

Assessing awareness and perceptions towards the existence of indigenous foods in Port St Johns of the Eastern Cape South Africa

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Intolerably high rates of food insecurity and micronutrient deficiencies still prevail at an alarming rate in rural poor communities who practice subsistence farming. Despite the fact that, the indigenous fruits and vegetables are abundantly available and are easily accessible in these rural communities. The consumption of indigenous vegetables and fruits can combat the food insecurity and micro-nutrient deficiencies in the resource-constrained communities. This is attributed to negative perceptions shared among rural communities specifically the younger generation are unaware about the indigenous foods. Against this background, the study was developed to assess awareness and perceptions towards indigenous fruits and vegetables in Port St Johns of the Eastern Cape Province of South Africa.

A multi-stage sampling technique was used to evaluate the availability of the perceptions of households and the contribution of indigenous fruits and vegetables on household food security. A total of 340 respondents were purposively selected in the study area. A positive impact on household food security was revealed suggesting that, consumption of indigenous fruits and vegetables may address rural household dietary diversity and food insecurity. The study therefore argues that, indigenous fruits and vegetables may be used as a food security coping strategy at household level in rural areas, given their availability especially in summer. Additionally, dispelling several negative perceptions that were noted and targeting consumption drivers will enhance the food security nexus of indigenous fruits and vegetables at household level.

Key words: Consumption of indigenous fruits and vegetables, food security, Indigenous fruits and vegetables, rural households

INTRODUCTION

South Africa is endowed with a great variety of indigenous fruits and vegetables and more than 100 different traditional vegetables have been found, particularly in rural areas (Lewu & Mavengahama, 2010; Dweba & Mearns, 2011; Ntuli *et al.*, 2012). According to Schippers (2000) the indigenous fruit and vegetable food plants are plants which some of their parts such as young, succulent stems and young fruits are culturally accepted and consumed as foods in different regions and locations of the world. Research also highlights that, different tribal people use different concepts to refer to indigenous vegetables. For instance the Sotho and Pedi tribes called it *morogo* whereas, the Zulu and Xhosa tribes use the term *imifino* which collectively means indigenous vegetables (Jansen van Rensburg *et al.*, 2007). Abukutsa-Onyango (2007) further argued that, indigenous fruits and vegetables vary according to location, climatic conditions and are specific to ethnic groups. In Addition, Vorster *et al.* (2007) concluded that the availability of indigenous fruits and vegetables vary according to seasons. Similarly, Jansen van Rensburg *et al.* (2007) observed that indigenous vegetables are abundant during summer season than in winter but are highly perishable. It has been reported that some of these species have been domesticated or are semi-domesticated while most of them grow as weeds in cultivated farms or wild in uncultivated fields (Matenge *et al.*, 2011; Vorster *et al.*, 2007; Jansen van Rensburg *et al.*, 2007).

Other studies have reported that rural people perceive the populations of indigenous vegetables and fruits to be in decline (Adedoyin & Taylor, 2000; Shackleton, 2003; Vorster *et al.*, 2007). In addition, literature further argues that, for seemingly abundant indigenous foods, people seldom consume all available plant material but are rather selective depending on certain (un)desirable characteristics like leaf hairiness, astringency (bitterness) and leaf size (which influences ease and speed of gathering/harvesting). As a result, not all that is available is consumed (Mavengahama, 2013).

Therefore, the claims of abundance and availability of indigenous foods have not been adequately determined (Mavengahama, 2013). Despite that, such studies with regards their availability are important as a preliminary step in the breeding of these species for desirable traits. These may include low anti-nutrients and low astringency, high micronutrient content as well as high yield of the edible parts (Mavengahama, 2013). Literature further suggests that even the Food Agriculture

Organisation (FAO) database on vegetable production in sub-Saharan Africa fails to capture African Leafy Vegetables currently used by the subcontinent (Smith & Eyzaguirre, 2007).

Literature Review: attitudes and perceptions of rural people on indigenous foods

According to Teleni and Goduka (2013) the most popular indigenous foods are collected or harvested from wild rather than cultivation. Notably, there is a decline in consumption of indigenous fruits and vegetables in rural areas of South Africa (Jansen van Rensburg *et al.*, 2007). Further, literature explained that South African communities associate the consumption of indigenous foods with poverty and low self-esteem (Cloete & Idsardi, 2012; Modi *et al.*, 2006; Jansen van Rensburg *et al.*, 2007; Majova, 2014). Moreover, the youth and urbanised people have a negative attitude and unaware of indigenous foods, as they are considered as food for poor people and the old fashioned (Jansen van Rensburg *et al.*, 2007). Further, a lack of awareness on indigenous foods' nutritional status (Vorster *et al.*, 2007; Dweba and Mearns, 2011) as well as their association with poverty and primitiveness are some of the reasons that discourage the youth from learning about indigenous vegetables and fruits (Faber *et al.*, 2010; Dweba & Mearns, 2011; Thandeka *et al.*, 2011; Ntuli *et al.*, 2013).

In Southern Africa the agricultural system has changed in both commercial and subsistence farming, it aimed at cash crop production (Abukutsa-Onyango, 2007; Jansen van Rensburg *et al.*, 2007). However, this type of farming promoted mono-cropping and encouraged the removal of indigenous vegetables in the fields as they are regarded as weeds. Moreover, this attitude towards indigenous vegetables still prevails among research communities, policy makers and extension advisors continue to advise farmers to eradicate them from their fields and gardens (Jansen van Rensburg *et al.*, 2007). Unquestionably, the same is not true in subsistence farming where women do most of weeding and tend to pull out the unwanted weeds and leaving the useful weeds for later use (Jansen van Rensburg *et al.*, 2007; Teleni and Goduka, 2013).

Cloete and Idsardi (2012) claimed that the association of indigenous foods with poverty and low self-esteem amongst rural people stems from socio-economic and cultural changes amongst African consumers. In addition, Vorster *et al.* (2007) claimed that attitudes and perceptions are divided by gender and cultural groups, but generally indigenous foods are perceived to be part of

the traditional diets. The same author also explained that in South Africa, the Zulu, Shangaan, Swazi, Tshonga, Pedi and Ndebele men do not always prefer to consume the indigenous vegetables as relish. On the other hand, the Xhosa males considered the indigenous vegetables as food meant for women, thus, prefer to eat meat. The same is true as Kepe (2008) declared that men seem to care less about indigenous vegetables before they are collected and prepared as compared to women.

Vorster *et al.* (2007) concluded that the attitude is assessed based on the taste and plant choice amongst men and women. Further, Vorster *et al.* (2007) confirmed that generally men prefer the bitter taste of blackjack (*Bidens pilosa* L), even though they are used in the mix of leaves to add taste to the dish. Also, it is noted that both women and men prefer amaranth and pumpkin leaves as relish to increase taste in their dishes (Modi *et al.*, 2006; Ntuli *et al.*, 2012; Vorster *et al.*, 2007). However, a lack of information on the cooking methods that would make the indigenous foods more attractive to younger people is likely to result in a decline in consumption (Dweba & Mearns, 2011).

Some studies have reported that younger generation in communities have a negative attitude towards indigenous foods (Van der Hoeven *et al.*, 2013; Vorster *et al.*, 2007; Dweba & Mearns, 2011). Whereas, Thandeka *et al.* (2011) mentioned that the younger generation disliked indigenous foods due to unfamiliar tastes and the ignorance of the preparation methods. Dweba and Mearns (2011) also observed that the young women in the eMantlaneni village shared the same attitude towards indigenous foods. There is dearth in literature that addresses the possible strategies that can be used to make the indigenous foods more attractive to younger generation. There is a need to determine other factors that influence the attitudes of younger generation towards the consumption of indigenous fruits and vegetables.

RESEARCH METHODOLOGY

The study was conducted in Port St Johns which is located in the Eastern Cape Province of South Africa. Port St Johns is a small coastal town with a variety of hills, sand dunes, rivers and the mountainous terrain that meet its picturesque (OR Tambo District Municipality Integrated Development Plan, 2010). Port St Johns falls under the Port St Johns Local Municipality which

belongs to the O.R Tambo District Municipality. The area is located approximately 90 km away from Mthatha (Port St Johns Local Municipality Integrated Development Plan, 2016).

Methods and research Instruments

This study was conducted on the baseline data of the rural households that consumed indigenous foods and those that do not consume them. A cross sectional survey research design was used in the study. Both multi-stage and probability sampling approach was used in this study area. The researcher managed to draw a sample size of 340 out of 670 household heads in these four villages due to limited resources and time constraints using probability sampling approach. The sample size of 340 was a reasonable size that represents the population of the study area.

From the study area, a total of 340 households were selected for participating in the study. A total of 80 households were the consumers of indigenous fruits and vegetables and 260 were the non-consumers making up a total of 340 households. It was found that most of the people in the study area did not consume the indigenous fruits and vegetables. This is attributed to the change of attitude and food preference and tastes towards the consumption of indigenous fruits and vegetables. This has resulted in a number of non-consumers being 260 relative to consumers. The distribution of respondents is summarised in Table 3.1.

Table 3.1: The distribution of respondents with respect to IVs & IFs consumption status.

Study area	Consumers	Non-consumers	Total
Port St Johns	80	260	340

Source: Author (2017)

Data collection and Analysis

The data was collected from the respondents in the study area. A questionnaire was used as the tool to gather information from the respondents. The questionnaire covers both qualitative and quantitative research questions. A qualitative research includes verbal data such as opinions, respondent's experience and feelings about a particular issue. In the case of this study, it includes the perceptions of the respondents on indigenous fruits and vegetables, the food security status of the respondents, the respondents' views about the availability of indigenous fruits and vegetables

in the study area. On the other hand, the quantitative method focuses on numerical data which is useful in statistical methods of data analysis. Hughes (2006) noted that the quantitative information validates the description of a research phenomenon. Furthermore, quantitative data includes age, level of income and family size of the respondents. Also, a questionnaire included personal information such as (age, gender, level of education, marital status and occupation). Data was collected in November 2016 during summer season whereby the indigenous fruits and vegetables were abundantly available.

The data was sorted, coded and summarised on Microsoft excel. Stata version 15 was used in analysing the coded data whereby frequencies, counts and percentages were presented in the form of tables and charts. The objectives of the study and their analytical tools are presented in Table 3.2

Table 3.2: The objectives and the analytical tools

Objectives of the study	Analytical tool
1. To assess the rural household's attitudes and perceptions towards indigenous foods.	Descriptive statistics (Frequency, percentages)

Discussion and Findings

Table 4.1: Demographic factors of the respondents

Demographic Variables		Frequency	Percentage (%)
Age	20 – 39	124	36.5
	40 -59	125	36.8
	60 +	91	26.7
	Total	340	100
Gender	Male	192	56.5
	Female	148	43.5
	Total	340	100

Marital status	Single	122	35.9
	Married	218	64.1
	Total	340	100
Household size	1 – 3	109	32
	4 – 7	128	37.7
	8 -11	103	30.3
	Total	340	100
Level of education	No education	56	16.5
	Primary school	87	25.6
	Secondary school	197	57.9
	Total	340	100
Occupation	Unemployed	145	42.7
	Casual labourers	92	27.1
	Formal employed	39	11.5
	Entrepreneurs	64	18.7
	Total	340	100
Sources of Income	Wages	92	27.1
	Business Profits	64	18.7
	Salaries	39	11.5
	Social grants	145	42.7
	Total	340	100
Level of income	100 < 1 000	88	26.1
	1 100 <2 000	170	50
	2 100 < 3 000	44	13
	3100 <	38	11
	Total	340	100
Land size	0.1-1ha	120	35.3

	1.1-3ha	176	51.8
	3.1-5ha	44	12.9
	Total	340	100

Source: Survey data (2017)

Table 4.1 indicates that 36.5% of the respondents were between the age of 20 and 39 years of age. Also 36.8% of them were between the age of 40 and 59 years of age while 26.7 % of them were above 60 years of age. Gender plays a significant role in the consumption of indigenous fruits and vegetables. The results revealed that most of the respondents (56.5 %) were males and 43.5 % were females. Marital status shows that 35.9% of the respondents were single and 64.1% of them were married. More than half of the respondents had attained secondary (57, 9%) level of education followed by those who had attained only primary level of education (25, 6%) and 16.5% of them had had no formal education.

Table 4.1 futher indicates that 37.7% of the respondents had more than four family members while 30.3 % of the respondents had large family size. In terms of occupation, 27 % of the respondents were informal employed and 42.7 % of the respondents were unemployed. Approximately 18.7% of the respondents were involved in the business sector while 11.5% of them were formally employed. It is noted that 42.7 % of the respondents earned their monthly income from social grants and 27.1% of them earned their income from informal employment. Also 18.7% of the respondents earned income from business and 11.5 receive income salaries. It is noted that half of the respondents received an amount that ranged between R1100–R 2000 while 26.1% of the respondents earned less R1 000. With regards to hectors, 51.8% of the respondents own 1 – 3 hectares of land while 35.3 % own less 1 hectare of land.

Rural households' perceptions of indigenous fruits and vegetables consumption

This section presents the results of shared perceptions on the consumption of indigenous fruits and vegetables from the study area. Figure 4.1 and 4.2 below present the summarised perceptions and attitudes on indigenous fruits and vegetables consumption shared by the respondents in the study area.

Shared perceptions on the consumption of indigenous vegetables

Figure 4.1 presents the perceptions on indigenous vegetables.

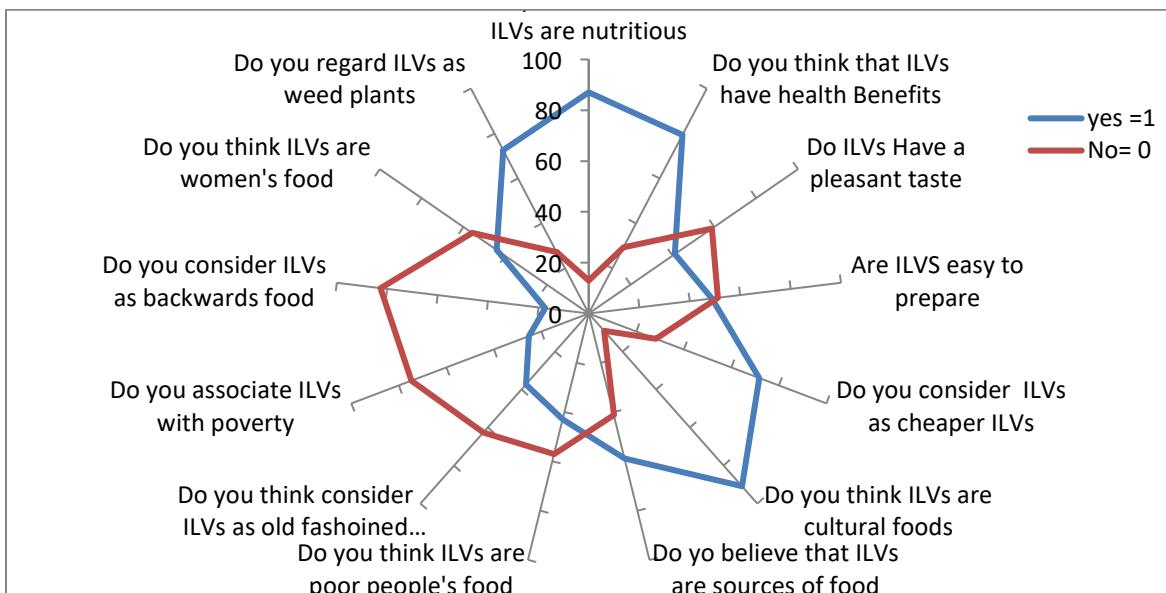


Figure 4.1: Shared perceptions on the consumptions of indigenous vegetables from the study area.

Source: Survey data (2017).

From the study area, the results revealed that 87.1% of the respondents believed that indigenous vegetables are nutritious and 12, 9 % of the respondents objected to that perception. The findings indicate that, the majority of the respondents from the study area associated indigenous vegetables with nutritious foods and this may trigger the consumption of indigenous vegetables. Several previous studies support these findings by highlighting that, indigenous vegetables are known as sources of both micro and macro nutrients (Modi *et al.*, 2006; Maroyi, 2011; Taleni & Goduka, 2013; Jansen van Rensburg *et al.*, 2004; Abukutsa-Onyango *et al.*, 2010).

With reference to perceptions related to health benefits, the results indicated that, 79, 4% of the respondents believed that indigenous vegetables have health benefits and 29, 6% of the respondents did not believe that indigenous vegetables had any health benefits. The findings suggest that, the majority of the respondents share positive perceptions of indigenous vegetables with regards to health benefits which may have positive influence on the use of indigenous vegetables. Similar findings were shared by Demi (2014), Matenge *et al.* (2011) and Thandeka *et*

al. (2011) who reported that indigenous vegetables play a crucial role in combating chronic diseases such as HIV/AIDS.

Figure 4.1 further show that, a total of 58,8% of the respondents did not believe that indigenous vegetables have a pleasant taste and this may negatively affect their consumption. Whereas, 41,2% of the respondents believed that, indigenous vegetables had a pleasant taste. Similar observations were shared by Tali & Goduka (2013) who argued that indigenous vegetables have low status in many communities and it may due to than bitter taste.

Results also indicate that 51,1 % of the respondents did not believe that indigenous vegetables are easy to prepare while the rest believed that indigenous vegetables are easy to prepare. The results suggest that the majority of the respondents believe that indigenous vegetables are not easy to prepare and this may result in a negative influence on the use of indigenous vegetables by households as they may prefer exotic vegetables. Contrary to these findings Vorster *et al.* (2007) argued that the soft, fast-cooking leaves of pumpkin and nightshade species are preferred to the finery leaves of cowpeas and the recipes used to prepare the different leafy vegetables tend to be fairly homogenous within particular cultural groups limiting culinary diversity.

Figure 4.1 further indicates that, 71,8% of the respondents believed that indigenous vegetables are cheaper vegetables than exotic vegetables. The results suggested that, the majority of the respondents believed that, indigenous vegetables are cheaper and this may encourage people to participate in their consumption. The findings of the study are in line with the observations made by Vorster *et al.* (2007) who revealed that indigenous vegetables are widely and freely available.

The results also indicated that, 90,9 % of the selected respondents believed indigenous vegetables are cultural foods, and only 9,1% did not believe that indigenous vegetables are cultural foods. The results suggest that, most of the respondents share positive perceptions of indigenous vegetables with reference to cultural food beliefs and this may promote their consumption. Similarly, findings of the study carried out by Tali & Goduka (2013) reported that Pedi people considered the collection and consumption of indigenous vegetables as part of their culture as the Pedi Proverb conveys that “meat is a visitor but *morogo* is our daily food”. Also, Jansen van Rensburg *et al.* (2007) revealed that, some parts of South Africa indicated differences in cultural preferences for indigenous and the practice of mixing indigenous vegetables in dishes is common.

Figure 4.1 further indicates that 58, 8 % of the respondents believed that indigenous vegetables are their sources of food. The results suggest that, the most of the people share positive perceptions with regards to indigenous vegetables as a source of food and this belief may promote the consumption of indigenous vegetables. These findings are in line with the perceptions shared by Vorster *et al.* (2007) who acknowledged that, indigenous vegetables are additional sources of food due to its ability to grow in these generally marginal areas. Moreover, they are used as sources of food, especially during winter as a source of dried food.

Indigenous vegetables are known as food for the poor, old fashioned food, associated with poverty, seen as food for women, labelled as food for backward people and seen as weeds (Jansen van Rensburg *et al.*, 2007; Vorster *et al.*, 2007; Cloete & Idsard, 2012; Thandeka *et al.*, 2011). However, Figure 4.1 deduced, that 42, 9% of the respondents from the study area believed that indigenous vegetables are poor people's food while, 57, 1% of the respondents did not believe so. In addition, the results revealed that, 37, 4% of the respondents shared the perception that indigenous vegetables are regarded as old fashioned food. Results further revealed that 25, 3% of the respondents from the study area associated indigenous vegetables with poverty while 74, 7% of the respondents did not believe that indigenous vegetables are associated with poverty. Generally, these results indicated, that people from the study area share positive perceptions towards the consumption of indigenous vegetables.

Shared perceptions on the consumption of indigenous fruits

This section presents rural households 'perceptions of indigenous fruits and vegetable consumption as summarised in Figure 4.2 below.

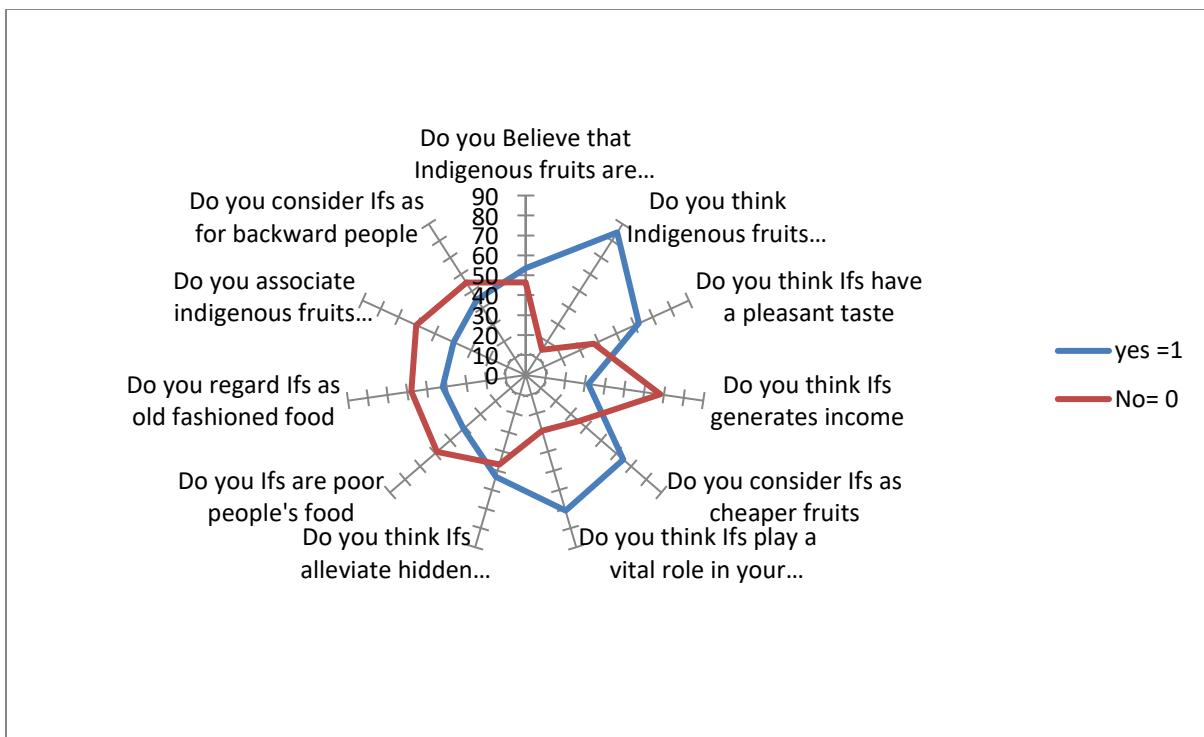


Figure 4.2: Shared perceptions on the consumptions of indigenous fruits from the study area.

Source: Survey data (2017).

Figure 4.2 revealed that 53,5% of the respondents from the study area believed that indigenous fruits are nutritious and 46,5% of the respondents were opposed to these findings. The findings of the study further suggested that, most of the respondents from the study area perceive indigenous fruits as nutritious foods. Both men and women respondents reported that they often consume indigenous fruits in the bush when they fetch the wood. The findings are consistent with those reported by Modi *et al.* (2006), Jansen van Rensburg *et al.*, (2004), Schreckenberg *et al.* (2006) , Kalaba (2007) and Oladele (2011) who argued that, indigenous foods (ALVs and Ifs) are known as the important sources of both micro and macro nutrients.

Figure 4.2 indicated that 85% of the respondents believed that indigenous fruits have health benefits while 15% of the respondents did not believe that indigenous fruits had any health benefits. The findings suggested that the majority of the people shared positive perceptions with reference to the health benefits of indigenous fruits and this may positively influence their consumption. Similar observations were reported by Flyman and Afolayan (2006) and Van Jaarsveld *et al.* (2014) who elaborated that indigenous foods (ALVs and Ifs) are important sources

of micronutrients including A and C, iron, zinc, folate and other nutrients, minerals and roughage needed to maintain health.

Furthermore, the results of the study revealed that 62, 4% of the respondents believed that indigenous fruits have a pleasant taste. The findings indicated that most of the people from the study area believe that indigenous fruits have a pleasant taste and this may increase the intake of indigenous fruits by rural households. Similar findings were also shared by Kalaba (2007) reporting that, some of the indigenous fruits in western Kenya are used in porridge as the substitute for sugar by rural people who do not have sugar due to their pleasant taste.

With reference to income generation, the results indicated that 68, 2% of the respondents disagreed with the perception that indigenous fruits generate income. The findings indicate that, the majority of the people did not believe in the income generating potential of indigenous fruits. Previous studies however noted that, there is potential to generate income though indigenous fruits are sold in rural informal markets (Mpala *et al.*, 2015; Kalaba, 2007; Elago & Tjaveondja, 2015).

Figure 4.2 further showed that 68, 2% of the respondents believed that indigenous fruits are cheaper than exotic fruits. The findings are in line with the reports of Matenge *et al.* (2011) who noted that indigenous foods represent a cheap but quality nutrition to the poor both in urban and rural areas where malnutrition is widespread.

Emerging from the results of the study was that, 70, 9% of the respondents believed that indigenous fruits are cultural fruits and 29, 1% of the respondents did not believe so. The results showed that, most of the people associated the consumption of indigenous fruits with their culture. The respondents indicated that, the consumption of indigenous fruits is part of their culture because even their forefathers were consuming indigenous fruits. Similar findings were shared by Ekesa *et al.* (2009) who highlighted that, indigenous fruits are often part of the traditional diet and culture and the subject of a body of indigenous knowledge regarding their use.

With reference to perceptions that indigenous fruits alleviate hidden hunger, the results showed that 53, 2% of the respondents shared the perception that indigenous fruits do alleviate hidden hunger and 46, 8% of the respondents did not believe so. The results revealed that, the majority of the respondents believed that indigenous fruits alleviate hidden poverty and this meant that, most of the people were bound to consume them. The results are consistent with several general

comparable findings of Legwaila *et al.* (2011), Jansen van Rensburg *et al.* (2004), Vorster *et al.* (2007), Maroyi, (2011), Schreckenberg *et al.* (2006), Oladele (2011), Kalaba (2007), Ekesa *et al.* (2009), Haule (2016) and Mithofer *et al.*, (2006) who reported that indigenous foods have the potential to manage hidden hunger and play a crucial role in household food security for the poorer rural people.

Contrary to popular belief that indigenous fruits are regarded as food for poor people, (Cloete & Idsardi, 2012; Modi *et al.*, 2006; Jansen van Rensburg *et al.*, 2007; Oladele 2011; Kalaba, 2007; Haule, 2016 ; Mithofer *et al.*, 2006; Ekesa *et al.*, 2009; Schreckenberg *et al.*, 2006), the results from the study revealed otherwise. For instance, it could be deduced from the findings of the study that, 58, 8% of the respondents did not believe that indigenous fruits are food for poor people and 41, 2% of the respondents believed that indigenous fruits are foods for poor people. The findings from the study suggested that respondents share positive perceptions with regards to the consumption of indigenous fruits.

Generally, most of the people share positive perceptions about the consumption of indigenous fruits and vegetables. This means that rural people still believe that indigenous fruits and vegetables have a potential contribution towards household food security. Given the positive perceptions shared by the rural communities, it is necessary to look at potential contribution of indigenous fruits and vegetables on household food security. This information is crucial in promoting the consumption of indigenous fruits and vegetables. The following section discusses the potential contribution of indigenous fruits and vegetables on household food security.

Discussion and conclusion

The aim of the study was to assess the awareness and perceptions rural households towards the existence of indigenous fruits and vegetables in Port St Johns of the Eastern Cape Province of South Africa. The study had three objectives; (1) to describe the availability of indigenous fruits and vegetables in rural areas of Port St Johns. (2) to assess the perceptions of rural households on consumption of indigenous fruits and vegetables. Descriptive statistics was used to answer the two objectives of the study. Household dietary diversity index, household food insecurity access scale.

With respect to objective one, the study noted that indigenous fruits and vegetables were abundantly available from the study area especially during summer.

The results of the study in the second objective revealed that, the majority of the people from the study area share positive perceptions towards indigenous fruits and vegetables. The most shared positive perceptions were that: (a) indigenous fruits and vegetables are nutritious, (b) they serve as a source of food, (c) they are cheaper and (d) have health benefits. However, there were some negative perceptions emerging from the results towards indigenous fruits and vegetables. The most shared negative perceptions were that: (a) indigenous fruits and vegetables are associated with poverty, (b) they are regarded as food for poor, (c) they are also regarded as women's foods, (d) in some incidences they are regarded as weeds and (e) lastly they are also considered as old fashioned foods.

The study concludes that indigenous fruits and vegetables were abundantly available in the summer season from the study area and positively perceived by a majority of the respondents, although some negative perceptions were noted in some areas. Several socio-economic factors namely: (gender, age, level of education, household size, garden size, access to formal markets and access to formal credit) were noted as possible drivers of indigenous fruits and vegetable consumption at household level

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List of references

- Abukutsa-Onyango, M.O., Adipala, E., Tusiime, G. and Majaliwa, J.G.M. 2010. Strategic repositioning of African indigenous vegetables in the Horticulture Sector. Paper presented at *Second RUFORUM biennial regional conference on “Building capacity for food security in Africa”*, 20 -24 September 2010, Entebbe, Uganda, 1413 - 1419.
- Adebooye, O.C. and Opadode, J.T. 2004. Status of Conservation of the Indigenous Leaf Vegetables and Fruits of Africa. *African Journal of Biotechnology*, 3(12):700 - 705.
- Cloete, P.C. and Idsardi, E. 2012. Bio-fuels and Food Security in South Africa: The Role of Indigenous and Traditional Food Crops. Paper presented at *International Association of Agricultural Economists Conference, 18 – 24 August, 2012, Foz do Iguacu, Brazil*, 1 – 30.
- Faber, M., Oelofse, A., Van Jaarsveld, P.J., Wenhold, F.A. and Jansen van Rensburg, W.J. 2010. African leafy vegetables consumed by households in the Limpopo and KwaZulu-Natal provinces in South Africa. *South African Journal of Clinical Nutrition*, 23(1): 30 - 38.
- Lewu, F.B. and Mavengahama, S. 2010. Wild vegetables in Northern KwaZulu Natal, South Africa: Current status of production and research needs. *Scientific Research and Essays*, 5(20): 3044 - 3048.
- Demi, S.M. 2014. *African indigenous food crops: Their roles in combatting chronic diseases in Ghana*. Unpublished Doctoral dissertation, University of Toronto, Canada. Available online: <https://search.proquest.com/docview/1650589683?pq-origsite=gscholar>. [Accessed on 15 March 2015].
- Dweba, T.P. and Mearns, M.A. 2011. Conserving indigenous knowledge as the key to the current and future use of traditional vegetables. *International Journal of Information Management*, 31(6): 564 - 571.
- Elago, S.N. and Tjaveondja, L.T. 2015. Socio-Economic Importance of two Indigenous Fruit Trees: *Strychnos Cocculoides* and *Schinziophyton Rautanenii* to the people of Rundu Rural

West Constituency in Namibia. *European Journal of Physical and Agricultural Sciences*, 3(2): 16 - 26.

Ekesa, B.N., Walingo, M.K. and Onyango, M.O. 2009. Accessibility to and consumption of indigenous vegetables and fruits by rural households in Matungu division, western Kenya. *African Journal of Food, Agriculture, Nutrition and Development*, 9(8): 1 - 14.

Flyman, M.V. and Afolayan, A.J. 2006. The suitability of wild vegetables for alleviating human dietary deficiencies. *South African Journal of Botany*, 72(4): 492 - 497.

Haule, M.J. 2016. Edible Indigenous fruits business, household income and Livelihoods of People of Songea District, Tanzania. *International Journal of Agriculture Innovations and Research*, 5(1): 2319 - 1473.

Hughes, C. 2006. Quantitative and qualitative approaches. *Warwick: University of Warwick*. *Google scholar*.

Jansen Van Rensburg, W. S., Venter, S. L., Netshiluvhi, T. R., Van Den Heever, E. and De Ronde, J. A. 2004. Role of indigenous leafy vegetables in combating hunger and malnutrition. *S. Afr. J. Bot*, 70(1): 52-59.

Kalaba, F.K. 2007. *The role of indigenous fruit trees in the rural livelihoods: a case of the Mwekera area, Copperbelt province, Zambia*. Unpublished Doctoral dissertation, Stellenbosch: University of Stellenbosch, Western Cape, South Africa.

Kepe, T. 2008. Beyond the numbers: Understanding the value of vegetation to rural livelihoods in Africa. *Geoforum*, 39(2): 958 - 968.

Legwaila, G.M., Mojeremane, W., Madisa, M.E., Mmolotsi, R.M. and Rampart, M. 2011. Potential of traditional food plants in rural household food security in Botswana. *Journal of Horticulture and Forestry*, 3(6):171-177

Majova, V.J. 2014. The rural-urban linkage in the use of traditional foods by peri-urban households in Nompumelelo community in East London, Eastern Cape. *Indilinga African Journal of Indigenous Knowledge Systems*, 13(1): 164 - 174.

- Maroyi, A. 2011. Potential role of traditional vegetables in household food security: A case study from Zimbabwe. *African Journal of Agricultural Research*, 6(26): 5720-5728.
- Mavengahama, S. 2013. *The role of indigenous vegetables to food and nutrition within selected sites in South Africa*. Unpublished Doctor of philosophy dissertation, Stellenbosch University, Western Cape Province, South Africa.
- Matenge, S.T., Van der Merwe, D., Kruger, A. and De Beer, H. 2011. Utilisation of indigenous plant foods in the urban and rural communities. *Indilinga African Journal of Indigenous Knowledge Systems*, 10(1):17 - 37.
- Mithöfer, D., Waibel, H. and Akinnifesi, F.K. 2006. The role of food from natural resources in reducing vulnerability to poverty: a case study from Zimbabwe. Paper presented at the 26th Conference of the International Association of Agricultural Economists (IAAE), 12 – 18 August 2006. Gold Coast, Australia, 1 - 14.
- Modi, M., Modi, A. and Hendriks, S. 2006. Potential role for wild vegetables in household food security: a preliminary case study in KwaZulu-Natal, South Africa. *African Journal of Food, Agriculture and Nutritional Development*, 6(1): 1 -13.
- Mpala, C., Dlamini, M. and Sibanda, P. 2015. The accessibility, utilisation and role of indigenous traditional vegetables in household food security in rural Hwange District. *International Open and Distance Learning Journal*, 1(3): 34 -49.
- Ntuli, N.R., Zobolo, A.M., Siebert, S.J. and Madakadze, R.M. 2012. Traditional vegetables of northern KwaZulu-Natal, South Africa: Has indigenous knowledge expanded the menu?. *African Journal of Agricultural Research*, 7(45): 6027 - 6034.
- Oladele, O.I. 2011. Contribution of indigenous vegetables and fruits to poverty alleviation in Oyo State, Nigeria. *Journal of Human Ecology*, 34(1):1 - 6.
- OR Tambo District Municipality. 2010. Integrated Development Plan Review 2010/2011. [Pamphlet]. Mthatha, South Africa.

Port St Johns Local Municipality. 2016. Integrated Development Plan Review 2016/2017. [Pamphlet]. Mthatha, South Africa.

Schippers, R.R. 2000. *African indigenous vegetables: an overview of the cultivated species*. Natural Resources Institute/ACP-EU Technical Center for Agricultural and Rural Cooperation, Chatham, UK.

Schreckenberg, K., Awono, A., Degrande, A., Mbosso, C., Ndoye, O. and Tchoundjeu, Z. 2006. Domesticating indigenous fruit trees as a contribution to poverty reduction. *Forests, Trees and Livelihoods*, 16(1): 35 - 51.

Shackleton, C. M. 2003. The prevalence of use and value of wild edible herbs in South Africa. *South African Journal of Science*, 99 (1): 23 – 25.

Smith, I. F. and Eyzaguirre, P. 2007. African leafy vegetables: Their role in the WHO's global fruit and vegetable initiative. *African Journal of Food Agriculture Nutrition and Development*, 7(3):1-17.

Taleni, V. and Goduka, N. 2013. Perceptions and Use of Indigenous Leafy Vegetables (ILVs) for Nutritional Value: A Case Study in Mantusini Community, Eastern Cape Province, South Africa. Paper presented at the *Proceedings of the International Conference on Food and Agricultural Sciences, 1 -12 October 2013. Melakaelaka, Malaysia*, 1 - 14.

Van Jaarsveld, P., Faber, M., Van Heerden, I., Wenhold, F., van Rensburg, W.J. and van Averbeke, W. 2014. Nutrient content of eight African leafy vegetables and their potential contribution to dietary reference intakes. *Journal of Food Composition and Analysis*, 33(1): 77 - 84.

Vorster, H.J., Van Rensburg, W.S.J., Stevens, J.B. and Steyn, G.J. 2008. The role of traditional leafy vegetables in the food security of rural households in South Africa. Paper presented at the *International Symposium on Underutilized Plants for Food Security, Nutrition, Income and Sustainable Development 806, 3 -7 March 2008, Arusha, Tanzania*, 23 - 28.

Van der Hoeven, M., Osei, J., Greeff, M., Kruger, A., Faber, M. and Smuts, C.M. 2013. Indigenous and traditional plants: South African parents' knowledge, perceptions and uses and their children's sensory acceptance. *Journal of ethnobiology and ethnomedicine*, 9(1): 61 - 78.

Wemali, E.N.C. 2014. *Contribution of cultivated African Indigenous Vegetables to agro-biodiversity conservation and community livelihood in Mumias Sugar Belt, Kenya*. Unpublished Doctoral Dissertation, Kenyatta University, Nairobi County, Kenya.