

Original Article

Consumer Demand and Uses for Special Tea (*Monsonia biflora* DC.): A Case Study of Consumers of Special Tea in Capricorn District Municipality

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ABSTRACT

This paper analysed the demand and uses of Special tea in Capricorn district municipality, Limpopo province. The Snowball sampling method was used to select 225 consumers of Special tea in the study area. A questionnaire was used as an instrument for collecting data and the collected data was analysed using descriptive statistics and the Negative binomial model. The level of demand for Special tea in the study ranged from 1 to 9 consumptions per annum. Male consumers dominated the sampled population (61%) and the respondents were mostly not married (64%). Several uses of Special tea were reported in the study and 24.9% of the consumers used the tea to cleanse the blood followed by 21.3% for body pains and general wellbeing. Factors, such as gender, access to medical aid, willingness to pay and marital status had a negative influence on demand while religion and reasons for using Special tea influenced demand positively. It is recommended that information on the benefits of using special tea be shared with the people, research on improving the taste and preference is necessary in order to induce consumption because the use of additives influences demand.

INTRODUCTION

A study conducted in the late nineties indicated that the collection of medicinal plants was initially practiced for subsistence and the demand thereof was minimal [1]. Today medicinal plants are used not only by rural people, but the demand is from mainly urban residents in both rich and poor countries [2,3,4,5]. The growing demand is not only for immediate consumption but there is a growing trend concerning the processing and promotion of medicinal products in most third-world countries [6]. A study by Nguyen *et al.* indicates that the market for herbal medicine is growing because of consumers' interest in the health benefits associated with the consumption of medicinal herbs [7]. In both Europe and North America, previous studies reported an increase in demand for medicinal plants which is fuelled by an outburst in consumer interest in natural products and aggressive marketing of herbal remedies [7, 8,9]. Hence, the increase in demand for medicinal herbs is witnessed in both developed and developing countries.

In South Africa as well, the New Growth Path and New Industrial Policy Framework have created opportunities for the industrialization of indigenous medicinal and aromatic plants and the country has a clear industrial demand for medicinal and aromatic products due to increased production and use of herbal health care formulations [10]. The Industrial Policy Framework also has the potential to raise the demand for medicinal plants in the pharmaceutical sector. Additionally, people are of the view that indigenous medicinal plants are affordable and safer to use and this is also increasing the use of medicinal plants due to the absence of regulations for collection in most rural settings [11,12]. This study is based on the demand for Special tea which is one of the medicinal tea that is consumed by people in South Africa. Special tea is described as a perennial herb that grows annual stems from a woody base. The plant has the potential to grow up to 60 cm and has long narrow leaves folded along the midribs [13, 14].

Table 1 Macronutrient composition of special tea within its different parts

	Fe	N	P	K	Ca	Mg	Zn	Mn
Fruit	137.00	1.35	0.32	1.41	1.79	0.27	47.33	93.67
Leaf	336.00	1.40	0.28	1.25	2.68	0.27	231.00	153.00
Stem	117.33	0.84	0.41	2.51	1.75	0.25	76.33	94.00
Root	415.33	0.73 c	0.26 b	1.91 b	0.74 c	0.25 a	182.00	191.00

Source: Mamphiswana *et al.*, 2011

Special tea is among the most appreciated and used medicinal teas in rural areas of South Africa with the belief that it can treat numerous diseases [15]. Mamphiswana *et al.* indicated that people in some areas of the Limpopo province are of the view that Special tea can cure diseases such as sexually transmitted diseases, cleanse blood (IKS), improve erector dysfunction, and enhance libido [16]. These views are supported by numerous studies that reported the presence of medicinal properties in the tea [17,18,19,20]. According to Mamphiswana *et al.* there is a high level of demand for Special tea in most rural communities of South Africa based on both consumption and resale [16]. Special tea was also found to have macronutrients in almost all of its organs [16]. As indicated in Table 1 various macronutrients were found within the body parts of the Special tea plants [16] and this could be a justification for the level of demand for the tea.

Hence, this study was aimed at investigating the available reasons for the high level of demand, and the factors influencing the demand for Special tea in the Capricorn district municipality.

MATERIALS AND METHODS

The survey for the study was conducted in Capricorn district municipality from April 2019 to March 2020. Capricorn district municipality was selected because Special tea grows in the area and most people sell and consume the Special tea. Of the district's total population, 96% are black African and most of them live in informal rural settlements with uneven distribution of wealth.

Data Collection and Analysis

Snowball sampling was used for selecting 225 respondents from an unknown population size of consumers of special tea. Snowball sampling is best suited for studies with hard-to-find respondents [21]. This process of sample size development assumed that a bond exists between the first respondent and others in the same target population, which permitted a series of referrals to be made

[22]. A survey questionnaire was used to collect data from the respondents and questions were structured based on; socioeconomic characteristics, uses of the Special tea, and demand for Special tea in a year. In this case, the demand for Special tea was measured based on the number of times that respondents consumed the tea in a year. Descriptive statistics were used to identify and describe the socio-economic characteristics of consumers, uses of Special tea, and demand. While the results are presented based on frequencies and percentages. After considering the distinct nature of the dependent variable with count values, the Negative Binomial model was used to analyze the factors influencing demand.

Model Specification (Negative Binomial Model)

A Negative binomial model was used for factors influencing demand for Special tea. The Negative binomial model is one of the count models that can estimate the count frequency of an event when the data is characterized by over-dispersion [23]. Considering the dispersion of the data in the study, the Negative binomial model was considered an appropriate method of determining factors influencing demand for special tea over the Poisson which was first proposed for the study. To be specific the Negative binomial model deals with the non-negative count variables. In practice, the count variable, in this case, is assumed to be generated by a Poisson-like process, and the Negative binomial fits in as a result of over-dispersion. Additionally, the Negative binomial model is a product of both Poisson distribution and the generalized factorial function [23,24]. The Negative binomial model application as compared to the Poisson model is that the Poisson is characterized by its mean while the Negative binomial model is a function of mean and conditional variance (α and μ). The mean for the negative binomial is α while its conditional variance is given as $\mu (1 + \alpha\mu)$. The mathematical presentation of the Negative binomial (NB2) model is therefore expressed as;

$$\log \lambda_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_k X_{ik} + \sigma \varepsilon_i$$

Where; λ_i is the expected value of the outcome which is the number of special tea consumption in this case.

x represents the independent variables with the corresponding coefficient β_k

$\sigma\varepsilon$ represents the disturbance term or error term.

The incidence rate ratio was also considered for showing how the number of special tea use changes with a unit change in the independent variable used in the model. Which is obtained through exponentiation of the coefficient of the independent variable [25]. The empirical model for demand for special tea with the variables used in the analysis is presented as follows:

$$\text{NCNSPYR} = \beta_0 + \beta_1 \text{GEN} + \beta_2 \text{MRT} + \beta_3 \text{REL} + \beta_4 \text{LACSPCL} \\ + \beta_5 \text{WMLK} + \beta_6 \text{RFRUSP} + \beta_7 \text{CLNBLD} + \beta_8 \\ \text{WLTPSP} + \beta_9 \text{ACDR} + \varepsilon.$$

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Consumers

As shown in Table 2 consumers of Special tea in the study area were dominated by single consumers (64%) and then married (31%), even though the study expected married consumers to dominate. Christians (74%) consumed special tea more than other religions in the study. The sampled population of Special tea users was dominated by high number (61%) of male consumers than females (39%). On aggregate, a high number of consumers (73.8) were satisfied with the use of Special tea for cleansing blood just like in any other medicinal use 24.9% of consumers were not sure of their level of satisfaction after using Special tea.

Uses of Special Tea by Consumers

Table 3 presents different reasons why people use Special tea in the study area. From the table, there are cases where consumers indicated to be using Special tea for one specific reason, and most of the time the consumers provided combinational uses of the tea. The results indicate that 24.9% of the consumers used Special tea to cleanse blood only. The use of Special tea for sexual reasons was identified in five categories and where the consumers used the tea for sexual reasons only it accounted for 4%. It is worth noting that the use of special tea for general body pains and the well-being of consumers accounted for 21.3%, this percentage includes the consumers who just prefer to use Special tea for any kind of body pain. Table 3 also

indicates that 1.8% of the consumers used Special tea for menstruation problems. However, some of the consumers who used the tea for menstruation purposes were also distributed in other combinations. Generally, the results identified several uses of special tea according to the consumers.

Figure 2 presents the descriptive results of Special tea consumers based on willingness to pay for raw special tea relative to the occupation of the consumers in the study. The results indicate that 13% of the unemployed consumers are not willing to pay, while 49% which is the highest percentage of the unemployed prefer to pay the base price. Most of the self-employed consumers (61%) were found to be willing to pay the base price, while self-employed consumers who are "Not willing to pay, willing to pay 5% more than base price and willing to pay 10% more than base price" account for 10% in each case.

The figure further indicates that part-time employed respondents had the highest percentage (39%) of consumers who were not willing to pay. Full-time employed respondents are consumers who expect to have a consistent flow of income provided everything remains constant, however, they came second in the category of consumers who are willing to pay the base price which is a category with the highest percentages among the different measures of willingness to pay. Generally, most of the consumers reported being willing to pay the base price, and consumers who are sure of monthly income featured in all categories except in the base price category where they scored zero percent.

Negative Binomial Results for Determinants of Demand for Special Tea

Negative binomial results for factors influencing demand for special tea are presented in Table 4. The demand for special tea was measured based on the number of times that consumers used the tea in a year which was observed to be ranging between 1 and 9 times. For this analysis, a total of 9 variables were used for regression and seven variables influenced the demand for a special tea in the study area. Of the 7 significant variables, 5 had a negative influence and two were positive. The Incidence Rate Ratio (IRR) was also used to assess the magnitude of change in demand when the independent variable changes by one unit. The following paragraphs present discussions on the seven variables that had a significant influence on the demand for Special tea.

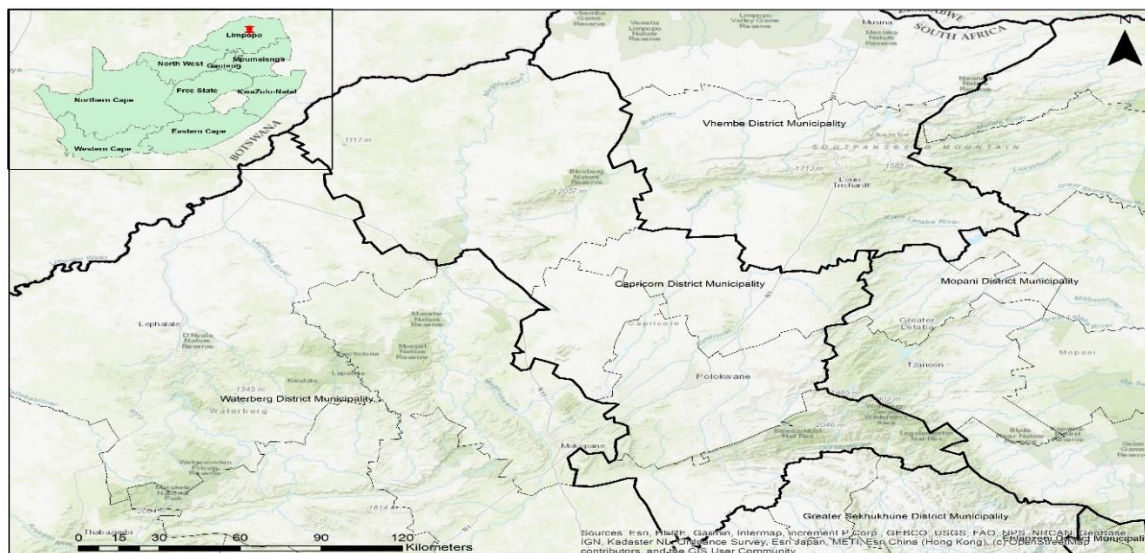


Fig. 1 Capricorn district map

Table 2 Frequencies and percentages of binary and categorical socio-economic variables

		Frequency	Percentage (%)
Marital status	Single	144	64
	Married	70	31
	Divorced	9	4
	Widow	2	1
Religion	Christian	167	74
	Cultural	20	9
	Other	38	17
Gender	Male	137	61
	Female	88	39
Level of satisfaction for using special tea to cleanse the blood	Not satisfied at all	0	0
	Not satisfied	3	1.3
	Not sure	56	24.9
	Satisfied	78	34.7
	Very satisfied	88	39.1

Table 3 Uses of special tea by consumers

Cleanse blood	24.9%
Sexual reasons	4.0%
High blood	1.3%
Menstruation cramps, skin problems, headache	2.2%
Sexual, blood cleansing, and headache	13.8%
Cleansing blood, stomach cramps, high blood and sexual	5.3%
Sexual, chest pains, constipation, high blood, headache, cleanse blood, menstruation	2.7%
For body pains and general well being	21.3%
Headache and blood cleanse	6.2%
Menstruation and cleanse blood and stomach cramps/constipation	5.3%
Cleanse blood, constipation and high blood	0.9%
Menstruation	1.8%
sexual, stomach cramps, cleaning blood and falling pregnant	2.2%
Constipation and cleanse the blood	3.1%
Arthritis and diabetes	0.9%
high blood, cleansing blood, and constipation	2.2%
Menstruation and headache	0.9%
Other	0.9%

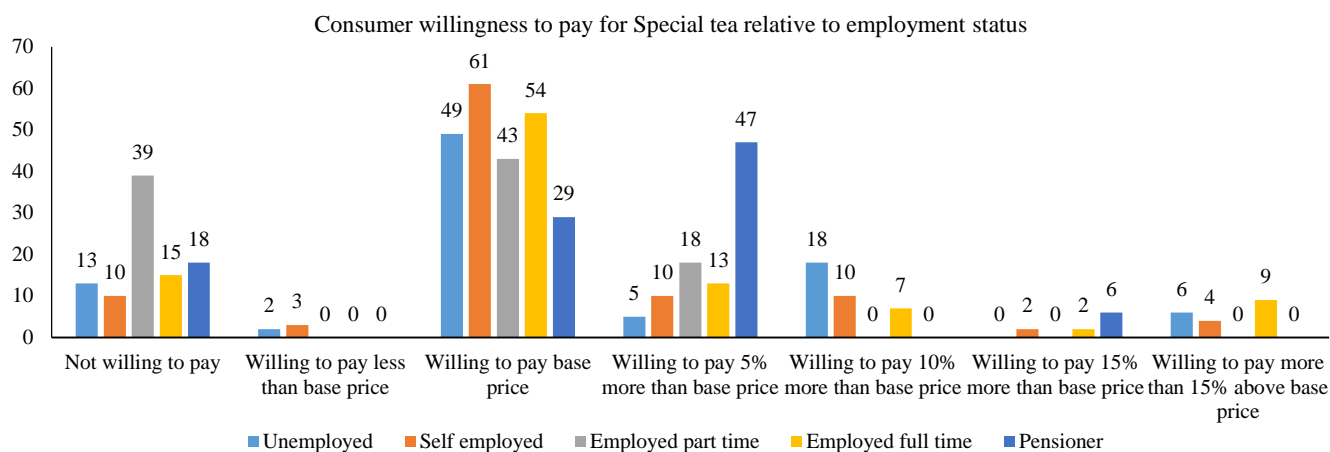


Fig. 2 Consumer willingness to pay for Special tea relative to employment status

Table 4 Negative binomial results for factors influencing demand for Special tea

Negative binomial results from Stata				
	Coef.	Std. Err	P> z	IRR
Gender	-0.531	0.115	0.007 ***	0.587
Access to clinic or Doctor	-0.621	0.170	0.050 *	0.536
Reasons for using special tea	0.053	0.025	0.026 **	1.055
Willing to pay for dry special tea	-0.898	0.104	0.000 ***	0.407
Marital status	-0.558	0.089	0.000 ***	0.572
Religion	0.276	0.167	0.029 **	1.318
Level of access to Special tea	0.034	0.083	0.665	1.035
Level of satisfaction for using special tea to cleanse blood	-0.432	0.083	0.001 ***	0.648
Special tea mixed with milk	0.015	.1209871	0.895	1.015
Con			0.002	29.517
Model summary				
An alpha	0.2702	.092877		
Alpha	1.092187			
LR Chi2	42.67			
Pseudo R2	0.028			
Log-likelihood	-741.23			
Likelihood ratio test of alpha = 0				

1%***,5%** ,10%*

Gender

The variable gender of the consumers was found to be statistically significant at a 1% (pv-0.007) confidence interval. Nevertheless, the variable had a negative coefficient indicating the existence of an inverse relationship between gender and demand for Special tea. The incidence rate ratio results revealed that a one-unit increase in the number of male consumers will reduce the log number of special tea consumption per annum by 0.587 times. This outcome was not anticipated, considering the fact that previous studies reported male dominance from consumption of Special tea [13]. Also, the descriptive statistics in the study reported a high

number of male consumers of special tea as compared to females.

Access to Clinic or Doctor

As was anticipated the variable access to clinics or doctors was observed to have a negative relationship with the number of uses of special tea per year. However, access to a clinic or doctor was statistically significant at a 5% level. The results revealed that as consumers of special tea have more access to doctors or clinics their number of Special tea consumption per annum will decline by 0.536. The results suggest that people who have access to clinics or doctors will prefer modern medicinal services over indigenous medicinal services. The outcomes are in line with Ariyo and Ariyo who

found the presence of healthcare medical centres to significantly influence the usage of medicinal plants [26]. The results suggest the presence of recognition of traditional medicinal plants by the modern medicinal system and the role it plays in promoting the use of medicinal plants where possible.

Reasons for using a Special Tea

The parameter reasons for using Special tea was found to have a positive relationship with the number of times that consumers use special tea per year and was significant at a 5% (pv-0.026) confidence level. The kind of influence that the variable has was correctly predicted and it implies that as the number of reasons for using special tea increases the log number of using special tea per annum will increase by 1.055. This shows that the more consumers find reasons for using special tea the higher the demand for the tea.

Willing to Pay for a Dry Special Tea

The Negative binomial results confirm the variable willingness to pay for a dry special tea to be statically significant with a p-value of 0.000, while the sign of the coefficient was found to be negative. This implies the existence of an inverse relationship between the willingness to pay for dry Special tea and the number of special tea consumption per annum. The results indicate that a unit increase in consumer willingness to pay will reduce the log number of special tea consumption per year by 0.407.

Marital Status

The explanatory variable marital status is reported to be statistically significant (pv-0.000), though the variable had a negative coefficient. This implies that a one-unit increase in the number of married respondents will lead to a 0.572 decline in the log number for special tea consumption per annum. However, studies indicate that people are of the view that special tea can address libido issues, hence, the envisaged outcome was that an increase in the number of married consumers would increase the level of demand for specials, though the opposite prevailed. But when considering the variable marital status categories in this study the results are not surprising because the study is dominated by consumers who are not married. When comparing with the literature the variable marital status was found to influence the use of the

medicinal plant [27], though, the variable had a positive influence unlike in the study.

Religion

The results from the Negative binomial model revealed that for every one-unit increase in the number of special tea consumers who are Christians the log number of special tea consumption per year will increase by 1.318. The implication is supported by the estimated level of significance with a p-value of 0.029 which is below the standard norm of $p < 0.05$ as well as the positive sign of the coefficient which demonstrates the existence of a positive relationship between religion and the dependent variable. It is also worth noting that people's religion continues to play a significant role in the demand and use of medicinal plants. The results agree with Usifoh and Udezi, who showed that religion had a positive influence on the use of medicinal plants with a p-value of 0.0001 [28], and Uzundumlu *et al.* also report similar outcomes concerning the influence of religion on the use of medicinal plants by the student [29].

Level of Satisfaction for using Special tea to Cleanse the Blood

Whenever people use medicinal plants, there is a certain level of satisfaction that they expect to derive, and it is because medicinal plants are used for a number of reasons. This variable was found to have a negative (pv-0.083) relationship with the number of uses of special tea per year. Although, it was previously indicated that consumers of special tea are mainly using it to treat erector dysfunctionality by the male respondent which could be the reason why the variable negatively influences the demand per annum in the study area [16]. The results revealed that a unit increase in the number of consumers who are satisfied with the use of special tea for cleansing blood will reduce the log number of special tea used per year by 0.648.

CONCLUSION AND RECOMMENDATIONS

The findings from the study indicate that most of the users of special tea in the study area were male consumers and a high number of them were not married. Most of the people in the study area used the tea for 'cleansing blood', 'Sexual, blood cleansing, and headache', and 'for body pains and general well-being'. However, there are several reasons why people consume special tea in the study

area. Integration between modern health practices and indigenous health practices is recommended because the results indicate an inverse relationship between the use of special tea and access to the clinic. It is further, recommended that information on the benefits of using special tea be shared with the people, research on improving the taste and preference is necessary in order to induce consumption because the use of additives by consumers influences the demand for Special tea.

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Conflict of Interest

We would like to confirm that the no conflict of interest that the researchers are aware of.

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