Typology of movement patterns of duck farmers moving in Pinrang regency, Indonesia

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Abstract. The characteristics of the process of moving duck breeding carried out by the moving duck farmers in Pinrang regency, one of which can be seen through its movement cycle. The dynamics of movement are based on the time of harvest. This study aims to analyze the typology of the movement patterns to moving ducks in Pinrang regency based on the distance of movement. This study uses a qualitative method with a case study of moving duck farmers in Pinrang regency. The comparative analysis is applied in looking at the cycle of movement patterns based on distance. The results showed that the movement patterns of moving duck farmers can be classified into the movement pattern of short-distance, medium-distance and long-distance where these three patterns have their characteristics based on indicators of distance traveled in one year, number of ducks transported during the movement, number the location occupied for duck grazing, the type used by conveyance, and the form of product as a result of the livelihood obtained.

1. Introduction

The development of the livestock sector can influence an increase in population and poultry production. One of the poultry that plays an important role in supplying the needs of animal protein for the community, both from egg production and from meat production are ducks. The population of ducks in South Sulawesi in 2017 was 5,699,519, the production of duck eggs reached 36,556,715 and meat production reached 2,821,262 (South Sulawesi Animal Husbandry and Animal Health Statistics 2018). More than 24.2% of egg needs are sourced from duck eggs and the contribution of meat production is 2.2% of the total meat needs in South.

In South Sulawesi, there is a livelihood system based on the integration of duck livestock with paddy fields that are not settled in an area but are nomadic. Sustainability of duck-based livestock livelihood systems is supported by the existence of paddy fields. Thus the sustainability of the livelihood system is achieved by finding and utilizing a livelihood capital so that the livelihood system can be formed. Duck farming has been cultivated by many people in several regencies in South Sulawesi Province. One of them is the Community in Pinrang regency [1]. The population, egg production and duck meat production in Pinrang regency can be seen in table 1.
Table 1. The population, egg production and ducks meat production in Pinrang regency from 2013 – 2017.

| Year | Duck population (tail) | Egg production (no) | Meat production (kg) |
|------|------------------------|---------------------|----------------------|
| 2013 | 865,280                | 5,527,095           | 12,324               |
| 2014 | 999,525                | 6,072,714           | 11,682               |
| 2015 | 1,034,498              | 6,285,196           | 512,077              |
| 2016 | 1,070,126              | 6,863,788           | 529,712              |
| 2017 | 1,086,562              | 6,969,209           | 537,848              |

Source: Statistics of animal husbandry and animal health in South Sulawesi [1]

Table 1 shows the population and production of ducks in the form of eggs and meat each year have increased. The population of ducks in 2013-2017, an increase of 25.57% and the production of duck eggs in 2013-2017, an increased of 26.09%. For ducks, meat production experienced a very high increase, namely from 2014 to 2017 which amounted to 526.166 tails. The condition occurs because the duck farmers increase their cattle population not only for egg production but also for ducks meat production [2]. This is supported by the existence of the remaining paddy fields scattered at harvest time, the number of restaurants made from duck and increasing public interest in consuming duck meat.

One of the livelihoods employed by households in the Pinrang regency that contributes to population development and duck production is as a moving duck farmer. This duck farmer runs a livestock business by moving between villages, between sub-districts, between regencies, and between provinces to utilize harvested paddy fields. Duck breeders perform maintenance by moving because it avoids the costs of duck ducks which is quite large. If in their area there is no grazing location, they try to move the ducks to other areas so that the ducks can produce and survive. For them, work as a duck farmer is a source of livelihood that can help the family economy. This work has been passed down from his parents. Every morning until the afternoon the farmers feed their ducks in the fields to get the scattered rice seeds and the biota in the paddy fields as a source of feed. Even though food is abundant, if there is no water, ducks cannot survive. Characteristics of paddy ecosystems, namely land that is inundated for relatively long periods so that it can maintain the paddy community and ecotype from generation to generation [3].

The location of the paddy fields to be addressed must have a source of water from irrigation, pumping water or other water sources. This is a condition of the lives of ducks that are herded in the fields. Harvested paddy fields with watery soil conditions contain a variety of natural foods such as scattered paddy, worms, snails and weeds which interfere with rice cultivation, which is a natural source of feed for ducks. Duck grazing in paddy fields can increase soil fertility and help eradicate pests that disturb paddy plants [4-9]. The presence of ducks in paddy fields causes an increase in grain yield, reduces the use of agricultural pesticides and protects the environment [5-8]. System of integration of wetland paddy plants and ducks interact with each other and support the growth of each other [3-9]. The purpose of this study is to explain the typology of livestock patterns of duck farmers in Pinrang regency.

2. Material and methods
This research was carried out in the Pinrang District which was the starting point for the movement of the moving duck farmers. The study was conducted in March - September 2017. This study uses a qualitative approach with a case study research design on the pattern of shifting duck farmers in Pinrang regency. As for the case variation, the transfer pattern which is based on the distance traveled by the duck breeders includes: short-distance movement pattern, medium-distance movement pattern and long-distance movement pattern
The location of this study began in Pinrang district, which is the starting point for the movement of duck breeding in the Pinrang regency and then continued in the location according to the movement of duck breeding from Pinrang regency. Here the researcher chooses locations based on three movement patterns based on distance. The patterns of duck breeding are: (1) short-distance movement, namely the moving within Pinrang regency, occupying two rice fields, (2) medium-distance movement, namely movement from Pinrang regency to the nearest neighboring area, Sidrap regency, part of Polman regency and Pare-pare regency, (3) long-distance movement, namely moving from Pinrang regency to Soppeng, Bone, Wajo, Barru, Pangkep, Maros, Gowa, Mamuju, Luwu, North Luwu and East Luwu regency. In the research to be conducted, researchers explore these three patterns.

Research data collection is done through interviews, observation, and documentation. The data collected will be analyzed descriptively qualitatively. Data collection is outlined in the field notes and documentation, then performs data processing by sorting the field notes based on the research theme, namely the pattern of duck breeding based on the distance of movement. Furthermore, sorting the data back and classifying data based on the pattern of displacements, namely short distances, medium distances, and long distances. After that, a comparative analysis of the transfer characteristics of the three displacement patterns. Further analysis, the process of clarifying the data with the informant by returning to or calling back informants about the truth of the paper presented. After that, the data is presented and a conclusion drawn.

3. Results and discussion
The variation of the movements based on the distance traveled by the moving duck farmers is first, the movement within the Pinrang District alone occupies two paddy fields around two months. This movement is carried out from one village to another or from village to another village or from sub-district to other sub-districts. Duck rearing is carried out starting from DOD (day old duck) to two and a half to three months old ducks with a minimum business scale of 1,000, and transportation costs around IDR 150,000 - IDR 200,000 for one car. The short distance is about 2 km and the furthest is about 20 km. They start raising ducks as they enter the harvest time in their area. The result of this movement is the enlargement of ducks. This is called the short-distance movement.

Secondly, the move from Pinrang regency to the nearest neighboring area, namely Sidrap Regency for more than two months and returning to Pinrang occupies two to three locations for four months. There also moved from Pinrang to Polewali for two months and moved to Sidrap for one month and returned to Pinrang for three months. The short distance is about 30 km and the furthest is about 75 km. Transportation costs around IDR 400,000 to IDR 600,000 for one car. The maximum number of duck ownership is 700 and the products produced are ducks and eggs. This is called the medium-distance movement.

Third, the transfer was carried out from Pinrang regency to move to Luwu or East Luwu or North Luwu Regencies for the next two months, stopping into Wajo or Soppeng or Bone for one month, then moving to Sidrap for one month and returning to Pinrang and occupying two locations for two months. The move also occurred from Pinrang, moved to Gowa for two months, then stopped in Maros for about one month and moved to Polman for about one month and then returned to Pinrang and occupied one location for two months. There was also a move from Pinrang to Wajo one month then moved to Sidrap one month and returned to Pinrang and occupied two to three locations for three months. The closest distance is about 80 km and the furthest is about 400 km. Transportation costs Rp. 750,000 to Rp. 1,500,000 for one car. The minimum number of duck ownership is 900-2,000. The product produced is ducks and eggs. This is called the long-distance movement.

As for the comparative picture of the characteristics of the patterns of movement of ducks farmers based on the distance moved, namely short-distance movement, medium-distance movement, and long-distance movement in several aspects [9] can be seen in table 2.
Table 2. Comparison of the characteristics of duck breeding patterns in short-distance, medium-distance, and long-distance movements

| Aspect                                      | Short-Distance Movement Patterns | Medium-Distance Movement Patterns | Long-Distance Movement Patterns |
|---------------------------------------------|----------------------------------|----------------------------------|--------------------------------|
| Number of rice fields locations which is occupied | 4 location                       | 9 location                       | 10 location                    |
| Displacement Distance                       | 1-20 kilometers                  | 30-75 kilometers                 | 80–400 kilometers              |
| Number of ducks transported                 | 1,000-1,500 ducks aged three weeks to two months | 500-650 laying ducks and 500-700 ducklings aged three weeks to two months | 800-900 laying ducks and 1.5 months old ducks 900 tails or 1,300 ducks |
| Type of conveyance                          | Pick-up Car                      | Pick-up Car and Truck Car        | Truck Car                      |
| Types of products                          | Enlargement of ducks age DOD to 3 months | Duck eggs and three-month-old ducks | Duck eggs and ducks are three to four months old |
| The position of duck farming in the household | Work as a duck farmer is carried out together with work as a rice farmer | There are duck breeders while working on the rice fields and there are completely duck breeders | The work as a duck farmer is carried out completely without any other work |

In Table 2, it can be seen that in the case of short-distance movement, duck farmers only moving to Pinrang regency. They make the move from village to village or from sub-district to sub-district. He occupies two paddy fields during one growing season so that in one year he occupies four paddy fields. In one paddy field location, duck farmers move on average to occupy it for one to one and a half months. When moving in their village, on average they occupy more than one location of paddy fields. In the case of medium-distance moving, the moving duck farmers to occupy a maximum of nine paddy fields in one year. The average duck farmer occupies four paddy fields in one growing season. The additional location occupied is only an alternative location, if the permanent location is not yet open. This alternative location is only occupied for a maximum of 10 days. In the case of long-distance movement, ducks shifted to occupy five paddy fields during one growing season so that in one year they occupy ten paddy fields. The average duck farmer occupies four paddy fields in one growing season. The additional location occupied is only an alternative location if the permanent location is not yet open. This alternative location is only occupied for a maximum of 10 days. In the case of long-distance movement, ducks shifted to occupy five paddy fields during one growing season so that in one year they occupy ten paddy fields. This shifting duck farmer moves from Pinrang which occupies two paddy fields then moves to Luwu occupying one to two paddy locations and then moved to Sidrap occupying one paddy field location. In the following planting season, duck farmers moved from Pinrang to occupy two paddy fields to North Luwu regency, which occupied two rice paddy locations and then moved to Soppeng District for almost two months. They did not move to Wajo Regency because of the flood.

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The distance of movement taken by duck farmers to move on three patterns of movement. In the pattern of short-distance movement, the distance traveled is the short-distance to reach 1 kilometer and the farthest distance around 20 km. These moving duck farmers do not move long distances because they also want to work in the paddy fields. In the medium-distance, the moving duck farmers to the short distance, which is around 30 km, which is in Baranti, Sidrap regency and the furthest about 75 km in the Tanrutedong area. In the long-distance movement, the short-distance traveled is 80 km, namely Soppeng regency and Wajo regency and the farthest distance is around 400 km in North Luwu regency.

Regarding the number of ducks transported, in the case of short-distance movement, the number of ducks transported 1000-1500 ducks. When they transport their ducks, if the ducks are moved for three weeks, they will immediately transport them, because the distance is not far. In the case of medium-distance movement, the number of ducks transported when leaving the area moves to Sidrap regency, namely to Baranti or to Tanrutedong, on average 500-600 ducks. The ducks that are transported are laying ducks. These ducks farmers limit the number of ducks because the location of the paddy fields occupied by the transfer capacity is limited because if there is too much in number then there is a possibility of ducks not laying eggs. Duck farmers will increase ducklings aged three weeks to one month if they have moved to Pinrang regency, but still, see the capacity of paddy fields. In the case of long-distance movements, if the ducks are to be moved to Luwu Regency, the population of ducks is an average of 900 laying ducks because it is adjusted to the capacity of available paddy fields. These duck breeders add ducks in the form of ducklings over one-month-old if they have moved to Wajo regency or Sidrap regency or Soppeng regency. This condition is carried out while still observing the availability of paddy fields occupied movements.

Regarding the type of car used to transport ducks, on short distance transfers, on average using a pick-up car because, in addition to the close distance, the cost is also cheap. As for medium distance transfer, the average use of a pick-up car is because the number of cattle transported is in accordance with the capacity of a pick-up car that is loaded with a maximum of 600 ducks for a three-level frame model pick-up car and a maximum of 800 ducks for a pick-up car up the four-level frame model. For long-distance movements, the type of car used to transport duck cattle is on average using a truck because it is adjusted to the number of ducks that are being transported, a maximum of 900 ducks for third level frame model trucks and 1200 ducks for level four-frame model trucks. For long-distance transportation is more dominated by large and medium-sized truck transport vehicles and on short distances and not much scale, using small transport vehicles [10].

Regarding the type of duck product produced, in short distance shifts, duck breeders maintain ducks to produce ducks of 2.5 months to three months, after which they are sold. They do not raise ducks until they lay eggs, because they also have to work the fields. At moderate distances, duck breeders maintain ducks to produce eggs and partly to produce ducks. When moving to Sidrap regency, they only raised ducks to produce eggs, but when they moved back to Pinrang District, the ducks breeders also maintained DOD until three weeks old at home and then herded them in the fields for up to 2.5 months or three months, after that sell it. If the laying ducks that are kept are two years old, then they keep some of the three-month-old female ducks to replace the ducks. On average, they sell their ducks that have laid their eggs after four cycles of paddy harvest are occupied by herding ducks. These duck farmers have a time strategy to sell their duck eggs that have laid eggs and when to store their female ducks that are kept from the DOD age. Furthermore, in long-distance movements, duck farmers keep ducks in addition to producing duck eggs as well as duck cattle. When moving to North Luwu regency, these ducks only brought ducks to lay eggs, because their main purpose was to produce eggs. The price of duck eggs when they move there is high because only a few regions harvest. When moving to Sidrap or Wajo or Sopeng, the duck breeders also raise three months or two
months old ducks and continue to herding when they return to their villages. When it is worth selling, they sell it. Usually, the ones that are sold first are three-month-old males, while the females are aged three to four months and some are also stored as a substitute for ducks whose egg production has decreased or some ducks have died or disappeared.

For the position of duck husbandry in the household, in the short distance movement, the duck farmer in addition to maintaining ducks for three months, namely three weeks at home and more than two months pasture in the rice fields, then at other times during one planting season, the duck farmers work on the fields. The main occupation they are farmers. In the medium-distance movement, most of the breeders are the main occupation of duck breeders, but there are some breeders as farmers. Therefore, if they are going to work on the rice fields, then the duck farmer entrusts the ducks to their members or guarantees them at home if there are no dwellers left. For long-distance movement, the main work is as a duck farmer. Every harvest season, duck farmers move to bring their ducks to be shepherded at the location of rice fields that are already in their control. Although some of the farmers have rice fields, the inheritance of their parents, they still ask people to work on the production sharing system.

The pattern of movement of duck farmers can be classified into the movement pattern of short-distance, medium-distance and long-distance where these three patterns have their characteristics based on indicators of distance traveled in one year, number of ducks transported during the movement, number of locations occupied for duck grazing, the type of conveyance used, and the form of the product as a result of farming a living.

4. Conclusion

The pattern of movement of duck farmers can be classified into the movement pattern of short-distance, medium-distance and long-distance where these three patterns have their characteristics based on indicators of distance traveled in one year, number of ducks transported during the movement, number of locations occupied for duck grazing, the type of conveyance used, and the form of the product as a result of earning a living.

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