



The Transformation Process of Cocoa Farmers Groups to Agro-industry Groups in Indonesia: a Soft System Methodology Approach

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Abstract

Development of cocoa agro-industry groups have been conducted by the government of Indonesia, but the growth has not been well planned. Establishment of the agro-industrial cocoa group is a form of cocoa downstream policies undertaken by the government, but the formation process is not well ordered. Cocoa processing group has existed, but still weak in institutional. It required a study how to establish an agro-industry group of cocoa. This study uses soft system methodology as the backbone for building a model of growth and development of an agro-industry group of cocoa. Results of a study using a soft systems methodology-approach has identified three (3) parts that constitute the system of purposeful human activity which relevant to problematic situations in the growth of the group agroindustrial cocoa, namely: (1) Growth group agroindustrial cocoa from the groups that existed in community; (2) Ranking of cocoa agro-industry group based on the needs and advancement of technology in the context of technology incentives; and; and (3) institutional patterns of internal (management, transaction systems) in order to strengthen institutional cocoa agro-industry group.

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This study also resulted in a conceptual model which is then compared with real world conditions and then developed into a growth model of agro-industrial group based technology incentives from the government.

Keywords: soft system methodology; cocoa agro-industrial groups; technology incentives.

1. Introduction

Indonesia is a producer of cocoa 3rd biggest world, by donating 18 percent of the global market. Ministry of Agriculture (MOA), reported that cocoa is one of the leading commodity plantation prospect as well as a great opportunity to improve the welfare of society as most cultivated by smallholder plantations ($\pm 94.01\%$), and until 2010 the area of cocoa has reached 1,650,621 ha with a production 837 918 tonnes and spread over 32 provinces [1]. In Indonesia, cocoa plantations have involved at least 1.7 million farmers. If in one household there are four members of the family farmer then at least 6.8 million people are dependent on the cocoa plantation sub-sector. Cocoa also has played an important role in creating jobs in both rural and urban. In addition, the role of other cocoa commodities. Agroindustrial very vital role in encouraging the growth and development of the economy that helped prop up the country's economy nationally [2, 3].

Downstream processing of cocoa is part of the agro-industry. Downstream of cocoa is expected to encourage and attract other economic sectors. Therefore, development of agro-industry is closely related to the future development of economic activities based on agriculture (contributing to the regional gross domestic product (GDP), employment, foster small businesses and medium, attracting investors and export foreign exchange [4, 5, 6]. Agro-industry was also able to overcome economic inequality and distribute welfare to alleviate poverty in Indonesia [7].

Agroindustrial existence is one of the pillars of the system of the Indonesian economy at present, then the role is very strategic. Even academically, agro-industry to become the leading sector of the Indonesian economy with the support of strong resources [8]. But the facts that occurred, shows that national agro-industrial system has not shown good performance. Maarif states that the institutional performance of the national agro-industry and agribusiness are not optimal [9]. The growth of agro-industry and agribusiness in Indonesia is caused by external conditions so that the sector can continue to grow. The fundamental issue is on two things; First, the development of agro-industry and agribusiness systems internally developed integrated. Second, the process of growth and change in the agro-industry and agribusiness systems are not managed properly (professional). Secondly, this is what causes the development of agro-industry and agribusiness system in Indonesia is too late. On the other hand, in-depth studies related to internal factors, mainly institutional as organizational and human resource capacity becomes important to be studied holistically by considering various actors involved in it [10].

One of the downstream strategy developed by the government is developing a small capacity of the cocoa industry to undertake the processing of cocoa beans. The government wants to integrate the aquaculture sector (on-farm) with the processing sector (off-farm), so that the development and fostering become easier. Community groups such as farmer groups or Farmers Group, Business Group, and cooperatives are encouraged to handle the cocoa agro-industry. For these conditions, technical assistance in the form of tools and machinery

has been given by the government to the group [11, 12]. The grant is one form of government incentives. Incentives are also given to small and medium industries and the government has provided incentives to small and medium industries. The Indonesian government provides nearly all forms of incentives to small industries. Incentives are given either in the form of tax incentives, assistance, direct aid and other economic incentives [13]. Economic incentives are commonly given by the government to businesses. López [14] reported on the need for government intervention in innovation in agricultural systems. The same thing was also found by Pérez and his colleagues [15] and Moretti and Wilson [16] that the incentives of the government is able to increase innovation in the development of innovation capacity in the industry. While research Tironi and his colleagues [17] shows the pattern of acceptance by farmers to incentives and technological innovation of the government in Chile. Acceptance speed is determined by the institutional innovations of farmers and incentives from the government. The government's role is very important in the development of innovations in agriculture and industry [18]. These studies form the basis of this research that is absolutely necessary technological incentives in cocoa agro-industry development. The technology incentives provided by the government. Villagers should be educated as a community-minded industry. Thus the village into the village industrial orientation can get added value, particularly in the agricultural industry [19]. The process of change will take time and cost to be effective.

The provision of technological assistance should correspond to the objective. One mechanism that can help reduce this distortion is to establish appropriate institutional. Existing institutional allegedly not in accordance with the institutional functions of agro-industry as a giver of value-added products. This is due to the weakness of the mastery of technology, so that the group given technological assistance is not necessarily needed or controlled by them so that the aid be underutilized. Technological assistance is expected to increase the capacity of the group but is not in question. To answer the above issues need a model of growth and development of agro-industry group-based incentives to agro-technology that groups can form a strong and independent. Research that has been done is aimed to develop a model of the changing process of the cocoa agro-industrial agency of the group of cocoa farmers with an incentive-based technology. The benefits of making this model are as an intellectual tool that is used to review and discuss the situation of growing cocoa agro-industry folk-based incentive technology.

The limitations of the research are as follows: (1) Research conducted on cocoa agro-industry group of people in cocoa production centers in Indonesia (Payakumbuh, West Sumatra); (2) Limitation of cocoa agro-industries in this study is a cocoa processing carried out from the harvest to be fat and cocoa powder industry; (3) The conceptual model of institutional change process that will be built based on the institutional changes of the cocoa farmer groups.

2. The Literatur Review

Research on the development of cocoa in Indonesia has been quite a lot. Several studies of cocoa of which research on aspects of agricultural cultivation of cocoa [20, 21]; post-harvest [22]; supply chain [23, 24, 25, 26, 27]; and economics and policy [28, 29, 30, 31]; has a lot to do. Research on institutional agro-industry both business organizations and farmer organizations have also been widely studied. Research on cocoa farmer group

institution also has a lot to do, but no one has specifically discussed the cocoa agro-industrial agency.

Research on the institutional and agro-industry group in particular cocoa has also been investigated by several researchers in Indonesia. Lolowang, for example, examines the institutional development of agro-industry in North Sulawesi [32]. The institutional model developed is a model of the cluster. In this study, he suggested the integration between businesses in the institutional and technological incentives for businesses. Budi, examined the agro-industry development sesame [33]. In his research, institutional development of agro-industry pattern suggested as a priority is a cooperative agro-industries. The research is focused discusses patterns of institutional development and institutional integration as a rule or norm, and still actors with institutional and agro-industry development that is focused on the business and marketing aspects. The idea of agribusiness and agro-institutional integration have also been raised by Ikatrinasari and his colleagues [34].

Based on the search results from multiple sources of literature, we know that there has been much research done on organizational changes and cocoa groups, and focus on social institutions and businesses. Yantu, conducted a study on the institutional development of cocoa agro-industry [35]. This study has discussed the development of regional economic model cocoa. The researchers see the conflict in the cocoa trading system between farmers and traders. This conflict is viewed by using game theory (game theory). Researchers stated that incentives technology through national movement (GERNAS) must be continued until there is a balance and farmers are able to mobilize their own business group. This study has not got to the stage of processing (off farm) and was at the level of business administration between farmers and traders in the cocoa supply chain. The discussion on the aspects of processing (agro-industry) cocoa has not been translated. Therefore, it is wide open research on institutional and cocoa agro-industry groups, ie groups that have the resources and conduct processing cocoa.

The research focus also on institutional issues. There are two types of institutional understanding that as a rule institutional and institutional as an organization [36]. As a rule, the institutional rules restricting the activities of members and administrators in achieving organizational goals. In this study, the term institution used interchangeably in reference to the physical terms such as marketing agencies, and refer to the institution as a rule, because in fact, the institution is not an organization. North, suggests that institutions are rules, and the organization is a player (actor) [37]. Kasper and Streit, defined the organization as a structuring planned to accumulate productive resources in the context of the pursuit of the goal [38]. The organization is a unity that allows people (farmers) achieve one or more objectives can not be achieved individually, individuals. Pakpahan, states that the system of economic organization of farmers consists of several elements (subsystems): (1). Institutional elements (rules), (2). Participants (human resources), (3). Technology, (4). Objectives, (5). Environment (natural, social, and economic). A group of farmers who were in an area can be seen as a system of economic organization of farmers[39].

The group is basically a combination of two or more people who interact to achieve common goals, where the interactions that occur are relatively fixed and has a specific structure [40]. According Ivancevich and Gibson, mean a group structure is the arrangement of the pattern of relationships between internal rather stable, consisting of: (1) a series of statuses or positions of its members are hierarchical; (2) social roles relating to statuses that; (3) elements of culture (values, norms, models) that maintains, justifies and glorifies structure[41].

One important phase in the development of the group is the growth phase of the formation or group. This phase is marked uncertainty about the purpose, structure, and leadership of the group [42]. In the group phase of the agro-industry is relatively easier to pass because this group is a form of transformation of farmers groups and agro-industry group.

Nofialdi, doing research on the development of agro-industries by using the approach of local community institutions (Nagari) [43]. The study discusses the selection of the level of technology, sources of financing and institutional businesses. This selection using Analytical Network Process (ANP). The study combines the local traditional institutions that are already living in a society with institutional attempts for developing agro-industries in West Sumatra. The study was one of the cornerstones of this research to be conducted, that the institutional development efforts need to accommodate the groups that have been living in the community. This research will be suggested changes to the group of existing groups, the farmer group or Farmers Group (Gapoktan) in order to accommodate the institutional studied local institution that has existed.

This research has been done using action research approach on the basis of soft system methodology (SSM) which see facts on the ground (real world) as a system consisting of sub-systems which are interconnected with each other (interconnected and interrelated). Checkland and Scholes, stated that the SSM is a tool to observe the facts on the ground are dispersed (ill structured), complicated, mysterious, and holons, then analyze and make conclusions on what is observed [44]. Soft Systems Methodology (SSM) was introduced by Peter Checkland at the University of Lancaster, England in 1981. The SSM was developed to address the management problems arising from human activity system. Many of the problems of management and organizations are not able to be completed by the old way of thinking [45, 46].

Checkland and Scholes [44] and Wilson [47], describes seven stages in the use of SSM are: (1) analyzing unstructured problems; (2) express the problem situation; (3) establishing the definition of the problems related to the problem situation; (4) build a conceptual model; (5) comparing the conceptual model problem situations; (6) establish a viable and desirable changes; and (7) take remedial action on the issue. Seven steps in the SSM process can be described in Figure 1 as follows:

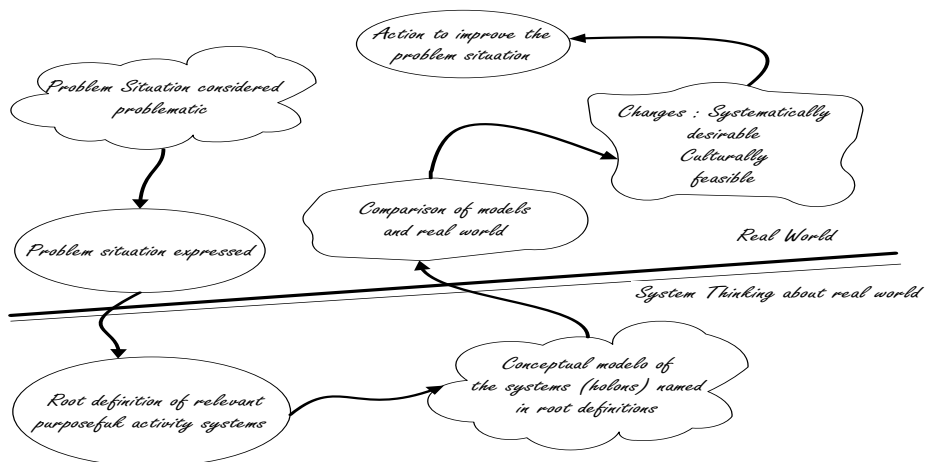


Figure 1: Conventional Model 7 steps of SSM [44]

Checkland and Scholes, forward seven principles in describing the process of SSM (SSM cycle of learning for action)[44]. Here are seven principles of the SSM by Checkland dan Scholes:

- 1) The idea of "real world problems" can be classified in the broad concept of "real world problematical situation". Here is said to be the real situation of the parties need to be considered and require attention and action.
- 2) Any problem situations are considered and discussed based on worldviews (*weltanschauungen*) on the parties to do. Worldviews are assumptions and interpretation of each of the parties in view of a case.
- 3) Any real world will contain conditions problematical situation how the parties perform its intended activity here means that the conceptual model (shape model system constructed to express a particular view) can be used as a tool to explore the quality and characteristics of the problems of the human system.
- 4) The model established in point 3 can be used as a reference in formulating the question in the discussion.
- 5) Events/activities to increase understanding of the invention real-world situations in discussions on four points need to accommodate worldviews of each party.
- 6) Research conducted with the principles of the above (1-5 principle) will never end. When it was discovered the action from the previous understanding, the implementation of previous results into a new situation, so it will proceed according to the principles back 3, 4, and 5. So the situation is never finished learning.
- 7) Researchers in using SSM must continue to think to follow cycles that occur.

3. Research Methodology

3.1. Data collection

The primary data obtained from in-depth interviews with the respondents, the chairman and members of farmers of cocoa in West Sumatra and South Sulawesi, member or officer of the Institute of Economic Welfare Society in Southeast Sulawesi, Indonesia Cocoa Association (ASKINDO), Indonesian Cocoa Industry Association (AIKI), Governmental Institutional companion cocoa farmers, bureaucrats in DG Industry and DG Kemenperin Agro Processing and Marketing of Agricultural Products Ministry of Agriculture and researcher at the Research Institute Perkebunan Nusantara. Secondary data were obtained from the publication of the Department of Trade and Industry and the Department of Plantations in the province of West Sumatra, South Sulawesi, Southeast Sulawesi, and Bali. and other relevant agencies. Secondary data were also obtained from the publication in the form of reports, statistical data is, the profile of the cocoa industry and others.

3.2. Data analysis

Data were analyzed using Soft Systems Methodology (SSM) developed Checkland and Poulter [48]. The steps being taken in this analysis are:

3.2.1. Knowing the problem situation occurs

In this stage, the development of the cocoa industry understanding of the situation of the people of incentive-based technology that occurred at the sites. Deepening state of the problem that occurred was done by collecting information on the conditions, problems occurred and accommodate all views, assumptions of the parties/stakeholders involved with regard to the utilization of cocoa beans. Analysis of the issue of cocoa agro-industry development situation analysis done by using one, two, three. one analysis (analysis of intervention) aims to look at structural intervention that has three roles: 1) the role of the client, which led to the investigation occurred; 2) the role of would-be problem solver that parties who wish to do something about the problem; 3) the role of owner problem, ie that owns and attention to the problems faced. Analysis two (social analysis) is to see how the social system is composed of norms, rules, and values that thrive in the community. Analysis three (political analysis), in this analysis that politics is seen as a process in which there is a difference between the interests of the parties, should be accommodated. Checkland and Scholes [44] provide an overview of criteria information collected in the analysis of politics is how power is acquired, used, maintained, transmitted and how to limit them.

3.2.2. Expressing the problem situation

Based on the results of the analysis of the first stage, then used to build a picture of the situation (rich picture) issues being studied. This image aims to describe the process of the activity of institutions/agencies/stakeholders involved in the problems of growing cocoa-based agro-industrial group base on technology incentives. The Rich picture is used as a tool to describe the interaction between stakeholders in the cocoa agro-industry development, incentive-based technology.

3.2.3. Build root definition relating issues to the situation

Root definition is built to identify system problems in the activity of the growth model of the cocoa agro-industry group. Root definition is done by using "The PQR Formula, that is what is done (P), how do (by Q) Why do (R). From any activities that aim, conducted enrichment information using by mnemonic method CATWOE. The method is detailed in Table 1.

3.2.4. Build a conceptual model

Based on the results of the root definition CATWOE collected then do modeling of growing cocoa agro-industry incentive-based technologies that involve the collection and structuring of the minimum activity required to perform the process of transformation by using elements CATWOE. The conceptual model consists of activities that have been tested 5E objectives (efficacy, efficiency, effectiveness, elegance, ethicality), which includes:

- Test the efficacy is tested whether the activity is aimed at generating the desired output.
- Test the efficiency is to test whether the intended activity using minimum resources.
- Test the effectiveness is to test whether the intended activity can effectively achieve the desired long-term goals.
- Test the elegance which measures whether the ongoing transformation process is undertaken elegant; and

- Test the ethicality is to see whether the process of transformation morally justified.

Table 1: CATWOE analysis

Systems Components	Definition
C: Customers	The person or group of people who directly or almost directly become victims or who would benefit from the transformation process.
A: Actors	The person or group of people who carry out transformation activities (T)
T: Transformasi	The process of converting inputs into outputs both concrete and abstract
W: Worldview (Weltanschauung)	Framework perspective thought or image that makes the root definition or T has a significant meaning in context
O: Owners	The person or group of people who rule over the system and have the authority to stop or change transformation
E: Environmental Constraint	The environmental constraints of the process of transformation T such legislation, budget and other resources

Source: [44]

3.2.5. Comparing the conceptual model with problem situations

The next stage is to compare the conceptual model to the conditions of the situation on the ground. This is done as a verification of the results of the conceptual model to the real world. At this stage, each of the parties/stakeholders involved asked for a response based on a conceptual model that has been generated.

3.2.6. Establish a viable and desirable changes

In accordance with the results of the conceptual model comparison with the field conditions do change according to the model that has been verified with field conditions.

4. Result and Studying

4.1. Problems exposure

SSM based on the stage, the disclosure and the depiction of the problem is the initial stage and the second stage. Phase one and two of this is a picture of the real world. In this case, SSM processes the disclosure of the problem situation. In stage one and two are presented two parts of the disclosure of the problem situation and overview of problem situations (rich picture). All stages are carried out by collecting the opinions of practitioners and experts in the field of agro-industry, cocoa and growth of groups and institutions through the formal and informal approach in meetings, discussions, examine documents, to a focus group discussion (FGD). Forms of interaction excavation opinions and perceptions also performed at the rich picture result confirmation, root definition, purposive activity models, and comparison with the real world.

Interviews are a tool for verification and confirm (rechecking) to information that has been obtained previously. Interviewing techniques used in this study are in-depth interviews. Before conducting interviews conducted

prior preparation materials and ends with the discussion summarizes the results of the discussions and studies.

At the stage of disclosure of the problem situation Checkland and Poulter [48] suggest using intervention analysis (analysis one), social analysis (analysis two), and political analysis (analysis three). Based on interviews and observations in the field that the stakeholders involved in agroindustrial cocoa can be grouped in three important actors namely, the government, farmers or farmer groups as a cocoa producer, and businesses or technopreneur (including cooperatives or other business entities). Here are the stages of disclosure issues cocoa agroindustry people owned:

a. Intervention Analysis

Analysis of interventions focused on the determination of the three parties whose role is very important in relation to the situation of the problem of the growing cocoa agro-industrial group model, incentive-based technology at the level of governments, farmers, and businesses.

Client - C : Researcher

Practitioners –P: Researcher

Own issues (Problem Owner) – O:

(1) Government

Stakeholders namely the government level of the Central Government (Ministry of Agriculture and Ministry of Industry), the Provincial Government (Department of Plantation and the Department of Industry and Trade), the district government (Perindagkop).

(2) Technopreneur

Technopreneur a person or institution that has the ability to connect to the supply chain and make the process of adding value, either through processing or other means.

Institutional include cooperatives, farmers' groups combined, entrepreneur, companion cocoa farmers, agency management prosperous economy.

(3) Providers of industrial raw materials of cocoa

Raw material providers include farmers or farmer groups / Subak Abian. The results of the analysis of this intervention are the identification of a picture of the situation existing problems on the model of growing cocoa agro-industry group, incentive-based technology in each of the stakeholders.

b. Social Analysis

In social analysis is focused on the role (role), norms (norms), values (values), each element of each stakeholder in the cultivation of cocoa agro-industry group incentive based technology.

Role

Each element of each stakeholder has a basic role that reflects their social position in the cultivation of cocoa agro-industry group incentive based technology. Here is the role of each party in the utilization of fish resources:

1. The Government has a role include:

Government's role as regulator and facilitator and providing social services to the creation of improved welfare of society, especially the actors involved in it.

In resolving the problems in the cultivation of cocoa agro-industry group with the principles of the stakeholders include local governments, among institutions (NGOs, Poktan, LEMS, cooperatives, technopreneur) with cocoa agro-industrial society (farmers, traders, small industries processing cocoa).

2. Technopreneur:

This word refers to a person or agency who created the business/enterprise with courage to risk and uncertainty to achieve profitability and growth by identifying opportunities that exist [49].

Gumbira-Said [50] explains that there are three components that build technopreneur term, namely, the capacity of R & D (research and development), entrepreneurship and venture capital. Eriyatno [51], mentioned the term technopreneur as the union between technology entrepreneurship. Could include traders and processors.

Technopreneur serves the welfare of farmers with a role in bridging/facilitation between the interests of farmers as a whole with stakeholders in an effort to improve the welfare of farmers. Traders role farmers sell their cocoa beans to the industrial production and downstream. Processing instrumental conduct business activities harvesting their crops as a source of revenue.

3. Providers of raw materials cocoa industry have a role include:

Contribute to run activities cocoa cultivation and post-harvest was good to get the seeds in accordance with ISO standards for sale to merchants as a source of income for farmers.

Norm

According to Checkland and Poulter [48], the norm is the expected behavior is related not- roles. Norma is in the cultivation of cocoa agro-industrial groups linked to the role played by each stakeholder. Norms prevailing in the respective stakeholders, namely:

1. The central government provincial and district subject to the code of conduct in its activities. Code of ethics in government are the laws regulations both central and local governing mechanism government work.
2. Technopreneur, cooperatives, and NGOs companion cocoa farmers as an institution between adhering to the Statutes/bylaws and code of ethics organization that has been agreed by all members of the organization and formal and informal agreements with farmers and traders as a supplier of raw materials.
3. Suppliers of raw materials, namely farmers and traders adhering to the informal agreement that has been agreed. The agreement is mutually supportive and facilitate the utilization of cocoa beans to benefit collectively.

Value

Values are the standards or criteria to which the behavior is in accordance with the role [48]. At the government level, technopreneur (between institutions) and other suppliers of raw materials, the value of each is as follows:

1. The Government is to develop policies that encourage downstream cocoa by businesses to obtain benefits for welfare improvement.
2. The institution of holding the values of justice, equality, togetherness independence, and transparency.
3. Suppliers of raw material (farmers/farmer groups) embrace the common values, traditional values are upheld, and independence.

All three elements are closely inter-related social, is dynamic and always changing.

4.2. The problematic situation overview

To identify problematic situations in the growth of agro-industrial group then conducted in-depth interviews or discussions were conducted with several owners of the issue (issue owner) of the stakeholders (stakeholders) cultivation of cocoa agro-industry group.

Besides to identified problematic situation of the growing cocoa agro-industrial group also conducted in-depth discussions to find out the problematic situation of agroindustry policy development and agro-industry group. The expert opinion obtained from direct interviews or opinions during the show Focus Group Discussions (FGD).

4.2.1. Summary of problematic situations

Problematic situations encountered in the growth of agro-industry groups are summarized in the respective stakeholders.

The complete results of the opinion of the stakeholders in the growth of the agro-industrial group, incentive-based technology can be summarized in table 2.

Table 2: Results of opinions and thoughts of stakeholders about the problematic situation of growing of agro-industrial groups

	Central Government, Provincial, and District	Technopreneur, Traders, Cooperatives, Industry	Farmer or Farmers Group
Government Policy	<ul style="list-style-type: none"> - Coordination and authority among government institutions as the most important stakeholders - Policy still sectoral, still not pay attention yet to the whole system in the cocoa industry - Policies to improve the quality of cocoa beans with fermented program mandatory for cocoa beans have not been followed by all farmers 	<ul style="list-style-type: none"> - Agencies builder quite a lot, but there is no sustainable development - Farmers who are members of farmer group many who do not understand the policies made by the government, so they need more intensive assistance from the government. 	<ul style="list-style-type: none"> - Government policies only allow trade in cocoa bean fermentation alone is difficult to do because there will always be the seeds are not fermented in the fermentation process - Government policies are still dominant helps entrepreneurs and major industries.
Growth Process	<ul style="list-style-type: none"> - Much of the equipment is not functioning due to the inability of farmers' groups in managing the human resources - The formation of the group and request assistance tool tends not "natural" based on need - It is still difficult to determine the level of technology needs - Assistance has not effectively grown the group 	<ul style="list-style-type: none"> - Many devices do not fit the needs of the group - It should be clear rules in providing assistance, especially ownership of machinery and equipment - The process of agro-industry growth in the group's vision takes time and needs a strong role of technopreneur 	<ul style="list-style-type: none"> - Farmers have not become the main destination actor mover incentives
Important actor growth group	<ul style="list-style-type: none"> - The formation process of technopreneurs in the group has not run well - Institutional and social capital is not well-formed - Agro-industry groups have been existing but still separated by sub-sectoral 	<ul style="list-style-type: none"> - Growth of entrepreneurship and technopreneurship takes time and there is no standard for the next grade for the group - The same approach is mutually beneficial un-institutionalized well 	

From the table above shows that the owner issue mainly owned by the government and technopreneur or cooperatives / industrial. Seen that farmers are still passive in addressing the issue of government policy. This problematic situation is the first stage of the SSM that is a situation that must be resolved through the next stages of SSM in order to know what actions need to be taken.

As one of the largest cocoa producer in the world, the development of downstream industries is expected to

become the motor of cocoa agribusiness system to increase the added value that is more competitive. This is important because the development of agro-industries will drive growth in primary agriculture even generate national economic growth quickly and evenly so that the development of agro-industries should occupy a central position in the government strategy [7] and [52]. Increasing the value-added cocoa can also be obtained through the downstream strengthening the domestic industry to the food industry, restaurants, pharmaceutical, candy and ice cream cakes [23].

4.3. Rich Picture

Rich Picture in SSM has used as a way of disclosure (Expressed) real-world situations that are considered problematic [46]. Presenting the rich picture is a form of descriptive information about problems that occur in the real world in the growth and development of cocoa groups agroindustry based on incentive technology and show all the stakeholders to participate and become their principal concern. Checkland and Poulter [48] states that researchers can submit freely problematic situations with images, lines, marks or special icon. Rich picture problematic situations can be seen in Figure 2.

4.4. Root definition dan Conceptual Growth Model of Cocoa Agroindustrial Group

In this part is done in two stages, namely, the third stage is the root definition, and the fourth stage draws up the conceptual model. In the third and fourth stages have been identified three (3) parts that constitute the system of human activities that have a purpose relevant to the problematic situation in the cultivation of cocoa agro-industry groups, namely:

1. Growing cocoa agro-industry group from the groups that existed in society
2. The rankings cocoa agro-industry group based on the needs and advancement of technology in the context of technological incentives
3. Patterns of institutional internal (management, transaction systems) in order to strengthen institutional cocoa agro-industry group

Each of the above system created for RD and conceptual model (CM) which will be a tool of intellectual discussion and dialogue about problematic situations encountered in the context of growing cocoa agro-industrial group based technology incentives.

All three systems of human activity which have a mean over a part of the system of growing cocoa agro-industrial group incentive-based technology that begins with the cultivation of cocoa agro-industry groups derived from groups that existed in society. The groups that exist in general is under the supervision of the Ministry of Agriculture. These groups produce the raw material of cocoa beans as the main input in the cocoa agro-industry supply chain system. These groups are then at the initiative of technopreneur make the process of internalization agroindustry.technopreneur vision that can come from internal groups or external groups. These innovators are generally the people who have received guidance and training from the government or universities. Of internal groups, technopreneur is individual who has the initiative in the creation and innovation. Changes made by the innovators that technopreneur. Institutional changes will be made if a change

of focus on the innovators and reduce the role of the opponents. Giddens [53] in structuration theory also states that public institutional changes made by the agents of change that exist within the institution. The agent of change can be made up of innovators or technopreneur. Stewart [54] states in an organization or society, humans follow a normal curve diagram. That is, in a group, there will be 2% are ready to be innovators or supporters of innovation or change.

The groups that existed then be given incentives so that technologies can be said as a group of agro-industries. Incentives should be coordination among technical institutions in order to avoid overlapping (overlap) incentives. Institutional mechanisms need to be arranged so technology incentives by the government, especially by the builder relevant. The main activity in this CM is coordination among government agencies builder cocoa agro-industry group. To support the acceleration of the process of "first class", from farmers groups and the agro-industrial group that is needed is the rating of cocoa agro-industry group based on the needs and advancement of technology in the context of technological incentives. For the continuation coaching needs of this group it is necessary to formulate the patterns of institutional internal (management, transaction systems) in order to strengthen institutional cocoa agro-industrial group; so that the risk of conflict could be reduced in the future. Since most of the farmer group/farmer group disbanded because of a conflict between members and administrators.

Along with this process, the agro-industry sector supervisors are encouraged to coordinate more intensive coaching in order to run well. When Act No 3/2014 about Industrial was published, expressly stated that the authorized agency or downstream fostering agro-industry is the Ministry of Industry. But without coordination and without cooperation with the agricultural sector downstream processes impossible to work. Agroindustri without a guaranteed supply of raw materials will not run. To get the support of all stakeholders it needs to be disseminated about the ranking of farmer groups or other agro-industrial groups that already exist in order to obtain initial state input forerunner agro-industry groups in Indonesia.

Growing cocoa agro-industry groups also have the scale of business constraints. Scale businesses owned by a group of cocoa processing is still not optimal so that the necessary vertical integration in the supply chain to achieve business efficiency. This integration requires a common vision within the group before the merger. This vision describes the agreement of the group to make the process of industrialization, which previously only had a vision of agriculture. Seeding a shared vision is carried by members of the group itself that the acceptance of a shared vision can exist.

Other problematic situations are the coordination between the respective stakeholders in the cocoa agro-industry group. The national government can issue a policy on agroindustrial development exception that is managed by a group or farmer group submitted to the Ministry of Agriculture. This has been done by the government through Law 17 of 1986, regarding the delegation of authority to coaching some of the industry to another ministry from the ministry of industry. This policy proposal that the government authorizes the agro-industrial development produced by farmer groups or joint farmer to the Ministry of Agriculture to the sustainability of agro-industry group sustainable development. In practice, the Ministry of Agriculture itself has come to provide guidance cocoa agro-industrial group through Processing and Marketing Director, Directorate General of

Plantation.

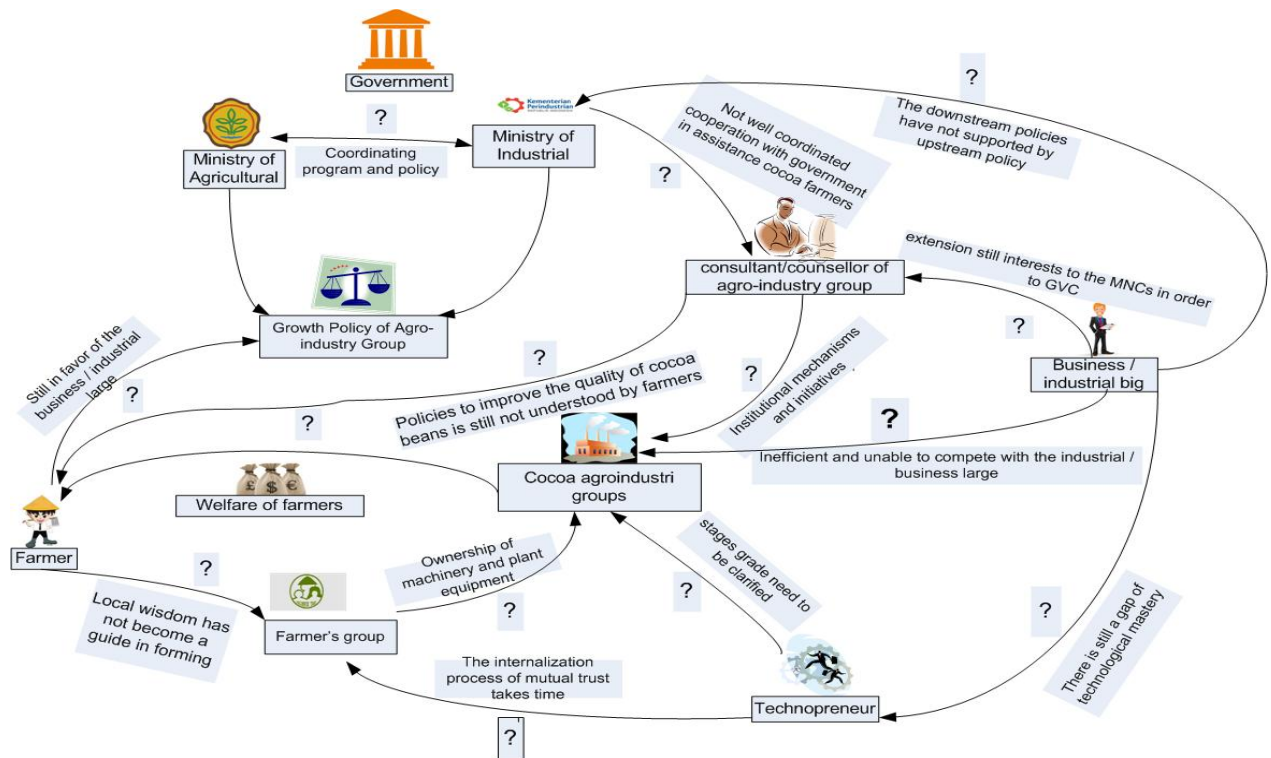


Figure 2: Problematic situations encountered in the cultivation of cocoa agro-industry group

System 1. Growing cocoa agro-industry group from the groups that existed in society

Root Definition of the above problems is a system of growing group of agro-industry originating from a group or farmer group or community as providers of raw materials cocoa beans that are managed by a technopreneur for further processing (P) through through incentive aid of technology from government (Q), so that farmers are able to improve the welfare of their group (R).

Table 3: CATWOE analysis of System 1.

C: Customers	Cocoa farmer and technopreneur
A: Actors	Government, technical assistance
T: Transformation	A process of merging the cocoa value chain carried out by groups of farmers as the backbone and driving technopreneur as agro-industry groups and government as an investor.
W: worldview	Implementation of processing cocoa from farmers by technopreneur into downstream products that add value and benefits are shared
O: Owners	Government and technopreneur
E: Environmental	Free trade, budget, and bureaucracy

The conceptual model in the form of the activity of human activities that have the purpose (of purposeful activity) for system 1 above are:

1. Technopreneur interacts with group members to embed a shared vision in the agro-industry group
2. The group has a shared vision of the agro-industry
3. Technopreneur interacts with the government to obtain technological incentives on behalf of the group
4. The Group proposes technopreneur request for assistance through the equipment and machinery of processing cocoa beans
5. The Government assesses institutional capacity
6. Recommendations ratings institutional capacity
7. The Government provides assistance procurement of equipment and machinery of processing cocoa bean
8. The Government provides guidance and technical guidance on cocoa processing technology
9. Agro-industrial group runs processing activities / downstream cocoa.

Table 4: Measurement Criteria of Conceptual Model Performance

Efficacy	Increased in value-added cocoa beans and increase farmers' income
Efficiency	The transformation process implemented in accordance with the financing capacity of the group with the most minimal cost
Effectiveness	Implementation of continuous processing of cocoa beans by agro-industry group
Elegance	The transformation process runs with active participation of all stakeholders
Ethicality	The transformation process gained recognition from all stakeholders morally.

To ensure the process of transformation goes well then it is necessary to apply some performance criteria of performance which includes increasing the added value of cocoa beans and increased incomes, members of the group. The transformation process needs to be seen also from the successful achievement of minimal costs while maintaining the ability of the capacity of the group to look for downstream processes cocoa beans can run. Besides this transformation process must involve all stakeholders to ensure the process runs smoothly.

System 2. The ranking of cocoa agro-industry group based on the needs and advancement of technology in the context of technological incentives by way of institutional capacity audit group.

Root Definition of the above problems is a system of institutional strengthening group agro-industry that originating from a farmer group or other groups engaged in cocoa as a provider of raw materials cocoa beans (P) through the audit institutional capacity so that it can be made the ranking of farmer groups or other groups of people engaged in cocoa as a provider of raw materials cocoa beans by the government (Ministry of Agriculture) (Q), that aid programs targeted incentives and appropriate (R).

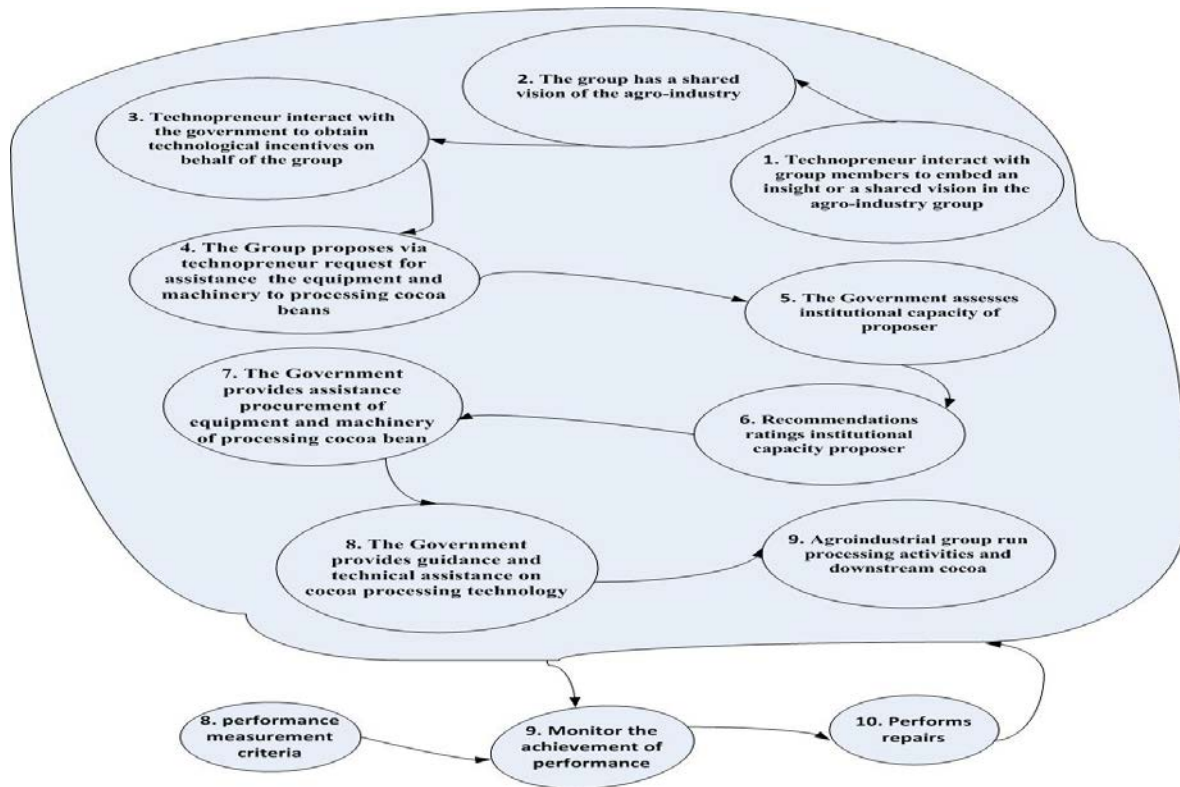


Figure 3: Activities in Purposeful Activity Model of System 1

Table 5: CATWOE Analysis of System 2.

C: Customers	Group / Unity of Cocoa Farmers Group and technopreneur
A: Actors	The Government (Ministry of Agriculture) and the Provincial of the Plantation Office
T: Transformation	The ranking of the group through the process of institutional audit by the preceptor/ Government (Ministry of Agriculture)
W: worldview	Institutional information and technology groups that reliably and accurately can be used as a base incentive process technology that could grow the cocoa agro-industrial group well.
O: Owners	Government
E: Environmental	Support from group members and local government, budget and availability of auditors as well as the rating standard formulation expertise

The conceptual model in the form of the activity of human activities that have the purpose (of purposeful activity) for system 2 above is:

1. Develop a rating standard of cocoa agro-industry group
2. Conduct a comparative study of the institution that has made a rating based technologies

3. Set up standard operational procedure (SOP) implementation cocoa agro-industry group rankings
4. Prepare competent and certified auditor
5. Provide training to auditors about the way to rating of cocoa agro-industry group
6. Choose the pilot project for the rankings implementation of cocoa agro-industry group
7. Conducting the audit ranking of cocoa agro-industry group
8. Replicate pilot project program to be implemented on a wider scope

Table 6: Measurement Criteria of Conceptual Model Performance

Efficacy	Audit institutional capacity of cocoa agro-industry group to be done
Efficiency	The transformation process is held with minimal financing
Effectiveness	Available data and information from the audit of institutional capacity and cocoa agro-industry group rankings
Elegance	The process for conducting audit the institutional capacity actively supported of all stakeholders
Ethicality	The transformation process gained recognition from all stakeholders morally

To ensure the process of transformation goes well then it is necessary to apply some performance criteria that include the implementation of performance audit capacity according to the Standard Operating Procedure (SOP) so that the data and information available institutional capacity of the agro-industry group. The transformation process needs to be seen also from the successful achievement of minimal cost with regard to the principles of the basic standard competencies institutional capacity of the group to the incentive by the government targeted and effectively. Besides this transformation process must involve all stakeholders to ensure the process runs smoothly. Stakeholders can be invited for institutional capacity to formulate design audit and rating group agro-industry consultant and companion cocoa by cocoa farmers that have existed over the years.

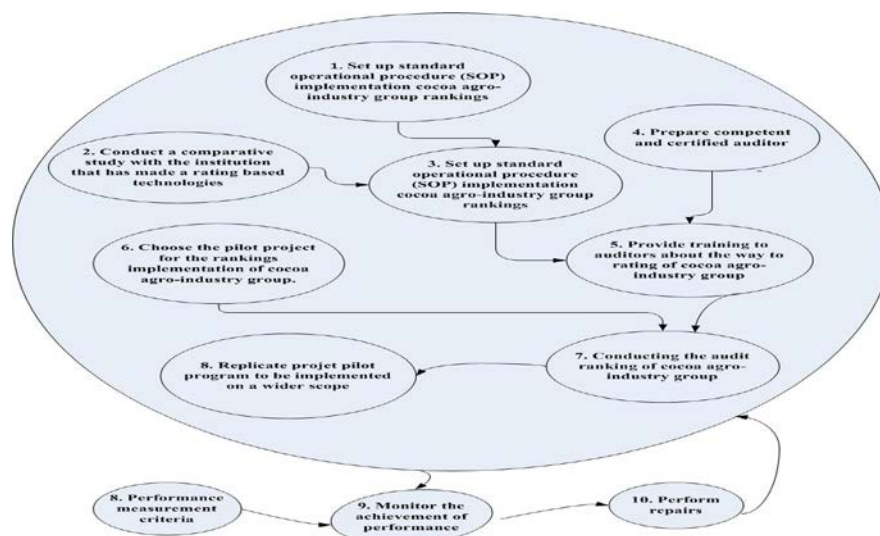


Figure 4: Activities in Purposeful Activity Model of System 2.

System 3. The internal patterns of institutional (management, transaction systems) in order to strengthen institutional cocoa agro-industry group

Root Definition of the above problems is a system that is owned by a group of agro-industry originating from a farmer group or other groups that engaged in the processing of cocoa beans (P) to create a system of management and institutional groups with assistance from the government (Q), for the group to run well (good governance) and sustainable (R).

Table 7: CATWOE Analysis of System 3.

C : Customers	Farmers group (cocoa farmer and technopreneur)
A: Actors	Government, technical assistance provider to farmer groups, consultants
T: Transformation	A process of making the system of institutional governance and mechanisms of internal group transactions by the government with the assistance of consultants
W: worldview	The implementation of all activities of cocoa agro-industrial group with minimal conflict and the conflicts that arise can be resolved
O: Owners	Government
E: Environmental	The readiness of stakeholders to implement a system of good governance, budget preparation available

The conceptual model in the form of the activity of human activities that have a purpose (of purposeful activity) for system 3 above are:

1. Technopreneur/chairman of the agro-industry groups to interact with the government for assistance on behalf of the group
2. The group proposes a request for help mentoring institutional management
3. The Government with the assistance of a consultant co-developed standard management and conflict mitigation
4. Standards of conflict management and mitigation of agro-industry group socialized and tested on a group agroindustry
5. The group conduct activities with the management standardized of cocoa. agroindustrial group

To ensure the process of transformation goes well then it is necessary to apply some performance criteria of performance which includes the availability of raw institutional rules cocoa agro-industrial groups.

The transformation process needs to be seen also from the successful achievement of minimal cost with regard to the capacity of the group to downstream processes cocoa beans can run.

Besides this transformation process must involve all stakeholders to ensure the process runs smoothly.

Table 8: Measurement Criteria of Conceptual Model Performance

Efficacy	There are standard rules of institutional cocoa agro-industry group
Efficiency	The use of financial resources and time are minimal
Effectiveness	Management of agro-industry group was good and the conflicts that arise resolved properly
Elegance	Setting process of institutional management standard support from all stakeholders actively.
Ethicality	The process of transformation and governance standards arranged morally gaining recognition from all stakeholders.

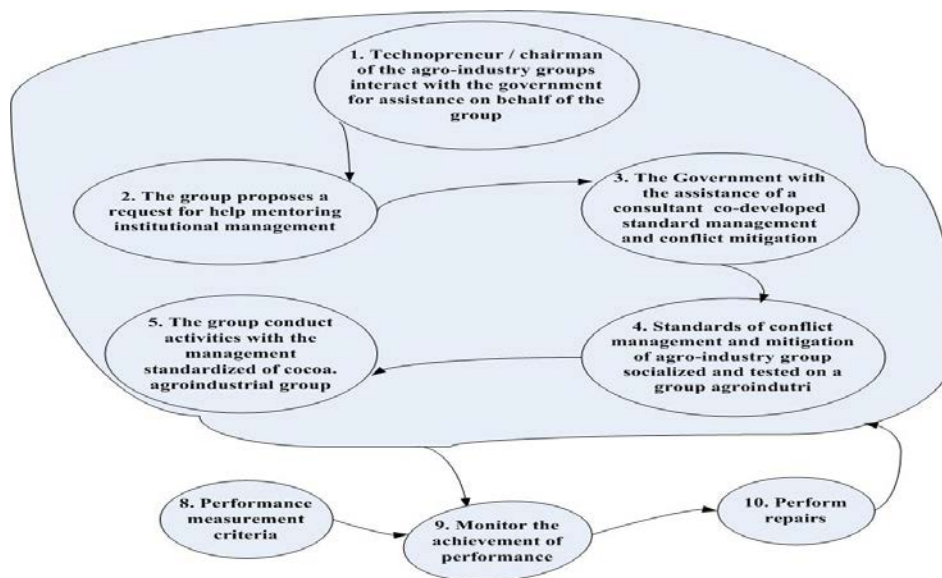


Figure 5: Activities in Purposeful Activity Model of System 3.

3.5. Gaps of Ideal Conditions for Growing Cacao Agroindustrial Group Based on Incentive- Technology in Indonesia

This stage is the stage fifth, sixth and seventh of the SSM. At this stage, the researchers will compare the Conceptual Model generated at stages 3 and 4 in the real world, in order to obtain paradigm (worldview) wider to formulate recommendations mark a repair. System of human activities that have the purpose (holon) is a tool that allows the discussion managed to answer these critical questions by using frame 5W 1H (What, When, Where, Who, Why and How) such as:

- Is the conceptual model happen in the real world?
- When will these activities can be carried out?
- Who is able to involved in these activities?
- Are there any gaps conceptual model of the real world? If there is, could be improved?

- How could do the improvements?

At this stage, it is possible SSM practitioners have difficulty in answering questions related to performance measurement. This difficulty may occur because of the complexity real world [48]. With the advent of many points of view will encourage the emergence of a desire to do the activities that have a purpose, which can be used as formulation changes suggestions, corrections or improvements on real-world problematic situations.

The following will show the comparison between the real-world problematic situation with the conceptual model that had been developed.

Tabel 9: Implementation of the fifth stage, sixth and seventh SSM of System 1

Activities	Real world situation	Gaps	Proposed improvement action
Technopreneur interacts with group members to embed an insight or a shared vision in the agro-industry group	Technopreneur interactions existing in both groups were introduced by the government or at the initiative of individuals in the group that pioneered conjures up visions of agroindustrial	There has been no real movement on the authorities to prepare technopreneur inspiring insight group with agro-industry vision	Creating a setup program technopreneur inserted into cocoa farmer groups in order to have an insight into the agro-industry vision
The group has a shared vision of the agro-industry	Not available	Not yet available setup guide the vision of agro-industries and stages of achievement for farmer groups	Creating a guidance of agroindustrial vision of cocoa farmer groups
Technopreneur interacts with the government to obtain technological incentives on behalf of the group	The techno is already interacting with the government. Proposed applications for assistance technologies are mostly carried out by the group leader at the same time having the authority to run the business group	Nothing significant just needs to be added disseminate programs of government aid to groups.	Make a socialization program for the incentive program through field supervisors
The Group proposes via technopreneur request for assistance the equipment and machinery to processing cocoa beans	Farmer groups already sent the proposal for assistance to the government (Ministry of Agriculture and Ministry of Industry)	The proposal was made with the help of the relevant office staff. So often there is stronger an "intervention wants" of the official than the scale of the needs.	Creating a training program proposal development assistance to the group leader or technopreneur both the printed version and the electronic version (e-proposal)
The Government assesses institutional capacity of proposer	There is already has a review of the simple verification in order to verify the capacity	Not yet available instruments of institutional capacity assessment, especially for	Creating instruments of institutional capacity assessment cocoa agro-industry group

Activities	Real world situation	Gaps	Proposed improvement action
	assessment	special technological capacity for the cocoa agro-industry group.	
Recommendations ratings institutional capacity proposer	For groups of farmers or unity of farmers groups and co-operatives has been an assessment of the rating.	For a group of agro-industry especially for cocoa has not provided group ratings	Creating a standard assessment and ranking of the cocoa agro-industrial group mainly for technological capacity.
The Government provides assistance procurement of equipment and machinery of processing cocoa bean	The government has provided aid equipment and machinery to business groups and farmers group	There is no significant gap, only on procurement process needs to be improved so that the technical specifications of machinery and equipment in accordance	Make detailed technical specifications of machinery and equipment assistance in accordance with the capacity of cocoa agro-industry group
The Government provides guidance and technical assistance on cocoa processing technology	The government with helping of field counselor and consultants have provided technical guidance on the processing of cocoa beans and cocoa.	There is no significant gap	
Agroindustrial group run processing activities and downstream cocoa.	No group agro-industry, but the activity in each sub-system of agro-industry value chain has been running	There is no a gap yet for new agro-industry cause initiative group just begin.	

Cocoa agro-industry development activities by the government have been running. This activity is still not integrated.

Activity growth cocoa agribusiness groups have also been made by the government as well as the development of downstream cocoa industry, but the activities are undertaken by the group of agro-industries to process cocoa beans into chocolate products both food and non-food new do.

This initiative was taken by the Directorate General of Processing and Marketing of Agricultural Products, Ministry of Agriculture. The Ministry of Agriculture itself has a growth guide farmers' groups, including the development and incorporation procedures farmer groups [55].

In the industrial sector, the program of downstream development has also been carried out by the Ministry of Industry through the Directorate General (DG) of Small and Medium Industries and Agro Industry DG.

Tabel 10: Implementation of the fifth stage, sixth and seventh SSM System 2

Activities	Real world situation	Gaps	Proposed improvement action
Set up standard operational procedure (SOP) implementation cocoa agro-industry group rankings	There is no rating agro-industry group.	There are no standard rating. There is already a standard assessment and rating made by the Ministry of Agriculture for farmers' groups and the Ministry of Cooperatives and SMEs to cooperatives.	Need a workshop to design audit institutional capacity of agro-industry group
Conduct a comparative study of the institution that has made a rating based technologies	There has been no implementation of these activities	The rankings are there only for farmers' groups and cooperatives but have not been for a group of agro-industry	The focused discussion needs to be held to prepare these activities and conduct study visits to countries that have existed agroindustry groups, such as the Netherlands, Thailand, and Malaysia.
Set up standard operational procedure (SOP) implementation cocoa agro-industry group rankings	Not available yet	Not available yet	These study procedures need to be prepared as a result of the discussion focused and workshop
Prepare competent and certified auditor	Not available yet	There is no gap	preparation of personnel auditor who did the ranking of farmer groups
Provide training to auditors about the way to rating of cocoa agro-industry group	Not conduct yet	There is no gap	Needs to be proposed to the government
Choose the pilot project for the rankings implementation of the cocoa agro-industry group.	No decide yet, still pending readiness ranking procedure	No pilot project has not been defined, but there has been the forerunner of a group that could be a pilot project.	Cooperation with the Director General of Plantation to set up a pilot project
Conducting the audit ranking of cocoa agro-industry group	Not yet	No significant gap	waiting for the pilot project
Replicate pilot project program to be implemented on a wider scope	No conduct yet	No available yet	Waiting for the auditing

The Ministry of Agriculture developed a cocoa-based cocoa agro-industry, with guidance from cultivation, post-harvest, and processing into pasta, fat, and cocoa powder. The Ministry of Industry to develop cocoa agro-industry in the more downstream sector, based businesses, and business groups. This growth programs in the form of incentive programs in the form of technology and equipment assistance cocoa machine processing and chocolate. The incentive is still sporadic and not pay attention to readiness groups and businesses. Readiness groups and businesses can be assessed from the rank and institutional capacity, especially the capacity technopreneurship (technology and entrepreneurship) that incentives appropriate and well targeted. So the detailed technical specifications can be made based on the capacity of technology assistance to group proposer.

In order for technology assistance program to the right target group, it is necessary the government should have a standard number of incentives to the group. This standard institutional capacity in the form of a rating group. Currently, the Ministry of Agriculture has a standard ranking for farmer groups. Traveler excluded groups made up of the beginner, advanced group, middle group and the main group [56]. Ministry of Cooperatives and SMEs also have a standard that divides cooperative ranking cooperatives into four categories, which are not qualified, sufficiently qualified, qualified and highly qualified [57]. This ranking standard has not noticed the technological aspects in detail, this is what distinguishes agro-industry group with farmers' groups and cooperatives. When it is urgent to set a standard ranking groups based on technological capacity, due to government incentives in the form of aid and processing machines are needed by the business group to accelerate the process of downstream and value-adding. In order for this ranking, the standard is more accurate, it is necessary to a study visit to the institution that has made a rating or standard study appeal to countries that already have a group of agro-industries such as Thailand or Malaysia.

Conflicts and split of the group often become the cause of the failure of the sustainability of a group. Weak institutional factors to be one cause. Weak institutional rules and norms to be the cause of this conflict and discord. Further [58] states that one of the efforts to strengthen that must be done is to encourage and guide farmers to cooperate. This impulse must arise internally from within the members of the group so that changes can occur to the group as a whole. So the motivation of social capital and common vision must be built before the rules of the institutional setup. It is, therefore, important for the government to encourage the process of change starts from within the group itself [59]. The task of government and extension agents provide information and access to institutions of advisory services to farmers. Then with the joint initiative of government agencies or consultants, an agro-industry advisory group jointly developed standard management and conflict mitigation. The result of this arrangement then tested for later use by the group cocoa agro-industries.

The programs and activities in order to develop agroindustry cocoa-based group have been done as described in the foregoing description. These programs are generally in the budget is majority-owned by the central government. At the level of central and local budgets and the program is divided into individual sectors of agro-industry builder cocoa. In the upstream sector, the Ministry of Agriculture has the authority to develop cocoa farmers and crops; and in the downstream sector, the Ministry of Industry has the authority for downstream development of cocoa beans.

Tabel 11: Implementation of the fifth stage, sixth and seventh SSM of System 1 **group**

Activities	Real world situation	Gaps	Proposed improvement action
Technopreneur/chairman of the agro-industry groups interacts with the government for assistance on behalf of the group	The techno is already interacting with the government. Proposed applications for assistance technologies are mostly conducted by chairman of the group once has authority running the business group	Nothing significant just needs to be added disseminate programs of government aid to groups.	Make a socialization program for the incentive program through a technical supervisor field
The group proposes a request for help mentoring institutional management	The group does not have the institutional management of relief assistance.	Proposed assistance is still dominant at the initiative of the government or technical field counseling	Make access guidance to extension institutions and counselor of agro-industry groups
The Government with the assistance of a consultant co-developed standard management and conflict mitigation	Not implemented yet	Not available	Make a compilation program management standards cocoa agro-industry group.
Standards of conflict management and mitigation of agro-industry group socialized and tested on a group agroindustry	Not tested yet	Not available	Can not be implemented, waiting for the completion the standards of management of cocoa agro-industry group
The group conduct activities with the management standardized of cocoa. agroindustrial group	Not implemented yet	No available	Waiting for activities previously carried out

Cocoa agro-industry development based group still have avoided overlapping of programs and activities. For it is urgent for the government to reaffirm the division of authority is particularly cocoa agro-industry development. Industry development division of authority ever exists at preceding governments [60]. But the development of industry-based on the group (other than cooperatives) has been no legal umbrella set so that overlapping programs often occur. While waiting for the legal umbrella is made, then an urgent need for coordination between the builder of this agro-industry, especially cocoa.

4. Cconclusions and Rrecommendations

The results of the political analysis (analysis of three) indicate that there are three (3) the party most interested

and influential in the transformation of a group of farmers into agro-industrial groups, namely; government, technopreneur, and farmers. Each of the parties has the authority interplay transformation process.

The process of transformation of a group of farmers into the agro-industry group has 3 (three) systems of purposeful human activities, namely:

1. The formation of the group comes from the cocoa agro-industry groups that have existed in the community
2. The rankings of cocoa agro-industry group based on the needs and advancement of technology in the context of technological incentives
3. Patterns of institutional internal (management, transaction systems) in order to strengthen institutional of cocoa agro-industry group

Each of the above systems made Root Definition (RD) and conceptual model (CM) who will be the intellectual tools for discussion and dialogue about problematic situations encountered in the context of the growth and development of an agro-industry group of cocoa-based incentive technology. Cocoa agro-industry development activities by the government have been running. This growth programs in the form of incentive programs in the form of technological assistance equipment and machinery cocoa processing and chocolate to groups that have existed in the community, one of which is a group of farmers. The incentive is still sporadic and not pay attention to readiness groups and businesses. Readiness groups and businesses can be assessed from the rank and institutional capacity, especially the capacity technopreneurship (technology and entrepreneurship) in order that appropriates incentives and appropriates it should be made detailed technical specifications based technology assistance group capacity proposer. Also need to set up institutional devices and standard management to avoid conflicts that might occur. This study recommends continuing the transformation of corrective action activities agroindustrial group incentive-based technology to create a model for the rating group and good governance. Another suggestion is that the government as key influencers in the change process to build coordination among government agencies builder cocoa agro-industry.

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