

Decision Making Model For Shrimp Farming Sustainability In Indonesia

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Abstract: Bumi Dipasena Jaya village implements a Joint Community Business system with adjusted business patterns and financial sharing patterns. With the background of the Dipasena Earth shrimp farm that has experienced a crisis, Bumi Dipasena Jaya Shrimp Farm in Lampung also has problems, especially in terms of the sustainability of its business. The purpose of this study is to find out problem in maintaining the sustainability of the Bumi Dipasena shrimp farm business and the alternative solution. The method used in this study is Soft Systems Methodology, with a decision-making analysis tool using Analytical Network Procurement (ANP) by comparing the success factors obtained during the implementation of Focus Group Discussion. The results obtained are infrastructure (40%) in this case related to electricity. The second priority of the calculation results is occupied by Human Resources (25%), an alternative solution offered is the dissemination of leadership and regeneration of leadership. The third priority is technology (15%) with alternative solutions in the form of saprotam research. The fourth priority is the environment (12%) with alternative solutions namely the social environment. The fifth priority is Regulation (4%) with alternative legal and institutional umbrella solutions. The sixth or final priority is politics (3%) with an alternative solution, namely the role of the government. The role of the government will be to provide policy solutions in overcoming problems that are security, comfort and certainty in trying.

Index Terms: Decision Making, Soft System Methodology, Joint Business Partnership Pattern, Sustainability, Shrimp farms.

1 INTRODUCTION

Kampung Bumi Dipasena in Rawajitu Timur sub-district, Tulang Bawang Regency, Lampung consists of thousands of hectares of shrimp farm land. This area is divided into 8 villages Bumi Dipasena Sentosa, Utama, Agung, Jaya, Mulya, Makmur, Sejahtera and Abadi with a total land area of 16,250 HA. The land consists of ponds as many as 17. 139 plots consisting of 14609 productive ponds and 3070 plots of unproductive ponds. The history of Bumi Dipasena, which is the village with the largest commodity of shrimp farms in the world, was initially managed by PT. Dipasena Citra Darmaja (PT DCD). The collaboration pattern used between DCD and farmers is a plasma-core partnership. In 1990-1999, the economic crisis that hit Indonesia caused PT DCD to experience problems. The turning point for the development of shrimp ponds on Bumi Dipasena began in 2013. At that time the Regional Shrimp Farmers Association (P3UW) declared the implementation of the "Mandiri Revitalization Program". "Mandiri Revitalization" begins with a commitment from farmers to continue shrimp farming by creating a new partnership system that is more just and transparent through an economic forum called the Bumi Dipasena Farmer Cooperative (KPBD) which later develops into a Village-Owned Enterprise. At present the community of Bumi Dipasena Jaya village is implementing a system of Joint Community Business with Business Patterns and Financial Patterns for adjusted yields. In this system, all communities are shareholders and farmers. Collaboration is carried out between farmers or communities using a partnership system. There are a number of assumptions underlying definitions of partnership. Firstly, the potential for synergy of some form. Secondly, the partnership involves both development and delivery of a strategy or a set of projects or operations. Thirdly in public-private partnerships the public sector are not pursuing purely commercial goals (Mc Quaid, 2000). In a public policy partnership can be defined as co-operation between people or organisation in the public or private sector for mutual benefit (see Holland, 1984). With the background of the Bumi Dipasena shrimp farm that has experienced a crisis, especially when the farm is managed by the company, the economic condition of Bumi Dipasena Jaya, which is currently improving, also has problems, especially in terms of the sustainability of its business. Sustainability can be defined as maintaining well-

being over a long, perhaps even an indefinite period (Kuhlman, T et al, 2010). For this reason, it is necessary to examine the problem in maintaining the sustainability of the Bumi Dipasena shrimp farm business and how the alternative solution.

2. RESEARCH METHOD

This study uses the Soft Systems Methodology (SSM) approach because this research requires a complex system approach with unstructured and evolving problems that have specific objectives. Implementation of the 7 stages of SSM Checkland's thinking really dominated this soft method, even when this method was used, Checkland's ideas should not be abandoned. Here are the seven stages of Checkland, *Entering the problem situation, Expressing the problem situation, Formulating root definitions of relevant systems, Building Conceptual Models of Human Activity Systems, Comparing the models with the real world, Defining changes that are desirable and feasible, Taking action to improve the real world situation* (Checkland, 1990). This approach is used when a technical approach is not able to explain various phenomena that are faced intact and accurately. So that in this case it can be concluded that Soft Systems Methodology (SSM) is a holistic approach in looking at real and conceptual aspects in society. SSM sees everything that happens as a Human Activity System because a series of human activities can be referred to as a system, that is, each activity is interconnected and forms a bond. The soft systems approach is considered a very productive methodology for learning every human activity organized in achieving certain goals. Then the decision-making analysis uses the Analytical Network Procurement (ANP) by comparing the success factors obtained during the FGD with the sub factor. Particular decision-making model or method it becomes an appropriate tool for strategic decision makers under varying complexity and time pressure. The appropriate model or method would change when the characteristics of the environment change. (Rahman N et al, 2009)

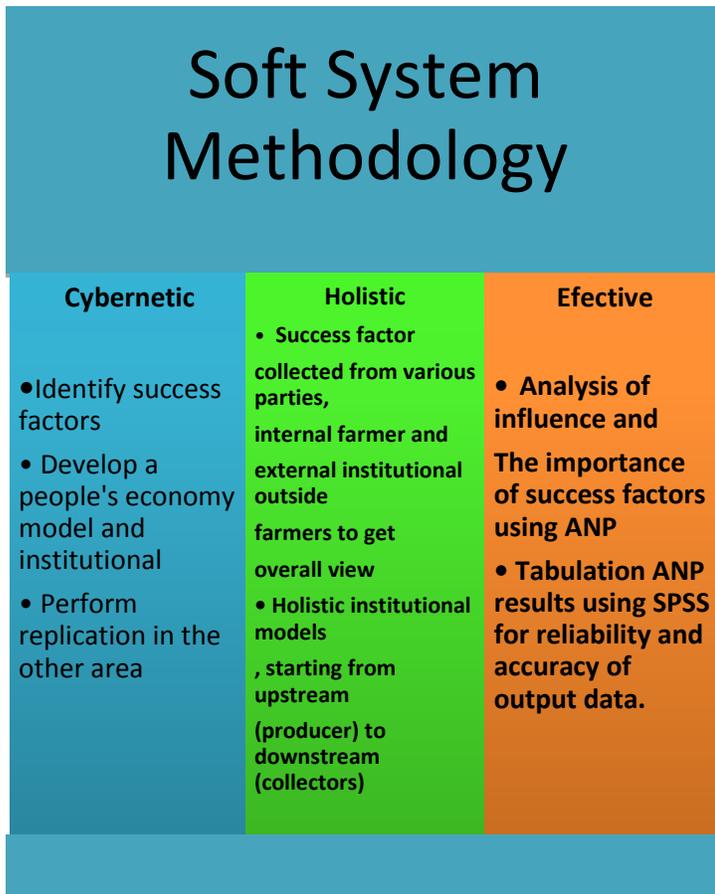


Figure 1. Methodology and Analysis Tools

In the first year of research the data used were primary data and secondary data obtained from the following activities: 1. Observation Observations were made by visiting a shrimp farming location in the village of Bumi Dipasena Jaya, Rawajitu Timur District, Tulang Bawang Regency, Lampung. The location is 204 km from the University of Bandar Lampung or about 5 hours drive. The implementation of this research is scheduled for 3 observations to the cultivation location with detailed activities.

Table 1. Details of Observation Activities

	Time	Activity
Visit 1	March	Regional mapping, visiting farmers, arranging permits with the Village Head, head of P3UW, Village-Owned Enterprises (BUMDes)
Visit 2	May	Operational observation of shrimp farming from upstream to downstream
Visit 3	August	Discuss with institutions and farmers about problems that have occurred

2. Focus Group Discussion (FGD) FGD is a process of gathering information on a particular problem that is very

specific through group discussions (Irwanto, 1998). The purpose of the FGD in this study was to obtain input and information related to institutional models in Bumi Dipasena Jaya. In order to obtain accurate and quality information and input FGD was conducted twice with different participants. The first FGD was FDG Expertise, held at the University of Bandar Lampung with 10 participants consisting of the Research Team, representatives of academics, Agribusiness Institution Experts, representatives of the Regional Planning and Development Agency of Tulang Bawang Regency, representatives of Lampung Province Research and Development Agency, representatives of the Community Empowerment Service Lampung Province Village. This FGD was held to obtain input on the factors that influence the success of the institutional model on Bumi Dipasena Jaya as well as workable solutions. Experts presented are representatives from various related fields to get holistic, comprehensive results from various perspectives. The second institutional and farmer FGD was held in Dipasena Jaya Village, Tulang Bawang with participants from P3UW representatives, Government Representatives of Dipasena Jaya Village, BUMDes / BUMakam Representatives, BUMades Representatives, Karang Taruna / Pemud Representatives. The FGD discussed a number of things including the role of P3UW, CRU, the shrimp farm business flow, the sale and calculation of the results of shrimp farms. 3. Questionnaire The results of the FGD Expert and institutional FGD and farmers were included in the "Research Questionnaire for the Population Economic Development Model in Bumi Dipasena Lampung" which contained an assessment of the influence and importance of the factors and sub-factors. This questionnaire was distributed to Experts who were present at the Expertise FGD after first being given information and assistance in filling out the method. The questionnaire in question can be seen in the appendix of this report.

2. RESULT AND DISCUSSION

3.1 The Result of Observation From the field observations together with the support team and Bumi Dipasena Jaya village community, information was obtained: 3.1.1 Stakeholders involved Stakeholders involved in the business process of vannamei shrimp farms on Bumi Dipasena are divided into internal and external actors. Internal actors are parties directly involved in vannamei shrimp cultivation while external actors are parties that are not directly involved but have an influence on the business. Internal actors are parties that are directly related both during cultivation and management, administratively and technically. These actors are Farmers and Business Entities Sub Blocks (BUSB), while external actors in shrimp farming in Bumi Dipasena Jaya Village are the Association of Regional Shrimp Farmers (P3UW), Investors, Shrimp Seed Providers, Saprotam Providers, Village Owned Enterprises (BUMKam), Infra, Government, Media, Non-Governmental Organizations (NGOs) and Community Organizations (CSOs), Universities, Buyers, Collectors, and Factories. 3.1.2 The Result of FGD The results of the two FGDs conducted were identification of success factors from shrimp farming institutions in Bumi Dipasena Jaya Village. These factors are processed and discussed with experts, communities and institutions outside the farm community to produce the following factors and subfactors:

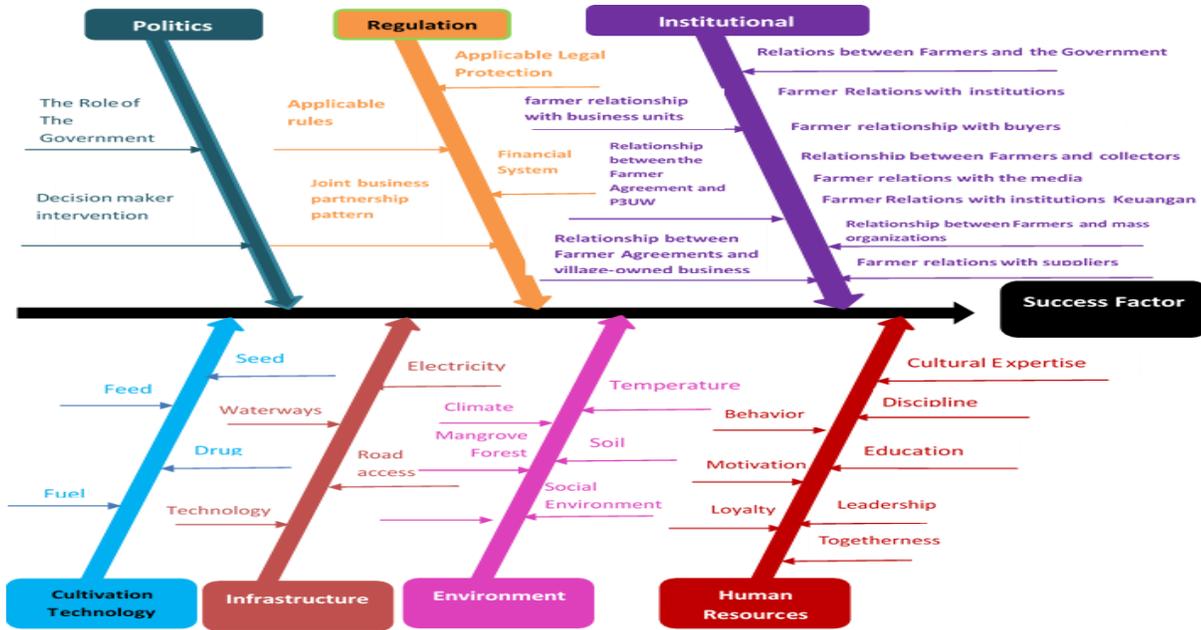


Figure 2. Fishbone of Success Factor

Priority Determination of Criteria and Alternative Solutions where the details of the Alternatives of each criterion are described in the problem table as follows:

Table 2. Criteria, Problems and Alternative Solutions

CRITERIA	PROBLEMS	ALTERNATIVE SOLUTION
HUMAN RESOURCES	Problems with idol-based leadership in just a few people	Leadership Regeneration
		Leadership Dissemination
POLITICS	The role of the Regional Government has not been fully felt from the side of farmers	Role of Regional Government
REGULATION	The absence of written Legal and Institutional protection in the use or implementation of business activities carried out by farmers	Legal Institutional Protection
TECHNOLOGY	The Saprotam sector is still very dependent on other parties and the unavailability of electricity, resulting in higher costs and other minimal activities	Pengembangan riset bidang Saprotam

ENVIRONMENT	The existing generation is a generation with the same social problems, so that the social environment is formed based on togetherness. But after this generation is no longer productive, the gap between generations and the same social conditions will fade	Social
INFRASTRUCTURE	After the conflict, access to electricity and these facilities was revoked. Current conditions, farmers use diesel-powered generators	Electricity

When viewed from the results of the calculation of priority values between the business sustainability criteria in Bumi Dipasena Jaya, it can be described in the form of tabulations of the following pie charts:

Table 3. Percentage Priority Criteria

Criteria	Percentage Priority
Infrastructure	40
Environment	12
Politics	3
Regulation	4
Human Resources	26
Technology	15

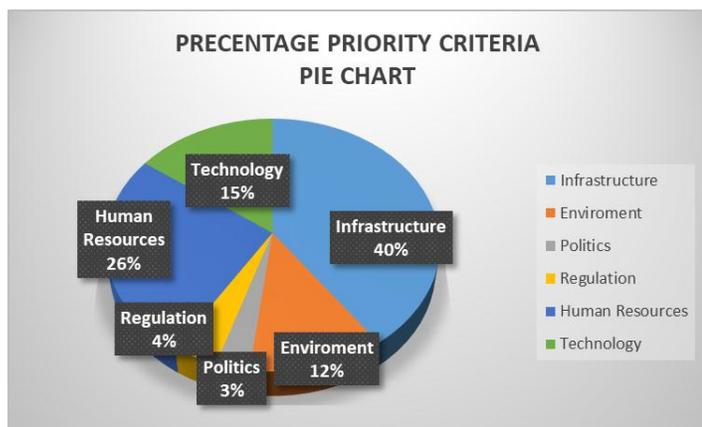


Figure 3. Percentage Priority Pie Chart

Explanation: Priority Criteria that are the basis for making decisions based on the effects of spread out in sequence are: Infrastructure Human Resources Technology Environment Regulation Politics When viewed from the results of the calculation of priority values between alternative solutions, the business in Bumi Dipasena Jaya can be described in the form of tabulation criteria for the following pie charts:

Table 4. Percentage Priority Alternatives

Criteria	Percentage Alternatives
Leadership Dissemination	25
Leadership Regeneration	13
The Role of The Government	4
Legal Protection	14
Institutional	14
Development of Research in the Saprotam Field	6
Electricity	14
Social	10

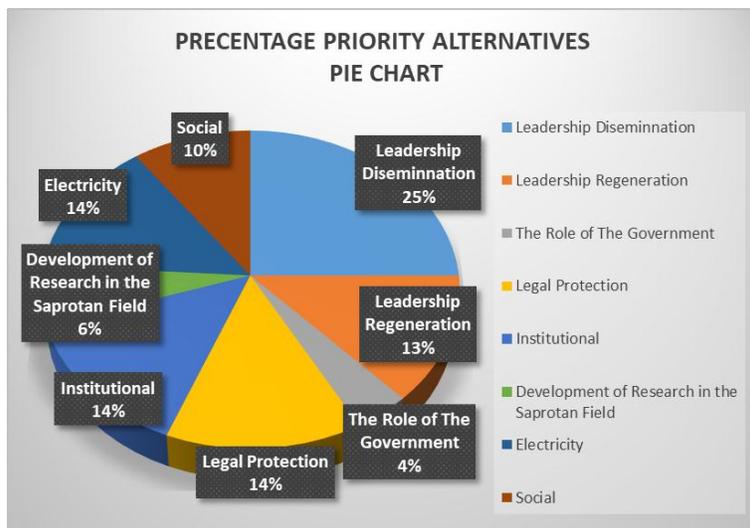


Figure 4 Percentage Priority Alternatives Pie Chart

Alternative priorities which form the basis of decision making based on the biggest influence are leadership dissemination of 25% and then followed by legal protection, institutional and electricity with a percentage value of 14%, regeneration of leadership by 13%, social 10%, development of research in the saprotam field 6% and the role of the government 4%. If we do a comparison of Interests and Influences between Criteria and Alternative Solutions, tabulations will be obtained as follows:

Table 5. Comparison of Interests and Influences between Criteria and Alternative Solutions

Details of Alternative Comparison Criteria and Presentations	Infrastructure	Environment	Politics	Regulation	Human Resources	Technology
Electricity	14					
Social		10				
The Role of the Government			4			
Legal Protection				14		
Institutional				14		
Leadership Dissemination					25	
Leadership Regeneration					13	
Development of Research in the Saprotam Field						6

Explanation: From the comparison of values of importance and influence between criteria and alternative solutions, it can be seen that HR has the greatest influence with 2 (two) Alternative Solutions namely Leadership and Regeneration Dissemination, followed by Regulation with Alternative Solutions in the form of Legal and Institutional Legal Protection, followed by electricity infrastructure, Social Environment, Technology in the form of developing the Saprotam Field Research and finally the Role of the Government.

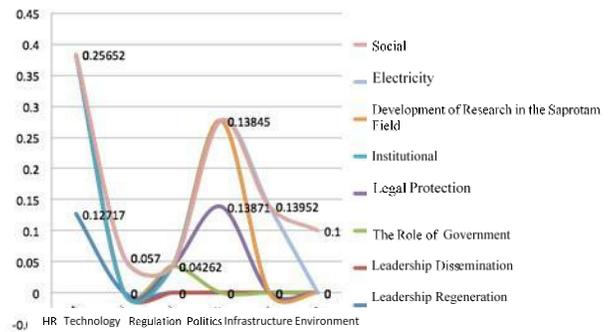


Figure 6. Line diagram

While the relationship between each criterion and alternative solutions shown by the diagram is as follows:

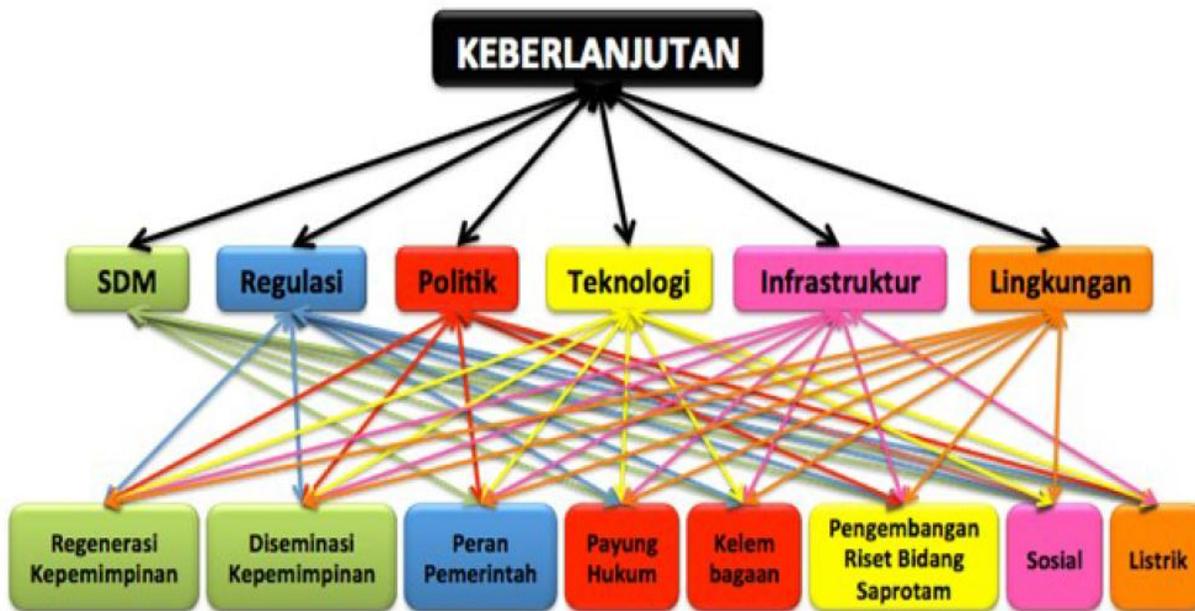


Figure 7. Relationship between each criterion and alternative solutions

2. CONCLUSIONS AND SUGGESTIONS

4.1 Conclusions

The stakeholders involved are divided into 2 actors, internal and external actors. Internal actors are actors who are directly involved, while external actors are people who are involved but not directly influence the shrimp farming process. From the results of the Focus Group Discussion, it was found that there were a number of additions and changes in relations and involvement between actors, so that all inputs could be used in prioritizing relationships and their effects on the sustainability of shrimp business in Bumi Dipasena Jaya. On the results of calculations when determining priorities between criteria or factors, it turns out that infrastructure (40%) in this case is related to electricity, is the main priority, because electricity is a necessity that

greatly determines shrimp production; farmers have been using non-generating electricity, both PLN and private, so the cost of production and mortality rates of shrimp vary from medium to high. The use of electricity in shrimp farming uses windmills that produce oxygen and release harmful gases for shrimp, so that if the electricity is in an unstable condition then the cultivation will be disrupted. The second priority of the calculation results is occupied by Human Resources (25%), an alternative solution offered is the dissemination of leadership and regeneration of leadership. This is also the focus of consideration. Because of socially leadership, Bumi Dipasena Jaya inevitably has highly respected leaders, is admired and becomes a role model with the history of the formation of P3UW (Regional Shrimp Farmers Association) both before the conflict, during conflict and after conflict. This is a special consideration,

because this generation is aged between 30 to 70 years, so the risk of vulnerability to business continuity that starts from togetherness will be low, if the leader of the leader who is a role model is gone. The third priority is technology (15%) with alternative solutions in the form of saprotam research. One of the unsuccessful cultivation due to (1) shrimp disease is a scourge for farmers such as white spot, inappropriate size growth and death, (2) dependence of farmers in the industry of seeds, drugs and food that are controlled by large industries and limited choices. This becomes a homework that needs to be considered, especially the government and aquaculture researchers. They need to be able to provide alternative options for farmers. The fourth priority is the environment (12%) with alternative solutions namely the social environment. The social environment here is more rooted; initially the farm community was formed with the current model, it is the existence of elements of the same boat and togetherness. The same thing and togetherness because having together felt conflict and debt, felt political violence and psychological stress. As with leadership, this generation will slowly detach from the togetherness because the next generation does not necessarily have the same social sense. The fifth priority is Regulation (4%) with alternative solutions to legal protection and institutions. Legal and institutional protections need to be done to provide security and certainty in business. The current business mechanism is more about a sense of togetherness and trust that is based on transparency among members in each business group. The sixth or final priority is politics (3%) with an alternative solution, namely the role of the government. The role of the government will be to provide policy solutions in overcoming problems that are security, comfort and certainty in trying. Of all priorities, several priorities can and have been done internally such as the dissemination and regeneration of leadership and the social environment. This is evidenced by the delegation of leadership and management or management of joint ventures by the younger generation, so that business runs only under the supervision of previous leaders. While priorities that need external handling such as electricity, legal and institutional protection, the involvement of other parties is needed. This needs to be done immediately, given the need for electricity, legal and institutional protection cannot be delayed.

4.2. Suggestions

Further research is needed to produce institutional forms and legal protection that are in line with the uniqueness of the business mechanism that has taken place, so that they can immediately determine and formalize institutions for a sense of security for business continuity. Further research is needed to create an institutional model that is suitable and can be replicated in other regions with different commodities.

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