



Actors and Actor Relations in Laying Hens Business in Blitar Regency

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Abstract | The laying hen farming business in the poultry industry, besides experiencing very rapid development, also experienced ups and downs. The Coronavirus Disease of 2019 (COVID-19) pandemic, which has been endemic in Indonesia for the last two years, has also affected the livestock business. This research analyzed the actors and the relations between actors in the laying hen farming business. The research was conducted using a qualitative method; data was collected through interviews, observation, documentation, and focused group discussions. The method of selecting informants uses purposive sampling of farmers and the Animal Husbandry Department of Blitar Regency. The study's findings indicated that actors involved in the laying hen farming business were small farmers, medium farmers, large farmers, farmer groups, poultry shops, the Animal Husbandry Department, Ministry of Agriculture-Directorate General of Livestock and Animal Health, feed/medicine companies, egg collectors/middlemen, local traders, inter-regional/island traders, and cooperatives. The growing demand for chicken eggs and the rapid capital turnover that is the primary incentive for business actors to pursue the chicken farming industry are the fundamental causes of the vast number of farmers' business players in Blitar Regency. The large-scale accessibility of production elements is another consideration. The actors operate their livestock company independently or in cooperation, and it has since evolved into a hereditary enterprise (inherited and sustained). The rise in feed prices and the fall in egg prices have significantly impacted small and medium-sized farms, driving many into bankruptcy. Farmers can also make do with fewer animals, altered feeding regimens, and a waiting period for more steady prices. In conclusion, farmers who operate large-scale enterprises are less impacted by changes in the cost of inputs and outputs because they have access to independent input suppliers and market networks that support productive and efficient business methods.

Keywords | Actor, Actor relation, Egg production, Laying chicken, Blitar regency

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INTRODUCTION

The development of purebred chickens in Indonesia has undergone various stages and business patterns. The Indonesian government issued Presidential Decree No. 50/1981, which stipulated that chicken farming was a small business, limiting the business scale of broiler and

egg-laying chicken farming. This regulation was deemed to have failed to encourage the growth of the chicken industry in Indonesia, so the government replaced it with Presidential Decree No. 22/1990, which allowed large-scale companies to enter the chicken industry on condition that 65 percent of production exported and companies must partner with small-scale farmers, and introduce new

business models-namely the partnership pattern (Abidin, 2003).

After the financial crisis in 1997 and the declining performance of chicken farming, the 1990 Presidential Decree was repealed with Presidential Decree No. 85/2000, which indicated that the government would not interfere in the structure of the livestock industry but would act as a regulator. The poultry industry in Indonesia has often experienced ups and downs in recent decades. In addition, farmers often face problems with high feed prices, fluctuating egg production, and egg selling prices that experience ups and downs, so farmers' income fluctuates (Maulana *et al.*, 2017). In addition, there is also imposed ban of used antibiotics growth promoters (AGPs) as feed accelerated for animal growth and reduced cost in Indonesia on the poultry both laying hens and broiler chicken began from late 2018 (Adli *et al.*, 2023a, b).

The ups and downs of the poultry industry are also caused by the COVID-19 pandemic, which has been endemic in Indonesia for the last three years. All regions in Indonesia have been affected by COVID-19, both directly and indirectly, including poultry farmers. The existence of COVID-19 also had an impact on the small-scale livestock sector, which caused market demand to decline; the seed supply chain was disrupted, and feed and medicines, production operations, distribution, and marketing which caused unstable commodity prices and a significant price gap, and then in finally farmers are very dependent on partnerships, including feed and other essential factors. Not infrequently, it also causes the price of feed to increase while the price of eggs decreases. Soya bean meal and fishmeal are major staple feed for poultry in Indonesia. A Soya bean meal and fish meal poses severe environmental issues every year through Indonesia (Adli, 2021).

Although some farmers can survive, this is different from small-scale farmers. Small farmers can be threatened with bankruptcy, so they cannot pay installments, guarantees, etc., for the continuity of their livestock business. This condition was the same as livestock in Indonesia in 1981-1990, where many small-scale broiler farmers could not repay their credit. They even went out of business one by one or went bankrupt. Several factors led to the bankruptcy of small-scale chicken farmers, namely inefficient business scale and high fluctuations in input and output prices. Hence, the bankruptcy experienced by small-scale farmers had a significant impact on the welfare of the farmers (Ilham, 2015).

Laying a chicken farming business requires a high investment but has a lucrative market opportunity for some people to private entrepreneurs. The government is aware of this fact, so it intervenes directly through

all lines of industry, from cultivation, downstream and upstream industries, marketing, and producer incentives to cooperative institutions. However, the government had to step down due to the power of the market mechanism, which crushed people's businesses and replaced them with capital-intensive and large-scale businesses. The government is trying to make policies to protect small-scale farmers. Laying hens that are less than five years old and small and medium-scale farms tend to need better management.

Large farmers often dominate the laying hen business. Small farmers can produce fewer eggs and market their products more limited. When viewed from a management perspective, smallholder farmers generally do not take into account labor costs because they do it themselves. In addition, integrated livestock companies have lower costs because feed and day-old chicken (DOC) costs are lower than independent farmers, who have to pay higher feed and DOC prices (Tangendjaja, 2014). Establishing cooperation between farmers and the private sector/livestock companies can benefit farmers by providing seeds, feed, and production facilities. Farmers can share the benefits of markets, capital, technology, and management controlled by large companies (Pelafu *et al.*, 2018). Defining the involvement and relationships of actors according to laying hens' business sector in Blitar Regency becomes the priority of this research.

MATERIALS AND METHODS

EXPERIMENTAL DESIGN

This research was conducted in 22 districts (all districts) in Blitar Regency, East Java Province, Indonesia. The research uses a qualitative approach. The data collection methods include interviews, observation, documentation studies, and Focused Group Discussion (FGD) (Mardawani, 2020). Technical and source triangulation techniques were used in the data collection (Sugiyono, 2017). Informants in this study consisted of large and medium farmers, small farmers, the Animal Husbandry Service of the Blitar Regency, pet shop entrepreneurs, administrators of farmer groups, feed and medicine distributors, and cooperatives. The determination of informants has been carried out purposively or purposively sampling with the criterion that the person has the information needed for this research. Data analysis conducted qualitatively refers to the analysis technique developed by Miles and Huberman (1994).

RESULTS AND DISCUSSION

OVERVIEW OF THE RESEARCH AREA

Blitar Regency is one of the areas in East Java Province geographically, Blitar is located at 111 25' - 112 20' East

Longitude and 7 57-8 9'51 South West. The capital city of East Java Province is Surabaya, approximately 160 km from Blitar Regency. Blitar Regency is listed as one of the strategic areas with a dynamic development. Blitar Regency is directly bordered by three other districts: Malang Regency in the east, Tulungagung Regency and Kediri Regency in the west, and Kediri Regency and Malang Regency in the north. Meanwhile, to the south, it is directly adjacent to the Indonesian Ocean. Blitar Regency has an area of around 158,879 km square, with land used as rice fields, yards, plantations, ponds, ponds, fish ponds, and forests. Blitar Regency is also passed by the Berantas River, which separates Blitar Regency into two parts, namely North Blitar Regency and South Blitar Regency at the same time, distinguishes the potential of the two areas, where North Blitar Regency is lowland, such as paddy fields and has a wet climate, while South Blitar Regency is an area quite critical mountains and dry climates.

The population of Blitar Regency in September 2020, according to the Agriculture Census 2020, was 1,223,745 people, with a male population of 616,511 and a female population of 607,234. Most of the people in Blitar work in the agriculture sector. The biggest agricultural commodity produced by the people of Blitar Regency is rice. The economic structure of the people of Blitar Regency is mostly based on the primary sector, namely the agricultural sector. The primary sector is support for the regional economy of Blitar Regency, reaching 47.90%. The agricultural sector is dominant in the economy of Blitar Regency, namely 54.54%.

Blitar district is a center of population and production of laying hens in Indonesia. Around 7,372 smallholder farmers are in Blitar, and company-scale farmers supply 436 firms. Blitar had 22 million laying hens, and 1,150–1,200 tons of eggs were produced daily. Internal and external factors support the development of layer farming in Blitar Regency. First, there is an abundance of maize available in Blitar and the adjacent areas to meet the need for poultry feed (Agropustaka, 2023). East Java produces the most corn in Indonesia, producing 5.73 million tons (21.5%) of the country's total maize output. Second, the farmers can self-mix their own feed by purchasing factory-mixed concentrates. Every day, the Blitar chicken growers require around 2,420 tons of feed. Third, for 87-91% of farm households, layer farming serves as their primary business or source of income. Farmers in Blitar believe that layer farming is more lucrative than other farming ventures like raising goats, beef cattle, dairy cows, and koi fish. Fourth, farmers have a strong sense of entrepreneurialism. The egg chicken farms in Blitar have resolute business risk management expertise, including production and pricing volatility issues.

LAYING HEN FARMING IN BLITAR REGENCY

The laying hen farming business in Blitar is a business that has been run by the community for generations since the early 1970s and was passed down by parents to the next generation. This form of livestock business varies from household scale (small scale), medium scale, and large scale. The scale of this business depends on the capital owned, the credit collateral that can be guaranteed, and the partner or market network. For small and medium farmers, capital apart from being obtained from their capital is often supplemented by bank credit to increase the scale of the business. If the business progresses, the farmer develops the business by increasing the land area, cage size, and chicken population.

Table 1: Number of laying hen farmers in Blitar per district.

No.	District	Total of farmers
1.	Bakung	132
2.	Wonotirto	30
3.	Panggungrejo	33
4.	Wates	112
5.	Binangun	57
6.	Sutojayan	34
7.	Kademangan	591
8.	Kanigoro	28
9.	Talun	154
10.	Selopuro	160
11.	Kesamben	51
12.	Selorejo	30
13.	Doko	44
14.	Wlingi	24
15.	Gandusari	109
16.	Garum	51
17.	Nglegok	173
18.	Sanankulon	46
19.	Ponggok	796
20.	Srengat	283
21.	Wonodadi	193
22.	Udanawu	135
	Total	3,267

On the other hand, if the business experiences a setback, the farmer will reduce the population to maintain the continuity of his livestock business. The types of chickens cultivated by farmers are dominated by laying hens, which the first generation has run in each family since the beginning. This is different from the number of broiler chicken farms. Table 1 shows the number of laying hen farmers in Blitar Regency. Generally, farmers in Blitar Regency are independent and run their businesses free from contractual agreements with third parties (partnerships). As independent farmers,

they bear all production costs and accept all of the risks and benefits arising from their decisions. Farmers procure day-old chickens (DOCs), feed, medicines, vitamins and disinfectants (MVD), and equipment from suppliers. Eggs are then sold through middlemen.

The laying hen population in Blitar Regency has decreased from 2020 to 2021. The population of kampung chickens in 2020 was 2,925,300 but decreased in 2021 to 2,526,600. The population of laying hens 2020 was 19,060,000, which also decreased in 2021 to 18,818,300. The broiler chicken population 2020 was 3,353,200, decreasing to 1,017,200 in 2021. The free-range chicken population declined in several areas: Talun, Kanigoro, Wonodadi, Udunawu, Nglegok, Garum, Gandusari and Selopuro sub-districts. The laying hen population declined in the Talun, Kanigoro, Srengat, and Kademangan sub-districts. Several areas experiencing an increase in the laying hen population are in the Wonodadi and Nglegok sub-districts. The decline in broiler chicken populations occurred in all sub-district areas.

The population decline was influenced by the COVID-19 pandemic, which limited community activities, resulting in limited egg distribution. The existence of a policy of assistance to the people of Jakarta who are affected by COVID-19, namely by taking eggs from Blitar, has only impacted some laying hen farmers in Blitar. According to [Wakhidati et al. \(2020\)](#), the impact felt by farmers during the COVID-19 pandemic was a decrease in income, a decrease in the selling price of broiler chickens, a decrease in the population of livestock kept, a decrease in consumers, and an increase in production costs. The selling price of livestock products during the COVID-19 pandemic was less reasonable. This is because the demand in the market decreases, so the selling price of production also decreases.

Chicken farms also give rise to business potential and the business of providing DOC, pullets, feed, OVD, and other services such as building cages and providing materials. Upstream companies finally captured this opportunity by opening poultry shops or partnerships with the community. In the end, the existence of poultry shops in Blitar also flourished and continued to grow. Currently, in Blitar Regency, approximately 180 Poultry Shops are spread across all sub-districts. The larger the chicken population, the greater the amount of feed needed. The existence of this poultry shop is a means of supporting the chicken farming business in Blitar Regency.

In 2021, there will be 4,170 chicken farming businesses in Blitar Regency, with a total chicken population of 23,667,897 chickens. The most significant number of chicken farming business actors are in the Ponggok District area, namely 1,021 farmers with a population of

5,837,826 livestock being kept. Meanwhile, the area with the fewest chicken farming business actors is located in the Wlingi District area, namely 31 farmers with a population of 95,100 livestock being kept.

The primary reason for the high number of business actors involved in chicken farming is the growing market for chicken products, particularly meat and eggs, and the quick capital turnover. The availability of production components in adequate amounts is another factor. [Dafitra et al. \(2018\)](#) classified the current business models used by chicken farmers into two categories: Partnership and independent models. The partnership pattern allows farmers and entrepreneurs to work together on managing livestock businesses. In a partnership, entrepreneurs and farmers must have equal positions to achieve the partnership's goals, including calculating production costs, which are fully regulated by the company and mutually agreed upon by the farmers. Meanwhile, the independent livestock system is a livestock business system with capital entirely borne by the farmer. Farmers provide cages, equipment, labor, DOC, feed, and market the egg.

ACTORS IN THE LAYING HEN FARMING BUSINESS IN BLITAR REGENCY

The results of the focus group discussion (FGD) which was conducted at the research location showed that there were 12 actors involved in the laying hen farming business, namely: (1) Small farmers, (2) Medium farmers, (3) Large farmers, (4) Farmer groups, (5) Poultry shop, (6) Animal Husbandry Department, (7) Ministry of Agriculture-Director General of Animal Husbandry, (8) Feed/Medicine Companies, (9) Egg collectors/ middlemen, (10) Local traders, (11) Inter-regional/island traders, and (12) Cooperatives.

SMALL FARMERS

The leading actor in the laying hen farming business is the farmer himself. The number of small-scale laying hen farmers in Blitar has reached 3,953 farmers spread throughout the Blitar Regency area. These small farmer actors are generally family businesses that independently raise laying hens. A small percentage of these farmers can make their feed (self-mixing), and most depend on feed produced by feed companies or purchased at poultry shops. This actor can freely sell his egg production to collectors or to local traders who are his customers. Apart from that, small farmers are often used in demonstration activities to convey egg and feed price aspirations, which could be more profitable for farmers. In carrying out their livestock business, small farmers are interested in ensuring that the prices of eggs, feed, medicines, and DOC are always stable and profitable for them to sustain their business. Even though these small farmers work independently, they

always hope for help and guidance from the government.

MEDIUM FARMERS

Medium farmers are farmers who cultivate between 11,501–234,000 laying hens. The number of farmers in Blitar Regency who fall into the medium breeder category is 212 farmers. They are independent farmers managed by families, so their management system is not too different from small farmers. They also still hope for government assistance for their business's sustainability. Most of these medium farmers make their feed (self-mix).

LARGE FARMERS

Large farmers are farmers who produce more than 234,000 laying hens. The research results show five large farmers in the Blitar district. These farmers have been able to make their feed on an industrial scale and sell it to small and medium farmers. The business scale is large and modern with advanced technology, they have assets and open access to capital, especially from banking institutions. The business sector is not only limited to egg production but also involves poultry shop businesses, feed production businesses, DOC, and pullet production businesses. Large farmers also build partnerships with small and medium farmers in providing feed, DOC, and pullets.

These large breeder actors often become government partners in making policies regarding laying hens. However, research consistently reveals that the consumption of animal-based proteins is too high, resulting in health hazards (cardiovascular diseases, diabetes type II, etc.) and environmental burdens associated with loss of biodiversity and the environmental impact of animal-based proteins in terms of their carbon footprint (Siddiqui *et al.*, 2022).

FARMER GROUPS

Farmers in Blitar Regency generally form groups that work in the food sector as livestock farmer groups. Livestock farmer groups function as (1) providers of livestock business input for their members, (2) information providers, (3) collective marketing, (4) establishing relationships between farmers extension workers and increasing farmers' access to information sources (Suminah *et al.*, 2022). The research results show that the functions expected to run routinely from the existence of the livestock farmer group have yet to be implemented well. The function of livestock farmer groups only runs when there is government or regional government assistance.

POULTRY SHOP

A poultry shop is a business that provides all the needs of chicken farmers, such as feed, medicine, and DOC. Blitar Regency has 180 poultry shops spread across more than 15 sub-districts, including Srengat (19), Nglegok

(17), Kademangan (15), Ponggok (27), Kanigoro (19), and Gandusari (16) sub-districts. Ponggok sub-district has the most poultry shops, namely 27 places because it has the largest population of chickens compared to other sub-districts. Some poultry shops also function to buy eggs from small farmers.

FEED AND MEDICINE COMPANIES

East Java Province has several companies providing feed (feed mills) and medicines. Some feed mills include Japfa Comfeed, Charoen Pokphand, Malindo Feedmil, and Wonokoyo, whose feed distribution extends to Blitar Regency. Feed companies distribute their products to poultry shops or directly to large farmers who have become their customers.

ANIMAL HUSBANDRY DEPARTMENT

The livestock service is a regional government agency tasked with fostering, developing, and supervising livestock businesses in Blitar Regency through counseling, granting permits, and facilitating the interests of farmers in procuring capital, technology, and livestock production facilities. This actor is interested in making the chicken farming business sustainable and providing welfare to farmers. This actor also routinely produces data regarding the development of the laying hen business in his area.

MINISTRY OF AGRICULTURE

The Ministry of Agriculture, in this case, the Directorate General of Animal Husbandry and Animal Health, plays a role in determining the amount of DOC production nationally, making national egg production projections, and making regulations or policies for the development of laying hen farming. The Directorate General of Animal Husbandry and Animal Health ensures the availability of eggs nationally, the ease and sustainability of doing business, data availability on population, production, farmers nationally, and the stability of national production.

EGG COLLECTORS/MIDDLEMEN

Egg collectors or middlemen are traders who buy eggs directly from the breeder's cage. The purchase price of eggs is determined through negotiations with the breeder according to the quantity and quality of the eggs. Egg collectors or middlemen will sell the eggs they get to local traders or big traders who have become their customers.

LOCAL TRADER

Local traders are traders who buy eggs from egg collectors/middlemen. They build partnerships with collectors to guarantee a daily supply of eggs. Prices from local traders become a reference for egg collectors or middlemen when purchasing eggs from farmers. In general, local traders sell their eggs to large traders. Several local traders at the

research location sell their eggs outside the area around Blitar Regency, but no one sells between islands.

TRADERS BETWEEN REGIONS/ISLANDS

Inter-regional/island traders are large traders who accommodate egg production from Blitar Regency to be marketed to Jakarta or other cities on Java, Kalimantan, Jayapura, and other islands. Traders between regions/islands are also carried out by large farmers who market their egg production outside the region.

COOPERATIVE

Cooperatives that operate in the laying hen farming business in Blitar Regency play a role in purchasing eggs, especially from small farmers who are their members. The cooperative sells its egg production to large traders or areas around Blitar Regency.

ACTOR RELATIONS IN THE LAYING HEN FARMING BUSINESS IN BLITAR REGENCY

SMALL FARMER RELATIONS

Small farmers are the main actors in the laying hen farming business in Blitar Regency. Small farmers in the egg production process often contact poultry shops or large farmers to meet their needs for feed, medicine, DOC, and pullets. They are also in contact with the Animal Husbandry Service to obtain counseling or government assistance. Many small farmers deal with egg collectors/middlemen and local traders to market their egg production. Only a few have direct contact with wholesalers in selling their eggs.

MEDIUM FARMER RELATIONS

It is similar to small farmers; medium farmers fulfill their needs for feed and medicine through poultry shops or feed and medicine companies. In general, medium farmers already make their feed (self-mixing). Some of them can provide DOC and pullets independently. They are also in contact with the Animal Husbandry Service to obtain counseling or government assistance. For marketing their eggs, they generally sell to wholesalers.

RELATIONSHIP BETWEEN LARGE FARMERS

Large farmers are connected with all the actors involved in the laying hen breeder business. They contact small farmers to meet feed needs and DOC or pullet needs. They also deal with feed and medicine companies to meet their needs and market them through their own poultry shop. With the regional and central governments (Ministry of Agriculture), we are always in touch regarding volume stabilization. This is because Blitar Regency is the largest egg producer in Indonesia. Regarding marketing, large farmers act as egg wholesalers for local traders, collectors, and cooperatives.

RELATIONS BETWEEN LIVESTOCK FARMER GROUPS

Livestock farmer groups generally only have relations with local governments to obtain assistance and extension guidance. This institution also incidentally provides egg price information to its members based on information obtained from traders. Livestock farmer groups do not carry out marketing of members' eggs.

POULTRY SHOP RELATIONS

Poultry shop as a business providing farmers' needs, especially DOC, feed, and medicine, has relationships with large farmers who are owners of large poultry shops in Blitar Regency. They also have relationships with feed and medicine companies and DOC/pullet companies to get supplies for sale. In general, it is rare to find poultry shops buying eggs from farmers. Its relationship with local governments is only in terms of legality and tax payments.

RELATIONS BETWEEN FEED AND MEDICINE COMPANIES

Feed and medicine companies in the laying hen farming business have many relationships with poultry shops that will sell their products. They also have many relationships with large farmers to provide concentrate for laying hens needed to make feed. Feed and drug companies have nothing to do with egg marketing.

RELATIONS WITH THE ANIMAL HUSBANDRY DEPARTMENT

The Animal Husbandry Department is in contact with the actors involved in cultivating laying hens through coaching, supervision, and assisting in the production process to marketing. This actor is not directly involved in laying hens' production and marketing activities.

RELATIONS OF THE MINISTRY OF AGRICULTURE

As with the livestock service at the district level, the Ministry of Agriculture-Directorate General of Livestock and Animal Health is in contact with the actors involved in the laying hen farming business in coaching and development through issued policies. Apart from that, the Ministry of Agriculture-Directorate General of Animal Husbandry and Animal Health also has many relationships with farmers by providing assistance related to the production process.

RELATIONSHIP BETWEEN EGG COLLECTORS/MIDDLEMEN

Egg collectors/middlemen are mainly related to small farmers who buy their egg production for marketing. Egg collectors/middlemen buy purebred chicken eggs directly from farmers, then store them and distribute them to traders. Collectors do not have relationships with actors in the laying hen production process.

LOCAL TRADER RELATIONS

Local traders have many relationships with egg collectors/middlemen who will collect the proceeds from the collectors' purchases. They also have relationships with other wholesalers or egg traders around Blitar Regency. Local traders do not have relationships with actors in the laying hen production process.

LARGE TRADER RELATIONS (TRADERS BETWEEN REGIONS/ISLANDS)

Wholesalers act as inter-regional/island traders, often in contact with large farmers, local traders, and cooperatives who supply eggs to be traded to other blood. Wholesalers who do not have a livestock business do not have relationships with actors related to the laying hen production process.

COOPERATIVE RELATIONS

The relationships built with cooperatives in the laying hen farming business are related to marketing their members' egg production and providing price information. Cooperative institutions do not have relationships with actors in the laying hen production process.

CONCLUSIONS AND RECOMMENDATIONS

In short, the laying hen population generally decreased from 2020 to 2021 due to the COVID-19 pandemic, so the supply of chicken meat and eggs also decreased. Livestock business actors, tiny ones, are generally family businesses managed using an independent system or a partnership pattern. Actors involved in the laying hen farming business are small farmers, medium farmers, large farmers, farmer groups, poultry shops, Animal Husbandry Department, Ministry of Agriculture-Directorate General of Livestock and Animal Health, feed/medicine companies, egg collectors/middlemen, local traders, inter-regional/island traders, and cooperatives.

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NOVELTY STATEMENT

The novelty of this research is the functions and interests of each actor influence the relationships between these actors. The functions of the actors are related to the production functions played by small, medium, and large farmers, and the product marketing function is played by egg collectors/middlemen, local traders, inter-regional/island traders,

cooperatives, and large farmers. Apart from that, there are also actors whose function is to provide/serve the needs of livestock production facilities, such as poultry shops, feed and medicine companies, and DOC/pullet supply companies. The Blitar Regency Livestock Service regulates and develops farmers at the local level and the Ministry of Agriculture-Director General of Livestock and Animal Health at the national level. The interests of these actors are attached to the functions carried out by these actors.

AUTHOR'S CONTRIBUTION

Makmun and Rahmadanih: Contributed to the acquisition of data and statistical analyses of data, writing original manuscript. Imam Mujahidin Fahmid, Muhammad Saleh S. Ali and Muhammad Yamin Saud: Contributed to supervision, review/ writing original article. All authors contributed to drafting the manuscript, revising the manuscript, and preparing the manuscript for publication.

ETHICAL APPROVAL

Since this research doesn't use animal or human, ethical approval for this study aren't necessary.

CONFLICT OF INTEREST

The authors have declared no conflict of interest.

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