# THE TONE SYSTEM OF KUSUNTU, A GURUNSI LANGUAGE OF TOGO

by

CHRISTINA SCHRADER

Bachelor of Arts in Linguistics and Biblical Studies at Gordon College, 2018

Thesis

Submitted in Partial Fulfillment of the Requirements for the Degree of

MASTER OF ARTS IN LINGUISTICS AND TRANSLATION

in the

FACULTY OF GRADUATE STUDIES

TRINITY WESTERN UNIVERSITY

April 2025

# Acknowledgements

This thesis was only possible because of the collaboration of my language consultants and mentors, friends and fellow researchers.

I would like to thank my linguistic mentor, David Roberts, who identified the need for this research and provided much of the groundwork. He also encouraged me to pursue my Master's degree. His love for the Kabiye people is equal to his academic interest in the language they speak. This love inspires my linguistic work for the Kusuntu.

Keith Snider's work has been instrumental in clarifying the process of tone analysis for linguists everywhere, including my own novice work. As my thesis supervisor, he has lent me his expertise in Niger-Congo tone systems and his knack for clear communication. Snider also welcomed me with hospitality and friendship. Brendon Yoder was my tone professor and dedicated second reader – he read through my thesis and provided helpful feedback during flights to and from Asia.

Professor Yoma Takougnadi helped me to find Kusuntu language consultants and expressed friendship toward me as a fellow researcher, which was a great encouragement. I must also thank Ulrich Kleinewillinghöfer, who shared his unpublished work on the Kusuntu noun class systems with me, greatly informing my analysis of tone in the Kusuntu noun class system.

The Bago-Kusuntu language committee APLBK (Association pour la Promotion de la langue Bago et Kusuntu) expressed friendship and support throughout my research. I am especially grateful to committee head Bariou Amedou for his ongoing communication, as well as that of Antonin Azoti, whose initial survey work and the development of the Bago orthography kickstarted the Bago-Kusuntu community's language development journey.

Kusuntu literacy instructor Figuinandi Samani traveled from the Kusuntu area to work with me in Kara on several occasions. His wealth of knowledge and his passion for his language and culture was inspirational and invaluable. I also want to thank the three Kusuntu language consultants who assisted with data collection in Kara: Fatao Katakiti, Abdul Bassit Adetou Vac, and Anasse Baba-Agba. Fatao Katakiti worked with me consistently from the

beginning of the project to its completion (over a span of four years), both in-person and remotely. His enthusiasm often surpassed my own, and I am thankful for his consistency and kindness.

This work would not have been possible without my brothers and sisters in Christ whose financial support allowed me to focus entirely on this research. Their encouragement and prayers motivated me throughout the process. Patricia Zandstra made the incredible commitment to pray for my thesis process every day from the time we met to its completion.

I must also thank my parents for feeding, housing, and encouraging me during the most significant portion of the thesis-writing process.

I am grateful to the faculty and my classmates at The Canada Institute of Linguistics (CanIL), as well as Director Bonaventure Ayité and my colleagues at SIL Togo-Benin, for their support, guidance, and encouragement.

Finally, I would not have and could not have accomplished this work without the motivating and sustaining power of the God who created speech.

## Abstract

In 2013, Bago and Kusuntu language communities of Togo developed a shared orthography, but well-trained Kusuntu writers still struggle to mark tone consistently. This thesis constitutes the first Kusuntu tone description and seeks to inform the development of Kusuntu tone orthography. The mora is the tone bearing unit and can be H, L, or toneless. Speakers are additionally aware of a mid pitch, which is the surface realization of a downstepped H. The underlying tone patterns of verb roots are H, Ø, HØ or ØH, while noun roots are H, L, LH, or HL. Floating H and L tones mark verbal aspect. The Obligatory Contour Principle is in effect and violations are repaired in one of three ways, depending on the domain level where the violation occurs. The majority of nouns take a noun class suffix and end in a HL pattern.

# Table of Contents

Acknowledgements ..... i
Abstract ..... iii
Abbreviations ..... vii
1. Introduction ..... 1
1.1 Sociolinguistic background ..... 1
1.2 Purpose ..... 1
1.3 Literature Review ..... 2
1.4 Data and Methodology ..... 4
1.5 Transcription ..... 5
1.6 Tone overview ..... 6
2. Segmental phonology overview ..... 8
2.1 Phonemic vowel inventory ..... 8
2.1.1 Vowel length ..... 9
2.1.2 Vowel harmony ..... 11
2.2 Phonemic consonant inventory ..... 12
2.3 Nasals ..... 13
2.4 Syllable types ..... 14
3. Grammar overview ..... 15
3.1 Constituent order ..... 15
3.2 Verbal morphology ..... 16
3.2.1 Verbal aspect ..... 17
3.2.2 Verbal extensions ..... 17
3.3 The noun phrase ..... 20
3.4 Noun class suffixes and concord suffixes ..... 22

3.5 Pronouns ..... 24
4. Verbs and tone ..... 25
4.1 Verb root tone patterns ..... 25
4.2 Non-finite vs. finite stems ..... 26
4.3 Perfective ..... 30
4.4 Imperfective ..... 35
4.5 Verbal extensions ..... 37
4.5.1 Causative extension /-sI/ ..... 38
4.5.2 Instrumental extension /nå/ ..... 39
4.6 Downstepped complements ..... 40
4.7 Summary ..... 45
5. Nouns and tone ..... 46
5.1 Noun root syllable profiles ..... 46
5.2 Noun root tone patterns ..... 47
5.3 Noun class suffixes and concord markers ..... 50
5.4 Noun class pairing 1-2 ..... 53
5.4.1 Class pairing 1-2 suffixes /-(Ù)-ná/, /-bå/ ..... 54
5.4.2 Kinship prefix /a-/ ..... 56
5.4.3 Class pairing 1-2 suffixes /-ŋɔ̀/, /-bà/ ..... 57
5.4.4 Summary ..... 58
5.5 Noun class pairing 3-4 ..... 58
5.5.1 Class pairing 3-4 suffixes /-ó̩Ò/ and /-ó̩ŋÈ/ ..... 59
5.5.2 Subclass pairing 3-4 suffixes /-ó̩/, /-níŋɛ̀/ ..... 62
5.5.3 Summary ..... 63
5.6 Noun class pairing 5-6 ..... 63
5.6.1 Class pairing 5-6 suffixes /-ó̩-rE̊/, /-(à)ná/ ..... 64

5.6.2 Class pairing 5-6 prefixes /ɖI-/, /a-/ ..... 68
5.6.3 Summary ..... 69
5.7 Noun class pairing 12-13 ..... 70
5.7.1 Class pairing 12-13 suffixes /-∅/ , /-sÉ/ ..... 71
5.7.2 Class pairing 12-13 suffixes /-◌́à/, /-◌́sÈ/ ..... 72
5.7.3 Subsets of class pairing 12-13 ..... 73
5.7.4 Class pairing 12-13 prefixes /a-/ and /ka-/ ..... 74
5.7.5 Summary ..... 75
5.8 Class 21 suffix /-tɔ̊/ ..... 75
5.9 Class 22 suffix /-mO̊/ ..... 78
5.10 Summary ..... 79
6. Orthographic suggestions ..... 81
6.1 Previous testing ..... 82
6.2 Nouns ..... 83
6.3 Verbs ..... 83
6.1.1 Grammatical minimal pairs ..... 84
6.1.2 Lexical minimal pairs ..... 85
6.1.3 Clause-final perfective ..... 87
6.4 Subject/possessive pronouns ..... 88
6.5 Downstepped complements ..... 88
6.6 Summary ..... 88
References ..... 90
Appendix A: Simple verb stems in their non-finite and finite forms ..... 92
Appendix B: Simple noun stems by class pairing ..... 101

# Abbreviations

| Abbreviations | Definitions |
|---|---|
| 1 | First person |
| 2 | Second person |
| 3 | Third person |
| ATR | Advanced Tongue Root |
| C | Class; classifier |
| COP | Copula |
| INST | Instrumental |
| DEM | Demonstrative |
| DIST | Distal |
| FIN | Finite |
| HTS | High tone spreading |
| PFV | Perfective Aspect |
| NF | Non-finite |
| IMP | Imperative |
| INTR | Intransitive |
| IPFV | Imperfective |
| MOD | Modifier |
| N | Nasal |
| NF | Non-finite |
| OP | Object Pronoun |
| PFV | Perfective |
| PL | Plural |
| PP | Possessive pronoun |
| PROX | Proximal |
| PX | Prefix |
| QP | Question pronoun |
| RT | Root |
| SG | Singular |
| SP | Subject pronominal prefix |
| SX | Suffix |
| TR | Transitive |
| V | Verb |

# 1. Introduction

In this section, I briefly introduce the purpose and context for this thesis, including a brief sociolinguistic background and history of previous community testing and orthography development, as well as pertinent research. I also detail how data was sourced for this current research and bring attention to transcription conventions used in this description. Finally, I present a brief overview of the tones and relevant tone processes.

## 1.1 Sociolinguistic background

Kusuntu [ISO 639-3 bqg] is a language spoken by over 10,000 people in the Tchamba prefecture of the Central region of Togo, West Africa. It is classified as an Eastern Gurunsi language of the Gur family (also called Mabia[1]) of Niger-Congo languages. The *Ethnologue* classifies the level of vitality for Bago-Kusuntu as "Stable: The language is not being sustained by formal institutions, but it is still the norm in the home and community that all children learn and use the language" (Eberhard et al. 2025). Kusuntu is spoken in the village of Kusuntu as well as in diaspora communities, the largest and most notable of which is situated in the city of Kpalimé in the Plateau region.

## 1.2 Purpose

The purpose of this research is to inform the language community of the factors underlying tonal orthography choices and to offer suggestions for testing. The Kusuntu share an orthography with the closely-related language Bago (Azoti et al. 2013). Literacy rates,

---

[1] Mabia is a more current term adopted by Africanist linguists to reflect commonly occuring morphemes in these languages: *ma* 'mother' and *bia* 'child.' See Bodomo et al. (2020: 8-11). Using Bodomo's paradigm, Kusuntu belongs to the Mabia West branch of Mabia languages.

however, are low (Eberhard et al. 2025, Azoti et al. 2000). A language committee was formed in 1987, but their efforts ended not long afterward. A second committee was formed in 2008 and literacy courses ran until 2018. The primary reason literacy classes are not currently being offered in the Kusuntu community is a lack of finances, but another factor is at play: learning to write tone has not been easy. Because tone in Bago and Kusuntu was not extensively studied before the development of the orthography, even the most practiced among those present at a literacy workshop in 2015 struggled to master the reading and writing of tone (Azoti & Moussa 2015).

The orthography guide to Bago and Kusuntu describes five surface patterns: high, low, mid, falling, and rising (Azoti et al. 2013: 24). The authors suggest marking only the high pitch with an acute accent <◌́>, with no distinction between mid and low pitches (2013: 25). The orthography guide does not identify the mora as the tone bearing unit (TBU) in Kusuntu. This led to an inconsistency in tone marking. Nasal codas bear tone, for example, but H tones are often left unmarked on nasal codas in the Kusuntu literature.

### 1.3 Literature Review

Ulrich Kleinewillinghöfer has written the two most comprehensive articles on Kusuntu, specifically: *The Verb in Kusuntu* (2000) and an unpublished paper on the noun class system (2006). I rely extensively on Kleinewillinghöfer's segmental analysis of the noun class system of affixation.

In Togo, Yoma Takougnadi wrote both his master's thesis (2010) and his doctoral thesis (2016) on the phonology and morphology of Bago. The scope of Takougnadi's work is broad and detailed, but his tone analysis relies on complex forms. My analysis follows Snider's (2018) systematic method of controlling for all factors that affect tone and drawing preliminary conclusions strictly from simple stems. What Takougnadi has identified as an upstepped L, I consider a downstepped H and I have identified different motivations for the process. Our method may not be the only reason we have come to different conclusions, however. Takougnadi identifies a mid pitch at the right edge of class 5 Bago nouns whereas the Kusuntu class 5 nouns I have collected are clearly and consistently L-final.

More recently, Emad Alansary (2021) published his doctoral thesis *Topics in the grammar of Bago* at the University of Ottawa, Canada. Alansary presents a clean way of accounting for the tonal conjugation of the verb, a process that works just as well with the Kusuntu data. He also presents a clear, synchronic analysis of the noun class system. My research builds on his work, specifically addressing the prevalent number of downstepped noun class suffixes found in Kusuntu not mentioned in his work, as well as an additional noun class /-tO/.

Gblem-Poidi (2016) compares Bago and Kusuntu, arguing these two should be treated as dialects of the same language. The Ethnologue also lists them this way (Eberhard et al. 2025), and the two communities worked together in 2016 to develop a shared orthography (Azoti et al. 2013).

JeDene Reeder reports for SIL following orthography testing in April of 2016 (Reeder 2016a), and following a tone orthography workshop held by SIL in Kara later that year, in October-November (Reeder 2016b). Reeder concludes that Bago would benefit from marking verbs for tone, and that Kusuntu has “certain” minimal pairs that require tone marking to distinguish them, but that more research is required. I offer further detail about the specific Kusuntu data in question and the linguistic reasoning to support her conclusions.

Dave Roberts writes extensively on tone in related Gur (Mabia) languages, especially Kabiye, with orthographic suggestions as the focus of most of his work. I apply Roberts’ analysis tonal overwriting (2016), and HLH plateauing (Roberts et al. 2016) to my Kusuntu data, none of which has been considered in the aforementioned research. I also adopt Roberts’ practical suggestions for the orthographic representation of this phenomenon.

Roberts and Walter (2021) compare the results of tone orthography classroom experiments conducted in ten Niger-Congo langauges. Their comparative analysis indicates that full tone marking may significantly improve people’s ability to read in some languages, but not others. Their recommendations for Tem, the language most closely related to Bago-Kusuntu among those tested, are the most relevant to this study. The authors advise against full tone marking in Tem because it “pays no dividends” regarding reader’s fluency or comprehension (p.282). Rather, they suggest testing an orthography that marks only tonal

inflection in the verb system, following Weathers (2008). I adopt a similar conclusion for tone orthography in Kusuntu.

## 1.4 Data and Methodology

Roughly half of the data used in this analysis were elicited during a participatory tone orthography workshop conducted at the SIL center in Kara, Togo in 2016 (Roberts 2016a). The workshop was led by David Roberts and facilitated by Carole Houndjo of Wycliffe Benin. The Kusuntu participants were Bariou Amedou and Figuinandi Samani. I received this data from Roberts in 2021, and checked the legacy data with Kusuntu language consultants. I then used the SIL Comparative African Word List (SILCAWL) (Snider & Roberts 2004) to add to it, nearly doubling the number of nouns and verbs in the FieldWorks database during the years 2021-2022. The current dataset contains over 600 nouns, but only around 300 of those are made up of the simple stems used in this analysis. Likewise, the dataset contains around 300 simple verb stems. My thesis focuses on these simple stems, but I also discuss two verbal extensions.

For security purposes, my research was based in Kara, rather than in the Kusuntu language area. I worked with four Kusuntu language consultants. Three of them were men who had spent at least 20 years in the Kusuntu language area, but had moved to the city of Kara for work. These were Fatao Katakiti, Abdul Adetou-Vac, and Anasse Baba-Agba. They were working in government radio, construction, and private entrepreneurship, respectively. The consultants use the Kusuntu language regularly on the phone with family, in person with fellow Kusuntu speakers in Kara, and on visits to their hometown at least once a month. All three have the equivalent of a high school education, and two of the three have post-secondary technical diplomas.

The fourth consultant was Figuinandi Samani, a man who had participated in the 2016 tone workshop and had been a Kusuntu literacy instructor. He was the only consultant among the four who had learned to read or write using Kusuntu orthography prior to this study.

Nouns were collected using the tone frames in Table 1, where X represents the target noun.

Table 1 : Initial noun collection frames

| Frames | Example | Gloss |
|---|---|---|
| H preceding | kɛ́rɛ́ X | ‘take X’ |
| H following | X dɛ́bɛ́rɛ́ | ‘X only’ |
| L preceding | ŋɛ̀lɛ̀ X | ‘find x’ |
| L following | X lʊ̀lʊ̀ | ‘X alone’ |

All verbs were first collected in the imperative mood using the frames in Table 2. The imperative tone pattern remained constant in all four frames.

Table 2 : Initial imperative verb collection frames

| Frames | Example | Gloss |
|---|---|---|
| H preceding | í X | ‘do X’ (PL) |
| H following | X sɛ́ | ‘do X tomorrow!’ (SG) |
| L preceding | bɛ̀ X bɔ́ɔ̀ | ‘don’t do X’ (PL) |
| L following | X sìsà | ‘do X quickly!’ (SG) |

I also collected written and oral narrative texts from five different narrators. The written texts were originally published as a collection of fables resulting from a writer’s workshop in 2015(Roberts 2016). The oral texts were collected from the abovementioned language consultants Figuinandi Samani and Fatao Katakiti. Interlinear examples are sometimes pulled from those texts.

## 1.5 Transcription

Interlinear examples are written phonetically. Phonemic transcriptions are represented using back-slashes /◌/, while phonetic transcriptions are represented using square brackets [◌]. A capital letter is used to represent a vowel phoneme that can be realized [+/-ATR]. Certain noun class suffixes are represented using the capital letter because they harmonize with the

root they are attached to. For example, /-◌́Ò/ is the phonemic representation of the class 3 suffix, which is realized [-◌́ò] or [-◌́ɔ̀] depending on the ATR quality of the noun root. The angled brackets <◌> are used to represent orthographic transcriptions. Phonologically high tones are referred to as H and phonologically low tones as L. On transcriptions, H is represented using an acute accent <◌́> above the TBU and L tones are marked with a grave accent <◌̀>. Toneless TBUs are left unmarked for tone, and polar tones are marked with a small circle diacritic <◌̊> above the TBU. I use the IPA standard [j] to represent the palatal approximant.

## 1.6 Tone overview

Kusuntu has two underlying tonemes: H and L. Additionally, certain morphemes are unspecified for tone and are realized L by default. Speakers are also aware of a mid pitch that is the surface realization of a downstepped H. The tone bearing unit in Kusuntu is the mora, rather than the syllable. This is demonstrated by the tone-bearing capacity of heavy syllables: the syllable profile CV can bear only single tones, while the heavy syllable profiles CVV and CVN each bear two tones. Additionally, the contour patterns HL and LH do not occur on a single mora, but can occur on a single syllable if it has two moras, such as CVV or CVN. [2] This indicates that the mora, rather than the syllable, is the TBU in Kusuntu. This also indicates that the nasal coda bears tone as well as the vowel. The underlying tone patterns of verb roots are H, Ø, HØ or ØH, while noun roots are H, L, LH, or HL.

Seven tone processes significantly affect the realization of Kusuntu words: high tone spreading (HTS), polarity, non-automatic downstep, HLH plateauing, and three strategies for

[2] CVN verb roots that are LH in the finite form seem to take a LH contour tone on the nucleus in the clause-final perfective form to allow for the perfective (L) to associate to the nasal coda. This is discussed in §4.3. A vowel-length test is required to confirm whether this is a "true" contour or whether the nucleus vowel has been lengthened to two moras to bear the two tones.

repairing a violation of the obligatory contour principle (OCP). These three strategies are H-deletion, H-merging, and L-insertion.

HTS occurs at the word-level: the H tone spreads rightward onto toneless TBUs to the end of the word. This is discussed further in §4.2.

Certain morphemes are always realized opposite to the preceding tone. For such morphemes, there is no evidence to support an underlying H or L tone, so they are simply considered "polar." The instrumental clitic /nå/ and several noun class suffixes are realized polar to the rightmost tone of the root.

Automatic downstep occurs when the pronunciation of a L tone causes the entire register to shift downward. Native speakers are unaware of this downward shift. Non-automatic downstep occurs when a floating L causes the same process to occur, this time perceptibly. H tones that follow a floating L are realized lower than H tones that precede floating L's.

HLH Plateauing is a post-lexical process whereby a singly linked L between two H's delinks, and the second H spreads leftwards onto the unassociated TBU. In example (1), the HL noun *ḍíà 'house'* followed by the H belonging partcile *-tí* creates a HLH sequence. The singly-linked L between the two H's delinks, and rightmost H spreads left onto the newly unassociated TBU. The floating L causes this now H TBU to surface as ˈH, an example of non-automatic downstep.

(1) HLH plateauing

| L delinks between two H's | | $H_2$ spreads left | (L) causes downstep | |
|---|---|---|---|---|
| H L H | | H(L)H | [ – – – ] | |
| dɪ a tɪ | → | dɪ a tɪ | [dí-ˈá tí] | 'inhabitant' |

The obligatory contour principle (OCP) is violated when two H tones are adjacent on the tonal tier. This violation is repaired in one of three ways, depending on the domain level where it occurs. The stem level describes a domain where a tonal morpheme has been added to the root, but no morpheme boundary exists. At this level, the OCP is repaired by deleting the second H in the sequence. Finite verb stems show this behavior, as discussed further in

§4.2. The macro-stem level includes inflectional affixes, such as noun-class suffixes, but does not include clitics. At this level, the OCP is repaired by merging two H tones across the morpheme boundary. This occurs between H-final noun roots and the H class 13 suffix /-sÉ/ and discussed further in 5.7.1. H-merger also occurs between HL noun roots and the HL-overwriting suffixes of classes 2, 3, 4, 5, 6, 12, and 13 and is introduced in §5.5.1. The phonological word level includes clitics. At this level, the OCP is repaired by the insertion of a floating L between two H tones across a stem-clitic boundary. This occurs between H-final verbs and third-person object pronouns and is discussed further in §4.6.

## 2. Segmental phonology overview

This section presents an overview of the phonemic vowel inventory in Kusuntu, as well as a few relevant phonological processes, such as vowel harmony and nasal place assimilation. This section also introduces the syllable types found in Kusuntu.

### 2.1 Phonemic vowel inventory

Kusuntu has nine phonemic vowels, including two high front vowels /i/ and /ɪ/, two mid front vowels /e/ and /ɛ/, two high back vowels /u/ and /ʊ/, two mid back vowels /o/ and /ɔ/, and a single low vowel /a/. These vowels are presented in Table 3 and align with the Bago vowels presented by both Alansary (2021) and Takougnadi (2016).

Table 3 : Kusuntu phonemic vowel chart

| | Front | | Central | Back | |
|---|---|---|---|---|---|
| | +ATR | -ATR | | +ATR | -ATR |
| High | i | ɪ | | u | ʊ |
| Mid | e | ɛ | | o | ɔ |
| Low | | | a | | |

### 2.1.1 Vowel length

Vowel length is contrastive in Kusuntu. In Table 4, long vs. short vowel pairs are presented in analogous environments (same noun class, same number of syllables, same or similar syllable profile) to demonstrate this contrast.

Table 4 : Vowel length contrast

| Vowel | Singular Noun | Gloss | Class |
|---|---|---|---|
| i | bítí | ‘danger’ | 5 |
| ii | tííbí | ‘inheritance’ | 5 |
| ɪ | mí-ˈtú | ‘pain’ | 1-9 |
| ɪɪ | fíí-tɔ̀ | ‘flower’ | 1-9 |
| e | kpéló-ò | ‘baobab tree’ | 3-4 |
| ee | kpèèló-ò | ‘eagle’ | 3-4 |
| ɛ | à-gbɛ̀sá | ‘eggplant’ | 5-6 |
| ɛɛ | à-gɛ́ɛ́má | ‘chameleon’ | 5-6 |
| a | kàkpá-à | ‘heart’ | 5-6 |
| a | gààbá-à | ‘lizard’ | 5-6 |
| u | dú-rɛ̀ | ‘cloth’ | 5-6 |
| uu | túú-rè | ‘mortar’ | 5-6 |
| ʊ | júˈlú-ná | ‘witch’ | 1-2 |
| ʊʊ | ásúú-ˈná | ‘mouse’ | 1-2 |
| o | dònó-ò | ‘soup’ | 3-4 |
| oo | bòòr-óò | ‘doorway’ | 3-4 |
| ɔ | tɔ̀nɔ́-ɔ̀ | ‘body’ | 3-4 |
| ɔɔ | fɔ̀ɔ̀lɔ́-ɔ̀ | ‘piece’ | 3-4 |

### 2.1.2 Vowel harmony

Kusuntu has ATR vowel harmony. The feature [+ATR] spreads from the stem to the affix so that all mid and high vowels are either [+ATR] or [-ATR] within a given word, as shown in examples (2)-(3).

(2) Class 21 suffix /-tO̊/

| | |
|---|---|
| bóˈlí-tó | 'blessing' |
| bɔ́lí-tɔ̀ | 'mosquito' |

(3) Class 5 affixes /ɖI-/ and /-rE̊/

| | |
|---|---|
| ɖí-bú-rè | 'mound' |
| ɖí-mú-rè | 'straw bale' |

The nouns in example (2) terminate with the same underlying class nine suffix /-tO/. The unspecified *O* of the suffix agrees with the [+ATR] feature of the vowels in *bólì-* to surface as [-tò] and agrees with the [-ATR] features of the vowels in *bɔ́lí-* to surface as [-tɔ̀]. The same type of agreement occurs for the class 5 prefix /ɖI-/ and suffix /-rE/ in example (3). The vowel in both affixes is unspecified for ATR value and always agrees with the ATR features of the vowels in the stem. These examples show that vowel harmony spreads from the stem to the affix, regardless of whether the affix precedes or follows the stem.

The vowel /a/ is [-ATR]. The primary evidence for this is that when /a/ is the only or final vowel in the stem, harmonizing suffixes are realized as [-ATR], as shown in (4). However, the vowel /a/ can co-occur with both [+ATR] and [-ATR] vowels, as shown in (5).

(4) /a/-only or /a/-final stems take [-ATR] affixes

| | |
|---|---|
| bá-mɔ̀ | 'palm wine' |
| dàrá-ˈtɔ́ | 'praise' |
| ɖì-sà-rɛ́ | 'wall' |

(5) The vowel /a/ co-occurs with both [+ATR] and [-ATR] vowels

| | [+ATR] | | [-ATR] | |
|---|---|---|---|---|
| I | bàǹsì | ‘manioc’ | càsí | ‘antelope’ |
| E | ɖèéˡsá | ‘pepper’ | ɖá-ŋɛ̀ | ‘wood’ |
| U | bú-à | ‘spring’ | júˡlú-ná | ‘witch’ |
| O | dʒòfá-à | ‘rain’ | bɔ́sá-à | ‘mat’ |

In some nine-vowel languages with ATR harmony, the vowel /a/ harmonizes for [ATR], but the [+ATR] feature only spreads from right to left (Casali Forthcoming). Additional phonetic research is required to determine whether the /a/ in Kusuntu harmonizes in [ATR] quality with adjacent vowels in either direction.

## 2.2 Phonemic consonant inventory

There are 22 consonant phonemes in Kusuntu, presented in Table 5. [3]

[3] The phonetic consonants [z], [c], and [ŋm͡] were taken into consideration as phonemes but excluded from the final analysis because the data contained fewer than three tokens for each sound. These tokens are perhaps borrowed words.

Table 5 : Kusuntu phonemic consonant chart

| | Labial | Alveolar | Post-alveolar | Palatal | Velar | Labial-Velar |
|---|---|---|---|---|---|---|
| Stops | p, b | t, d | ɖ | | k, g | k͡p, g͡b |
| Fricatives | f, v | s | | | | |
| Affricates | | | d͡ʒ | | | |
| Nasals | m | n | | ɲ | ŋ | |
| Liquids | | l, r | | | | |
| Glides | | | | j | | w |

The Kusuntu data in Table 5 affirms Takougnadi's (2016) assessment of Bago phonemes and mostly affirms Alansary's (2021), the only difference being that Alansary does not acknowledge the voiceless bilabial stop /p/ as phonemic in Bago, while the Kusuntu data supports a phonemic /p/. Table 6 presents examples of /p/ and /b/ occurring in analogous environments.

Table 6 : Voiced/unvoiced bilabial contrast

| | | | |
|---|---|---|---|
| /p/ | pàpà-∅ | pàpà-sɛ́ | 'fan (n) |
| | písɔ́-ɔ̀ | písí-ŋɛ̀ | 'mahogany tree |
| | pílí | | 'be able' |
| /b/ | bàlá-ˡtɔ́ | bàlá-ˡná | 'footstep' |
| | bíŋ́-à | bíń-sɛ̀ | 'year' |
| | bìlì | | 'roll' |

## 2.3 Nasals

Nasals assimilate to the place of articulation of the following consonant, both within a word and across word boundaries, as shown in Table 7.

Table 7 : Nasal consonant assimilation

| Perfective | Gloss |
|---|---|
| ɔ sáˡḿ-mɛ́ | ‘he caught me’ |
| ɔ sáˡń-ró | ‘he caught us’ |
| ɔ sáˡŋ́-kú | ‘he caught it (the horse)’ |
| ɔ sáˡŋ́-ké | ‘he caught it (the dog)’ |
| ɔ sáǹ dʒí | ‘he caught here’ |
| ɔ sáǹ dɛ̀ | ‘he caught yesterday’ |
| ɔ sáˡḿ bɔ́rɛ̀ | ‘he caught the rock/pebble’ |
| ɔ sáŋ̀ gànfúˡmú-ré | ‘he caught the cicada’ |
| ɔ sáŋ̀ kùbɛ́ | ‘he caught the coconut’ |

In utterance-final position, however, the nasal consonant elides and transfers its nasal quality onto the preceding vowel, which is, in turn, compensatorily lengthened. This is shown in example (6).

(6) Utterance-final realization of the nasal coda

| Underlying form | Phonetic form | Gloss |
|---|---|---|
| /ɔ sáŋ̀/ | [ɔ sa̋ã̀] | ‘he caught’ |

## 2.4 Syllable types

The syllable types presented by Alansary (2021) and Takougnadi (2016) in their analyses of Bago are the same as those found in Kusuntu. These are presented with Kusuntu examples in Table 8.

Table 8 : Syllable types

| Syllable type | Example | Gloss |
|---|---|---|
| V | í.dʒá | ‘truth’ |
| N | ǹ.ɖǒḿ | ‘frog’ |
| VN | àm̀.bá | ‘someone’ |
| CV | tà.lì | ‘arrive’ |
| CVN | sáŋ́ | ‘catch’ |
| CVV | súú.rí | ‘add; fill’ |

As Alansary points out in Bago, the syllable VN rarely occurs. Other than question pronouns, he cites one substantive noun. In Kusuntu, only the question pronouns and indefinite pronouns use the syllable VN. The syllable N occurs word-initially. The most common syllable type is CV. Verbs roots are either monosyllabic CV or CVN, or disyllabic CVCV. The syllable profiles of nouns is discussed further in §5.1.

## 3. Grammar overview

This section presents the grammatical background neccesary for the later discussion of tonal behavior related to verbs (§4) and nouns (§0). Consituent order is presented in §3.1, followed by a brief overview of verbal morphology in §3.2, an introduction to the noun class system in §3.3, and a quick look at personal and noun-class pronouns in §3.5.

### 3.1 Constituent order

Kusuntu has SVO constituent order. A noun phrase or subject pronominal prefix precedes the verb, which is optionally followed by a direct object, as shown in (7).

(7) The ox and the hunter (Abreté 2015)

| | |
|---|---|
| ɔ́ɔ́-kú | ná-ŋɛ̀ |
| 3SG\IPFV-kill | ox-C4 |

'he kills oxen'

Location information follows the direct object and sometimes takes a postposition, such as *mɛ̀* 'in' in example (8), or *dʒàŋ́* 'beside' in example (9).

(8)

| | | | | | |
|---|---|---|---|---|---|
| ágòlù-ná | ŋùrù | wɛ̀ | dìk͡pèn-ɖɛ́ | ɖi̩rì | mɛ̀ |
| young.man-C1 | DET.C1 | COP | village-C5 | DET.C5 | in |

'this young man lives in a village'

(9)

| | | | | |
|---|---|---|---|---|
| bàá-à | kɔ́ɔ̀ | bísá | búnà | dʒàŋ́ |
| dog-C12 | come/FAC | lay.down | baby | beside |

'the dog came to lay down beside the baby'

## 3.2 Verbal morphology

Transitive verbs are followed by a direct or indirect object. The indirect object precedes the direct object, as shown in (10).

(10)

| | | |
|---|---|---|
| ɔ̀-fá | ɔ̀-dìfɔ́-ˈná | bí-ˈná |
| 3SG-give | 3SG-friend-C2 | money-C5 |

'he gave his friends money'

Often, the indirect object is expressed as an object pronoun. In this case, it is attached to the verb as a clitic, as shown in (11).

(11) ɔ̀-dìfɔ́-ˡná bìsí = ˡí bí-ˡná
3SG-friend-C2 ask = 3SG money-C5
'his friends asked him for money'

### 3.2.1 Verbal aspect

Kusuntu, like Bago, distinguishes between perfective and imperfective aspects tonally, as discussed in 4.3 and 4.4. Other tenses and modalities are indicated through particles and auxiliary verbs, and are not addressed in this study.

### 3.2.2 Verbal extensions

Verbs in Kusuntu can often be extended by one or both of the following verbal extensions: the causative extension /-sI/ and/or the instrumental extension /-ná/. The extension /-sI/ is valence-increasing and almost always adds a causative meaning to the verb. Where simple/extended pairs are found, the simple stem is univalent and patientive, such as *fèŋ̀* 'wake up,' while the extended form is bivalent and causative, such as *fèǹ-sì* 'cause X to wake up,' as shown in Table 9.

Table 9 : Causative extension /-sI/

| Simple NF | Gloss | Extended NF | Gloss |
|---|---|---|---|
| ɖò | 'sleep' | ɖò-sì | 'dream' |
| jò | 'quarrel; war' | jòò-sì | 'start a fight; mix people' |
| ŋɔ̀ | 'drink' | ŋɔ̀-sì | 'nurse' |
| ɖá | 'get lost' | ɖàń-sí | 'lose; mislead' |
| ɖé | 'be good' | ɖé-sí | 'arrange' |
| k͡pá | 'burn' | k͡pá-sí | 'cause to burn' |
| ɖìŋ̀ | 'be extinguished' | ɖìǹ-sì | 'extinguish' |
| ɖùŋ̀ | 'jump; hurt' | ɖùǹ-sì | 'make jump' |
| fɔ̀ŋ̀ | 'pull, drag' | fɔ̀ǹ-sì | 'withdraw; lift out' |
| fèŋ̀ | 'wake up' | fèǹ-sì | 'cause to wake up' |
| kùŋ̀ | 'take a piece' | kùǹ-sì | 'break X up into pieces' |
| ŋɔ̀ŋ̀ | 'grill' | ŋɔ̀ǹ-sì | 'chop (with an axe/machete)' |
| tìŋ̀ | 'descend' | tìǹ-sì | 'lower' |
| síŋ́ | 'stop; stand up; encounter' | síń-sí | 'store (up), place; stop (INTR)' |
| dʒìŋ́ | 'ascend' | dʒìń-sí | 'cause to ascend' |
| bàrà | 'lean on; be stubborn' | bàràǹ-sì | 'prevent; cause to delay' |
| lùlù | 'give birth' | lùrùǹ-sì | 'help X give birth' |
| mìlì | 'drive' | mìlìǹ-sì | 'drive a car' |
| wìlì | 'teach; show; dry ' | wìlìǹ-sì | 'make dry' |
| fùlùŋ̀ | 'fade' | fùlùǹ-sì | 'cause to fade; whiten' |
| mɛ̀lɛ̀ŋ̀ | 'go mad' | mɛ̀lɛ̀ǹ-sì | 'deceive' |

Some simple/extended pairs have a non-causative semantic relationship. For example, *ɖò-sì* means ‘dream’ rather than ‘cause to sleep.’ Additionally, several more verbs are extended by /-sI/ that do not have simple-stem counterparts.

Like the causative extension /-sI/, the instrumental extension /-nå/ is valence-increasing. As a verbal extension, the morpheme is almost always glossed ‘with.’ The morpheme can also stand alone as comitative particle ‘and’ between two nouns as shown in (12).

(12) The lion and the leopard (Amedou 2015)

| | | | | |
|---|---|---|---|---|
| bú$^{\downarrow}$wátí | nà | kìnìkìnìú | jɛ́ | ɖ̀ífó-$^{\downarrow}$ná |
| lion | and | leopard | COP | friend.C2 |

'the lion and the leopard are friends'

The extension primarily functions to allow for the use of an instrument, but it can also make an intransitive verb transitive, a transitive verb causative, or allow for accompaniment,[4] as shown in examples (13)-(16). Its tone is realized polar to the preceding TBU and is discussed further in §4.5.2.

The copula *wɛ̀* 'be' is transformed by the /-nå/ extension into the possessive 'have,' lit. 'be with,' as shown in (13).

(13) /nå/ as possessive

a.

| | |
|---|---|
| ɔ̀-wɛ̀ | ágb̰ɛ́rí |
| 3SG-COP | dignitary |

'he is a dignitary'

b.

| | |
|---|---|
| ɔ̀-wɛ̀=ná | òsò |
| 3SG-COP=INST | gun |

'he has a gun'

The verb *fɛ́* 'flee' in (14) may or may not take an object, but *fɛ́-na* 'cause to flee' requires an object.

[4] Kleinewillinghöfer (2000: 98) refers to this suffix as "associative."

(14) /nå/ as valence-increasing

a. ɔ́-fé ˡbá-à
3SG-flee dog-C12
'he fled (from) the dog'

b. ɔ́-fé-nà bàá-à
3SG-flee = INST dog-C12
'he drove away the dog'

In example (15), /nå/ is used as a comitative morpheme. While the verb *ɖí* 'eat' already takes a direct object, the clitic /nå/ allows a secondary one: he ate food 'with peppers.'

(15) /nå/ as comitative

a. ɔ́-ɖí = nà dèésá-∅ ɖí-tò
3SG-eat = INST pepper-C12 food-C21
'he ate food with peppers'

The most common indication of the /-nå/ suffix is the use of an instrument in accomplishing an already transitive action, as shown in (16).

(16) /nå/ as instrumental

a. ɔ́-ɖí ɖí-tò
3SG-eat food-C21
'he ate food'

b. ɔ́-ɖí = nà bɔ̀lá-ˡá ɖí-tò
3SG-eat = INST spoon-C12 food-C21
'he ate food with a spoon'

## 3.3 The noun phrase

Within a noun phrase, modifiers follow the head noun. This is true of adjectives, numerals, determiners, and demonstratives, as shown in (17).

(17) Modifiers follow head noun

a. lɔ́-ɔ̀ gb̰ɔ̀ŋ̀gb̰ɔ̀ǹkɔ̀-wà
forest-C3 big-C3
'big forest'

b. àk̰pá-à bàtòòrò kùñɔ́-ŋɔ̀
men-C2 three-C2 poor-C2
'three poor men'

c. ná-ˡŋúná kùrù
ox-C3 DET.C3
'a certain ox'

d. àlú-ˡná ŋúdʒè
woman-C1 PROX.C1
'this woman'

Only possessive nouns precede head nouns in noun phrases, as shown in (18). Possessive pronouns act as prefixes.

(18) Possessive noun precedes head noun

a. ágbérí-∅ sìkà-∅
dignitary-C12 twin-C12
'the dignitary's twin'

b. mà-jí-rɛ̀
1SG-name-C5
'my name'

The associative noun phrase does not use any particle or grammatical tone to link associated nouns. They are simply juxtaposed, the possessor preceding the possessee.

## 3.4 Noun class suffixes and concord suffixes

The noun itself is composed of a stem and a suffix that marks its noun class. Kusuntu nouns are classified according to their concord markers into ten classes. The numbering system is discussed in §5.3. A given class may contain multiple subsets of class suffixes. Each noun elicited was placed into a frame using the adjective ‘good’ to identify its class. Table 10 presents examples of this frame for each of the ten classes.

Table 10 : Noun class suffixes and concord suffixes

| Class | Noun class suffix | Concord suffix | Noun phrase | | Gloss |
|---|---|---|---|---|---|
| 1 | -(Ù)-ná/ -ŋɔ̀ | -ŋɔ̀ | ákp͡á-ˈná<br>man-C1 | lɔ̀lɔ̀ń-ŋɔ̀<br>good-C1 | ‘good man’ |
| 2 | -bå | -bà | ákp͡á-à<br>man-C2 | lɔ̀lɔ̀ń-bà<br>good-C2 | ‘good men’ |
| 3 | -ó̩Ò | -kɔ̀ | gìsɔ́-ɔ̀<br>horse-C3 | lɔ̀lɔ̀ń-kɔ̀<br>good-C3 | ‘good horse’ |
| 4 | -ó̩ŋÈ | -ŋɛ̀ | gìsí-ŋɛ̀<br>horse-C4 | lɔ̀lɔ̀ń-ŋɛ̀<br>good-C4 | ‘good horses’ |
| 5 | -ó̩rE̊ | -ɖɛ̀ | káˈdʒímí-rè<br>chicken-C5 | lɔ̀lɔ̀ń-ɖɛ̀<br>good-C5 | ‘good chicken’ |
| 6 | -(à)ná | -ŋà | káˈdʒímí-ˈná<br>chicken-C6 | lɔ̀lɔ̀ń-ŋà<br>good-C6 | ‘good chickens’ |
| 12 | -Ø/-ó̩à | -kà | bàá-à<br>dog-C12 | lɔ̀lɔ̀ń-kà<br>good-C12 | ‘good dog’ |
| 13 | -sÉ/-ó̩sÈ | -sì | bàá-sɛ̀<br>dog-C13 | lɔ̀lɔ̀ń-sì<br>good-C13 | ‘good dogs’ |
| 21 | -tɔ̊ | -tɔ̀ | bɔ́lí-tɔ̀<br>mosquito-C21 | lɔ̀lɔ̀ń-tɔ̀<br>good-C21 | ‘good mosquito’ |
| 22 | -mɔ̊ | -bɔ̀ | kp͡íń-ɖɛ̀<br>thing-C22 | lɔ̀lɔ̀ń-bɔ̀<br>good-C22 | ‘good thing’ |

## 3.5 Pronouns

The different pronouns for each class are presented in Table 11. Up to three pronouns exist for a given class/person: subject, possessive, and object. In the singular, subject and possessive pronouns are segmentally identical.

Table 11 : Pronouns

| Person | Class | Singular | | | Plural | | |
|---|---|---|---|---|---|---|---|
| | | SUBJ | POSS | OBJ | SUBJ | POSS | OBJ |
| First | | ma- | ma- | -mɛ̊ | ɖɪ | ɖáŋ̀- | -rʊ̊ |
| Second | | n- | n- | -nɪ̊ | ɪ | àmɛ́- | -àmɛ́ |
| Third | 1-2 | ɔ- | ɔ- | -ɪ | ba | ba- | -bɛ |
| | 3-4 | kʊ- | kʊ- | -kʊ | ŋɪ | ŋɪ- | -ŋɪ |
| | 5-6 | ɖɪ- | ɖɪ- | -ɖɪ | ŋa | ŋa- | -ŋɛ |
| | 12-13 | ka- | ka- | -kɛ | sɪ | sɪ- | -sɪ |
| | 21 | tʊ- | tʊ- | -tʊ | | | |
| | 22 | bʊ- | bʊ- | -bʊ | | | |

Subject pronominal prefixes bear grammatical tone according to the aspect of the verb; a floating L tone associated with the pronoun indicates perfective aspect and a floating LH tone indicates imperfective. This is discussed further in §4.4. First- and second-person object pronouns are polar, except for the second-person plural pronoun *àmɛ́* 'you,' which is LH. The realization of these personal pronouns following H-final and L-final verbs is presented in Table 12.

Table 12 : First and second person object pronouns

| Person | Root tone | Singular | Gloss | Root tone | Plural | Gloss |
|---|---|---|---|---|---|---|
| 1 | LH | ɔ-tɔ̀ḿ = mɛ̀ | ‘he told me’ | LH | ɔ-tɔ̀ń = rù | ‘he told us’ |
| | HL | ɔ-sáˈḿ = mɛ́ | ‘he caught me’ | HL | ɔ-sáˈń = rú | ‘he caught us’ |
| 2 | LH | ɔ-tɔ̀ń = nì | ‘he told you’ | LH | ɔ-tɔ̀ń = àmɛ́ | ‘he told you’ |
| | HL | ɔ-sáˈń = ní | ‘he caught you’ | HL | ɔ-sáǹ = àmɛ́ | ‘he caught you’ |

Third-person pronouns are realized H and are downstepped following H-final verbs. This is discussed further in §4.6.

## 4. Verbs and tone

Kusuntu verbs are marked by both lexical and grammatical tone. Lexically, verb roots are marked by one of three underlying tone patterns. This is discussed in §4.1. Grammatically, the insertion of a H tone marks a conjugated verb, as discussed in §4.2. A floating L following the verb and a floating H preceding it distinguish the perfective from imperfective aspects, as discussed in §4.3 and §4.4. The tonal behavior of two highly productive verbal extensions is discussed in §4.5, and the tonal behavior of object complements is discussed in §4.6. A full list of simple verb stems is included in Appendix A.

### 4.1 Verb root tone patterns

Three contrasting tone patterns occur on non-finite simple verb stems: H, Ø, and ØH. These are shown in Table 13. A H tone can be prelinked to either the first or second TBU of the verb root. When the H tone is prelinked to the first TBU, it spreads right onto the second toneless TBU. When the H tone is prelinked to the second TBU, the initial tonelss TBU takes a default L, resulting in a LH surface pattern.

Table 13 : Verb root tone patterns

| Tone | CV | CVN | CVCV |
|---|---|---|---|
| H | [tɛ́] | [sáŋ́] | [tásí] |
| | ‘get ahead’ | ‘trap’ | ‘dry’ |
| | (26) | (4) | (47) |
| Ø | [yɛ̀] | [tɔ̀m̀] | [bìlì] |
| | ‘do’ | ‘speak’ | ‘roll’ |
| | (26) | (28) | (86) |
| ØH | | [dʒìŋ́] | [bìrí] |
| | | ‘ascend’ | ‘carry on back’ |
| | | (7) | (12) |

## 4.2 Non-finite vs. finite stems

While many tenses, aspects, and modalities are formed using auxiliary verbs and other particles, the conjugation of the verb stem itself is rather simple. The verb stem comes in two primary forms: non-finite and finite (Alansary 2021: 48; Kleinewillinghöfer 2000:99). The non-finite form is the unmarked stem, while the finite is the conjugated form. The non-finite stem is used for the imperative, prohibitive, and future aspects, while the finite stem is used for imperfective and perfective aspects. The finite is formed by the addition of a floating H.

Table 14 : Non-finite vs. finite verb stems

| | Non-finite | | Finite | | Gloss |
|---|---|---|---|---|---|
| CV | Ø | yɛ̀ | H | yɛ́ | ‘do’ |
| | H | tɛ́ | H | tɛ́ | ‘get ahead’ |
| CVCV | Ø | bìlì | LH | bìlí | ‘roll’ |
| | H | tásí | HL | tásì | ‘dry’ |
| | ØH | bìrí | HL | bírì | ‘carry on back’ |
| CVN | Ø | tɔ̀m̀ | LH | tɔ́ḿ | ‘speak’ |
| | H | sáŋ́ | HL | sáŋ̀ | ‘trap’ |
| | ØH | dʒìŋ́ | HL | dʒíŋ̀ | ‘ascend’ |

Alansary’s analysis of this tonal verb conjugation in Bago works for the Kusuntu data as well (Alansary 2021: 48-51). He analyzes the low pitches of the non-finite forms as underlyingly toneless. These toneless TBUs are not associated with tone and can be thought of as “available.” The finite verb form is created when a floating H tone associates to the rightmost available (underlyingly toneless) TBU, as shown in (19)-(22).

(19) Conjugation of ‘do’

NF FIN H associates to available TBU

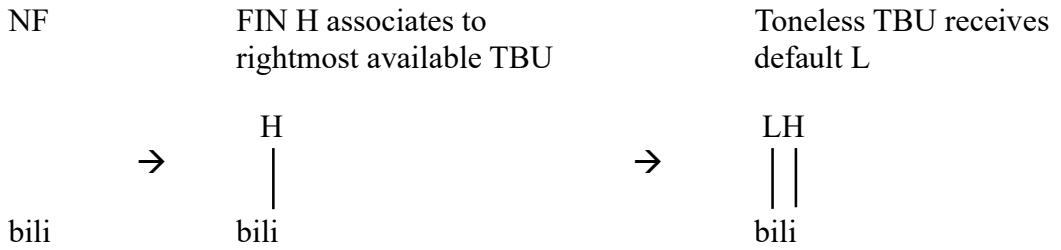
H

→ |

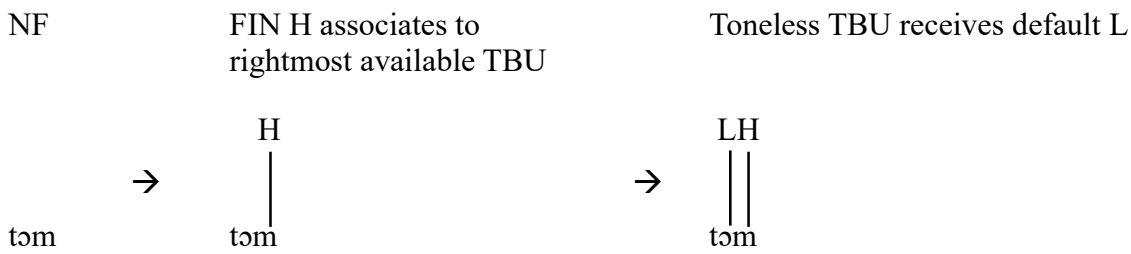
/jɛ/ [jɛ́]

(20) Conjugation of ‘get ahead’


(21) Conjugation of ‘roll’




(22) Conjugation of ‘speak’




The addition of the finite H to a root already linked to H creates a sequence of H’s on the tonal tier that violates the OCP. To repair this violation, the second H in the sequence is deleted, as shown in (23)-(26).

(23) Conjugation of ‘dry’

| NF | FIN H associates to R-most available TBU | $H_2$ deletes to repair OCP | Toneless TBU receives default L |
|---|---|---|---|
| H | HH | H | H L |
| tasɪ | tasɪ | tasɪ | tasɪ |

(24) Conjugation of ‘carry on back’

| NF | FIN H associates to R-most available TBU | $H_2$ deletes to repair OCP | Toneless TBU receives default L |
|---|---|---|---|
| H | HH | H | H L |
| biri | biri | biri | biri |

(25) Conjugation of ‘trap’

| NF | FIN H associates to R-most available TBU | $H_2$ deletes to repair OCP | Toneless TBU receives default L |
|---|---|---|---|
| H | HH | H | HL |
| saŋ | saŋ | saŋ | saŋ |

(26) Conjugation of ‘ascend’

| NF | FIN H associates to R-most available TBU | $H_2$ deletes to repair OCP | Toneless TBU receives default L |
|---|---|---|---|
| H | HH | H | HL |
| dʒɪŋ | dʒɪŋ | dʒɪŋ | dʒɪŋ |

## 4.3 Perfective

The perfective and imperfective aspects both use the conjugated (finite) verb form. These two aspects are distinguished by tones preceding and following the verb stem. The perfective is marked by a floating L on the right of the finite verb stem when the verb is clause-final, as shown in (27).

(27) Clause-final perfective
bà-wîì
3PL-cry\PFV
‘they cried’

When the verb is followed by a complement, however, the perfective L does not appear, either immediately following the verb or at the end of the clause. Unless the verb is clause-final, the perfective is no different from the simple finite conjugation of the verb. In (28), the first verb *dʒòró* ‘get up’ is marked by the perfective floating L because it is clause-final. The consecutive marker *kà* that follows serves as a conjunction to join two clauses. The second verb *fú* ‘follow’ is not clause-final and is therefore not marked by the perfective L tone. Non-finite forms such as the serial verb *fú* ‘follow’ in (28) are left unmarked for TAM in the morphemic gloss.

(28) The lion and the leopard (Amedou 2015)

| | | | | | |
|---|---|---|---|---|---|
| bà-dʒòróò | kà | fú | gb̑ɔ́-ɔ̀ | kùrù | kp̑ákp̑á |
| 3PL\PFV-get.up\PFV | and | follow | path-C3 | DET.C3 | same |

‘they got up and took the same path’

Example (29) shows H verb *té* ‘go ahead’ followed by H object complement *ágb̑érí* ‘dignitary.’ If the perfective L were floating between the verb and its complement, the H noun *ágb̑érí* ‘dignitary’ would be downstepped. Since non-automatic downstep does not occur in examples such as (29), the perfective L is thought to be either absent or deleted in clause-medial position.

(29) Clause-medial perfective

| | |
|---|---|
| ɔ̀-té | ágb̑ɛ́rí-∅ |
| 3SG\PFV-get.ahead | dignitary-C12 |

‘he went ahead of the dignitary’

Table 15 shows how this clause-final perfective (L) is added to finite verb stems of differing tone patterns and syllable profiles.

Table 15 : Clause-final perfective

| | Non-finite | | Finite | | Clause-final perfective | | Gloss |
|---|---|---|---|---|---|---|---|
| CV | Ø | jɛ̀ | H | jɛ́ | HL | jɛ́ɛ̀ | ‘do’ |
| | H | tɛ́ | H | tɛ́ | HL | tɛ́ɛ̀ | ‘get ahead’ |
| CVCV | Ø | bìlì | LH | bìlí | LHL | bìlîì | ‘roll’ |
| | H | tásí | HL | tásì | HL | tásì | ‘dry’ |
| | ØH | bìrí | HL | bírì | HL | bírì | ‘carry on back’ |
| CVN | Ø | tɔ̀m̀ | LH | tɔ̀ḿ | LHL | tɔ̌m̀ | ‘speak’ |
| | H | sáŋ́ | HL | sáŋ̀ | HL | sáŋ̀ | ‘trap’ |
| | ØH | dʒìŋ́ | HL | dʒíŋ̀ | HL | dʒíŋ̀ | ‘ascend’ |

When the finite form of the verb stem is already L-final, the perfective L is deleted, as shown in (30) through (33).

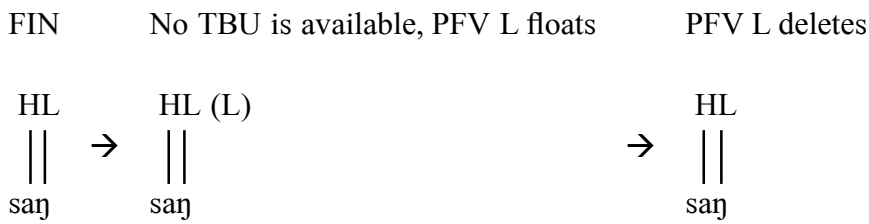
(30) Clause final perfective ‘dried’

| FIN | | No TBU is available, PFV L floats | | PFV L deletes |
|---|---|---|---|---|
| H L | → | H L (L) | → | H L |
| tasɪ | | tasɪ | | tasɪ |

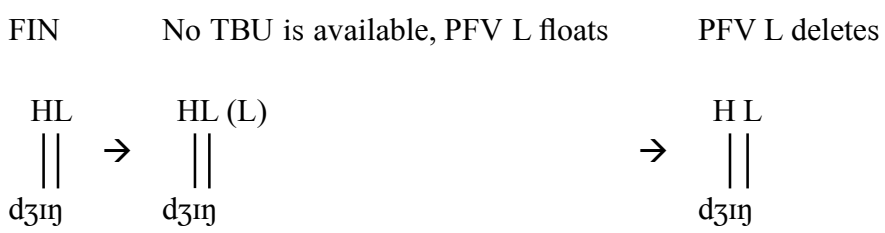
(31) Clause final perfective ‘carried on back’

| FIN | | No TBU is available, PFV L floats | | PFV L deletes |
|---|---|---|---|---|
| H L | → | H L (L) | → | HL |
| biri | | biri | | biri |

(32) Clause final perfective ‘trapped’

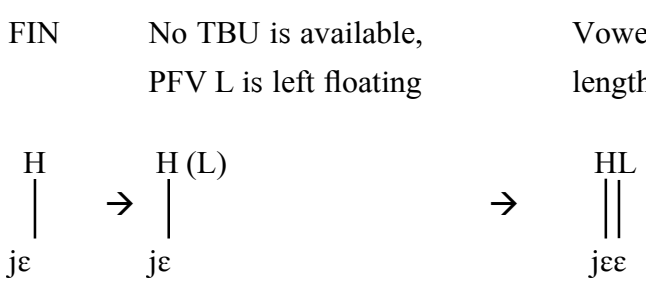



(33) Clause final perfective ‘ascended’




When the rightmost TBU of a finite verb is associated to H, the final vowel of the verb stem is lengthened to carry the perfective L tone, as shown in (34) throught (36).

(34) Clause final perfective ‘did’

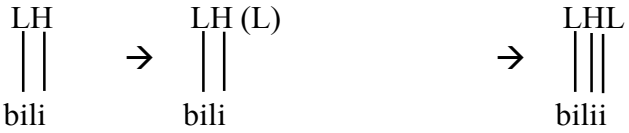


(35) Clause final perfective ‘went ahead’

| FIN | No TBU is available, PFV L is left floating | Vowel lengthens, PFV L associates to lengthened segment |
|---|---|---|


(36) Clause final perfective ‘rolled’

| FIN | No TBU is available, PFV L is left floating | Vowel lengthens, PFV L associates to lengthened segment |
|---|---|---|




Verb stems with a CVN syllable profile are the exception. Kusuntu does not allow nasals to lengthen to allow for the perfective (L) to associate. Rather, the perfective (L) associates to the nasal coda, and this forces the stem-final H to move leftward so that the contour occurs on the nucleus rather than the coda, as shown in (37).

(37) Clause final perfective ‘spoke’

| FIN | No TBU is available for PFV (L) | LH merges onto nucleus, PFV (L) associates to nasal coda |
|---|---|---|
| L H → | L H (L) → | LH L |
| tɔm | tɔm | tɔ m |

## 4.4 Imperfective

The imperfective aspect is marked by a floating H that precedes the verb. Subject pronominal prefixes are lengthened by the addition of a mora to accommodate the floating H, as shown in (38).

(38) Imperfective aspect
bàá-wí
3PL\IPFV-cry
‘they are/were crying’

Table 16 presents the realization of all subject pronominal prefixes according to the aspect of the verb they precede. The stem of a perfective verb is preceded by a L subject pronominal prefix while the imperfective is preceded by a LH subject pronominal prefix.

Table 16 : Subject pronomial prefixes

| Person/class | Plurality | Perfective | Imperfective |
|---|---|---|---|
| First | SG | mà- | màá- |
| | PL | ḍì- | ḍìí- |
| Second | SG | ǹ- | ǹń- |
| | PL | ì- | ìí- |
| Third | SG | ɔ̀- | ɔ̀ɔ́- |
| | PL | bà- | bàá- |
| 3 | SG | kù- | kùú- |
| 4 | PL | ŋì- | ŋìí- |
| 5 | SG | ḍì- | ḍìí- |
| 6 | PL | ŋà- | ŋàá- |
| 12 | SG | kà- | kàá- |
| 13 | PL | sì- | sìí- |
| 21 | Non-count | tù- | tùú- |
| 22 | Non-count | bù- | bùú- |

When the subject of a verb is a full noun phrase, such as in (39), the imperfective aspect is marked by the particle [-ná], which precedes the verb.

(39) Kusuntu imperfective particle [ná]

a. àk͡pá-ꜜá ná wí
people IPFV cry
'the people were crying'

b. bú-nà ná ꜜd͡ʒóró sàlààŋ
child-C1 IPFV get.up slowly
'the child gets up slowly'

This is unlike Bago, where the subject noun is marked by a floating H tone in the same way that subject pronominal prefixes are, using a lengthened final vowel to carry the H.

Takougnadi (2016) and Alansary (2021) both attest to this phenomenon, presented in (40) and (41).

(40) Bago (Takougnadi 2016: 261)

a. vú-nàá dóró fɛ̀tɛ̀rɛ̀ɛ̀
child-C1\IPFV get.up slowly
'the child gets up slowly'

b. béɛ́-rɛ̀ɛ́ d͡ʒíŋ̀ básɛ̀ lɔ́
monkey-C5\IPFV climb palm.tree on
'the monkey climbs the palm tree'

(41) Bago (Alansary 2021: 76)

a. mà-ɖò̩góó sɔ̀ɔ̀lí wɔ̀rɔ̀-ɔ́ kòd͡ʒé
1SG -girlfriend\IPFV love golden.chain-C3 PROX.C3
'my girlfriend will love this golden chain'

b. ɔ̀-ɔ́lúú váŋ̀
3SG-wife\IPFV be.sick
'his wife is sick'

## 4.5 Verbal extensions

Two verbal extensions are highly productive in Kusuntu. These are the toneless causative extension /-sI/ and the polar instrumental extension /nå/. The grammatical functions of these extensions are discussed in §3.2.2, and the tonal behavior of these extensions is discussed in this section. The causative extension /-sI/ is realized with the same tone as the preceding TBU, while the instrumental /-nå/ is realized opposite to the preceding tone. As shown in §4.2, the floating H tone of the finite form associates to the rightmost toneless TBU of the verb stem. When a verb has been extended by the toneless extension /-sI/, therefore, the finite floating H associates to the causative extension. The polarization of the instrumental

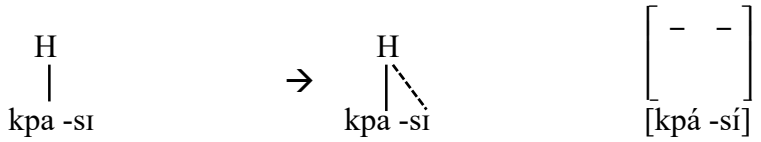
extension, however, occurs after the conjugation of the verb stem. Many verbs may be extended by both of these extensions. When that occurs, /-sI/ precedes /nå/.

### 4.5.1 Causative extension /-sI/

The causative /-sI/ extension is underlyingly toneless and is realized with the same tone as the preceding TBU. Following H, the suffix is H. Following L, the suffix is realized L, as shown in (42).

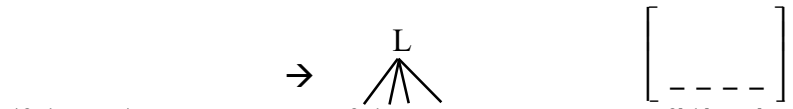
(42) Causative extension /-sI/

a. NF stem + /-sI/ HTS




‘cause to burn’

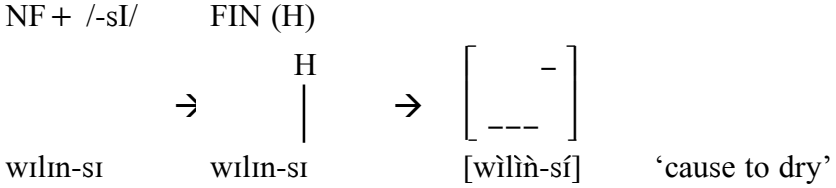
b. NF stem + /-sI/ Toneless TBUs receive default L




‘cause to fade’

The causative extension /-sI/ is added to the verb before it is conjugated, so that the floating H suffix of the finite construction associates to the toneless morpheme /-sI/ rather than to the rightmost toneless TBU of the root. The correct order of alternation is shown in (43), as compared with the incorrect order in (44), whose output does not occur.

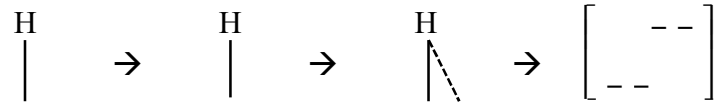
(43) Conjugation follows causative extension /-sI/




‘cause to dry’

(44) Conjugation does not precede causative extension /-sI/

FIN (H) + /-sI/




wìlìń wìlìń-sɪ wɪlɪn-sɪ *[wìlìń-sí] ‘cause to dry’

### 4.5.2 Instrumental extension /nå/

The instrumental extension /nå/ is polar; it always bears a tone opposite to the final tone of the verb stem. Following L-final stems, /nå/ is realized H, as in *là=ná* ‘leave with; swear by.’ Following H-final stems, /nå/ is realized L, as in *fé=nà* ‘drive away.’ This participation in polarization, a lexical tone process in Kusuntu, is what identifies /nå/ as a part of the verb.

Unlike /-sI/, however, the /nå/ extension receives its tone after the conjugation of the simple stem, and is thus treated as a clitic rather than a suffix. Tonal polarity applies to the output forms so that the /nå/ extension always surfaces polar to the preceding tone, whether the verb is non-finite or finite, as shown in Table 17.

Table 17 : Instrumental extension /nå/

| Non-finite | NF tone | Finite | FIN tone | Gloss |
|---|---|---|---|---|
| fé=nà | H-L | fé=nà | H-L | 'chase' |
| kɔ̀=ná | L-H | kɔ́=nà | H-L | 'bring' |
| k͡pégé=nà | HH-L | k͡pé↓gé=ná | HL-H | 'approach' |
| fɛ̀lɛ̀=ná | LL-H | fɛ̀lɛ́=nà | LH-L | 'underestimate' |
| dʒìń=nà | LH-L | dʒí↓ń=ná | HL-H | 'climb up with/using' |

For example, the extension is realized H following underlyingly L verb *kɔ̀* ‘come,’ as shown in the imperative example (45). Once conjugated, however, the verb is H and the suffix is therefore realized L, as shown in the perfective example (46).

(45) kɔ̀ = ná dí-tò
come-with food-C21
'bring food!'

(46) mà-kɔ́ = nà dèésá-∅
1SG-come-with pepper-C12
'I brought pepper'

When both /-sI/ and /nå/ are added to a verb stem, /-sI/ precedes /nå/, as shown in (47).

(47) Double extensions

| | |
|---|---|
| síń-sí=nà | 'leave something with someone' |
| sòǹ-sì=ná | 'forget someone; neglect someone' |
| téń-sí=nà | 'strain (food) with (tool)' |
| wìlìǹ-sì=ná | 'dry (INTR) with (tool)' |
| yòò-sì=ná | 'mix (INTR) with (tool)' |

The causative /-sI/ acts as a part of the verb stem, undergoing conjugation, while the instrumental /nå/ extends conjugated stems. No morphemes can come between the verb root and the suffix /-sI/, but at least one morpheme can come between the verb root and the clitic /na/. Again, it is the output form that undergoes polarity so that the tone of /nå/ is opposite to the preceding tone, even when preceded by /-sI/. For these reasons, the extension /nå/ is treated as a clitic rather than a suffix of the verb.

## 4.6 Downstepped complements

Two demonstratives, the adverb *gbóó* 'also,' and all third person object pronouns are realized with a downstepped H tone following H-final verbs, whether finite or non-finite. These are presented in (48).

(48) Downstepped complements

| | | | |
|---|---|---|---|
| DEM.PROX | ɖì-jɛ́ | ɖí-ɖí | ˈdʒí |
| | 1PL-COP | 1PL-eat | here |
| | ‘we will eat here’ | | |

| | | |
|---|---|---|
| DEM.DIST | síŋ́ | ˈmɔ́ |
| | stop | DEM.DIST |
| | ‘stop there’ | |

| | | |
|---|---|---|
| ADV | bà-tìrí | ˈgbóó |
| | 3PL-gain.weight | also |
| | ‘they gained weight also’ | |

| | |
|---|---|
| OPC1 | ɔ̀-sɔ̀ŋ́-ná = ˈí |
| | 3SG-meet-with = C1 |
| | ‘he met her’ |

| | | |
|---|---|---|
| OPC2 | bà-ɖî | fɔ́sí = ˈbɛ́ |
| | 3PL-go/IPFV | greet = C2 |
| | ‘they went to greet them’ | |

| | |
|---|---|
| OPC3 | lɔ́ = ˈkú |
| | throw = C3 |
| | ‘throw it’ |

| | |
|---|---|
| OPC4 | ɔ̀ɔ́-ˈɖólí = ˈŋí |
| | 3SG//IPFV-learn = C4 |
| | ‘he is teaching them’ |

OPC5 ɔ̀-ná = ˡɖ́
3SG-see = C5
'he saw it'

OPC6 ɔ̀-fɔ̀rí = ˡŋɛ́
3SG-abandon = C6
'she abandoned them'

OPC12 ɔ̀-dìrí = ˡkɛ
3SG-grind = C12
'he ground it'

OPC13 ɔ̀-yé ɔ́-bálí = ˡsí
3SG-COP 3SG-hide = C13
'he will hide them'

OPC21 kɛ́rɛ́ = ˡtʊ́
take = C21
'take it'

OPC22 ɔ̀-yé ɔ́-yúgú = ˡbʊ́
3SG-COP 3SG-find = C22
'she will find them'

The proximal demonstrative ˡ*ʤí* and distal ˡ*mɔ́* are analyzed as (L)H, forming a neat set with a third LH demonstrative, the out-of-sight distal *bìlá*. Alansary's data supports this analysis; he references these two demonstratives in Bago as *ʤeé* and *mɔ́ɔ́* (2021: 66). The two downstepped demonstratives were placed in a frame following HL to test for plateauing, as shown in (49)-(50). That no plateauing occurs supports the analysis that the underlying tone pattern is not HL-H but HL-(L)H, where the second L between two H's blocks (or rather, fails to trigger) plateauing.

(49) 

ɔ̀-ɖ́írì mɔ́

3SG-be.behind there.in.sight

'he was behind there'

(50) 

kʊ̀-yɔ́bì dʒí

C4-gallop here

'it (the horse) galloped here'

The same phenomenon occurs for the adverb ˈ*g͡bóó* 'also,' which can similarly be analyzed as underlying (L)H, because it does not undergo plateauing. In (51), if the L of *túrù* 'have fun' were isolated between two Hs, it would delink and be realized as ˈH. The fact that this TBU is realized L is a sign that it is not the only L between H tones. Another floating L follows it, attached to the left edge of the adverb *g͡bóó* 'also.'

(51) 

bàá-túrù g͡bóó

3PL\IPFV-have.fun also

'they had fun, too'

Third person object pronouns, on the other hand, cannot be analyzed as (L)H because they do trigger plateauing following HL-final verbs, as shown in (52). If the third person object pronoun carried a floating L, the preceding L would not delink and plateau.

(52) $\begin{bmatrix} - & & \\ - & - & - \end{bmatrix}$

ɔ-gá-ˈsí=kɛ́

3SG-hide=C12

‘he hid it’

Following H-verbs, third-person pronouns are downstepped as an OCP repair strategy. A similar phenonemon occurs in Kishamba (Myers 1997: 883), where monosyllabic H-toned verbs are downstepped following H-toned object pronouns. In Kusuntu, the object pronouns are underlyingly H and are in the same domain as the verb, as a clitic. The OCP is therefore violated, and a floating L is inserted to repair the violation. The floating L causes the H object pronoun to downstep, as shown in (53). Following L-final verbs, the OCP is not violated so no floating L is inserted.

(53)

| H OP violates OCP | | (L) inserted to repair OCP | | (L) triggers downstep | |
|---|---|---|---|---|---|
| H H | → | H(L)H | → | $\begin{bmatrix} - & \\ & - \end{bmatrix}$ | |
| tɛ=ɪ | | tɛ=ɪ | | [tɛ́=ˈí] | ‘go ahead of him’ |

One other morpheme surfaces as downstepped following the verb: the clause marker *bɛ́*. This particle sounds identical to the third-person plural object pronoun, and is identifiable only by context. This particle usually marks a dependent clause, but it always follows the verb directly, preceding object complements, as shown in (54)-(56). Like the object pronoun, this particle is realized H or downstepped ˈH following H.

(54) Three poor men (Oke 2015)

| | | | | |
|---|---|---|---|---|
| bú-nà | tàlí | ˡbɛ́ | nà | ɖʲí-tò |
| child-C1 | arrive | when | with | food-C21 |

'When the youngest returned with the food,'

| | | | | |
|---|---|---|---|---|
| bìlàá | bà-gb͡íŋ̀ | bú-nà | kà | tɔ́rí |
| then | 3PL-grab | child-C1 | and | slaugher |

'then they grabbed him and killed him.'

(55)

| | | | | | |
|---|---|---|---|---|---|
| ɔ̀-dʒú | ˡbɛ́ | ˡbílá | | | |
| 3SG-go | when | DEM.DIST | | | |

'When he arrived there,'

| | | | | | |
|---|---|---|---|---|---|
| bʊ̀ʊ́-mí=ná=ˡí | mɔ́ | ɔ̀-sɔ̀ǹsí | á ˡɖɛ́tʊ́-nà | lɔ́ | |
| C10\IPFV-listen.to=3SG | there.in.sight | 3SG-forget | girl-C1 | on | |

'having done well for himself there, he forgot about the girl'

(56) The ox and the hunter (Abreté 2015)

| | |
|---|---|
| bà-ɖʲíˡí | fɔ̃́sí=ˡbɛ́ |
| 3PL-go\PFV | greet=3PL |

'they went to greet them'

## 4.7 Summary

Verbal tone in Kusuntu is privative: verbs are marked by a H tone or an absence of tone. The H tone marking a verb root does not always associate to the first TBU, but it can be prelinked to any TBU. The H tone spreads rightward onto toneless TBUs to the end of the word. Finite verbs are marked by a floating H that associates to the rightmost toneless TBU of the verb stem. The OCP is violated when a sequence of H tones occurs within a lexical domain, such as occurs when the finite H tone associates to a verb root that already has a H tone prelinked to an adjacent TBU. At the stem level, the OCP violation is repaired by the deletion of the

second H tone in the sequence. The resulting toneless TBU receives a default L tone. Third-person object pronouns are underlyingly H and, following H-final stems, also violate the OCP. Across the stem-clitic boundary, however, the OCP violation is repaired by the insertion of a floating L tone. This causes the H object pronouns to surface as downstepped ˈH. The other lexical tone process occurring in the verb system is polarity. First- and second-person object pronouns, as well as the instrumental clitic /nå/, are realized polar to the preceding TBU.

## 5. Nouns and tone

Most nouns require a noun class suffix in both the singular and the plural. A certain number of nouns take no suffixes in the singular form. The possible syllable profiles of nouns are limited and are discussed in §5.1. The distribution of tone patterns on noun roots is presented in 5.2. An overview of the ten noun classes and their concord markers is presented in §05.3 before each class is described individually in §5.4 through §5.9. A full list of simple noun stems is included in Appendix B.

### 5.1 Noun root syllable profiles

Noun roots can have the underlying syllable profiles laid out in Table 18.

Table 18 : Noun syllable profiles

| Roots | | Suffixes |
|---|---|---|
| Monosyllabic | Disyllabic | |
| CV- | V.CV | -V |
| CVV- | V.CVN | -CV |
| CVN- | CV.CV | -V.CV |
| | CVV.CV | -CV.CV |
| | CV.CVV | |
| | CVN.CV | |

The monosyllabic roots CV, CVV, and CVN must be followed by a noun class suffix; they do not occur in isolation. While CVN is a common syllable profile for verb stems, nouns always end in open syllables. In multisyllabic noun stems, the heavy syllable CVN only occurs word-initially. The syllable CVV mainly occurs word-initially, with only five exceptions in the data collected. Alansary and Takougnadi agree that in Bago, only a nasal can take the coda position of a syllable, whether word-medially or word-finally (Takougnadi 2016: 119; Alansary 2021: 40-41). The prefix /a-/ accounts for all vowel-initial nouns.

## 5.2 Noun root tone patterns

Nouns that take a class suffix in both the singular and plural are referred to as “bound stems.” Monosyllabic roots require a noun class suffix and cannot stand alone.[5] Bimoraic stems, however, can stand alone. A subsection of nouns in classes 1 and 12 take no singular suffix. These are referred to as “free-standing stems.” The distribution pattern of tone patterns on both bound and free-standing noun stems is presented in Table 19 and discussed immediately following the table.

[5] Only one free-standing monosyllabic noun was collected: the heavy syllable CVV stem sàá ‘spider’.

Table 19 : Noun root tone patterns

| | Free-standing stems | Bound stems (take a noun class suffix) | | | |
|---|---|---|---|---|---|
| Stem tone | CVCV | CV | CVV | CVN | CVCV |
| H | [ɖ́wú-∅] | [bɔ́-ɔ̀] | [ɖúú-rè] | [sṹ-tɔ̀] | [ŋɔ́rú-tɔ̀] |
| | ‘mirror’ | ‘cave’ | ‘cloth’ | ‘fetus’ | ‘the unknown’ |
| | (4) | (40) | (7) | (12) | (8) |
| L | [sàkà-∅] | | | [sʊ̀ṅ-tɔ́] | [kàwì-á] |
| | ‘gourd instrument’ | | | ‘breakfast’ | ‘illness’ |
| | (5) | | | (1) | (1) |
| LH | [kàsí-∅] | | [dʒàá-à] | | [fɔ̀kí-rɛ̀] |
| | ‘antelope’ | | ‘crab’ | | ‘leaf’ |
| | (7) | | (9) | | (15) |
| HL | [síkà-∅] | | | | [wíˡlí-ŋɛ́] |
| | ‘doubt (n)’ | | | | ‘star’ |
| | (2) | | | | (7) |

Disyllabic CVCV free-standing noun stems show a four-way contrast: H, L, LH, and HL stems occur. The syllable profiles of bound stems are more diverse than free-standing stems, but the tone patterns are more restricted. At the surface level, bound singular stems almost always have a H tone associated to either the first or second TBU. The HL tone pattern does not occur on bound monosyllabic stems CVV or CVN. Bound CV stems are always H and CVV stems are H or LH. Most CVN stems are H; only one is L. Most CVCV stems are HH, LH, or HL; only one is L. Aside from the seven HL CVCV stems shown in Table 19, bound nouns are marked by a H-final stem followed by a L suffix.

Alansary (2021) presents a synchronic analysis of Bago where most roots are inherently H-final, but Roberts (2016) poses another possibility that could account for such an irregular distribution in Kabiye: he posits a HL noun class suffix whose H tone overwrites the final TBU of the non-singular Kabiye noun stems. This tonal overwriting seems to occur among

Kusuntu bound noun stems as well. The tonal behavior of individual noun class suffixes is described according to this analysis in §05.4 through 5.9.

Where this H-tone overwriting occurs, the underlying tonal contrast of noun roots is neutralized, as shown in Table 20. Monomoraic roots are always realized H because the H of the HL suffix pattern docks onto the rightmost TBU of the root, in this case the only TBU. Bimoraic nouns have a four-way tonal contrast underlyingly, but the docking of the HL suffix neutralizes this contrast so that only two patterns surface: HH-L and LH-L. Because the second tone of these noun roots is neutralized, data tables label roots according to the first tone (the only known tone) in the pattern, as shown in the rightmost column of Table 20.

Table 20 : HL docking suffix neutralizes root tone contrast

| | Surface tone | Root tone | Tone represented in data tables |
|---|---|---|---|
| Monomoraic stems | H-L | H | H |
| | | L | |
| Bimoraic stems | HH-L | H | |
| | | HL | |
| | LH-L | L | L |
| | | LH | |

Two other hypotheses could account for the root-final H tone preceding the L suffix. The first is that the root-final H is a historical suffix (or the trace of one) which precedes the innovative noun class suffix. This hypothesis is attractive because it allows for a cohesive analysis where almost all noun class suffixes are polar, and those consistently realized L do so only because they follow the historic H suffix. According to the second hypothesis, the root-final H is a result of a phonological dissimilation process much like OCP repair. In this hypothesis, the noun class suffixes in question are underlyingly L, and the L of the suffix triggers the preceding tone to be raised in order to avoid a dispreferred LL sequence at the stem-suffix morpheme boundary. For simplicity, these two hypotheses are set aside for now and the data in this thesis is presented according to the HL-overwriting suffix analysis.

## 5.3 Noun class suffixes and concord markers

There are ten classes of concord markers in the nominal system of Kusuntu. The nouns described in this section are categorized according to their concord marking and their singular-plural pairings. Within a given concord class there may exist multiple subsets of nominal suffixes. For example, one subject pronominal prefix *ɔ-* refers to all singular human nouns, and corresponds to the proto-Gur nouns class 1. The plurals of these nouns belong to the proto-Gur class 2, and take subject pronominal prefix *ba-*. Classes 1 and 2, therefore, form a "class pairing." Class 1 nouns do not all take the same class suffix. Neither do class 2 nouns. The different nominal suffixes within a given class are categorized as "subsets" of that class.

Table 21 presents the noun class pairings and the main subsets of suffixes within each class. The first column identifies Kusuntu noun classes according to a proto-Gur reconstruction by Miehe et al. (2012). This is the numbering system used in this thesis. For cross-reference, the second and third columns include the class numbers used by Takougnadi (2016) and Alansary (2021) in their treatment of Bago. Notably missing from the Bago data are all nouns ending in class 21 suffix /-tɔ̰/. The null symbol <∅> represents the absence of a noun class suffix. Classes 21 and 22 are made up of non-count nouns and so do not have a paired class.

Table 21 : Noun class suffixes

| Proto-Gur | Tak | Alansary | SG SX | PL SX | Singular | Plural | Gloss |
|---|---|---|---|---|---|---|---|
| 1-2 | 1-2 | 1 | -Ù-ná | -bå | ɖʊ́m-ˈʊ́-ná | ɖʊ́ḿ-bà | ‘snake’ |
| | | | | | ŋɔ́ˈrʊ́-ná | ŋɔ́rʊ́-bà | ‘stranger’ |
| | | | -ŋɔ̊ | -bå | dɔ́-ŋɔ̀ | dɔ́-bà | ‘elder’ |
| | | | -ɔ̀ná | -ɔ́à | á-k͡pá-ˈná | á-k͡pá-à | ‘person’ |
| 3-4 | 3-4 | 4 | -ɔ́Ò | -ɔ́ŋÈ | bèn-ɔ́ɔ̀ | bèn-í-ŋɛ̀ | ‘amulet’ |
| | | | | | kʊ́bɔ́-ɔ̀ | kʊ́bʊ́-ŋɛ̀ | ‘mountain’ |
| | | | -ɔ́Ò | -nɪ̊ŋɛ̊ | lɔ́-ɔ̀ | lɔ́-ˈníŋɛ́ | ‘forest’ |
| | | | (H) | -nɪ̊ŋɛ̊ | kɔ̀l-ɔ́ | kɔ̀lɔ̀-níŋɛ̀ | ‘basin’ |
| 5-6 | 7-8 | 3 | -ɔ́rɛ̊ | -(à)nå | fɔ̀kí-rɛ̀ | fɔ̀kí-ˈná | ‘leaf; paper’ |
| 12-13 | 5-6 | 2 | -∅ | -sÉ | ɖ́íwú-∅ | ɖ́íwú-sé | ‘mirror’ |
| | | | -ɔ́à | -ɔ́sÈ | wàlá-à | wàlá-sɛ̀ | ‘slate’ |
| 21 | NA | NA | -tɔ̊ | | díˈlí-tɔ́ | | ‘clan’ |
| 22 | 9 | 5 | -mɔ̊ | | mʊ́ˈlʊ́-mɔ́ | | ‘flour’ |

As Alansary (2021: 55) notes for Bago, Kusuntu noun class pronouns are generally opposite to the root-final TBU. For Alansary, this is a result of an underlying H suffix whose tone is deleted following H-final roots to repair an OCP violation. In Kusuntu, no significant evidence supports an underlyingly H suffix so the suffixes are considered polar.

Classes 2, 3, 4, 5, 12, and 13 are marked by a HL suffix whose H tone overwrites the final tone of the noun root. This is discussed further in the individual analyses of each noun class pairing in §5.4 through §5.9.

Table 22 presents the concord pronouns for each class.

Table 22 : Noun class suffixes and concord pronouns

| CLASS | PX | SX | SP/ POSS | OP | DEM PROX | DEM DIST | Q | INDEF | ‘other’ |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | -Ù-nå | ɔ̀ | í | ŋǘˈdʒé | núŋ́ | àǹŋǘ | ŋ̀ùrù | ŋ̀ùrù ńŋ̀ù |
| 2 | | -ónà/ -bå/ -áà | bà | bɛ́ | báˈdʒé | báŋ́ | àǹbé | bàrì | bàrì ńbà |
| 3 | | -ÓÒ | kù | kú | kúˈdʒé | kúŋ́ | àǹkú | kùrù | kùrù ńkɔ̀ |
| 4 | | -(Í)ŋĖ | ŋ̀ì | ŋ́í | ŋ́íˈdʒé | ŋ́íŋ́ | àǹŋ́í | ŋ̀ìrì | ŋ̀ìrì ńŋ̀è |
| 5 | (ɖI-) | -órÈ | ɖì | ɖí | ɖíˈdʒé | ɖíŋ́ | àǹdí | ɖìrì | ɖìrì ńɖè |
| 6 | (a-) | -(à)nå | ŋà | ŋɛ́ | ŋáˈdʒé | ŋáŋ́ | àǹŋɛ́ | ŋàrì | ŋàrì ńŋà |
| 12 | | -∅/-áà | kà | kɛ́ | káˈdʒé | káŋ́ | àǹkɛ́ | kàrì | kàrì ńkà |
| 13 | | -sÉ/-(á)sĖ | sì | sí | síˈdʒé | síŋ́ | àǹsí | sìrì | sìrì ńsè |
| 21 | | -tỌ | tù | tú | túˈdʒé | túŋ́ | àǹtú | tùrù | tùrù ńtɔ̀ |
| 22 | | -mỌ | bù | bú | búˈdʒé | búŋ́ | àǹbú | bùrù | bùrù ńbɔ̀ |

Adjectives take noun class suffixes that concord with the classes of the nouns they modify. These are presented in Table 23. Much like nouns, the final segment of the adjective stem is H, followed by a L concord suffix, resembling the HL overwriting tone pattern of the majority of noun class suffixes.

Table 23 : Adjectives marked by concord suffixes

| Class | Noun | Gloss | Adjective | | | | |
|---|---|---|---|---|---|---|---|
| | | | 'small' | 'new' | 'old' | 'good' | 'bad' |
| 1 | ŋɔ́ˈrú-ná | 'stranger' | túːtúbú-ŋɔ̀ | fɔ́lí-ŋɔ̀ | ɖɔ́-ŋɔ̀ | lɔ̀lɔ̀ń-ŋɔ̀ | téétéé-ŋɔ̀ |
| 2 | ŋɔ́rú-bà | 'strangers' | túːtúbú-bà | fɔ̀lí-bà | ɖɔ́-bà | lɔ̀lɔ̀ń-bà | téétéé-bà |
| 3 | gìsɔ́-ɔ̀ | 'horse' | túːtúbú-kɔ̀ | fɔ̀lí-kɔ̀ | ɖɔ́-kɔ̀ | lɔ̀lɔ̀ń-kɔ̀ | téétéé-kɔ̀ |
| 4 | gìsí-ŋɛ̀ | 'horses' | túːtúbú-ŋɛ̀ | fɔ̀lí-ŋɛ̀ | ɖɔ́-ŋɛ̀ | lɔ̀lɔ̀ń-ŋɛ̀ | téétéé-ŋɛ̀ |
| 5 | fɔ̀kí-rɛ̀ | 'leaf' | túːtúbú-ɖɛ̀ | fɔ̀lí-ɖɛ̀ | ɖɔ́-ɖɛ̀ | lɔ̀lɔ̀ŋ́-ɖɛ̀ | téétéé-ɖɛ̀ |
| 6 | fɔ̀kí-ˈná | 'leaves' | túːtúbú-ŋà | fɔ́lí-ŋà | ɖɔ́-ŋà | lɔ̀lɔ̀ń-ŋà | téétéé-ŋà |
| 12 | bàá-à | 'dog' | túːtúbú-kà | fɔ̀lí-kà | ɖɔ́-kà | lɔ̀lɔ̀ń-kà | téétéé-kà |
| 13 | bàá-sì | 'dogs' | túːtúbú-sì | fɔ̀lí-sì | ɖɔ́-sì | lɔ̀lɔ̀ń-sì | téétéé-sì |
| 21 | bɔ́lí-tɔ̀ | 'mosquitos' | túːtúbú-tɔ̀ | fɔ̀lí-tɔ̀ | ɖɔ́-tɔ̀ | lɔ̀lɔ̀ńŋ-tɔ̀ | téétéé-tɔ̀ |
| 22 | múˈlú-mɔ́ | 'flour' | túːtúbú-bɔ̀ | fɔ̀lí-bɔ̀ | ɖɔ́-bɔ̀ | lɔ̀lɔ̀ń-bɔ̀ | téétéé-bɔ̀ |

## 5.4 Noun class pairing 1-2

Class pairing 1-2 is the human class pairing. The data collected in class pairing 1-2 is minimal and diverse. The nominal class suffixes marking most simple stems in this class pairing are singular /-(Ù)ná/ and plural /-◌́bà/. However, a few other suffix pairings are worth mentioning. Realizations of the class pairing 1-2 suffixes are presented in Table 24 and discussed in the following sub-sections. Several nouns in this class are marked by the kinship prefix /a-/, whose underlying tone is unknown and therefore left unmarked in Table 24.

Table 24 : Class pairing 1-2 suffixes

| PX | SG SX | PL SX | Root profile | Root Tone | Singular | Plural | Gloss |
|---|---|---|---|---|---|---|---|
| | -(Ù)-ná | -ə́bà | CVN | H | ɖʊ́m-ˡʊ́-ná | ɖʊ́m̀-bà | ‘snake’ |
| | | | CVCV | H | júl-ˡú-ná | júlú-bà | ‘witch’ |
| | | | CVCV | LH | ɖòkú-ˡná | ɖòkú-bà | ‘senile person’ |
| | -(Ù)-ná | -ə́ŋè | CVCV | LH | dʒòŋú-ˡná | dʒòní-ŋè | ‘chief’ |
| | -nà | -(á)à | CV | H | bú-nà | bí-à | ‘child’ |
| | -(Ù)-ná | -là | CVCV | H | jìbá-ˡná | jìbá-là | ‘male’ |
| (a)- | -ŋɔ̀ | -ə́bà | CV | H | dɔ́-ŋɔ̀ | dɔ́-bà | ‘elder’ |
| a- | -(Ù)-ná | -(á)à | CV | H | á-k͡pá-ˡná | á-k͡pá-à | ‘man’ |
| a- | | | CV | H | à-fá | à-fá-nà | ‘mother’ |
| | | | CVCV | LH | à-dɛ̀sí | à-dɛ̀sí-nà/ -bà | ‘older sister’ |

### 5.4.1 Class pairing 1-2 suffixes /-(Ù)-ná/, /-bå/

The most common suffix combination for simple stems in the class 1-2 pairing is singular /-(Ù)-ná/ and plural /-bå/, as shown in Table 25.

Table 25 : Class pairing 1-2 suffixes /-(Ù)-ná/, /-bå/

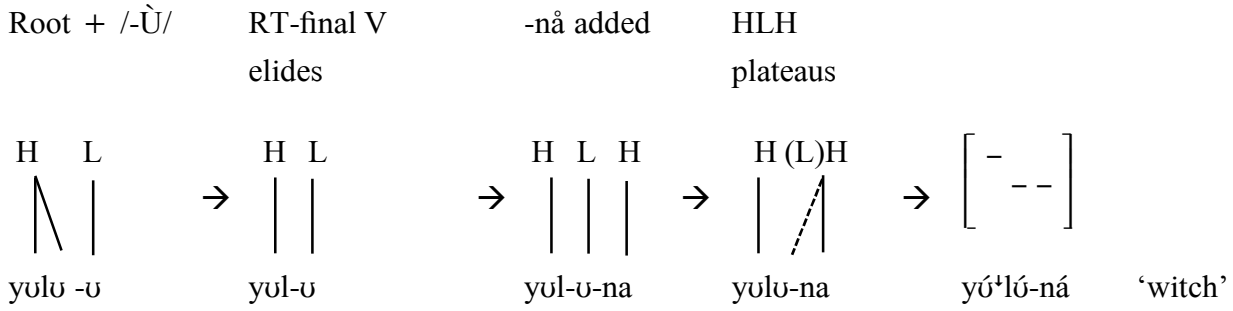
| Root profile | Root tone | Root | Singular | Plural | Gloss |
|---|---|---|---|---|---|
| CVN | H | ɖʊ́m̀- | ɖʊ́m-ˡʊ́-ná | ɖʊ́m̀-bà | 'snake' |
| CVCV | H | yúlú- | yúlˡú-ná | yúlú-bà | 'witch' |
| | | ŋɔ́rú- | ŋɔ́rˡú-ná | ŋɔ́rú-bà | 'stranger' |
| | | ŋ͡mɛ́lí- | ŋ͡mɛ́lˡú-ná | ŋ͡mɛ́lí-bà | 'thief' |
| | LH | ɖòkú- | ɖòkú-ˡná | ɖòkú-bà | 'old person' |

The noun roots in the collected data for this class are all H-final. Therefore, even though the plural suffix /-bå/ is only realized [-bà], it is as likely polar as underlyingly L.

The singular suffix is made up of two parts. Kleinewillinghöfer (2006) distinguishes “the old suffix /-U/” as a morpheme separate from the innovative singular suffix /-nå/, and it is treated as such here. Root-final vowels elide with the /-Ù/ suffix so that the root-final vowel becomes /U/.

The singular suffix is realized as either -˩HH or -H˩H depending on the tone of the root. The vowel at the right edge of the root elides when suffixed by /-Ù/. The H of the elided vowel can be delinked in this process, but not deleted. A doubly-linked H, such as that of the root *yólʊ́-,* delinks and the suffix /-Ù/ takes its place so that the stem becomes HL. When the H suffix /-nå/ is added, the resulting HL-H pattern triggers plateauing and is realized H˩HH, as shown in (57).

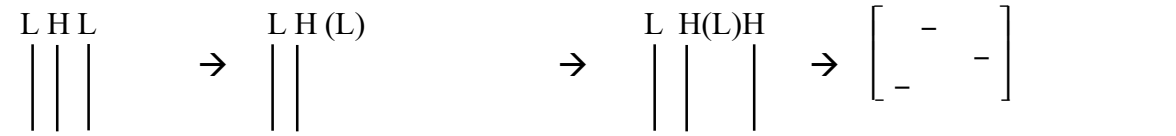
(57) H root *yólʊ́* + /-Ù/ + /-nå/




However, a singly-linked H must remain intact. The LH root *dòkú-* remains LH when suffixed by /-Ù/. The L of the suffix delinks instead, causing it to float and trigger downstep on the following morpheme /-ná/, as shown in (58).

(58) LH root *dòkú-* + /-Ù/ + /-nå/

| root + /-Ù/ | L floats when RT-final V elides | -nå added | (L) causes DS |
|---|---|---|---|




The noun *bú-nà* ‘child’ is the only CV root collected in this class and the only occurence of a L realization of the singular suffix /-nå/. Either the L historic suffix /-Ù/ is not added to CV roots, or it has elided so that the H root *bú-* is suffixed directly by polar suffix /-nå/.

Several nouns in this class are derived from verbs using the agentive suffix /-rU/, as shown in Table 26. The old suffix /-U/ is possibly the trace of this agentive suffix.

Table 26 : Agentive suffix /-rU/

| Verb | Gloss | Agentive SG | Agentive PL | Gloss |
|---|---|---|---|---|
| tɛ́ | 'guide ' | gbè-tɛ́-ˈrú-ná | gbè-tɛ́-rà | 'guide (n)' |
| fàrà | 'cultivate' | fàrá-ˈrú-ná | fàrá-rá-à | 'farmer' |
| sìbù | 'die' | sìbú-ˈrú-ná | sìbí-rà | 'dead person' |
| kpè kùsóò | 'sing a song' | kùsù-kpé-ˈrú-ná | kùsù-kpé-rà | 'singer' |
| sì táńɖɛ̀ | 'be with beer' | tàǹɖɛ̀-sí-ˈrú-ná | tàǹɖɛ̀sí-rà | 'drunk person' |
| mɛ̀lɛ̀ŋ | 'go mad' | mɛ̀lɛ̀mɔ́-ˈrú-ná | mɛ̀lɛ̀mí-rà | 'crazy person' |
| gbàlàŋ | 'go blind' | gbàlàmɔ́-ˈrú-ná | gbàlàmí-rà | 'blind person' |

### 5.4.2 Kinship prefix /a-/

Most kinship terms in Kusuntu are prefixed by /a-/. Aside from *á-súú-ˈná* ‘mouse,’ all of the collected nouns with this prefix are kinship terms, presented in Table 27.

Table 27 : Kinship prefix /a-/

| SG SX | PL SX | Root profile | Root tone | Singular | Plural | Gloss |
|---|---|---|---|---|---|---|
| -(Ù)ná | -bà | CVV | H | á-súú-ˈná | á-súú-bà | ‘mouse’ |
| | | CVCV | LH | á-ˈdétú-ˈná | á-ˈdétí-bà | ‘girl’ |
| | | CVCV | L | á-gòlù-ná | á-gòlù-bá | ‘young man’ |
| -(Ù)ná | -(á)à | CV | H | á-k͡pá-ˈná | á-k͡pá-à | ‘person’ |
| -(á)à | -nà | CVCV | L | à-bàbá-à | à-bàbá-nà | ‘father’ |
| -∅ | -nà | CV | H | à-fá-∅ | à-fá-nà | ‘mother’ |
| | | CVCV | LH | à-dɛ̀sí-∅ | à-dɛ̀sí-nà | ‘older sister, aunt’ |
| | | CVCV | LH | à-dʒìdʒó-∅ | à-dʒìdʒó-nà | ‘nephew; uncle’ |
| -∅ | -níŋɛ̀ | CVCV | HL | à-dʒóŋù-∅ | à-dʒóˈŋú-níŋɛ̀ | ‘older brother’ |
| -∅ | -(á)sɛ̀ | CVCV | HL | à-bálù-∅ | à-bálá-sɛ̀ | ‘husband’ |

Some of the nouns in Table 27 take the singular suffix /-(Ù)-nå/ and plural suffix /-bå/ as discussed in §5.4.1. The plural suffix /-bå/ is primarily realized L, with one exception: *ágòlù-bá* ‘young men.’ Additionally, two nouns *ák͡pá-à* ‘people’ and *álá-à* ‘women’ are suffixed by /-(á)à/ in the plural, while *àbàbá-à* ‘father’ takes the same suffix in the singular. The noun *bí-à* ‘child’ also takes this plural suffix. Five of the nouns prefixed by /a-/ take no singular suffix. Three of these take the plural suffix /-nà/. The noun *à-dʒóŋù* ‘older brother’ takes the class 4 plural suffix /-níŋɛ̀/ and *àbálɔ̀* ‘husband’ takes the class 6 plural suffix /-ɔ́sɛ̀/.

The prefix is realized H preceding nouns suffixed by /-(Ù)-ná/ and L preceding nouns that have no singular suffix.

### 5.4.3 Class pairing 1-2 suffixes /-ŋɔ̀/, /-bà/

Three of the nouns collected take the singular suffix /-ŋɔ̀/ and plural suffix /-bà/. These suffixes match the adjectival concord suffixes for the 1-2 class pairing. These nouns are marked by a HL pattern at the right edge of the word.

Table 28 : Class pairing 1-2 suffixes /-ŋɔ̀/, /-bà/

| Root tone | Singular | Plural | Gloss |
|---|---|---|---|
| H | á-ŋɔ̀ | ámɨ́-bà | ‘person’ |
| | dɔ́-ŋɔ̀ | dɔ́-bà | ‘elder’ |
| | tétɛ́ɛ́-ŋɔ̀ | tétɛ́ɛ́-bà | ‘traitor’ |

### 5.4.4 Summary

The human class pairing 1-2 is marked primarily by suffixes /-(Ù)-ná/ and /-bå/, with few exceptions. The plural forms of this class pairing are always HL-final, regardless of the segmental suffix. This HL tone pattern also marks the right edge of singular forms taking segmental suffix /-ó̩ŋɔ̀/. A subset of this class is marked by the prefix /a-/. The tone of this prefix is determined by the suffix: it is H preceding nouns that take singular suffix /-(Ù)-ná/ and L preceding nouns that take no singular suffix.

## 5.5 Noun class pairing 3-4

Class pairing 3-4 is primarily marked by singular suffix /-ó̩Ò/ and plural suffix /-ó̩ŋÈ/. Both the singular and plural forms are marked by a HL pattern at the right edge of the stem, as shown in Table 29. Stems with a syllable profile CV or CVV take plural suffix /-nɨ̀ŋɛ́/ and an additional subclass takes a floating H singular suffix and plural suffix /-níŋɛ̀/.

Table 29 : Class pairing 3-4 suffixes

| SG SX | PL SX | Root profile | Root tone | Singular | Plural | Gloss | Frequency |
|---|---|---|---|---|---|---|---|
| -ó̩Ò | -(ú)-ŋɛ̀ | CV | H | sɔ́-ɔ̀ | sú-ú-ŋɛ̀ | ‘head’ | 1 |
| | -(í)-ŋɛ̀ | CVN | L | bɛ̀n-ɔ́ɔ̀ | bɛ̀n-í-ŋɛ̀ | ‘amulet’ | 5 |
| | -ó̩-ŋÈ | CVCV | H | kúbɔ́-ɔ̀ | kúbú-ŋɛ̀ | ‘mountain’ | 4 |
| | | | L | gìsɔ́-ɔ̀ | gìsí-ŋɛ̀ | ‘horse’ | 11 |
| -ó̩Ò | -nìŋɛ́ | CV | H | lɔ́-ɔ̀ | lɔ́-ˡníŋɛ́ | ‘forest’ | 4 |
| | | CVV | L | dʒòó-ò | dʒòó-ˡníŋɛ́ | ‘queue’ | 3 |
| -ó̩ | - níŋɛ̀ | CVCV | L | sɔ̀rɔ́-∅ | sɔ̀rɔ̀-níŋɛ̀ | ‘month, moon’ | 2 |
| -∅ | - níŋɛ̀ | CVCV | L | lɔ̀kɔ̀-∅ | lɔ̀kɔ̀-níŋɛ̀ | ‘well’ | 1 |

### 5.5.1 Class pairing 3-4 suffixes /-ó̩Ò/ and /-ó̩ŋÈ/

The class pairing 3-4 suffixes /-ó̩Ò/ and /-ó̩ŋÈ/ are realized as shown in Table 33.

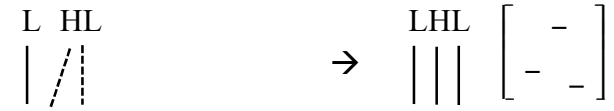
Table 30 : Class pairing 3-4 suffixes /-ɔ́Ò/, /-ɔ́ŋÈ/

| Root profile | Root tone | Root | Singular | Plural | Gloss |
|---|---|---|---|---|---|
| CV | H | sɔ́- | sɔ́-ɔ̀ | sɔ́-ɔ́-ŋɛ̀ | ‘head’ |
| CVN | L | nɔ̀n- | nɔ̀n-ɔ́ɔ̀ | nɔ̀ní-ŋɛ̀ | ‘room’ |
| | | bɛ̀n- | bɛ̀n-ɔ́ɔ̀ | bɛ̀ní-ŋɛ̀ | ‘amulet’ |
| | | bɔ̀n- | bɔ̀n-ɔ́ɔ̀ | bɔ̀ní-ŋɛ̀ | ‘arm’ |
| | | tɔ̀n- | tɔ̀n-ɔ́ɔ̀ | tɔ̀ní-ŋɛ̀ | ‘body’ |
| | | dòn | dòn-óò | dòní-ŋɛ̀ | ‘soup, broth’ |
| CVCV | H | k͡pélé- | k͡pél-óò | k͡pélí-ŋɛ̀ | ‘baobab tree’ |
| | | písí- | pís-ɔ́ɔ̀ | písí-ŋɛ̀ | ‘cashew tree’ |
| | | kúbú- | kúb-ɔ́ɔ̀ | kúbú-ŋɛ̀ | ‘mountain’ |
| | | fúrú- | fúr-óò | fúrú-ŋɛ̀ | ‘bag’ |
| | L | gìsí- | gìs-ɔ́ɔ̀ | gìsí-ŋɛ̀ | ‘horse’ |
| | | tìk͡pó- | tìk͡pó-ò | tìk͡pú-ŋɛ̀ | ‘big forest’ |
| | | kùsó- | kùsó-ò | kùsú-ŋɛ̀ | ‘song’ |
| | | kùmó- | kùmó-ò | kùmú-ŋɛ̀ | ‘fire’ |
| | | wòsó- | wòsó-ò | wòsú-ŋɛ̀ | ‘soul’ |
| | | bòró- | bòró-ò | bòrú-ŋɛ̀ | ‘canoe’ |
| | | fúró- | fúró-ò | fúrú-ŋɛ̀ | ‘bag’ |
| | | kàlɔ́ | kàlɔ́-ɔ̀ | kàlú-ŋɛ̀ | ‘couch grass, weed’ |
| | | làlɔ́- | làlɔ́-ɔ̀ | làlú-ŋɛ̀ | ‘hunt’ |
| | | dʒàdʒɔ́ | dʒàdʒɔ́-ɔ̀ | dʒàdʒú-ŋɛ̀ | ‘elephant’ |
| | | kúbɔ́- | kúbɔ́-ɔ̀ | kúbú-ŋɛ̀ | ‘mountain’ |

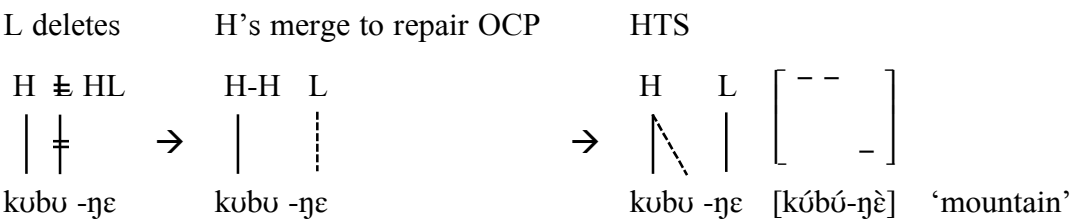
The H tone of both the singular and plural suffixes docks onto the rightmost TBU of the root and overwrites the final root tone. The association of the suffix tone to the stem is shown in (61) and (62). When the root-final L is singly-linked, as in (62), it deletes to allow the H of

the HL suffix to associate. This accounts for the lack of L-final roots in the surface realizations in Table 30.

(59) HL overwriting suffix /-ó̩Ò/
H associates to root $V_2$




(60) HL overwriting suffix /-ó̩ŋÈ/




In example (60), a H tone is already associated to the root. The docking of the H suffix therefore causes a HH sequence that violates the OCP. The OCP repair strategy at this domain-level is to merge the two H tones.

The plural suffix /-ó̩ŋÈ/ is preceded by either /I/ or /U/. Alansary accounts for this variation by claiming two different root-final vowels: a mid vowel /E/ versus a mid-back vowel /O/. These two mid vowels heighten to /I/ or /U/, respectively, in anticipation of the closing of the velum for the following consonant /ŋ/ (Alansary 2021: 96-97). Additionally, roots with the syllable profile CVN take an epenthetic /I/ so that they too are realized /-ÍŋÈ/. The underlying noun roots are posited according to this analysis in Table 30. The one monomoraic CV root *sɔ-* ‘head’ lengthens to *sʊ́-ʊ́-ŋɛ̀* in the plural.

Roots with a CV or CVV syllable profile take plural suffix [-nìŋé], as shown in Table 31.[6] This suffix is is likely polar, realized LH when it follows H-final roots. Post-lexical plateauing then causes the suffix to surface as ˈHH.

Table 31 : Class pairing 3-4 suffixes /-ɔ́Ò/, [-nìŋé]

| Tone Pattern | Singular | Plural | Gloss |
|---|---|---|---|
| H | lɔ́-ɔ̀ | lɔ́-ˈníŋé | ‘forest’ |
| | tɔ́-ɔ̀ | tɔ́-ˈníŋé | ‘bow; lance’ |
| | bɔ́-ɔ̀ | bɔ́-ˈníŋé | ‘cave’ |
| | yú-ù | yú-ˈníŋé | ‘war’ |
| LH | dʒòó-ò | dʒòó-ˈníŋé | ‘tail’ |
| | gb̀ɔ́-ɔ̀ | gb̀ɔ́-ˈníŋé | ‘path, route’ |
| | bɔ̀ɔ́-ɔ̀ | bɔ̀ɔ́-ˈníŋé | ‘traveler’ |

### 5.5.2 Subclass pairing 3-4 suffixes /-ɔ́/, /-níŋɛ̀/

A few class 3 nouns end with /ɔ́/, rather than HL falling /-ɔ́ɔ̀/. The plural form takes the same polar suffix /-níŋɛ̀/, realized HL because it follows L-final roots. The trimoraic stems in Table 40 are not likely simple stems, but are included to show the suffix pattern.

[6] With the exception of *sɔ́-ɔ̀, sú-úŋɛ̀*, ‘head’ (see Table 1)

Table 32 : Class pairing 3-4 suffixes /-ó/, [-níŋè]

| Root profile | Root | Singular | Plural | Gloss |
|---|---|---|---|---|
| CVCV | sɔ̀rɔ̀- | sɔ̀rɔ́ | sɔ̀rɔ̀-níŋè | ‘month, moon’ |
| | kɔ̀lɔ̀- | kɔ̀lɔ́ | kɔ̀lɔ̀-níŋè | ‘basin’ |
| CVCVCV | kʊ̀fɔ̀lɔ̀- | kʊ̀fɔ̀lɔ́ | kʊ̀fɔ̀lɔ̀-níŋè | ‘game’ |
| CVNCV | kʊ̀ŋ͡gb̰ɔ̀- | kʊ̀ŋ͡gb̰ɔ́ | kʊ̀n̰͡gb̰ɔ̀-níŋè | ‘scarf’ |

In Alansary’s Bago data, the roots of these forms are realized as H-final in the plural as well as in the singular, supporting his analysis that roots in this class are H-final (Alansary 2021: 98). The L tone of the plural stems in Table 32, however, support a H tonal singular suffix.

### 5.5.3 Summary

The majority of the nouns in class pairing 3-4 are marked by singular suffix /-óÒ/ and plural suffix /-óŋÈ/. The vowel /I/ is epenthesized between CVN roots and the plural suffix /-ŋÈ/. Whether the segmental suffix is monomoraic or bimoraic, the right edges of the nouns are consistently marked by a HL pattern that comes from the (H)L overwriting suffix. Only a handful of nouns in this class break this pattern, suffixed by only a floating (H) in the singular and /-níŋè/ in the plural.

## 5.6 Noun class pairing 5-6

Class pairing 5-6 nouns are marked by different realizations of singular suffix /-órE̊/ and plural suffix /-(à)ná/. The plural suffix /-(à)ná/ has two surface realizations: [ˈná] or [ˈáná]. This is the only class paring that has a significant subset of nouns marked by class prefixes as well as suffixes, discussed further in §5.6.2.

### 5.6.1 Class pairing 5-6 suffixes /-ó-rE̊/, /-(à)ná/

The majority of nouns in class pairing 5-6 take singular suffix /-ó-rE̊/ and plural suffix /-(à)ná/. Table 33 shows examples of the realizations of these nouns and their frequencies.

Table 33 : Class pairing 5-6 suffixes /-ó-rE̊/, /-(à)ná/

| Root profile | Root tone | Root | Singular | Plural | Gloss | Frequency |
|---|---|---|---|---|---|---|
| CV | H | bú- | bú-rɛ̀ | bú-ˡná | ‘pebble’ | 7 |
| CVV | H | túú- | túú-rɛ̀ | túú-ˡná | ‘mortar’ | 2 |
| | LH | mìí- | mìí-rɛ̀ | mìí-ˡná | ‘millet’ | 1 |
| CVN | H | táń- | táń-ɖɛ̀ | tán-ˡáná | ‘drink’ | 4 |
| | LH | dʒɔ̀ḿ- | dʒɔ̀ḿ-ˡɪ́-rɛ́ | dʒɔ̀ḿ-ˡáná | ‘storm’ | 1 |
| CVCV | H | fɔ́ŋí- | fɔ́ŋí-rɛ̀ | fɔ́ŋ-ˡáná | ‘neck’ | 10 |
| | L | fɔ̀kí- | fɔ̀kí-rɛ̀ | fɔ̀kí-ˡná | ‘leaf; paper’ | 7 |

The singular suffix /-rE̊/ is preceded by a floating H tone that docks onto the rightmost TBU of the root and overwrites the final root tone, much like the class pairing 3-4 suffixes presented in §5.5.1. This accounts for the lack of L-final roots in the surface realizations of nouns in this class. The docking of the H suffix onto a hypothetically L-final root is presented in (61). When a HL-docking suffix associates to an already H-associated root, the two H tones merge to repair the violation of the OCP.

(61) (H)-polar overwriting suffix /-ó-rE̊/

| L deletes | H associates to root $V_2$ | H’s merge to repair OCP | Polar SX realized L | | |
|---|---|---|---|---|---|
| H ǂ (H) | H H | H | H L | [ ¯ ¯ _ ] | |
|  | →  | →  | →  | | |
| fɔŋɪ | fɔŋɪ | fɔŋɪ | fɔŋɪ | [fɔ́ŋí-rɛ̀] | ‘neck’ |

The suffix /-rE̊/ has three segmental realizations: /-rE/, /-ɖE/ or /-E/. These are conditioned by the preceding segment (Kleinewillinghöfer 2006). Noun roots with the syllable profile CV or CVV take /-rE̊/, as do most CVCV stems. This is shown in (62).

(62) Vowel-final roots take /-rE̊/

| Root | SG | PL | Gloss |
|---|---|---|---|
| bú- | bú-rɛ̀ | bú-↓ná | ‘pebble’ |
| túú- | túú-rè | túú-↓ná | ‘mortar’ |
| fɔ̀kí- | fɔ̀kí-rè | fɔ̀kí-↓ná | ‘leaf; paper’ |
| kímí- | kímí-rɛ̀ | kím↓á-ná | ‘debt’ |
| túmú- | túmú-rɛ̀ | túm↓á-ná | ‘work’ |

Where a noun root ends in coronal nasal [n], the singular suffix is realized /-ɖE̊/, as shown in (63).

(63) [n]-final roots take /-ɖE̊/

| Root | SG | PL | Gloss |
|---|---|---|---|
| táń- | táń-ɖɛ̀ | tán-↓áná | ‘drink’ |

Where a liquid consonant /l/ or /r/ is the last consonant in a noun root, the final syllable merges with the suffix, so that nouns such as *[wálá-rɛ̀] or *[ŋárá-rɛ̀] do not occur. Rather, the root-final vowel deletes and is replaced with shortened suffix /-E̊/, as shown in (64).

(64) /-rE̊/ realized /-E̊/ following liquid consonants

| Root | SG | PL | Gloss |
|---|---|---|---|
| wálá- | wál-ɛ̀ | wál-↓áná | ‘coal’ |
| ŋárá- | ŋár-ɛ̀ | ŋár-↓áná | ‘agouti’ |
| sàwélé- | sàwél-è | sàwél-↓áná | ‘squirrel’ |

One noun root ends in a bilabial nasal [m], shown in (65). In this instance, the suffix is realized with an epenthetic /-I-/ preceding the polar suffix /-rE̊/. The epenthetic /I/ is realized polar to the preceding tone.

(65) [m]-final roots takes /-Ì-rE̊/

| Root | SG | PL | Gloss |
|---|---|---|---|
| dʒɔ́m- | dʒɔ́m-ˈí-rɛ́ | dʒɔ́m-ˈáná | ‘storm’ |

As in several other class pairings, the noun roots are overwhelmingly H-final. This causes the polar suffix to almost always be realized L. The suffix is analyzed as polar rather than L because of examples like *dʒɔ́m-ˈí-rɛ́* ‘storm’ in (65) and because of the behavior of the suffix following complex forms, as discussed in §5.6.2.

The H plural suffix /-(à)ná/ is realized in one of two ways depending on the segmental structure of the root.

Open monosyllabic roots CV and CVV take [-ˈná], as shown in (66).

(66) CV and CVV roots take [ˈná]

| | | |
|---|---|---|
| bú-rɛ̀ | bú-ˈná | ‘pebble’ |
| túú-rè | túú-ˈná | ‘morter’ |
| mìí-rɛ̀ | mìí-ˈná | ‘millet’ |

Closed monosyllabic CVN roots take [-ˈáná], as shown in (67) and (68). The H of the root /tán-/ (67) is originally doubly-linked, but when the N becomes an onset, it loses its ability to bear tone and the H becomes singly-linked. The LH sequence of suffixes is added and the resulting HLH pattern plateaus.

(67) H CVN roots take [-ˈáná]

| RT + PL SX | N becomes onset, H delinks | HLH plateau | |
|---|---|---|---|
| H L H | H L H | | |
| tan-ana | ta.na.na | [tán-ˈáná] | ‘drinks’ |

The H of the LH root *dʒɔ́m-* (68) is singly-linked and cannot delink, so the nasal remains a TBU. The LH sequence of suffixes is added and the resulting HLH pattern plateaus.

(68) LH CVN roots take [-ˡáná]

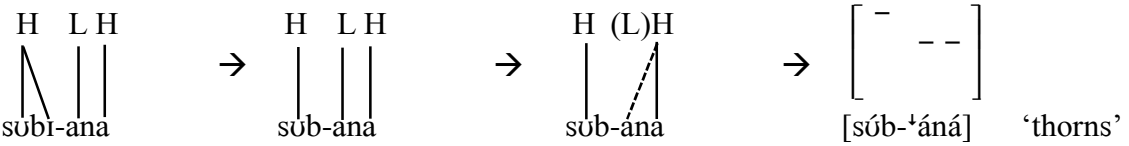
RT + PL SX HLH plateau


‘storms’

Among disyllabic roots, one of two things can happen. If the root contains a doubly-linked H tone, the second TBU of the root deletes, as shown in (69). The H root plus LH suffix results in a HLH pattern that plateaus to surface as H$^{\downarrow}$HH.

(69) H CVCV roots take [-ˡáná]

RT + PL SX RT $V_2$ deletes HLH plateaus

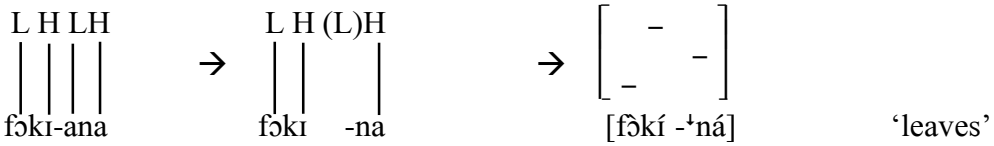



‘thorns’

If the H tone of the root is singly linked, as in the case of LH disyllabic roots, H is not able to delink from its sole TBU. Instead, the initial TBU of the suffix deletes and leaves its L tone to float as shown in (70).

(70) LH CVCV roots take [-ˡná]

RT + PL sx [a] deletes, L floats (L) causes downstep




5.6.2 Class pairing 5-6 prefixes /ɖI-/, /a-/

A subset of nouns in class pairing 5-6 takes class prefixes as well as class suffixes. The singular prefix is /ɖI-/ and the plural prefix is /a-/. The tonal behavior of the prefix is unpredictable based on the current dataset. Even the relatively small set of data presented in Table 43 shows a four-way contrast in the tonal realization of the prefix, as discussed immediately following the table.

Table 34 : Class pairing 5-6 prefixes /ɖI-/, /a-/

| Root profile | PX tone | Root tone | Singular | Plural | Gloss | Frequency |
|---|---|---|---|---|---|---|
| CV | H- | H | ɖí-bú-rè | á-bú-ˡná | ‘mound’ | 3 |
| | L- | H | ɖì-gó-rè | à-gó-ˡná | ‘tribe; hut’ | 4 |
| CVV | H- | L | ɖí-ɖèè-ré | á-ɖèè-ná | ‘udder’ | 2 |
| CVN | L- | L | ɖì-fʊ̀ǹ-ɖɛ́ | à-fʊ̀ŋ-àná | ‘fish trap’ | 2 |
| CVCV | H- | H | ɖí-ból-è | á-ból-ˡáná | ‘epoch’ | 1 |
| | L- | H | ɖì-dʒól-è | à-dʒól-ˡáná | ‘okra’ | 1 |
| | L- | L | ɖì-sàr-ɛ́ | à-sàr-ànà | ‘wall’ | 2 |

Preceding H-initial roots, the prefix can be realized H as in *ɖí-bú-rè* ‘butte’ or L as in *ɖì-dʒól-è* ‘okra.’ Preceding L-initial roots, the prefix can be realized H as in *ɖí-ɖèè-ré* ‘udder’ or L as in *ɖì-sàr-ɛ́* ‘wall.’ The same four examples show four-way contrast in the relationship between the tonal realization of the prefix and its corresponding suffix.

Many reduplicated stems also take the prefixes /ɖI-/ and /a-/. Preceding these complex stems, however, the prefix is consistently realized L, regardless of the tone pattern of the

stem, as shown in Table 35. The fact that the prefixes /ɖI-/ and /a-/ are realized L preceding complex stems implies that these prefixes are either underlyingly L or toneless.

Table 35 : Reduplicated roots prefixed by /ɖì-/, /à-/

| Singular | Plural | Gloss |
|---|---|---|
| ɖì-k͡pék͡pé-rè | à-k͡pék͡pé-ˈná | ‘hat’ |
| ɖì-gòŋ̀gòmíl-è | à-gòŋ̀gòmíl-ˈáná | ‘club; cudgel’ |
| ɖì-kúńkúm-írè | à-kúńkùm-àná | ‘borassus fruit’ |
| ɖì-kòŋ̀kòòl-é | à-kòŋ̀kòòl-àná | ‘groundnut shell’ |
| ɖì-kɔ̀ŋ̀kɔ̀m̀íl-ɛ̀ | à-kɔ̀ŋ̀kɔ̀míl-ˈáná | ‘snail’ |

Another possibility is that the noun root tone pattern associates to the whole stem, starting with the prefix, so that a L prefix indicates a L-initial noun root tone pattern and a H prefix indicates a H-initial root tone pattern. A similar hypothesis is put forward by Roberts (2016) regarding certain Kabiye nouns.

### 5.6.3 Summary

Class pairing 5-6 nouns are consistent in their use of the singular suffix /-◌́rE̊/ and plural suffix /-(à)ná/. The realization of the singular suffix is conditioned by the place features of the second root consonant. The realization of the plural suffix depends on the syllable structure of the root, as well as the root tone pattern. Open monosyllabic roots with a CV or CVV syllable profile take [-ˈná], while closed monosyllabic roots take [-ˈáná]. Among CVCV roots, those with a LH pattern take [-ˈná] while those with a doubly-linked H take [-ˈáná]. Finally, 19 of the collected nouns in this pairing take singular prefix /ɖI-/ and plural prefix /a-/ in addition to class suffixes. The prefixes are likely underlyingly L or toneless, but their tonal behavior is unpredictable at this point in the research.

## 5.7 Noun class pairing 12-13

Class pairing 12-13 contains the largest set of nouns collected, with nearly a hundred simple stems. The pairing includes the following semantic categories: animals, body parts, kinship terms, food, tools, time and place, seasons and weather phenomena, abstract nouns, loan words, and diminutive forms (Kleinewillinghöfer 2006). Loans and diminutives, along with prefixed and other complex forms, are excluded from the data at this stage of the analysis.

Nouns in class pairing 12-13 are marked by two suffix combinations, shown in Table 36.

Table 36 : Class pairing 12-13 suffixes

| SG SX | PL SX | Root profile | Root tone | Singular | Plural | Gloss | Frequency |
|---|---|---|---|---|---|---|---|
| -∅ | -sÉ | CVV | LH | sàá-∅ | sàá-sɛ́ | ‘tarantula’ | 1 |
| | | CVCV | H | ɖíwú-∅ | ɖíwú-sé | ‘mirror’ | 2 |
| | | | L | pàpà-∅ | pàpà-sɛ́ | ‘fan’ | 3 |
| | | | LH | kàsí-∅ | kàsí-sɛ́ | ‘antelope’ | 4 |
| | | | HL | síkà-∅ | síꜜká-sɛ́ | ‘doubt’ | 1 |
| -◌́à | -◌́sÈ | CV | H | bú-à | bú-sɛ̀ | 'spring' | 4 |
| | | CVCV | H | kórá-à | kórá-sɛ̀ | ‘bracelet’ | 3 |
| | | | L | wàlá-à | wàlá-sɛ̀ | ‘slate’ | 8 |

Over half the nouns collected in this pairing take no singular suffix and H plural suffix /-sÉ /. These are discussed in §5.7.1. Just under half the nouns take singular suffix /-◌́à/ and plural suffix /-◌́sÈ/. These are discussed in §5.7.2. Nouns that do not fall neatly into either suffix pairing category are discussed in §5.7.3. A number of nouns in this class pairing (and only in this class pairing) are prefixed by /ka-/ in both the singular and the plural forms. The prefix is segmentally identical to the singular class subject pronominal prefix, and thus appears to be a historic class prefix. Similarly, a large number of nouns in this class pairing are prefixed by /a-/, a segment that is only found word-initally in this class pairing and in class pairing 1-2. Both prefixes are discussed in §5.7.4. The tonal behavior of both prefixes is unpredictable based on the current data.

### 5.7.1 Class pairing 12-13 suffixes /-∅/ , /-sÉ/

Nouns with no singular suffix make up just over half of the 12-13 class pairing data. The plurals of these forms take H suffix /-sÉ/, as shown in Table 37.

Table 37 : Class 12-13 suffixes /-Ø/, /-sÉ/

| Root profile | Root tone | Singular | Plural | Gloss | Frequency |
|---|---|---|---|---|---|
| CVCV | H | ɖíwú-∅ | ɖíwú-sé | ‘mirror’ | 2 |
| | L | sìkà-∅ | sìkà-sɛ́ | ‘twin’ | 3 |
| | LH | màrá-∅ | màrá-sɛ́ | ‘law’ | 4 |
| | HL | síkà-∅ | síꜜká-sɛ́ | ‘doubt’ | 1 |

The suffix is realized as H regardless of the preceding tone. Even H-final roots take the H plural suffix /-sÉ/, with no apparent violation of the OCP. Alansary (2021: 55-56) claims free-standing noun stems are in a separate tonal domain from the plural suffix, and therefore do not violate the OCP. For a more consistent analysis, I hypothesize that the OCP is violated in this domain just as it is at the root- and word-level, but that the repair strategy at the macrostem-level is to merge the sequence of H tones, as shown in (71). This repair occurs on the tonal tier, and is therefore imperceptible in the surface form.

(71) Stem-level OCP repair: merging of H tones

H’s merge to repair OCP


According to Myers (1997: 870), Shona shows similar behavior. The “fusion” of two H tones occurs as an OCP repair strategy only at the macrostem level.

### 5.7.2 Class pairing 12-13 suffixes /-ó̠à/, /-ó̠sÈ/

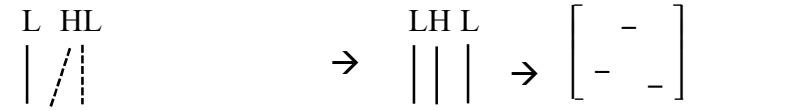
Just under half of the class pairing 12-13 nouns take singular suffix /-ó̠à/ and plural suffix /-ó̠sÈ/ as shown in Table 38 and discussed below.

Table 38 : Class pairing 12-13 suffixes /-ó̠à/, /-ó̠sÈ/

| Root profile | Root tone | Singular | Plural | Gloss | Frequency |
|---|---|---|---|---|---|
| CV | H | fá-à | fá-sɛ̀ | ‘field’ | 5 |
| CVV | L | dʒàá-à | dʒàá-sɛ̀ | ‘crab’ | 4 |
| CVCV | H | bɔ́sá-à | bɔ́sá-sɛ̀ | ‘traditional mat’ | 3 |
| | L | wàlá-à | wàlá-sɛ̀ | ‘slate’ | 8 |

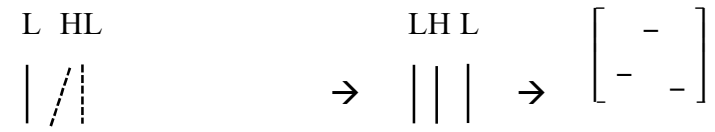
In this dataset, suffixes are always preceded by H. Alansary keeps his analysis synchronic and calls all the noun roots of this class H-final (2021: 85-69). This is the simplest analysis, but does not account for the lack of L and HL noun roots. To account for the uneven distribution pattern of noun roots, I analyze the singular and plural suffixes as (H)L, where the H tone of the suffix docks onto the rightmost TBU of the noun root and overwrites the final tone of the root. This accounts for the lack of L-final roots in the surface realizations in Table 38. The association of the suffix tone pattern to the stem is shown in (72) and (73).

(72) HL overwriting suffix /-ó̠à/
H associates to root $V_2$



(73) HL overwriting suffix /-ó̰sÈ/

H associates to root $V_2$




5.7.3 Subsets of class pairing 12-13

A few nouns do not neatly fall into either of the categories presented in §5.7.1 or §5.7.2. Three nouns take HL overwriting suffix /-ó̰sɛ̀/ in the plural, but do not take a singular suffix. These are presented in Table 39.

Table 39 : Shortened class 13 suffix /-à/

| Root tone | Singular | Plural | Gloss |
|---|---|---|---|
| HL | ɖélà-∅ | ɖélá-sɛ̀ | ‘place’ |
| | sírà-∅ | sírí-sɛ̀ | ‘machete’ |
| | tíŋà-∅ | tíŋí-sɛ̀ | ‘hip’ |

Five nouns in this class pairing take singular suffix /-ŋɛ/, as shown in Table 40. The tonal realization of /-ŋɛ/ for a given noun matches the tone of its corresponding plural suffix, meaning the singular and plural suffixes are either both H or both L.

Table 40 : Class pairing 12-13 suffixes /-ŋɛ̊/, /-sɛ̊/

| Root profile | Root tone | Singular | Plural | Gloss |
|---|---|---|---|---|
| CV | H | ɖá-ŋɛ̀ | ɖá-sɛ̀ | ‘cane; stick’ |
| CVV | LH | bɔ̀ɔ́-ŋɛ̀ | bɔ̀ɔ́-sɛ̀ | ‘rope’ |
| CVCV | HL | wíl$^{\text{l}}$í-ŋɛ́ | wíl$^{\text{l}}$í-sɛ́ | ‘star’ |
| | | yíl$^{\text{l}}$í-ŋɛ́ | yíl$^{\text{l}}$í-sɛ́ | ‘horn’ |
| | | k͡pí$^{\text{l}}$rí-ŋɛ́ | k͡pí$^{\text{l}}$rí-sɛ́ | ‘wasp’ |

### 5.7.4 Class pairing 12-13 prefixes /a-/ and /ka-/

The tonal behavior of the class 12-13 prefixes /a-/ and /ka-/ is unpredictable. The tone is neither consistently H or L, nor is it consistently similar or dissimilar to the first tone of the following TBU. Unlike the kinship prefix /a-/ of class pairing 1-2 (see §5.4.2), the tone of these prefixes is not predictable based on its suffix. What factors affect the tone of these prefixes is yet to be seen.

Table 41 : Class pairing 12-13 prefix /a-/

| Root profile | PX tone | Root Tone | Singular | Plural | Gloss | Frequency |
|---|---|---|---|---|---|---|
| CV | L- | H | à-rá-∅ | à-rá-sɛ́ | ‘thunder’ | 3 |
| | L- | L | à-fà-∅ | à-fà-sɛ́ | ‘pig’ | 4 |
| CVCV | H- | H | á-gb̰ádá-∅ | á-gb̰ádá-sɛ́ | ‘robe’ | 2 |
| | L- | H | à-kúwá-∅ | à-kúwá-sɛ́ | ‘groundnut’ | 1 |
| | L- | L | à-gb̰ògb̰ò-∅ | à-gb̰ògb̰ò-sɛ́ | ‘bait’ | 1 |
| | L- | LH | à-kùtú-∅ | à-kùtú-sé | ‘orange’ | 6 |
| | H- | LH | á-kùjí-∅ | á-kùjí-sé | ‘parrot’ | 1 |
| | L- | HL | à-wárɛ̀-∅ | à-wáˈrɛ́-sɛ́ | ‘back of something’ | 3 |

Table 42 : Class pairing 12-13 prefix /ka-/

| Root profile | PX tone | Root tone | SG | PL | Gloss | Frequency |
|---|---|---|---|---|---|---|
| CV | H- | L | ká-ràá-∅ | ká-ràá-sɛ́ | ‘fence’ | 1 |
| CVCV | L- | L | kà-sìŋ̀à-∅ | kà-sìŋ̀à-sɛ́ | ‘spirit of the dead’ | 1 |
| | H- | LH | ká-ˈdʒáŋ̀á-∅ | ká-ˈdʒáŋ̀á-sɛ́ | ‘sun’ | 2 |
| | L- | HL | kà-dʒúwà-∅ | kà-dʒúˈwá-sɛ́ | ‘benefit’ | 2 |
| CV | L- | L | kà-wì-á | kà-wì-sɛ́ | ‘illness, disease,’ | 1 |
| CVCV | H- | H | ká-sérá-à | ká-sérá-sɛ̀ | ‘thought’ | 3 |
| | L- | LH | kà-gìrá-à | kà-gìrí-sɛ̀ | ‘basket’ | 3 |
| | H- | LH | ká-ˈɖ́irá-à | ká-ˈɖ́irá-sɛ̀ | ‘youngest child’ | 1 |

The nouns *á-kòjí* ‘parrot’ and *ká-ràá* ‘fence’ are anomalies in that they do not undergo HLH plateauing.

### 5.7.5 Summary

Two major suffix pairs mark the nouns in class pairing 12-13. Over half the nouns take no singular suffix and H plural suffix /-sÉ/. A subset of these are prefixed by /-a/. Just under half the nouns take singular suffix /-◌́à/ and plural suffix /-◌́sɛ̀/, whose (H) tone overwrites the root-final tone. A subset of nouns within these two suffix pair groupings are prefixed by /ka-/. Prefixes /a-/ and /ka-/ resemble historical prefixes of proto-Gur. Based on the current data, the tonal behavior of these two prefixes is unpredictable.

## 5.8 Class 21 suffix /-tɔ̰/

Noun class 21 is primarily made up of non-count nouns and substantives derived from verbs. The class is marked by the segmental suffix /-tɔ̰/, which is realized polar to the preceding tone.

Table 43 : Class 21 suffix /-tɔ̰/

| Root profile | Root tone | Noun | Gloss | Frequency |
|---|---|---|---|---|
| CV | H | ló-tò | ‘stomach’ | 7 |
| CVV | H | túú-tù | ‘common cold’ | 3 |
| CVN | H | fṹ-tɔ̀ | ‘grass’ | 3 |
| | L | sʊ̀n̄-tɔ́ | ‘breakfast’ | 1 |
| CVCV | H | ŋɔ́rú-tɔ̀ | ‘the unknown’ | 2 |
| | LH | fɛ̀fɛ́-tɔ̀ | ‘breath, wind’ | 4 |
| | HL | dí$^{L}$lí-tɔ́ | ‘clan’ | 6 |

Underlyingly H-final roots dominate the dataset so that the nouns in this class, like most others, are characterized by a HL-final pattern. At least one noun *sʊ̀n̄-tɔ́* ‘breakfast’ has a L

root and its suffix is therefore realized H. At least two simple nouns have a HL root pattern: *dí↓lí-tɔ́* ‘clan’ and *bó↓lí-tó* ‘blessing.’

Some nouns in this class take a downstepped H suffix /-↓tɔ́/. These nouns are nominalizations of verbs, which take a floating L tone between the finite verb and the polar suffix. This floating L causes the suffix to surface as downstepped and is discussed immediately following Table 44.[7]

[7] At least one noun *súlú-↓tɔ́* ‘african locust bean’ is derived from another noun rather than a verb: súlúù̀ ‘African locust bean tree.’

Table 44 : Class 21 nouns derived from finite verbs

| Root profile | PFV verb tone | Clause-final PFV | Nominalization | Gloss |
|---|---|---|---|---|
| CV | H(L) | té-è | té-ˈtɔ́ | ‘going ahead’ |
| | | wí-ì | wí-ˈtɔ́ | ‘crying’ |
| | | mí-ì | mí-ˈtɔ́ | ‘pain’ |
| | | ká-à | ká-ˈtɔ́ | ‘leftovers’ |
| | | tá-à | tá-ˈtɔ́ | ‘stain (n)’ |
| | | kí-ì | kí-ˈtɔ́ | ‘offspring, exceeding’ |
| CVN | HL | sáŋ̀ | sáˈń-tɔ́ | ‘catching’ |
| | | ɖɔ́ŋ̀ | ɖɔ́ˈń-tɔ́ | ‘stirring’ |
| | L͡HL | tɔ̌m̀ | tɔ̀ḿ-ˈtɔ́ | ‘speaking’ |
| | | dʒǐŋ̀ | dʒì̀ń-ˈtɔ́ | ‘wisdom’ |
| CVCV | HL | sérì | séˈrí-tɔ́ | ‘thinking’ |
| | | bɔ́rɛ̀ | bɔ́ˈrɛ́-tɔ́ | ‘trampling’ |
| | | bárì | báˈrí-tɔ́ | ‘end’ |
| | LHL | làgá-à | làgá-ˈtɔ́ | ‘imitation’ |
| | | fìtí-ì | fìtí-ˈtɔ́ | ‘payment’ |
| | | sʊ̀gʊ́-ʊ̀ | sʊ̀ʊ́-ˈtɔ́ | ‘burden’ |
| | | sàsí-ì | sàsí-ˈtɔ́ | ‘glory (n)’ |
| CV-CV | H-L | ɖɛ́-sì | ɖɛ́ˈsí-tɔ́ | ‘arrangement’ |
| CVV-CV | H-L | sáá-sì | sáˈsí-tɔ́ | ‘beginning’ |
| | | ɲáá-sì | ɲááˈsí-tɔ́ | ‘cry (n)’ |

As seen in §4.3, the perfective aspect is marked by a floating L on the right of the finite verb stem when the verb is clause-final. The nominalized form of the verb is similarly marked by a floating L at the right edge of the finite verb. This causes the nominalizing suffix to downstep, as shown in (74).

(74) Derivation of *sàsí-ˈtɔ́* 'beginning'

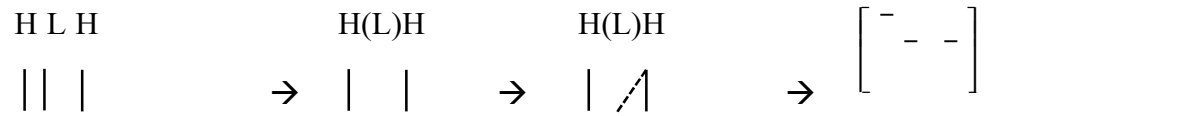
FIN verb + PFV (L) + /-tɔ̰/ (L) triggers downstep


'beginning'

When the finite form of the verb stem is already L-final, the perfective or nominalizing (L) deletes. Verbs like *bɔ́rɛ̀* 'trample' are HL in both the finite and perfective forms. Following these HL verbs, the nominalizing suffix /-tɔ̰/ is realized H and the HL-H pattern triggers plateauing, as shown in (75).

(75) Derivation of *bɔ́ˈrɛ́-tɔ́* 'trampling'

PFV verb + /-tɔ̰/ L delinks H of SX spreads left




'trampling'

## 5.9 Class 22 suffix /-mO̰/

Noun class 22 is made up of non-count nouns such as liquids, masses, events, and concepts. This noun class is characterized by the suffix /-mO̰/, which is realized polar to the preceding tone, as shown in Table 45. Following HL roots, the polar suffix /-mO̰/ is realized H, triggering HLH plateauing.

Table 45 : Class 22 suffix /-mO̰/

| Root profile | Root tone | Noun | Gloss |
|---|---|---|---|
| CV | H | tɔ́-mɔ̀ | ‘affair’ |
| | | sí-mɔ̀ | ‘death, funeral’ |
| | | nyí-mò | ‘fat’ |
| | | yó-mò | ‘mushroom; broth’ |
| | | nyí-mɔ̀ | ‘species of fish’ |
| | | nyɛ́-mɔ̀ | ‘sand’ |
| | | bá-mɔ̀ | ‘palm wine’ |
| CVV | LH | dɔ̀ɔ́-mɔ̀ | ‘potash cinder’ |
| CVCV | | làlí-mɔ̀ | ‘saliva’ |
| | | sʊ̀sʊ́-mʊ̀ | ‘sesame’ |
| | HL | sí↓lí-mɔ́ | ‘tears (n)’ |
| | | mʊ́↓lʊ́-mɔ́ | ‘flour’ |
| | | ní↓nɛ́-mʊ́ | ‘pus’ |
| | | sá↓lí-mɔ́ | ‘blood’ |
| | | mɛ́↓lí-mɔ́ | ‘theft’ |
| | | tʊ́↓lʊ́-mɔ́ | ‘fetish’ |

## 5.10 Summary

Table 21, which was presented originally in §5.3, is reproduced here as Table 46 for immediate reference in this summary of noun class suffixes and their tonal behavior.

Table 46 : Noun class suffixes

| Proto-Gur | Tak | Alansary | SG SX | PL SX | Singular | Plural | Gloss |
|---|---|---|---|---|---|---|---|
| 1-2 | 1-2 | 1 | -Ù-ná | -bå | ɖúm-ˈú-ná | ɖúḿ-bà | ‘snake’ |
| | | | | | ŋɔ́ˈrú-ná | ŋɔ́rú-bà | ‘stranger’ |
| | | | -ŋɔ̊ | -bå | dɔ́-ŋɔ̀ | dɔ́-bà | ‘elder’ |
| | | | -ò̩ná | -ó̩à | á-k͡pá-ˈná | á-k͡pá-à | ‘person’ |
| 3-4 | 3-4 | 4 | -ó̩Ò | -ó̩ŋÈ | bèn-ɔ́ɔ̀ | bèn-í-ŋɛ̀ | ‘amulet’ |
| | | | | | kúbɔ́-ɔ̀ | kúbú-ŋɛ̀ | ‘mountain’ |
| | | | -ó̩Ò | -nn̊ŋɛ̊ | lɔ́-ɔ̀ | lɔ́-ˈníŋɛ́ | ‘forest’ |
| | | | (H) | -nn̊ŋɛ̊ | kɔ̀l-ɔ́ | kɔ̀lɔ̀-níŋɛ̀ | ‘basin’ |
| 5-6 | 7-8 | 3 | -ó̩rE̊ | -(à)nå | fɔ̀kí-rɛ̀ | fɔ̀kí-ˈná | ‘leaf; paper’ |
| 12-13 | 5-6 | 2 | -∅ | -sÉ | ɖíwú-∅ | ɖíwú-sé | ‘mirror’ |
| | | | -ó̩à | -ó̩sÈ | wàlá-à | wàlá-sɛ̀ | ‘slate’ |
| 21 | PL of 3 | NA | -tO̊ | | díˈlí-tɔ́ | | ‘clan’ |
| 22 | 9 | 5 | -mO̊ | | múˈlú-mɔ́ | | ‘flour’ |

As shown in Table 46, the majority of noun class suffixes are (H)L. These are made up of a H tone that overwrites the rightmost tone of the root, followed by a L suffix. Similarly, the suffix /-ná/ of classes 1 and 5 is preceded by L suffixes /-Ù/ and /-à/ respectively. The resulting LH pattern triggers either downstep or HLH plateauing depending on the syllable structure of the root. Subsets of class 1 and 12 take no singular suffix and a subset of class 3 is suffixed by a floating H that overwrites the rightmost tone of the root, with no segmental suffix.

Class pairing 1-2 is characterized by a combination of historic singular suffix /-Ù/ and innovative suffix /-ná/. A subset of class pairing 1-2 nouns take the kinship prefix /a-/. The prefix is realized H preceding nouns suffixed by /-(Ù)-ná/ and L preceding nouns that have no singular suffix. Further data collection would benefit the analysis of class pairing 1-2.

Classes 2-5 and 12-13 are characterized by a HL tone pattern at the right edge of the inflected stem. This tone pattern is analyzed as inherent to the suffix, where the H tone of the suffix overwrites the rightmost TBU of the noun root.

The plural class 6 is characterized by LH suffix /-(à)ná/. A subset of class pairing 5-6 has noun class prefixes as well as suffixes. Singular forms are prefixed by /dɪ̰-/ and plural forms by /a-/. The prefixes are likely underlyingly L or toneless, but their tonal behavior is unpredictable at this point in the research.

Just over half the nouns in class pairing 12-13 are free-standing in the singular form and take H suffix /-sÉ/ in the plural. A subset of class pairing 12-13 nouns are prefixed by /a-/ and another set by /ka-/. The tonal behavior of these prefixes is unpredictable based on the current research.

Noun classes 21 and 22 are marked by suffixes that are simply realized polar to the stem-final tone. Most verbs can be nominalized by adding a floating L tone and the class 21 suffix /-tɔ̰/ to the finite verb form.

## 6. Orthographic suggestions

In this section, I make suggestions as to the orthographic representation of tone in Kusuntu, having considered the results of this study and previous informal orthographic testing. In the current orthography (Azoti et al. 2013), all H tones are marked with an accute accent and L tones are left unmarked. In their evaluation of the Bago-Kusuntu orthography, Azoti and Moussa (2015) observe that even the most actively involved and educated participants of literacy efforts conducted up to that point failed to mark tone consistently. They question whether novice writers just need more time to master the orthography or if they would benefit from changing the orthography to either drop tone marking altogether or mark only verbs for tone.

The findings of the present study support Azoti et al's proposal that only verbs should be marked for tone. Specifically, non-finite verb forms should be distinguished from finite verb

forms. Rather than marking verbs for phonological tone, however, I suggest testing an orthography that marks verbs according to their grammatical form.

In the current orthography, certain morphemes are already marked for grammatical function, rather than phonological tone. Azoti and Moussa (2015:8) suggest that possessive pronouns and object pronouns be hyphenated to the noun or verb to which they refer. This distinguishes them from subject pronouns, which stand alone. Additionally, the LH imperfective pronoun is hyphenated between the L and H vowels. Even if the second vowel is left unmarked for its H tone, the aspect is still immediately recognizable. Marking pronouns for grammatical function should provide the reader with sufficient information to know how to pronounce their tones correctly.

## 6.1 Previous testing

In 2016, Bago and Kusuntu speakers were informally tested for reading comprehension of an orthography that left tone completely unmarked (Reeder 2016a). Reeder observed that underdifferentiation of both lexical and grammatical tone contrast caused problems for the readers. Lexically, readers struggled to disambiguate minimal pairs among both verbs and nouns. Grammatically, the greatest confusion arose in distinguishing between what Alansary terms the non-finite and finite verb forms. In discussion with Reeder following this testing, however, Kusuntu language committee leaders suggested leaving tone unmarked.

Additionally, Roberts and Walter's (2021) research indicates that full tone marking does not significantly improve reader's fluency or comprehension in the Tem language. The Tem results are especially relevant to the current study because Tem is a part of the same Eastern Gurunsi language family with Kusuntu and is spoken in the same language area. Many Kusuntu speakers are also bilingual in Tem. Weathers (2008) suggests testing a Tem orthography that represents tone only in the verb inflection system. This is what I suggest for Kusuntu as well.

## 6.2 Nouns

Only 10 minimal pairs were found among the ~600 nouns collected for this study. These are presented in Table 47. Based on this small percentage and following the suggestion of the Kusuntu language committee leaders (2016a), I propose leaving nouns unmarked for tone.

Table 47 : Lexical minimal pairs – nouns

| Class | Noun 1 | Gloss 1 | Noun 2 | gloss 2 |
|---|---|---|---|---|
| 1 | àfá | 'mother' | àfà | 'pig' |
| 1 | gbètèrú-ˈná | 'monitor lizard' | gbètéˈrú-ná | 'guide' |
| 3 | ásíyá | 'mast' | asíyà | 'cat' |
| 5 | ɖímú-rɛ̀ | 'straw bale' | ɖìmù-rɛ́ | ‘tale’ |
| 12 | kàrá-à | 'leg; foot' | kárà-á | 'fence' |
| 12 | síkà | 'doubt' | sìkà | 'twin' |
| 12 | sìsìrí | ‘chain’ | sísírì | 'magic' |
| 21 | mí-tɔ̀ | 'dough' | mí-ˈtɔ́ | 'pain' |
| 21 | súlú-tɔ̀ | 'néré tree' | sùlú-ˈtɔ́ | 'someone who asks' |
| 21 | ŋɔ́rú-tɔ̀ | ‘something unknown' | ŋɔ̀rú-tɔ̀ | 'angry person; swollen thing' |

Orthography developers wanting to distinguish tonal lexical minimal pairs might consider altering the spelling of a given noun in each pair, especially if both words are just as likely to occur in similar contexts.

## 6.3 Verbs

Both lexical and grammatical tone are especially active among verbs. Rather than marking all verbs for tone, I suggest testing an orthography that identifies the marked grammatical construction of the verb, that is, the finite form. Lexical tonal minimal pairs are more

frequent among verbs than among nouns. Whether and how to disambiguate them is an area for further study.

### 6.1.1 Grammatical minimal pairs

Grammatical tone plays a major role in the Kusuntu verb system. Most verbs have a grammatical tonal minimal pair (the finite vs. non-finite form) that potentially warrants orthographic representation. I suggest testing three orthographies: the current orthography that marks all H tones, one that does not mark tone at all, and one that marks verbs for grammatical form rather than phonological tone. One option would be to mark finiteness with a capital letter on the marked (finite) form. This is presented in Table 48. I predict that intermediate to advanced readers and writers will find an orthography that marks verbs for finiteness to be the most intuitive.

Table 48 : Orthographic representation of non-finite vs. finite verbs

| Profile | Verb form | Tone | Orthographies to test | | | Gloss |
|---|---|---|---|---|---|---|
| | | | Control: no tone marking | Current: H tones marked | Proposed: finite form marked | |
| CV | NF | ∅ | <dʒu> | <dʒu> | <dʒu> | 'go' |
| | FIN | H | <dʒu> | <dʒú> | <Dzu> | |
| | NF | H | <fe> | <fé> | <fe> | 'flee' |
| | FIN | H | <fe> | <fé> | <Fe> | |
| CVCV | NF | H∅ | <seri> | <sérí> | <seri> | 'think' |
| | FIN | HL | <seri> | <séri> | <Seri> | |
| | NF | ∅H | <laga> | <lagá> | <laga> | 'love' |
| | FIN | HL | <laga> | <lága> | <Laga> | |
| | NF | ∅ | <bala> | <bala> | <bala> | 'walk' |
| | FIN | ∅H | <bala> | <balá> | <Bala> | |

### 6.1.2 Lexical minimal pairs

Twenty tonal lexical minimal pairs were found among the ~300 verbs collected for this study. These are presented in Table 49. I suggest testing for ambiguity between these verbs when left unmarked for tone in a number of different TAM constructions. I predict that the underdifferentiation of the unmarked forms will cause some confusion for readers. However, marking these verbs for tone is not a solution because tone varies according to the finiteness of the verb. Additionally, teaching people to mark only certain verbs for tone, and only in certain constructions, is not a good didactic approach. This is an area for future study and testing.

Table 49 : Lexical tonal minimal pairs – verbs

| NF | FIN | Gloss | NF | FIN | Gloss |
|---|---|---|---|---|---|
| ɖá | ɖá | 'wait' | ɖa | ɖá | 'get lost' |
| ŋmɛ | ŋmɛ́ | 'braid' | ŋmɛ́ | ŋmɛ́ | 'age' |
| boḿ | bóm | 'pound' | bom | boḿ | 'tie (knot)' |
| díɲ́ | díŋ | 'drip' | dɪŋ | dɪɲ́ | 'turn off' |
| dʒɪŋ | dʒɪɲ́ | 'know' | dʒɪɲ́ | dʒíŋ | 'ascend' |
| ɖɛ́ɲ́ | ɖɛ́ŋ | 'taste' | ɖeɲ́ | ɖɛ́ŋ | 'meet' |
| ŋaŋ | ŋaɲ́ | 'have fear' | ŋáŋ | ŋáŋ | 'frighten' |
| saŋ | saɲ́ | 'wash (hands)' | sáɲ́ | sáŋ | 'catch' |
| síɲ́ | síŋ | 'stop' | sɪŋ | sɪɲ́ | 'worship' |
| birí | bíri | 'wear on back' | bírí | bíri | 'be black' |
| fɔ́sí | fɔ́sɪ | 'greet (v.); thank' | fɔsɪ | fɔsí | 'loosen' |
| gb͡ala | gb͡alá | 'practice necromancy' | gb͡alá | gb͡ála | 'associate' |
| kp͡ɛrɛ | kp͡ɛrɛ́ | 'share' | kp͡érɛ́ | kp͡érɛ | 'disturb' |
| laga | lagá | 'imitate' | lagá | lága | 'love' |
| mɪlɪ | mɪlí | 'drive a car' | mílí | mílɪ | 'sow' |
| sélé | séle | 'deny' | sele | selé | 'tremble' |
| ŋɔnsɪ | ŋɔnsí | 'cut' | ŋɔ́ńsí | ŋɔ́ńsɪ | 'diminish' |
| tíńsí | tíńsi | 'continue' | tinsi | tinsí | 'gather' |
| ɲáásí | ɲáásɪ | 'cry' | ɲaasí | ɲaasí | 'burn' |
| dʒalansɪ | dʒalansí | 'hang (TR)' | dʒaláńsí | dʒaláńsɪ | 'wash (TR)' |

### 6.1.3 Clause-final perfective

As discussed in §4.3, the perfective aspect is indicated clause-finally by a floating L tone. This only affects verbs whose finite forms are H-final. When the root is vowel-final, the vowel lengthens and the L associates to the lengthened segment. The orthography currently represents the output of this process, as shown in Table 50.

Table 50 : Orthographic representation of clause-final perfectives

| Profile | Clause-final PFV | Orthographic representation | Gloss |
|---|---|---|---|
| CV | yɛ́ɛ̀ | yɛ́ɛ | ‘do’ |
| CVCV | bìlîi | bilíi | ‘roll’ |
| CVN | tɔ̌m̀ | ? | ‘speak’ |

Only 29 of the verbs with a CVN profile are LH in the finite form and therefore affected by the perfective floating L. For these forms, the LH root pattern compresses onto the nucleus as a contour and the floating L associates to the nasal coda. The nucleus vowel is not obviously lengthened to accompany the LH contour, but the vowel length has not been precisely measured. The current practice for writing these forms is unknown because so few textual examples exist of this small set of lexemes in the clause-final perfective form. I propose a dictation test to see how speakers would write these forms intuitively. I assume that speakers will write these LHL forms as HL <tɔ́m>, identical to the non-finite counterparts of these verbs. I do not predict this under-differentiation to cause confusion for readers because the non-finite form does not occur clause-finally, but this could also be tested. Another option would be to write the clause-final perfective form with a lengthened vowel, as <tɔ́ɔ́m>, even if this does not represent the phonetic length of the vowel. The Nateni orthography has adopted a similar practice (Roberts & Walter 2021: 50-51). However, writing this form with the long vowel representation may cause readers to pronounce a long vowel where there is none.

## 6.4 Subject/possessive pronouns

In the current orthography, possessive pronouns are attached to the verb using a hyphen, L perfective subject pronominal prefixes stand alone unmarked, and LH imperfective subject pronominal prefixes are marked with a hyphenated lengthened segment, with an accent aigue on the H vowel. In the current literature, tone is often marked incorrectly on these imperfective pronouns. Reeder (2016b) suggests the hyphenated segment may suffice to indicate the LH tone pattern without the need for tone marking. I suggest dropping the tone marking and keeping the hyphenation, as presented in Table 51.

Table 51 : Orthographic representation of subject/possessive pronouns

| Person | Possessive (L) | Perfective (L) | Imperfective (LH) |
|---|---|---|---|
| 1SG | ma- | ma | ma-a |
| 1PL | ɖɪ- | ɖɪ | ɖɪ-ɪ |
| 2SG | n- | n | n-n |
| 2PL | ɪ- | ɪ | ɪ-ɪ |
| 3SG | ɔ- | ɔ | ɔ-ɔ |
| 3PL | ba- | ba | ba-a |

## 6.5 Downstepped complements

Downstepped third-person object pronouns form a closed and complete set and are currently marked by a hyphen connecting the verb to the object pronoun. This hyphen suffices to identify object pronouns as distinct from a subject pronominal prefix starting a new clause. As such, the orthography does not need to mark the tone of object pronouns. The other downstepped complements discussed in §4.6 are rare and highly recognizable and probably do not need to be marked for tone either.

## 6.6 Summary

Based on the results of this study and the works of Azoti and Moussa (2015) and Reeder (2016a; 2016b), I conclude that the Kusuntu orthography does not benefit from marking noun

stems for tone. The orthography does benefit, however, from marking verbal aspect, which is expressed through grammatical tones. Rather than marking all verbs for tone, however, I suggest testing an orthography that identifies the marked grammatical construction of the verb, that is, the finite form, in some way. The use of hyphens to identify the grammatical construction of a given pronoun suffices to indicate to the reader the grammatical tone of the pronoun.

## References

Abreté, Amínu. 2015. The ox and the hunter. *Amvraná, sɔńsɛ, aḍuwana na fɔńgí rí rí sɛ́: Contes, coutumes, proverbes, et devinettes*, 5–6. APLBK and SIL Togo.

Alansary, Emad. 2021. *Topics in the grammar of Bago*. Ottawa: University of Ottawa.

Amedou, A. Barihou. 2015. The lion and the leopard. *Amvraná, sɔńsɛ, aḍuwana na fɔńgí rí rí sɛ́: Contes, coutumes, proverbes, et devinettes*, 7–8. APLBK and SIL Togo.

Azoti, Kodjo P & Diller, Jason & Jordan-Diller, Kari. 2000. *Enquête Sociolinguistique Sur Le Kusuntu Et Le Bago*. Kara, Togo: SIL Togo-Bénin.

Azoti, Kodjo P & Moussa, Zakari. 2015. *Évaluation de l'orthographe Bago-Kusuntu*. Kara, Togo: SIL Togo-Bénin.

Azoti, Kodjo P & Moussa, Zakari & Akassi, Bassarou. 2013. *Guide Orthographique du Bago et Kusuntu*. Kara, Togo: SIL International.

Bodomo, Adams & Abubakari, Hasiyatu & Issah, Samuel Alhassan (eds.). 2020. *Handbook of the Mabia languages of West Africa*. Glienicke: Galda Verlag.

Casali, Rod. Forthcoming. *Analyzing Tongue Root Harmony Systems*. (https://casali.canil.ca/ATRMethodologyBook/)

Eberhard, David & Simons, Gary F. & Fennig, Charles D. 2025. Bago-Kusuntu. *Ethnologue: Languages of the World*. Dallas, Texas: SIL International. (http://www.ethnologue.com) (Accessed February 10, 2025.)

Gblem-Poidi, Massanvi Honorine & Kantchoa, Laré. 2016. Le bago et le kusuntu : Deux langues differentes ou deux variantes d'une seule langue? *Études Togolaises: Revue Togolaise des Sciences* 10(2). 248–258.

Kleinewillinghöfer, Ulrich. 2000. The Verb in Kusuntu. *Cahiers Voltaiques / Gur Papers* 5. 95–101. (Ed. Beyer, Klaus & Reineke, Brigitte & Schwarz, Anne.)

Kleinewillinghöfer, Ulrich. 2006. Kusuntu nominal classification.

Miehe, Gudrun & Kleinewillinghöfer, Ulrich & von Roncador, Manfred & Winkelmann, Kerstin (eds.). 2012. Overview of noun classes in Gur (II).pdf. *Gur Monographs / Monographes voltaïques* (Noun Classes) 2. 5–37.

Myers, Scott. 1997. OCP effects in optimality theory. *Natural Language & Linguistic Theory* 15(4). 847–892.

Oke, Djamiou. 2015. Three poor men. *Amvraná, sɔńsɛ, aḍuwana na fɔńgí rí rí sɛ́: Contes, coutumes, proverbes, et devinettes*, 10–11. APLBK and SIL Togo.

Reeder, JeDene. 2016a. *Rapport sur le testing de l'orthographe bago-kusuntu*. Kara, Togo: SIL Togo.

Reeder, JeDene. 2016b. *Vers une orthographe appropriée pour le bago : rapport issu de l'atelier sur l'orthographe du ton au centre de formation de SIL à Kara au Togo du 25 octobre au 11 novembre 2016*. Kara, Togo: SIL Togo.

Roberts, David. 2016. Word tone and tonal overwriting in Kabiye nouns. *Journal of African Languages and Linguistics* 37(1). 131–160. (doi:10.1515/jall-2016-0004)

Roberts, David & Walter, Stephen (eds.). 2021. *Tone orthography and literacy: the voice of evidence in ten Niger-Congo languages* (Studies in Written Language and Literacy volume 18). Amsterdam ; Philadelphia: John Benjamins Publishing Company.

Roberts, David & Walter, Stephen L. & Snider, Keith. 2016. Neither Deep nor Shallow: A Classroom Experiment Testing the Orthographic Depth of Tone Marking in Kabiye (Togo). *Language and Speech* 59(1). 113–138. (doi:10.1177/0023830915580387)

Snider, Keith. 2018. *Tone Analysis for Field Linguists*. Dallas, Texas: SIL International. (https://www.sil.org/resources/archives/72010) (Accessed March 17, 2021.)

Takougnadi, Yoma. 2010. *Essai de description phonologique du Bago*. Kara, Togo: Université de Kara.

Takougnadi, Yoma. 2016. *Description phonologique et morphologique du Bago, langue Gurunsi du Togo*. Lomé, Togo: Université de Lomé-Togo.

Weathers, Andy. 2008. Vers une orthographe appropriée du ton pour le Tem. *SIL Togo-Bénin* (Série électronique de documents de travail) 6. (https://www.sil.org/system/files/reapdata/15/01/42/150142168505869852861718862597466831199/SEDT_2018_006.pdf)

## Appendix A: Simple verb stems in their non-finite and finite forms

| Profile | Tone | NF | FIN | Gloss |
|---|---|---|---|---|
| CVCV | HH | | | |
| | | bábú | bábù | 'incubate, set (on eggs); hide (INTR)' |
| | | bálí | bálì | 'hide (INTR)' |
| | | bárí | bárì | 'finish, complete' |
| | | bɔ́sí | bɔ́sì | 'sell' |
| | | bírí | bírì | 'be black; unripe' |
| | | bísá | bísà | 'lay down; go to sleep' |
| | | bólí | bólì | 'detach (INTR)' |
| | | búlú | búlù | 'mix liquids; confuse (INTR)' |
| | | ɖɔ́gɔ́ | ɖɔ́g | 'hold' |
| | | ɖɛ́sí | ɖɛ́sì | 'arrange; resolve; fix; protect; defend' |
| | | ɖɛ́lí | ɖɛ́lì | 'spy, spy on; visit (INTR)' |
| | | fĩgí | fĩgì | 'sweat; tire out (INTR)' |
| | | fúlú | fúlù | 'open (a bottle), unwrap; open to let loose (INTR)' |
| | | fúrú | fúrù | 'rush on something; beat up (INTR)' |
| | | fúsí | fúsì | 'close, shut; hit; cover' |
| | | fʊ́sí | fʊ́sì | 'tighten (INTR)' |
| | | gb̲ésí | gb̲ésì | 'bark, woof' |
| | | kárá | kárà | 'attach (headwrap)' |
| | | kɔ́tí | kɔ́tì | 'bang, knock' |
| | | kɛ́rɛ́ | kɛ́rɛ̀ | 'take' |
| | | kóbí | kóbì | 'feces' |

| | | |
|---|---|---|
| kóró | kórò | 'cut (INTR)' |
| k͡pálá | k͡pálà | 'open (a door)' |
| k͡pásí | k͡pásì | 'burn (INTR)' |
| k͡pésí | k͡pésì | 'cough' |
| k͡pɛ́gɛ́ | k͡pɛ́ɛ̀ | 'approach someone' |
| k͡písí | k͡písì | 'dust; wipe out (tr, fig)' |
| lísí | lísì | 'choose (INTR), pick up' |
| mɔ́rí | mɔ́rì | 'compete, rival' |
| mílí | mílì | 'shell' |
| nyígí | nyígì | 'push, press' |
| pílí | pílì | 'be able; beat (INTR)' |
| sálá | sálà | 'break (INTR)' |
| sárí | sárì | 'tear (INTR)' |
| sɔ́sí | sɔ́sì | 'plant' |
| sélí | sélì | 'deny' |
| sérí | sérì | 'think' |
| sóló | sólò | 'take off the fire' |
| tɔ́rí | tɔ́rì | 'slaughter; steal, trick (tr, fig)' |
| tɔ́sí | tɔ́sì | 'set off (a trap); turn off' |
| télí | télì | 'lean against (INTR)' |
| túlú | túlù | 'startle, surprise' |
| túló | túlò | 'shell (groundnuts)' |
| wóló | wólò | 'take off, unstick' |
| yálí | yálì | 'disperse; scatter (INTR)' |

| | | | | |
|---|---|---|---|---|
| | | yɔ́bí | yɔ́bì | 'gallop' |
| | | fɔ́sí | fɔ́sì | 'greet; thank' |
| | | tási | tásì | 'dry out (INTR) in the sun; be large' |
| | | yúgú | yúgù | 'get, obtain, find; catch up with (INTR)' |
| CVCV | LL | | | |
| | | bàgà | bàgá | 'get your fill' |
| | | bàlà | bàlá | 'walk' |
| | | bɔ̀rɔ̀ | brɔ́ | 'spoil (food) (INTR)' |
| | | bèrì | bèrí | 'recite incantations' |
| | | bìlì | bìlí | 'roll' |
| | | bìrì | bìrí | 'pour' |
| | | bìsì | bìsí | 'ask, request' |
| | | bùtì | bùtí | 'dump' |
| | | dɛ̀sì | dɛ̀sí | 'get drunk' |
| | | dʒìrì | dʒìrí | 'have an itch' |
| | | dʒòrò | dʒòró | 'get up; take off; fly; smell bad' |
| | | dʒùsì | dʒùsí | 'wear clothes, get dressed' |
| | | ɖ̣àgà | ɖ̣àgá | 'get angry' |
| | | ɖ̣àrà | ɖ̣àrá | 'cut (a cord); circumcise' |
| | | ɖ̣ɔ̀lì | ɖ̣lí | 'last' |
| | | ɖ̣òlì | ɖ̣òlí | 'learn' |
| | | fàgà | fàgá | 'ride a horse' |
| | | fàrà | fàrá | 'cultivate, farm; hoe (v)' |
| | | fàsì | fàsí | 'peel; hhave diarhea; insult' |

| | | |
|---|---|---|
| fɔ̀rɔ̀ | frɔ́ | 'knead' |
| fɔ̀rì | frí | 'abandon, be uncapable' |
| fɛ̀lɛ̀ | fɛ̀lɛ́ | 'filter corn by pouring it' |
| fɪ̀lì | fɪ̀lí | 'whistle' |
| fɪ̀tì | fɪ̀tí | 'reimburse' |
| fò̩sì | fò̩sí | 'blow (with mouth)' |
| fʊ̀sì | fsí | 'loosen, soften; humble yourself' |
| g͡bàlà | g͡bàlá | 'deceive' |
| g͡bìgì | g͡bìgí | 'vomit' |
| gɛ̀lɛ̀ | gɛ̀lɛ́ | 'admire' |
| kàlà | kàlá | 'haggle; count' |
| kò̩sì | kò̩sí | 'scoop up' |
| k͡pàgà | k͡pàgá | 'saw (wood); cut open, split' |
| k͡pɛ̀rɛ̀ | k͡pɛ̀rɛ́ | 'distribute; divide, separate (INTR)' |
| k͡pìlì | k͡pìlí | 'whip; prune, weed-whack; roll up (a mat)' |
| k͡pɪ̀rì | k͡pɪ̀rí | 'undress' |
| kùlù | kùlú | 'crawl (lizard)' |
| làgà | lágà | 'imitate' |
| làlì | làlí | 'crush (INTR); iron' |
| lìlì | lìlí | 'swallow' |
| lɪ̀lì | lɪ̀lí | 'pour a little to drink' |
| lùlù | lùlú | 'leak, fall, run (liquid)' |
| lʊ̀lʊ̀ | lʊ̀lʊ́ | 'bear (child), give birth' |
| màrì | màrí | 'move out; stack' |

| | | |
|---|---|---|
| mìrì | mìrí | 'sprinkle, water' |
| mùgì | mùgí | 'smile, laugh' |
| mùrù | mùrú | 'tell, recount (story)' |
| nàrà | nàrá | 'boil (water), bubble up' |
| nàrì | nàrí | 'stretch' |
| ŋàlà | ŋàlá | 'fry' |
| ŋàrà | ŋàrá | 'sew' |
| ŋɔ̀rɔ̀ | ŋrɔ́ | 'swell; get angry' |
| ŋèlì | ŋèlí | 'look for' |
| ŋèsì | ŋèsí | 'lick' |
| ŋèrì | ŋèrí | 'lie' |
| ŋ͡mɛ̀lì | ŋmɛ̀lí | 'steal' |
| sàrà | sàrá | 'sharpen (knife); insult (fig, tr)' |
| sàsì | sàsí | 'congratulate; praise' |
| sɔ̀sì | ssí | 'suck up' |
| sèlè | sélè | 'tremble' |
| sèrì | sèrí | 'fight' |
| sèsì | sèsí | 'dig up (yams)' |
| sìbù | sìbú | 'die' |
| sòrì | sòrí | 'peck' |
| sùgù | sùgú | 'wear (on one's head)' |
| sùlù | sùlú | 'invoke; beg (for money); pray' |
| tàlì | tàlí | 'arrive' |
| tɔ̀gɔ̀ | tgɔ́ | 'chew' |

| | | | | |
|---|---|---|---|---|
| | | tɛ̀lì | tɛ̀lí | 'add (gift?)' |
| | | tìlì | tìlí | 'rumble (thunder)' |
| | | tìlì | tìlí | 'touch, feel (active)' |
| | | tìrì | tìrí | 'send (someone to do something)' |
| | | tìrì | tìrí | 'get fat, enlarge' |
| | | tùgù | tùgú | 'tap; push ' |
| | | tʊ̀rʊ̀ | tʊ̀rʊ́ | 'scratch' |
| | | wàrì | wàrí | 'scrape' |
| | | wàsì | wàsí | 'criss cross; rinse (INTR)' |
| | | wìlì | wìlí | 'teach; show; dry' |
| | | wòsì | wòsí | 'empty liquid; open your mouth' |
| | | yàgà | yàgá | 'throw to someone' |
| | | yàsì | yàsí | 'sweep; traverse (TR)' |
| | | yèsì | yèsí | 'cut (hair); shave' |
| | | yìrì | yìrí | 'part; slice' |
| | | dìrì | dìrí | 'grind' |
| | | fʊ̀rʊ̀ | fʊ̀rʊ́ | 'pierce; surprise; go out' |
| | | sàgà | sàgá | 'sit down; be founded' |
| | | sìgì | sìgí | 'hit, strike, kick; plant; found' |
| | | yèlè | yèlé | 'leave (something somewhere); allow, permit' |
| CVCV | LH | | | |
| | | bɔ̀rɛ́ | bɔ́rɛ̀ | 'trample' |
| | | bìrí | bírì | 'carry on back' |
| | | dɔ̀sí | dɔ́sì | 'stop up; obstruct' |

| | | | | |
|---|---|---|---|---|
| | | ɖ̀ìrí | ɖ́írì | 'be behind' |
| | | fɛ̀lá | fɛ́là | 'faint' |
| | | fʊ̀má | fʊ́mà | 'swim' |
| | | gɔ̀lɔ́ | gɔ́lɔ̀ | 'kneel down' |
| | | gùlú | gúlù | 'pluck (chicken); pick (weeds); dig up' |
| | | kàlí | kálì | 'trip someone on purpose' |
| | | làgá | lágà | 'love' |
| | | sàmá | sámà | 'authenticate; convoke' |
| | | tʊ̀ní | tʊ́nì | 'draw up; straighten' |
| | | tùrú | túrù | 'burst' |
| | | gb̀álá | gb́álà | 'tie up; create conflict (TR)' |
| | | tìlá | tílà | 'slide; (be) slippery' |
| CVN | HH | | | |
| | | ɖ́íŋ́ | ɖ́íǹ | 'taste, make someone taste (INTR)' |
| | | sáŋ́ | sáǹ | 'catch (a person)' |
| | | síŋ́ | síǹ | 'stop; stand up; encounter (INTR)' |
| | | téŋ́ | téǹ | 'lean against (INTR)' |
| CVN | LL | | | |
| | | bɔ̀ŋ̀ | bń | 'tether (sheep, goats)' |
| | | dʒìŋ̀ | dʒìń | 'know (something or someone)' |
| | | ɖ̀ùŋ̀ | ɖ̀ùń | 'sow; plant; bury someone' |
| | | ɖ̀ùŋ̀ | dùń | 'hurt; prick; jump' |
| | | fɔ̀ŋ̀ | fń | 'pull (a cord); drag; dispute' |
| | | fɛ̀ŋ̀ | fɛ̀ń | 'wake up (INTR)' |

| | | | | |
|---|---|---|---|---|
| | | fɛ̀ŋ̀ | fɛ́ń | 'breathe, smell; roast; grill' |
| | | g͡bàŋ̀ | g͡báń | 'save' |
| | | kàŋ̀ | káń | 'nail down' |
| | | kɔ̀ŋ̀ | kń | 'come' |
| | | kìŋ̀ | kíń | 'lend' |
| | | k͡pàŋ̀ | k͡páń | 'flow continuously (a river)' |
| | | kùŋ̀ | kúŋ́ | 'take a bit, a piece; cut the skin' |
| | | lèŋ̀ | léń | 'throw away, get rid of' |
| | | lùŋ̀ | lúḿ | 'weave' |
| | | màŋ̀ | máń | 'hit, strike; fight' |
| | | nyàŋ̀ | nyáń | 'buy' |
| | | nyìŋ̀ | nyíń | 'trap' |
| | | ŋàŋ̀ | ŋáń | 'have fear' |
| | | ŋɔ̀ŋ̀ | ŋń | 'grill' |
| | | ŋùŋ̀ | ŋúŋ́ | 'bury' |
| | | sàŋ̀ | sáń | 'wash your hands' |
| | | sɔ̀ŋ̀ | sń | 'light up; stab; meet together' |
| | | sìŋ̀ | síń | 'adore' |
| | | sùŋ̀ | súń | 'hang up' |
| | | tìŋ̀ | tíń | 'descend, go down; land, alight' |
| | | lùŋ̀ | lúń | 'enter, go in' |
| | | tɔ̀m̀ | tóḿ | 'speak, talk' |
| CVN | LH | | | |
| | | bòŋ́ | bóǹ | 'pound' |

| | | |
|---|---|---|
| dʒìŋ́ | dʒíŋ̀ | 'ascend, go up' |
| ɖèŋ́ | ɖéŋ̀ | 'meet, make acquaintance' |
| ɖòŋ́ | ɖóŋ̀ | 'stir' |
| g͡bìŋ́ | g͡bíǹ | 'snatch, seize; catch (object in air)' |
| gùŋ́ | gúŋ̀ | 'squat down; bow; squat' |
| kèŋ́ | kɛ́ŋ̀ | 'herd (cattle, sheep); Lead, guide; steer' |

## Appendix B: Simple noun stems by class pairing

| PX | SG SX | PL SX | Root Profile | Root tone | SG | PL | Gloss |
|---|---|---|---|---|---|---|---|
| **Class pairing 1-2** | | | | | | | |
| Prefixes /a-/, /a-/ | -∅ | -à | CV | H | á-lù-∅ | á-lá-à | ‘wife’ |
| | -∅ | -ónà | CV | H | à-fá-∅ | à-fá-nà | ‘mother’ |
| | -∅ | -ónà | CVCV | LH | à-dèsí-∅ | à-dèsí-nà/-bà | ‘older sister’ |
| | -∅ | -ónà | CVCV | LH | à-dʒìdʒó-∅ | à-dʒìdʒó-nà | ‘maternal uncle; nephew’ |
| | -(Ù)-ná | -(á)à | CV | H | á-k͡pá-ˡná | á-k͡pá-à | ‘man’ |
| | -(Ù)-ná | -(á)à | CV | H | á-lú-ˡná | á-lá-à | ‘woman’ |
| | -(Ù)-ná | -ómbà | CVN | H | ɖúm-ˡú-ná | ɖúḿ-bà | ‘snake’ |
| | -(Ù)-ná | -là | CVCV | LH | jìbá-ˡná | jìbá-là | ‘male’ |
| | -(Ù)-ná | -óbà | CVCV | H | júl-ˡú-ná | júlú-bà | ‘witch’ |
| | -(Ù)-ná | -óbà | CVCV | H | ŋ͡mél-ˡú-ná | ŋ͡mélí-bà | ‘thief’ |
| | -(Ù)-ná | -óbà | CVCV | H | ŋúr-ˡú-ná | ŋúrú-bà | ‘stranger’ |
| | -(Ù)-ná | -óbà | CVCV | LH | ɖòkú-ˡná | ɖòkú-bà | ‘senile person’ |
| | -(Ù)-ná | -óŋè | CVCV | LH | dʒòŋú-ˡná | dʒòní-ŋè | ‘chief’ |
| | -nà | -(á)à | CV | H | bú-nà | bí-à | ‘child’ |
| | -nà | -(á)à | CV | H | | tí-à | ‘tree; medicine’ |
| | -ŋɔ̀ | -óbà | CV | H | dɔ́-ŋɔ̀ | dɔ́-bà | ‘elder’ |
| **Class pairing 3-4** | | | | | | | |
| | -∅ | - níŋɛ̀ | CVCV | L | lɔ̀kɔ̀-∅ | lɔ̀kɔ̀-níŋɛ̀ | ‘well’ |
| | -ó | - níŋɛ̀ | CVCV | L | sɔ̀r-ɔ́ | sɔ̀rɔ̀-níŋɛ̀ | ‘month, moon’ |
| | -ÓÒ | -nìŋɛ́ | CV | H | bɔ́-ɔ̀ | bɔ́-ˡníŋɛ́ | 'cave' |
| | -ÓÒ | -nìŋɛ́ | CV | H | jó-ò | yú-ˡníŋɛ́ | 'war' |
| | -ÓÒ | -nìŋɛ́ | CV | H | lɔ́-ɔ̀ | lɔ́-ˡníŋɛ́ | 'forest' |

| PX | SG SX | PL SX | Root Profile | Root tone | SG | PL | Gloss |
|---|---|---|---|---|---|---|---|
| | -ÓÒ | -(ú)-ŋɛ̀ | CV | H | sɔ́-ɔ̀ | sú-ú-ŋɛ̀ | ‘head’ |
| | -ÓÒ | -nìŋɛ́ | CV | H | tɔ́-ɔ̀ | tɔ́-ˈníŋɛ́ | 'bow (hunting)' |
| | -ÓÒ | -ó-ŋÈ | CVCV | H | fúró-ò | fúrú-ŋè | ‘bag’ |
| | -ÓÒ | -ó-ŋÈ | CVCV | H | k͡péló-ò | k͡pélí-ŋè | ‘baobab tree’ |
| | -ÓÒ | -ó-ŋÈ | CVCV | H | kúbɔ́-ɔ̀ | kúbú-ŋè | ‘mountain’ |
| | -ÓÒ | -ó-ŋÈ | CVCV | H | písɔ́-ɔ̀ | písí-ŋè | ‘mahogany’ |
| | -ÓÒ | -ó-ŋÈ | CVCV | L | bòró-ò | bòrú-ŋè | 'canoe' |
| | -ÓÒ | -ó-ŋÈ | CVCV | L | dʒàdʒɔ́-ɔ̀ | dʒàdʒú-ŋè | 'elephant' |
| | -ÓÒ | -ó-ŋÈ | CVCV | L | dʒìbó-ò | dʒìbó-ŋè | ‘anus’ |
| | -ÓÒ | -ó-ŋÈ | CVCV | L | dʒìmɔ́-ɔ̀ | dʒìmɔ́-ŋè | 'calabash' |
| | -ÓÒ | -ó-ŋÈ | CVCV | L | gìsɔ́-ɔ̀ | gìsí-ŋè | 'horse' |
| | -ÓÒ | -ó-ŋÈ | CVCV | L | kàlɔ́-ɔ̀ | kàlú-ŋè | 'couch grass; weed' |
| | -ÓÒ | -ó-ŋÈ | CVCV | L | kùmó-ò | kùmú-ŋè | 'fire' |
| | -ÓÒ | -ó-ŋÈ | CVCV | L | kùsó-ò | kùsú-ŋè | 'song' |
| | -ÓÒ | -ó-ŋÈ | CVCV | L | làlɔ́-ɔ̀ | làlú-ŋè | 'hunt' |
| | -ÓÒ | -ó-ŋÈ | CVCV | L | tìk͡pó-ò | tìk͡pú-ŋè | 'large forest' |
| | -ÓÒ | -ó-ŋÈ | CVCV | L | tùká-à | tùkú-ŋè | 'den, lair, hole' |
| | -ÓÒ | -ó-ŋÈ | CVCV | L | wòsó-ò | wòsú-ŋè | 'soul' |
| | -ÓÒ | -(í)-ŋɛ̀ | CVN | L | bɔ̀nɔ́-ɔ̀ | bɔ̀ní-ŋɛ̀ | ‘arm’ |
| | -ÓÒ | -(í)-ŋɛ̀ | CVN | L | bɛ̀n-ɔ́ɔ̀ | bɛ̀n-í-ŋɛ̀ | ‘amulet’ |
| | -ÓÒ | -(í)-ŋɛ̀ | CVN | L | dɔ̀nó-ò | dɔ̀ní-ŋè | ‘soup, broth’ |
| | -ÓÒ | -(í)-ŋɛ̀ | CVN | L | nɔ̀nɔ́-ɔ̀ | nɔ̀ní-ŋɛ̀ | ‘room’ |
| | -ÓÒ | -(í)-ŋɛ̀ | CVN | L | tɔ̀nɔ́-ɔ̀ | tɔ̀ní-ŋɛ̀ | ‘body’ |
| | -ÓÒ | -nìŋɛ́ | CVV | L | g͡bɔ̀ɔ́-ɔ̀ | g͡bɔ̀ɔ́-ˈníŋɛ́ | ‘path, road’ |
| | -ÓÒ | -nìŋɛ́ | CVV | L | dʒɔ̀ó-ò | dʒɔ̀ó-ˈníŋɛ́ | ‘queue’ |

| PX | SG SX | PL SX | Root Profile | Root tone | SG | PL | Gloss |
|---|---|---|---|---|---|---|---|
| **Class pairing 5-6** | | | | | | | |
| Prefixes /ɖɻ-/, /a-/ | -(I)rÈ | -(à)ná | CV | H | ɖɻ́-mɔ́-rɛ̀ | á-mɔ́-ˈná | 'bail of straw' |
| | -(I)rÈ | -(à)ná | CV | H | ɖɻ́-ú-rè | á-kú-ˈná | 'cloth' |
| | -(I)rÈ | -(à)ná | CV | H | ɖɻ́-bú-rè | á-bú-ˈná | 'mound' |
| | -(I)rÈ | -(à)ná | CV | H | ɖɻ̀-sɔ̀-rɛ́ | à-sɔ̀-ná | 'sorghum; yam' |
| | -(I)rÈ | -(à)ná | CV | H | ɖɻ̀-mɔ̀-rɛ́ | à-mɔ̀rà-ná | ‘story (tale)’ |
| | -(I)rÈ | -(à)ná | CV | H | ɖɻ̀-gó-rè | à-gó-ˈná | ‘tribe; hut’ |
| | -(I)rÈ | -(à)ná | CVCV | H | ɖɻ̀-dʒól-è | à-dʒól-ˈáná | ‘okra’ |
| | -(I)rÈ | -(à)ná | CVCV | H | ɖɻ́-ból-è | á-ból-ˈáná | ‘epoch; season’ |
| | -(I)rÈ | -(à)ná | CVCV | L | ɖɻ̀-sàr-ɛ́ | à-sàr-àná | ‘wall’ |
| | -(I)rÈ | -(à)ná | CVN | L | ɖɻ̀-fʊ̀ǹ-ɖɻ́ | à-fʊ̀ŋ-àná | ‘fish trap’ |
| | -(I)rÈ | -(à)ná | CVN | L | ɖɻ̀-k͡pɛ̀ǹ-ɖɻ́ | à-k͡pɛ̀ŋà-ná | ‘village’ |
| | -(I)rÈ | -(à)ná | CVV | L | ɖɻ́-ɖɻ̀è-ré | á-ɖɻ̀è-ná | ‘udder’ |
| | -(I)rÈ | -(à)ná | CVV | L | ɖɻ́-ɖɻ̀ù-ré | á-ɖɻ̀wà-ná | ‘proverb’ |
| | -(I)rÈ | -(à)ná | CV | H | bí-rɛ̀ | bí-ˈná | 'money' |
| | -(I)rÈ | -(à)ná | CV | H | bú-rɛ̀ | bú-ˈná | 'stone (small)' |
| | -(I)rÈ | -(à)ná | CV | H | ɖɻ́-rɛ̀ | ɖɻ́-ˈná | 'dice' |
| | -(I)rÈ | -(à)ná | CV | H | fɔ́-rɛ̀ | fɔ́-ˈná | 'liver' |
| | -(I)rÈ | -(à)ná | CV | H | fɪ́-rɛ̀ | fɪ́-ˈná | 'yam' |
| | -(I)rÈ | -(à)ná | CV | H | jí-rè | jí-ˈná | 'day; daytime' |
| | -(I)rÈ | -(à)ná | CV | H | sɔ́-rɛ̀ | sɔ́-ˈná | 'music; dance (n)' |
| | -(I)rÈ | -(à)ná | CVCV | H | bɔ́sí-rɛ̀ | bɔ́ˈsá-ná | 'puff adder' |
| | -(I)rÈ | -(à)ná | CVCV | H | fɔ́ŋí-rɛ̀ | fɔ́ˈŋá-ná | 'neck' |
| | -(I)rÈ | -(à)ná | CVCV | H | léŋ-írè | léˈŋá-ná | 'chest' |
| | -(I)rÈ | -(à)ná | CVCV | H | ɲím-írɛ̀ | ɲíˈmá-ná | 'nail (n)' |

| PX | SG SX | PL SX | Root Profile | Root tone | SG | PL | Gloss |
|---|---|---|---|---|---|---|---|
| | -(I)rÈ | -(à)ná | CVCV | H | nám-írɛ̀ | ná$^{L}$má-ná | 'grinding stone' |
| | -(I)rÈ | -(à)ná | CVCV | H | ŋɔ́m-írɛ̀ | ŋɔ́$^{L}$má-ná | 'bone' |
| | -(I)rÈ | -(à)ná | CVCV | H | síb-írè | sí$^{L}$bí-ná | 'face' |
| | -(I)rÈ | -(à)ná | CVCV | H | sísí-rè | sí$^{L}$sá-ná | 'sugar cane' |
| | -(I)rÈ | -(à)ná | CVCV | H | súbí-rè | sú$^{L}$bá-ná | 'thorn' |
| | -(I)rÈ | -(à)ná | CVCV | H | túmú-rè | túm-$^{L}$áná | 'work (n)' |
| | -(I)rÈ | -(à)ná | CVCV | L | gb̀èŋí-rè | gb̀éŋá-$^{L}$ná | 'slave' |
| | -(I)rÈ | -(à)ná | CVCV | L | lèg-írè | lègí$^{L}$rá-ná | 'cheek' |
| | -(I)rÈ | -(à)ná | CVCV | L | fɔ̀kí-rè | fɔ̀kí-$^{L}$ná | 'leaf' |
| | -(I)rÈ | -(à)ná | CVCV | L | mɛ̀sí-rè | mɛ̀sí-$^{L}$ná | 'intelligence' |
| | -(I)rÈ | -(à)ná | CVCV | L | sàbí-rè | sàbí-$^{L}$ná | '[head]pad' |
| | -(I)rÈ | -(à)ná | CVCV | L | bèbí-rè | bèbí-$^{L}$ná | 'palm nut' |
| | -(I)rÈ | -(à)ná | CVCV | L | dʒàmí-rɛ̀ | dʒàmá-$^{L}$ná | 'wound, sore' |
| | -(I)rÈ | -(à)ná | CVN | H | ɖáń-ɖɛ̀ | ɖá$^{L}$ná-ná | 'nest' |
| | -(I)rÈ | -(à)ná | CVN | H | fʊ́ń-ɖɛ̀ | fʊ́$^{L}$ná-ná | 'fur; feathers' |
| | -(I)rÈ | -(à)ná | CVN | H | táń-ɖɛ̀ | tá$^{L}$ná-ná | 'beer (traditional)' |
| | -(I)rÈ | -(à)ná | CVN | H | tɔ́ń-ɖɛ̀ | tɔ́$^{L}$ná-ná | 'skin; hide' |
| | -(I)rÈ | -(à)ná | CVN | LH | dʒɔ̀ḿ-$^{L}$ɪ́-rɛ́ | dʒɔ̀ḿ-$^{L}$áná | 'storm' |
| | -(I)rÈ | -(à)ná | CVV | H | ɲúú-rè | ɲúú-$^{L}$ná | 'thigh' |
| | -(I)rÈ | -(à)ná | CVV | H | túú-rè | túú-$^{L}$ná | 'morter' |
| | -(I)rÈ | -(à)ná | CVV | LH | mìí-rè | mìí-$^{L}$ná | 'millet' |
| **Class pairing 12-13** | | | | | | | |
| Prefixes /a-/, | -∅ | -nà | CV | H | à-fá-∅ | à-fá-nà | 'mother' |
| | -∅ | -sÉ | CV | H | à-rá-∅ | à-rá-sɛ́ | 'thunder' |
| | -∅ | -sÉ | CV | H | à-tú-∅ | à-tú-sé | 'parable' |

| PX | SG SX | PL SX | Root Profile | Root tone | SG | PL | Gloss |
|---|---|---|---|---|---|---|---|
| | -∅ | -sÉ | CV | L | à-fà-∅ | à-fà-sɛ́ | ‘pig’ |
| | -∅ | -sÉ | CV | L | à-k͡pà-∅ | à-k͡pà-sɛ́ | ‘tire’ |
| | -∅ | -sÉ | CV | L | à-pù-∅ | à-pù-sé | ‘ocean, sea’ |
| | -∅ | -sÉ | CV | L | à-tɛ̀-∅ | à-tɛ̀-sɛ́ | ‘fertile soil’ |
| | -∅ | -sÉ | CVCV | H | á-g͡bádá-∅ | á-g͡bádá-sɛ́ | ‘robe (man's gown)’ |
| | -∅ | -sÉ | CVCV | H | á-g͡bérí-∅ | á-g͡bérí-sé | ‘dignitary’ |
| | -∅ | -sÉ | CVCV | H | à-kúwá-∅ | à-kúwá-sɛ́ | ‘groundnut, peanut’ |
| | -∅ | -sÉ | CVCV | L | à-g͡bòg͡bò-∅ | à-g͡bòg͡bò-sé | ‘bait’ |
| | -∅ | -sÉ | CVCV | LH | à-ḍ̀ìbá-∅ | à-ḍ̀ìbá-sɛ́ | ‘pawpaw, papaya’ |
| | -∅ | -sÉ | CVCV | LH | à-g͡bɛ̀sá-∅ | à-g͡bɛ̀sá-sɛ́ | ‘egg-plant’ |
| | -∅ | -sÉ | CVCV | LH | à-kàbá-∅ | à-kàbá-sɛ́ | ‘entrance hut’ |
| | -∅ | -sÉ | CVCV | LH | à-kòḍ́í-∅ | à-kòḍ́í-sé | ‘banana’ |
| | -∅ | -sÉ | CVCV | LH | à-kùtú-∅ | à-kùtú-sé | ‘orange’ |
| | -∅ | -sÉ | CVCV | LH | à-lòkí-∅ | à-lòkí-sé | ‘sweet potato’ |
| | -∅ | -sÉ | CVCV | HL | á-g͡bókɛ̀-∅ | á-g͡bóˡké-sé | ‘tobacco’ |
| | -∅ | -sÉ | CVCV | HL | à-mánà-∅ | à-máˡná-sɛ́ | ‘belongings’ |
| | -∅ | -sÉ | CVCV | HL | à-wárɛ̀-∅ | à-wáˡrɛ́-sɛ́ | ‘back of something’ |
| Prefixes /ka-/, /ka-/ | -á | -sÉ | CV | L | kà-wì-á | kà-wì-sɛ́ | ‘illness’ |
| | -á | -sÉ | CV | L | ká-rà-á | ká-ràá-sɛ́ | ‘fence’ |
| | -ó̩à | -ó̩sÈ | CVCV | H | ká-sérá-à | ká-sérá-sɛ̀ | ‘thought’ |
| | -ó̩à | -ó̩sÈ | CVCV | H | ká-sálá-à | ká-sálá-sɛ̀ | ‘skin condition’ |

| PX | SG SX | PL SX | Root Profile | Root tone | SG | PL | Gloss |
|---|---|---|---|---|---|---|---|
| | -óà | -ósÈ | CVCV | H | ká-túlá-à | ká-túlá-sɛ̀ | surprise |
| | -óà | -ósÈ | CVCV | LH | kà-gìrá-à | kà-gìrí-sɛ̀ | basket |
| | -óà | -ósÈ | CVCV | LH | kà-tàlá-à | kà-tàlá-sɛ̀ | chin |
| | -óà | -ósÈ | CVCV | LH | kà-kàrá-à | kà-kàrá-sɛ̀ | track |
| | -∅ | -sÉ | CVCV | LH | ká-ˈséyí-∅ | ká-ˈséyí-sé | 'black bean' |
| | -∅ | -sÉ | CVCV | LH | ká-ˈdʒáŋá-∅ | ká-ˈdʒáŋá-sé | 'sun' |
| | -∅ | -sÉ | CVCV | H(L) H | kà-kíˈsá-∅ | kà-kíˈsá-sɛ́ | 'rag' |
| | -∅ | -sÉ | CVCV | HL | kà-dʒúwà-∅ | kà-dʒúˈwá-sɛ́ | 'benefit' |
| | -∅ | -sÉ | CVCV | HL | kà-kúrà-∅ | kà-kúˈrá-sɛ́ | 'hump (of hunchback)' |
| | -∅ | -sÉ | CVCV | L | kà-sìŋà-∅ | kà-sìŋà-sɛ́ | 'spirit of the dead' |
| | -óà | -ósÈ | CV | H | bú-à | bú-sɛ̀ | 'spring' |
| | -óà | -ósÈ | CV | H | ɖí-à | ɖí-sɛ̀ | 'house' |
| | -óà | -ósÈ | CV | H | fú-à | fú-sè | 'pregnancy' |
| | -óà | -ósÈ | CV | H | lí-à | lí-sɛ̀ | 'partridge' |
| | -óà | -ósÈ | CV | H | fá-à | fáá-sɛ̀ | 'field' |
| | -óà | -ósÈ | CVCV | H | bɔ́sá-à | bɔ́sá-sɛ̀ | 'traditional mat' |
| | -óà | -ósÈ | CVCV | H | jélá-à | jélá-sɛ̀ | 'horn (musical instrument)' |
| | -óà | -ósÈ | CVCV | H | kórá-à | kórá-sɛ̀ | 'bracelet' |

| PX | SG SX | PL SX | Root Profile | Root tone | SG | PL | Gloss |
|---|---|---|---|---|---|---|---|
| | -óà | -ósÈ | CVCV | L | bɔ̀lá-à | bɔ̀lá-sɛ̀ | 'spoon (traditional)' |
| | -óà | -ósÈ | CVCV | L | dʒàlá-à | dʒàlá-sɛ̀ | 'bead' |
| | -óà | -ósÈ | CVCV | L | dʒàmá-ꜜá-sɛ́ | dʒàmá-ꜜá-sɛ́ | 'crowd' |
| | -óà | -ósÈ | CVCV | L | dʒòfá-à | dʒòfá-sɛ̀ | 'rain' |
| | -óà | -ósÈ | CVCV | L | kàk͡pá-à | kàk͡pá-sɛ̀ | 'courtyard' |
| | -óà | -ósÈ | CVCV | L | kàrá-à | kàrá-sɛ̀ | 'leg' |
| | -óà | -ósÈ | CVCV | L | sàrá-à | sàrá-sɛ̀ | 'sacrifice' |
| | -óà | -ósÈ | CVCV | L | wàlá-à | wàlá-sɛ̀ | 'slate' |
| | -óà | -ósÈ | CVV | L | bàá-à | bàá-sɛ̀ | ‘dog’ |
| | -óà | -ósÈ | CVV | L | dʒàá-à | dʒàá-sɛ̀ | ‘crab’ |
| | -óà | -ósÈ | CVV | L | gb̀àá-à | gb̀àá-sɛ̀ | ‘bathing place’ |
| | -óà | -ósÈ | CVV | L | kìá-à | kìí-sɛ̀ | ‘market (n)’ |
| | -∅ | -sÉ | CVCV | H | ɖ́íwú-∅ | ɖ́íwú-sɛ́ | ‘mirror’ |
| | -∅ | -sÉ | CVCV | H | gáɖ́ó-∅ | gáɖ́ó-sɛ́ | ‘bed’ |
| | -∅ | -sÉ | CVCV | L | pàpà-∅ | pàpà-sɛ́ | 'fan (n)' |
| | -∅ | -sÉ | CVCV | L | sàkà-∅ | sàkà-sɛ́ | 'gourd instrument' |
| | -∅ | -sÉ | CVCV | L | sìkà-∅ | sìkà-sɛ́ | 'twin' |
| | -∅ | -sÉ | CVCV | LH | kàsí-∅ | kàsí-sɛ́ | 'antelope' |
| | -∅ | -sÉ | CVCV | LH | k͡pèlá-∅ | k͡pèlá-sɛ́ | 'hawk' |
| | -∅ | -sÉ | CVCV | LH | tèbí-∅ | tèbí-sɛ́ | 'skirt' |
| | -∅ | -sÉ | CVCV | LH | màrá-∅ | màrá-sɛ́ | 'law' |
| | -∅ | -sÉ | CVCV | HL | síkà-∅ | síꜜká-sɛ́ | ‘doubt’ |
| | -∅ | -sÉ | CVV | LH | sàá-∅ | sàá-sɛ́ | ‘tarantula’ |
| | - | -sÈ | CV | H | - | ɲɔ́-sɛ̀ | ‘smoke’ |

| PX | SG SX | PL SX | Root Profile | Root tone | SG | PL | Gloss |
|---|---|---|---|---|---|---|---|
| | -ɔ̀ | -sÈ | CV | H | nɔ́-ɔ̀ | nɔ́-sɛ̀ | ‘mouth’ |
| | -ná | -ná-sÉ | CVV | H | súú-ná | súúná-sɛ́ | ‘baby naming ceremony’ |
| | -ŋɛ̊ | -sɛ̊ | CV | H | ɖá-ŋɛ̀ | ɖá-sɛ̀ | ‘cane, stick’ |
| | -ŋɛ̊ | -sɛ̊ | CVV | LH | bɔ̀ɔ́-ŋɛ̀ | bɔ̀ɔ́-sɛ̀ | ‘rope’ |
| | -ŋɛ̊ | -sɛ̊ | CVCV | HL | jíˈlí-ŋɛ́ | jíˈlí-sɛ́ | ‘horn’ |
| | -ŋɛ̊ | -sɛ̊ | CVCV | HL | wíˈlí-ŋɛ́ | wíˈlí-sɛ́ | ‘star’ |
| | -ŋɛ̊ | -sɛ̊ | CVCV | HL | k͡píˈrí-ŋɛ̊ | k͡píˈrí-sɛ́ | ‘wasp’ |
| **Class 21** | | | | | | | |
| | -tỌ | | CV | H | dí-tɔ̀ | | 'food' |
| | -tỌ | | CV | H | jí-tɔ̀ | | 'witchcraft' |
| | -tỌ | | CV | H | ló-tɔ̀ | | 'abdomen (external)' |
| | -tỌ | | CV | H | mí-tɔ̀ | | 'dough' |
| | -tỌ | | CV | H | sɔ́-tɔ̀ | | 'poison (on arrow)' |
| | -tỌ | | CV | H | tɛ́-tɔ̀ | | 'country, ethnic area' |
| | -tỌ | | CV | H | wɔ́-tɔ̀ | | 'cold (n)' |
| | -tỌ | | CVCV | H | bɔ́lí-tɔ̀ | | ‘mosquito’ |
| | -tỌ | | CVCV | H | ŋɔ́rú-tɔ̀ | | ‘the unknown’ |
| | -tỌ | | CVCV | LH | fɛ̀fɛ́-tɔ̀ | | ‘breath, wind’ |
| | -tỌ | | CVCV | LH | dʒìrí-tɔ̀ | | ‘scabies’ |
| | -tỌ | | CVCV | LH | kʊ̀bí-tɔ̀ | | ‘fiancé’ |
| | -tỌ | | CVCV | LH | g͡bàlí-tɔ̀ | | ‘prophecy (n), sight’ |
| | -tỌ | | CVCV | HL | báˈrí-tɔ́ | | 'end (n)' |
| | -tỌ | | CVCV | HL | bóˈlí-tó | | 'blessing' |

| PX | SG SX | PL SX | Root Profile | Root tone | SG | PL | Gloss |
|---|---|---|---|---|---|---|---|
| | -tO̊ | | CVCV | HL | dí⁺lí-tɔ́ | | 'clan' |
| | -tO̊ | | CVCV | HL | dí⁺sí-tɔ́ | | 'arrangement' |
| | -tO̊ | | CVCV | HL | ɲá⁺sí-tɔ́ | | 'a cry' |
| | -tO̊ | | CVCV | HL | sá⁺sí-tɔ́ | | 'beginning' |
| | -tO̊ | | CVN | H | fʊ́ń-tɔ̀ | | ‘grass; weeds; the bush’ |
| | -tO̊ | | CVN | H | náń-tɔ̀ | | ‘meat; game’ |
| | -tO̊ | | CVN | H | súń-tɔ̀ | | ‘fetus’ |
| | -tO̊ | | CVN | L | sʊ̀ǹ-tɔ́ | | ‘breakfast’ |
| | -tO̊ | | CVV | H | fíí-tɔ̀ | | ‘silk, hair (of maize); flowers’ |
| | -tO̊ | | CVV | H | ɲíí-tɔ̀ | | ‘iron’ |
| | -tO̊ | | CVV | H | túú-tù | | ‘common cold’ |
| **Class 22** | | | | | | | |
| | -mO̊ | | CV | H | sí-mɔ̀ | | ‘death, funeral’ |
| | -mO̊ | | CV | H | tɔ́-mɔ̀ | | ‘affair’ |
| | -mO̊ | | CV | H | nyí-mò | | ‘fat’ |
| | -mO̊ | | CV | H | yó-mò | | ‘mushroom; broth’ |
| | -mO̊ | | CV | H | nyí-mɔ̀ | | ‘species of fish’ |
| | -mO̊ | | CV | H | nyɛ́-mɔ̀ | | ‘sand’ |
| | -mO̊ | | CV | H | bá-mɔ̀ | | ‘palm wine’ |
| | -mO̊ | | CVCV | LH | làlí-mɔ̀ | | ‘saliva’ |
| | -mO̊ | | CVCV | LH | sʊ̀sú-mʊ̀ | | ‘sesame’ |

| PX | SG SX | PL SX | Root Profile | Root tone | SG | PL | Gloss |
|---|---|---|---|---|---|---|---|
| | -mO̊ | | CVV | LH | dɔ̀ɔ́-mɔ̀ | | ‘potash cinder’ |
| | -mO̊ | | CVCV | HL | sí↓lí-mɔ́ | | ‘tears (n)’ |
| | -mO̊ | | CVCV | HL | mú↓lú-mɔ́ | | ‘flour’ |
| | -mO̊ | | CVCV | HL | ní↓né-mú | | ‘pus’ |
| | -mO̊ | | CVCV | HL | sá↓lí-mɔ́ | | ‘blood’ |
| | -mO̊ | | CVCV | HL | mé↓lí-mɔ́ | | ‘theft’ |
| | -mO̊ | | CVCV | HL | tú↓lú-mɔ́ | | ‘fetish’ |