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Functioning of farm-grown timber value chains: Lessons from the smallholder-produced teak (*Tectona grandis* L.f.) poles value chain in Southern Benin

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ABSTRACT

The study examined the functioning of the smallholder-produced teak poles value chain in Southern Benin from an analytical perspective combining the governance structure, the institutional environment, and the distribution of consumer price among chain actors. The objective was to identify bottlenecks militating against improved functioning of the farm-grown timber value chains. A fieldwork was carried from August 2008 to September 2010, to identify the agents and the organisations involved in the value chain. Data were collected on the functions performed, the costs borne and the income received by each category of agent, the marketing channels within the value chain, the interactions among agents, the consumption of the product, and the role of the organisations connected to the value chain. This was done by combining semi-structured interviews, focus group meetings, and structured interviews. In addition, data were collected on the institutional environment from both primary and secondary sources. The following agents were involved in the value chain: nurserymen, planters, local intermediaries, brokers, traders, and consumers. The forest service was the main governmental organisation involved in the functioning of the value chain. The governance structure in the value chain was driven by a mixture of government and the market. Various weaknesses were found in the forest policy, the forest regulation and their implementation. Planters' share of consumer price was lower than traders' return. The relevant policy options to address these issues were discussed.

1. Introduction

Market-oriented agriculture has become a major development strategy in most developing countries (Dorward et al., 2004; Jama and Pizarro, 2008). Despite the liberalisation in recent decades, the efficiency of markets in developing countries is still hampered by coordination failures, high transaction costs (Dorward et al., 2005; Poulton et al., 2006), imperfect and asymmetric information, lack of market institutions, and uncertainty concerning government policy (Coulter and Onumah, 2002).

In recent decades, smallholder forestry – i.e. the multipurpose management of small woodlots by smallholder farmers in developing countries (Harrison et al., 2002) – has been gaining more and more importance. Hundreds of millions of smallholder farmers are engaged in tree planting for various purposes (Ramadhani et al., 2002; Russell and Franzel, 2004; Scherr, 2004). Considering the alarming deforestation rate in most developing countries (FAO, 2011), and the growing demand for forest products (Scherr, 2004), smallholder forestry is expected to play a critical role in the forestry sector. Smallholder forestry is socially desirable, to provide forest products as well as environmental service. This activity is often viewed as a potential contributor to the improvement of the livelihoods of smallholder farmers (Anyonge and Roshetko, 2003; Russell and Franzel, 2004; Scherr, 2004). The management of small woodlots can generate substantial income to complement agricultural revenue. However, efficient markets are to play a critical role to capture this potential. It is known that the potential for smallholder farmers to draw income from their produce depends widely on the efficiency in marketing (Barrett, 2008; Dorward et al., 2004; Markelova et al., 2009). Unfortunately, various problems constrain both traders and smallholder farmers, regarding the marketing of farm-grown timber around the world. These include the lack of market information, high transaction costs, difficulties for traders to get timber supplies (Anyonge and Roshetko, 2003; Nawir et al., 2007), and the low return to smallholder farmers (Maldonado and Louppe, 1999; Nawir et al., 2007).

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The above remarks justify efforts to understand the functioning of smallholder-produced timber markets, so as to identify areas where interventions can improve the functioning of the industry as a whole. The rationale for targeting the overall functioning is that efforts to upgrade the performance of individual firms in a region may have limited impact if they are "embedded in a sea inefficiency" (Kaplinsky and Morris, 2002). Accordingly, the value chain framework has emerged as a relevant tool to analyse industries. "The value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use" (Kaplinsky and Morris, 2002). Although the value chain analysis is mainly viewed as an analytical tool for understanding the way firms and countries participate in the global economy – i.e. global value chains – "it is also useful as an analytical tool in understanding the policy environment which provides for the efficient allocation of resources within the domestic economy" (Kaplinsky and Morris, 2002). The focus of the current study is about the latter aspect of value chain analysis, i.e. the analysis of domestic value chains.

The objective of this study was to identify bottlenecks militating against improved functioning of the farm-grown timber value chains. We examined the case of the smallholder-produced teak poles value chain in Southern Benin which provides a case study to assess the functioning of farm-grown timber value chains. Teak planting by smallholder farmers has developed widely in Southern Benin. Pole – meaning here, timber with diameter ranging from 5 to 15 cm (Aoudji et al., 2011) – was farmers' main production objective.

Value chains are usually described through four core elements, namely an input–output structure or the value-added sequence from production to consumption; a territorial structure i.e. the geographical concentration and/or dispersion of the activities; a governance structure that refers to the power relations that determine how financial, material and human resources are allocated within the chain; and an institutional framework that identifies how local, national, and international contexts influence activities within chains (Gereffi, 1994). However, there is no single way to carry out a value chain analysis (Kaplinsky and Morris, 2002), so that the aspects dealt with in a given study widely depend on the researcher's purposes. In the current study, we mapped the value chain and then we focused mainly on the governance structure and the institutional environment. A good value chain governance ensures that interactions between firms along the value chain are efficient (Gereffi et al., 2005). There are five types of governance, from low coordination level to high coordination level: market, modular, relational, captive, and hierarchy (Gereffi et al., 2005). With regard to the importance of the institutional framework, it is known that economic performance is influenced by the institutional environment (Beck and Laeven, 2006; Davis, 2008; Nelson and Sampat, 2001). Lastly, we dealt with the input–output structure, but this aspect was treated at the surface level, based on the decomposition of consumer price among value chain actors.

The main questions that were intended to be addressed in this article are as follows: What are the potential for win–win relationships and better coordination within the value chain? What policy changes are needed to back smallholder-produced timber value chains? Although the setting of this study is Southern Benin, the above questions are relevant to enlighten policy makers in most developing countries, considering similarities such as the prevailing deforestation, the development of tree plantation on-farm, and market inefficiencies. The remainder of this article is organised as follows. The next section deals with the research methodology. The results and the discussion are presented in Sections 3 and 4, respectively. In the last section, we summarise the main findings with the related policy recommendations.

2. Methods

2.1. Data collection

A field work was conducted in Southern Benin (Fig. 1), from August 2008 to September 2010. The research approach used was built on existing guidelines for value chain analysis (Kaplinsky and Morris, 2002; Lebailly et al., 2000; Tallec and Bockel, 2005a). Data collection was organised in two stages. The first stage consisted in identifying products flows and the operations performed from production to consumption, identifying all the agents connected to the value chain, and getting an overview of their respective functions. For this purpose, teak planters were chosen as the starting point. The value chain was then followed until we reached the end-consumers. A given category of agent was identified by relying on information provided by his trade partners. During this stage, respondents were selected based on purposive sampling. Data were collected based on semi-structured interviews, and focus group meetings. The organisations involved in the functioning of the value chain were also surveyed. Lastly, information on the institutional environment was collected from both secondary and primary sources.

The first stage enabled us to differentiate two categories of agents connected to the value chain: (i) the direct agents who were those having the product ownership at a given time along the chain (planters, traders, and consumers), and (ii) the indirect agents who intervened merely in the functioning of the value chain. During the second stage, we focused exclusively on the direct agents, by carrying out in-depth surveys. Teak planters and rural consumers – also referred to as local consumers – were surveyed in the Atlantique department, across five communes representative of the agro-ecological conditions under which smallholder teak plantations developed in Southern Benin, namely Allada, Tori-Bossito, Toffo, Zè, and Kpomassè (Fig. 1). Surveys among traders and urban consumers were carried out in five cities (Cotonou, Abomey-Calavi, Porto-Novo, Sèmé-Kpodji, and Ouidah). Metropolitan centres were known as the major consumption centres of teak pole in Southern Benin; and traders have settled outlets there, to ensure the availability of this product to consumers. In the surveys among planters and traders, the respondents were selected based on cluster sampling at the lowest administrative level (village for planters and city quarters for traders). Those surveys randomly covered about 15% of villages in the selected communes, and 15% of urban quarters in each town, for planters and traders, respectively. With regard to surveys of consumers – both local and urban consumers – the interviewees were selected by using a systematic sampling procedure (see further details in Aoudji et al. (2011)). The number of respondents interviewed was 254, 107, 223, and 195 for planters, traders, urban consumers, and rural consumers, respectively. Data were collected through face-to-face interviews, using standardised questionnaires. At this stage, we were assisted in data collection by two enumerators. Planters and traders provided information about their functions in the value chain, the marketing channel used, their interactions with other chain partners (commercial exchanges, access to market information, access to financial service, association membership), the costs borne, and the revenues generated by their activities in the value chain. Consumers provided data on the various consumption forms of teak poles. [1]

2.2. Data processing and results compilation

The first stage consisted in mapping the value chain, through the product and its various transformations along the chain, the agents involved in the value chain and their respective functions (Tallec

[1] Many other data were collected during the in-depth surveys, but those data are presented in separated articles.