

Morphophonological Processes and Micro-variations in the Verbal Morphology of ciLungu, ciMambwe, and ciNamwanga Languages

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DOI:10.5281/zenodo.17335172

ARTICLE INFO

Article history:

Received : 18-09-2025

Accepted : 28-09-2025

Available online : 12-10-2025

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Citation: Siame, P., Kangwa, K. N., Kapau, H. M., & Chisenga, R.P.A. (2025). Morphophonological Processes and Micro-variations in the Verbal Morphology of ciLungu, ciMambwe, and ciNamwanga Languages. *IKR Journal of Arts, Humanities and Social Sciences (IKRJAHS)*, 1(4), 244-249.



ABSTRACT

Original research paper

This paper presents an in-depth, comparative linguistic analysis of three closely related yet distinct Bantu languages spoken in the northern region of Zambia: ciLungu (Guthrie's M14), ciMambwe (M15), and ciNamwanga (M22). Despite their genetic proximity and shared historical lineage, these languages remain critically under-documented, with significant gaps in the descriptive analysis of their grammatical systems. This study aims to address this lacuna by conducting a meticulous examination of their verbal morphophonology, identifying and elucidating the core processes that govern verb form construction. Through a methodical application of the comparative method, informed by principles of Lexical Phonology and Morphology and comparative Bantu linguistics, the research delineates a comprehensive inventory of phonological and morphological operations. These include, but are not limited to, strategic vowel lengthening for tense-aspect marking, gliding and glide-induced harmony, a suite of strategies for resolving vowel hiatus, pervasive vowel and consonant harmony systems, and various forms of vocalic coalescence. The investigation reveals that while these languages share a foundational inventory of morphophonological rules attributable to their common ancestry, they are distinguished by systematic and predictable micro-variations. For instance, a key differentiating feature is the realization of plural subject prefixes: ciLungu and ciMambwe employ a voiced palatal glide [j], while ciNamwanga utilizes a voiced bilabial glide [w]. Furthermore, ciLungu exhibits a unique use of the voiceless glottal fricative [h] in specific verbal environments, a feature absent in its linguistic relatives, which instead maintain a palatal glide. The detailed findings of this research provide an indispensable empirical foundation for applied linguistic endeavors, particularly for curriculum developers, lexicographers, and language planners engaged in the creation of pedagogical materials, grammatical guides, and literacy resources aimed at promoting and preserving this vulnerable linguistic heritage.

Keywords: ciLungu, ciMambwe, ciNamwanga, Bantulanguages, morphophonology, micro-variation, Zambia.

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1. Introduction

The Bantu languages ciLungu, ciMambwe, and ciNamwanga, classified under the Guthrie system as M14, M15, and M22 respectively, constitute a significant yet understudied linguistic cluster in northeastern Zambia. Historical linguistic evidence suggests a common genealogical origin from a

proto-language closely related to, or a dialect of, Fipa spoken in the southern highlands of Tanzania (Nurse & Phillipson, 1999). Subsequent migrations brought these speech communities into their present-day locations in Zambia's Northern and Muchinga Provinces, where they have evolved in relative, though not complete, isolation from one another.

Despite their prevalence as primary community languages in districts, such as Mpulungu, Mbala, Senga, Isoka, and Nakonde, they occupy a marginalized status within the national framework. The Zambian government's language-in-education policy designates English and IciBemba as the official mediums of instruction and administration in these regions. This policy presents a profound pedagogical challenge, as the significant typological and lexical differences between IciBemba and the local LuMaNa languages result in low mutual intelligibility. Consequently, children are often required to acquire initial literacy skills in a linguistically distant second language, a scenario that can hinder educational achievement and accelerate language shift away from the indigenous vernaculars.

This research is predicated on the urgent need for comprehensive grammatical description and documentation of these languages. It is argued that a concerted, comparative approach to analyzing ciLungu, ciMambwe, and ciNamwanga collectively referred to herein as the LuMaNa languages will yield a more robust and efficient framework for their preservation and development than isolated, language-specific studies. A comparative analysis not only illuminates the shared structural core but also precisely maps the points of divergence, providing a holistic understanding of the language cluster. Such a foundation is a prerequisite for the creation of effective orthographies, teaching materials, and literature, which are essential tools for reversing language marginalization and mitigating the risk of endangerment posed by dominant regional and international languages (Siame, 2024).

The central objective of this study is to provide a fine-grained, descriptive analysis of the verbal morphophonology of the LuMaNa languages. The verb in Bantu languages is a highly complex word, often encoding subject, tense, aspect, mood, object, and derivational information within a single morphological unit. The interaction between these morphemes triggers a range of phonological processes that are central to understanding the language's grammar. This research seeks to map these processes systematically. The study is guided by two principal research questions:

- i. What are the primary morphophonological processes such as lengthening, assimilation, harmony, glide formation, and hiatus resolution that are operational in the verbal morphology of ciLungu, ciMambwe, and ciNamwanga?
- ii. In what specific ways do the applications of these processes converge across the three languages, and what systematic micro-variations serve as key diagnostic features for distinguishing between them?

The answers to these questions will make a significant contribution to the descriptive linguistics of the Zone M Bantu languages and provide a vital resource for future language development initiatives.

2. Literature Review

A review of existing scholarship reveals a stark disparity in the level of documentation between the LuMaNa languages and more prominent Zambian languages like IciBemba or CiNyanja. The available literature on LuMaNa is sparse, fragmented, and often not readily accessible.

The genetic relationship between ciLungu and ciMambwe is exceptionally close. Mann & Kashoki's (1977) foundational lexicostatistical study calculated a cognate sharing rate of 92%, a figure that suggests dialectal variation rather than separate language status. However, sociolinguistic reality often trumps lexicostatistics. As demonstrated by Siame & Banda (2021), the speech communities themselves perceive ciLungu and ciMambwe as distinct linguistic entities, a perception grounded in palpable phonological, morphological, and lexical differences, as well as strong, separate ethnic identities. This underscores the necessity of treating them as individual units for the purpose of detailed grammatical analysis.

The most substantial theoretical work on ciLungu is attributed to Bickmore (2004, 2007), whose research focused predominantly on its tonal system and theoretical phonological constraints. For instance, Bickmore (2004) discusses the language's treatment of vowel hiatus, noting that while certain vowel sequences appear on the surface, underlying constraints prohibit combinations like *[wu] or *[wo], which are resolved through processes like glide deletion or consonant hardening. While theoretically insightful, this work does not extensively explore the practical outcomes of these processes across the entire verbal paradigm nor does it engage in a sustained comparative analysis with ciMambwe or ciNamwanga.

Documentation for ciMambwe is even more limited. The primary resources include a practical dictionary compiled by Halemba (1994, revised 2007) and a very brief grammatical sketch by Rupya (1962). The recent work by Siame & Banda (2021) represents a step forward, offering a preliminary analysis of the tense-aspect-mood system, but a full grammatical description remains absent. In addition, Siame & Banda (2024d) document a common orthography and short grammar of LuMaNa detailing the writing and spelling system as well as some aspects of tense-aspect-mood system, although a full grammatical description remains a recommendation for further research. The situation for ciNamwanga is the most critical, with a near-total absence of published linguistic description of its core grammatical structures. Existing materials are typically unpublished academic theses, such as, Lungu (2020) or works focused on sociolinguistics and cultural practices like Sinkamba (1984), which, while valuable, do not address structural morphology.

A recent study by Lumwanga et al. (2022) compared phonological features between IciBemba and ciMambwe but explicitly excluded morphological phenomena and did not consider ciLungu or ciNamwanga. Therefore, a significant gap exists in the literature: a dedicated, comparative morphophonological study of the verbal systems of all three LuMaNa languages. This paper seeks to fill that void, providing a systematic and detailed account that serves both theoretical and applied linguistic purposes.

3. Theoretical Framework

This research is situated within an integrated theoretical framework that combines the model of Lexical Phonology and Morphology (LPM) with the established practices of comparative Bantu morphophonology. This dual approach provides both the mechanistic tools for analyzing word-

internal processes and the historical context for understanding cross-linguistic patterns.

Lexical Phonology and Morphology (Kiparsky, 1982; Mohanan, 1986), an evolution of the generative tradition initiated by Chomsky and Halle (1968), posits a stratified lexicon where morphological and phonological processes interact in a cyclic, level-ordered manner. A central tenet of LPM is that word formation, including inflection and derivation occurs within the lexicon, where morphological rules interact with a specific set of phonological rules known as lexical rules. This model is particularly well suited for Bantu languages, where the verb is a complex amalgam of prefixes and suffixes added in a relatively fixed order (the morphological template), each step of which can trigger phonological changes. LPM allows us to model the derivational pathway from an underlying morphological representation to the surface phonetic form, making it a powerful tool for explaining alternations in vowel length, consonant mutations, and glide formation observed in the LuMaNa data.

Complementing this, the study employs the methodology of comparative Bantu morphophonology (Hyman, 1991, 2003; Mtenje-Mkochi & Mtenje, 2019; Siame et al, 2024; Siame & Banda, 2024a-c; Siame & Kangwa; Siame, 2022). This approach provides a robust framework for systematically comparing linguistic features across genetically related languages. It allows the researcher to distinguish between shared retentions from a common ancestral proto-language such as the basic verbal template and many core roots and innovations that have occurred in the historical development of each individual language like the specific strategies for hiatus resolution or tense marking.

This framework is essential for interpreting the micro-variations not as random discrepancies but as the predictable outcomes of different historical sound changes and analogical leveling processes.

4. Methodology

A qualitative research design was adopted for this study, utilizing the comparative method, a cornerstone of historical and descriptive linguistics (Fox, 1995) which acted as a primary analytical engine. The core objective was to identify, describe, and contrast the morphophonological processes active in the three languages.

Data collection was conducted through direct elicitation and structured observation sessions with native speaker consultants in the heartland regions of each language: Mpulungu District for ciLungu; Mbala and Senga Districts for ciMambwe; and Isoka and Nakonde Districts for ciNamwanga. Two proficient native speakers per language, who were also fluent in English, were recruited as linguistic consultants. They participated in multiple sessions involving translation tasks, paradigm building, such as conjugating verbs across tenses, aspects, and moods with different subject and object markers, and the production of naturalistic phrases and short narratives.

A significant advantage of this study was the involvement of the lead researcher as a native speaker of the LuMaNa cluster. This insider perspective provided deep intuitive knowledge and allowed for the identification of subtle patterns and

acceptable grammaticality judgments that might be missed by an external researcher. This aligns with the interpretive, emic approach highly recommended in linguistic fieldwork (Merriam, 1998; Dwyer, 2006).

The data analysis was conducted thematically, organized around the key morphophonological processes under investigation like "vowel lengthening," "glide harmony," "hiatus resolution". The analysis was iterative and ongoing, proceeding concurrently with data collection in accordance with established principles of qualitative inquiry (Mugenda & Mugenda, 1999; Creswell & Poth, 2018). Collected data was transcribed phonetically, and underlying forms were postulated to trace the derivational processes triggered by morpheme combinations.

5. Findings and Discussion

The analysis uncovers a rich tapestry of morphophonological processes that are largely shared across the LuMaNa languages but are distinguished by critical micro-variations in their application and surface realization.

5.1 The Phonological and Semantic Role of Vowel Lengthening

Vowel lengthening is not merely a phonetic detail but a primary morphological mechanism for encoding tense and aspectual distinctions as illustrated in the examples below:

- (1) ciLungu:*tulamwazwa* [tu-la-mu-a-zu-a] 'We will help him/her' (pl)
- (2) ciMambwe:*tulamuma* [tu-la-mum-a] 'We will beat him/her' (pl)
- (3) ciLungu:*yalaamwazwa* [i-a-la:-mu-a-zu-a] 'They will be helping him/her' (pl)
- (4) ciMambwe:*yalaamupama* [i-a-la:-mupam-a] 'They will be beating him/her' (pl)
- (5) ciNamwanga:*tuliwamuuma* [tu-li-u-a-mu:m-a] 'We will be beating him/her' (pl)

In ciLungu and ciMambwe, the future tense paradigm provides a clear example. In examples (1-2), the short tense marker (TM) marks the simple future [-la-]. However, to express the future progressive (an action that will be ongoing at a future time), the vowel of this TM is lengthened to [-laa-] as shown in examples (3-4). The lengthened TM [-laa-] is the sole indicator of the progressive aspect. This prosodic modification carries a heavy functional load.

Results show that ciNamwanga in example (5), however, deviates from this strategy. It retains the short future TM [-li-] for the simple future. To form the progressive, it does not lengthen the TM but instead employs a periphrastic construction. This involves lengthening the vowel of the object marker, for instance, the underlying [-mu-] becomes surface [mu:-] and often introducing an additional subject marker, creating a multi-word construction that conveys the progressive meaning. This fundamental difference in architectural strategy for building the same aspectual meaning

is a key diagnostic feature separating ciNamwanga from its two relatives.

- (6) ciNamwanga: *waliwamuuma* [u-a-liwa-muu-m-a] 'They will be beating him/her' (pl).

Example (6) shows that the long vowel in the object marker [-muu-] and the overall periphrastic structure marks the progressive, while the TM [-li-] remains short.

5.2 Gliding Processes: Simple and Complex

Gliding in LuMaNa languages is a pervasive hiatus resolution strategy where a high vowel (/i/, /u/) becomes a non-syllabic glide ([y], [w]) when immediately preceding another vowel.

5.2.1 Simple Gliding

This is common across Bantu languages. In the present progressive, the subject marker (SM) glides before the TM [-ku-] as illustrated below:

- (7) ciLungu/ciMambwe:
Underlying structure: /i-a-ku-i-z-a/ ('SM-TM-come-FV')
Surface structure: [ya-kw-i-za] → [yakwiza] 'they are coming'

In the above examples of the underlying and surface structures, the SM /u-/ becomes the glide [w] before the vowel-initial TM /-ku-/. On the other hand, /i-/ becomes the glide [y].

5.2.2 Gliding Co-occurring with Lengthening

More interactions that are complex occur where gliding combines with vowel lengthening to create semantic contrasts, particularly in intonation-based question/statement distinctions.

- (8) ciLungu (Statement): *yakwaazwa* [i-a-ku-a-a-zu-a] → [ya-kwaa-zwa] 'they are helping'.

In example (8), the statement shows that the glide [w] is formed and the following vowel [-a-] is lengthened.

- (9) ciLungu (Question): *yakwazwa?* [ya-kwa-zwa] 'Have they helped you?'

In example (9), the same glide [w] is formed in the question just like in the statement in example (8), but the vowel [-a-] remains short instead of being lengthened. Therefore, the difference in vowel length, coupled with tone, distinguishes a statement from a question.

5.3 Systems of Harmony: Vowel and Consonant

Harmony processes ensure phonological agreement between affixes and roots, enhancing articulatory ease and phonological coherence within the word.

5.3.1 Vowel Harmony

This is evident in the formation of plural imperatives. The final vowel (FV) of the verb root harmonizes with the vowel of the plural suffix [-ni].

Let us examine the singular versus plural imperative in the examples below:

- (10) ciLungu/ciMambwe: *lya* [li-a] 'eat!' (sg) → *lyini* [li-i-ni] 'eat!' (pl).

In example (10), the FV in ciMambwe and ciLungu changes from /-a/ to /-i-/ to harmonize with the /i/ in the suffix marker /-ni/.

- (11) ciNamwanga: *lya* [li-a] 'eat!' (sg) → *lyani* [li-a-ni] 'eat!' (pl).

Crucially, in example (11), ciNamwanga does not undergo this vowel change; the root-final vowel /-a/ is maintained, and the suffix simply follows. This is a clear micro-variation in the application of vowel harmony between example (10) for ciLungu and ciMambwe, and example (11) for ciNamwanga.

5.3.2 Consonant Harmony

This system of harmony that involves consonants is also called alternation. In this system of harmony, the stem-internal consonants can alternate based on the phonological environment created by subsequent suffixes. This is often a form of regressive assimilation.

Let us also consider the present versus the past tense to determine consonant harmony in the LuMaNa example below:

- (12) LuMaNa: /vu-ang-a/ 'to talk' (Pres) → /vu-anz-ile/ 'talked' (Past)

The velar nasal /ŋ/ in the present tense root /-ang-/ harmonizes to the alveolar nasal /n/ in the past tense form before the alveolar consonant /z/ in the past tense suffix /-ile/. This change in point of articulation creates a more phonotactically agreeable sequence.

5.4 Resolution Strategies for Vowel Hiatus

Underlying sequences of two vowels (hiatus) are generally disfavored and are resolved through deletion or glide formation.

Let us examine how gliding is resolved:

- (13) LuMaNa: *imyenzo* /i-mi-e-nz-o/ → [i-mye-nzo] 'hearts' (pl).
(14) LuMaNa: *umwando* /u-mu-a-nd-o/ → [u-mwa-ndo] 'rope' (sg).

In example (13), the high vowel /i/, from an underlying form, glides to [y] to break up the vowel sequence. On the other hand, in example [14], the high back vowel /u/ glides to [w] to resolve the vowel sequence.

Deletion is yet another vowel hiatus resolution strategy that is illustrated in the example that follows:

- (15) LuMaNa: *ukutiina* /u-ku-tiina/ 'to fear' → *ukutina* [u-ku-tin-a] 'to press'.

In examples (15), vowel hiatus leads to the loss of a vowel through another process called vowel deletion. The first TM in [-tii-] has vowel length that eventually loses a vowel [-i-] in the second part of the analysis. In addition, the TM remains [-ti-]. In the above minimal pair, the deletion of one vowel from a long vowel sequence in the root completely changes

the meaning of the verb, demonstrating the phonemic role of vowel length and the functional importance of deletion.

- (16) ciNamwanga: *ukuluuka* [u-ku-lu-uk-a] 'to vomit' → *ukuluka* [u-ku-luk-a] 'to plait/weave'

A similar undertaking to example (15) is noticed in (16) where the TM [-luu-] loses a vowel and remains [-lu-] in the second part. We argue that in examples (15-16), when deletion occurs, the verbs repair vowel hiatus (VV) by changing the form and meaning.

5.5 Vowel Coalescence

When two vowels meet at morpheme boundaries, they may fuse or coalesce into a single vowel segment, often triggering lengthening or quality change. This process affects verbal structures in various ways.

Coalescence triggers fusion. The fusion of SM /u-/ and TM /i-/ creates a glide [w] as illustrated below:

- (17) LuMaNa: /*mu-i-za*/ → [mwi-za] 'you have come'.

The above example shows that the vowels /u/ and /i/ do not coalesce into a new vowel but are resolved by the first /u/ becoming a glide [w].

Secondly, coalescence in ciMambwe triggers deletion and lengthening as demonstrated below:

- (18) ciMambwe: *ukusisya* 'to remove' + *ivikwi* 'dirt' → [ukusisiivikwi] 'to clean'

In ciMambwe, a common process involves the deletion of one vowel and the compensatory lengthening of another during fusion. As can be seen in example (18), after fusion, the glide [y] is realized as [i] followed by another /i/ to form /ii/ in the output, a strategy that leads to lengthening. On the other hand, the final vowel [-a] in the first word is deleted.

Thirdly, coalescence triggers assimilation and lengthening as demonstrated below:

- (19) ciNamwanga: *ukutalalika* 'to make cool' + *inyanyi* 'relish' → [ukutalalikiinyanyi] 'to refrigeraterelish'

The above example shows that in ciNamwanga, a sequence of /i + i/ routinely coalesces into a long [i:] through assimilation and lengthening.

Coalescence also leads to deletion as shown below:

- (20) ciLungu and ciMambwe: /*uku-vyal-a* + *umwana*/ → [uku-vyal-umwana] 'to givebirth'.

The weak final vowel /a/ of an infinitive prefix is often deleted before a vowel-initial stem. This is a straightforward deletion strategy in LuMaNa to avoid a VV sequence.

6. Conclusion

This study has provided a comprehensive and detailed analysis of the principal morphophonological processes that characterize the verbal systems of ciLungu, ciMambwe, and ciNamwanga. The investigation confirms that these languages, by virtue of their shared genealogical origin, operate with a common toolkit of phonological operations: vowel lengthening for grammatical distinction, gliding, vowel and consonant harmony, hiatus resolution, and coalescence.

However, the systematic application of these processes reveals consistent and predictable micro-variations that serve as key identifiers for each language.

The findings underscore a closer phylogenetic relationship between ciLungu and ciMambwe, which pattern together in many aspects (e.g., future tense formation, vowel harmony in imperatives), while ciNamwanga frequently employs distinct strategies, such as, periphrastic future progressive, lack of vowel change in plural imperatives. These differences, however, exist within a framework of high structural similarity and likely do not severely impede mutual intelligibility.

7. Implications

The practical implications of this research are substantial. The detailed description of these grammatical systems provides an essential foundation for applied linguistic work. It is strongly recommended that curriculum developers, lexicographers, and language advocates leverage the documented similarities to create unified pedagogical materials under the "LuMaNa" umbrella. This approach would be far more efficient than creating three entirely separate sets of resources and would promote a stronger, collective identity for these languages. Simultaneously, an awareness of the documented differences is crucial for creating accurate language-specific materials. Future research should build on this morphophonological foundation to explore syntax, discourse patterns, and semantic systems to achieve a complete grammatical description of these fascinating and under-documented Bantu languages.

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