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Regional Food Hubs For Distribution of Regional Food Logistics (Case Study on the Establishment of a Food Distribution Center in Banten Province, Indonesia)

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Abstract. Agriculture has a strategic role in sustaining the economy of a region, especially in improving food security and production of agricultural products. Food Hubs plays the role of building a food system that is capable of aggregating, distributing and connecting farmers with consumers directly. This requires the role and management of effective distribution methods by integrating the roles of farmers and consumers in a distribution center. The Distribution Center (DC) is managed by a Regional-Owned Enterprise (*BUMD*) that assists farmers in producing, selling and distributing food. Distribution Centers are able to overcome the problem of stock scarcity, price disparity, and price fluctuations in goods - especially staples. The Food hubs are supported by the determination of the number of warehouses, warehouse locations, and warehousing standards for the management of food staple inventory warehouses. Besides determining the level of inventory of safe food staples (buffer stock) is based on the main parameters: lead time and demand requirements. Food Hubs Operations embody the role of farmers, traders, in supporting the activities of distribution centers managed by Regional owned enterprises. Food hubs interactions involve institutions that play a role in sustaining these activities.

1. Introduction

The agricultural sector is one sector that has an important role in supporting the Indonesian economy. The agricultural sector in Indonesia needs to be developed in line with population growth and technological developments in order to increase agricultural production. Agriculture plays an important role in the development and as a measure of the welfare level of a country's population, especially in meeting the needs, supplies, and food consumption of its population. One of the commodities that is very important and in line with the government's program in food self-sufficiency is food crops. Food crops are one of the commodities and are currently being developed and are of concern to the government. Problems with food security (rice) such as lack of rice availability and rising rice prices can trigger social insecurity, economic and political instability and can thoroughly disrupt national stability. Aspects that must be met to achieve food security conditions are the adequacy and stability of food availability, affordability/distribution of food and food quality/safety. Distribution is the process flow from one process to the next. Supply Chain Management includes management information systems, purchasing, customer service, resources, transportation, production schedules, demand fulfilment processes, inventory management, warehousing and marketing [15]. The food hubs is an emerging food distribution model that can link small and medium farmers with other



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institutions (consumers, distribution agents), by creating new value chains that strengthen local and regional food systems [13]. A Regional Food hub is a business or organization that actively manages the aggregation, distribution and marketing of food products whose sources are identified primarily from local and regional producers to strengthen their ability to meet wholesale, retail and institutional demand [11]. Food hubs as a network and intersection of grassroots, community-based organizations and individuals who work together to build a more socially, economically and environmentally friendly food system that connects farmers with consumers directly ”[5]. Food Knives contribute to strengthening local and regional food systems and broader community goals of sustainability and health”[4].

The Food Hubs builds effective information flows and transparency among value chain partners, thus enabling each partner in the supply chain to fully understand the costs of production, processing, transportation and marketing operations, all of which help ensure that supply chain partners can negotiate acceptable returns [20]., revealed that the supply chain is a dynamic that involves a constant flow of information, products, and funds between different stages [6] There are 3 main components in the supply chain, namely the upstream supply chain that includes the activities of manufacturing companies with distribution and linking with retailers, internal supply chain management / internal supply chain management which includes storage, and finally is a downstream supply chain / downstream supply which includes shipping to end customers with a chain with an agricultural supply chain company. Commodity supply chain management of agricultural commodities and products is different from supply chains of non-agricultural commodity businesses, because: (i) commodities and agricultural products are perishable, (ii) the process of planting, growth and harvesting depends on climate and season, (iii) results harvests have varying shapes and sizes. (iv) agricultural commodities and products are cages making agricultural products difficult to handle [1]. All of these factors must be considered in the management design of commodity supply chains and agricultural products in order to obtain a comprehensive, effective, efficient, responsive and sustainable supply chain system.

2. Related Research

This section provides guidance on what and how the scope of regional food hubs is in realizing regional food logistics. Describe the appropriate methods for applying food hubs for regional food logistics. Interaction involved in the food hubs.

2.1. Scope of Regional Food hubs

The recent emergence of the concept of the food node and its development throughout the country have attracted much attention. Food hub operations have been framed as a strategy to improve local and regional food systems, specifically by increasing market access to small and medium scale agriculture.

Several case studies have commented on expected and observed operational characteristics of food hubs, including the ability of food hubs to differentiate their products throughout the supply chain as well as their potential to engage in transparent and collaborative relationships with business partners and other stakeholders. Product differences refer to the ability to identify and market certain product attributes. This can include information about producers and their locations, emerging practices, or group branding.

The emergence of alternative food networks (AFN) over the past few decades, including farmers' markets and Community Supported Agriculture (CSA), has signaled a direct response to the failures of industrial agriculture, and presented new opportunities for regional / rural communities to facilitate development and change [14]. Through AFN, food production, consumption and distribution ideally inspires social justice, improves ecological health, and prioritizes the needs of the community while increasing economic benefits.

Regional Food Hubs / (RFHs) represent the latest type of AFN, and are most related to the results of developing regional / rural development for producers, consumers, and communities over the past five years [8]. Policy makers, practitioners, and funders have actively embraced and financed RFHs which is defined as an organization that collects, stores, markets and distributes locally and regionally sourced food from several producers to many consumers [3], especially with regard to the capacity of such organizations, namely regional / rural revitalization and agricultural development [20].

A significant gap, however, exists in what is known about RFHs (Blay-Palmer et al., 2013; Fischer et al.). To stem the loss of family agriculture and stabilize rural communities in decline. Fischer et al. With RFHs, provide some support for theorization, but with limited empirical investigations of RFHs to date, such ideas are still untested and debated. What research has been done for RFHs offers little insight into regional / rural development, and is often at odds in a narrow result within the scope, lack of input from members of the local community, especially from consumers, without respecting site conditions, or applied outside the village, in the context of high prices where the ability to engage with claims related to food products. Many initiatives such as community-supported agriculture and farmers' markets exist as alternatives to global food systems, industrialization, conventional . This initiative broadens infrastructure and market opportunities for "middle agriculture" and promotes more sustainable food systems and food value chains. One concept that is quickly gaining recognition and attention from various stakeholder groups - from non-profit organizations and urban designers to universities and the United States Department of Agriculture - is food hubs. Food Hubs seem to offer many benefits, including expanded market opportunities for farmers, job creation, and increased access to healthy food by consumers [16].

The Food hubs / food center concentrates on aggregation, distribution and marketing, connecting producers with buyers in the supply chain. USDA [18], maintains a list of parent food centers that can be classified as follows:

- 1). Agriculture to the consumer model: producers who sell directly to consumers through farmers' markets, enforce agriculture, purchasing clubs and CSA
- 2). Agricultural to business / institutional model: producers selling to supermarket chains, independent grocery stores, schools, hospitals, institutions, restaurants and other businesses
- 3). Hybrid model: a combination of the agricultural to consumer and agricultural to business / institutional models

Determine the characteristics of Regional Food Hubs [2], including :

- 1) Carry out or coordinate the aggregation, distribution and marketing of food produced locally or regionally from various producers to various markets.
- 2) Regard producers as valuable business partners, not interchangeable suppliers and commit to buying from small to medium scale local producers whenever possible.
- 3) Work closely with producers, especially small scale operations, to ensure they can meet buyer requirements by providing technical assistance or finding partners who can provide this technical assistance.
- 4) Use product differentiation strategies to ensure that producers get good prices for their products. Examples of product differentiation strategies include preservation of identity (knowing who produced it and where it came from), group branding, special product attributes (such as heirlooms or unusual varieties), and sustainable production practices (such as certified organics, minimum pesticides, or "independently naturally "grown or raised).
- 5) Aiming to be financially viable while also having positive economic, social, and environmental impacts in their communities, as demonstrated by conducting certain production, community, or environmental services and activities.

Important factors in supporting the success of the Regional Food Hubs :

- 1) Thought and practice of leadership and entrepreneurship.
This includes visionary, committed and experienced individuals or teams, supported by strong and capable Board who are willing to innovate, take risks and come up with creative solutions to meet business growth and consumer demand for local and regional products, as well as design and provide services that meeting the needs of vulnerable people in the local community [3], Partnerships and networks are key, especially with producers [19]. Opportunities to develop in and / or utilize resources from established organizations, different from building entirely new organizations, are very important, as they start small and simple without the need to focus on physical infrastructure.
- 2) Engagement in local communities is very important to ensure relevance and credibility as well as a strong understanding of consumer motivation that drives demand for identified sources and values [12].
- 3) Reaching the minimum sales threshold and / or non-sales income is essential for long-term survival.

2.2. Regional Food Hubs Distribution Methods

The distribution method in the food hubs in the handling of the Provincial distribution center is described as follows:

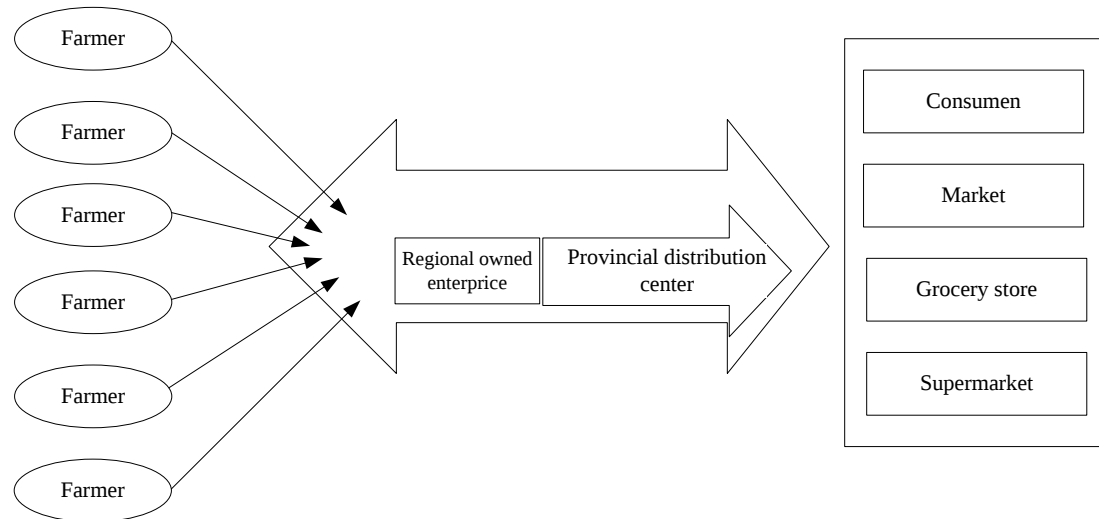


Figure 1. Flow distribution method in food hubs

2.3. Farmers

The Food Hubs overcomes the challenge of improving alternative food systems to serve as aggregators, processors, distributors and marketers and/or sales brokers in alternative food supply chains. Every node in the supply chain is important to enhance its development. Some nodes facilitate sales from small and medium-sized producers to institutional buyers by combining products from various sources. This provides buyers with the high volume and variety of product lines they need and allows small and medium-sized producers to compete with larger operations [9].

The role of farmers providing food (rice) which is spread throughout the regions in Banten Province is aggregated in each district which is spread in various regions, accommodated in warehouses owned by individuals or regions through warehouse receipts. Purchases through warehouse receipts are funded through regional banks to collect food/rice before being distributed to distribution centers. Usually, when it enters the rice warehouse receipts it has gone through stages from rice to milling. In this process, there has been a flow of sales from farmers to Regionally Owned Enterprises with appropriate prices and controlled rice.

Some nodes offer processing services that can cover everything, this allows the node to make food available throughout the year in areas with limited planting seasons; add value to farmers' income; meet consumer demand for comfort [17].

Aggregation/collection, food products before and after harvest plans made between farmers and the food/food node are mechanisms to anticipate what products will be available together with expectations for when they will be sent [10]. Pre-harvest talks with potential buyers provide guidance on consumer trends, desired products, quantity needed, and preferred packaging. Successful sales of food products depend on providing quality/inventory quality and consistency. Farmers must produce products with market recognized standards.

2.4. Regionally Owned Enterprises (BUMD)

This agency has the role of managing the Distribution Center because it is calculated to have the advantage of accommodating all aspects of Distribution Center activities to achieve physical, economic and trade development.

From physical development, BUMD has a role in managing infrastructure assets/facilities and infrastructure of distribution centers including buildings, facilities, transportation and distribution.

Economic development, namely creating purchase prices at the producer level and selling prices at the consumer level, is more stable. On the other hand, farmers get the consumption of goods and Saprotan needs at lower prices. Thus farmers are expected to be prosperous and consumers get a guaranteed supply of rice commodities at stable prices.

The Regional Government through BUMD has an interest in the solution to the problem of stock scarcity, price disparity, and fluctuations in the price of goods - especially staples, especially rice.

Mapping of food needs (demand side) is carried out to identify the types of food staples and the estimated needs of each type of food staples in an area. Food supply mapping (supply side) is intended to identify the supply of each type of food and the estimated volume of food production in an area.

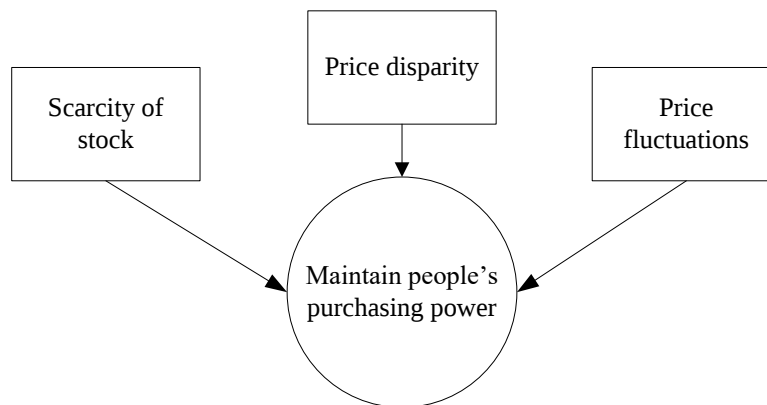


Figure 2. Maintaining people's purchasing power

Identification of Commodity Availability,

price and supply/demand controls in several regions in the district/city are in accordance with the figure

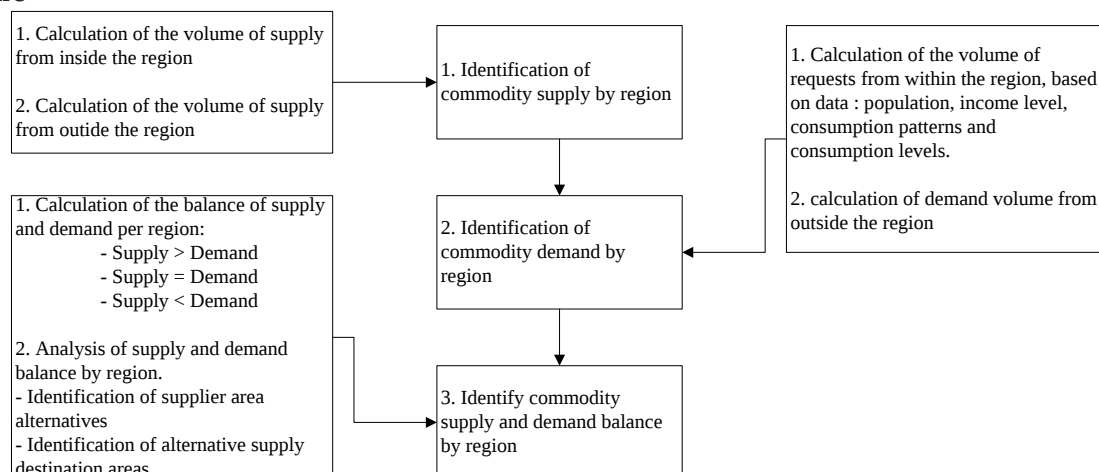


Figure 3. Identifying material availability, price control and supply-demand

The smooth distribution will guarantee the accuracy of the stock and be able to control the disparity and fluctuations in commodity prices of basic commodities. Fluctuations in prices of staples contribute significantly to regional and national inflation rates. Fluctuating inflation rates, moreover tend to be high, have an impact on overall economic stability [6]. Warehousing plays an important role in overcoming fluctuations in surpluses and shortages of food staples. Determination of the number of warehouses, warehouse locations, and warehousing standards for the management of food staple inventory warehouses. Determination of the level of inventory of safe food staples (buffer stock) is based on the main parameters: lead time and demand requirements. Food packaging and handling processes need to be done safely to protect from damage, loss and degradation of food quality from primary producers (farmers), industrial producers (food processing manufacturing companies),

wholesalers, retailers to consumers. In managing food staple warehouses, food expiration needs to be considered. Food staples are perishable goods. Warehouse standards and cold chain transportation modes are required for certain types of staples. To maintain the limit of food supply, the application of FIFO (first-in-first-out) in the management of staple food supplies is absolutely necessary. The use of an inventory card will ensure the supervision of food inventory in and out. In warehouses with SKUs (stock-keeping units), a large and complex supply of food staples requires the use of a WMS (warehouse management system) application system.

With this WMS application, it can be monitored the stock of food staples, receipts, storage, picking, and expenditure of food staples from the warehouse. From the description of the method of distribution of food hubs, operational activities in the distribution center can be described as follows :

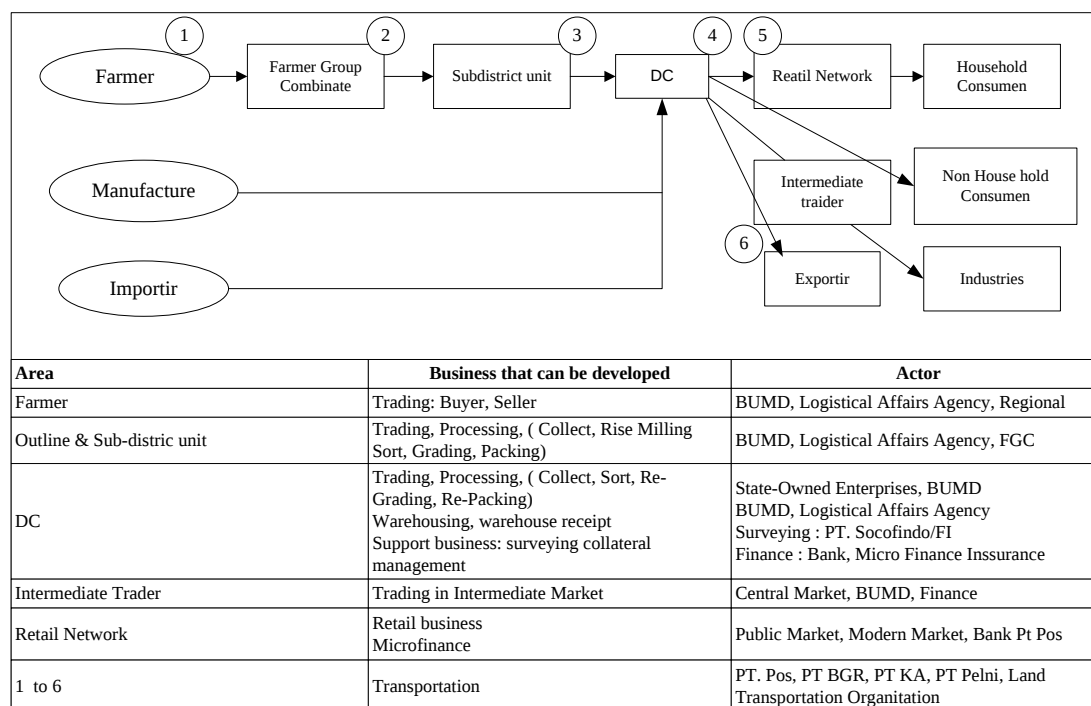


Figure 4. Food Hubs operations in a distribution center

2.5. Interactions involved in the food hubs

Distribution Centers make purchases and sales directly through established markets, for specified commodities.

1). Purchase

The Distribution Center has a procurement division that is responsible for purchasing food commodities to various suppliers and from various regions. The purchase of food commodities is aimed at businesses upstream in the supply chain of each commodity. With notes, the upstream part is included in the criteria, as follows:

- Manufacturers incorporated in groups/organizations.
- Groups/individuals who have rice mills.
- Small and Medium Enterprises that have the ability to process agricultural produce.

Quantity of purchases is carried out with reference to the level of demand (market size) in a certain area and the trade deficit of commodities in other regions. That is, there will be a calculation for the proportion of the purchase scale of each commodity managed by the Distribution Center. That, as a solution to meet food needs in areas which are the marketing areas of every Distribution Center presence. If the strategy continues and is stable, it will have a slow impact on the movement of disparity between regions.

2). Sales

The Distribution Center has a marketing and business division that is responsible for carrying out commodity sales. The payment system for commodity sales is done in 2 ways: cash and tempo.

Payments from consumers are made in cash. Payment methods can be in cash or transfer. Payments from consumers that are made on time can be in cash or transfer and the maximum payment duration is 45 days after the sale and purchase transaction.

The various Sales Centers for Distribution Centers are as follows:

- a) People's market.
- b) Traders (non-market people).
- c) Modern markets.
- d) Horeca (Hotels, restaurants and cafes).
- e) Catering company.
- f) Processing industry.
- g) Shops.

The sales targets set are the nodes of the supply chain of basic commodities that will approach the final consumer. Thus, ideally, the supply chain of commodities managed and traded by the Distribution Center does not exceed 4 links.

One of the causes of the frequent fluctuations in prices of basic commodities, due to the supply chain length is too long, even as happened in early 2017, prices soared sharply in public markets that have a negative impact on high inflation. For this reason, the support of Government regulations concerning the trade system for essential commodities is essential. The role of the distribution center's control range which is controlled by the Government is also needed to oversee the operation of the Distribution Center's operational systems and procedures so that the development objectives of the Distribution Center can be realized quickly.

Commodities come from the coverage area and outside the scope of the suppliers managed by the Distribution Center management.

(1) Supply area

The commodities managed and traded by the Distribution Center are food products, whichever make purchases to suppliers from various regions of the production center. Each Distribution Center has a different coverage area with the presence of Distribution Centers in other regions. That is, there will be a determination of regional objects as the scope of each Distribution Center. For example, the Makassar Distribution Center will have different marketing coverage areas than the Papua Distribution Center. However, the Makassar Distribution Center and the Papua Distribution Center in obtaining a supply of commodities can be sourced from the same supplier partners originating from the commodity production centers.

(2) Mechanism, empowerment and procurement

Distribution Centers in obtaining a various supply of commodities through the production center areas. The Distribution Center procurement division is a division that is closely related to suppliers in the area of production centers. The production center of each commodity has a different distribution. For example, centers of rice production with shallots and red chillies. One of the centers of rice production is in Banten and East Java, shallots in Brebes Regency, Central Java, while red chili is in Garut Regency, West Java. The relationship between the Distribution Center and commodity production centers is closely related to several aspects, as follows:

(a) Empowerment

Related to the activities of coaching, growing and developing suppliers.

(b) Procurement.

Associated with the activity of realizing the purchase of suppliers' production results from the activities of guidance, growth and development of suppliers. With the empowerment and procurement system by the Distribution Center procurement division, it will reduce the level of the price disparity between regions. Distribution Centers will work together with suppliers through the principle of partnership.

The realization of the interaction of food hubs produces a picture of the distribution center as follows:

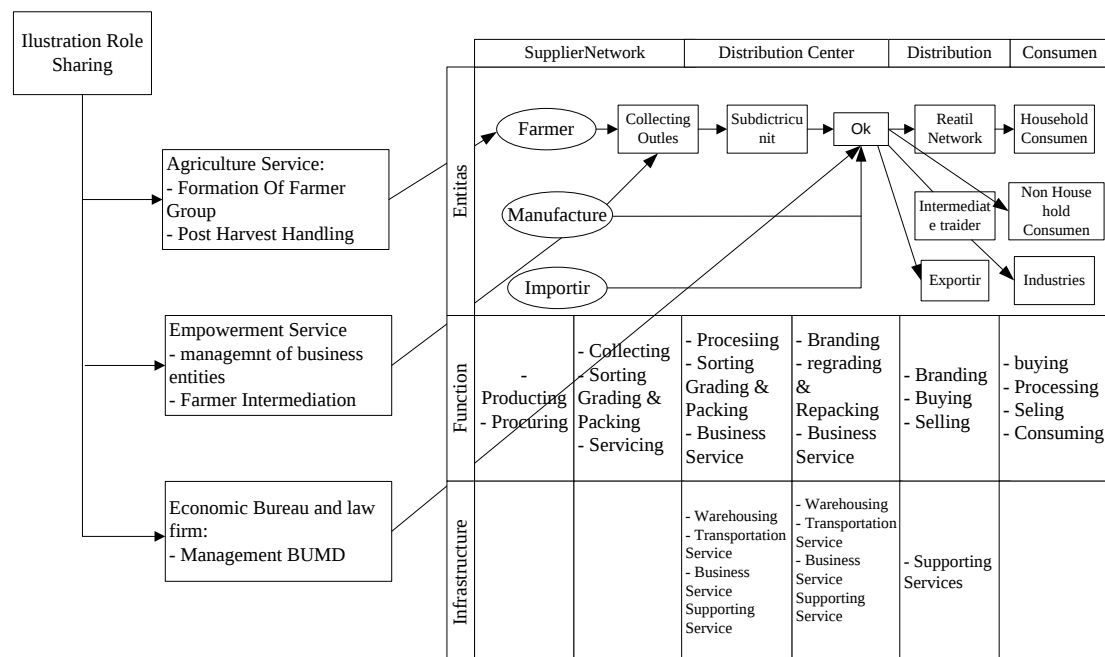


Figure 5. Interaction of food hubs in realizing the Distribution Center

3. Conclusions

- Regional Food Hubs is a business or organization that actively manages the aggregation, distribution and marketing of food products whose sources are identified mainly from local and regional producers
- Food Hubs distribution method shows distribution that gives producer/farmer capable of supplying products to distribution centers and the role of Regionally Owned Enterprises that can handle and manage all activities at distribution centers so as to produce adequate supply distribution.
- Interaction Food Hubs divide the role of institutions in realizing distribution management in the activities of well-managed distribution centers.

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