



Conserving indigenous knowledge as the key to the current and future use of traditional vegetables

T.P. Dweba^a, M.A. Mearns^{b,*}

^a Department of Agriculture, Animal Health and Human Ecology, University of South Africa, P.O. Box 392, Unisa 0003, South Africa

^b Department of Information and Knowledge Management, University of Johannesburg, P.O. Box 524, Auckland Park 2006, South Africa

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ABSTRACT

Indigenous knowledge erodes rapidly. When the loss of this knowledge negatively affects the lives and health of traditionally living rural communities, a drive to conserve indigenous knowledge becomes vital. This article argues that the transfer of indigenous knowledge on traditional vegetables will ensure the availability and utilisation of this important food source for resource-poor rural communities. Data collected on the present use of traditional vegetables at a rural Xhosa village in the Eastern Cape Province of South Africa documented indigenous practices of traditional vegetable use and measured attitudes and perceptions of young women. Findings revealed that although traditional vegetables are readily available, there is a decline in the use of traditional vegetables in this village. Since the loss of associated indigenous knowledge is a reality, and in view of the negative attitude towards traditional vegetables, future use of this valuable food source is threatened. The transfer of the associated indigenous knowledge holds the key to the potential future use of traditional vegetables. Altered perceptions of traditional vegetables are crucial for the conservation of the associated indigenous knowledge. As a result awareness campaigns to promote the use of traditional vegetables, related nutritional education, including proper cooking and preservation techniques are necessary.

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1. Introduction

"It is recognised that a major threat to the sustainability of natural resources is the erosion of people's knowledge, and the basic reason for this erosion is the low value attached to it. The erosion of people's knowledge associated with natural resources is under greater threat than the erosion of natural resources themselves" (Odora Hoppers, 2002, p. 7).

Indigenous knowledge involves knowledge about survival that is possessed by local people in their communities and is passed on from generation to generation (Kaya & Masoga, 2005). This knowledge is found in both rural and urban communities and deals with issues concerning the survival of the community, the protection and use of the local environment, and food security. Indigenous knowledge is found in different areas such as agriculture, social welfare, peace building and conflict resolution, medicine and food technology (Odora Hoppers, 2004). Indigenous knowledge is mostly undocumented and therefore at risk of being lost to future generations (Kaya & Masoga, 2005). Like many other types of indigenous knowledge systems the knowledge about traditional vegetables is vanishing and this situation warrants immediate action to retain or

regain it (Aphane, Chadha, & Oluoch, 2003, pp. 1–17). Traditional vegetables are gathered from both cultivated and uncultivated lands and the knowledge about traditional vegetables is passed on from generation to generation as part of the indigenous knowledge system of the community (Lwoga, Ngulube, & Stilwell, 2010). Traditional vegetables, which are edible plants that are used as vegetables, are part of traditional production systems and local knowledge. These plants have been used locally over a number of years, but did not necessarily originate in that particular area (Keller, Mndiga, & Maass, 2004, p. 288; Keller, Mndiga, & Maass, 2005, pp. 400–413). Indigenous vegetables are those edible plants that are biologically indigenous to an area, while introduced vegetables are those vegetables that have been introduced into a particular area and have not physiologically adjusted to the local conditions and subsequently require many agricultural inputs. Indigenous vegetables have adapted (indigenised) to local conditions after their introduction, with the result that they are considered as local. Examples of indigenised vegetables are maize, pumpkins and sweet potatoes (Laker, 2007, p. 311; Nesamvuni, 2000, p. 14). In this study the term 'traditional vegetables' is used to refer to both indigenous and indigenised vegetables, while the term 'introduced vegetables' refers to exotic vegetables that have not adapted to local conditions and require high inputs to thrive.

It is reported that in South Africa alone more than 100 different species of plants are used as traditional vegetables. The importance

* Corresponding author. Tel.: +27 11 559 4700; fax: +27 11 559 2822.
E-mail address: mearns@uj.ac.za (M.A. Mearns).

of traditional vegetables lies in their high nutritional value and their ability to thrive under adverse conditions (Lephole, 2004; Modi, Modi, & Hendricks, 2006; Nesamvuni, 2000; Van Vuuren, 2006, pp. 22–25). Traditional vegetables and traditionally grown crops grow well during drought periods and in areas with low or unreliable rainfall, which is the case in many parts of South Africa. Traditional vegetables can survive poor soils, require less inputs and resources during production and are often available at times when introduced vegetables such as spinach and cabbage are not. Traditional vegetables require less chemical fertilizers and pesticides since they have adapted well to local growing conditions (Lephole, 2004; Modi et al., 2006; Nesamvuni, 2000; Van Vuuren, 2006, pp. 22–25).

The consumption of traditional vegetables is decreasing – even in the rural areas of South Africa – in favour of introduced vegetables. The neglect by both policy makers and researchers has led to the scarcity of information on traditional vegetables (Aphane et al., 2003; Jansen van Rensburg et al., 2007, pp. 317–324). Since documentation on traditional vegetables is scarce, elderly people remain the most valuable sources of information. The fear exists that if nothing is done to conserve valuable information on traditional vegetables this information may soon disappear from society, because the youth are generally reluctant to gain such knowledge (Vorster, Jansen van Rensburg, Van Zijl, & Venter, 2007b). The youth's resistance to accepting indigenous knowledge is embedded in the negative attitudes associated with practices that appear outdated and unpopular, contrasted against perceived acceptable knowledge systems that have historically rejected indigenous knowledge systems. Through the global move to rediscovering indigenous knowledge and the systems that govern it, the practical and cognitive heritage of people around the world are regained to provide new insights into human society (Hountondji, 1977, p. 35).

This article argues that the transfer of indigenous knowledge on traditional vegetables will ensure that the availability and utilisation of traditional vegetables will be maintained as an important food source for resource-poor rural communities. Furthermore, the transfer of the indigenous knowledge associated with traditional vegetables to the younger generation holds the key to the potential future use of traditional vegetables.

2. Research design and methods

The argument of this article is supported by research findings from a study conducted at eMantlaneni village, approximately 40 km from the town of Lusikisiki in the Eastern Cape Province of South Africa. eMantlaneni village, a traditional Xhosa village, was selected as a study area because it is fairly isolated and it is known as an area where traditional vegetables have commonly been utilised frequently, a fact confirmed during the scoping visit. Lusikisiki is linked to the village with a gravel road that makes it difficult to access during the rainy season. This remoteness of the area is believed to boost traditional vegetable usage due to the inaccessibility of introduced fresh produce at vegetable markets (Jansen van Rensburg et al., 2007, p. 318). The research question of the study was to determine the availability of traditional vegetables in this village and to assess the current and possible future utilisation of traditional vegetables as a food source. Some of the objectives of the study were the documentation of indigenous knowledge associated with traditional vegetables and the related attitudes of younger women towards traditional vegetable use.

The study followed the structural functionalism theory suggested by Babbie (2008, p. 39). It is a philosophical paradigm that stresses the interrelatedness of different parts of a system in achieving a common goal. In this study elderly women were regarded as fundamental sources and repositories of indigenous knowledge while younger women's attitudes towards traditional vegetables

were regarded as a major determinant of the potential use of traditional vegetables in the future. Women were selected due to their traditional role in household chores and cooking. A combination of qualitative and quantitative data collection methods was used in the study to complement the weakness of one method with the strengths of the other.

Data were collected on the present use of traditional vegetables and the potential for future use of the vegetables. A triangulated approach using questionnaires and focus group discussions with 38 women aged 50 and above was employed, and the sample was selected through snowball sampling. The elderly women are regarded as custodians of indigenous knowledge associated with traditional vegetables based on their utilisation and preservation practices of traditional vegetables. Two focus group discussions were conducted to determine the beliefs and attitudes of 16 younger women, randomly sampled, on their use of traditional vegetables. The aim was to get an indication of the potential future use of traditional vegetables.

The traditional vegetables were collected and taken to the South African National Biodiversity Institute (SANBI) for scientific identification as they had been identified by their vernacular names in the village. Some of the villagers, mostly the elderly women, assisted in collecting the vegetables. The plant samples were collected using herbarium procedures as suggested by Fish (1999, p. 7). The challenges in collecting plant samples appear to relate indirectly to the loss of indigenous knowledge.

3. Loss of indigenous knowledge

Several research works have indicated that indigenous knowledge of traditional vegetables is diminishing in communities (Flyman & Afolayan, 2006, pp. 492–497; Jansen van Rensburg, Vorster, Van Zijl, & Venter, 2007, pp. 317–326; Keller et al., 2005, pp. 400–413; Lwoga et al., 2010, p. 13; Musinguzi, Kikafunda, & Kiremire, 2006, pp. 1–14). The loss of indigenous knowledge results in reduced consumption of traditional vegetables, which contributes to the lack of diet diversity. This ultimately translates into food insecurity and micronutrient deficiency, especially among poor communities (Flyman & Afolayan, 2006, pp. 492–497). Different factors have contributed to the loss of knowledge about traditional vegetables. These include the introduction of new vegetables, politics, changes in lifestyle, the stigma associated with the use of traditional vegetables and habitat loss (Keller et al., 2005, pp. 400–413).

3.1. Introduction of new vegetables

The introduction of new vegetables has been cited as one of the causes for the loss of knowledge about traditional vegetables. The new vegetables are widely promoted by agricultural research and extension, thus leading to the complete substitution of traditional vegetables (Jansen van Rensburg, Vorster, et al., 2007, pp. 1–13; Keller et al., 2005, pp. 400–413). Newly introduced vegetables also provide monetary value for the farmers since they are very popular and can be easily marketed. Farmers are therefore more enthusiastic about the cultivation of these 'new' vegetables than traditional vegetables that are not easy to market to large populations (Keller et al., 2005, pp. 400–413; Musinguzi et al., 2006, pp. 1–14).

3.2. Historical policies

Politics have been reported to play a significant role in the loss of indigenous knowledge about traditional vegetables. Through agricultural and health policies introduced vegetables have been promoted for both cultivation and consumption purposes at the expense of traditional vegetables (Aphane et al., 2003; Jansen van

Rensburg, Vorster, et al., 2007, pp. 317–324). It has been reported that in some instances exceptional catchphrases have been created to market exotic vegetables, thus influencing farmer's choices of vegetables for cultivation. Moreover, laws have been put in place to prohibit people from entering forests for activities such as collecting firewood and grazing animals. Consequently, this has had a direct impact on the accessibility to those traditional vegetables that are only collected while tending grazing animals and gathering firewood in the forests (Keller et al., 2005, p. 407). This suggests that if similar attention and support were to be given to traditional vegetables in agricultural and health policies, the loss of traditional vegetable knowledge could be minimised, which would help to increase their use. Furthermore, laws regarding entering forests could be more lenient because some traditional vegetables only grow in forests. Therefore, in areas where entrance is prohibited by certain legislation the harvesting of these vegetables could be negatively affected.

3.3. Stigma attached to the use of traditional vegetables

Negative attitudes towards the use of traditional vegetables have also been cited as one of the reasons that contribute to the loss of knowledge about traditional vegetables. In most areas traditional vegetables are associated with poverty and primitiveness. As a result most people, especially the youth, have stopped using traditional vegetables because they do not want to be labelled as backward (Jansen van Rensburg et al., 2007, p. 9; Shava, 2000, p. 28).

3.4. Changes in lifestyle

Changes in lifestyle have also contributed to the loss of knowledge regarding traditional vegetables. It is reported that in the past women collected most traditional vegetables in the forests and along river banks while they were gathering firewood. This form of collection is on the decline and is often no longer practised due to the current availability and use of alternative forms of fuel. People visit forests less frequently and this leads to changes in the type of food that is being collected, accessed and utilised (Keller et al., 2005, p. 407; Shava, 2000, p. 28).

3.5. Habitat loss

Owing to deforestation and the clearing of land near homesteads for farming, natural vegetation, which includes traditional vegetables that are found in the wild, is rapidly disappearing. This situation has had a negative impact on the variety of wild vegetables that are available and has caused the deterioration of the associated indigenous knowledge (Keller et al., 2005, p. 407). Availability was mentioned as one of the key aspects that determines what is eaten. In a study by Viljoen, Botha, and Boonzaier (2005, p. 56) unavailability was specifically mentioned as one of the reasons why people do not consume traditional vegetables. In order to understand people's patterns of consumption, their food behaviour and attitudes towards food need to be clarified.

4. Food behaviour and attitudes

The term 'food behaviour' is used to refer to people's habits in utilising food, and includes the collection, storage, preparation and consumption of food. Maslow's theory of needs explains that people eat for survival before progressing to eat for status and self-actualisation. People tend to address the needs that are at the bottom of the hierarchy before advancing to needs that are at the higher level of the hierarchy. The need to survive is the most fundamental need of all the needs and is mostly determined by the

availability at that specific time. Once this immediate need is met, the next one is the social need for security, which includes the storing of food for future use. Next in the hierarchy is the need for belonging, which urges people to choose food that is eaten and accepted by the social group. In a way food is believed to provide comfort and express cultural identity (Kittler & Sucher, 2000, pp. 3–4; Parraga, 1990, pp. 661–663).

Sometimes food choices are influenced by culture and people's beliefs about certain food. By and large, beliefs stem from health or religious reasons, but some are motivated by religious convictions only (Parraga, 1990, pp. 661–663). Food is also used to define status, which often leads to a change in food consumption patterns when people stop eating their ordinary food because it is associated with low status and adopt food that is thought to endow them with greater social standing. This attitude becomes more significant in social gatherings where people would only eat what is considered to be appropriate. The last reason why people choose certain food is to meet self-actualisation needs by experimenting with foods of different ethnic or economic groups based on personal preference (Kittler & Sucher, 2000, pp. 3–4; Parraga, 1990, pp. 661–663).

5. Traditional vegetable use

Humans' use of traditional vegetables has been reported all around the world. For centuries traditional vegetables have constituted a substantial part of the African diet. The vegetables and their edible parts vary from one region to the other. In some areas people choose to eat leaves and in some they prefer the seeds, flowers or tubers, depending on the type of indigenous plant and the area or region. The edible parts are mostly cooked as stews, soups or relishes (Keith, 1992, pp. 17–20). In a study conducted in the Rukungiri district in Uganda, 34 plants were identified as traditional vegetables (Musunguzi et al., 2006, pp. 1–14). At the time of their study, Adebooye and Opabode (2004, pp. 700–705) confirmed that there were about 397 different species of traditional vegetables in Africa.

Apart from these vegetables there are several other vegetable species that are consumed in different parts of South Africa. Shava (2000, p. 58) identified 78 species in a conducted at Tuku village in the Eastern Cape, while Nesamvuni (2000:11) identified 53 species of traditional vegetables that are eaten by the VhaVenda, a cultural grouping of people that live in the Venda region in the Limpopo Province of South Africa.

Concern has been expressed about the decline in the consumption of these vegetables. Traditional vegetables are currently neither widely consumed nor produced in large quantities because people are not aware of their nutritional value and westernisation has led to a negative perception of these vegetables. Research scientists and policy makers have neglected traditional vegetables, with the result that too little or no information is available on their uses, cooking methods and nutritional value or the bioavailability of nutrients they contain. Recent research indicates that there are a number of traditional vegetables that could help to alleviate the inadequate intake of nutrients that has resulted from the inaccessibility of introduced vegetables to households (Lephole, 2004; Modi et al., 2006; Nesamvuni, 2000; Uusiku, Oelofse, Duodu, Bester, & Faber, 2010; Van de Heever, 1995; Van Vuuren, 2006). The decline in the consumption of traditional vegetables can also be attributed to a decrease in the variety of traditional vegetables and fruits that are available. It can therefore be seen that there are a number of environmental, political and socio-economic reasons that lie at the heart of indigenous knowledge loss with regard to traditional vegetables (Adebooye & Opabode, 2004, pp. 700–705).

It is documented that traditional vegetables are not only used as food sources but also as medicinal sources (Ezebilo, 2010, p. 3). They are believed to have antibacterial properties, and to contain

antioxidants, which help to promote good health by assisting in the prevention of cancer and hypertension. Their role is not only dietary, but also therapeutic, as they may help to stimulate the immune system and generate tissue (Flyman & Afolayan, 2006, pp. 492–497).

In south-west Nigeria traditional vegetables have also been reported to play a vital role in generating income for communities because these vegetables are sold at prices much higher than their introduced counterparts, particularly during dry seasons. This is especially significant in view of the fact that these vegetables need very little inputs during production (Adebooye & Opabode, 2004, pp. 700–705). It has also been reported in Limpopo, KwaZulu-Natal and the Eastern Cape that traditional vegetables are sold to generate income for households (Jansen van Rensburg, Vorster, et al., 2007, pp. 317–324; Nesamvuni, 2000).

Traditional vegetables are also used as traditional medicine. Adebooye and Opabode (2004) listed 24 indigenous leafy vegetables that are used for medicinal purposes. In Lesotho 43.7% of the respondents of a study conducted by Lephole (2004, p. 38) mentioned that they had used certain traditional vegetables to treat hypertension and diabetes.

The benefits that traditional vegetables offer communities as a food source, medicinal source and source of income validate the need to determine current use and investigate the potential of future use. The conservation of the associated indigenous knowledge is vital for the processing and preservation of traditional vegetables. Furthermore, it is vital to transfer the indigenous knowledge to younger women to ensure that the utilisation of traditional vegetables continues. The attitudes of specifically young people towards traditional vegetables determine the potential for future use of these vegetables as a food source.

6. Traditional vegetables at eMantlaneni

The demographic data reported for the village indicates that the majority of households in this village could benefit considerably from traditional vegetables as they provide households with a cheap alternative source of food. Most households in this village are regarded as very vulnerable to food insecurity because the households are very large (more than six people), their income is low and they are female-headed. According to the Department of Agriculture (2002, pp. 22–26), larger households usually translate to few-income earners and higher dependency rate, which in turn has a negative impact on money available to each household. Since the production of traditional vegetables requires less monetary input than introduced vegetables, it could play a significant role in ensuring greater food security in these households.

6.1. Availability of traditional vegetables at eMantlaneni

A total of 33 traditional vegetables were reported to be available at eMantlaneni village. They are listed in Table 1. However, during the collection of specimens the exact number of vegetables that were available in the study area could not be confirmed, because not all the vegetables could be obtained. Out of the 33 traditional vegetables that were identified 30 were found to be growing in and around the village at the time of the proposed specimen collection. They were subsequently collected for botanical identification.

After they had been collected the traditional vegetables were grouped into three categories in terms of accessibility. There were vegetables that were found in abundance (8 out of 30) within 1 km from the households, some (11 out of 30) were found growing sparsely at an approximate distance of 5 km, while some were scarcely found about 10–15 km away from the households (11 out of 30). Accessibility and availability could be the major factors that

might have contributed to the reduced use of traditional vegetables. One of the reasons that leads to reduced consumption of traditional vegetables is reluctance to walk long distances to gather vegetables, as mentioned in studies conducted by Keller et al. (2005, p. 410), Viljoen et al. (2005, p. 56) and Jansen van Rensburg, Vorster, et al. (2007, pp. 8–9). This was also found to be the case at eMantlaneni.

The availability of vegetables is mostly seasonal. Out of the total reported available vegetables only seven are available throughout the year (Table 1). Out of the 33 traditional vegetables that were identified only nine vegetables were used by 60% of the 38 participants. Table 1 also shows parts eaten and the frequency of use per vegetable. In terms of parts eaten, participants reported that they eat mainly the leaves with the exception of a few vegetables whose fruits are also eaten.

6.2. Cultivation of traditional vegetables at eMantlaneni

Eighty-five per cent of traditional vegetables found in eMantlaneni grow naturally and are not cultivated (Table 1). Labadarios et al. (2000, p. 533) found in their study that people who grew their own vegetables had a higher intake of minerals and vitamins. Therefore, the cultivation of traditional vegetables is highly recommended as it provides reliable access to nutritious food. The cultivation of traditional vegetables seems to be a common practice in eMantlaneni village. About 77% of respondents indicated that they cultivated one or two kinds of traditional vegetables at their homes. However, only five traditional vegetables out of a possible 33 were cultivated in eMantlaneni. Echoing the reason given in a previous study (Jansen van Rensburg, Vorster, et al., 2007, p. 324), the major reason given by respondents (67%) for not cultivating these vegetables was that most traditional vegetables are readily available. However, owing to habitat loss the availability of traditional vegetables is not guaranteed (Keller et al., 2005, p. 407; Viljoen et al., 2005, p. 56). During the collection of specimens for herbarium identification the importance of cultivating traditional vegetables to ensure reliable access became evident. The main reason (63%) respondents gave for not cultivating the rest of the traditional vegetables is a lack of knowledge. Therefore, more research regarding the cultivation of traditional vegetables is warranted in order to impart appropriate cultivation practices to communities.

The fact that only a few kinds of traditional vegetables are cultivated in the village could have a negative impact on the future availability and accessibility of some traditional vegetables. This was confirmed by the fact that some of the vegetables that were identified by the participants could not be found in the village despite extensive searches. The absence of these vegetables could be attributed to seasonality, but could also be as a result of habitat loss. It is clear that the availability of traditional vegetables is diminishing, which is in agreement with the findings of a study by Jansen van Rensburg, Vorster, et al. (2007, pp. 8–9).

6.3. Cooking and preservation of traditional vegetables at eMantlaneni

The method used to prepare traditional vegetables at eMantlaneni village was mostly reported as boiling the leaves in large quantities of water. Once the vegetables were cooked, the excess water was drained and discarded. This cooking method is likely to cause nutrient loss, especially where the water soluble vitamins such as vitamin B complex and vitamin C are discarded with the drained water (Den Hartog, Van Staveren, & Brouwer, 2006, pp. 69–70; Flyman & Afolayan, 2006, p. 494). In general, only this one method is used to prepare traditional vegetables in the village. This lack of variety could make the traditional vegetables less appealing especially among the youth, thus contributing to reduced

Table 1
Utilisation patterns of traditional vegetables at eMantlaneni village.

Traditional name and botanical name of traditional vegetable	Parts eaten; L = leaves, F = fruit	Percentage respondents utilise vegetable (%) <i>n</i> = 38	Availability; distance from village in kilometres (km)	Available through year; A = annual, S = seasonal	Cultivated (C); naturally occurring only (N)
1. Gcamche/ <i>Obetia tenax</i> (N.E.Br.) Friis	L	97.4	<1	S	C
2. Nomdlom-boyi/ <i>Amaranthus viridis</i> L.	L	94.7	<1	S	N
3. Umhlaban-gulo/ <i>Bidens pilosa</i> L.	L	92.1	<1	S	N
4. Irhwaba/Ihlaba/ <i>Sonchus oleraceus</i> L.	L	76.3	1–5	S	N
5. Ububazi/ <i>Laportea penduncularis</i> (Wedd.) Chew subsp. <i>penduncularis</i>	L	73.7	<1	A	C
6. Umsobo/ <i>Solanum chenopodioides</i> Lam	L	68.4	1–5	S	N
7. Iwatane (botanical name unidentified: poor specimen condition)	L; F	65.8	10–15	A	N
8. Imithwane/ <i>Curcubita moschata</i> (Duch. Ex Lam)Duch. Ex Poir	L; F	65.8	<1	S	C
9. Uswelentaka/ <i>Physalis peruviana</i>	L	60.5	<1	S	C
10. Iguzu/Beruala thunbergii (DC.)H. Wolff	L; F	42.1	1–5	S	C
11. Uchaphazana/ <i>Momordica foetida</i> Schumach	L	28.9	10–15	A	N
12. Isiqashomba/ <i>Erucastrum strigosum</i> (Thunb)O.E.Schulz	L	26.3	1–5	S	N
13. Uvel 'egoli/uvel'emampondweni/ <i>Galinsoga parviflora</i>	L	23.7	<1	S	N
14. Imbuya/ <i>Amaranthus lividus</i> L.	L	23.7	1–5	S	N
15. Uqudalele/ <i>Hypochaeris radicata</i> L.	L	21.1	10–15	A	N
16. Imbiki-cane/ <i>Chenopodium giganteum</i> D. Don	L	15.8	<1	S	N
17. Impontshani/ <i>Polycarpon tetraphyllum</i> (L.)L.	L	15.8	1–5	S	N
18. Nongob-ozana/ <i>Centalla asiatica</i> (L.) Urb.	L	13.2	1–5	S	N
19. Indlwabulele/ <i>Cotula australis</i> (Spreng) Hook. F.	L	13.2	1–5	A	N
20. Ufinywane/ <i>Stachys</i> sp.	L	13.2	10–15	S	N
21. Intebe/ <i>Zantedeschia aethiopica</i> (L.)Spreng	L	13.2	10–15	S	N
22. Uhlalani (botanical name unidentified: poor specimen condition)	L	10.5	10–15	S	N
23. Ucholachola (botanical name unidentified: poor specimen condition)	L	10.5	10–15	S	N

Table 1 (Continued)

Traditional name and botanical name of traditional vegetable	Parts eaten; L = leaves, F = fruit	Percentage respondents utilise vegetable (%) n = 38	Availability; distance from village in kilometres (km)	Available through year; A = annual, S = seasonal	Cultivated (C); naturally occurring only (N)
24. Intsheb'ebhokwe (botanical name unidentified: poor specimen cond.)	L	7.9	1–5	S	N
25. Jikeleza/ <i>Lactuca serriola</i> L.	L	7.9	10–15	S	N
26. Umdende/ <i>Rumex sagittatus</i> Thunb	L	5.3	10–15	A	N
27. Itshon-gwe/ <i>Pachycarpus</i> sp.	L	5.3	10–15	S	N
28. Ubazana/ <i>Drouguetia ambigua</i> Wedd.	L	5.3	10–15	A	N
29. Inkanga/ <i>Conyza sumatrensis</i> (Retz.) E. Walker var. <i>Sumatrensis</i>	L	2.6	1–5	S	N
30. Unabakuse (botanical name unidentified: specimen not collected)	L	2.6	^a	S	N
31. Ityumbembe (botanical name unidentified: specimen not collected)	L	2.6	^a	S	N
32. Umyeyane (botanical name unidentified: specimen not collected)	L	2.6	^a	S	N
33. Incoban-cobana/ <i>Tetragonia</i> sp.	L	2.6	1–5	S	N

^a Vegetable completely unavailable at time of specimen collection.

usage (Vorster, Jansen van Rensburg, Van Zijl, & Venter, 2007a, p. 9).

Preservation of traditional vegetables helps to ensure food availability during the dry season (Bhat & Rhubuluz, 2002, p. 95; Vorster et al., 2007a, p. 9). However, since preservation, like the rest of other food processing methods, largely affects the nutrient composition of food, especially vegetables, more suitable processing methods need to be used (Flyman & Afolayan, 2006, pp. 494–495). In eMantlaneni village, drying is the only method reported to preserve traditional vegetables. This finding can be compared to that of Vorster et al. (2007a, pp. 1–13), namely that all the Xhosa households who participated in their study dried vegetables without blanching them first. Although the drying of traditional vegetables is widely practised in eMantlaneni village (82% of the respondents), the actual drying process used raised some serious concerns regarding the retention of nutrients. When green vegetables are dried in direct sunlight without prior blanching much of the nutrients are destroyed (Flyman & Afolayan, 2006, pp. 494–495). The villagers' lack of knowledge about this matter may be attributed to the loss of knowledge regarding the drying of vegetables that was also reported by Vorster et al. (2007a, p. 7).

Dried vegetables are mostly used to prepare a porridge dish mixed with vegetables called isigwampa. The finding that this dish is unpopular among the youth and the men could have a negative impact on food security during times when households rely on dried vegetables. This means that although drying makes it possible for vegetables to be available in the dry season, some members of the community might prefer not to consume them. Findings by Vorster et al. (2007a, p. 6), Nesamvuni (2000, p. 89), Nguni and

Mwila (2007, p. 12) indicate that dried traditional vegetables were also used to make a relish called ilaxa, a dish found to be favoured by the men and the youth. However, at eMantlaneni dried vegetables were generally not used to prepare ilaxa.

7. Young women's knowledge of and attitudes to the use of traditional vegetables

In this study elderly women were found to be more knowledgeable about the number of traditional vegetables that were available at eMantlaneni village when compared to young women who participated in the study. Older women identified 33 traditional vegetables while young women only identified five traditional vegetables. These findings on the younger generation's knowledge of traditional vegetables corroborate previously published literature as reported by Odhav, Beekrum, Akula, and Baijnath (2007, p. 430), Modi et al. (2006, p. 9), Lephole (2004, p. 80) and Vorster et al. (2007b, p. 6). This finding is contrary to that of a study conducted by Shava (2000, pp. 23–25) in the Eastern Cape region where the younger generation were found to have extensive knowledge of traditional vegetables. According to Vorster et al. (2007a, p. 6) the labelling of traditional vegetables as 'poverty food' and as indicative of being 'backward' is the reason why the youth are not keen to learn about these vegetables. Disparities in the younger generation's level of knowledge of traditional vegetables could have been due to the fact that Tuku village, where Shava conducted his study, is characterised by close bonds between the elderly and the younger generation, making it possible for the transfer of knowledge to be easier due to an intact traditional culture (Shava, 2000, p. 25).

It appears that the consumption of traditional vegetables by the younger generation is decreasing at eMantlaneni. Young women indicated that they only consume two out of the 33 traditional vegetables identified by the elderly women. This is in agreement with findings by Vorster et al. (2007a, p. 6, 2007b, p. 3), Modi et al. (2006, p. 9) and Keller et al. (2005, p. 407) where members of the younger generation showed lower levels of appreciation for traditional vegetables. According to these aforementioned studies, the decreased consumption of traditional vegetables is largely attributed to the introduction of vegetables and a change in food preferences, which in practice translates to a change in food habits. A change in lifestyle is another factor that is reported to be responsible for the decrease in the consumption of traditional vegetables by the youth. Young people are allegedly no longer keen to walk long distances to gather vegetables, neither are they willing to go to the forests to gather firewood (Keller et al., 2005, p. 407; Shava, 2000, pp. 28–29). Furthermore, education and urbanisation also contribute to the negative perception of traditional vegetables mainly by instilling new values and attitudes among the youth at the expense of their cultural norms (Shava, 2000, pp. 34–35). The reduced consumption of traditional vegetables is a major concern as it is the first sign that their survival as a food source is threatened (Keller et al., 2005, pp. 410–411).

The young women of eMantlaneni's negative attitude towards traditional vegetables emerged in the focus group discussions in which they participated. Several statements from the focus group, such as that they preferred modern foods and that they associated traditional vegetables with rural communities and the older generation, suggest that they do not perceive traditional vegetables as a preferred food choice. Furthermore, the fact that traditional vegetables are less often included in their diets than introduced vegetables and the finding that they associate traditional vegetables with poverty forecasts a bleak future for the consumption of traditional vegetables in this village. Moreover, participants indicated that it would be inappropriate to serve traditional vegetables at social gatherings attended by visitors. According to Kgaphola and Viljoen (2000, pp. 20–21) only foods that are considered to display prestige and high status are served at important occasions or to guests, showing that these dishes are not highly valued. The perception among the young that traditional vegetables should not be served to guests strengthens the view that their attitude to the use of traditional vegetables is negative. This confirms previous research by Vorster et al. (2007a, p. 2, 2007b, p. 3), Keller et al. (2005, p. 407) and Shava (2000, p. 34) that found that the youth associate traditional vegetables with famine and poverty. Participants also indicated that they would not eat the traditional vegetables at social gatherings, which further brings to the fore the issues of status as mentioned by Kittler and Sucher (2000, pp. 3–4), that at social gatherings people often eat what is associated with upward mobility.

8. Conclusion

Given the demographic characteristics of the majority of families in this study, such as lower incomes, large families and the fact that most of the households are female-headed, traditional vegetables could play a major role in achieving food security. They could provide families with alternative sources of nutrients that are cheaper and easily accessible.

There is evidence that shows that the consumption of traditional vegetables is declining in eMantlaneni. This suggests that there is a need for awareness campaigns which could help to re-create awareness, which in turn could increase knowledge, status and utilisation.

Furthermore, the results obtained from this study show that nutrient loss is likely to occur due to improper cooking practices such as the use of too much water when boiling the traditional vegetables. There is a need to conduct a nutritional analysis of the cooked traditional vegetables in order to establish whether nutrition education which includes proper cooking methods is required. This will promote user confidence and greater general utilisation of traditional vegetables.

The data suggests that there is a lack of variety in the cooking methods. This could cause traditional vegetables to be boring and consequently less appealing. Variety in the preparation of traditional vegetables is recommended. It is suggested that recipes used by different ethnic groups be made available to the women of this community, since it is believed that access to a greater variety of cooking methods would increase the inclusion of traditional vegetables in their diets, thus increasing diet diversity.

In eMantlaneni there is also limited knowledge of the cooking of dried vegetables. For example, dried vegetables are only used to prepare the porridge-mixed dish. This raises concerns, as participants stated that the youth and the men prefer a relish to the porridge. Therefore, more education on the cooking of the dried vegetables is warranted, since it could increase the general accessibility to and utilisation of traditional vegetables.

The results of the study further suggest that there is a lack of knowledge pertaining to the appropriate drying practices for traditional vegetables. To prevent the loss of nutrients, proper drying practices need to be investigated so that this knowledge can be imparted to the community. In addition to that, other alternative preservation techniques need to be explored to increase availability of traditional vegetables.

It is recommended that future research efforts include a nutritional assessment of the community's food intake to enable researchers and policy makers to recommend and design appropriate intervention strategies. The actual cooking practices with traditional vegetables need to be investigated and a nutritional analysis of a broad spectrum of uncooked, cooked and preserved traditional vegetable dishes need to be done to determine their actual nutrient contribution.

These findings, although directly related to the study area, are not necessarily relevant to the study area only, but have international relevance. Studies conducted on indigenous knowledge conservation should go beyond merely documenting the indigenous knowledge. Alternative systems to conserve the indigenous knowledge such as databanks, technology-based repositories in the form of recordings and internet-based portals have proved to be valuable in conserving indigenous knowledge. The specific contribution of this study towards the conservation of indigenous knowledge recognises the value of the original indigenous knowledge system, namely the transfer of indigenous knowledge to the younger generation as the future custodians of the indigenous knowledge. Research to determine potential future custodians' attitudes towards the application of the indigenous knowledge will provide valuable insight into the curbing of the loss of indigenous knowledge.

Odora Hoppers (2002, p. 7) contended that the erosion of people's knowledge is at the core of the erosion of natural resources. From this study the authors dare to attribute the negative attitudes towards indigenous practices as the most significant reasons for the erosion of indigenous knowledge about traditional vegetables.

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Tuliswe Dweba is a junior lecturer in the Department of Agriculture, Animal Health and Human Ecology at the University of South Africa. She lectures undergraduate courses in food processing, food preservation and community nutrition. Her research interests include alleviation of food insecurity through food-based strategies.

Dr. Martie Mearns is a senior lecturer in the Department of Information and Knowledge Management at the University of Johannesburg. She lectures both undergraduate and postgraduate courses in knowledge management, competitive intelligence and research methodology. Her research interests include the conservation of indigenous knowledge specifically through cultural tourism and the management of information and knowledge within a variety of industries.