L2/26-015

Revised Proposal to Encode N’ko Phonetic Extensions for Bambara

Boubacar Diakite, bdiakite@gmail.com

Neil Patel, neil@jamra-patel.com

Date: March 22, 2025

Changes from previous proposal titled *Preliminary Proposal to Encode N’ko Phonetic Extensions for Malian Languages* L2/25-081:

- Narrowed scope to only Bambara additions
- Fixed missing mark combinations
- Restructured document
- Additional evidence

Changes from previous proposal titled *Preliminary Proposal to Encode N’ko IPA*:

- N’ko renamed N’ko Phonetic Extensions
- Repertoire limited to just the characters required for Malian languages and French loan words with full system in appendix
- Characters renamed from phoneme-based nomenclature to form-based nomenclature
- Updated app install data and current student enrollment numbers
- Updated list of source materials
- Marks previously used for adverb marking now are used for verb marking
- Addition of new tone marks along with combining classes
- Added Unicode Character Properties
- Added all possible mark combinations
- Code chart updated to roadmap codepoints 1E960-1E9CF

1. Executive Summary

This proposal is for encoding additional marks and letters needed to write Bambara with greater linguistic precision than standard N’ko. These additions work with the existing N’ko writing system. It should be noted that characters in this proposal are a subset of a larger system called the N’ko Phonetic Extensions that was developed to support many languages including but not limited to the indigenous languages of Mali. Previous proposals included a larger repertoire from this system. However, as Bambara is the lingua franca in Mali the evidence of use for Bambara is more readily available. When used for Bambara the community also refers to this system as N’ko Kakura, which translates to modern N’ko to distinguish it from standard N’ko.

1.1 Proposed Repertoire to Be Encoded

This proposal is to encode 8 base letters, 17 diacritics and 2 modifiers into an extension block for N'ko to support Bambara.

1.2 Education, Awareness & Demographics

- From 2019 to 2025, approximately 1200 students have been taught or are actively studying N'ko Kakura.
- Classes are conducted both in-person at university level in Bamako, Mali and online via Telegram.
- Online students are in Mali, Guinea, Côte D'Ivoire and France.
- The script has been discussed on RT Mali, a streaming news service in Mali which has regular segments on N'ko. [16, 17] (Figure 22)
- Dr. Diakite maintains a YouTube channel with N'ko Kakura lessons with 2.57K subscribers [15] (Figure 23)

1.3 Stability

- The development of the N'ko Phonetic Extensions involved deploying Arabic-encoded fonts and input methods for both desktop and mobile to accelerate the rate of use.
- Over the course of 6 years, the script has undergone 15 iterations to fine tune character design and repertoire as well as technical font issues.
- Not all iterations involved the characters required for Bambara.
- The design of Bambara letters has not changed since 2019.
- The design of diacritics has not changed since 2019, however new diacritics have been added as recently as 2024 to disambiguate infrequent grammatical features.

Iterations by year

Year	# Iterations	Events	Changes
2018	Initial revision		
2019	7	font deployed with desktop support, promotion in villages (Figure 28), engagement w/government ministries	**Repertoire development and refinement**
2020	0		
2021	0		
2022	4	mobile support, university classes	**Technical issues, Repertoire refinement (Tamashek)**
2023	1		**Bug fix with script connection Mark addition (Bambara)**
2024	2		**Technical issues, Mark addition (Bambara)**

1.4 Endorsements and Support

While N'ko Kakura and the larger Phonetic Extensions are not yet recognized as an official writing system in Mali its progress is being followed by government ministries.

- During the development of the N'ko Phonetic Extensions Dr. Diakite along with Dr. Mugane, Directo of the Harvard African Language Program, engaged government ministries in Mali and Pan African Council of Traditional and Customary Authorities (CPATC) to gauge interest in the system. (Appendix A, C, D)
- The former Ministère de la Refondation de l'Etat in Mali has used N'ko Kakura to produce some government documents. [22, 23]
- In October 2023 CPATC made an officially declaration to support the efforts to develop the N'ko Phonetic Extensions. (Appendix B)
- Universities in Bamako that offer N'ko Kakura classes are state-run institutions and curricula are approved by department heads. (Figure 29)

1.5 Overview of Material Evidence

Sorted commonplace to pedagogical

Non-fiction Books

Topic	# of Materials	# of Authors	Subset by Inventor
Traditional Medicine *[12] (Figure 8)*	**1**	**1**	**0**
Spirituality *[13] (Figure 9)*	**1**	**1**	**0**

Captions in YouTube Videos

Topic	# of Materials	# of Authors	Subset by Inventor
Fictional Web Series *(Figure 7)*	**1**	**1**	**0**
Cooking Videos *[18] (Figure 6)*	**3**	**1**	**0**

Government Documents

Topic	# of Materials	# of Authors	Subset by Inventor
Health Bulletin *[20] (Figure 3)*	**1**	**1**	**0**
Administrative Terminology *[22, 23, 24] (Figure 4, Figure 18, Figure 19, Figure 20)*	**3**	**1**	**0**
Translation of Constitution *[21] (Figure 17)*	**1**	**1**	**1**

Ephemera

Type	# of Materials	# of Authors	Subset Inventor
Calendar *[19] (Figure 2)*	**1**	**1**	**0**

Pedagogical (health)

Topic	# of Materials	# of Authors	Subset by Inventor
Basic Anatomy Book *[14] (Figure 5, Figure 16)*	**1**	**1**	**1**

Pedagogical (math)

Type	# of Materials	# of Authors	Subset by Inventor
Primary Education Book *[6] (Figure 13)*	**1**	**1**	**0**

Pedagogical (writing system/language)

Type	# of Materials	# of Authors	Subset by Inventor
Primary Education Books *[1, 2, 3, 4, 7, 8] (Figure 10, Figure 27)*	**6**	**6**	**1**
College Level Education Books *[10, 11] (Figure 14, Figure 31, Figure 32)*	**2**	**3**	**1**
General Education Videos *[15] (Figure 23)*	**20**	**1**	**20**

2. Introduction

N'ko Phonetic Extensions, as its name indicates, are an extension of the N'ko script, encoded in 2006 (L2/04-172), which adds original characters to satisfy the need of other African languages throughout West Africa and the continent. For more in depth introduction to the purpose and justification of the full system see sections I and II in L2/25-081.

This proposal focuses on the additions required for Bambara which are referred to within the community as N'ko Kakura to distinguish it from the standard N'ko as developed by Solomana Kanté in 1949. Kanté's system was intended provide a unified method of writing generally mutually intelligible Manding languages of Maninka, Bambara, Dioula, and Mandinka, which similar structure but varying pronunciation. To this end Kanté's created literary language register called Kangbe that borrows from all the languages but is heavily influenced by Maninka or the Maninkamory dialect of Guinea. As a result, certain letters of the N'ko alphabet stand in for multiple phonemes.

While N'ko has been widely adopted by the Manding community, there are limitations. First, the lack of phonetic clarity makes N'ko difficult to adapt to other Mande languages such as Soninke, Dogoso and Senufo, etc. Second, the lack of uppercase in the N'ko script does not offer enough precision in grammatical representation. This concern has come into the forefront as Mali is taking steps towards making indigenous languages official languages and needs to be able to create legal documents without ambiguity. To address these concerns Dr. Boubacar Diakite developed the N'ko Phonetic Extensions. For the remainder of this document N'ko, as developed by Kanté will be referred to as N'ko Maninkamory and the phonetic extensions specifically for Bambara will be referred to as N'ko Kakura.

3. Development

In 2015, a delegation of over ten African kings from the Pan African Council of Traditional and Customary Authorities (CPATC) urged Mali and Guinea to propose N’ko as a continental script to the African Union. This led to discussions about adapting N’ko, similar to Latin script adaptations, for various African languages. N’ko leaders and Harvard's African Language Program found significant interest in a unifying script like N’ko during their visits to several African countries. These early discussions led to the development and deployment of the N’ko Phonetic Extensions in Mali. While there is currently active development of materials for all Malian languages the greatest progress has been made for Bambara as it is the lingua franca of the country.

Development of a working N’ko Phonetic Extensions typeface started in spring 2019 with the first iteration completed by the fall of the same year. This initial iteration was taught at the University of Bamako and in villages throughout 2019-2020 primarily in the Bambara language. Modifications were made throughout 2020 to 2024, to refine the tonal marking system and refine glyph design and language coverage.

The font was distributed alongside desktop keyboards with mobile input available in 2022. Analytics provided by the keyboard app “Clavier Malien,” available for Android, provides insight into the user base and adoption. The chart below shows the app installs in blue tones along the monthly average users in orange tones. The user base has been steadily increasing since 2022. Currently there are about 1200 active monthly users. Sixty to seventy percent of the user base is in Mali with the remainder in the countries of Guinea, Côte D’Ivoire and France. Initially the users outside of Mali were those who installed it out of curiosity however, with the launch of online classes conducted over Telegram these are now known to be users enrolled in the classes.

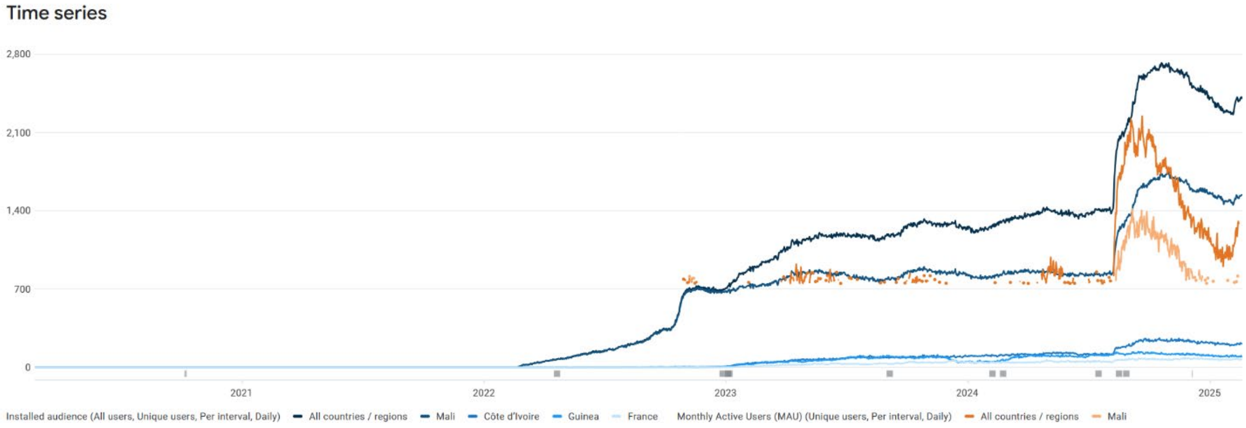


Figure 1: Installation base and monthly active users of the Clavier Malien application since its release.

4. Usage

Since the public introduction of the N’ko Phonetic Extensions in 2019 more than 600 students have been trained in use of the script in public universities in Bamako. In the fall semester of 2023 approximately 100 students were enrolled in language classes that utilize the N’ko Phonetic Extensions with most of the classes teaching Bambara. (Figure 21) As of 2025, the script is being taught at University of Administrative and

Political Sciences (FSAP), National Engineering Higher Education (ENI) and African Franco-Arab University (UPAFA). There are also 4 online classes outside of the university system. Currently, there 450 students enrolled in university classes and 226 students in the online program. (Figure 24, Figure 25, Figure 26)

- **Primary Education (script/language):**
  - *Bamanankan San Folo* [11] (Figure 12)
  - *Bamanankan San Filanan* [2]
  - *Language 1er Annee* [3] (Figure 27)
  - *Language 2eme Annee* [4]
  - *N'ko Bambara Writing* [7]
  - *N'ko Lakalanni* [8]
- **Primary Education (math):**
  - *Math Kakura* [6] (Figure 13)
- **Primary Education (health):**
  - *The Body Nyesson* (Human body functions) [14] (Figure 5, Figure 16)
- **College Education (script/language):**
  - *Le 1er Module de l'enseignement du Nko-Bambara à l'université* [9]
  - *Assike Kakura* (Advanced Nko): [10] (Figure 14)
  - *Assike Filanan Nyeson* [11] (Figure 31, Figure 32)
- **General Education (script/language):** N'ko Kakura Walada YouTube videos. [15] (Figure 23)
-

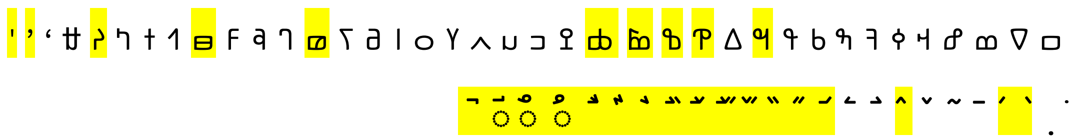
Outside of educational environments N'ko Kakura has been used for a variety of purposes, outlined below.

- **Non-Fiction:**
  - *Basiya Nyafoli* **-** Book on traditional medicine [12] (Figure 8)
  - *La Spiritualité Africane* – Book on African Spirituality (Figure 9)
- **Video captions**:
  - Fictional web series (Figure 7)
  - Cooking videos [18] (Figure 6)
- **Health Bulletins**: Prevention COVID-19 infections [20] (Figure 3)
- **Government Documents**:
  - *Dictionaire des mots administratifs* - Administrative Terminology [22] (Figure 4, Figure 19)
  - *Lexique de travail* – Government Job Functions [23] (Figure 18)
  - *Projet de Constitution* – Translation of Constitution [21] (Figure 17)
  - *L'Hierarchie des Grades Au Mali* – Military ranks in Mali (Figure 20)
- **Ephemera**: Calendar [19] (Figure 2)

5. Structure

5.1 Overview

N'ko Kakura follows the same conventions of N'ko Maninkamory letters. Letters run right-to-left and are connected while allowing for an unconnected version to be used. Below is the complete orthography for Bambara with additions highlighted in yellow.



The system utilizes all existing N’ko letters with 8 additional letters that better represent the phonemes in Bambara. The N’ko Maninkamory letters that are no longer used with the N’ko Kakura are as follows: ߠ NKO LETTER NA WOLOSO (07E0), ߧ NKO LETTER NYA WOLOSO (07E7), ߨ NKO LETTER JONA JA (07E8), ߩ NKO LETTER JONA CHA (07E9) AND ߪ NKO LETTER JONA RA (07EA).

N’ko Kakura uses all existing N’ko tone marks with the addition of 17 new marks. The function of the existing N’ko Maninkamory tonal marks differs with N’ko Kakura however there are no changes to placement.

N’ko Kakura also introduces two new syncope symbols which are used in conjunction with ߑ NKO LETTER DAGBASINNA (07D1) which has been repurposed for this purpose.

5.2 Consonants

The proposed consonants below add phonemes present in Bambara but are not explicitly part of N’ko Maninkamory. [29]

tʃ	dʒ	ʃ	z	g	v	ŋ	ʔ

5.3 Diacritics

The largest difference between N’ko Maninkamory and N’ko Kakura is the tonal marking system which accomplishes two things. The first is separating vowel length from tone (See 11.2.3 Vowel Length Mark), the second is broadening the repertoire to allow for improved representation of tonal modulation and grammatical precision. Below is the expanded repertoire of diacritics. All marks are centered above the base letter and would have a combining class of 230.

high tone	*low tone*	*low-high tone*	*low-low tone*	*high-high tone*	*low-low-high tone*	*low-low-high-mid tone*	*low-high-mid tone*
high-high-mid tone	*high-high-low tone*	*high-high down step tone*	*high-high down step high tone*	*high-high down step mid tone*	*convert low tone*	*convert high tone*	*low verb mark*
high verb mark							

N’ko Kakura also uses existing diacritics from N’ko Maninkamory but with different functions. The following marks *do not need encoding*.

Diacritic	**Name**	***New function***
◌߫	NKO COMBINING SHORT HIGH TONE (07EB)	mid-tone
◌߭	NKO COMBINING SHORT RISING TONE (07ED)	vowel length
◌߮	NKO COMBINING LONG DESCENDING TONE (07EE)	high-low tone
◌߯	NKO COMBINING LONG HIGH TONE (07EF)	high-mid tone
◌߱	NKO COMBINING LONG RISING TONE (07F1)	mid-low tone
◌߲	NKO COMBINING NASALISATION MARK (07F2)	nasalization/assimilation

5.3.1 Input Considerations for Diacritics

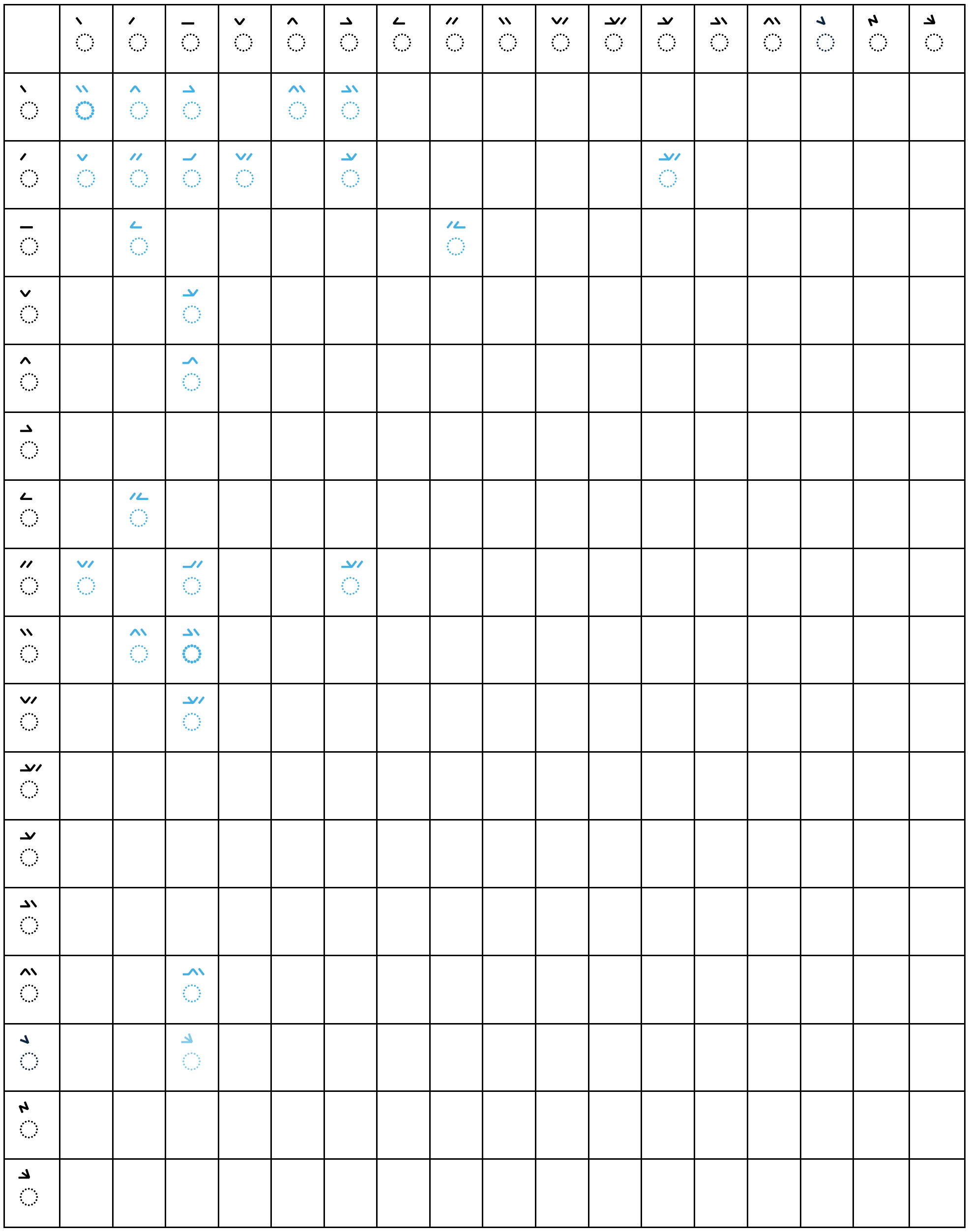
There are three basic tone marks that represent the fundamental tonal levels of Bambara: high, low and mid. These marks shown below are the basis for the structure of the compound tone marks. *Orange rows do not need encoding.*

Diacritic	*Name*	*Function*
◌߫	NKO COMBINING HIGH TONE	high tone
◌߬	NKO COMBINING LOW TONE	low tone
◌߫	NKO COMBINING SHORT HIGH TONE (07EB)	mid tone

While it is not preferred it is possible for a user to attempt to type the compound marks in a piecemeal fashion. This behavior has not been observed by the current users; therefore, it is likely that well-designed input methods that make compound tone marks readily accessible will be sufficient to ensure proper input.

Table 1 shows the equivalent compound marks which would be formed if a mark from the first column were followed by one of the marks in the top row. It should be noted this is not the same as the grammatical rules that dictate how tone marks are modified (Figure 30).

Table 1: Mark Normalization Grid



5.3.2 Vowel Length and Combinations

The NKO COMBINING SHORT RISING TONE mark which *does not need encoding* is repurposed to indicate long vowels in Bambara that are not geminated vowels (Figure 31). Because vowel length and tone marking are treated separately in N’ko Kakura this mark can be used in conjunction with some of the tone marks.

Diacritic	***Name***	***Function***
◌߭	NKO COMBINING SHORT RISING TONE (07ED)	vowel length

When combining with tone marks the vowel length mark *must* precede the tone mark. The vowel length mark is never rendered after the tone mark. The illustration below is presented in typing order and is read right-to-left. The combination of the two marks must be centered over the base letter. Some examples can be seen in Figure 9.

combined vowel length and low tone mark	*low tone mark*	*vowel length mark*

The following tone marks (*orange marks do not need encoding*) can be combined with the vowel mark in the same fashion as above:

Tone	*Vowel Length + Tone*
◌ high tone	ߊ
◌ low tone	ߊ
◌ mid tone	ߊ
◌ low-high tone	ߊ
◌ high-low tone	ߊ
◌ high-mid tone	ߊ
◌ mid-low tone	ߊ
◌ low tone verb	ߊ
◌ high tone verb	ߊ

5.3.3 Nasalization/Assimilation

The N'ko Kakura system allows for assimilation to be indicated by expanding the role of the NKO COMBINING NASALIZATION MARK (07F2). When placed below a vowel, the mark indicates that the vowel is post-nasalized and when used with consonants it indicates assimilation. (See 11.2.4 Assimilation)

Diacritic	*Name*	*Function*
◌߲	NKO COMBINING NASALISATION MARK (07F2)	vowel length

The assimilation mark can be used in conjunction with *all* tone marks (*5.3 Diacritics*), vowel length mark and valid combinations of both (*5.3.2 Vowel Length and Combinations*). Below is a single example to illustrate usage.

Tone	***Tone + Assimilation/Nasalization***	***Vowel Length + Assimilation/Nasalization***	***Vowel Length + Tone + Assimilation/Nasalization***
◌́ low tone	ǃ́	ǃ̇	ǃ́̇

5.4 Modifiers

N’ko Kakura utilizes three elision symbols. When vowels are elided in Bambara the proper syncope symbol is used to account for the tone of the removed vowel. Note, the representation below is the *isolated* form of the symbols.

’	‘	'
high tone vowel syncope symbol	*low tone vowel syncope symbol*	toneless syncope symbol

The syncope symbols in N’ko Kakura have joining behavior which consists of a connecting baseline that is present when adjacent to another letter. The joining behavior is demonstrated below.

high tone vowel syncope symbol	’’’ ’
low tone vowel syncope symbol	‘‘‘ ‘
toneless vowel syncope symbol	''' '

The current N’ko code block includes 3 apostrophe-like symbols which can lead to some confusion. ߴ NKO HIGH TONE APOSTROPHE (07F4), ߵ NKO LOW TONE APOSTROPHE (07F5), and ߑ NKO LETTER DAGBASINNA (07D1). The first two *do not* join and never have a baseline stroke. Whereas the latter *does* join but has a baseline stroke in all positions including the isolated position. As a result, none of the existing apostrophe-like symbols match the rendering and shaping behavior needed for the N’ko Kakura syncope symbols.

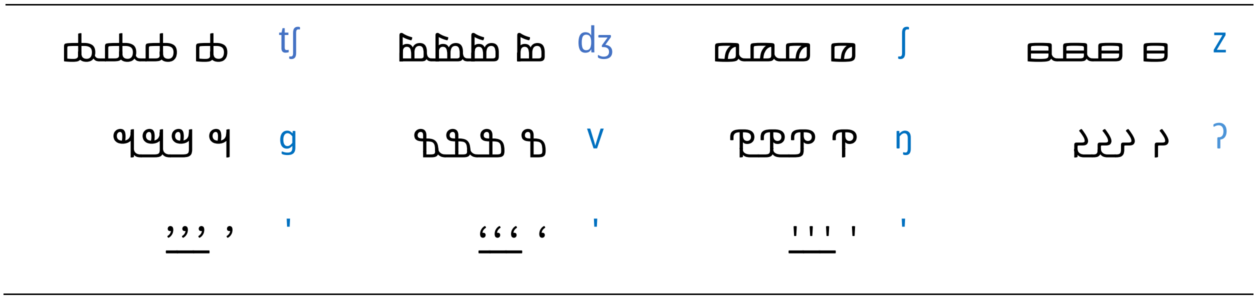
Existing N’ko Symbols	**Final**	**Medial**	**Initial**	**Isolated**
NKO HIGH TONE APOSTROPHE (07F4)	N/A	N/A	N/A	ߴ
NKO LOW TONE APOSTROPHE (07F5)	N/A	N/A	N/A	ߵ
NKO LETTER DAGBASINNA (07D1)	ߑ	ߑ	ߑ	ߑ

The table below shows each of the symbols in use. Note the differences in shaping and rendering when used in connected vs unconnected form.

	Connected	Unconnected
Existing N'ko Symbols		
NKO HIGH TONE APOSTROPHE (07F4)	[illegible]	[illegible]
NKO LOW TONE APOSTROPHE (07F5)	[illegible]	[illegible]
NKO LETTER DAGBASINNA (07D1)	[illegible]	[illegible]
N'ko Kakura Symbols		
high tone syncope symbol	[illegible]	[illegible]
low tone syncope symbol	[illegible]	[illegible]
Toneless vowel syncope symbol	[illegible]	[illegible]

5.5 Script Connections

N'ko Kakura additions run right-to-left and connected. The table below shows the isolated, initial, medial and final forms for each of the additions except for the marks and modifiers.



6. Attestation

The proposed repertoire is attested in the examples below from various sources. All sources except for Figure 5, Figure 10 and Figure 11 are from non-pedagogical materials produced by authors other than the inventor. The characters attested in these two figures occur under very specific circumstances and are therefore quite rare.

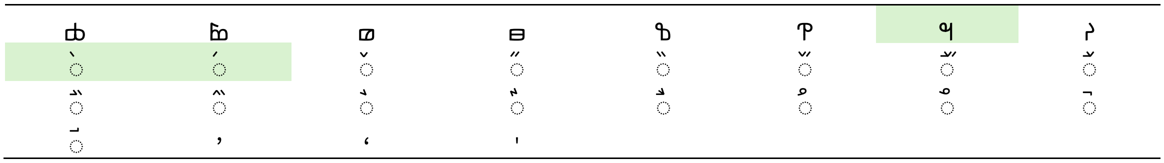
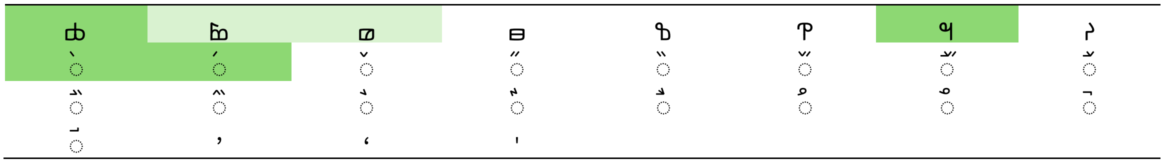
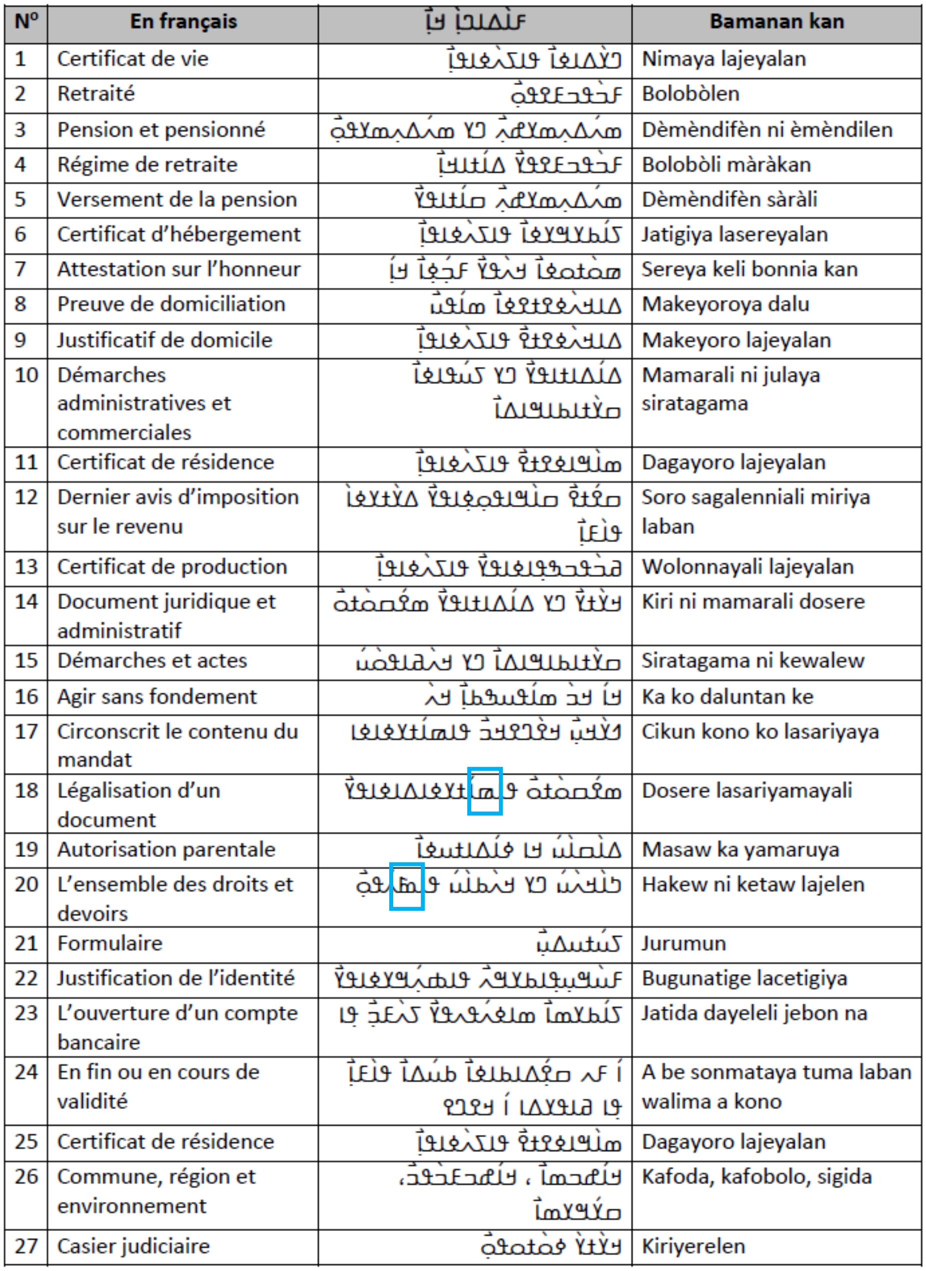


Figure 2: Calendar produced by the Ministère de la Refondation de l'Etat [19]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
◌̀	◌́	◌̌	◌̋	◌̏	◌?	◌?	◌?
◌?	◌?	◌?	◌?	◌?	◌?	◌?	◌?
◌?	ʼ	ʻ	ˈ				

Figure 3: Sample page from a COVID-19 Health Bulletin [20]

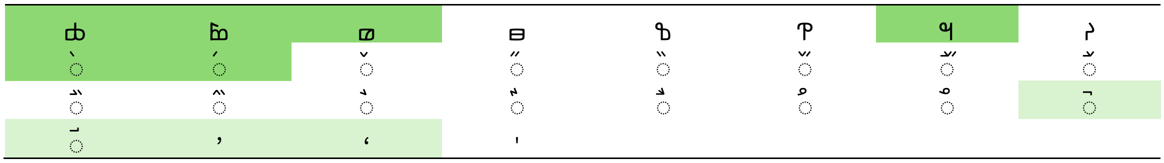




Dictionnaire des mots, expressions et phrases à traduire en Bamanan kan

N°	En français		Bamanan kan
1	Certificat de vie		Nimaya lajeyalan
2	Retraité		Bolobòlen
3	Pension et pensionné		Dèmèndifèn ni èmèndilen
4	Régime de retraite		Bolobòli màràkan
5	Versement de la pension		Dèmèndifèn sàràli
6	Certificat d'hébergement		Jatigiya lasereyalan
7	Attestation sur l'honneur		Sereya keli bonnia kan
8	Preuve de domiciliation		Makeyoroya dalu
9	Justificatif de domicile		Makeyoro lajeyalan
10	Démarches administratives et commerciales		Mamarali ni julaya siratagama
11	Certificat de résidence		Dagayoro lajeyalan
12	Dernier avis d'imposition sur le revenu		Soro sagalenniali miriya laban
13	Certificat de production		Wolonnayali lajeyalan
14	Document juridique et administratif		Kiri ni mamarali dosere
15	Démarches et actes		Siratagama ni kewalew
16	Agir sans fondement		Ka ko daluntan ke
17	Circonscrit le contenu du mandat		Cikun kono ko lasariyaya
18	Légalisation d'un document		Dosere lasariyamayali
19	Autorisation parentale		Masaw ka yamaruya
20	L'ensemble des droits et devoirs		Hakew ni ketaw lajelen
21	Formulaire		Jurumun
22	Justification de l'identité		Bugunatige lacetigiya
23	L'ouverture d'un compte bancaire		Jatida dayeleli jebon na
24	En fin ou en cours de validité		A be sonmataya tuma laban walima a kono
25	Certificat de résidence		Dagayoro lajeyalan
26	Commune, région et environnement		Kafoda, kafobolo, sigida
27	Casier judiciaire		Kiriyerelen

Figure 4: Excerpt of document defining terminology for governmental functions [23]



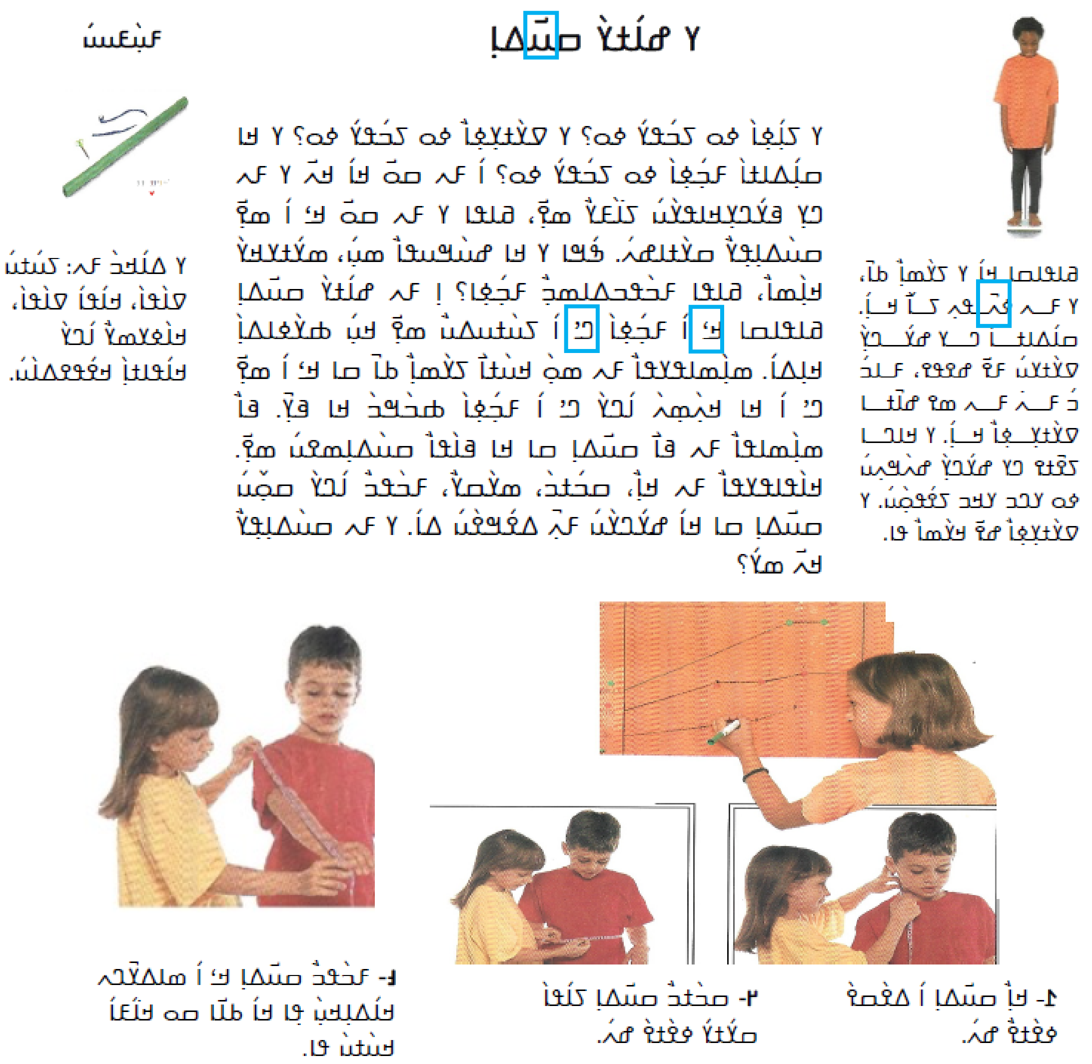
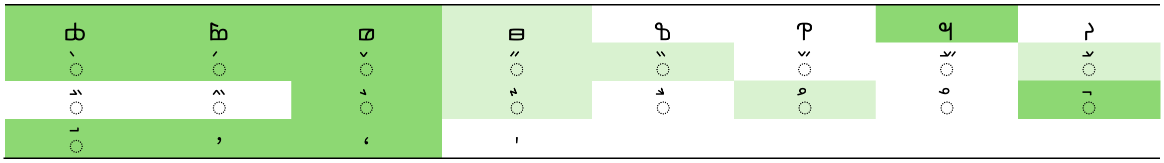


Figure 5: Sample page from a children's book on basic anatomy. [14]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
◌̀	◌́	◌̌	◌̋	◌̏	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	,	‘	'				

Figure 6: Screenshot of cooking video on YouTube with terminology written in N’ko Kakura. [18]

Figure 7: Screenshot of fictional content on YouTube, captioned using N'ko Kakura



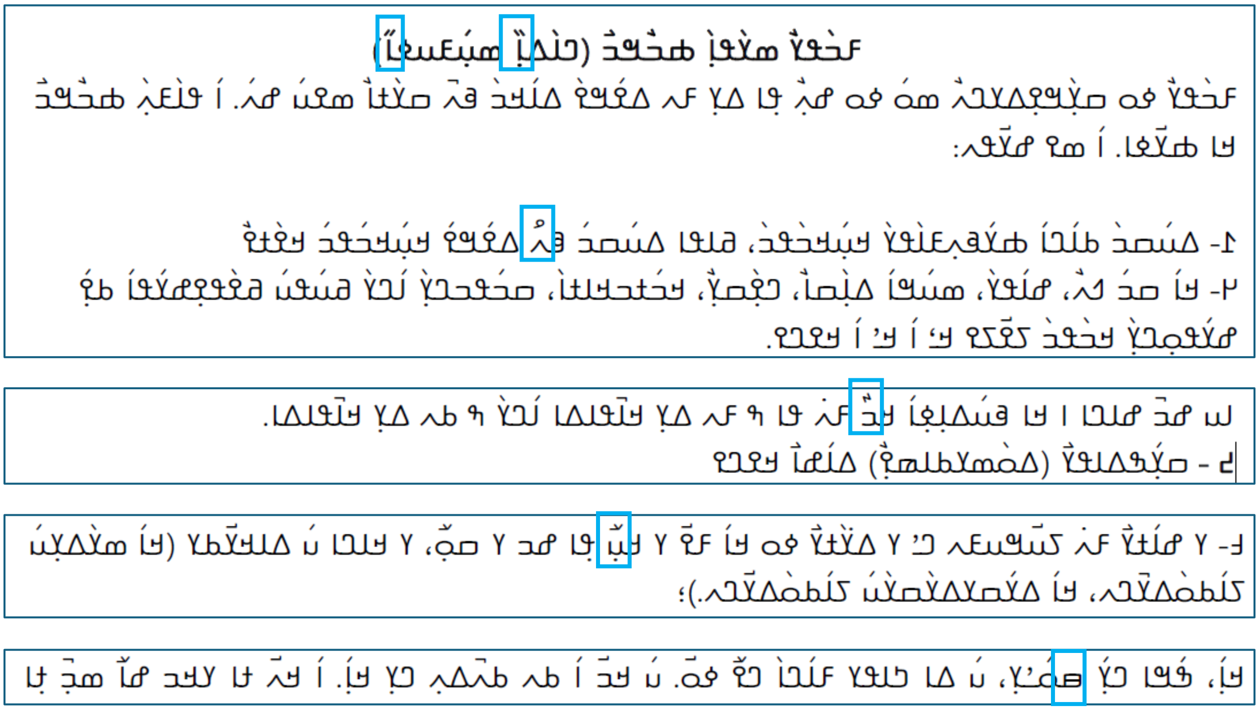


Figure 8: Excerpts from a book on Traditional Medicine. [12]

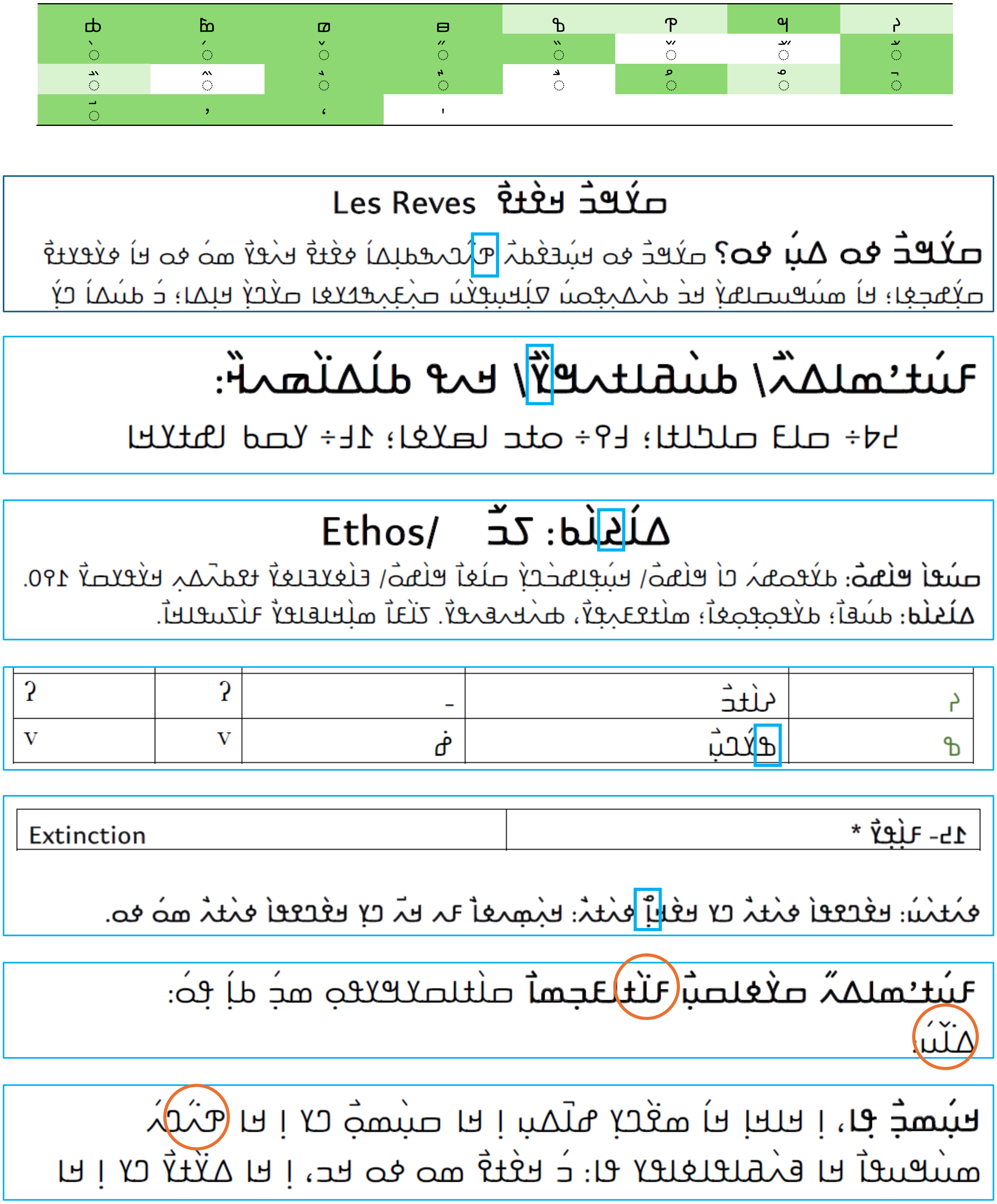


Figure 9: Excerpts from a book about African Spirituality. Orange circles show examples of vowel length mark used in conjunction with tone marks. [13]

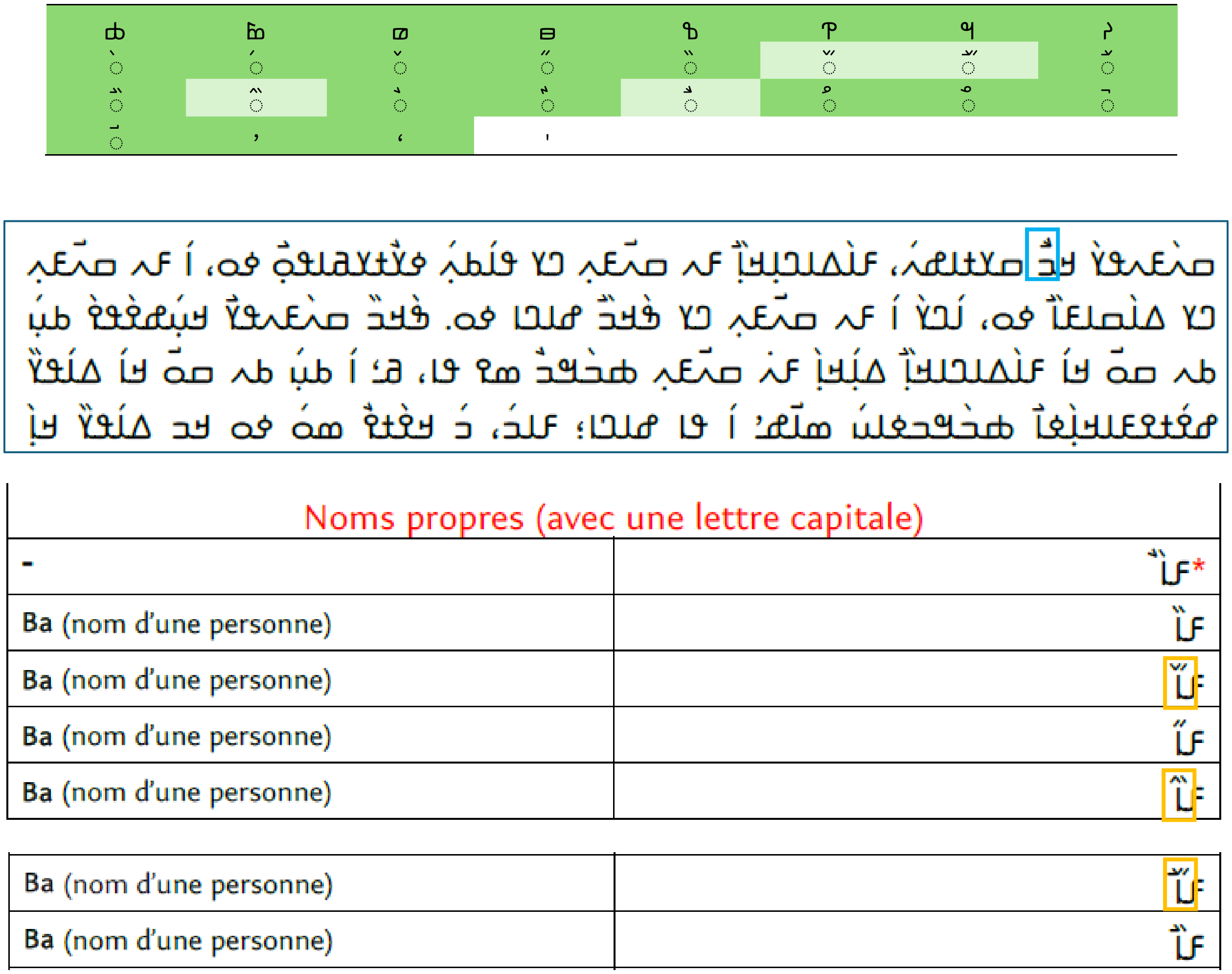


Figure 10: Excerpts from a Bambara language learning book. The final three marks in orange are used to make proper nouns based on underlying tonal qualities. Since these circumstances are very specific they are currently not present in existing materials. [11]

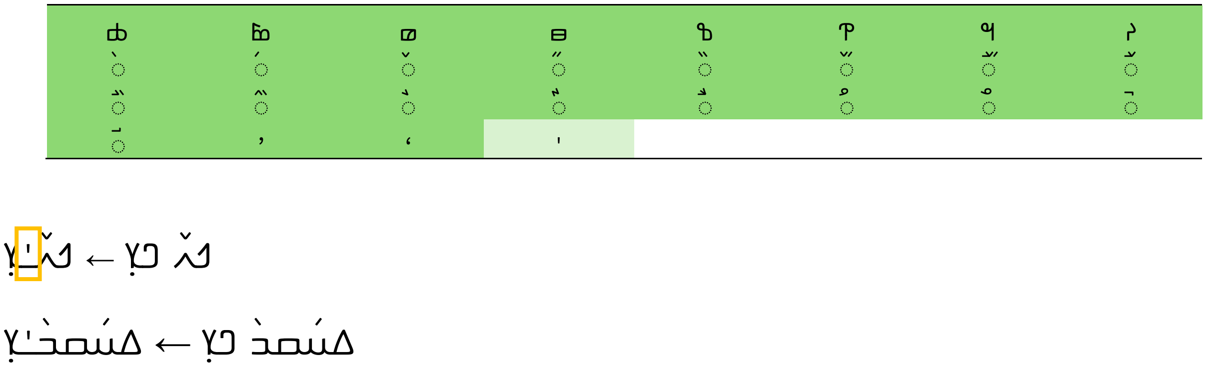


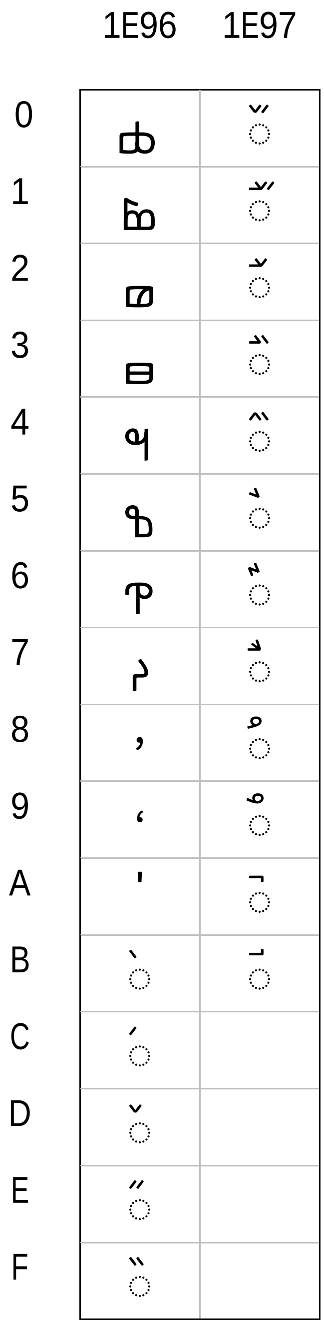
Figure 11: Example of toneless syncope symbol in use provided by Dr. Diakite. Usage of this mark is rare but possible.

7. Proposed Unicode Repertoire

Glyph	*Code*	*Proposed Character Name*	*Phoneme*
		NKO LETTER TA SA DIGRAPH	tʃ
		NKO LETTER DA WITH LEFT FLUE	dʒ
		NKO LETTER SA WITH BOTTOM RIGHT EYELET	ʃ
		NKO LETTER SA BAR	z
		NKO LETTER KA WITH LOOPED FLAG	g
		NKO LETTER REVERSED FA	v
		NKO LETTER LOOPED NA	ŋ
		NKO LETTER BENT A	ʔ
,		NKO HIGH TONE VOWEL SYNCOPE SYMBOL	'
‘		NKO LOW TONE VOWEL SYNCOPE SYMBOL	'
'		NKO APOSTROPHE	'
		NKO COMBINING HIGH TONE	
		NKO COMBINING LOW TONE	
		NKO COMBINING LOW HIGH TONE	
		NKO COMBINING LOW LOW TONE	
		NKO COMBINING HIGH HIGH TONE	
		NKO COMBINING LOW LOW HIGH TONE	
		NKO COMBINING LOW LOW HIGH MID TONE	
		NKO COMBINING LOW HIGH MID TONE	
		NKO COMBINING HIGH HIGH MID TONE	

◌		NKO COMBINING HIGH HIGH LOW TONE	
◌		NKO COMBINING HIGH HIGH DOWN STEP TONE	
◌		NKO COMBINING HIGH HIGH DOWN STEP HIGH TONE	
◌		NKO COMBINING HIGH HIGH DOWN STEP HIGH MID TONE	
◌		NKO COMBINING CONVERT TO LOW TONE	
◌		NKO COMBINING CONVERT TO HIGH TONE	
◌		NKO COMBINING LOW VERB MARK	
◌		NKO COMBINING HIGH VERB MARK	

8. Draft Chart Showing Proposed N’ko Extended Block



9. Arabic Shaping Text

```
NKO LETTER TA SA DIGRAPH; D; No_Joining_Group
NKO LETTER DA WITH LEFT FLUE; D; No_Joining_Group
NKO LETTER SA WITH BOTTOM RIGHT EYELET; D; No_Joining_Group
NKO LETTER SA BAR; D; No_Joining_Group
NKO LETTER KA WITH LOOPED FLAG; D; No_Joining_Group
NKO LETTER REVERSED FA; D; No_Joining_Group
NKO LETTER LOOPED NA; D; No_Joining_Group
NKO LETTER BENT A; D; No_Joining_Group
NKO HIGH TONE VOWEL SYNCOPE SYMBOL; D; No_Joining_Group
NKO LOW TONE VOWEL SYNCOPE SYMBOL; D; No_Joining_Group
NKO APOSTROPHE; D; No_Joining_Group
```

10. Unicode Character Properties

```
1E960;NKO LETTER TA SA DIGRAPH;Lo;0;R;;;;;N;;;;;
1E961;NKO LETTER DA WITH LEFT FLUE;Lo;0;R;;;;;N;;;;;
1E962;NKO LETTER SA WITH BOTTOM RIGHT EYELET;Lo;0;R;;;;;N;;;;;
1E963;NKO LETTER SA BAR;Lo;0;R;;;;;N;;;;;
1E964;NKO LETTER KA WITH LOOPED FLAG;Lo;0;R;;;;;N;;;;;
1E965;NKO LETTER REVERSED FA;Lo;0;R;;;;;N;;;;;
1E966;NKO LETTER LOOPED NA;Lo;0;R;;;;;N;;;;;
1E967;NKO LETTER BENT A;Lo;0;R;;;;;N;;;;;
1E968;NKO HIGH TONE VOWEL SYNCOPE SYMBOL;Lo;0;R;;;;;N;;;;;
1E969;NKO LOW TONE VOWEL SYNCOPE SYMBOL;Lo;0;R;;;;;N;;;;;
1E96A;NKO APOSTROPHE;Lo;0;R;;;;;N;;;;;
1E96B;NKO COMBINING HIGH TONE;Mn;230;NSM;;;;;N;;;;;
1E96C;NKO COMBINING LOW TONE;Mn;230;NSM;;;;;N;;;;;
1E96D;NKO COMBINING LOW HIGH TONE;Mn;230;NSM;;;;;N;;;;;
1E96E;NKO COMBINING LOW LOW TONE;Mn;230;NSM;;;;;N;;;;;
1E96F;NKO COMBINING HIGH HIGH TONE;Mn;230;NSM;;;;;N;;;;;
1E970;NKO COMBINING LOW LOW HIGH TONE;Mn;230;NSM;;;;;N;;;;;
1E971;NKO COMBINING LOW LOW HIGH MID TONE;Mn;230;NSM;;;;;N;;;;;
1E972;NKO COMBINING LOW HIGH MID TONE;Mn;230;NSM;;;;;N;;;;;
1E973;NKO COMBINING HIGH HIGH MID TONE;Mn;230;NSM;;;;;N;;;;;
1E974;NKO COMBINING HIGH HIGH LOW TONE;Mn;230;NSM;;;;;N;;;;;
1E975;NKO COMBINING HIGH HIGH DOWN STEP TONE;Mn;230;NSM;;;;;N;;;;;
1E976;NKO COMBINING HIGH HIGH DOWN STEP HIGH TONE;Mn;230;NSM;;;;;N;;;;;
1E977;NKO COMBINING HIGH HIGH DOWN STEP HIGH MID TONE;Mn;230;NSM;;;;;N;;;;;
1E978;NKO COMBINING CONVERT TO LOW TONE;Mn;230;NSM;;;;;N;;;;;
1E979;NKO COMBINING CONVERT TO HIGH TONE;Mn;230;NSM;;;;;N;;;;;
1E97A;NKO COMBINING LOW VERB MARK;Mn;230;NSM;;;;;N;;;;;
1E97B;NKO COMBINING HIGH VERB MARK;Mn;230;NSM;;;;;N;;;;;
```

11. Supplementary Information

11.1 Supplementary Figures

Figure 12: Sample page from primary education book on language, “Bamanankan San Folo” [1]

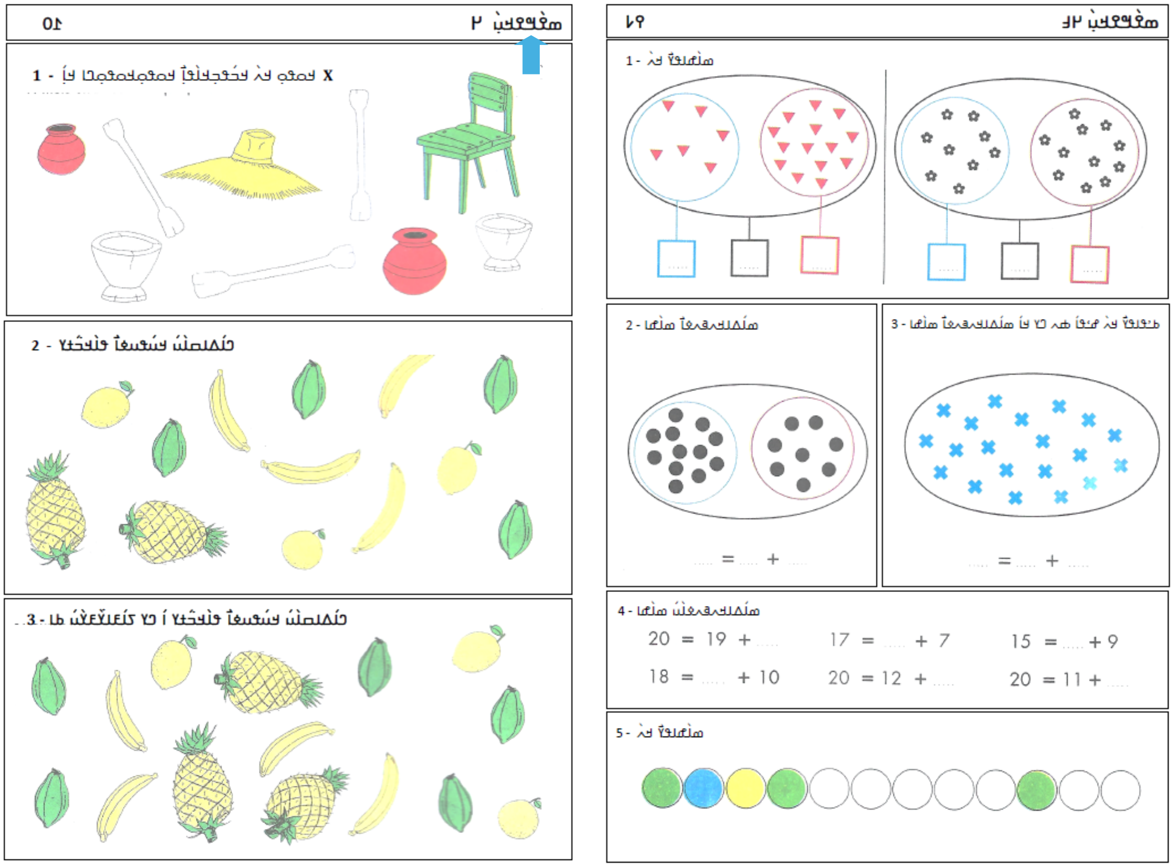


Figure 13: Sample page from primary education book on mathematics, "Math Kakura." [6]

Figure 14: Example of how tone marks vary with noun class from "Assike Kakura." [10]

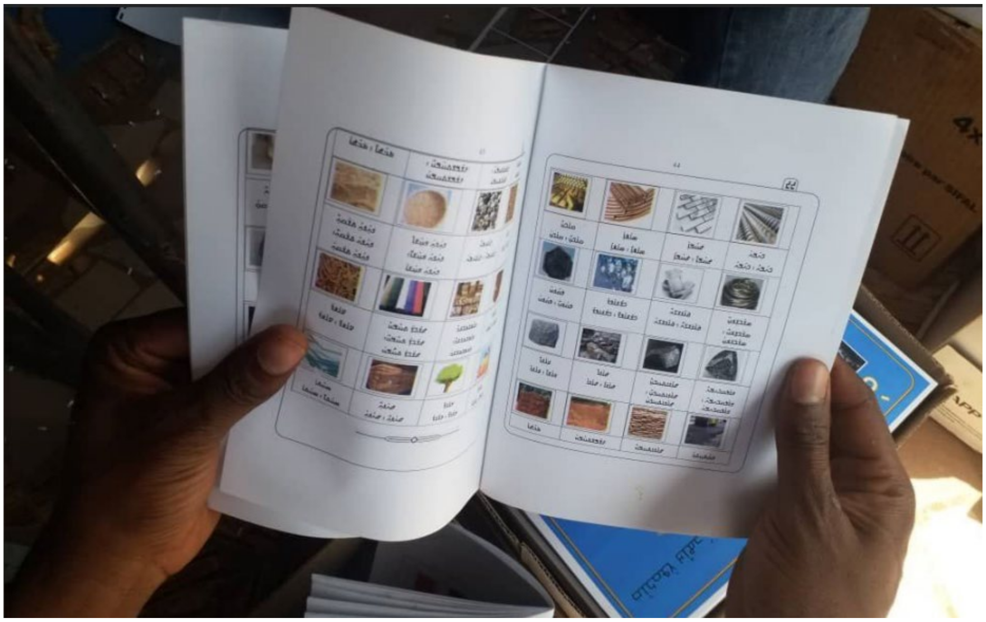


Figure 15: Print edition of "Assike Kakura." [10]

Figure 16: Sample page from a children's book on basic anatomy, "The Body Nyesson" [14]

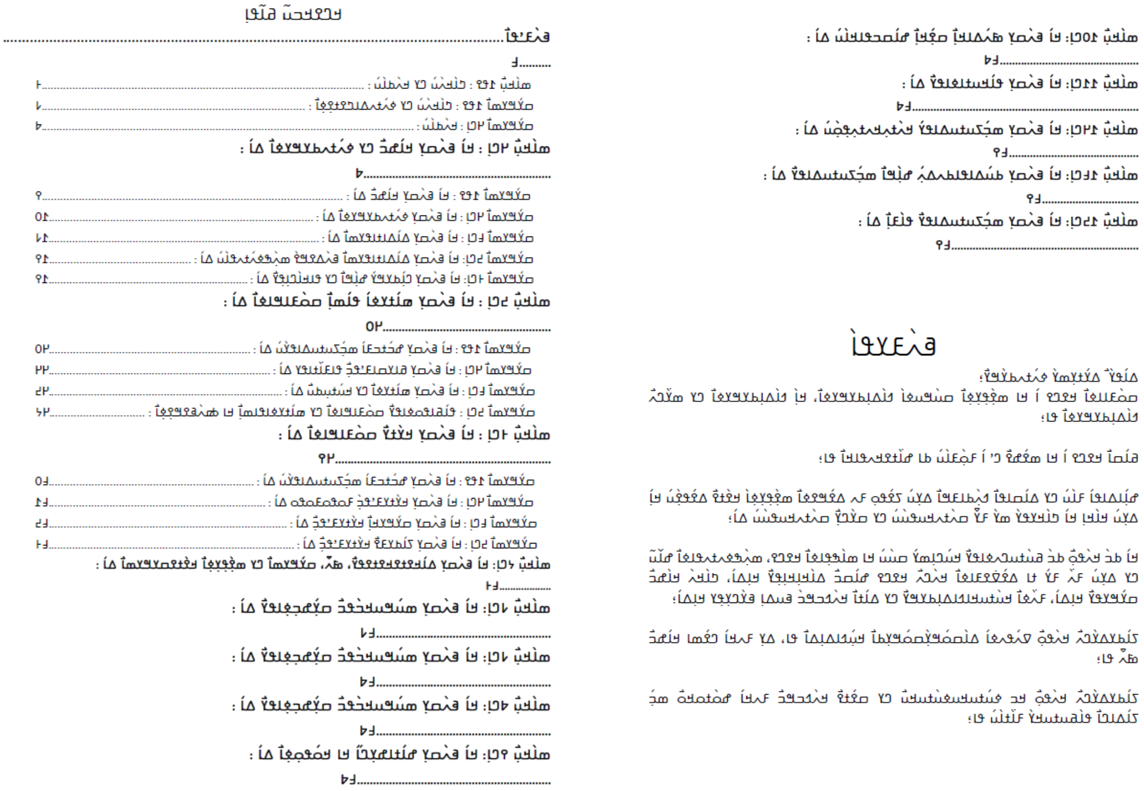


Figure 17: Table of Contents and Preamble of the Malian constitution translated into Bambara. [21]

Concepts en français	En bamanankan	En NKO	
		Script NKO	
Démocratie	jemafanga	[illegible]	Bèeya
Politique	Polotigi	[illegible]	Bèrèbèrèli
Parti politique	Polotigi Jekulu	[illegible]	Bèrèbèrèli kuluka
Elections	Nienatali	[illegible]	Nianatali
Grève	Baarabila	[illegible]	Furunkuli
Revendication	Hake nyinin	[illegible]	Nyininnali
Officier	Surasi nyemogo	[illegible]	Sofa
Service public	Foroba Ca	[illegible]	Foroba Cinyada
Hymne national	Faso fasa	[illegible]	Faso Kundonkili
Citoyenneté	Jamanadenya	[illegible]	Dugudenya

Concepts en français	En bamanankan	En NKO	
		Script NKO	
Patriotisme	Fasoden nyumanya	[illegible]	Fabadenya
Bonne gouvernance	Mara kecogo nyuman	[illegible]	Kunasigiya nyumanya
Légitimité	Seriyamaya	[illegible]	Jotigimaya
Légalité	Seriyama	[illegible]	Kuruntumaya
Transition	Taransison	[illegible]	Ceromayali
Régime	Fanga	[illegible]	Marakan
Nation	Jamana	[illegible]	Faso
Devise	defisi	[illegible]	Kunkan
Un Peuple-Un But-Une Foi	Fasojama kelen-lanyinin keled-nkaninya kelen	[illegible]	Mirindi-kelen Nata telen- nkaninya kelen
Moralité	Jogo nyumanw	[illegible]	Jogomaya

Concepts en français	En bamanankan	En NKO	
		Script NKO	
Etat	kafo	[illegible]	Kafo
Police	polosi	[illegible]	Tonboloma
Economie	marata	[illegible]	makorokoroli
Université	Sanfe kalanso	[illegible]	Jaabada
Education	Lamo	[illegible]	Lamo
Crise	geleya	[illegible]	Koja
Pandémie	Fiyen bana	[illegible]	Jaabajankaro
Constitution	Seriya baju	[illegible]	Sigikan
Subvention	Demen	[illegible]	Bolomagen
Jeunesse	funenkeninya	[illegible]	Funenkeya

Figure 18: Excerpt of document outlining terminology required for political and public discourse commissioned by le Ministère de la Refondation de l’Etat. [23]

28	Les condamnations pénales d'un individu	[illegible]	Mogo kelen niankili jalaki
29	Secteur public et privé	[illegible]	Foroba cakeda ni donduguma cakeda
30	Condamnation infamante par la justice	[illegible]	Lakololi niankili keli kirida fe
31	Fonction publique et une demande de naturalisation	[illegible]	Foroba cakeda ni lasunguniali lanyinin
32	Certificat d'hérédité	[illegible]	Centa lasereyalan
33	Le versement d'une pension de réversion	[illegible]	Dantigeli demendifen do sarali
34	Une créance détenue par l'administration	[illegible]	Bolomafen marali mamaralida fe
35	C'est une partie du département qu'administre le sous préfet	[illegible]	Nin ye kotigiyada fan do de ye kaforen dugula kuntigi be min mamara
36	La représentation de l'État dans sa circonscription ou pour un domaine spécifique relevant d'une priorité nationale	[illegible]	Kafo koyirali a ka latintanw kono walima dakun kerenkerenen do la min sirilen be faso foloya ko do la
37	La mise en œuvre des politiques publiques de l'État dans sa circonscription	[illegible]	Kafo ka foroba berebereli bolodali a ka latintan kono
38	La coordination des activités des services techniques déconcentrés de l'État	[illegible]	Kafo ka senkolaya baara dennyogonabaliw donjurumali
39	La certification conforme des actes administratifs et civils	[illegible]	Mamarali kow ni nantanya ko dalabenenw lajeyali
40	Acte de naissance	[illegible]	Bankeli seben

Figure 19: Excerpt of "Dictionnaire des Mots Administratifs" published by former state Refondation Minister. [22]

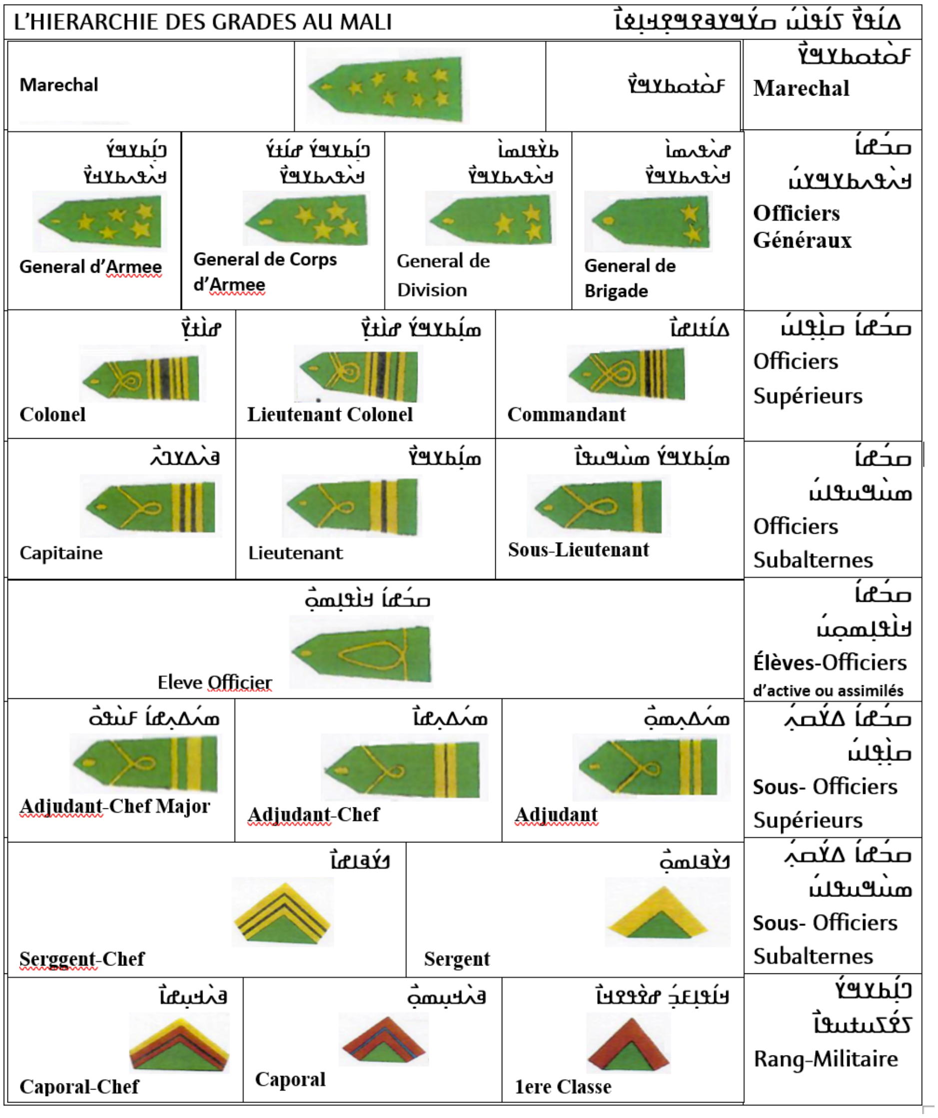


Figure 20: "L'hierarchie des Grades au Mali" showing the names of military ranks. [24]

Figure 21: Images of students learning N'ko Kakura at the University of Bamako.

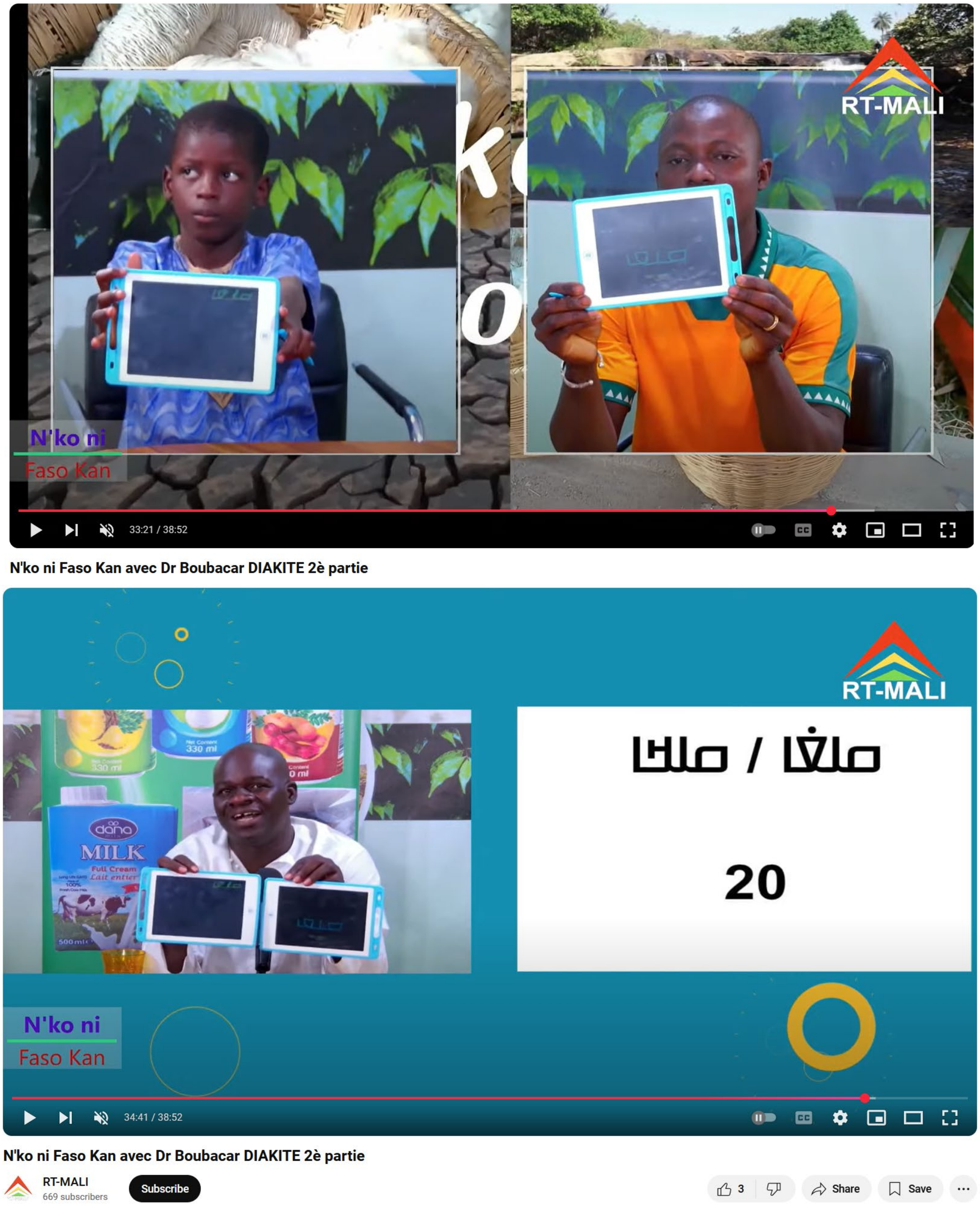


Figure 22: Screenshots of YouTube video about N'ko Kakura. In addition to an introduction of the writing system the video features students writing words for images they are shown. [16]

Figure 23: Screenshot from one of the videos on Boubacar Diakite's channel giving lessons on how tone marking with N'ko Kakura helps disambiguate noun classes. [15]

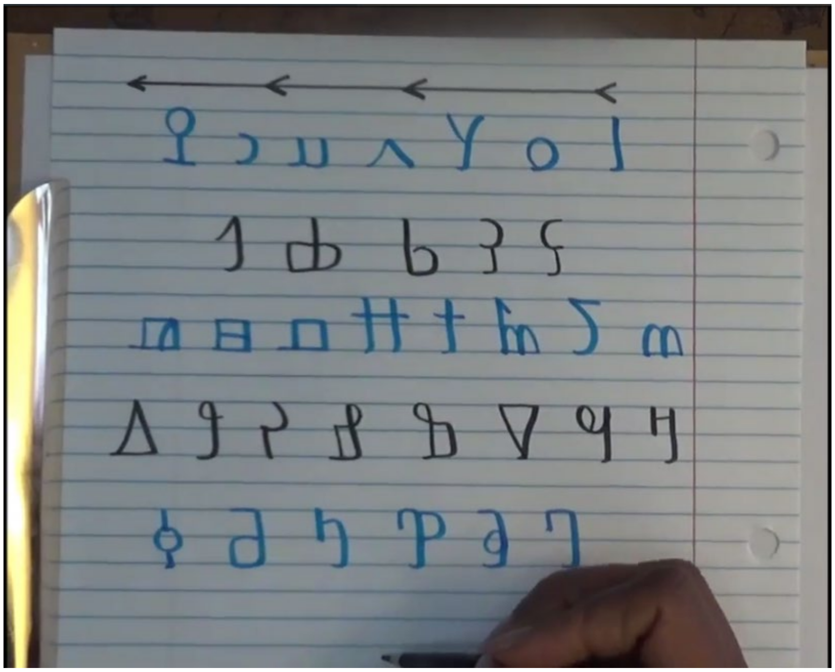
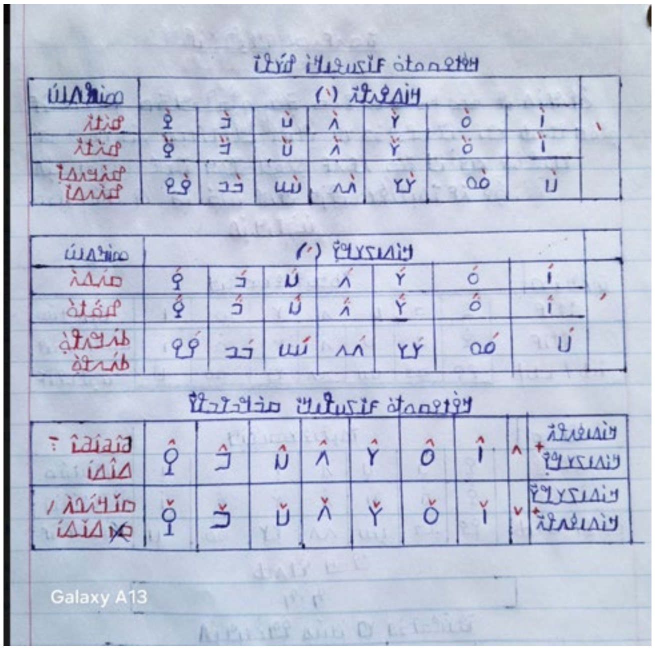


Figure 24: Video posted to Telegram online classes showing how all Bambara letters are written.

Figure 25: Screenshots of Telegram-based classes with submitted assignments



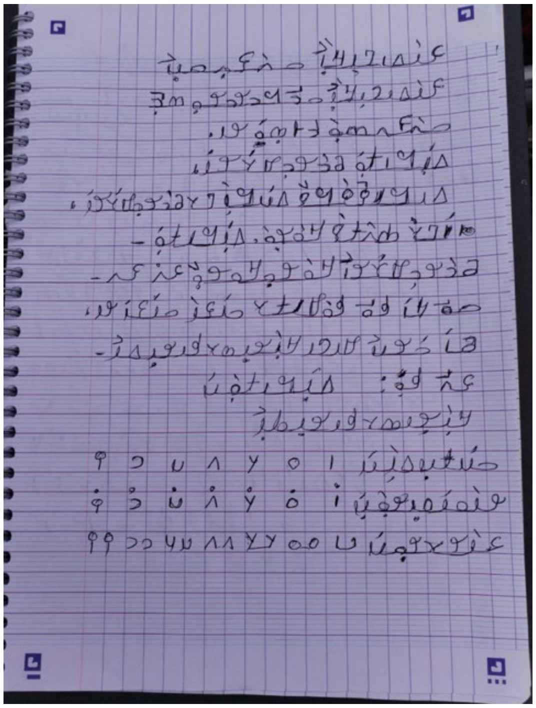
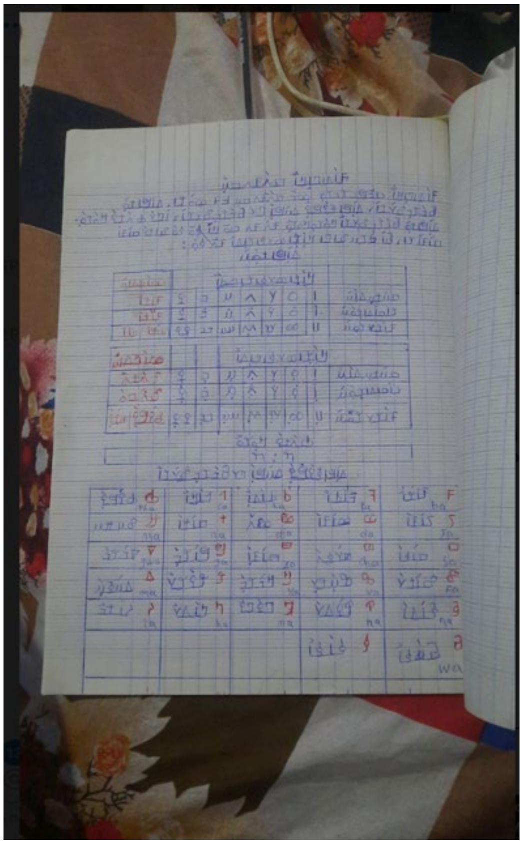
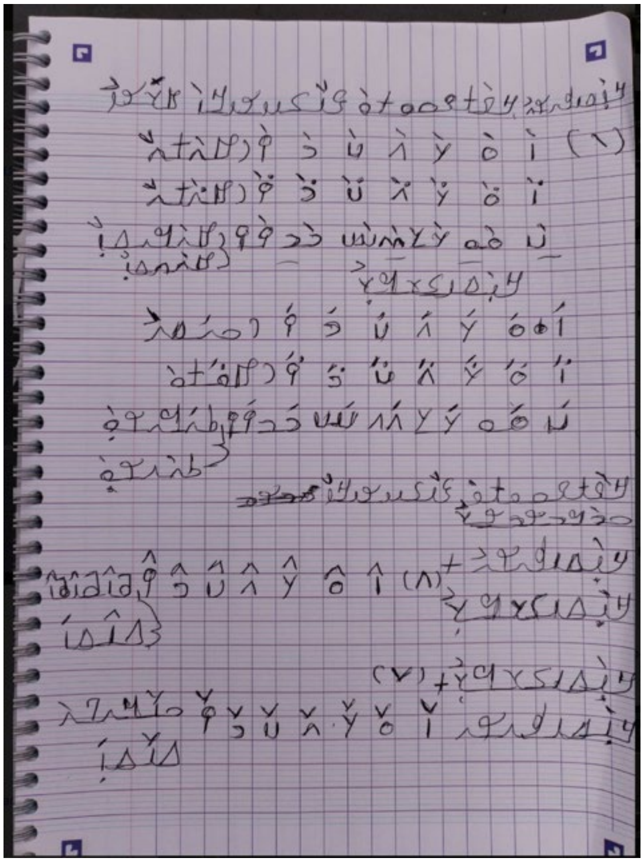




Figure 26: Samples of handwritten lessons from students.

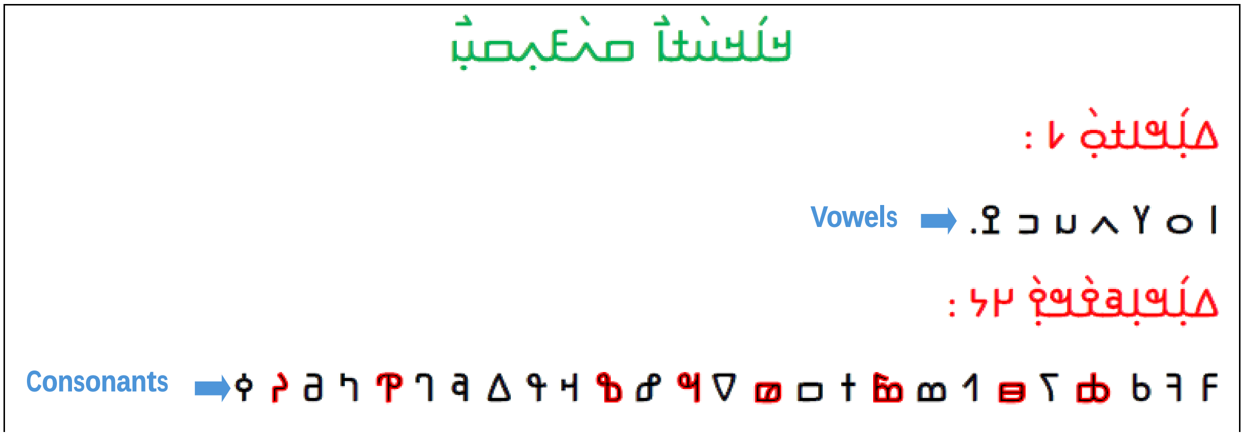


Figure 27: Excerpt of Bambara 1st year language educational book showing orthography. New letters from N'ko Kakura are in red. [3]

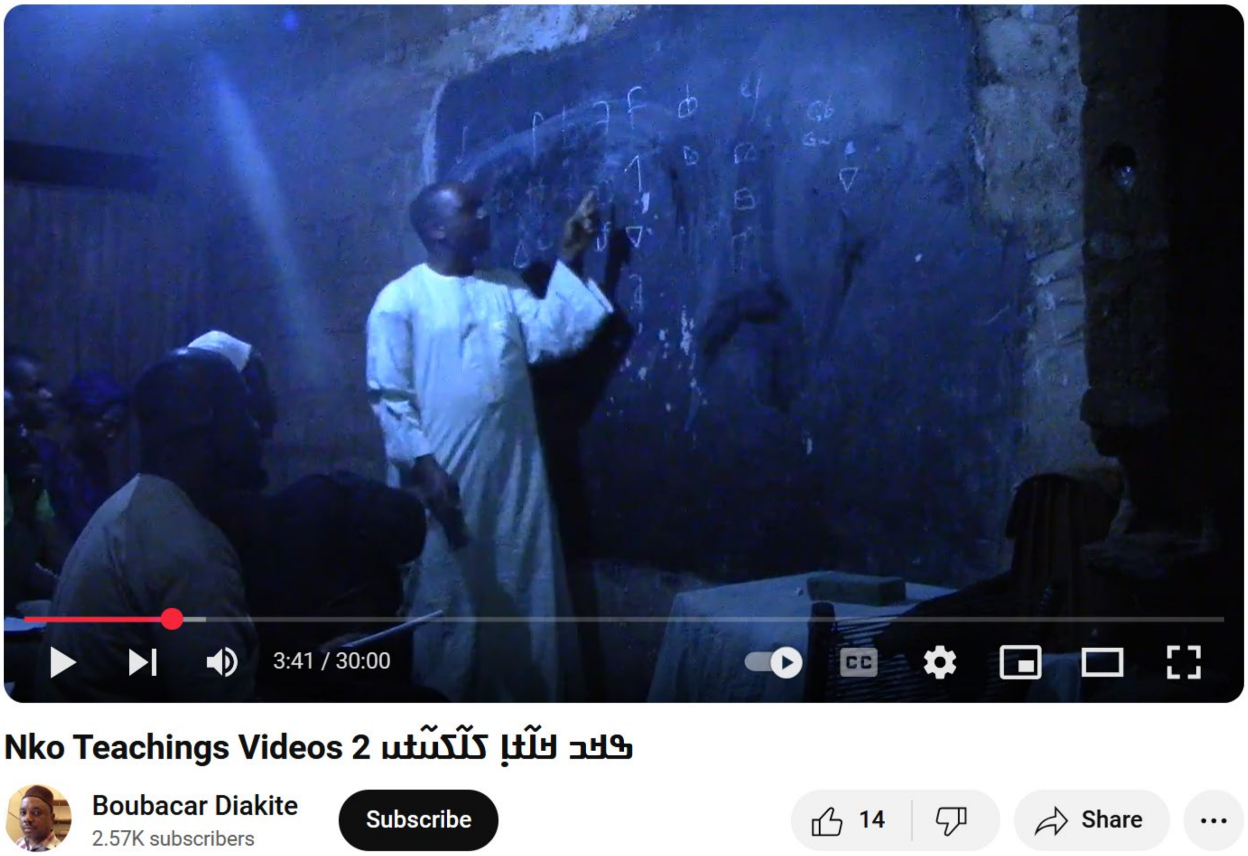
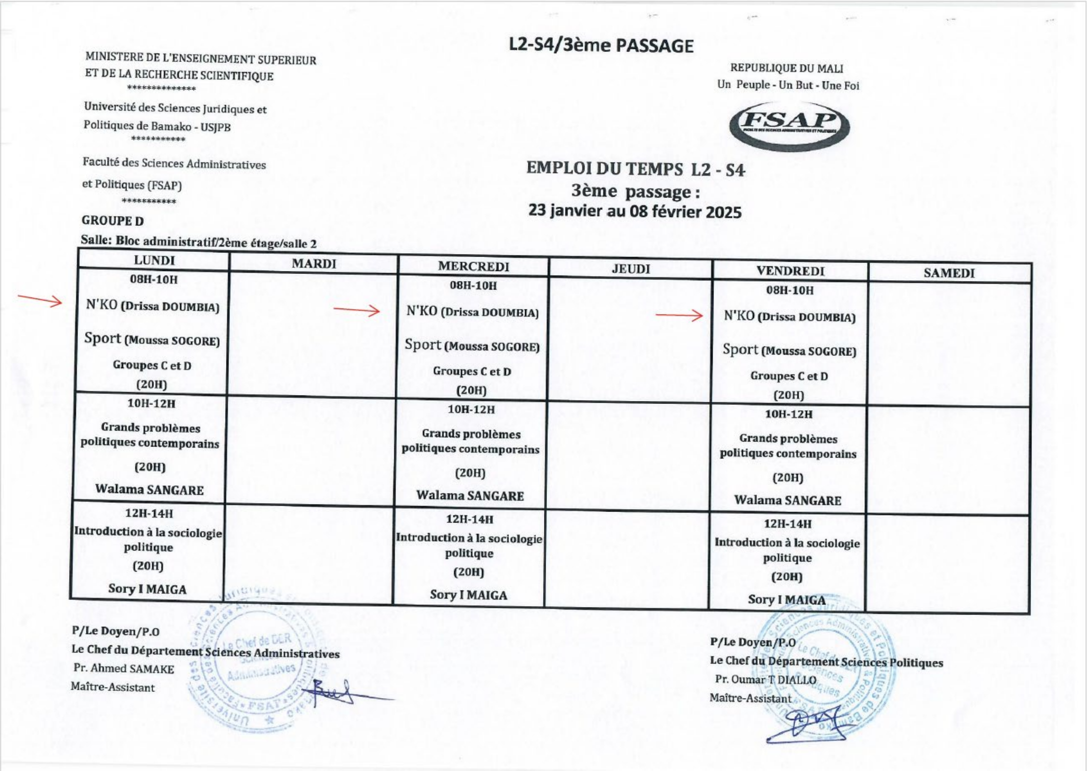


Figure 28: Video of classes on N'ko Kakura conducted in villages in Mali in 2020.



L2-S4/3ème PASSAGE

MINISTERE DE L'ENSEIGNEMENT SUPERIEUR
ET DE LA RECHERCHE SCIENTIFIQUE
****

Université des Sciences Juridiques et Politiques de Bamako - USJPB
****

Faculté des Sciences Administratives et Politiques (FSAP)
****

REPUBLIQUE DU MALI
Un Peuple - Un But - Une Foi

FSAP

EMPLOI DU TEMPS L2 - S4
3ème passage :
23 janvier au 08 février 2025

GROUPE D
Salle: Bloc administratif/2ème étage/salle 2

LUNDI	MARDI	MERCREDI	JEUDI	VENDREDI	SAMEDI
08H-10H N'KO (Drissa DOUMBIA) Sport (Moussa SOGORE) Groupes C et D (20H)		08H-10H N'KO (Drissa DOUMBIA) Sport (Moussa SOGORE) Groupes C et D (20H)		08H-10H N'KO (Drissa DOUMBIA) Sport (Moussa SOGORE) Groupes C et D (20H)	
10H-12H Grands problèmes politiques contemporains (20H) Walama SANGARE		10H-12H Grands problèmes politiques contemporains (20H) Walama SANGARE		10H-12H Grands problèmes politiques contemporains (20H) Walama SANGARE	
12H-14H Introduction à la sociologie politique (20H) Sory I MAIGA		12H-14H Introduction à la sociologie politique (20H) Sory I MAIGA		12H-14H Introduction à la sociologie politique (20H) Sory I MAIGA	

P/Le Doyen/P.O
Le Chef du Département Sciences Administratives
Pr. Ahmed SAMAKE
Maître-Assistant

P/Le Doyen/P.O
Le Chef du Département Sciences Politiques
Pr. Oumar T DIALLO
Maître-Assistant

Figure 29: Official 2025 class schedule from FSAP with N'ko Kakura classes identified. The curriculum is stamped and signed by department heads at the university.

11.2 Details of N'ko Kakura Grammatical System

11.2.1 N'ko Kakura vs. N'ko Maninkamory

Compound tone marks represent a sequence of tones that are conjoined to reflect tonal modulation that occur in Bambara as well disambiguate specific grammatical features, such as noun class, compound nouns, substantives, etc.

This improves upon the tonal marking system of N'ko Maninkamory which can be ambiguous as illustrated in the following examples. The table below shows how common neuter nouns are marked when they change from definite and indefinite nouns. For comparison the same conversions are shown in N'ko Maninkamory. For a complete demonstration of grammar rules for all tone marks see 11.2.2 Tone and Accents.

Common Nouns in N’ko Maninkamory			Common Nouns using N’ko Kakura		
Indefinite	Definite	Neuter	Indefinite	Definite	Neuter
ߝߊ	ߝߊ	ߝߊ	ߝߊ̀	ߝߊ̄̀	ߝߊ̀
ߝߊ߬	ߝߊ߭	ߝߊ߭	ߝߊ́	ߝߊ̄̌	ߝߊ̌
ߝߙߊ߫	ߝߙߊ	ߝߙߊ	ߝߊ̀ߙߊ̀	ߝߊ̀ߙߊ̄̀	ߝߊ̀ߙߊ̀
ߝߙߊ߬	ߝߊ߬ߙߊ	ߝߊ߬ߙߊ	ߝߊ́ߙߊ́	ߝߊ́ߙߊ̄̀	ߝߊ́ߙߊ̀

When the same common nouns above are changed into proper nouns the tones shift accordingly.

Proper Nouns in N’ko Maninkamory			Proper Nouns using N’ko Kakura		
Indefinite	Definite	Neuter	Indefinite	Definite	Neuter
ߝߊ߫	ߝߊ	ߝߊ߫	ߝߊ̏	ߝߊ̄̏	ߝߊ̏
ߝߊ߬	ߝߊ߭	ߝߊ߭	ߝߊ̋	ߝߊ̄̋	ߝߊ̌̋
ߝߙߊ߫	ߝߙߊ	ߝߙߊ߫	ߝߊ̀ߙߊ̏	ߝߊ̀ߙߊ̄̏	ߝߊ̀ߙߊ̏
ߝߙߊ߬	ߝߊ߬ߙߊ	ߝߊ߬ߙߊ߫	ߝߊ́ߙߊ̋	ߝߊ́ߙߊ̄̏	ߝߊ́ߙߊ̏

It is worth noting that in N’ko Maninkamory if two syllables use the same vowel/tone combination the first vowel is omitted (see bottom two rows in table above). In other words, for a word structured in the following way, $C_1V_1C_2V_2$ where V_1 equals V_2, the word is written as $C_1V_2V_1$. This rule is not used when writing with N’ko Kakura. Without this rule there is no need to make a notation for loan words that have intentional consonant clusters using the NKO LETTER DAGBASINNA (07D1). (See Elision11.2.5)

11.2.2 Tone and Accents

Bambara has 2 fundamental tones, high ◌̀ and low ◌́ and 3 accents, high ◌̀ , mid ◌̄ and low ◌́. These marks are the basis for more complex marks which are used to represent various grammatical features. The tables below outline the complete tone marking. These tables are from *Assike Filanan Nyeson*. [11].

1. **Substantiation ;** (l'étoile [*] veut dire que même si c'est ça, on ne fait pas comme ça par simplicité) :

[illegible] + [illegible] = [illegible] Lexical tones + high accent (for nominalization)	[illegible] = [illegible] [illegible] Lexical tones
[illegible] Hair	[illegible] Hair/ to put hair
[illegible] Age	[illegible] Age/ to pass the night
[illegible] Group	[illegible] Group/ to beat/ to group
[illegible]* / [illegible] Mountain	[illegible] Mountain/ to bubble

2. **Les formes de nom :**

= (Ø) [illegible] [illegible] **La forme indéfinie**	[illegible] =(¯) [illegible] (¯) + (̀) + (̀) **La forme définie**	[illegible] **Substantiation**	[illegible] **Lexème**
[illegible] Des cheveux	[illegible]* / [illegible] Les cheveux	[illegible] Cheveux	[illegible] Cheveux/ mettre les cheveux
[illegible] Un âge	[illegible] L'âge	[illegible] Âge	[illegible] Âge/ passer la nuit
[illegible] Un groupe	[illegible]* / [illegible] Le groupe	[illegible] Groupe	[illegible] Groupe/ battre/ grouper
[illegible] Une montagne	[illegible]* / [illegible] La montagne	[illegible] Montagne	[illegible] Montagne/ faire bulle
[illegible] Un assaisonnement	[illegible]* / [illegible] L'assaisonnement	[illegible] Assaisonnement	[illegible] Assaisonnement/ assaisonner
[illegible] Une écharpe	[illegible]* / [illegible] L 'écharpe	[illegible] Écharpe	[illegible] Écharpe/ mettre l'écharpe

3. Les formes de complément de nom :

[illegible] La forme indéfinie	[illegible] La forme définie	[illegible] Substantiation	[illegible] Nom+ nom
[illegible] Une maison en fer	[illegible] La maison en fer	[illegible] Maison en fer	[illegible] Fer + maison
[illegible] Un vélo	[illegible] Le vélo	[illegible] Vélo	[illegible] Fer + cheval
[illegible] Un fer de construction	[illegible] Le fer de construction	[illegible] Fer de construction	[illegible] Maison + fer
[illegible] Un fer de cheval	[illegible] Le fer de cheval	[illegible] Fer de cheval	[illegible] Cheval + fer

4. Pour former les verbes :

[illegible] / [illegible] Mettre des cheveux
[illegible] / * [illegible] Passer la nuit
[illegible] / * [illegible] Battre/ grouper
[illegible] / * [illegible] Faire des bulles
[illegible] / * [illegible] Assaisonner
[illegible] / * [illegible] Mettre l'écharpe

5. Pour marker les noms propres :

Common nouns	
Maman	L̉F
La maman	L̄F
Une maman	L̀F
Chèvre	ĽF
Une chèvre	ĹF
La chèvre	L̄̌F
Noms propres (avec une lettre capitale)	
-	L̉F*
Ba (nom d'une personne)	L̏F
Ba (nom d'une personne)	Ľ̌F
Ba (nom d'une personne)	L̋F
Ba (nom d'une personne)	L̂̀F
Ba (nom d'une personne)	Ľ̋F
Ba (nom d'une personne)	L̄̀F

The formation of compound tone marks depends on the underlying tone of a word or phrase and the grammatical context. The figure below demonstrates the rules for which compound tone mark if formed in different circumstances.

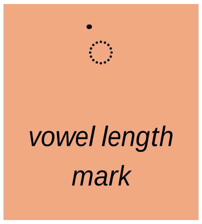
14

5) Les accents et les tons s'associent en quatre temps : le temps de la nominalisation, le temps de rendre un nom défini, le temps de l'adjonction des compléments de noms, et le temps de préfixation.

- Si le ton haut original s'associe à l'accent haut du substantif, ça donne deux hauts (̀ = ̏).
- Si le ton haut original s'associe à l'accent haut du substantif, accompagné de l'accent moyen du défini, ça donne deux hauts et un moyen (̀ = ̄ ̏).
- Si le ton haut original s'associe à l'accent haut du substantif et a l'accent haut du complément de nom, ça donne trois hauts (̀ = ̀̀̀).
- Si le ton haut original s'associe a l'accent haut du complément de nom et a l'accent moyen du défini, ça donne deux hauts et un moyen (̀ = ̄ ̏).
- Si le ton bas original s'associe à l'accent haut du substantif, ça donne deux bas-haut (̌ = ̌̌).
- Si le ton bas original s'associe à l'accent haut du substantif, accompagné de l'accent moyen du défini, ça donne bas-haut moyen (̌ = ̄ ̌).
- Si par l'effet du complément de nom le haut est devenu bas, c'est comme ça que ça sera marqué (̊); mais si le haut du complément de nom vient s'ajouter au ton haut original d'un mot polysyllabique, c'est comme ça que le début sera marqué (̀).
- Si par l'effet du complément de nom le bas est devenu haut, c'est comme ça que ça sera marqué (̊); mais si le haut du complément de nom vient s'ajouter au ton bas original d'un mot polysyllabique après un nom de ton bas, cela ne prendra qu'un haut comme ca (̀) à son début.

Figure 30: Rules for the application of compound tone marks [11]

11.2.3 Vowel Length Mark



The NKO COMBINING SHORT RISING TONE (07ED) has been repurposed to indicate vowel length. Bambara has three different vowel lengths, short, long and geminated. This mark is used to indicate long vowels. This is a change from N'ko Maninkamory where NKO COMBINING SHORT RISING TONE (07ED) indicated *both* a shortening of the vowel length and a rise in tone.

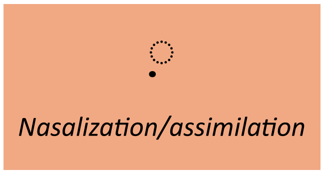
Non-nasalisées [illegible]							
ߐ ɔ	ߏ o	ߎ u	ߍ ɛ	ߌ i	ߋ e	ߊ a	[illegible] Les courtes voyelles
ߐ߭ ɔ:	ߏ߭ o:	ߎ߭ u:	ߍ߭ ɛ:	ߌ߭ i:	ߋ߭ e:	ߊ߭ a:	[illegible] Les longue voyelles
ߐߐ ɔɔ	ߏߏ oo	ߎߎ uu	ߍߍ ɛɛ	ߌߌ ii	ߋߋ ee	ߊߊ aa	[illegible] Les doubles voyelles

Figure 31: Table from "Assike Filanan Nyseon" demonstrating how non-nasal vowels are written with different lengths

Nasalisées [illegible]							
ߐ߲ ɔ̃	ߏ߲ õ	ߎ߲ ũ	ߍ߲ ɛ̃	ߌ߲ ĩ	ߋ߲ ẽ	ߊ߲ ã	[illegible] Les courtes voyelles
ߐ߲߭ ɔ̃:	ߏ߲߭ õ:	ߎ߲߭ ũ:	ߍ߲߭ ɛ̃:	ߌ߲߭ ĩ:	ߋ߲߭ ẽ:	ߊ߲߭ ã:	[illegible] Les longue voyelles
ߐߐ߲ ɔɔ̃	ߏߏ߲ oõ	ߎߎ߲ uũ	ߍߍ߲ ɛɛ̃	ߌߌ߲ iĩ	ߋߋ߲ eẽ	ߊߊ߲ aã	[illegible] Les doubles voyelles

Figure 32: Table from "Assike Filanan Nyseon" demonstrating how nasal vowels are written with different lengths. Note that nasalization mark (dot below) is placed only under the second vowel when doubled.

11.2.4 Assimilation



N’ko Maninkamory only allows for two specific cases of assimilation to be indicated. This is achieved by replacing ߟ NKO LETTER LA and ߦ NKO LETTER YA with ߧ NKO LETTER NA WOLOSO and ߨ NKO LETTER NYA WOLOSO, respectively, when they follow ߣ NKO LETTER NA or a nasalized vowel.

N’ko Kakura, however allows for assimilation to be indicated by expanding the role of the NKO COMBINING NASALIZATION MARK (07F2). When placed below a vowel, the mark indicates that the vowel is post-nasalized just as it does in N’ko Maninkamory. While this mark is never placed under a consonant in N’ko Maninkamory, in N’ko it can be placed under a consonant to indicate it has assimilated a neighboring sound. The following sample words show this usage.

Example:

ߞߎߡߎ߲ߦߊ – kumunya ߞߎߡߎ߲ߦ߲ߊ - kumunɲa

ߞߍ߲ߘߍߦߊ – kendeya ߞߍߣ߲ߘߍߦߊ - kenndeya

With this expanded use of the NKO COMBINING NASALIZATION MARK, NKO LETTER NA WOLOSO and NKO LETTER NYA WOLOSO are no longer used with this system.

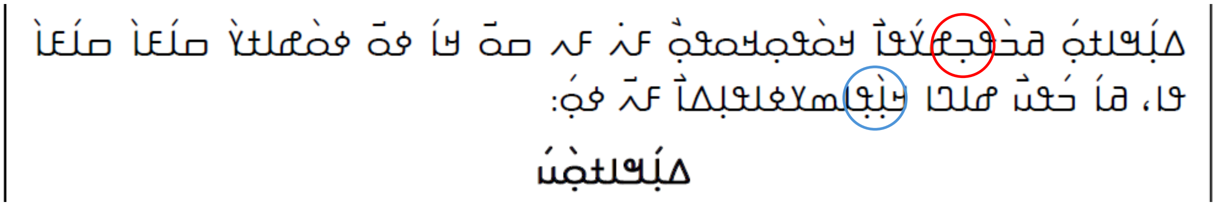


Figure 33: Sample of assimilation occurring between a ߊ and la ߟ (blue) and nasalization of o (red).

11.2.5 Elision

’	‘	'
high tone vowel syncope	*low tone vowel syncope*	*toneless vowel syncope*

N’ko Kakura includes three elision symbols. The first two are used when vowels are elided in tonal languages. During this process the omitted vowel is replaced with the appropriate symbol to indicate the tone of the omitted vowel. The HIGH TONE VOWEL SYNCOPE SYMBOL and LOW TONE VOWEL SYNCOPE SYMBOL are the like the NKO HIGH TONE APOSTROPHE (07F4) and NKO LOW TONE APOSTROPHE (07F5), however in N’ko Kakura these symbols have joining behavior. (See part 5.5 Script Connections) In *unconnected text*, the apostrophes in N’ko Maninkamory and the syncope symbols in N’ko Kakura system are indistinguishable. However, in *connected text* the LOW TONE SYNCOPE SYMBOL appears like the ߑ NKO LETTER DAGBASINNA (07D1). Discussion on shaping differences can be found in part 5.4 Modifiers.

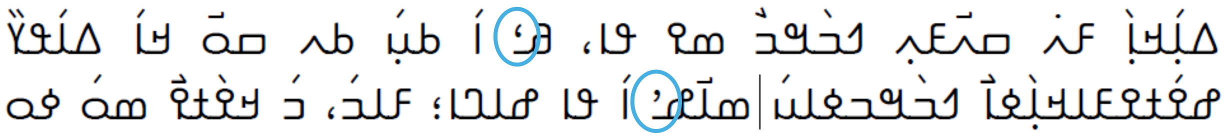
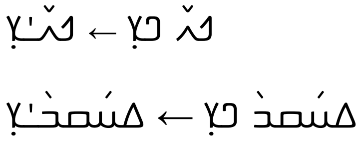


Figure 34: Sample of syncope marks in Bambara language text (blue circles)

The third symbol NKO APOSTROPHE is used for omitting consonants or vowels where tone is not a factor. Although this resembles and functions much like the APOSTROPHE (0027), this symbol has joining behavior which requires separate encoding. (See part 5.5 Script Connections) The following example shows the NKO APOSTROPHE being used to replace the consonant ߙ which has no underlying tone.



12. References

Source Materials:

1. *Bamanankan San Folo* (Topic: 1st grade language), Check B. Kante; Mamadou L. SISSOUMA and Abdoul Karim Sangare
2. *Bamanankan San Filanan* (Topic: 2nd grade language), Check B. Kante; Mamadou L. SISSOUMA and Abdoul Karim Sangare
3. *Language 1er Annee* (Topic: 1st grade language), Yaya Diarra
4. *Language 2eme Annee* (Topic: 2nd grade language), Yaya Diarra
5. *Couverture Math 2eme Année* (Topic: 2nd grade mathmatics), Mamadou L. Sissouma ; Check B. Kante ; Bakary Samake ; Abdoul K. Sangare
6. *Math Kakura (Modern Mathematics)*, Adama Coulibaly
7. *N'ko Bambara Writing* (Topic: Bamara Writing Rules), Dr. Boubacar Diakite
8. *N'ko Lakalanni* (Topic: Teaching N'ko), Adama Coulibaly
9. *Le 1er Module de l'enseignement du Nko-Bambara à l'université* (1st year Nko-Bambara module for universities), Fanafie Koro A. Coulibaly; Drissa Doumbia
10. *Assike Kakura1 (Advanced Nko)*. (2025) Dr. Boubacar Diakite
11. *Assike Filanan Nyeson, 2025*, Dr. Boubacar Diakite
12. *Bassiya Nyafoli (Traditional medicine explained)*, Youssouf Traore.
13. *La Spiritualité Africaine*. (2025), *Par Bah Karabenta*
14. *The Body_Nyesson (Human body functions)*, Dr. Boubacar Diakite
15. YouTube. (n.d.). *Nko Kakura Walada* [Video playlist]. YouTube. https://www.youtube.com/playlist?list=PLfLQgo6HBI_8TnEZSRUWN_6UzCUmGWorm
16. YouTube. (Jan 28, 2025). [N'ko ni faso kan L' amélioration en écriture Nko de Dr Boubacar Diakité] YouTube. N'ko ni faso kan L' amélioration en écriture Nko de Dr Boubacar Diakité]
17. YouTube. (Feb 13, 2025). *[N'ko ni Faso Kan avec Dr Boubacar DIAKITE 2è partie]*. YouTube. https://www.youtube.com/watch?v=na1_tlSNx_8
18. *NeBrai ߓߙߋ (Cuisine of Mali)*. (n.d.). YouTube channel. YouTube. Retrieved March 25, 2025, from https://www.youtube.com/@NeBrai-w2x
19. *2021 Calendar.* (2021) Ministère de la Refondation de l'Etat
20. *COVID-19 Bulletin. (2020)*, Institut National de Sante Publique
21. *Projet de Constitution (Constitution Project)*. (2023) Adama Coulibaly, Bambara translation Dr. Boubacar Diakite
22. *Dictionaire des mots administratifs*. (2023) Mohamed S. Coulibaly, Former State Refoundation Minister
23. *Lexique de travail (Work Wordlist).* (2023) Mohamed S. Coulibaly, Former State Refoundation Minister
24. *L'hierarchie des grades au mali. (2021)*

References:

25. Weidman, Scott & Rose, Sharon. (2008). A Foot-Based Reanalysis of Edge-in Tonal Phenomena in Bambara.
26. Valentin Vydrin. Tonal inflection in Mande languages: The cases of Bamana and Dan-Gwffffftaa. Palancar, Enrique L., Léonard, Jean Léo. Tone and Inflection: New facts and new perspectives, De Gruyter, pp.83-105, 2016, 978-3-11-045275-4.
27. Wikipedia Contributors. (n.d.). Help:IPA/French. In Wikipedia, The Free Encyclopedia. Retrieved February 12, 2025, from https://en.wikipedia.org/wiki/Help:IPA/French

28. "Décret n°2023-0401/PT-RM du 22 juillet 2023 portant promulgation de la Constitution" (PDF). *Journal officiel de la République du Mali*. 22 July 2023. Retrieved 19 December 2023.
29. Vydrin, V. (2020). Vowel elision and reduction in Bambara. *Italian Journal of Linguistics, 32*(1), 103-124. https://doi.org/10.26346/1120-2726-150

13. Appendices

A. Pictures from meetings with various African leaders to build support for N’ko Phonetic Extensions

Figure A-1: Administrators of the National Language Center in Cameroon during meeting to discuss the N’ko Phonetic Extensions.

Figure A-2: Dr. Diakite and Dr. Mugane meeting with African Kings to build support for N’ko Phonetic Extensions.

Figure A-3: Meeting with African Kings in Guinea to build support for N'ko Phonetic Extensions.

Figure A-4: King's meeting with Malian Minister in support of N'ko Phonetic Extensions

B. DECISION N°02/ML/PBC/CAB/N/23 of October 10, 2023 in support of the Nko-Phonetic Extensions system Nko-IPA writing and teaching within the CPATC.

CONSEIL PANAFRICAIN DES AUTORITES TRADITIONNELLES ET COUTUMIERES – CPATC

Paix – Unité – Développement

PANAFRICAN COUNCIL OF TRADITIONAL AND CUSTOMARY AUTHORITIES – PACTCA

Peace – Unity – Development

Contact : +229 63 07 39 71 ou +237 677 82 86 80 ou +223 91 15 11 12
Email : contact@pactna.org - Site Web : www.pactna.org

DÉCISION N°02/ML/PBC/CAB/N/23 du 10 Octobre 2023 portant soutien à l'écriture Nko-IPA et son enseignement au sein du CPATC.

Le Président du Bureau Continental

- Vu les Statuts du CPATC ;
- Vu les Résolutions de l'Assemblée Générale CPATC, du 10 au 12 septembre 2018, à Abidjan en Côte-d'Ivoire ;
- Vu les Recommandations de la Réunion du Bureau continental tenue les 11 et 12 janvier 2019, à Dahè au Bénin ;
- Vu les Résolutions de l'Assemblée Générale Extraordinaire du CPATC du 27 novembre 2021 tenue à Dahè au Bénin ;

Décide :

Article 1 : *Le CPATC* a décidé de soutenir les efforts des adeptes du Nko-IPA, allant dans le sens de généraliser l'écriture à toutes les langues africaines.

Article 2 : Dr Boubacar Diakité et son équipe sont chargés de l'initiation et de la formation du collège des rois souhaitant apprendre l'écriture et l'instituer dans leurs communautés.

Article 3 : Dr Diakité exercera cette tâche, cumulativement avec ses fonctions de Conseiller Spécial du Président du CPATC, dans le cadre des dispositions prévues par les textes règlementaires du CPATC et de la Convention citée supra.

Fait à Cotonou, le 10 octobre 2023

Ampliations :

1. Secrétariat Général
2. Autorités Nationales du Mali
3. Autorités Nationales de la Guinée
4. Intéressé
5. Archives/Chrono

CONSEIL PANAFRICAIN DES AUTORITES TRADITIONNELLES ET COUTUMIERES

Professeur Octave Cossi HOUDEGBE
(Majesté Dada AVIYAN KOKPON)
Roi de Dahè/ Président du CPATC

Accréditation N°210/MISP/DC/SGM/DAIC/SC/SA, République du Bénin
Siège social : Rue Université Houdegbe, 06 B.P. 2080 Cotonou
Réf. Bancaire : BJ067/01515/515100000367/64 – UBA PK10 Cotonou – SWIFT : COBBBJBJ

C. Letter from Dr. John Mugane, Director of the Harvard African Language Program (ALP) in support of N’ko Phonetic Extensions

HARVARD UNIVERSITY
DEPARTMENT OF AFRICAN AND AFRICAN AMERICAN STUDIES
Barker Center. 12 Quincy Street. Cambridge, Massachusetts 02138-3879

Tel. 617.495.4113
Fax. 617-496-2871

October 12, 2023

<u>To Whom This May Concern</u>

I, Dr. John Mugane, Director of the Harvard African Language Program (ALP), am pleased to note that Nko script, the most dynamic in West Africa, has reached an unparalleled level of implementation among the West Africans communities. I have been fortunate to invite, many times, the Nko leaders to the Harvard Conference on African Languages in the Disciplines and Professions (ALDP) and I have always been amazed and surprised by the progress of writing in West African countries. I worked with Dr. Boubacar Diakité, a linguist and Nko teacher, to develop the idea of making some African scripts usable at the same time for many languages on the continent. On this ground, Nko has a chance if it is improved as planned by the codification of the Nko-IPA.

In 2015, Dr. Diakité and I traveled to several African countries to promote the use of Nko as an international African script. To this end, we have garnered support from many African traditional leaders ready to take the idea to the African Union. I remember that some of the difficult questions, which were not addressed satisfactorily, were that the Nko script of the time did not have all the sounds and used a lot of diacritics to write unfamiliar sounds. I think that's where the idea of improving the script to allow it to write all the sounds correctly came about.

Therefore, I support this project and look forward to writing Gikuyu, my mother tongue, in the new international Nko.

Sincerely,

John Mugane, Director of African Languages Program
Harvard University, 1280 Mass Ave, 3rd Floor, Cambridge, MA 02138

D. L’enseignement Nko au Mali : Réalités, ambitions et perspectives, Dr. Boubacar Diakite, 2021

L’enseignement Nko au Mali : Réalités, ambitions et perspectives

Dr. Boubacar Diakité

L’invention de l’ecriture Nko

Nko est une écriture inventée par Solomana Kanté, suite à la publication par Gamal Marwa dans un journal ivoirien que « les langues africaines sont douces à écouter mais ne peuvent être transcrites ». Le jeune Kanté, qui a quitté son village, réputé pour son éducation religieuse, pour se lancer dans le commerce, a vite compris la nécessité de se consacrer à la recherche d'une solution pour écrire, de manière adéquate, les langues africaines. Dans un premier temps, il a essayé d'adapter l'écriture arabe à sa langue maternelle, le maninka, mais c'était très limité, surtout dans les trois dimensions de l'écriture: un système vocalique insuffisant (3 voyelles), un système consonantique qui manquait de sons importants de la langue mandingue. (p, ɲ, ŋ, v etc.), et le système tonal est complètement absent. Après trois ans de tests, l'écriture arabe a été abandonnée. Ce fut alors le tour de l'écriture latine. À son tour, elle n'a pas tardé à montrer ses faiblesses, notamment au niveau des signes diacritiques (ton et accent). Le ton est un élément essentiel de désambiguïsation en lecture et en compréhension. Au bout de quatre ans, Kante, insatisfait de l'écriture latine, renonce à essayer les écritures étrangères et se consacre à l'invention d'une écriture originale, adaptée à sa langue.

L’origine du nom Nko

Après avoir inventé l’écriture, Kanté a songé lui donner un nom rassembleur et générique car il avait constaté que les noms existants contiennent en eux même les germes de la division. C’est ainsi qu’il a évité les noms bases sur les ethnies comme Maninkakan, Bamanankan, Julakan et

Mandingokan, ceux basés sur les lieux tel que Segukakan, Wasolonkakan, Khasonkakan, Beledugukakan etc. A leurs places, il trouva un nom que Soundiata avait, à l'occasion, utilise lors de son discours solennel du grand rassemblement de Kurukanfuga en 1236 en ces termes : « Je m'adresse à vous qui dites ***Nko*** quand vous parlez … ». Une seconde raison liée a l'utilisation du nom **Nko** (je dis) est qu'il se distingue des autres noms de langue en ce sens qu'il est une phrase traductible dans toutes les langues africaines. Au vu de ce qui précède, le **Nko** est à la fois une écriture et une langue.

Le système de propagation de l'ecriture Nko

Nko a été inventé en Côte d'Ivoire, grandit au Mali et propagé en Guinée. Dès les premières heures de son invention, Kanté a compris que son nouveau-né sera confronté à double rejet de ceux qui sont sensé l'embrasser les premiers, notamment les deux catégories d'instruits de ses concitoyens : les arabophiles et les francophiles. Les premiers la rejetteront pour des raisons religieuses tel que « l'Arabe est la langue de la religion musulmane et ou les gens du paradis ne parle que l'arabe » ; les seconds la rejetteront pour des raisons de privilèges et de prestiges, car le français leur donne le privilège d'être fonctionnaire, entre autres, et le prestige d'être appelé 'instruit ou intellectuel'. A son entendement, ces deux couches l'adopteront uniquement, d'une part, quand les premiers verront qu'elle a été tolérée par les religieux d'autre cieux, d'où la traduction du Coran et Hadith en Nko dès les premières heures au risque d'être taxée d'une écriture a propension religieuse. Et d'autre part quand les second verront qu'il y'a des connaissances qu'eux ignorent malgré leur multiples diplômes et qualifications d'où l'écriture de nos histoires, tradition et médicine non-conventionnelle. Maintenant ceux qui n'ont aucune raison de la rejeter sont nos parents analphabètes. On les trouve généralement dans les marches et les mines, d'où l'envoi des premiers

élèves herboristes formés dans les marches et mines pour vendre les médicaments traditionnels, venter et enseigner le Nko en même temps. C’est ainsi que le Nko a pu gagner du terrain dans nos villes et campagnes.

La capacité du Nko à écrire les langues nationales

A l’origine, le Nko désignait un système d’écriture compose de 27 lettres, dont 7 voyelles et un neutre. Bien que l’intention ait été d’écrire toutes les langues africaines, Kanté avait tout naturellement commencé par son propre dialecte qui est le Maninkamorikan de Kankan en République de Guinée. D’autre professeurs du Nko, comme Karamogo Baba Diane, ont par extension, utilise les diacritiques existants, et autre fois utilisée par Kanté pour marquer les tons, pour représenter des sons non-existants dans le système Maninkamorikan. Le hic étant que les voyelles sont déjà chargées de diacritiques et s’il faut en ajouter autant aux consonnes, ça rendrait la lecture beaucoup plus difficile et confuse. Si pour Kanté des sons humains attestés manquaient, en revanche pour Diane, il y’avait une possibilité effrénée de transcrire l’impossible. Pour ce dernier, le nombre de syllabe qu’il prétend pouvoir écrire dépasserait les possibles sons que l’humain pourrait physiologiquement produire de sorte qu’il n’y avait d’incohérence entre la transcription et les sons. N’étant pas linguistes de formation, tous les deux avaient produit des systèmes fort perfectibles. Ce que Dr. Diakité à tenter de faire, au terme de sa thèse intitule : *Quelques aspects de la phonologie tonale de Nko*.

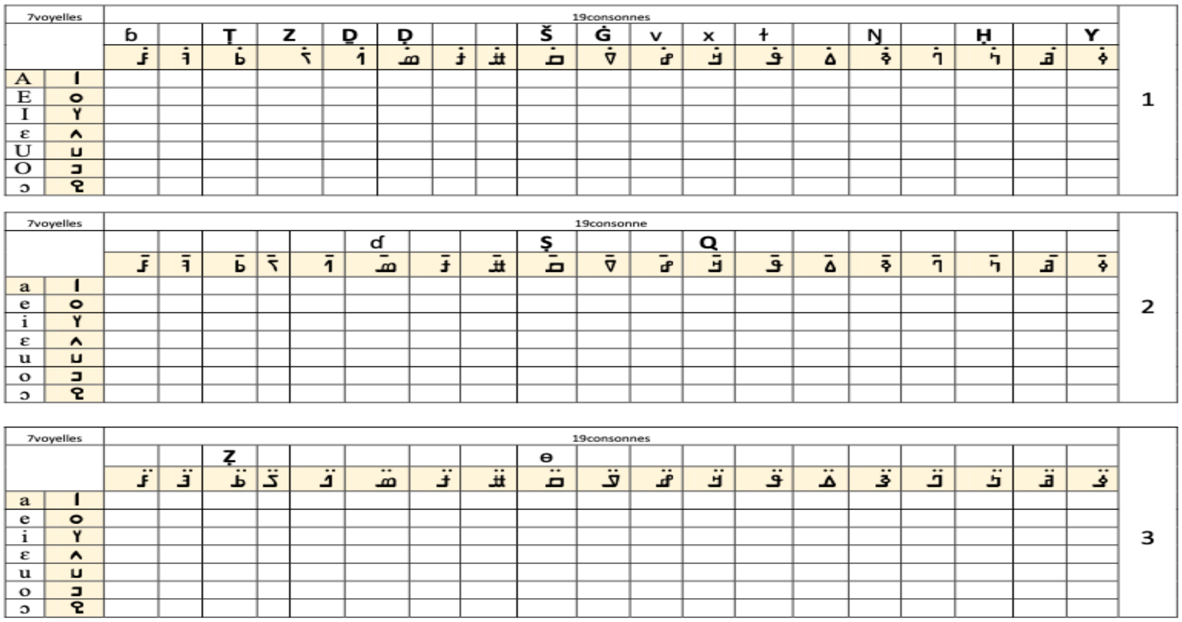
À l'origine, Nko faisait référence à un système d'écriture composé de 27 lettres, dont 7 voyelles et une neutre. Bien que l'intention ait été d'écrire toutes les langues africaines, Kanté a naturellement commencé avec son propre dialecte qui est le Maninkamorikan de Kankan en République de Guinée. D'autres professeurs de Nko, comme Karamogo Baba Diane, ont par extension, utilisé des signes diacritiques existants, et à d'autres moments utilisés par Kanté pour marquer les tons, pour

représenter des sons inexistants dans le système Maninkamorikan. Le hic, c'est que les voyelles sont déjà chargées de diacritiques et que son ajout a un grand nombre de consonnes rendrait la lecture beaucoup plus difficile et déroutante. Si pour Kanté les sons humains attestés faisaient défaut, en revanche pour Diane, il y avait une possibilité effrénée de retranscrire l'impossible. Pour ce dernier, le nombre de syllabes qu'il prétend pouvoir écrire dépasserait les sons que les humains pourraient possiblement produire physiologiquement, alimentant les possibilités d’une incohérence entre la transcription et les sons. N'étant pas linguistes de formation, tous deux avaient produit des systèmes très perfectibles. Ce que Dr. Diakité essaya de faire, à l'issue de sa thèse intitulée : *Quelques aspects de la phonologie tonale de Nko.*

Le système consonantique Nko de Kanté :

	Labial	Labio-Dental	Alveolar	Palato-Alveolar	Palatal	Velar	Velo-labial	Glottal
Nasal	m ߡ		n ߣ		ɲ ߧ	ŋ		
Stop	p b ߔ ߓ		t d ߕ ߘ	c ɟ ߗ ߖ		k g ߞ	gb ߜ	
Fricative		f v ߝ	s z ߛ	ʃ				h ߤ
Affricate				ʧ ʤ				
Approximant	w ߥ				j ߦ			
Liquid			l, r ߟ ߙ					

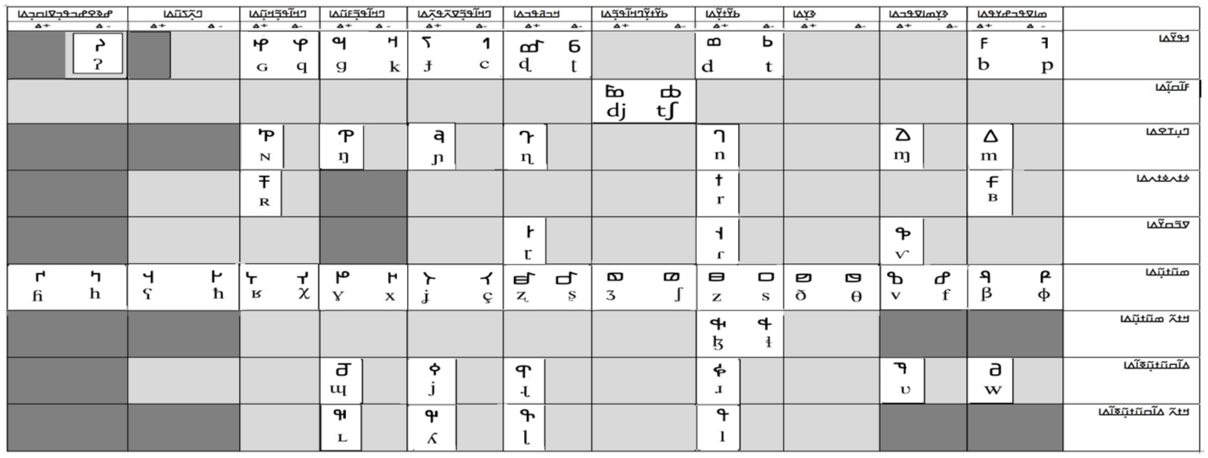
Le système consonantique Nko de Diane :



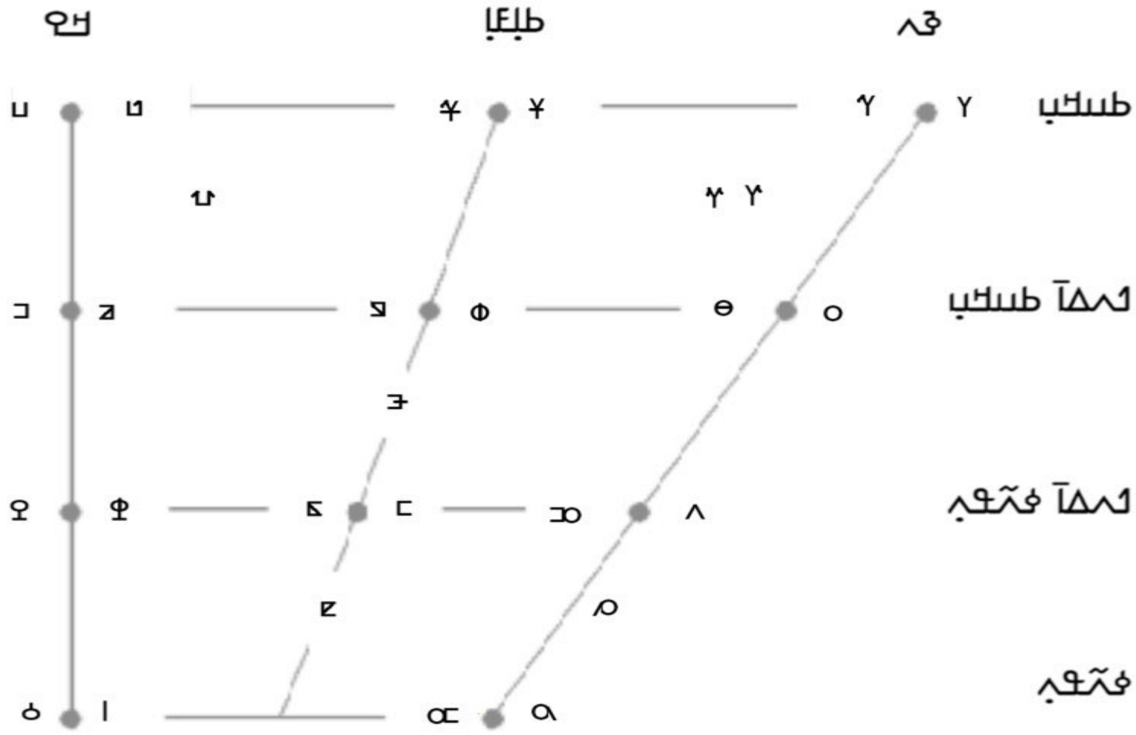
Sur les voyelles, Kanté et Diane se sont limités à sept (7) alors que pour transcrire les langues africaines, il faut seize (16) des (28) de l'Alphabet Phonétique International (IPA). Si nous nous en tenons au système de Diane, nous pourrions avoir plusieurs signes diacritiques sur la même consonne.

Diakité, se référant au système Kanté et s'inspirant du système IPA, a pu concevoir un système complet prenant en compte les sons attestés et ceux qui peuvent être éventuellement produits par l'homme. C'est ce système qui sert à transcrire toutes les langues du monde comme le latin IPA.

Système Consonantique Nko de Diakité :



Système vocalique Nko de Diakité :



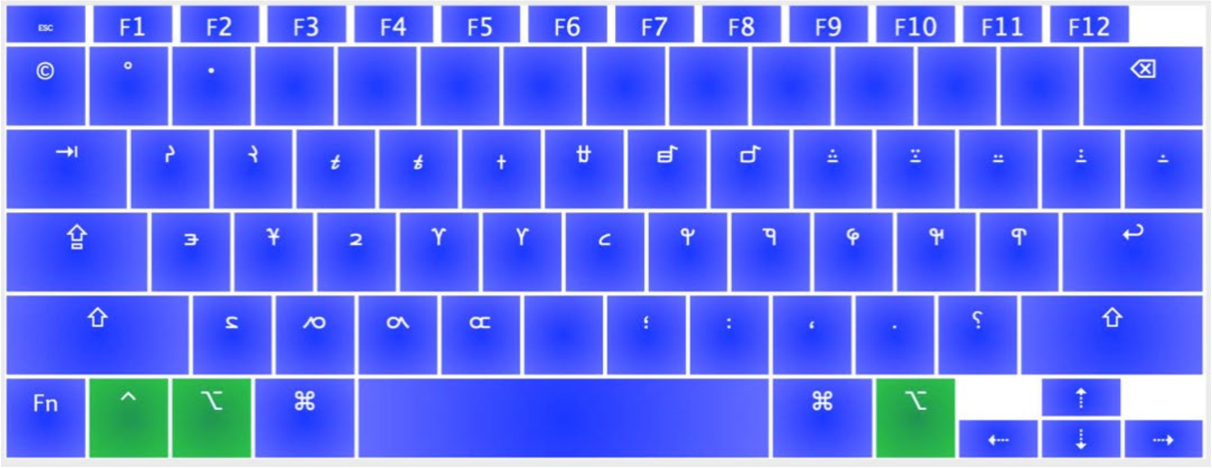
Aspects technologiques de l'écriture Nko

Le Nko tel que conçu par Kanté et Diane est déjà intégré au système Unicode qui permet à tous les outils informatiques (ordinateur, téléphone portable, tablettes) de toutes les plates-formes (IOS,

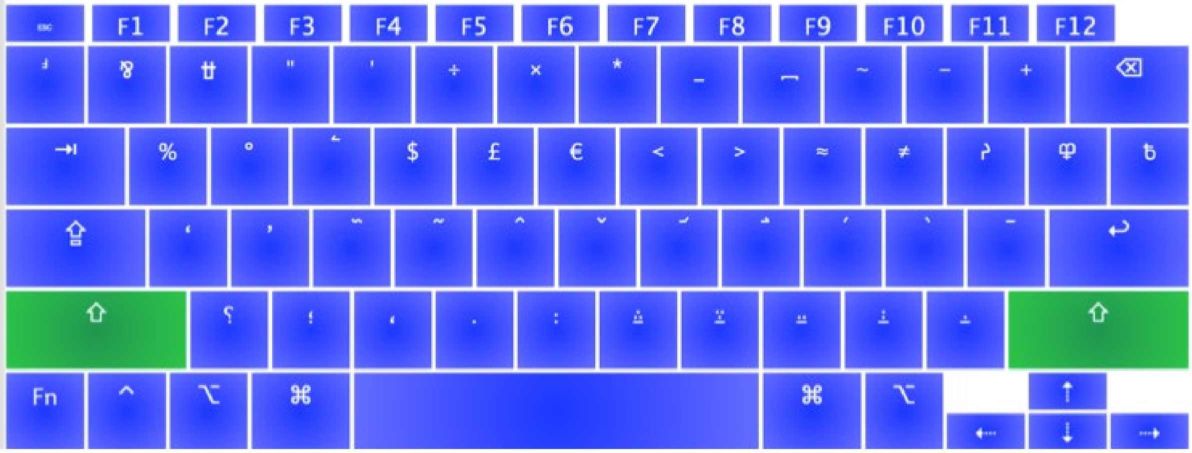
Android et Open Source) d'utiliser le script Nko pour le traitement d’Imput et de Output (Entrée et Sortie). En revanche, celui de Diakité est en phase d'introduction dans le système Unicode. Néanmoins, les polices et les claviers pour les langues maliennes sont déjà opérationnels. C'est ainsi qu'un alphabet commun pour les langues nationales du Mali est créé, suivi d'alphabets dérivés pour chacune de nos langues et la liste est ouverte.

Clavier pour Nko Phonétique International :

esc
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12
Fn


esc
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12
Fn

Clavier Commun pour les langues du Mali :



Clavier dérivé Soninke:

Clavier dérivé Songhoi:

Clavier dérivé Fulfulde:

Conclusion:

Les langues africaines, à travers Nko, sont désormais dotées d'un système d'écriture universel. Il appartient à ceux qui sont au pouvoir aux niveaux national et continental d'adopter une stratégie d'inaliénation de nos langues ; en particulier dans les domaines de la connaissance, de l'information, de la communication, de la science et de la technologie. Cette stratégie consiste à adopter une écriture qui intègre tous les peuples africains. À ce jour, seul le Nko peut le faire et il a déjà fait ses preuves en publiant, continuellement, des centaines de livres par an. La politique et la planification linguistiques relèvent de la responsabilité des gouvernements. Et, il est important de noter que l'origine de l'Écriture est l'Afrique et que les autres continents se sont dotés de systèmes d'écriture qui renforcent leur intégration, affirment leurs identités et confirment leur souveraineté. La question de la langue et de l’écriture est avant tout une question de souveraineté.

MERCI.

ISO/IEC JTC 1/SC 2/WG 2

PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646[1]
Please fill all the sections A, B and C below.

Please read Principles and Procedures Document (P & P) from http://std.dkuug.dk/JTC1/SC2/WG2/docs/principles.html **for guidelines and details before filling this form.**

Please ensure you are using the latest Form from http://std.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html.

See also http://std.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html **for latest *Roadmaps*.**

A. Administrative

1. **Title:** ***Revised Proposal to Encode N'ko Phonetic Extensions for Malian Languages***
2. Requester's name: *Boubacar Diakite, Neil Patel*
3. Requester type (Member body/Liaison/Individual contribution): *Individual Contribution*
4. Submission date: *3/22/2025*
5. Requester's reference (if applicable):
6. Choose one of the following:
   - This is a complete proposal:
   - (or) More information will be provided later: *X*

B. Technical – General

1. Choose one of the following:
   - a. This proposal is for a new script (set of characters): *No*
     - Proposed name of script:
   - b. The proposal is for addition of character(s) to an existing block: *No*
     - Name of the existing block: *New block: N'ko Extensions*
2. Number of characters in proposal: *28*
3. Proposed category (select one from below - see section 2.2 of P&P document):
   - A-Contemporary *X*
   - B.1-Specialized (small collection)
   - B.2-Specialized (large collection)
   - C-Major extinct
   - D-Attested extinct
   - E-Minor extinct
   - F-Archaic Hieroglyphic or Ideographic
   - G-Obscure or questionable usage symbols
4. Is a repertoire including character names provided? *Yes*
   - a. If YES, are the names in accordance with the "character naming guidelines" in Annex L of P&P document? *Yes*
   - b. Are the character shapes attached in a legible form suitable for review? *Yes*
5. Fonts related:
   - a. Who will provide the appropriate computerized font to the Project Editor of 10646 for publishing the standard? *JamraPatel*
   - b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.):
6. References:
   - a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided? *Yes*
   - b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached? *Yes*
7. Special encoding issues:
   - Does the proposal address other aspects of character data processing (if applicable) such as input, presentation, sorting, searching, indexing, transliteration etc. (if yes please enclose information)?
8. Additional Information:

Submitters are invited to provide any additional information about Properties of the proposed Character(s) or Script that will assist in correct understanding of and correct linguistic processing of the proposed character(s) or script. Examples of such properties are: Casing information, Numeric information, Currency information, Display behaviour information such as line breaks, widths etc., Combining behaviour, Spacing behaviour, Directional behaviour, Default Collation behaviour, relevance in Mark Up contexts, Compatibility equivalence and other Unicode normalization related information. See the Unicode standard at http://www.unicode.org for such information on other scripts. Also see Unicode Character Database (http://www.unicode.org/reports/tr44/) and associated Unicode Technical Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode Standard.

---

[1] Form number: N4502-F (Original 1994-10-14; Revised 1995-01, 1995-04, 1996-04, 1996-08, 1999-03, 2001-05, 2001-09, 2003-11, 2005-01, 2005-09, 2005-10, 2007-03, 2008-05, 2009-11, 2011-03, 2012-01)

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before? *Yes*
   If YES explain *Preliminary proposal was review in Jan 2024 and March 7 2025. This is a revision*
2. Has contact been made to members of the user community (for example: National Body, user groups of the script or characters, other experts, etc.)? *Yes*
   If YES, with whom? *University of Bamako*
   If YES, available relevant documents: *Section 13: Appendices*
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included? *Yes*
   Reference: *Enclosed*
4. The context of use for the proposed characters (type of use; common or rare) *common*
   Reference:
5. Are the proposed characters in current use by the user community? Yes
   If YES, where? Reference: *Enclosed*
6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP? *No*
   If YES, is a rationale provided?
   If YES, reference:
7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)? *No*
8. Can any of the proposed characters be considered a presentation form of an existing character or character sequence? *No*
   If YES, is a rationale for its inclusion provided?
   If YES, reference:
9. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters? *No*
   If YES, is a rationale for its inclusion provided?
   If YES, reference:
10. Can any of the proposed character(s) be considered to be similar (in appearance or function) to, or could be confused with, an existing character? *Yes*
    If YES, is a rationale for its inclusion provided? *Yes*
    If YES, reference: *Section 5: Structure. Part 5.4: Modifiers*
11. Does the proposal include use of combining characters and/or use of composite sequences? *Yes*
    If YES, is a rationale for such use provided? *Yes*
    If YES, reference: *Section 5.3: Diacritics*
    Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided?
    If YES, reference:
12. Does the proposal contain characters with any special properties such as control function or similar semantics?
    If YES, describe in detail (include attachment if necessary) *No*
13. Does the proposal contain any Ideographic compatibility characters? *No*
    If YES, are the equivalent corresponding unified ideographic characters identified?
    If YES, reference: