1. Introduction

Ward and Schroeder (2002) note that there are two overall mechanisms that help to describe how prices are derived in a given area or for any particular transaction, namely price determination and price discovery. The former, i.e. price determination, is when the price of a product is determined by the laws of supply and demand (Martinez, 2004; Peterson, 2014; Ward and Schroeder, 2002). Thus, factors like quality, certainty of the supply, speculation and availability of substitutes play a role in the determination of prices. For example, a customer is inclined to pay a higher price if they can be guaranteed a consistent supply of a specific quality (Martinez, 2004). The same applies to non-timber forest products (NTFPs), where quality is potentially vital in price determination (Martinez, 2004; Ndoye et al., 1997). The latter, i.e. price discovery, is a process through which buyers and sellers negotiate an agreed price for a given quantity and quality of a particular product (Peterson, 2014; Ward and Schroeder, 2002). This differs from price determination where the price of a product is set by the broad forces of supply and demand, thus these forces generally set an equilibrium price of a product (Martinez, 2004; Peterson, 2014).

The limited literature suggests that the prices of NTFPs are probably determined through price discovery (Agea et al., 2013; Martinez, 2004; Ndoye et al., 1997). This is likely to be a consequence of the poorly developed or imperfect NTFP markets in most rural areas, as well as the socio-economic characteristics of the market participants (although such attributes would also influence price determination). For example, some NTFP traders set their prices on the basis of the costs of food and labour incurred during harvesting of the raw materials (FPRDI-ITTO, 2012). In many instances, markets are imperfect as the prices are set by a few buyers. For instance, middlemen colluded in setting the price of Palmyra Palm (Borassus flabellifer) products in north-eastern Nigeria (Tee et al., 2009), resulting in collectors being reduced to price takers. Famuyide et al. (2012) found that the markets for Bitter Kola (Garcinia kola) and Alligator Pepper (Aframomum melegueta elegueta) in Ibadan, Nigeria, tend towards oligopoly, as the market for these two products are characterised by few sellers and price discrimination. Additionally, age, level of education, experience in the trade, transport cost and cost of the products had significant positive effects in price determination of the products. This suggests that older, educated, experienced sellers were likely to set higher prices. In Labo, Philippines, the prices of handicraft products were dictated by a monopolistic exporter (FPRDI-ITTO, 2012) and the other actors in the supply chain had little option but to accept the price set by the exporter (FPRDI-ITTO, 2012).

Agea et al. (2013) reported that in Bunyoro-Kitara Kingdom, Uganda, the majority (73%) of the sellers based their prices for wild and semi-wild food plants on the daily market demand and on the time and risks involved in harvesting the plants (56%). Some sellers (40%) based their prices on the market price of substitute food plants and on price information from other markets, whilst other (35%) considered the previous or past season’s prices. Therefore, there are uniform or formal
mechanisms in the setting of prices for these food plants. Agea et al. (2013) also observed that in all cases, price setting followed a kind of "action-reaction sequence". Thus, the process of setting prices entailed bargaining between the buyer and seller until an equilibrium price was reached somewhere between the minimum price the seller was willing to take and the maximum price the customer was willing to pay (Ndoye et al., 1997). In this setting, there was always negotiation of prices between the buyer and seller even if the seller has offered the buyer a reasonable market price. These findings are corroborated by several studies in various southern African countries, where the establishment of market prices of wild edible plants, particularly indigenous fruit, was not based on definite mechanisms (pricing based on demand, pricing based on the total cost incurred or pricing based on competition) (Ham et al., 2008). The same was reported for price setting of wild food plants in west and central Africa (Tchoundjeu et al., 2008).

In other cases sellers consider each buyer's ability to pay for the product. Therefore, the first price offered is determined by the seller's appraisal of the buying power of each buyer; a simple glance at the potential buyer by the seller helps the seller to determine the price to charge that specific buyer (Agea et al., 2013; Botha et al., 2004).

In the Mpumalanga Lowveld, South Africa, Botha et al. (2004) noted that sellers of medicinal plants were largely price takers. Similarly, Pereira et al. (2006) highlighted that sellers of reed craft products in two rural villages of the Eastern Cape, South Africa, were mostly price takers as many buyers push for lower prices. Some crafters cannot stand firm on fixed prices as they wish to maintain a good reputation and relationships in the community. Shackleton (2005) found that in Bushbuckridge, South Africa, wood carvers were largely price takers as most buyers were willing to pay only about one-third of the originally set price.

In India Mahapatra and Tewari (2005) noted that some NTFP collectors were poor, unfamiliar with the money exchange system and owed money to local lenders and traders which compelled them to offer high value NTFPs for low value food products. They also observed that the primary harvesters lacked knowledge about storage methods and were unaware of future market forecasts. Consequently, they preferred selling their products soon after harvesting even though the price may be low, rather than being able to wait and sell when the price was high.

The above studies indicate that a wide variety of approaches and factors that can influence the setting of prices of NTFPs. However, since most are based on a single or relatively few sites, there is no indication of the prevalence of the different factors across multiple sites and products within a uniform macro-context. The determination of prices of NTFPs is important to avoid either over or under-valuing them in markets and in poverty studies. Therefore, this study sought to determine the contextual factors and sellers' considerations behind the setting of prices for selected NTFPs in different areas of South Africa. South Africa is a particularly useful setting for such a study because of its marked dual first and third world economies, strong market integration and yet extensive use of NTFPs. Based on previous work and this macro-context it was hypothesised that there would be high variation in the mechanisms used by NTFP sellers to set prices for their products. In addition, the pricing factors taken into account are likely to vary between the types of NTFPs, type of market (local market or urban market), socio-economic characteristics of the seller and method used by the seller to procure the NTFPs.

2. Methods

2.1. Site Selection and Data Collection

Fifteen towns with a relatively higher presence of NTFP sellers were purposely selected across South Africa (Fig. 1). Most of the sellers were found in formal markets, whereas those selling at home were found in villages adjacent to or further away from town. A formal market was assumed to be a market where "sellers can publicly advertise their prices and locations, whereas in informal markets, sellers need to trade through bilateral bargaining so as to remain anonymous from the taxing authority" (Anbarci et al., 2012). A structured questionnaire was administered to 300 sellers between September 2015 and June 2016; 223 in formal urban markets and 77 at home markets. All NTFP sellers at each site who were willing to participate were interviewed. The questionnaire included sections on types of NTFPs sold, reasons for selling, number of years in the trade, connections with other sellers, source of the traded NTFPs, frequency of offering discounts, credit and lowering prices to customers, factors taken into account when setting prices and socio-economic characteristics of the respondent. Local, experienced field assistants with good knowledge of each site were recruited for translating the English questionnaires under the direction of the first author.

2.2. Data Analysis

Descriptive statistics were used to summarise the socio-economic characteristics of the NTFP sellers across all sites, the NTFPs traded, sources of NTFPs, reasons for selling NTFPs, and changes in the number of sellers. Frequency tables were used to show the various factors taken into account by sellers in setting prices. A general linear model (GLM) regression analysis (using Statistica v13) was applied to identify the significant pricing factors taken into account by the sellers and factors influencing their willingness to lower prices or sell on credit. The GLM is a generalization of the linear regression model, such that effects can be tested (1) for categorical predictor variables and for effects of continuous predictor variables and (2) in designs with multiple or single dependent variables. Thus, the GLM made use of the least square methods of the general linear model to estimate and test hypotheses about effects.

3. Results

3.1. Nature of NTFP Trade

3.1.1. Socio-economic Characteristics of NTFP Sellers

Three-quarters (75.3%) of the NTFP traders were female. The age of sellers ranged from 19 to 85 years, with a mean of 48 ± 11.8 years (Table 1). About 45% of the sellers were at least 50 years old, whilst only 27.3% were < 40 years old. There was a wide range in the number of years trading NTFPs (1–40 years), with a mean of 9.5 ± 8.1 years. About 55% of the sellers had been trading for < 10 years. The highest school grade attained ranged from 0 (no formal education) to 12 (highest secondary school grade), with an average of 6.3 ± 3.8 years. About 15.3% of the sellers had no formal education, whilst 42.3% had attained school grades of seven or less.

Selling NTFPs was generally a full-time activity, with sellers spending 5.8 ± 1.2 days per week and about 8.2 ± 1.9 h per day. The majority (79.3%) of the sellers reported that selling NTFPs was their main source of household cash income, with only 8% and 5.7% claiming their main household cash income to be state child grants and state old-age pensions, respectively. The average income share from NTFP trade for those reporting that NTFP trade was not their main source of household income was divided into quartiles, almost one-third (30.3%) of the sellers fell into quartile 4 (76–100% of total household income). Members of this group averaged 9.5 ± 7.7 years as NTFP traders (Table 2). Almost half (49.3%) of the sellers fell into quartile 3 (50 to 75% of total household income), and had a similar number of years in the trade (9.9 ± 8.1) as quartile 4 (Table 2). The few (12.7%) falling in quartile 2 (25–50% of total income) had slightly fewer years as NTFP traders (7.9 ± 8.8). The sellers (77%) in quartile 1 viewed the trade as a supplementary activity, garnering < 25% of their household income from NTFP trade, even though they had, on average, been trading for
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