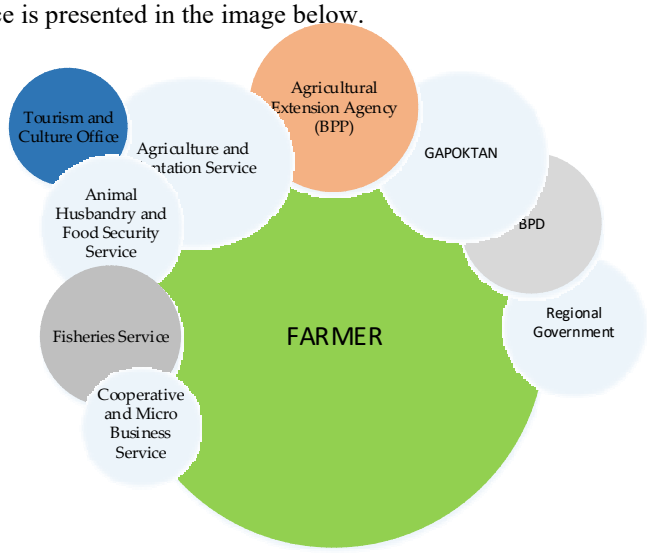

Figure 4.1 Venn Diagram of Pakancupung Area
Source: author's analysis

3. LQ Analysis

According to LQ calculations, the leading agricultural commodities of Pakancupung are rice, corn, sweet potato, tomato, red chili, cayenne pepper, avocado, rambutan, guava, sapodilla, melinjo, durian, banana, jackfruit, cloves, kapok cotton, and buffalo.

4. Growth Share analysis

According to Growth calculations, the agricultural commodities increasing annually in Pakancupung are corn, peanut, cucumber, tomato, eggplant, red chili, cayenne pepper, petai, alapukat, rambutan, durian, pineapple, jackfruit, grape, guava, sugarcane, cocoa, coconut, coffee, cottonwood, patchouli, beef cattle, dairy cow, goat, sheep, pig, free-range chicken, broiler, duck, wild duck, and rabbit.

Three methods are used to determine the main commodities to be developed i.e. LQ, Growth Share, and interview with stakeholders. From the three assessments, the following results were obtained:

Tabel 4.1 Outstanding Commodities in Pakancupung Area

Commodity Variety	Growth Share	LQ	Interview	Conclusion
Agriculture	-Corn -Peanut	- Rice - Corn - Sweet potato	- Rice - Organic rice	-Rice -Organic rice
Vegetables	-Cucumber - Tomato - Eggplant - Red chili pepper - Cayenne pepper - Petai	- Tomato - Red chili pepper - Cayenne pepper	- Shallot - Red chili pepper	- Shallot - Red chili pepper
Fruits	- Avocado - Rambutan - Durian - Pineapple - Jackfruit - Grape - Water apple	- Avocado -Rambutan - Guava - Sawo - Melinjo - Durian - Banana - Jackfruit	-	-

Commodity Variety	Growth Share	LQ	Interview	Conclusion
Plantation	-Sugarcane - Cocoa -Coconut - Coffee - Kapok - Patchouli	- Cloves - Kapok	-	-
The Farm	- Beef cattle - Dairy cow - Goat and sheep - Pig - Kampong chicken - Broiler -Ducks - Rabbit	- Bufallo	-	-
Fishery	-	-	- Catfish	- Catfish

Source: author's analysis

5. Linkage System Analysis

Pakancupung agropolitan area has four main commodities, namely rice, organic rice, red chilies and shallots. The agricultural sector in Pakancupung agropolitan area has linkages to four other sectors, i.e. the livestock sector, the industrial sector, the trade sector and the tourism sector. The linkages between the agricultural sector and the livestock sector include the provision of fertilizers for agricultural crops and the use of agricultural waste as animal feed.

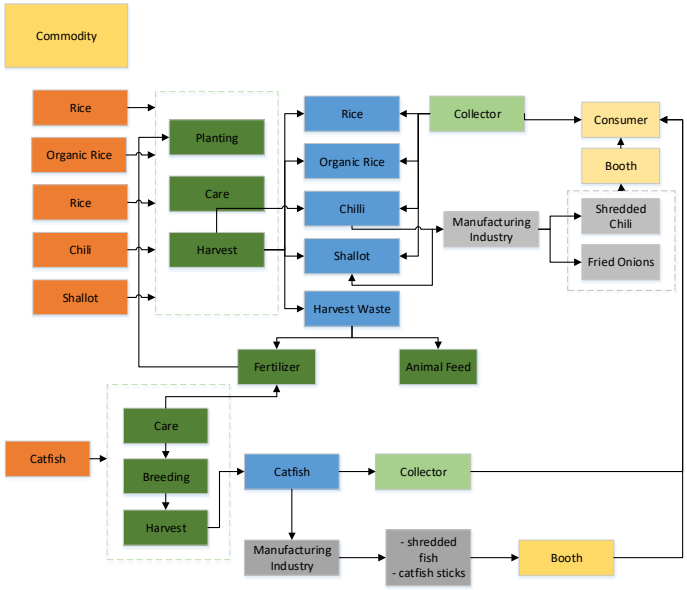

Figure 4.2 Linkage System Kawasan Pakancupung
Source: author's analysis

The linkages between the agricultural sector and the industrial sector include processing agricultural products into processed products such as fried onions and chilli sauce. The linkages between the agricultural sector and the trade sector include the marketing of agricultural products and their processed products by distributing them at gift shops and conducting exhibition which is usually held at Simpang Lima Gumul. The linkages between the agricultural sector and the tourism sector include the promotion of agropolitan areas by carrying out the nursery tourism activities in Pare.

6. Agropolitan Subsystem Analysis

The agropolitan subsystem analysis consists of the upstream subsystem, the farming subsystem, the downstream subsystem and the supporting subsystem. Based on the result of the analysis calculations and interview conducted at Pakanpucung the main commodities include rice, organic rice, shallot, chilli, and catfish.

a. Rice Subsystem

Rice is the primary product mostly produced in Kandangan Subdistrict. The upstream subsystem for rice consists

of high quality seeds and phonska fertilizer. The farming subsystem for rice consists of five stages, including soil cultivation for 20-25 days, seedlings by planting high quality and certified seeds, planting three times a year, husbandry by fertilizing, weeding, soil heaping and controlling pest and disease, and harvesting three times a year. The downstream subsystem is an analysis to observe the process of managing products into semi-finished products and final products. Rice harvested by the farmers of Pakancupung is usually sold directly through forestaller. Farmer groups, saving and loan cooperatives in the village, and the governments support the rice farmers in Pakancupung.

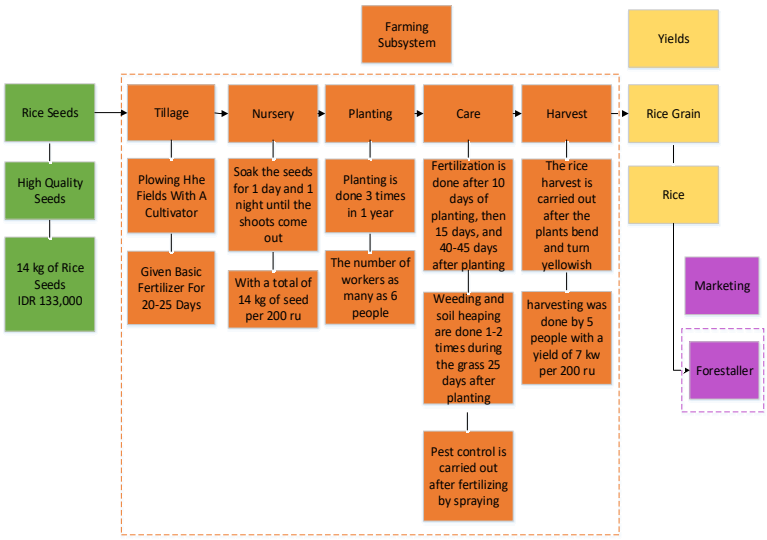

Figure 4.3 Rice Commodity Subsystem in Pakancupung Area
Source: author's analysis

b. Organic Rice Subsystem

Organic rice is rice grown by relying on natural ingredients without synthetic chemicals. The upstream subsystem for organic rice consists of high quality seeds and fertilizers in the form of manure and compost. The farming subsystem for organic rice covers five stages, including soil cultivation using machine, seedlings with certified seeds, planting three times in a year, treatment by fertilizing, weeding, soil heaping and controlling pests and disease, and harvest three times a year.

The organic rice from Pakancupung is usually sold directly without any processing through forestaller. Farmer groups, saving and loan cooperatives in the village, and the governments support the rice farmers in Pakancupung.

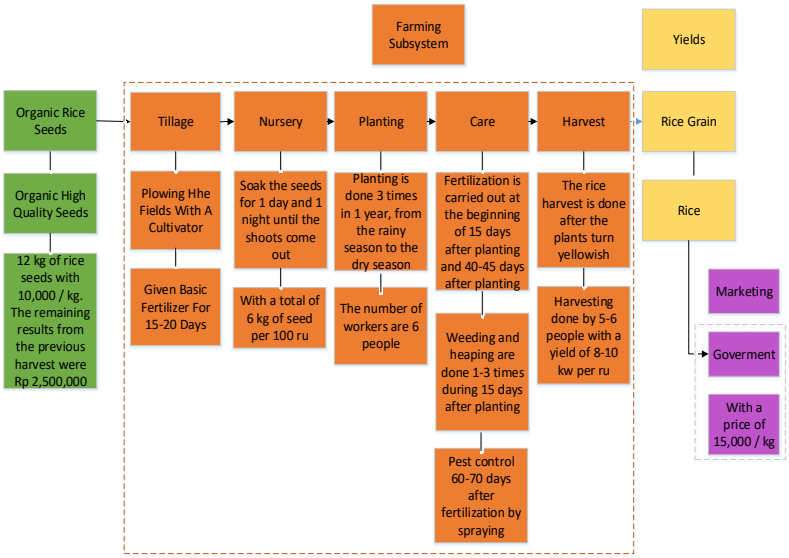

Figure 4.4 Subsystem of Organic Rice in Pakancupung Area
Source: author's analysis

c. Shallot subsystem

Shallots are the main commodity mostly produced in Pakancupung, one of which is in Badas Subdistrict. The upstream subsystem for shallot is seeds, fertilizers and plant sprays. The farming subsystem for shallot consists of five stages, including manual land cultivation, seedling for two days, planting twice a year, crop husbandry (fertilizing, weeding, soil heaping, pest and disease controlling), and harvesting.

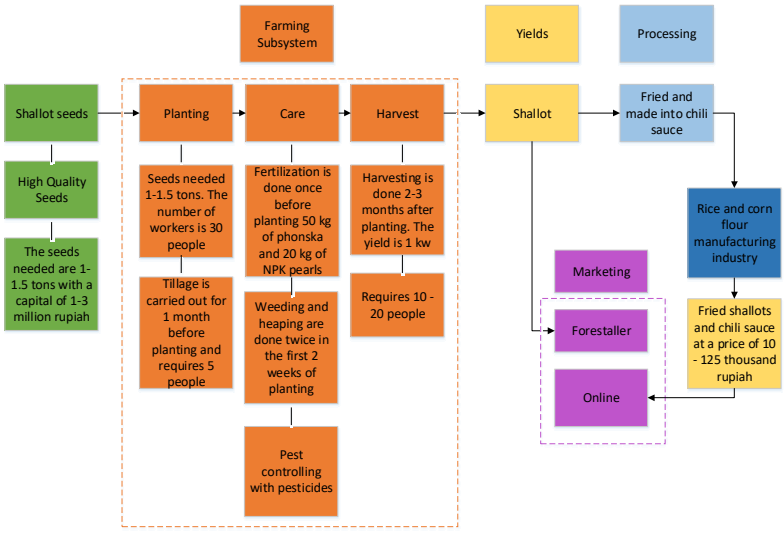

Figure 4.5 Shallot Subsystem of Pakancupung Area
Source: author's analysis

The harvest of onions is usually done 2-3 months after planting around February and July. The shallot is usually sold directly to forestallers and to neighbors around the farmer's house. However, some farmers also process the shallots into processed products like fried shallots and sauce. The existence of farmer groups and the role of the governments are proponents for shallot farmers in Pakancupung.

d. Chilli Subsystem

The upstream subsystem for chilies consists of seeds, fertilizers and plant sprays. The farming subsystem for chilli consists of five stages, including soil cultivation with hoes, seedling for two days, planting twice a year, husbandry by fertilizing, weeding, soil heaping, pest and disease controlling, and harvesting.

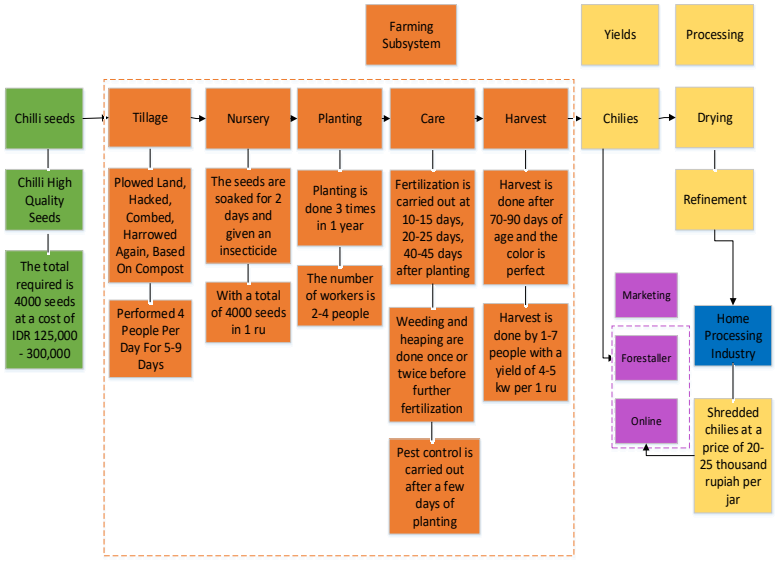

Figure 4.6 Chili Subsystem at Pakancupung
Source: author's analysis

The farmers can harvest chilies of 4.5 kw for 100ru. The chillies are usually sold directly to forestallers and to neighbors around the farmer's house. However, there are also chilli farmers who process their harvest into shredded chilli. The proponents for chilli farmers in Pakancupung include farmer groups, saving and loan

cooperatives in the village and the governments.

e. Catfish Subsystem

Catfish in Kediri Regency are farmed in a media called stilling basin (KAT). The type of catfish being farmed is the African catfish. The farming activity lasts for two months. KAT water replacement is also carried out every two months. Catfish can be fed in the form of dead fish, bran, urea fertilizer, processed eggs, cheese and noodles. The ratio of feeding catfish to the total weight of catfish is 1:1. Catfish is sold for IDR 25,000.00/kg. If the farming yields a big number of catfish, then it will be processed into other products such as sticks, chips, and dendeng (a kind of jerky).

5. Conclusion

Overall, the number of agropolitan supporting facilities and infrastructure in Pakancupung area is sufficient. Based on the institutional analysis in Pakancupung area, the institutions that have a big influence on farmers are the Agriculture and Plantation Office, the Agricultural Extension Center (BPP) and Gapoktan.

Agricultural commodities which become the main commodities of Pakancupung are rice, corn, sweet potato, tomato, red chilli, cayenne pepper, avocado, rambutan, guava, sapodilla, melinjo, durian, banana, jackfruit, cloves, kapok and buffalo. Agricultural commodities in Pakancupung which increase every year are corn, peanut, cucumber, tomato, eggplant, red chilli, cayenne pepper, petai, alapukat, rambutan, durian, pineapple, jackfruit, grape, water apple, cocoa sugarcane, coconut, coffee, cotton wool, patchouli, beef cattle, dairy cow, goat, sheep, pig, free-range chicken, broiler, duck, wild duck, and rabbit.

The main commodities to be developed in Pakancupung are rice, organic rice, shallot, red chilli, and catfish. Based on the linkage system analysis, Pakancupung area has 3 main commodities, namely rice, chilli and shallot. The agricultural sector in Pakancupung has linkages with 4 other sectors, namely the livestock sector, the industrial sector, the trade sector, and the tourism sector.

The researcher has some recommendations to improve the main sectors and to develop Pakancupung agropolitan area. First, to repair the access road in order to accelerate the distribution of agricultural products. Second, to encourage the institutions to involve in the agropolitan activities in order to increase added value, competitiveness, and community income through agribusiness and agro-industrial activities which can indirectly improve the regional economy in Kediri Regency.

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