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Lexicalisation of crop names in Bena, Hehe, and Sangu societies of Tanzania

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ABSTRACT

This paper examines the names of crops in the Bantu languages Bena, Hehe, and Sangu. This was sparked by the realisation that certain crops are native to Africa while others were introduced to inland Bantu languages through interactions with coastal communities. Coastal communities acquired these crop names from Asian and European languages before presenting them to the interior regions. The theory of lexicalisation guided this study to account for the nativisation and coinage of crop names. Data were collected through fieldwork in Iringa, Njombe and Mbeya regions. Five elderly speakers of each language were acquired through purposive and snowball sampling techniques. The study found three layers of crop names among Bena, Hehe, and Sangu: one crop with a single name among the three languages, one crop with different names in the three languages, and one crop with multiple names within a single language. Additionally, the study found that the three languages lexicalise crop names by coining expressions and borrowing from Kiswahili. Coinage of expressions was achieved through semantic extension and adjustments of previously existing words or crop names. The study extends the theory of lexicalisation by examining how borrowing, semantic extension, and cultural integration influence crop naming in Bantu languages.

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1. Introduction

The paper's contribution surrounds naming crops in the Bantu languages Bena, Hehe, and Sangu spoken in the Southern Highlands of Tanzania. The first intent emanates from previous research that has shown that there are crops indigenous to Africa (Chami, 2021), and their names are common across the Niger-Congo area (Bostoen, 2006, 2007; Lusekelo, 2016). The paper aims to identify crop names that are primarily common across the three languages and compare them with crop names attested in neighbouring languages, namely Kinga, Kisi, Luguru, Matengo, Ngoni, Pangwa, and Wanji.

The second contribution surrounds the penetration of names of crops from national and official languages into minority languages in African settings. Research has shown that names of crops penetrated the Tanzanian languages from Asian and European languages through Kiswahili (Lusekelo, 2016; Rockel, 1997). In Tanzania, schooling and the establishment of Government institutions enabled the penetration of Kiswahili names of crops into Tanzanian languages (Lusekelo, 2020). In the course of examining names of crops among the speakers of Bena, Hehe, and Sangu, we account for the penetration of Kiswahili names into these languages. In the process, we invoke the theory of lexicalisation to account for the nativisation of the Kiswahili names in Bena, Hehe, and Sangu.

In the process of nativisation of words of foreign origin, usually, two mechanisms appear to be involved. On the one hand, an existing name of another crop or wild plant is extended to a particular

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new crop (Lusekelo, 2016). Alternatively, a semantic extension of the newly borrowed name is also attested (Lusekelo, 2020). In the realm of the theory of lexicalisation, the coinage of names is employed as one of the principles of forming new words (Brinton & Traugott, 2005). In the data analysis stage, we outline the coinages of names of crops in the three Bantu languages.

Therefore, this study is important in understanding the native crop names in Bena, Hehe, and Sangu, as well as the effects of language contact on lexical items, specifically crop names. Based on this study's significance and motivation, the study intended to answer the following research question: How do Bena, Hehe, and Sangu lexicalise crop names and what does this reveal about language contact and nativisation? Accompanied by this research question were two objectives: to examine crop names across the three study languages and to investigate the Bena, Hehe, and Sangu crop names lexicalisation strategies and the impact of interaction with Kiswahili. Two terminologies, lexicalisation and semantic extension, have been used extensively in this study. For the purposes of this research, lexicalisation refers to the creation of new words or expressions, while the semantic extension is the expansion of the meaning of an existing word.

2. The study societies

The current study was conducted through fieldwork in three regions where the Bena, Hehe, and Sangu reside and speak their languages. The choice of three regions was based on the purpose of the study, which was to examine the lexicalisation of crop names among closely related Bantu languages. Specifically, the selected study societies are found in the Southern Highlands zone of Tanzania (National Bureau of Statistics Ministry of Finance & Iringa Regional Secretariat, 2013; National Bureau of Statistics Ministry of Finance & Planning & Mbeya Regional Secretariat, 2018; National Bureau of Statistics Ministry of Finance & Planning & Njombe Regional Secretariat, 2020). It was envisaged that these societies could be sharing similar crop names because of geographical adjacency (Mumford, 1934) and similar history of crop cultivation that is tied to their adaptation to the local environment, social structures, and external influences like trade, migration, colonialism, and religious missions (Iliffe, 1979; Redmayne, 1968; Winans, 1965, 2002).

To begin with, the Bena are found in Njombe Region (before 2012, Njombe District of Iringa Region). For this group, the study was conducted in Njombe District Council (Njombe DC), specifically in Lupembe Ward where Bena is predominantly spoken as was suggested by native speakers. Furthermore, Lupembe Ward was representative of the two prestigious dialects of the language (Morrison, 2011, 2015): the dialect spoken around Mdandu Village (northwest) and the dialect spoken around Lupembe Village (far east of Bena speaking area)[1]. The historical significance of Mdandu as a cultural hub and Lupembe as a centre of missionary activities is believed to contribute to the prestige of these two dialectal regions among the Bena.

In terms of livelihood, the indigenous Bena engage in food and cash crop production and small-scale livestock keeping, especially dairy farming. Maize, Irish and sweet potatoes, beans, cowpeas, bananas, vegetables and fruits are their food crops, while the cash crops include tea, coffee, tree farming, wheat, pyrethrum, and fruits. This demonstrates that the introduction of cash crops during colonisation influenced Bena's style and production methods. Historically, before colonisation, the Bena practised shifting cultivation and grew staple crops similar to Hehe, such as maize, millet, beans, and sorghum (Iliffe, 1979; Winans, 2002). In addition to staple crops, the Bena were renowned for cultivating cassava, yams, and bananas, benefiting from their varied climatic zones (Iliffe, 1979; Monson, 2000).

Similarly, the Hehe are primarily based in Iringa Region and Hehe is particularly spoken in four districts: Mufindi, Iringa Urban, Iringa Rural, and Kilolo (Languages of Tanzania Project (LOT), 2009). For this group, the study was conducted in Mufindi District, where Maduma Ward and Wangamaganga Village were selected for fieldwork. The selection was based on recommendations from native speakers, who identified Maduma as one of the wards where Hehe is predominantly spoken. In addition, the area is situated within the *central strip* of Iringa Region, where 'Standard Hehe' is believed to be spoken (Madumulla, 2017).

Regarding agriculture, the residents of the selected ward and village mainly engage in crop production and livestock keeping. The major crops grown here are maize, cowpeas, beans, sweet and Irish

potatoes, sunflower, vegetables, and fruits. It should be noted that, historically, the Hehe are known for cultivating crops like maize, millet, and sorghum (Winans, 1965). These staple crops were crucial and supported their growing population under Chief Mkwawa's centralised political structures. In addition to staple crops, the Hehe also grew beans, groundnuts, and sweet potatoes, along with practising animal husbandry (Redmayne, 1968; Winans, 1965). Therefore, the inclusion of the Hehe in comparing the lexicalisation of crop names in the Southern Highland languages was highly relevant.

Lastly, the Sangu people reside in Mbarali District of Mbeya Region. For this group, Luhanga Ward and Madundasi Village in this district were selected based on the recommendation of the District Administrative Secretary (DAS) for Mbarali DC. Additionally, the selection of Madundasi was influenced by its reputation as one of the areas where Central or Pure Sangu is spoken (Kaajan, 2009, 2012). Currently, the Sangu engage in agriculture and livestock keeping for their livelihood. Besides rice, which is the main food and cash crop (Mbarali District Council, 2017), they also grow maize, sweet potatoes, sorghum, sunflower, cassava, beans, groundnuts, simsim/sesame, vegetables, and fruits.

Historically, the Sangu were originally pastoralists engaged in semi-nomadic cattle herding. They gradually incorporated and engaged in agriculture because of their contacts with agricultural communities like the Bena, Hehe, and Nyakyusa (Winans, 2002). As they settled with agriculture, the Sangu grew staple crops like maize, millet, and sorghum. These were later complemented by rice because of the suitability of the Usangu plains for rice cultivation. This shift in subsistence strategies perhaps deepened the economic ties and interactions among these three groups.

Consequently, the frequent interactions among the Bena, Hehe, and Sangu, driven by their geographical proximity, trade, warfare, and social relations, fostered similarities in their staple crops (Iliffe, 1979). Therefore, these groups were ideal for a comparative study on the lexicalisation of crop names.

3. Methods and materials

The present study employed a qualitative research approach with an ethnographic research design. This approach was considered because the study was conducted in naturalistic environments where Bena, Hehe, and Sangu are spoken to understand how these ethnic groups identify and name their crops (Creswell, 2014). In addition, the ethnographic research design enabled the researchers to collect and analyse data obtained from natural contexts where the speakers of the languages live and interact with vegetation to obtain their basic needs (Kombo & Tromp, 2006; Nunan, 2008). By employing qualitative methods like participant observation and taking photos of crops, we were able to collect rich data that enabled us to explore the lexicalisation of crop names among the study languages.

In each study region, five informants per village were selected to participate in two data collection techniques: the jungle-walk-and-identify method and focus group interviews. Through the jungle-walk-and-identify method, the researchers walked with all five informants in the fields to identify crops, elicited and discussed the names of crops and their products (fruits, seeds, or tubers), and recorded all relevant information about the crops. Specifically, the jungle-walk-and-identify method is a qualitative data collection technique often used in ethnographic, ecological, or linguistic research (Gallois et al., 2020). The method requires the researcher to walk through environments (such as forests, fields, or villages) while accompanied by knowledgeable local participants such as community elders, farmers, or specialists. Together, they identify, discuss, and document relevant features, species, objects, or cultural items in situ (Charwi et al., 2023; Gallois et al., 2020).

During the jungle-walk-and-identify method, photographs of the identified crops were taken by a Samsung S8+ camera with a very good resolution, while conversations were recorded by a voice recorder whose recording quality was very good (Sony IC recorder, ICD.PX470) (Bowern, 2008). Photo-taking and audio-recording aided the note-taking process while also saving time. Focus group interviews were specifically conducted for verification and eliciting additional information that was probably not asked while in the fields. For example, informants were asked whether a crop was known by other names, to state the meaning(s) of the crop name, or to state the reasons behind the naming (if any). Approximately 51 crop names were elicited from informants, with 39 of these found to be shared among the three ethnic groups.

Two non-probability sampling techniques, purposive and snowball sampling, were used to obtain study informants. The five informants per village were elderly speakers of Bena, Hehe, and Sangu. While it is possible that members of different age groups might be knowledgeable about their language and plants, this study used elderly speakers of the selected languages who were also knowledgeable about crops. The choice was based on their command of the selected language and their long-lived experience in farming. Similarly, we opined for elderly speakers of the selected languages based on the grounds that several scholars (Fleck, 2007; Leyew, 2011; Nolan & Turner, 2011; Shangali et al., 1998; Si, 2011) recommend the selection of elderly speakers when conducting ethnobotanical studies. For instance, while Fleck (2007) claims that older people know more about their plants than younger people or average members of society, Nolan and Turner (2011) stipulate that community elders are frequently the bearers of the largest amount of native plant knowledge.

The snowball sampling technique was also useful in obtaining the five informants per village. Through the help and experience of local government officials, the first obtained informant assisted in locating other elders who knew crops as demanded by the study. Thus, the adequacy of the sample size was determined by the point of saturation, as advocated by different scholars regarding qualitative research (e.g. Creswell, 2014; Kumar, 2019). The obtained five informants provided extensive information about crop names to the extent that we could not get any new significant information by adding another informant.

The data for this study were analysed qualitatively following some steps proposed by Creswell (2014) for qualitative data analysis: (1) organising and preparing the data for analysis, (2) reading and looking at all the data, (3) coding all the data, (4) description, i.e. using codes to generate description, (5) representation of description and narrative, and (6) making interpretation and implication. For example, regarding step one, the recorded crop names were transcribed per respective languages, translated to English, and assigned scientific designations. Next, the researchers classified crop names into categories based on similarities and differences across Bena, Hehe, and Sangu. Moreover, themes and subthemes were generated based on the objectives of the study, examination of crop names and lexicalisation process across the three study languages. Data presentation, as seen in the subsequent section, was done through narrations accompanied by tables and clear examples. Interpretation of the data involved interpreting the findings using the lens of the lexicalisation theory, proving proof of what relates or does not relate to the past literature, and presenting the study findings' implications.

Consistency and accuracy of data and study findings were observed through the strategies of trustworthiness. These include credibility, dependability, confirmability, and transferability criteria (e.g. Lincoln & Guba, 1985; Stahl & King, 2014). For example, among other things, the researchers constructed shorter and clearer questions that demanded straightforward information for both jungle-walk-and-identify and focus group interviews. The questions were rendered into Kiswahili (the Tanzania national language, which is spoken and understood by many citizens).

Lastly, the study observed ethical issues by seeking clearances from the government authorities, and we obtained the informant's consent after informing them. The informants filled in a consent form (under the guidance of the researchers) after being informed thoroughly the purpose of the study. The researchers carefully observed the informants' willingness, anonymity, and confidentiality.

4. Lexicalisation theory

Most scholars agree that, in the theory of lexicalisation, complex lexemes and/or phrases become a single unit with a reduced semantic content hence the addition of new lexemes to the recipient language (Brinton & Traugott, 2005; Fernández-Domínguez, 2010; Hilpert, 2019; Lipka, 1992; Ten Hacken & Thomas, 2013). Previously, Lipka (1992, p. 7) defined lexicalisation as 'the process by which complex lexemes tend to become a single unit, with specific content, through frequent use. In this process, they lose their nature as a syntagma, or combination, to a greater or lesser extent'. It is also associated with 'institutionalised words that belong to the norm of the language and are more or less familiar to the members of a certain speech community, which can be defined as a special social group' (Lipka, 1992, p. 11). Today, Hilpert (2019, p. 1) states that 'the term lexicalisation describes the addition of new open-class elements to a repository of holistically processed linguistic units'. The lexicalisation process involves word-formation

processes such as affixation, compounding, borrowing, and coinage (Brinton & Traugott, 2005; Fernández-Domínguez, 2010; Hilpert, 2019).

Brinton and Traugott (2005) state that lexicalisation provides a language with fresh referential and predicative content by recruiting new members for the 'lexical' inventory. In the process, lexicalisation sometimes may co-occur with grammaticalisation. These two processes sometimes seem so opposite that they start to look identical in places. In fact, some scholars have argued that the two are veritable mirror images of each other (Brinton & Traugott, 2005; Fernández-Domínguez, 2010; Lipka, 1992; Ten Hacken & Thomas, 2013). They argue that although synchronic approaches have employed the term 'lexicalise' to explain links between logical structure and syntax, they find it more helpful to think of lexicalisation and grammaticalisation in diachronic terms that assume gradual variation and change.

Brinton and Traugott (2005) define lexicalisation as the creation of new lexical entries through processes of fusion and separation. Both of these may be characterised as processes of institutionalisation (Brinton & Traugott, 2005; Fernández-Domínguez, 2010; Lipka, 1992; Ten Hacken & Thomas, 2013). Fusion involves an increasing degree of dependency and includes such processes as univerbation, fused compounds, demorphologisation, and idiomaticisation. Moreover, univerbation finds expression in such apparently analysable lexical items as 'wherewithal', 'dyed-in-the-wool', and 'nuts-and-bolts', while fused compounds are those which have coalesced to the degree that their two constituent parts are no longer distinguishable. In some cases, one root may still be recognizable (e.g. 'cobweb' and 'mildew'); in other cases, neither root is recognizable (e.g. 'gossip' and 'halibut') (Brinton & Traugott, 2005).

Brinton and Traugott (2005) state that demorphologisation occurs when a formerly morphological construction fuses to the degree that its grammatical marker can no longer be analysed morphologically—only phonologically and lexically. The word 'awake', for example, once contained grammatically productive morphemes (Old English on + wacan), but the word can no longer be given such an analysis. Idiomaticisation involves the highly productive process of novel clause-level constructions that can no longer be thought of in terms of their constituent parts. The expression 'shoot the breeze' provides one example.

It is stipulated by Brinton and Traugott (2005) and Ten Hacken and Thomas (2013) that both lexical fusion and lexical separation are, in fact, processes of institutionalisation. They state that 'the spread of an usage to the community and its establishment as the norm' is a key factor (Brinton & Traugott, 2005, p. 45). The process of creating institutionalised or 'frozen' forms has also been referred to in the literature using other names such as 'routinisation', 'petrification', and 'canonisation'. Previously, Lipka (1992, p. 8) stated that 'institutionalisation in particular, but also lexicalisation, depends on different regional, social, "stylistic" and other varieties of a language'.

Two stages of lexicalisation are worth noting: 'An important feature of coinages is that they may be produced and be used for some time, but they may as well disappear without a trace, and their lifespan will come to an end' (Fernández-Domínguez, 2010, p. 199). The second stage involves 'a coinage may, alternatively, be produced and widely employed for a reasonable amount of time. In that case, the word becomes institutionalised mainly because the nonce formation starts to be accepted by other speakers as a known lexical item' (Fernández-Domínguez, 2010, p. 199). This means that 'the shift from coinage to institutionalised word can be hardly pinned down accurately, as institutionalised words can be unmistakably recognised only once they are at this stage' (Fernández-Domínguez, 2010, p. 199).

In analysing the data in the paper, we apply the theory of lexicalisation through four key steps. In step one, we pay much attention to the process of semantic change of the previously existing words and expressions to name the new crops which were introduced among the Bena, Hehe, and Sangu speakers. In step two, we examine crop name coinages to evaluate the strategies used by Bena, Hehe, and Sangu speakers in creating new names. In step three, we observe names which appear to have been integrated from the neighbouring ethnic groups, mainly the Gogo from the north, the Nyakyusa from the southwest, the Ngoni from the southeast, and the Luguru from the northeast. In step four, we account for the lexical borrowing from Kiswahili and English, the national languages of Tanzania. While steps one and two are in line with Fernández-Domínguez (2010) who insists on tracing the origin of lexical entries in a lexicon, steps three and four are in line with Brinton and Traugott (2005) who define lexicalisation as the creation of new lexical entries through borrowing.

The essence of institutionalisation, which is underscored by previous scholars (Brinton & Traugott, 2005; Fernández-Domínguez, 2010; Lipka, 1992; Ten Hacken & Thomas, 2013), is ignored in the current research. This happens because the three languages of Bena, Hehe, and Sangu have not been standardised. Each of these languages does not contain grammar books and dictionaries. This status is not strange for Tanzania, where only Kiswahili is standardised for official use.

5. Findings

This section presents the results. The first part presents the layers of crop names among Bena, Hehe, and Sangu, while the second part highlights the lexicalisation of crop names among these languages.

5.1. Layers of crop names among Bena, Hehe, and Sangu

The results of this paper demonstrate that crop names are not uniform among Bena, Hehe, and Sangu despite the political and historical ties among these ethnic groups. These languages share similarities in the names of some crops while also demonstrating differences in the names of other crops. This is in harmony with other scholars' suggestion (e.g. Heine & Legère, 1995) that plant terminology differs from one village to another as well as from one region to another. These differences are partly influenced by geographical factors (Lusekelo & Amir, 2023) and cultural practices of each ethnic group.

The study identified three categories of crop names among the Bena, Hehe, and Sangu languages: (i) one crop sharing a single name across the three languages, (ii) one crop with distinct names among the three languages, and (iii) one crop with multiple names within a single language. The first scenario or layer of crop names characterises crop names that are similar in the three languages. Table 1 illustrates examples of crop names that were found to be similar in Bena, Hehe, and Sangu.

Note that Table 1 only summarises the native crop names that are common across all three languages. However, most of the crop names shared by the three languages were loanwords from Kiswahili. To avoid unnecessary repetition of data, examples of these crop names are provided in Table 2, which illustrates lexicalisation through borrowing from Kiswahili. This point informs that the penetration of Kiswahili into the interior Bantu went hand-in-hand with the diffusion of crops and their associated names. This observation is in line with Lusekelo (2016), who stated that most crops in Tanzania diffused from the coast to the interior of the country. Therefore, the Southern Highlands zone was not an exception in this penetration and diffusion of Swahili culture among ethnic groups.

The second point to emphasise in this section, especially from Table 1, concerns the presence of native crop names that are common across these languages. The presence of shared native crop names

Table 1. Shared native crop names in Bena, Hehe, and Sangu.

Bena	Hehe	Sangu	Common name	Botanical name
litosani	*litoofu*	*litoofani*	Irish potato	*Solanum tuberosum*
lidzebele	*litsebele*	*lijebele*	Maize/corn	*Zea mays*
libangayeye	*liyeye*	*libangayeeya*	Sunflower	*Helianthus annuus*
lingoogo	*lingoogo*	*lingoogo*	Peanuts	*Arachis hypogaea*
Wuledzi	*wuletsi*	*wulesi*	Finger millet	*Eleusine corocana*

Table 2. Crop names lexicalised through borrowing from Kiswahili.

Bena	Hehe	Sangu	Common name	Botanical name
bamia	*bamia*	*bamia*	Okra	*Abelmoschus esculentus*
binzali	*binzali*	*binsali*	Turmeric	*Curcuma longa*
hitungulu	*kitungulu*	*shitungulu*	Onion	*Allium cepa*
linyanya	*linyanya*	*linyanya*	Tomato	*Solanum lycopersicum*
mhogo	*mhogo*	*mhogo*	Cassava	*Manihot esculenta*
mpunga	*mpunga*	*mpunga*	Paddy/rice	*Oryza sativa*
muembe	*muembe*	*muyembe*	Mango	*Mangifera indica*
muva	*muva*	*muva*	Sugarcane	*Saccharum officinarum*
nzugumawe	*nzugumawe*	*njugu*	Bambara groundnut	*Vigna subterranea*

among the Bena, Hehe, and Sangu languages underscores the significance of these crops in the communities being studied. The staple foods of the Bena, Hehe, and Sangu communities consist of crops like maize (*Zea mays*), finger millet (*Eleusine corocana*), and pearl millet (*Pennisetum glaucum*). These crops have long been integral to their diets and are also traditionally used in brewing. Therefore, the importance of these crops is evident in the resemblance of some crops' names, as revealed in Table 1. Additionally, the similarity in native crop names among Bena, Hehe, and Sangu supports the claim that some crops are indigenous to Africa (Chami, 2021), with their names being commonly shared across the Niger-Congo region (Bostoen, 2006, 2007; Lusekelo, 2016).

The second scenario of correspondence between crops and names in Bena, Hehe, and Sangu was that of one crop with many or different names across the three languages. In this study, the pattern observed was that either each language had an unique name for a crop, or two of the languages shared the same name while the third language had a different name for that crop. Consider the following examples in Table 3 for more details.

Based on the observations from Table 3, the multiple crop names for a single crop can be categorised into two types: native names among Bena, Hehe, and Sangu (the majority) and names borrowed from Kiswahili. For example, concerning *bangi* 'cannabis', the crop is from Asian or Persian languages. The Bena and Hehe languages borrowed from Kiswahili, while the Sangu used their native name, *njaanga*. Bena and Hehe represent an example of lexicalisation through borrowing from Kiswahili, as discussed in Section 5.2.

Similarly, based on tobacco, the crop name *saayo* is common in the Southern Highlands (Iringa and Njombe), while *nniimba* is common among languages of Ruvuma River (Matengo, Makhuwa, Yao, Ngoni). *Nniimba* is also used in southern Africa. These observations suggest that the Bena, Hehe, and Sangu have preserved the native names of some crops or crops introduced long before the spread of Kiswahili into the Southern Highlands of Tanzania. This suggests that these societies were practising agriculture even before the contact with the coastal people.

Another observation from the results in Table 3 regards Sangu. This language has shown some differences in the names of crops that are similar to the neighbouring languages Bena and Hehe. This variation in crop names between Sangu and the neighbouring languages Bena and Hehe might be informed by the contacts between Sangu and yet other neighbouring languages beyond Bena and Hehe. These are such as Safwa (southwest), Bungu (west), Wanji (south), Kimbu (northwest) and Gogo (northeast) (Kaajan, 2009, 2012). On the contrary, Bena and Hehe have shown slight differences in this section, where one crop had multiple or different names across languages. That is, the Bena and Hehe languages share more crop names than their counterpart Sangu. This can be attributed to their high degree of mutual intelligibility and strong historical connections.

Besides language contacts, however, geographical factors (e.g. Lusekelo & Amir, 2023) are also responsible for the variation in the names of some other crops. While the Bena and Hehe are in the highlands, the Sangu are in the lowlands. Therefore, some crops are familiar to Sangu but not the Bena and Hehe. For instance, consider these Sangu native crop names: *wumeeja* 'sesame/simsim' (*Sesamum indicum*), *linseenze* 'cucumber' (*Cucumis sativus*), and *ling'weeva* 'watermelon' (*Citrullus lanatus*). These crops are familiar to the lowland Sangu but not the highland Bena and Hehe. As a result, the Bena and Hehe do not

Table 3. One crop with different names in Bena, Hehe, and Sangu.

Bena	Hehe	Sangu	Common name	Botanical name
bangi	*bangi*	*njaanga*	Cannabis	*Cannabis sativa*
choloko	*choloko*	*moojo*	Mung bean	*Vigna radiata*
naandala	*laande*	*naandala*	Cowpea	*Vigna unguiculata*
lifulaisha	*libikitiindi*	*likutu lya juungwa*	Prickly pear	*Opuntia ficus-indica*
lufweni	*lifweni*	*nsakhani*	African spinach	*Amaranthus cruentus*
nyampila	*likayeva*	*munkhayeeva*	Ceara rubber tree	*Manihot glasiovii*
ludoogi	*ludoogi*	*nnorooro*	Common beans	*Phaseolus vulgaris*
maange	*lupangi*	*mbaanga*	Pigeon pea	*Cajanus cajan*
luwono	*luwono*	*muyeemba*	Castor-oil	*Ricinus communis*
mdela	*mdela*	*lidule*	Sweet potato	*Ipomoea batatas*
saayo	*saayo*	*nniimba*	Tobacco	*Nicotiana tabacum*
wupemba	*wupemba*	*nkhaata*	Pearl millet	*Pennisetum glaucum*

have native names for these crops and have instead nativised the borrowed Kiswahili names: *wufuta* (sesame), *litango* (cucumber), and *litikiti maji* (watermelon).

The third and final layer of correspondence between crops and names in Bena, Hehe, and Sangu is the occurrence of one crop with multiple or different names within a single language. In this layer of crop names, some crops were found to have more than one name in a language. Consider the following examples for more clarification concerning the case of one crop, many names in a single language.

Several observations can be drawn from the examples in Tables 4–6. First, in all three languages, there are both older and modern crop names, as reported by the informants. The older crop names are rarely used by the young members of the society. Similarly, these older crop names are being overtaken by modern names, which in most cases are related to Kiswahili borrowing. From the examples, these older crop names include the likes of *ludoogi* (beans), *lulatula* (finger millet), *ng'owo/likhowo* (banana), and *ngongiilwe* (wheat), which are being replaced by *luhalagi* (beans), *wuletsi/-dzi* (finger millet), *ndisi* (banana), and *ngano* (wheat), respectively. Moreover, names like *lifweni/lufweni/lipala* (African spinach) and *lingoogo* 'peanuts' (*Arachis hypogaea*) are no longer used by the younger generation in the Bena and Hehe. They have embarked on the Kiswahili words *mchicha* (African spinach) and *karanga* (peanuts), respectively. This indicates a significant shift, with native crop lexemes being gradually lost and replaced by Kiswahili terms.

Other studies have also shown that many Tanzanian Bantu communities have borrowed Kiswahili crop names into their languages. A notable example is the word *maharage* (beans). Lusekelo (2016) suggested that the word *maharage* is likely of Bantu origin and was probably introduced to other parts of the country through contact with coastal Swahili during the caravan trade. This assumption was based on TUKI's (2001) non-inclusion of etymological information for the word in question. However, if many Tanzanian languages use that word to refer to beans, the situation for Bena, Hehe, and Sangu is different, as all three languages possess native names for beans that are not connected to Kiswahili (*ludoogi, nnorooro*). Only in recent years have the original words for beans begun to be replaced by Kiswahili-related terms, such as *luhalagi* and *mahalagi*.

Secondly, there are cases where crops have more than one name, but the names are not associated with Kiswahili, the Tanzanian lingua franca. This point is relevant to pairs like *nyawuletsi/*nyaduundwe* (in Hehe), *nyang'angati, ligangati/*nyaduundwe* (in Bena), and *lindendeele/*libangayeye* (in Bena). For reasons

Table 4. One crop with multiple names in Bena.

Name1	Name2	Name3	Common name	Botanical name
ludoogi	*luhalagi*	*mbwanda*	Common beans	*Phaseolus vulgaris*
lufweni	*lipala*	—	African spinach	*Amaranthus cruentus*
ndisi	*ng'owo*	—	Banana	*Musa spp.*
ngano	*ngongiilwe*	—	Bread wheat	*Triticum aestivum*
nzugumawe	*nzugu*	*isugu*	Bambara groundnut	*Vigna subterranea*
libangayeye	*lindendeele*	—	Sunflower	*Helianthus annuus*
nyaduundwe	*nyang'angati/ligangati*	—	White radish	*Raphanus sativus*
nyanyachungu	*ngogwe*	*mwa*	Mock tomato	*Solanum aethiopicum*

Table 5. One crop with multiple names in Hehe.

Name1	Name2	Common name	Botanical name
Ludoogi	*luhalagi*	Common beans	*Phaseolus vulgaris*
nyawuletsi	*nyaduundwe*	White radish	*Raphanus sativus*
nyanyachungu	*ngogwe*	Mock tomato	*Solanum aethiopicum*
nzugumawe	*nzugu*	Bambara groundnut	*Vigna subterranea*
lulatula	*wuletsi*	Finger millet	*Eleusine corocana*

Table 6. One crop with multiple names in Sangu.

Name1	Name2	Common name	Botanical name
lijebele	*lingaagu*	maize	*Zea mays*
ndisi	*likhowo*	banana	*Musa spp.*
njugu	*njugumawe*	Bambara groundnut	*Vigna subterranea*

Table 7. Crop names lexicalised through coinage of expressions.

Sn	Bena	Hehe	Sangu	Common name	Botanical name
1	*luyungu lwa hiheela*	*lunyungu lwa kigeeti*	*luyungu lwa luduungulu*	Calabash gourd	*Lagenaria siceraria*
2	—	*lunyungu lwa ligeenge*	*luyungu lwa lijeenje*	Winter squash	*Cucurbita maxima*
3	*luyungu lwa ndagala*	*lunyungu lwa lisaasa*	—	Pumpkin	*Cucurbita pepo L.*
4	*luyungu lwa litakali*	*lunyungu lwa litakali*	*luyungu lwa litakali*	—	*Lagenaria sp.*
5	*luyungu lwa ngongiilwe*	*lunyungu lwa ngongiilo*	*luyungu lwa lituumba*	Squash	*Cucurbita moschata*
6	*luyungu lwa nyambamidza*	*lunyungu lwa nyachuusa*	—	Malabar gourd	*Cucurbita ficifolia*

that the informants could not identify, the starred forms are preferred or more commonly used by the younger generation compared to the other crop names. This situation may eventually lead to the disappearance of one name in favour of the other in the future.

Third, based on the informants of this study, some crop names are linked to borrowing from other neighbouring languages. For example, in Bena, the crop names *mbwanda* (beans), *isugu* (Bambara nut), and *mwa* (mock tomato) are stated to be borrowed from either the Ngoni, Ndendeule, or Matumbi. These are languages spoken in the southeastern part of the Bena-speaking area. In Sangu, similarly, the crop name *lingaagu* (which is currently used by the majority of younger Sangu) is stated to be borrowed from Safwa. Furthermore, from the examples, other variations in naming the same crop have been brought by clipping, whereby speakers prefer to use the shorter form of a crop name than its longer form (c.f., *nzugumawe* vs. *nzugu*; *njugumawe* vs. *njugu* 'Bambara groundnut' *Vigna subterranea*). Lastly, the informants were unable to explain the reasons behind other variations in naming the same crop, leaving it unclear whether these variations result from borrowing or from nicknaming (e.g. *nyanyachungu* vs. *ngogwe* 'mock tomato' *Solanum aethiopicum*).

Unlike Tables 5 and 6, Table 4 includes three names for certain crops. Although the third names in Table 4 [*mbwanda* (beans), *isugu* (Bambara nut), and *mwa* (mock tomato)] are noted as borrowings from neighbouring languages, they nevertheless represent dialectal variation within Bena. According to the informants, these third names are known only to the Bena in the Lupembe area, but are unfamiliar to the Bena in the northwest, around Mdandu Village.

5.2. Lexicalisation of crop names

This part presents and discusses how crop names are lexicalised in Bena, Hehe, and Sangu. The findings have shown, among other things, that crop names are lexicalised through coinage of expressions and lexicalisation by borrowing from Kiswahili (Brinton & Traugott, 2005; Fernández-Domínguez, 2010; Lipka, 1992). Some crop names are genitive expressions or phrases among Bena, Hehe, and Sangu. In this case, these crop names have been lexicalised through the coinage of different expressions. Consider the following examples in Table 7.

Table 7 demonstrates examples of crop names lexicalised through coinage of expressions. Different concepts are found to play a role in the process of coining expressions for the lexicalisation of crop names. For instance, the presented crop names in Table 4 have been coined based on the crops' primary uses or functions in these societies. In the Bena, Hehe, and Sangu languages, the term *lunyungu/nyungu* (in Hehe) or *luyungu/nyungu* (in Bena and Sangu) specifically refers to pumpkin or squash seeds. Various types of pumpkin seeds are used as a vegetable ingredient. They are dried, fried, and ground into flour or butter, which is then added to the vegetables. Additionally, the Bena, Hehe, and Sangu peoples chew these fried pumpkin seeds like how they enjoy peanuts and sunflower seeds.

Therefore, given the popularity and utility of these pumpkin seeds among the Bena, Hehe, and Sangu peoples, this paper suggests that the name of the seeds was extended to refer to the crop as well. Because there are various types of pumpkins and squashes, the crop name is derived from the seed name first, which is later modified to reflect the specific type of pumpkin or squash. Even when referring to the gourd made from squash or the vegetables from a specialised pumpkin crop for vegetables, the name still begins with the seed name. Refer to the names for the calabash gourd (*Lagenaria siceraria*) and malabar gourd (*Cucurbita ficifolia*) from the table. Despite the crops having various uses—such as picking vegetables, making gourds, consuming the pumpkin or squash itself, and using the seeds as vegetable ingredients—the seeds are given prominence in naming these crops (Table 7).

Furthermore, the study found that the lexicalisation of crop names through the coinage of expressions can occur beyond practical or utility-based criteria. The language speakers can lexicalise a crop name by forming expressions referring to the crop's physical features like its shape, colour, taste, or texture. For example, the Sangu crop name *likutu lya juungwa* 'prickly pear' *Opuntia ficus-indica* is coined based on the Sangu's perception that the width and weight of the crop's leaves resemble an elephant's ears. Therefore, the name can be translated as 'the ear of an elephant'. In referring to the same crop, *li-bikitiindi* 'prickly pear' *Opuntia ficus-indica,* the Hehe coined an expression which refers to the growth habit of the crop. It is likened to bamboo for its growth habit and the tendency to be evergreen throughout.

Lexicalisation of crop names through the coinage of different expressions is not unique to Bena, Hehe, and Sangu only. Other Bantu languages equally have demonstrated coinage of expressions for crop names. Kiswahili (Heine & Legère, 1995), Vidunda (Legère, 2009), Nyamwezi and Sukuma (Lusekelo & Amir, 2023) as well as Chasu (Mziray & Lusekelo, 2023) are some examples of languages that also demonstrated coinage of expressions for crop names. Research has indicated that product names are often extended to refer to the crops themselves (e.g. Mziray & Lusekelo, 2023); however, the findings of the current study highlight an unique pattern in how seed names are used to label different varieties of pumpkins and squashes.

The second mechanism of lexicalising crop names among Bena, Hehe, and Sangu is by borrowing from Kiswahili. This is parallel with the theory of lexicalisation, which suggests that lexical items can be created via borrowing (Brinton & Traugott, 2005). The following table demonstrates cross-cutting crop names lexicalised by borrowing from Kiswahili.

Source: Field Data (2023).Table 2 demonstrates cross-cutting crop names among Bena, Hehe, and Sangu that have been lexicalised through borrowing from Kiswahili. In contrast to the cross-cutting native names shown in Table 1, many shared crop names across these societies have been lexicalised through borrowing from Kiswahili. This situation suggests that many interior Bantu languages experienced similar contact with the Swahili people from the coast of the country through caravan trade. Lexicalisation of crop names through borrowing from Kiswahili is evident in other Bantu languages as well (c.f., Legère, 2009; Lusekelo, 2016, 2020; Mziray & Lusekelo, 2023). Lexicalisation of crop names via borrowing from other neighbouring Bantu languages is also stated; however, because of missing critical evidence, we cannot establish the exact direction of borrowing.

6. Discussion

This section addresses two aspects: first, the evidence of language contact in the interaction between indigenous crops and New World cereals; and second, the semantic extension of crop names among the Bena, Hehe, and Sangu communities.

6.1. Language contact evidenced between indigenous crops and New World cereals

The first observation surrounds the naming of the indigenous crop of cowpea, which archaeologists claim to be native to Eastern Africa (Chami, 2021; Singh et al., 1997). In the three languages, the name *naandala* or *laande* (cowpea) is attested. The name also occurs in the Bantu languages Nyakyusa and Safwa in Mbeya Region. Bostoen and Muluwa (2017) found the name ***-kóndè** 'cowpea' (*Vigna unguiculata*) to be common across the Niger-Congo area in West Africa. The name *kunde* (cowpea) is attested in Kiswahili but does not manifest in the names of crops among the speakers of Bena, Hehe, and Sangu. Perhaps the essence of *naandala* (cowpea) emanates from the borrowing from the neighbouring languages.

Besides the name for 'cowpea' (*Vigna unguiculata),* language contact is also evidenced in the names of these crops: Bambara nuts (*Vigna subterranea)*, finger millet (*Eleusine corocana*), maize (*Zea mays*), and sorghum/pearl or great millet (*Pennisetum glaucum*). The names for the referred crops in Bena, Hehe, and Sangu correspond to the semantic adjustment of the names of crops (Lusekelo, 2016). For example, the Bena, Hehe, and Sangu adjusted the meaning of the name ***-bede** to refer to 'maize' (*litsebele*) instead of 'millet' as attested in other Eastern Bantu languages (refer to Bostoen, 2006, 2007). This insight expands the theoretical understanding of lexicalisation by emphasising the role of cultural salience in shaping

lexical outcomes. However, the name *–**njugu** is attested for Bambara nuts, as was suggested by Bostoen (2006, 2007).

The study languages' crop names for Bambara groundnut and pearl millet verify that these crops are traditional in Africa. Kahlheber et al. (2009, p. 256) claim that 'words for "pearl millet" that are reconstructed to particular stages of Bantu language history are not only strong indications of the crop's cultivation but also its human-driven spread along with the language(s) spoken by its cultivators'. They found that domesticated pearl millet (*Pennisetum glaucum*) and Bambara groundnut (*Vigna subterranean*) were domesticated in Cameroon. In this regard, the speakers of Bena, Hehe, and Sangu appear to have been traditionally farmers. This is not strange as Bostoen et al. (2015) already hinted that farmers from West Africa might have used their knowledge of the cultivation of pearl millet to conquer other areas of sub-Sahara Africa.

Change occurred mainly due to the penetration of the New World cereals. Previously, Kahlheber et al. (2009, p. 267) hinted that 'pearl millet farmers might have been replaced by new immigrants with another, largely unknown crop inventory forming the base for alternative, more productive forms of rainforest agriculture'. This appears to be confirmed by the domination of maize (*Zea mays*) and rice (*Oryza sp*.), which replaced indigenous crops in Tanzania. The findings validate the theory's emphasis on external influence in lexical adaptation while extending its scope to include the multilayered naming patterns observed, such as single crops with multiple names or shared names across languages.

The notion *-**pemba** 'maize, millet' has also been documented to have been incorporated and replaced with pearl millet. Lusekelo (2016) discusses the penetration of the name *-**pemba** 'maize' as the coming of the crop from Asia and being cultivated along the coast of East Africa. The literature shows that the crop was first introduced in the islands in the Indian Ocean and then penetrated the interior of the continent (McCann, 2001; Miracle, 1965). In Tanzania, it is stated that 'there is a reference to it in all these places, in Zanzibar, and around the mouth of the River Ruvuma in the seventeenth century' (Miracle, 1965). It follows that Bena, Hehe and Sangu speakers integrated maize and maintained sorghum.

6.2. Semantic extension in the names of crops

Lexicalisation theory explains how new elements are incorporated into a language's vocabulary, encompassing the formation of words as well as the creation of multi-word expressions and fixed phrases (Brinton & Traugott, 2005; Hilpert, 2019). During the process of lexicalisation, lexemes are adapted into languages through an extension of existing words or semantic shifts/adjustment. Crop names that are created through the coinage of expressions (i.e. multi-word expressions) (Hilpert, 2019) have shown an extension in meaning in Bena, Hehe, and Sangu. Various concepts play a role in the coinage of crop names and extension of meaning. For example, the size of the plant or plant part, the weight of the plant part, physical appearance and growth habit were extended to lexicalise a crop name *likutu lya juungwa* (Sangu) and *libikitiindi* (Hehe) 'prickly pear' *Opuntia ficus-indica*.

The concepts were compared to different entities (e.g. an elephant's ear and a bamboo) but were ultimately extended to create a crop name. In this case, the name of another plant or an animal is extended to name a crop (Lusekelo, 2016). Additionally, the study showed how the name of a crop product (e.g. seed, fruit, or tuber) or its utility can be extended to lexicalise a crop name. Refer to the examples in Table 7, where the seed's name has given rise to the names of various types of pumpkins and squashes. These results reveal the creative capacity of speakers to use existing lexical resources to accommodate new concepts. This aligns with the theoretical view that lexicalisation involves both innovation and reinterpretation within a language's semantic system.

7. Conclusion

From the results of this paper, it is reasonable to conclude that Bena, Hehe, and Sangu share several crop names which have diffused and nativised from Kiswahili. These include *mhogo* (cassava), *mpunga* (paddy/rice), *ngano* (wheat), and *nyanyachungu* (mock tomato). This is a piece of evidence that the communities in the Southern Highlands of Tanzania had similar contact with Kiswahili-a language which is believed to have received many crop names from the external world and transported them to other

Bantu languages (Lusekelo, 2016). In addition, these study languages have shown similarities and variations in native crop names. The variation in native crop names, among other things, has been alluded to the individual language's contacts with other neighbouring Bantu languages. For example, the Bena names *mbwanda* (beans), *isugu* (Bambara nuts) and *mwa* (mock tomato) have been associated with Ngoni, Ndendeule, and Matumbi languages.

It has also been noted that concerning differences in crop names among these languages, a great deal of variation is shown between Sangu from Hehe and Bena. The Hehe and Bena have a great similarity in the names of crops. This is a witness of their historical contacts and interactions to date. The paper has also enlightened the language contact evidenced between indigenous and New World cereals, and semantics in the integration of crop names. Studies in other languages are encouraged to document native crop names to preserve the ecological knowledge tied to these names before they are all overtaken by Kiswahili. The study contributes knowledge to the documentation of native crop names and the impact of language contact on lexical items, including crop names. Lastly, the study advances the theory of lexicalisation by illustrating how borrowing, semantic extension, and cultural integration influence the naming of crops in Bantu languages. It emphasises the effects of language contact and sociocultural dynamics on lexical development.

Note

1. Scholars divide the Bena-speaking region into three to six dialectal areas. A systematic study examining the linguistic variations among these dialects has yet to be conducted. Although Morrison (2015) highlighted some linguistic variations, they were not organised according to the proposed dialects or dialectal areas.

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