The root of the problems of developing rabbit farming business in Lembang Subdistrict, West Bandung Regency, Indonesia

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Abstract. Rabbit farming in Indonesia has the potential to be developed, especially in rural areas. However, the great potential above does not necessarily improve the welfare of rabbit breeders, especially after the current Covid-19 pandemic. In-depth research is needed on various problems in the development of rabbits, especially those related to socio-economic and policy aspects. This study aims to determine the root cause of the development of rabbit farming in the Lembang Subdistrict, West Bandung Regency, Indonesia. This study employs a descriptive approach, with a case study research. The analysis method utilizes a matrix of Strengths, Weaknesses, Opportunities, and Threats (SWOT) and the Drivers, Pressures, States, Impacts, and Responses (DPSIR) framework. The study results show the importance of collaboration between stakeholders, mainly in the development of breeding centers and efforts to encourage the movement of tourism activities.
Key Words: collaborative management, DPSIR, SWOT matrix.

Introduction. Rabbit farming in Indonesia has the potential to be developed, mainly in rural areas, considering the carrying capacity in the form of the availability of feed derived from forage and agricultural waste. In addition, rabbits have a high reproductive ability with fast growth. Yurmiati (2011) reported that every 100 does with ten bucks may produce 92000 kits of various ages after 24 months. Rabbits have a birth interval of 60 days, with an average of 4 kits.

However, the great potential above does not necessarily improve the welfare of rabbit breeders (Handoyo & Adi 2011). Moreover, during the Covid-19 pandemic, the number of rabbit sales decreased drastically. This is in line with the severe decline in tourist activities, including visits to restaurants in tourist areas, due to the government's implementation of a policy of restricting public mobility to anticipate the transmission of the disease. The condition happened in several regions in Indonesia, including in Lembang Subdistrict, West Bandung Regency (Saepuloh 2021). Because the region is one of the well-known tourist destinations in West Java Province, rabbit marketing relies on sales from pet rabbits to tourists and rabbit meat to be processed, particularly into unique "satay" processed food products, which restaurants in the area offer. Therefore, it is necessary to conduct further research on various problems in the development of rabbits in Lembang Subdistrict, West Bandung Regency, especially from socio-economic and policy perspectives. Furthermore, the results of this study are expected to provide recommendations for the development of rabbit livestock and provide input for breeders in Lembang Subdistrict, West Bandung Regency, to improve their welfare.

Previous studies related to rabbits have discussed many aspects, such as the provision of alternative feeds (Nuriyasa et al 2014; Kaborang 2014; Purwaningsih et al 2017; Marhaeniyanto et al 2017; Sengkey et al 2020) or rabbit reproduction (Eristyadi 2013; Harmusyanto 2013). Then, several studies concern rabbits as experimental animals to obtain alternative medicines (Hamzah et al 2013; Artho et al 2015; Susilo et al 2017). So far, the socio-economic aspects of rabbits has been less studied; for

example, Jefri (2014) discusses the marketing aspects of the rabbit farming business. This study aims to determine the root cause of the development of rabbit farming in the Lembang Subdistrict, West Bandung Regency, Indonesia.

Material and Method

Overview of study location. This study uses a case study in Lembang Subdistrict, Bandung Regency, West Java Province, Indonesia, which was conducted in September 2021. This region is one of the centers of rabbit farming that still exists and is well known, mainly in West Java Province. Geographically, Lembang Subdistrict is located in the easternmost part of West Bandung Regency, located between 6°45'33.0" and 6°51'33.1" south latitude and 107°35'22.5" and 107°43'34.4" east longitude. The area of the Lembang Subdistrict is 95.56 km^2 or 7.32% of the total area of the West Bandung Regency (BPS 2020a). The total population was be 199756 people in 2021 (BPS 2022), spread over 16 villages (BPS 2020b).

The administrative area of Lembang Subdistrict is volcanic because it is located at the foot of Mount Tangkuban Parahu. Most soil types are brown andosol, brown regosol, brown latosol, gray regosol, and litosol. The topography of the Lembang Subdistrict is in the form of slopes (ridges) and plains. The climate in the region is represented by cool air with an average temperature of 20.04°C, an average humidity percentage of 84.63%, with rainfall varying in each village between 1500-2500 mm per year (Ardhitya 2014; Jefri 2018). Based on these biophysical conditions, Lembang Subdistrict has a fertile land, with many rivers, so most of the land has the potential to develop the agricultural sector. This sector has become a potential sector for the economy of Lembang Subdistrict. A total of 37978 people depend on their livelihood in the agricultural sector (BPS 2018).

Land use for agriculture dominates land use in Lembang Subdistrict. The horticultural crop sub-sector, particularly vegetable crops, is the leading agricultural sub-sector in the region. Vegetable production from the region is the mainstay of the contribution of the horticulture sub-sector in West Bandung Regency. In addition, Lembang Subdistrict has several forest areas in the form of protected forests, community forests, grand forest parks, and nature tourism parks. The function of each type of forest area is to increase biodiversity, as a habitat for fauna, as a place for flora collection, as a place for community recreation, and others. Based on the wealth of these resources, Lembang Subdistrict is one of the famous agro-tourism destinations in West Java Province (Ardhitya 2014).

Data collection. The study employs secondary and primary data. Secondary data is obtained by collecting data and information sourced from literature searches, socio-economic data from the Central Statistics Agency, and other related sources. Meanwhile, primary data is utilized to strengthen the research analysis. The data was obtained from interviews with competent sources who understand the problems of developing rabbit farming in West Bandung Regency, especially in the Lembang Subdistrict. The determination of resource persons is based on a sampling method in the form of judgment sampling.

Data analysis method. This study uses a descriptive approach with a case study research. The analysis methods include a matrix of Strengths, Weaknesses, Opportunities, and Threats (SWOT) and the Drivers, Pressures, States, Impacts, and Responses (DPSIR) framework. The SWOT matrix is used to extract descriptions and map the problems regarding rabbit farming in Lembang Subdistrict, Bandung Regency, based on internal strengths and weaknesses and external opportunities and threats. Furthermore, this study analyzes specific problems to unravel the root problems encountered in the development of rabbit farming in the region using the DPSIR framework.

Results and Discussion

Description of rabbit farming business in Lembang Subdistrict, West Bandung Regency. The development of rabbit farming in the subdistrict cannot be separated from the development of the farming business in general in the greater Bandung area. Based on Afif (2012), the history of the development of farming business began in 1963, when rabbit breeders in the greater Bandung area received assistance in the form of superior rabbit material from Japan, the Netherlands, and Germany. The rabbit material was then crossed with local rabbits to obtain the first offspring. Since then, rabbit farming in Lembang Subdistrict has begun to grow and the area became a rabbit farming center.

Initially, the number of rabbit breeders in the Lembang Subdistrict was insignificant, and only a few people operated a rabbit farming business. This is because they just had a hobby and love for rabbits. Until the early 1990s, the people of the subdistrict, particularly the village of Gudangkahuripan, had begun to operate the farming business, considering the easy way of keeping rabbits and generating additional income from the sale of livestock. In addition, the area's strategic location (adjacent to various tourist destinations) makes it easier for the breeder to reach consumers.

Based on the description of the study location, the biophysical conditions in the Lembang Subdistrict are very conducive to developing rabbit farming. However, currently, the availability of forage feed is starting to become challenging, mainly during the dry season, in line with the expansion of residential areas in the region. To maintain the continuity of their business, some breeders search for solutions, one of which is producing artificial feed (in the form of pellets).

Rabbit farming businesses in the subdistrict generally carry out traditional cultivation activities, with a business scale in the form of smallholder farms using extensive and semi-intensive production systems. The government held training for developing these businesses, especially training on the correct technical cultivation of rabbits. However, the breeders are still faced with obstacles; among others, many deaths occur in this livestock due to disease attacks or the scarcity of good sources of biological material. This people's rabbit farms have an open opportunity to be developed into large farms by implementing an intensive production system.

There are several reasons for optimism in the development of rabbit farming in the region; among others, institutionally, breeders already have breeder groups that are legalized by the local government (based on Village Regulations and Regional Regulations). The breeder groups are established based on the similar mission and vision among the breeders. However, in general, the membership of rabbit breeders in these groups is still passive. The reason is that they are discrete when determining prices, so they reach higher profits. This fact causes the price of rabbits to vary and fluctuate.

The rabbit breeder group's role is basically as a forum for communication and coordination for rabbit enthusiasts and farming practitioners. The activities held out by the group are breeding rabbits, producing feed and feed-making machines, and becoming collectors to market broiler rabbits. However, the group has not been able to coordinate rabbit farming activities carried out by each breeder, even though the group already has a transparent legal entity. Hence, the rabbit breeders have not felt the role of the group. One of the consequences is that there is no standardization of the selling price of rabbits.

In general, there are three types of rabbit breeders in this subdistrict: breeders only, collectors and traders, and breeders as well as collectors and traders. The first, breeders are widely available in this region, and some among them are capable of producing rabbits of good quality. This is because they are directly involved in keeping the livestock, supported by adequate knowledge from long experience in carrying out rabbit cultivation. Collectors and traders greatly assist in marketing the breeders. Breeders grow rabbits and then sell them to collectors and traders. Thus, they do not have the power to determine the last selling price.

The second type of breeder is collectors and traders, who do not have a farming place and livestock. They only work to obtain rabbits from smallholder breeders and take care of rabbits after conveying the order. They purchase rabbits from smallholder breeders at low prices and then resell them to consumers at high prices. The weakness of

this type of breeder is that they do not always reach satisfactory quality rabbits because they do not keep them.

The last type includes both the previous types, breeders, collectors and traders. They grow rabbits themselves and then sell them directly to consumers. Consumers obtain rabbits of superior quality, and breeders of this type get reasonable prices from consumers. However, when there is a shortage of rabbits, these breeders also buy rabbits from smallholder breeders directly or through collectors and traders. This type of breeder is spread along the Lembang-Bandung road. The breeders have limited capital, primarily smallholder breeders, considering that they need significant capital to raise rabbits and rent a place to display rabbits for sale.

In addition to the local market, domestic rabbit marketing opportunities reach several areas in Java and outside Java Island. Meanwhile, marketing abroad is aimed at Malaysia, Thailand, Brunei, and Saudi Arabia. The rabbit market tends towards meat products because the demand for rabbit meat from abroad is relatively high. In addition to meat, rabbit farming produces fur and manure needed by the garment industry and horticulture.

One of the challenges faced when marketing rabbits in Indonesia, especially the meat, is the intense competition from other animal meat products, such as beef and chicken. Moreover, the interest of the Indonesian people in consuming rabbit meat is still low, generally caused by food habit factors and psychological effects (considering cute and favorite animals) (Raharjo 2005). Another challenge is the lack of support from the government, especially in the construction of breeding centers, which makes it difficult for breeders to obtain good material. The above description can be summarized in a SWOT matrix (Table 1).

Table 1

SWOT matrix for rabbit farming business development in Lembang Subdistrict, West Bandung Regency, Indonesia

Strengths (S)	*Weaknesses (W)*
1. Biophysical conditions and geographical location support cultivation activities and access to marketing. 2. Rabbit farming has been running for a long time and is carried out from generation to generation. 3. There are groups of rabbit breeders who have legality from the government. 4. The ability of breeders to innovate, especially in producing artificial feed.	1. Rabbit cultivation activities are still traditional (because they are in the form of smallholder farms). 2. The roles and functions of breeder groups have not run optimally. 3. Disease attacks and rabbit deaths, mainly due to the limited number of good rabbit breeds. 4. No selling price standardization exists (prices vary by breeder). 5. Limited capital (especially experienced by smallholder breeders).
Opportunities (O)	*Threats (T)*
1. Demand for rabbit meat is increasing, primarily from abroad. 2. The garment industry and horticulture are believed to need rabbit-based products such as fur and manure.	1. Strict domestic consumption competition from other animal meat products (especially beef and chicken). 2. Lack of government support, especially in the provision of breeding centers.

The root of the problem of developing rabbits in the region. This study discusses the causal relationship of various problems encountered in the development of rabbit farming in Lembang Subdistrict, West Bandung Regency, by focusing on one part of the weaknesses and threats in the SWOT matrix. The discussion of problems through the DPSIR framework is expected to obtain a series of root problems in the development of rabbit farming in the region (Figure 1).

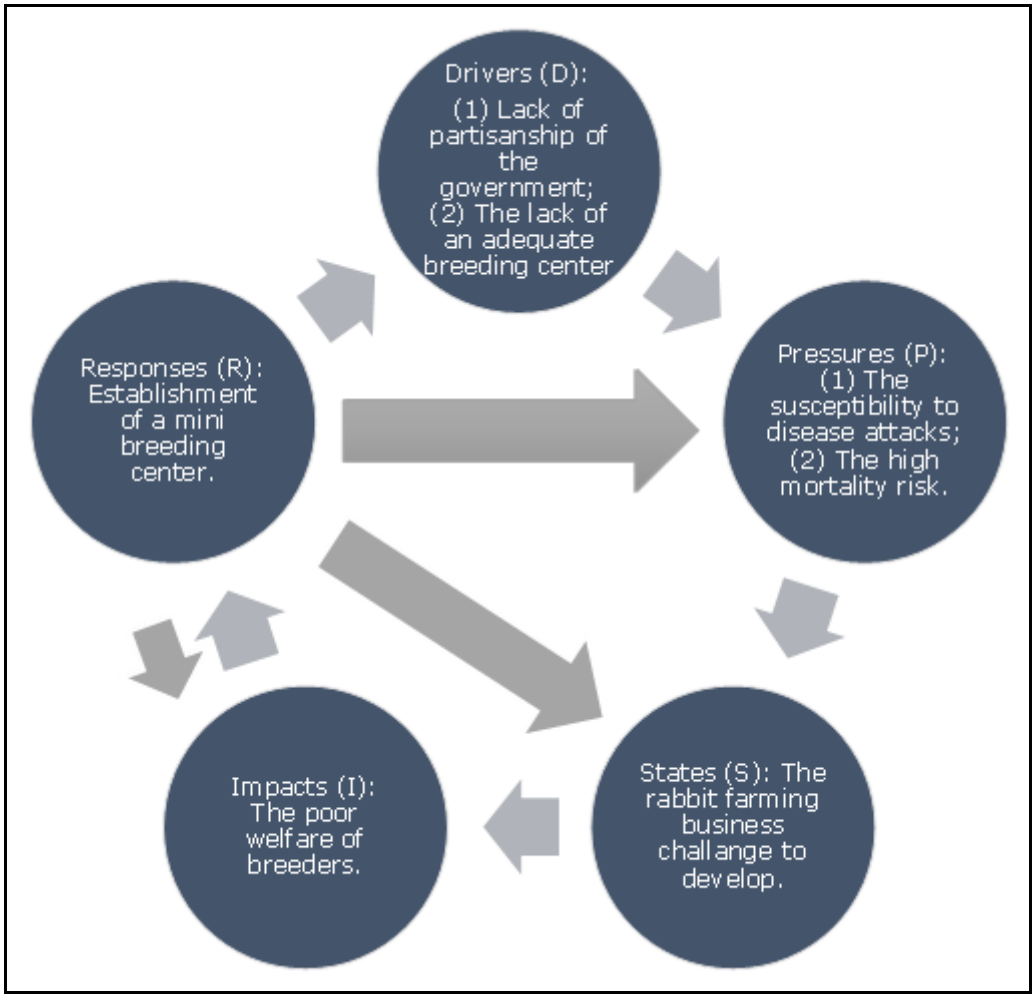

Figure 1. DPSIR framework of the rabbit farming business problems in Lembang Subdistrict, West Bandung Regency, Indonesia.

Drivers. One driving force that threatens the development of rabbit farming in the region is the government's lack of support for developing rabbit husbandry. It is indicated by the fact that a breeding center has not been built, even though it is greatly needed and eagerly awaited by the breeders. This was somewhat expected, because it requires a high cost, and the government budget is limited. The breeding center is very much needed because breeders have difficulty obtaining good broiler rabbits. Therefore, the breeding center is expected to concentrate on producing broiler rabbit breeds. Currently, the local breeders have not focused on breeding rabbits. They breed rabbits without recording, so the race of rabbits being cultivated is unclear. In turn, these breeding activities only produce kits of low quality. Most breeders are still unfamiliar with the quality of broiler rabbits. They only see it from the perspective of its oversized body shape, not from its productivity. For example, the Flemish Giant rabbit does not necessarily produce much meat because the bones are large and mortality rate is high. Broiler rabbits must have high productivity when giving birth to many kits, considering the rapid decline in the reproductive rate of the broodstock. Therefore, it is necessary to replace the broodstock quickly as well. To produce superior broiler broodstock, breeders must pay attention to aspects of productivity, among others, based on the growth rate and the number of kits born and produced by a broodstock. Rabbits with good productivity can affect the selling price, encouraging breeders to earn more profits (Jogja Benih 2013).

Pressures (P). Factors that arise along with the drives are the susceptibility to disease attacks and the high mortality risk. The existence of a breeding center aims to produce

better biological material by controlling rabbit breeding, preventing the occurrence of inbreeding, which can cause susceptibility to disease. So far, without a breeding center, breeders obtain biological material through uncontrolled breeding of rabbits, so that rabbits are prone to disease (Suyitno & Mahmudah 2012). The condition justifies the high mortality rate of rabbits in the Lembang Subdistrict, especially puppies.

States (S). These factors cause the rabbit farming business in Lembang Subdistrict hard to develop. This was exacerbated by the arrival of the Covid-19 pandemic, in line with restrictions on people's mobility. Hereafter, it spread to a decline in tourism activity, and the sales value of the business decreased.

Impacts (I). This condition causes the poor welfare of breeders. Many breeders stopped their farm operations during the pandemic and sold almost all of their livestock. Many breeders have switched professions to become traders in food and others, and even shepherds of sheep and goats.

Responses (R). The breeding center is expected to overcome the problems regarding the limitations of rabbit biological material that are currently faced. Through the Animal Research Center of the Ministry of Agriculture, the central government has responded to the problems, among others, by establishing a mini breeding center. However, the broodstock owned will not be sufficient to meet the high needs of rabbit broodstock from breeders. For this reason, it is necessary to build a breeding center of large capacity involving the private sector. The government can provide incentives to the private sector, to invest in the construction of breeding centers. Universities also need to be involved, especially in applying technology and providing human resources.

Conclusions. Efforts to develop rabbit farming do not only need the role of the government, but also need to involve all stakeholders, including the private sector and universities. The government can encourage the private sector to invest in breeding centers. The private sector can cooperate with universities, especially concerning operational, technical and management aspects of breeding centers, and also provision of human resources. The government must be proactive in encouraging and facilitating the private sector by providing incentives to facilitate investment, both fiscal and non-fiscal. Other technical agencies within the scope of the West Bandung Regency Government must support the main tasks and functions of the Fisheries and Livestock Service Office as the leading sector.

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Conflict of Interest. The authors declare that there is no conflict of interest.

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