

Improving of Coconut Agroindustry Development Based on Key Elements of Actors and Linkage Structure: Existence from Konawe Island, Indonesia

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Abstract

This paper explores the condition of the coconut agroindustry in Konawe Island, Southeast Sulawesi Province, Indonesia that has abundant natural resources of coconut plants and potential to increase the coconut agro-industrial development system (ADS) sector based on coconut utilization into cooking oil ingredients. The experimental method was applied using community focus group discussion (CFGD) approach to determine the elements of CADS actors and the Interpretive Structural Modelling (ISM) method to analyze and determine the actors as the main key elements in the CADS. The study found that coconut farmers and consumers are the main keys in the CADS in Konawe Island. The role of actor elements that influence CADS such as the banking sector, coconut farmers at the second level, department of industry and trade, local government, and collection traders at the third level. Classification of CADS actors has been obtained the linkage quadrant classification are coconut farmers, local government, plantation agency, coconut processing industry, and the department of industry and commerce, while the elements of consumers and universities are in independent quadrant. This

study provides knowledge to CADS for improving the coconut agroindustry, especially those in the coconut fruit processing industry. As founders in this industry lack a business management background or experience in order to help them better prepare themselves and avoid failure early in their business. The findings of this study provide information for small coconut processing entrepreneurs on the influence on CADS growth of the relevant actor elements and structures.

Keywords: Coconut, Farmers, Agroindustry, Actors, Linkage structure

INTRODUCTION

The coconut agroindustry development system (CADS) in Konawe Island as an institutional system is inseparable from the dynamics and complexity of problems and the many parties involved or involved either directly or indirectly in efforts to develop coconut processing businesses (Suliyanto and Jati 2013; Moreno et al. 2020). The complexity and dynamics in question are higher because the scale of businesses engaged in the coconut agroindustry in Southeast Sulawesi Province and especially in Konawe Island is mostly classified as microenterprises (Ulyasniati et al. 2022). Microenterprise actors actually have a strategic role in sustaining economic growth because the number of microenterprises throughout Indonesia is 57,189,393 (98.77%) of the total business and is able to absorb 97% of the workforce along with its contribution to Gross domestic product (GDP) of 61.07% (Aziz 2019; Rahmadiane and Mahmudah 2022). This fact should provide a strong signal that microenterprises including the coconut agroindustry are very important to be empowered (Syapsan 2019). Despite its strategic role and relatively large contribution to GDP, the fact is that its strengthening and development tend to be neglected due to the capitalistic hegemony of large and medium-sized entrepreneurs whose number of large businesses is 5,066 (0.01%) but controls 95% of economic turnover, followed by the number of medium-sized businesses of 52,106 (0.09%) and small businesses of 654,222 (1.13%) (Robitaille et al. 2021).

The coconut industry in Konawe Island does not have the ability to compete, especially with processed products in the form of cooking oil or copra (Yusuf et al. 2020). Konawe Island should be a granary and coconut oil warehouse that will supply the needs of cooking oil at least in the region itself, even Southeast Sulawesi cooking oil needs to export because the community has been cultivating coconut for generations and is one of the coconut centres in Southeast Sulawesi (Purba and Nisa 2018; Orentlicher 2019; Saediman et al. 2021). However, the fact is quite ironic because the current actual conditions show that cooking oil products that control the entire market in Konawe Island and even the Southeast Sulawesi market are cooking oil produced from palm oil by

large entrepreneurs such as Bimoli, Filma, Tropical, Kunci Mas products (Maharani et al. 2021). On the other hand, smallholder coconut crops fill almost the entire land area of Konawe Island, which tends to be neglected and unprocessed. Most coconut farmers sell their coconut products in the form of logs and only a small number of community members process coconut into cooking oil for their own needs and process coconut into copra (Bollido 2019; Alouw and Wulandari 2020). This fact is related to the role of agroindustry parties (actors) and a number of problems as a cause of the lack of competitiveness of processed coconut products (Kustiari et al. 2021; Syahza et al. 2021). In connection with the dynamics, complexity, and strategic role of the coconut agroindustry, so in this paper analyses the key elements and structure of linkages between actors of the CADS that can be used as a reference by parties, especially policymakers of the CADS.

EXPERIMENTAL METHODS

This research uses the CFGD method in depth to obtain the elements of actors and their respective needs for the CADS. In addition to apply the CFGD method, it also uses the Interpretive Structural Modelling (ISM) method to analyse and determine the key elements of actors of the CADS. One of the stages of the ISM technique is to organize the hierarchy can be approached with 5 criteria, namely:

- 1) Bond strength within and or between groups/levels.
- 2) The relative frequency of oscillation; lower levels are shaken faster than higher levels.
- 3) Context: higher levels operate at a slower timeframe in a wider space;
- 4) Coverage: higher levels cover lower levels; and
- 5) Functional relationships: higher levels have slow variables that affect fast variables at lower levels.

Another stage of the ISM technique is to divide the substance under review into elements and sub-elements in depth until they are deemed adequate. This sub-element arrangement uses input from relevant stakeholders. Subsequently, the contextual relationships between sub-elements are established, expressed in terms of subordinates leading to pairwise comparisons. Based on the consideration of contextual relationships, a Structural Self Interaction Matrix (SSIM) is prepared, then a Reachability Matrix (RM) table is created and calculations according to the Transitivity Rule by making corrections to the SSIM until a closed matrix is obtained. The RM that has met the transience rule is then processed to determine the choice of level (level partition). The results can be depicted in the form of a schematic of each element according to vertical and horizontal levels. Based on the RM, sub-elements within one element can be organized according to Driver

Power Dependence (DPD) into 4 classifications or sectors, namely autonomous sectors, dependent sectors, linkage sectors, and independent sectors (Alam et al. 2020). The research framework is summarized in Figure 1.

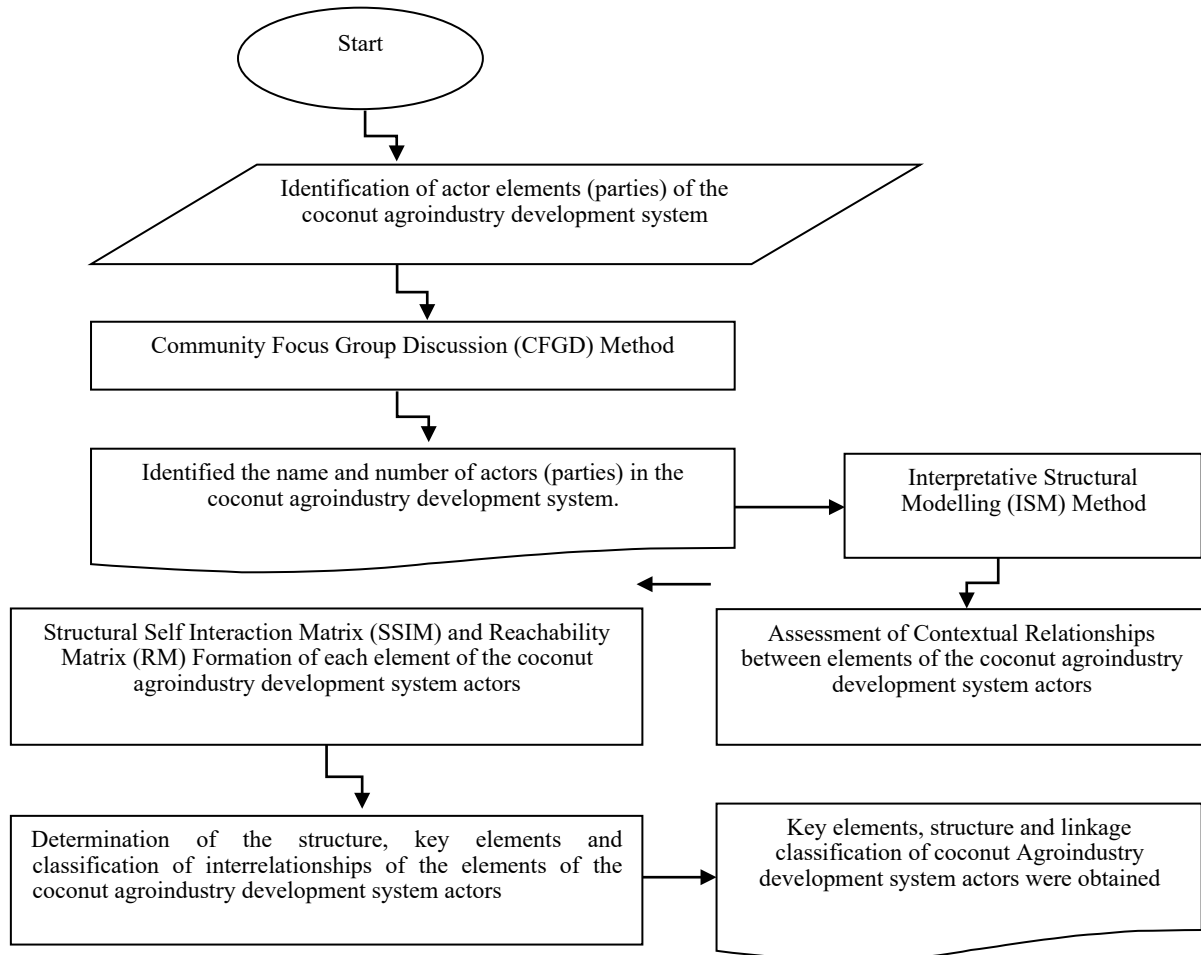


Figure 1. Research Framework

RESULTS AND DISCUSSION

Identification of Actors in the Coconut Agroindustry Development System

If the development of coconut processing businesses in Konawe Island was studied with a system approach, it is certain that many stakeholders are directly or indirectly related. This condition is caused by the many parties involved in the CADS including farmers, collection traders, coconut industries, the government, higher education, and consumers. Each party has an interest or need for the coconut agroindustry

development system; therefore, it is necessary to analyse the system. Refers to Stam & Van de Ven (2021) states that the analysis one of the system components needed to be known as the actors involved and their respective needs for a system being studied. They are explained that the main task in the stage of identifying system actors is to explore the needs of each actor. In connection with the identification stage of the CADS actors, the CFGD method was used to identify the role of each element in the coconut development business. Firstly, the stage of identifying the actor's elements is very important and crucial because there are many facts that the failure of development due to it is not formulated thoroughly and the elements of actors are not known to be key elements (who does what) and should receive special attention (Bomhof-Roordink et al. 2019). One obvious example is integrated coconut processing project that has been built with billions of rupiah in Konawe Island but until now it was not operating. To minimize or even eliminate such failures, it is necessary to identify the actors of the CADS that hinder the growth of the coconut crop utilization agroindustry in Konawe Island.

Based on the results of the CFGD activity study on the elements of the actors of the CADS in Konawe Island, 9 elements of actors along with their needs in the development of coconut agroindustry have been obtained. The results of the identification of the actors in coconut processing business development system are presented in Table 1.

Table 1. Results of identification of actors and their requirement with the CADS in Konawe Island

No.	Actors of Coconut Agroindustry	Requirement Elements of Coconut Agroindustry Development Actors	Requirement Code
1	Coconut Farmers	Easy and secure marketing of coconut products	KBTH-01
		Reasonable selling price of coconut products in the form of logs	KBTH-02
		High production of cultivated coconut	KBTH-03
		The quality of coconut produced is good	KBTH-04
		Access to capital, equipment, and business management is facilitated	KBTH-05
		Achieve an economically viable standard of living	KBTH-06
2	Collection Traders	High profit	KBTH-07
		Easy access to markets	KBTH-01
		Sufficient business capital	KBTH-05
		There is ease of collecting coconut products	KBTH-08

3	Coconut Industry	Processing	Continuity of raw material availability	KBTH-09
			High quality of raw materials	KBTH-04
			Low price of raw materials	KBTH-10
			Production target achieved	KBTH-03
			The quality of processed products produced is of high quality	KBTH-11
			High profit obtained	KBTH-07
			Smooth credit repayment	KBTH-12
4	Local government		More job opportunities	KBTH-13
			Increased regional income	KBTH-14
			Does not cause problematic waste	KBTH-15
5	Higher Education (universities)	Education	Development of processed coconut products based on the results of science and technology studies	KBTH-16
			Work procedures in accordance with applicable regulations	KBTH-17
6	Plantation Agency		High productivity of coconut per unit area	KBTH-03
			Coconut production is easily absorbed by the market	KBTH-01
			Coconut farmers are skilled in managing coconut plantations	KBTH-18
			There is an intensification, extensification, and rehabilitation of coconut plants	KBTH-19
7	Department of Industry and Trade	of	Procedures and quality standardization of processed coconut products are met	KBTH-20
			There are continuity and stability in the price of processed coconut products	KBTH-21
8	Banking		Guarantee of smooth credit repayment	KBTH-05
			The number of customers in banks increases	KBTH-22
9	Consumers		Low price of processed coconut products	KBTH-23
			Quantity and quality of coconut processed products are guaranteed	KBTH-24
			Diversification and diversity of processed coconut products	KBTH-25

Source: The authors

The results of the CFGDs presented in Table 1 shows that there are 9 (nine) elements that become actors in CADS, in which 25 requirements that need attention in the CADS. If examined more closely, it was found that there are some requirements of the same actor elements and synergize but there are also needs that are of opposite interests. This is due to the needs of the coconut farmer element of the actor who wants a decent selling price of coconut fruit while the needs of the coconut processing industry manager element want cheap raw material prices. To deal with such a situation, it is necessary to approach the analysis of the CADS so that the parties get a balanced solution (win-win solution) (Network 2020).

1.1. Interpretative Structural Modelling (ISM) Analysis for Actors of Coconut Agroindustry Development System

The results of the ISM analysis of the elements of the actors of the coconut agroindustry development system in Konawe Island shows that the main key element actors are coconut farmers and consumers. This is appropriate with Malaka et al., (2019) statement that the coconut processing industry has a very important role in improving the welfare of millions of Indonesian farmers, because of the total 3.34 million hectares of coconut plantations in Indonesia, 98% are owned by farmers. This includes coconut plantations in Konawe Island, all of which are owned by farmers who have been cultivated for generations. Thus, the role of farmers occupies a strategic position in the CADS, especially in relation to the continuous supply of raw materials (Sairam and Jayasekhar 2018). Furthermore, the consumer element as an actor in the coconut agroindustry development system also occupies a key position. This relates to the form, type and quantity as well as the quality of processed coconut products that will be produced, always taking into account the wants and needs of consumers. Most microenterprise development failures are due to the fact that the products produced do not match consumer demand in terms of shape, quantity, quality and taste (Sharma et al. 2021).

According to (Sun et al. 2020) and (Raval et al. 2018), ISM is one of the modelling techniques developed for strategic policy planning. ISM also analyses the elements of the system and solves them in the form of graphs of direct relationships between elements and hierarchical levels. Elements can be policy objectives, organizational targets, assessment factors and others. The direct relationships can be in various contexts (relating to contextual relationships) (Sukamdani and Sukwika 2022). The second key element is assistance from universities. As previously described, the problem of information disconnection both related to technical production, product marketing and access to financial capital by micro business actors, the existence of continuous assistance is very important in the CADS. This is in line with the change in the paradigm of higher education as stipulated in the Merdeka Belajar Kampus Merdeka

(MBKM) policy which prioritizes flexibility for students and lecturers to study outside the campus based on development issues in a broad sense.

The relationship between actor elements in the agro-industrial cluster was obtained from expert opinion. The structural self-interaction matrix (SSIM) is compiled based on the relationship between these goal elements. The affordability matrix obtained based on SSIM is then revised according to the transitivity rules (Purnomo et al. 2020). The revised SSIM was obtained based on the revised reachability matrix. The results of the ISM analysis of the actor elements of the coconut agroindustry development system are presented in Table 2, while the structural model diagram in Figure 2. The DPD matrix of actor elements is then made based on driver power (DP) and dependence (D) presented in Figure 3.

The results of the ISM analysis based on the hierarchical structure (level) and the relationship between DP and D, it is clear that there are 6 levels of structure where the main structure is Banking followed by Coconut Farmers as the second level, then the Department of Industry Trade and Local Government and Collecting Traders at the third level. This indicates that the lack of financial capital for farmers requires the banking world to be a source of funding in credit facilities, but assistance is needed to access capital. In line with this, the existence of Higher Education (Universities) at level 5 as well as the 2nd key element is a new hope for coconut farmers and coconut processors in terms of assistance and training on an ongoing basis. For more details, the hierarchical structure and relationship of DP and D elements of the CADS actors are presented in Figure 2.

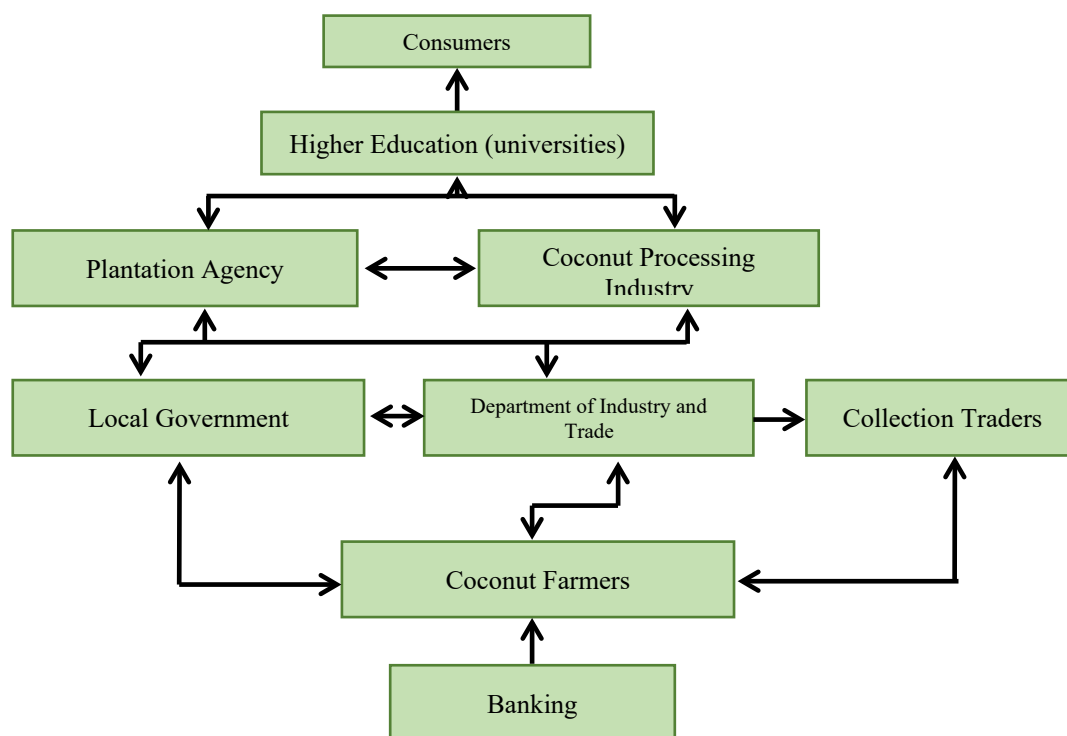


Figure 2. Results of hierarchical structure of CADS actors based on ISM analysis

Table 2. Results of ISM analysis of CADS Actor Elements

Actors of Coconut Agroindustry	Actors of Coconut Agroindustry									DP	Key Elements
	Coconut Farmers	Collection Traders	Coconut Processing Industry	Local government	Higher Education (universities)	Plantation Agency	Department of Industry and Trade	Banking	Consumers		
Coconut Farmers	1	1	1	1	1	1	1	1	1	9	1
Collection Traders	1	1	0	0	0	0	0	1	0	3	5
Coconut Processing Industry	1	1	1	1	0	0	1	1	1	7	3
Regional revenue office	1	1	0	1	0	1	1	1	0	6	4

Higher Education (universities)	1	1	1	1	1	1	1	1	0	8	2
Plantation Agency	1	1	1	1	0	1	1	1	0	7	3
Department of Industry and Trade	1	0	1	1	0	1	1	1	0	6	4
Banking	0	0	0	0	1	0	0	1	0	2	6
Consumers	1	1	1	1	1	1	1	1	1	9	1
D	8	7	6	7	4	6	7	9	3		
LEVEL	2	3	4	3	5	4	3	1	6		

Furthermore, ISM analysis classifies the elements of actors in the CADS into 4 sectors (autonomous, dependent, linkage and independent). The results of the ISM analysis based on this classification found that the elements of actors included in the linkage quadrant are Coconut Farmers, Local Government, Plantation Office, Coconut Processing Industry, and Department of Industry and Trade. This gives an indication to the parties that for the development of the coconut agroindustry, these elements need to get the main attention because they have relationships with various other elements so that the coconut processing development system is unstable. Meanwhile, the consumer actor element and the university element are in the independent quadrant, which indicates that the two elements of the system actors have a great driving force for the success of the coconut processing development business system. For more details, it can be seen in Figure 3.

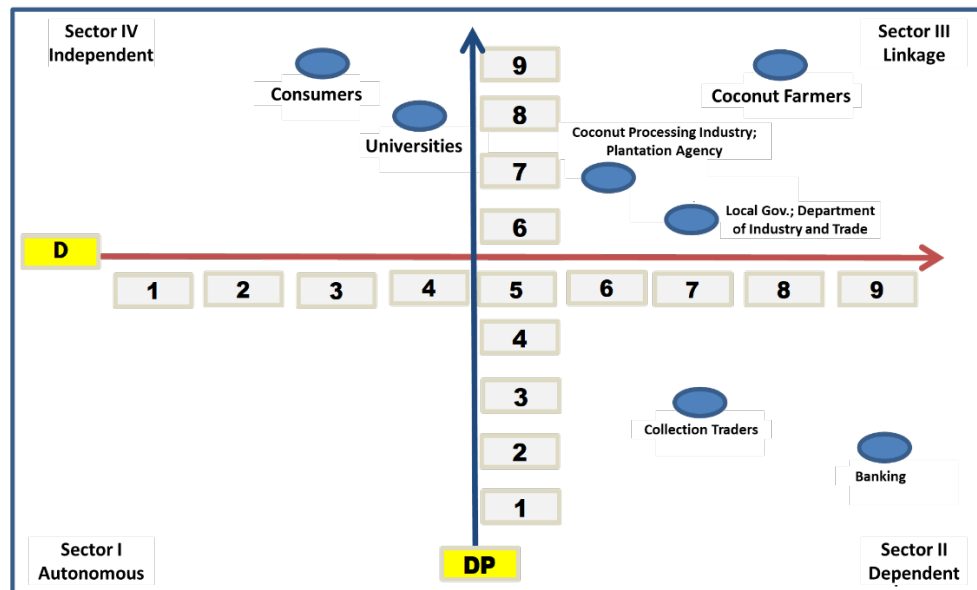


Figure 3. Results of ISM Analysis of the Relationship between DP and Dependence D on Actor Elements in the CADS

Figure 3 shows that consumer elements and universities elements are in sector IV independent, coconut processing industry group, local government and industry offices elements are in sector III linkage level, and collection traders and bank elements are in sector II dependent. The most important priority element that should be addressed or improved is the group of farmers and consumers. In this case, universities play a role in connecting between parties that have been an obstacle for farmers and coconut processors, especially with banks, the relevant agencies including coaching and training for coconut processing businesses in terms of technical production, marketing and financial management that takes place on an ongoing basis.

CONCLUSION

The key actors of the CADS in Konawe Island are farmers and consumers. If these two key elements are not prioritized in the CADS, there is a tendency for failure in the development of coconut crop agroindustry. The main hierarchical structure level of the CADS is Banking followed by Coconut Farmers as the second level, then the Department of Industry Trade and Local Government and Collecting Traders at the third level. This indicates that the lack of financial capital for farmers requires the banking world to be a source of funding in credit facilities but needs assistance to be able to access capital. The lack of sustainable assistance in the CADS, especially related to the technical aspects of production, marketing of processed products, financial management, and accessibility of additional financial capital, is the cause of the slow acceleration of business development. Based on the classification of the

elements of the CADS, it is found that those included in the linkage quadrant classification are coconut processing industry group, local government and industry offices elements. Meanwhile, the element of consumers and universities elements are in the independent quadrant, which indicates that both elements have a great driving force towards the success of the CADS.

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Declaration of competing interests

The authors declare that they have no competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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