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Application of Soft System Methodology for Modelling Institutional Strengthening of Salt Farmers

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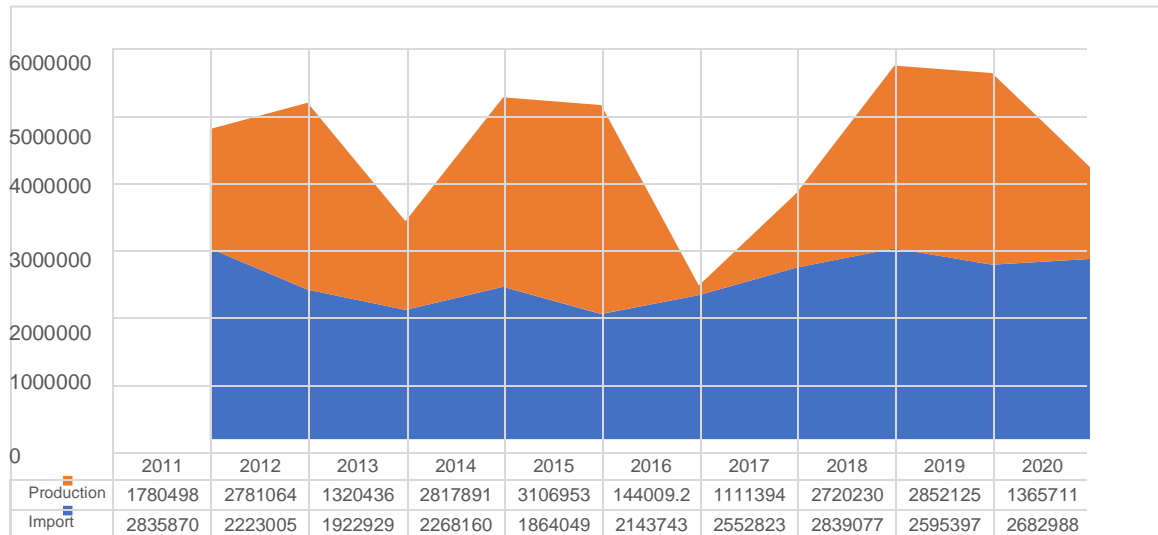
Abstract. Salt farmers (smallholders) are the main actors in the production cycle of the national salt supply chain. However, they still face various problems regarding production technology, productivity, quality, market prices, product absorption by industry, access to capital, and incentives. Strengthening their institutional capacity requires collaboration and support from the government and other actors along the supply chain. This study aims to develop a model of institutional strengthening of salt farmers by applying a soft systems methodology. The institutional strengthening model was developed in three forms, i.e., the establishment of a salt farming corporation, the formation of cooperatives, and the revitalization of the salt farmer association. Various individual actors are involved, assessed, and then integrated into this model. The suggested strengthening model involves cooperatives and/or BUMDes (village-owned enterprises), farmer groups, and processing factories supported by government and financial institutions with partnership programs.

Keywords. institutional model, salt, salt farmer, soft system methodology, supply chain

1. Introduction

Salt has been considered one of the nine community staples and a national strategic commodity. The need for salt is not only for household consumption but also for various industrial purposes, both food and non-food (such as chemicals, cosmetics, pharmaceuticals, and mining). With the natural support of the second longest coastline in the world, which reaches 95.181 km, Indonesia has not been able to meet the needs of salt independently.

Indonesia still has a high Import Dependency Ratio (IDR) on salt commodities. Figure 1 shows that Indonesia's average import dependence from 2011 to 2020 is above 50% of the total national salt needs. Moreover, IDR reached more than 60% in 2013, 2016, and 2020. This indicates that Indonesia's low ability (Self Sufficient Ratio) to meet its own needs on salt – that Indonesia is still far from being self-sufficient in salt.



(Source: KKP, 2021)

Figure 1. The development of the number of production and imports of national salt 2011-2020

Salt production in Indonesia is mostly done by independent smallholders (farmers). Only about 15 per cent of production is carried out by PT Garam, which is a state-owned company (KKP 2019). These farmers rely heavily on the evaporation of seawater in the pond fields to produce salt. As a result, weather becomes the dominant cause of fluctuations in its production. Production days become shorter when high rainfall, resulting in decreased productivity. In 2016, salt production fell by more than 90% due to this high rainfall condition. The average domestic salt productivity is only in the range of 70 tons/hectare/season, with 4-5 months of production. In addition to the problem of low productivity, smallholders generally produce salt that is not qualified for industrial purposes (Munadi et al., 2016; Ihsannudin et al., 2018).

From a geographical point of view, of the total production of 2.3 million tons of salt in 2018, around 80 per cent is concentrated in only a few districts/cities on Java Island, of which 30 per cent is located on Madura Island (KKP 2018). This concentrated area of salt production results in a long logistics chain and high distribution cost from producers to consumers, given that Indonesia consists of thousands of islands.

Therefore, the consumer market price can be much higher than that of the farmers. In 2014, for example, when the average price of consumption salt reached Rp 5,000 per kilogram, the price at salt farmers was still about Rp 600 (Kemenperin 2015). Even at this price level, farmers face quite large fluctuations. Based on the InterCAFE IPB University study report (2018), the price aspect in the salt farming practice has become one form of risk faced by farmers; per Rp 1,000 per kilogram, it is expected that there is a potential loss of Rp 680 per kilogram (mainly due to an oversupply condition).

The salt supply chain also involves many stakeholders to meet consumer demand and maximize profits: salt farmers, intermediary traders, salt processing factories, distributors, retailers, and end customers. This long supply chain implies many obstacles, including risk, efficiency, performance, coordination, institutional effectiveness, and profit margins from salt farmers.

Besides, the salt import policy has contributed to problems in the production and distribution of salt. The import of salt may decrease the enthusiasm of salt farmers to increase the quantity and quality of production because of the suspected leakage of salt import distribution to the consumption salt market. This also has caused the price of salt at the farmers' level to be more depressed, along with their low bargaining power in the salt supply chain system (Munadi et al. 2016). Smallholder salt is a labour-intensive industry that involves many households. This condition can further impact the overall performance of the national salt industry.

From the explanation above, one of the critical points in national salt governance is the institutional aspect of salt farmers, which then implies their low bargaining position. his salt farmer institutional problem has also become the attention of researchers (Erlina dan Kurniawan 2015; Ihsannudin et al. 2018; Fauzin 2019; Nugroho et al. 2020; Yudhonegoro 2020; Bullah dan Rimawati 2021; Haendra et al. 2021; Komariyah et al. 2021). The limited institutional capacity of smallholder salt farmers has an impact on the received low price, limited partnerships, and difficult financial access. Subsequently, this affects low productivity and efficiency.

The main objective of this research is to build an adaptive institutional model and find the right strategy for strengthening the institutional aspects of smallholder salt farmers in Indonesia. The research is elaborated as follows: (1) identifying the role and existing barriers of each stakeholder related to institutional aspects of salt farmers, (2) analyzing key elements that considerably influence efforts to strengthen salt farmers' institutions, and (3) formulating the most effective strategy suitable to improve salt farmers' institutions.

2. Research methods

This research uses a qualitative method with a literature study. Data were collected from secondary sources, such as books, journal articles, news, and policies and regulations related to the research topic. It applies soft system methodology (SSM) to describe the complex institutional conditions of salt farmers. The SSM-based framework for this study is shown in Figure 2. In the first stage, institutional issues of salt smallholders were identified to gather information about the needs and constraints of each stakeholder. Finally, a strategy to strengthen the institution of salt farmers was developed using the SSM framework (Chekland dan Scholes 1999; Tavella and Hjortsø 2012; Asrol et al. 2018; Kholil et al. 2020; Raharja et al. 2020

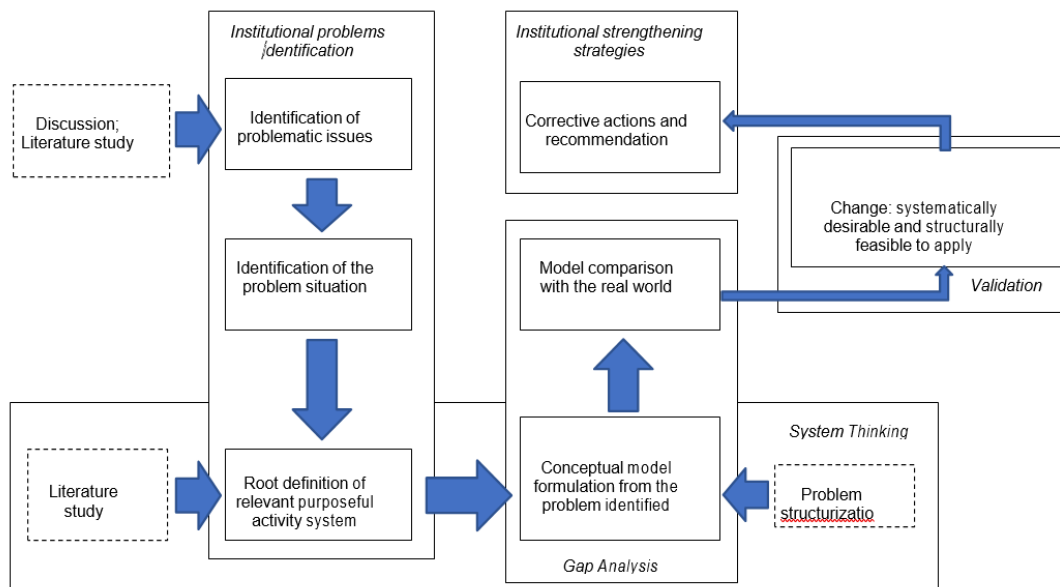


Figure 2. Research framework (adapted from Asrol et al. (2018); Raharja et al. (2020))

In this study, all secondary data were obtained from previous research works of literature that examined issues related to the salt farmers' institution (Erlina and Kurniawan 2015; Munadi et al. 2016; Ihsannudin et al. 2018; InterCAFE IPB University 2018; Fauzin 2019; Nugroho et al. 2020; Yudhonegoro 2020; Bullah and Rimawati 2021; Diananing et al. 2021; Haendra et al. 2021; Komariyah et al. 2021).

Confirmation of data and analysis of the institutional situation of salt farmers was carried out through literature study and brainstorming, following the SSM research framework, as described in Figure 2. Based on the research framework above, this research was conducted through analysis and synthesis of data and information obtained. The data and information are presented as a rich picture to convey general and comprehensive problems, which are then translated into a CATWOE analysis (customer, actor, transformation, world view, owner, and environmental constraint). This is where the root definition of institutional strengthening for salt farmers is formulated. The root definition formulation at the next level is used as the basis for building a conceptual model of the institutional strengthening of salt farmers.

3. Results and discussion

Institutional Issues of Smallholder Salt Farmers

This study begins by identifying essential institutional problems of smallholder salt farmers. At this stage, the problem is presented in a causal relationship between actors along the value chain. Based on various works of literature, several facts related to the institutional problems of smallholder salt farmers were found. However, a further examination has indicated that the selling price of raw salt at the farmer level is considered the primary problem. In general, the processing companies consider the salt produced by smallholders to have low quality and yields, so the selling price received by salt farmers is also low (Munadi et al. 2016; InterCAFE IPB University 2018). This is due to smallholders' conventional technology that relies heavily

on sunlight – so it is strongly influenced by weather conditions – and less efficient production practices (Munadi et al. 2016; Ihsannudin et al. 2018; Fauzin 2019).

In addition, the salt from smallholders generally flows through collectors or intermediary traders, which are then sent to processing factories. From the market structure perspective, salt farmers face an oligopsony market with a limited number of traders. These traders are usually extensions of the salt processing factory. In such conditions, salt farmers do not have the power to determine the price (price taker), quality, or even weight of the raw salt sold (InterCAFE IPB University 2018).

As mentioned above, the access of salt farmers to sell raw salt directly to processing plants is very limited. This causes a high level of dependence on intermediary traders. This high dependence is also due to a "bond" system where intermediary traders are able and willing to meet the capital needs of farmers with easy and light requirements.

More vital farmer institutions can be achieved if farmers are gathered in groups or cooperatives, which can improve their bargaining positions and enable more partnerships. However, this effort does not stand alone in how salt farmers transform their institutional position but is related to various multi-level parties. The existing problems are described in a rich picture representing the relationship between the problematic conditions and the role of each party involved. The rich picture illustrates the policy issues, cross-sectoral relations, and technical aspects. In addition, it helps to define complex problems in a more easy and structured illustration. A rich picture of the institutional problems of salt farmers is presented in Figure 3.

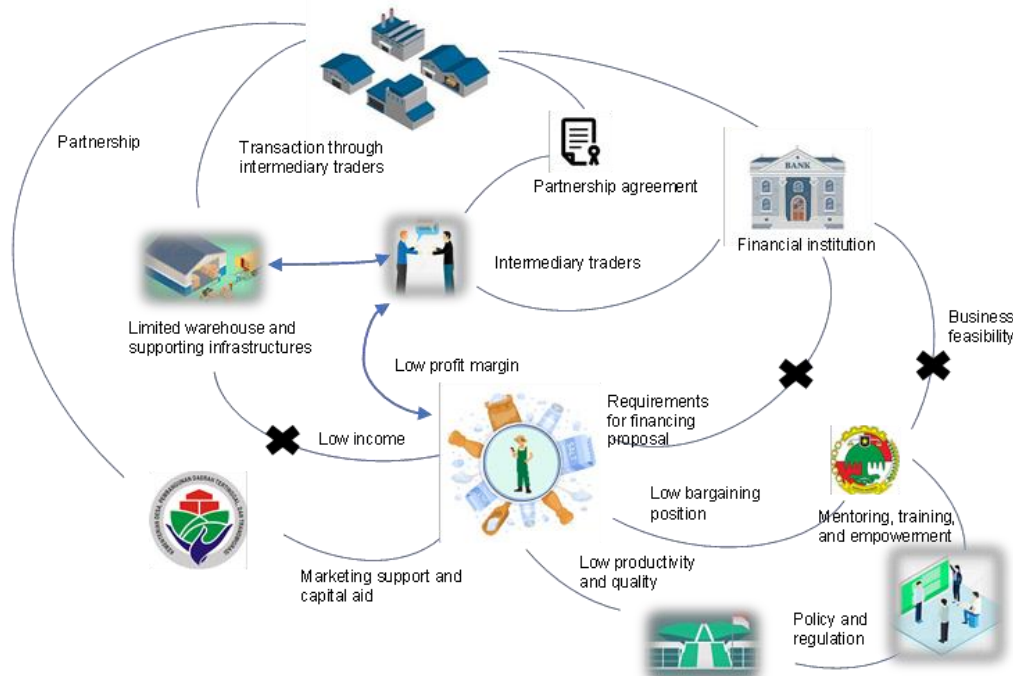


Figure 3. A rich picture of institutional strengthening issues of salt farmers

Root Definition Formulation

The root definition of problematic issues regarding salt farmers' institutional strengthening in this research is conducted by identifying and analyzing CATWOE (Customers, Actors, Transformation, World views, Owners, and Environmental constraints).

Based on literature study and discussion, the CATWOE elements that have been identified and analyzed are as follows:

1. Customers: the parties on whom the proposed institutional strengthening model puts an advantage or disadvantage, i.e., in this context, are smallholder salt farmers and intermediary traders;
2. Actors; the parties who engage in critical activities of institutional strengthening of smallholder salt farmers, i.e., in this context, salt processing factories, PT Garam, and supporting institutions (such as the Ministry of Marine Affairs and Fisheries, Asosiasi Petani Garam Rakyat Indonesia (APGRI: the Association of Indonesian Salt Farmers), Asosiasi Industri Pengguna Garam Indonesia (AIPGI: the Association of Indonesian Salt Industrial User) and financial institutions);
3. Transformation: the salt farmers empowerment process that requires the active participation of supervisory institutions from both industry and the government to support this salt farmer institutional strengthening efforts;
4. World view: the realization of an independent and empowered salt farmer institution with improvement in bargaining position, income, productivity, and quality towards sustainable salt supply chain;
5. Owners: the parties who can stop or change the process of farmers' institutional strengthening, i.e., in this context, the government, the industry office, the cooperative service, LPMUKP (Lembaga Pengelola Modal Usaha Kelautan dan Perikanan).
6. Environmental constraints: those outside the scope of the model studied, i.e., in this context, policy conflicts, land use conflicts, and the strong influence of intermediary traders in the smallholders' salt supply chain.

Therefore, the root definition in this research context is defined as follows: "a model of institutional strengthening of smallholder salt farmers with their active participation in improving quality, productivity, and bargaining position through assistance and supervisory by relevant agencies, salt processing factories, and community organizations, to attain the sustainable smallholders' salt supply chain".

The Basis of Conceptual Model for Institutional Strengthening of Salt Farmers

In this study, the conceptual model for institutional strengthening of salt farmers was developed based on the analysis of five basic elements, i.e., needs, goals, possible changes, parties, and environment. From the literature study, the systematization of these elements is presented in Table 1.

Identifying these elements is required as a basis for developing a conceptual model for the institutional strengthening of smallholder salt farmers. The conceptual model describes the relationship between activities and the role of each party in solving the main problem in strengthening the institutional capacity of salt farmers. Actors need to be involved in the conceptual design of the model for institutional improvement of salt farmers, especially the government, salt farmers, APGRI, cooperatives, BUMDes, traders, and processing factories.

Proposed Model for Institutional Strengthening of Salt Farmers

Strengthening salt farmers' position along the supply chain requires the process of institutionalization. They will be more considered if joined in a group that is an important part of various institutional relationships. Actively consolidating salt farmer groups (or joint groups) and cooperatives are believed to create a positive impact on salt farmers. However, the

contribution of the above institutional forms has not been maximally felt because of various aspects such as poor administration and management, as well as complicated bureaucracy. The absence of written rules and conventions also contributes to ineffective binding in farmers' group membership. Therefore, it is vital to establish rules and policies with legal force to ensure that the potential benefits for both individual salt farmers and their organizations are realized.

This study proposes three institutional models to strengthen smallholder salt farmers' institutions, i.e., 1) corporatization of salt farmer institutions, 2) collaboration between salt farmer cooperatives with BUMDes, and 3) revitalization of salt farmer associations (especially at the regional level). Any salt farmer groups (or joint groups) need to be encouraged to form larger institutional units with economic orientation and legal status, such as a cooperative. In such forms of institution, corporate farming cultures and practices can be induced in the smallholder salt businesses.

In the next stage, the collaboration between salt smallholder's cooperatives with BUMDes needs to be established. It is useful to take advantage of the program and financial support through this cooperative-BUMDes partnership from the local government. Of course, this collaboration requires multiparties participation from political, economic, technical, and governance sides.

Further, the salt farmer's association (APGRI) should be revitalized, especially in its function of committing training and capacity development for salt smallholders, as well as advocating any possible partnership with salt processing industries. Besides, APGRI can mediate various problems, such as land and business certification, the absorption of smallholders' salt by industry, and state land asset utilization for a salt pond.

Table 1. Elements dan sub-elements of salt farmers' institutional problem

Elements	Sub-Elements
Need	<ol style="list-style-type: none"> 1. Farmers' awareness to join groups 2. Central and regional government supports in the forms of policies, regulations, funding, affirmative programs 3. Industry/salt processing mill's support in developing a partnership with salt farmer institutions 4. Salt farmers' management and governance institution
Objective	<ol style="list-style-type: none"> 1. Increase in salt farmers' income 2. Clear cooperation and transaction between salt farmers and other business actors (land owners, intermediary traders, and processing factories) 3. Government support in providing market access for salt farmers' products 4. Quality and productivity improvement of salt farmers 5. Availability and ease of financial access
Possible change	<ol style="list-style-type: none"> 1. Ease of access to salt price information in various levels of quality and distribution channel 2. Transparency in quality assessment of farmers' raw salt 3. Better inter parties' cooperation and partnership 4. Capacity and skill improvement in managing salt pond land and applying the technology of more effective, efficient, and sustainable production 5. Improvement in government performance of support towards increasing salt farmers' productivity 6. Ease of monitoring and control of salt trade system and the price at the farmer level 7. Favorable and fair bargaining position of salt farmers

Party	<ol style="list-style-type: none"> 1. Smallholder salt farmer groups (or joint groups) 2. Salt farmer cooperatives 3. BUMDes (village-owned enterprises) 4. The Association of Indonesian Salt Farmers (APGRI) 5. The Association of Indonesian Salt Industrial Users (AIPGI) 6. PT Garam 7. Salt processing industries/factories 8. Marine and fishery service department 9. Cooperatives and SMEs service department 10. Trade service department 11. Industry service department
Environmental constraint	<ol style="list-style-type: none"> 1. Existing institutions considered not providing quite enough benefits for salt farmers 2. Salt farmers' lack of trust in institutional functions 3. Strong influence of intermediary traders on salt farmers' business 4. Salt farmers' lack of commitment to institutions' decision making and activities for a common goal 5. Conflict of interest in institutional management 6. Lack of managerial capacity in institutional management

Source: processed from various works of literature (Erlina dan Kurniawan 2015; Munadi et al. 2016; Ihsannudin et al. 2018; InterCAFE IPB University 2018; Fauzin 2019; Nugroho et al. 2020; Yudhonegoro 2020; Bullah dan Rimawati 2021; Diananing et al. 2021; Haendra et al. 2021; Komariyah et al. 2021)

To provide optimal impact, the three recommended institutional models above are integrated into one primary model, as presented in Figure 4. In this integrative model, cooperatives are positioned as the core because the model's success in implementation highly depends on how well they are established. The cooperatives must be formed based on the needs and collective awareness of their members of, salt farmers. However, as a core actor in the institutional strengthening of salt farmers, cooperatives need support from other related parties.

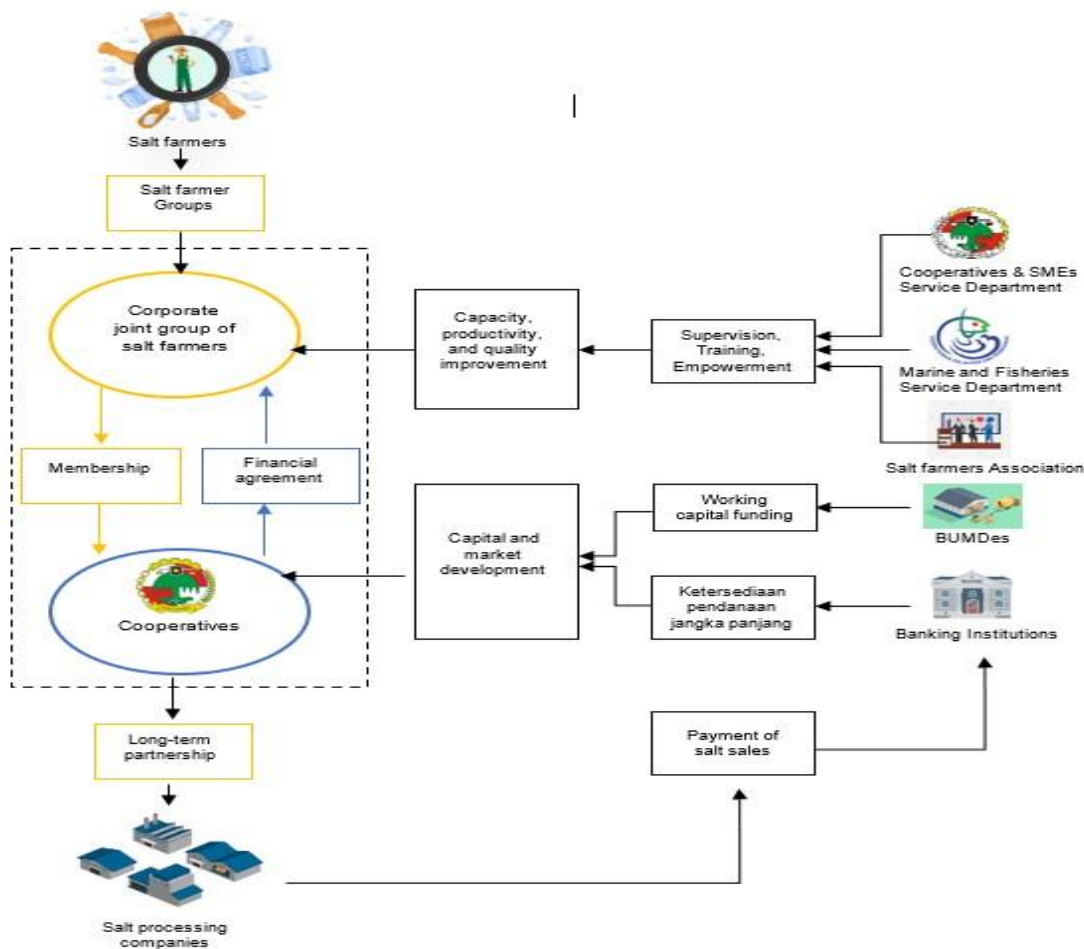


Figure 4. A proposed integrated model for institutional strengthening of salt farmers

4. Conclusion

Smallholder salt farmers have been afflicting various institutional problems that have put them in a vulnerable position in the salt supply chain. Some of them have considerable impact and, therefore, need more attention, such as low productivity, quality, price, and bargaining position, as well as long supply chain. Salt farmers' institutional capacity improvement is required to synergize the relationship between actors vertically and horizontally. This study proposes an integrated institutional model to strengthen salt farmers' capacity, with cooperatives as its core institution. This model is needed by all related stakeholders in the salt value chain to accommodate their reflective objectives.

As the implication of these conclusions, more tangible actions to form such an institution that applies cooperation and collaboration between relevant governmental and non-governmental parties to support the salt farmers' institutional strengthening are required. Once again, Institutional strengthening implementation programs must also be carried out through collaboration and cooperation between related agencies to realize competitive smallholder salt farmers.

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