

# CHAPTER 1

## Introduction

### 1.1 Historical Background

Indonesia is the fourth populous nation in the world with a growing population and Gross domestic product (GDP), which makes the demand for animal protein challenging. Indonesia has 13,466 islands, five of which are major islands. Poultry meat is an important source of protein, mostly derived from broilers but also coming from native chickens (10%), layers (3%) and ducks (1%) (Tangendjaja., 2013). Unlike poultry, beef consumption is quite low as it is three times more expensive than poultry meat, however, cattle have an essential place in Indonesian food and is quite popular. Cattle and poultry play an important role for the small holder livelihood, in terms of income and employment. The poultry industry in Indonesia has several sectors like poultry breeding, commercial layer, commercial broiler and backyard poultry. The poultry industry is spread all over Indonesia, with broiler production concentrated in West Java Province, commercial layer sector in East Java and native chickens all across Indonesia (DGLAHS., 2015).

The majority of the cattle production is extensive or semi-intensive on small holder farms with 2 to 3 cattle. Cattle raised through intensive systems are found in feedlots of mostly imported cattle and fewer numbers of local cattle. These feedlots are operating in Lampung and West Java using imported beef cattle from Australia (Cottle and Khan., 2014). The economic growth and urbanization has increased demand for beef and chicken, which provided opportunities for traders to expand trading activities, bringing with it and increased risk of introduction and transmission of infectious diseases (Ortiz-Pelaez., 2006).

Social network analysis is an approach to analyze livestock movements. This method has been popular in veterinary epidemiology and several studies have been published (Martinez-Lopez et al., 2009; Lockhart et al., 2010; Mweu et al., 2013; Aznar et al., 2011; VanderWaal et al., 2015), though few in Indonesia. Social network is a term emerging from the social sciences that generically refers to a group of elements and the nature and extent of the connections, relationships, or interactions between and among them. The main goal of the social network is detecting and interpreting individuals within a group (Martinez-Lopez et al., 2009). A network is a collection of units of interest that may or may not be connected, the units of interest are normally called nodes or vertices in physics or mathematics nodes, which could be as an individual (persons, animal, protein, genes) or as a collective (group of individuals such as farm, market, regions). The node may have attributes, such as type of species, geographical locations and size in terms of number of animals (Dube et al., 2011). In this study, we collected data by a diary based study and obtained a static network in each month within a 12 months period.

## 1.2 Objectives

The aim of this study was to determine poultry and cattle movement patterns in three provinces using a social network analysis.

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