1. Introduction

1.1 Background

The agricultural sector and rural areas play important roles in the economy of Indonesia. Based on the data taken from the 2000 Year Population Census, approximately 58 percent of the Indonesians are rural inhabitants. Besides contributing to food supplies for the overall economy, the rural areas provide significant contribution to exports and thereby foreign exchange earnings. Nevertheless, the rural areas are less advanced than urban areas in terms of physical infrastructures as well as socio-economic welfare. Consequently, roughly 80 percent of the poor in the country are found in rural areas (SURYAHADI et al., 2006). INDONESIA'S CENTRAL BOARD OF STATISTICS (2001) reported that the poor population in Indonesia was approximately 37.1 million, with 28.6 million living in rural areas.

For this reason, poverty reduction in rural areas is of great priority in many developing countries (PALOMO et al., 2000), including Indonesia. One way to reduce poverty is to increase market access for rural households. Better market access can lead to the reduction of input prices and the increase of output prices at the farmgate level; thus positively influencing productivity (HAU and VON OPPEN, 2002) and increasing household incomes.

The concepts of market access are multi-dimensional and dynamic (PENDER et al., 2001), including access to transportation facilities, distance to roads, condition of roads, distance (or travel time) to populated places, as well as the structure of the market (i.e. the number of traders), as MINTEN (1999), FAFCHAMPS and MINTEN (1998), and REIS and DIANA (2004) exemplify. Households in rural areas often face barriers to market access. It takes much time for them to get access to reliable markets, which are located sometimes far away from their homes. Few households, who have assets (e.g. vehicles), are directly able to reach certain markets (MAKHURA, 2001). The accessibility of the market and market participation embrace potential possibilities for a sustainable improvement of incomes for rural people. Due to the importance of agricultural development in accelerating rural development, the rural markets, a medium of physical and marketing infrastructure, should be improved in the agricultural sector.

1.2 Problem Statement

The vicinity of the "Lore Lindu National Park" (LLNP) is classified as one of the poorest regions in Indonesia. In 1997, mean income was 597,300 IDR, which was more than 50 percent below the poverty line of 1,165,750 IDR per household. Based on the same figure, 97 percent of the villages were classified as below the poverty line (ANZDEC, 1997).

The new phenomenon in this study area is also characterized by an increase in population by 60 percent over the last twenty years, of which 21 percent is due to immigration. In some of the districts, even, population has doubled in the last twenty years. These people have been attracted by the income opportunities in the cultivation of coffee and cocoa cultivations. The areas planted with cocoa have often been located inside the LLNP, and the cocoa area has increased from almost zero to 18,000 hectares during the past two decades. Unfortunately, such areas have been a major source of deforestation (MAERTENS, 2003). Ninety-six percent of households in the vicinity of the LLNP earn a living from crop production, and crop production accounts for 44 % of the total household's income (SCHWARZE, 2004).

The region surrounding the Lore Lindu National Park is also characterized by inadequate access to credit, to markets for agricultural input and outputs as well as to technology (SFB, 2003, p.193). The low level of rural infrastructure leads to higher input prices and lower output prices at a farmgate level as well as higher transport and transaction costs for farmers procuring seeds and fertilizers. Only two asphalt roads connect the villages in the districts to the provincial capital. MAERTENS et al. (2002) shows with the samples of 80 villages that one fourth of the sample villages mainly in the district of Kulawi and Lore Selatan cannot be reached by car. It takes up to three days for some villagers on foot or by horse to reach the nearest asphalt roads.

1.3 Objectives of the Study

This study is aimed at describing changes in land use during the period of 2001 to 2004 with specific emphasis on market access (agricultural input and output markets). It is part of project A4 "Economic analysis of land use system of rural households" in the scope of the Collaborative Research Centre Stability of Rainforest Margin Areas in Indonesia (SFB 552 - STORMA).

The analysis of the influence of market access on land use by rural households is conducted through a descriptive analysis and causal analysis. The descriptive analysis addresses the ownership of land and the characteristics of the land use. Moreover, it describes the changes in the land ownership and land use between 2001 and 2004. The causal analysis attempts to answer the question of what factors influence the land use with special emphasis on market access. The analysis of land use is focused on the three major crops in the research area: wetland rice, cocoa and coffee. Thus, the objectives of the study are to:

- explore the relationship between households' access to market and land use as well as to describe the changes in land use between 2001 and 2004 with respect to market access,
- analyze the influence of market access on land use between 2001 and 2004 focusing on the three main crops: rice, coffee and cocoa, and to
- provide recommendations to support policy reforms and implementation of rural development programs.

1.4 Organisation of the Study

This study is organized in seven chapters. After the introduction in the first chapter, the second chapter highlights the theoretical framework and empirical literature on the basis of different theoretical concepts that are useful to analyse the influence of market access on land use. The second chapter also reviews the empirical evidence of the influence of market accessibility on land use. This chapter ends with the conceptual framework, which is described for further analysis, and the hypothesis of study is provided.

The third chapter discusses the research methodology and the approach used in the analysis throughout this work. It presents the sampling frame and describes the selection of households. The third chapter ends with the presentation of the methodology employed in the causal analysis. It shows the different econometric models which are applied to analyze the influence of market access on land use as well as the influence of market access on households using agricultural input.

Chapter four provides an overview on the environmental and social conditions of Indonesia particularly in Central Sulawesi and the research area around the Lore Lindu National Park. It focuses on site, geophysical and climatic conditions and the economic structure and land use conditions.

Chapter five provides a detailed result of descriptive analysis of relationship between market access and land use in the study area. This section specifically seeks to explore the relationship between households' access to market and land use as well as to describe the changes in land use between 2001 and 2004 with respect to the market access.

Chapter six presents the result of the econometric model used in this dissertation. The model is designed to present the influences of market access on land use patterns and to investigate the influence of market access on fertilizer use. The second part of this chapter presents the descriptive statistics of variables. The third part presents the results of the econometric model analyzing the crop choices made by households. Then, the fourth part presents the results of the econometric model analyzing the use of fertilizer.

Finally, the conclusions are presented and recommendations are drawn in chapter seven.

2. Literature Review and Theoretical Framework

2.1 Introduction

This chapter develops the theoretical framework and empirical literature based on the different theoretical concepts that are useful to analyse the influence of market access on land use. This chapter consists of five sections. First, the concept of market access will be explored, and the definitions of accessibility of markets are discussed. Then, the concept of land use is explained. The fourth section presents the definition of the (farm) household. The fifth section reviews the empirical evidence regarding the influence of market accessibility on land use. This chapter ends with the conceptual framework, which is described for further analysis and the hypotheses of study are provided.

2.2 Concept of Accessibility of Market

2.2.1 Transaction Cost Economics

Formerly, transaction cost economics was acknowledged in the economic literature by COASE (1937) in his seminar paper 'The Nature of the Firm', which explained that the decision whether to have a transaction within a firm or in the market place will be determined by transaction costs. WILLIAMSON (1979, 1985, and 1993) views transaction costs as costs associated with reaching and enforcing agreements.

Moreover, he emphasized that transaction costs are seen as a trade-off between the costs of coordination within an organization and the costs of transacting and forming contracts in the market. Transaction costs also refer to those for measuring the valuable attributes of the commodity exchanged and the costs of providing and ensuring the desired attributes (NORTH, 1990).

Nevertheless, transaction costs are difficult to define precisely. Economic literature provides various definitions of transaction costs. FURUBOTH and RICHTER (as quoted by BENHAM and BENHAM, 2000) distinguish two examples of transaction costs: the cost of using the market (market transaction cost) and that of exercising the right to give orders within the firm (managerial transaction costs). Moreover, RANDALL (1972) describes that transaction costs include costs of obtaining information, establishing the bargaining positions, bargaining and arriving at a number of decisions and enforcing the decisions made. On the contrary, on the basis of Coase's work in HOBBS (1997), transaction costs are classified into the costs for information gathering, negotiation and monitoring and the enforcement of contracts.

Addressing the types of activities, EGGERTSON (1990) identifies five types of activities in which transaction costs are incurred. Among them are:

- searching for information about potential for contracting parties and the price and quality of the resources in which they have property rights (i.e. personal time, travel expenses and communication costs),
- bargaining needed to find the true position of contracting parties, especially when prices (e.g. wages, interest rate, etc) are not determined exogenously,
- initiating formal or informal contracts, that is, defining the obligations of the contracting parties,
- monitoring contractual partners to see whether they abide by terms of the contract, and
- enforcing the contract and collecting damages when the partners fail to observe their contractual obligations.

The issue of transaction costs has always been figured importantly in agricultural markets and in marketing agricultural production. In the context of marketing agricultural production, JAFFEE and MORTON (as quoted in MAKHURA, 2001) provide two dimensions of transaction costs, namely:

- screening cost, referring to the uncertainty about the reliability of potential suppliers or buyers and the uncertainty about the actual quality of the goods, and

- transfer cost, concerned with the legal, extra legal or physical constraints on the movement and transfer of goods. This dimension commonly includes handling storage costs, transport costs and so forth.

In agricultural marketing, traders and agro-processors deal with a large number of small farms and face different types of transaction costs (HAYES (2000), PINGALI (2005), and MAKHURA (2001)):

- the bureaucratic costs associated with managing and coordinating integrated production, processing and marketing,
- the opportunity costs of time used to communicate with farmers and coordinate them,
- the costs involved in establishing and monitoring long-term contracts,
- the screening costs linked to uncertainties about the reliability of potential suppliers or buyers and the uncertainty about the actual quality of the goods and
- the transfer costs associated with the legal or physical constraints on the movement and transfer of goods. They also include handling and storage costs, transport costs and so forth.

Some costs are also related to physical details of the transaction, such as transport, marketing, packaging or handling. This is conceptually similar to Haddad and Zeller's idea (1997) that transaction costs are associated with the administrative cost of screening, delivery and the monitoring of implementation program. This view of cost is relevant to this study, as pointed by ZEIBET and DUNN (1998). They emphasize that transaction costs include high transport costs due to the distance of the farm from