

Proposal to Encode Bima Characters in the UCS

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1. Introduction

The Bima script was used historically in West Nusa Tenggara, Indonesia for writing *nggahi mbojo* (ꦒꦲꦶꦩꦧꦺ) or Bimanese (ISO 639-3: bhp), a Malayo-Polynesian language currently spoken by approximately 800.000 people.

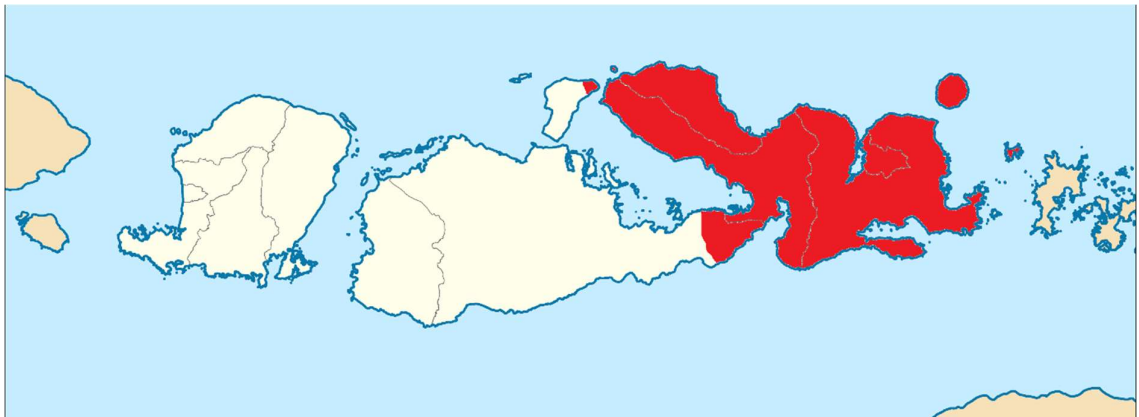


Figure 1: The Map of West Nusa Tenggara province. The red-colored area indicates the area of the Bima language speaker. (Source:

https://commons.wikimedia.org/wiki/File:Indonesia_West_Nusa_Tenggara_location_map.svg)










































The script was maintained for official purposes in the sultanate of Bima until 20th century. It was used for writing several historical accounts, such as genealogical records (fig. 6), king's diary, religious and history text (fig. 7), etc. After the independence of Indonesia, interest in the script revived among the Bimanese people. Today, the Bima City government made this script a compulsory subject in primary and secondary schools. It should be noted however that the modern Bimanese communities use the Latin alphabet for most everyday purposes. The modern use of this script is still limited to short examples in instructional materials (fig. 9), glosses in the tri-scriptural street signs (fig. 11), and decorative elements such as calligraphies (fig. 8).

2. Proposal History

- ※ [Indonesian and Philippine Scripts and Extensions](#) – C. Miller
- ※ **L2/16-075** [Proposal to encode VIRAMA signs for Buginese](#) – A. Pandey
- ※ **L2/16-119** [Representing Bima in Unicode](#) – A. Pandey
- ※ **L2/16-159** [Preliminary proposal to encode 'Buginese Extensions' in Unicode](#) – A. Pandey

3. Comparison of Bima and Buginese repertoires


































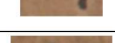




























Several letters are shared between Bima and Buginese, but there are differences in the forms and values of letters, as well as letters used in Bima for sounds that are not represented in the standard Buginese script. A comparison is shown below, using Buginese as the basis for comparison as it is already encoded in Unicode.

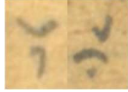

Character name	Bugis		Bima			
	EAP 988/1/10	glyph	EAP 988/1/4	EAP 988/1/29	EAP 988/1/145	glyph
Ka		//				//
Ga		~				~ ¹
Nga		人				人
Ca		~				~
Ja		~				~
Nya		≈				≈
Ta		^				^
Da		∨				∨ ²
Na		^				^
Ba		人				人 ³
Pa		~				~

¹ Also read as /^hg/ in Bima

² Also read as /^hd/ and /d/ in Bima

³ Also read as /b/ and /^mb/ in Bima



Ma		∨				∨
Ya		≈				x
Ra		≈				≈
La		≈				≈
Wa		≈				≈
Sa		◊				◊
Ha		∞				≈
A		≈				≈
Nyca		≈				≈
Mpa		≈				≈
-i		◊				◊
-u		◊				◊
-e		◊				◊
-o		◊				◊
Fa						≈
Nta						≈
Reduplication						∨
Gemination						◊









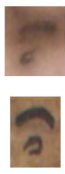













Killer						
Pallawa						:

4. Script Details

The Bima script is basically Bugis script with a few modifications or additional characters to suit the Bima language. Therefore, the basic rules and structure of Bima is also like that of Buginese.


4.1. Killer sign

Like another killer sign, the  KILLER SIGN is used to omit the inherent vowel of the letters. This sign does not produce conjuncts. This sign seems to be inspired by  ARABIC SUKUN. However, this sign is not always above the letter. Scriptwriters often put it below the letters and/or change it shape. Scriptwriters also even mixed the two in one manuscript. The table below shows the KILLER SIGN variations.

letters						
variations						
letters						
variations						

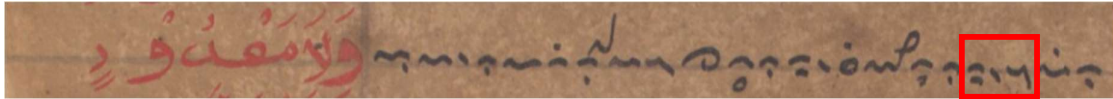
These variations can be handled at the font level, so they don't need to be encoded separately.

4.2. Consonant reduplication

The  REDUPLICATION SIGN is used for reduplicating the onset consonant of the previous syllable in a word. Its usage is based upon a convention opposite that of the doubling of vowel signs for the abbreviation of syllables. As there is no sign or other means for marking the inherent vowel of a consonant, it is not possible to abbreviate two contiguous syllables consisting of identical consonants by doubling their vowel signs. This applies solely to cases where the onset consonant and the consonant of the following syllable are identical. In such a case, the consonant following

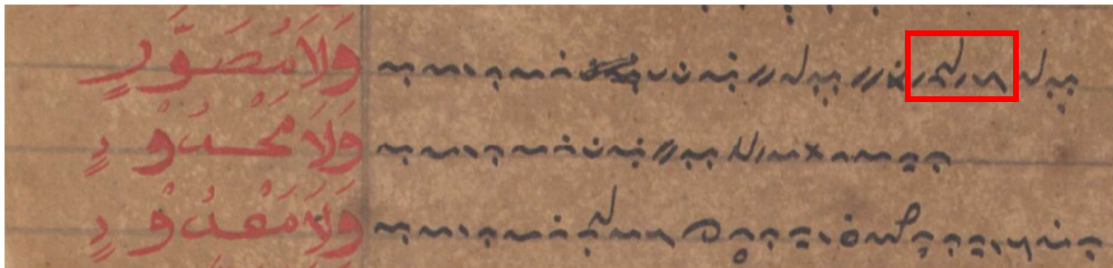
the onset is replaced with the REDUPLICATION SIGN.

The usage of REDUPLICATION SIGN is illustrated in the following examples. The boxed text in the excerpt below is rara , which is the syllable ra < ra RA, o VOWEL SIGN O> followed by ra REDUPLICATION SIGN:



This text is to be read as rara *rora*. As shown, the REDUPLICATION SIGN reduplicates the onset consonant RA of the previous syllable *ra*, but does not carry the accompanying vowel *o*; it retains the inherent vowel *a*.

The REDUPLICATION SIGN may also serve as a vowel carrier, as shown below. The boxed text shows bebe , which is the syllable be followed by an e REDUPLICATION SIGN carrying the e VOWEL SIGN E.



This text is to be read as bebe *bebe*.









The usage of REDUPLICATION SIGN is based upon the practice of using the digit '2' as a mark of repetition. The form of REDUPLICATION SIGN is derived from U+A9CF JAVANESE PANGRANGKEP, which is itself based upon U+0662 ARABIC-INDIC DIGIT TWO. A similar system of syllable reduplication is used in Buginese. However, a separate REDUPLICATION SIGN-type character has not been encoded for Buginese and the Unicode standard states that the Javanese PANGRANGKEP is to be used. As pairs of base letters and combining vowel signs belonging to different script blocks may complicate rendering, syllable identification, collation, and other processing, it may not be practical to use Javanese PANGRANGKEP as a base letter in Bima script contexts. For this reason, the REDUPLICATION SIGN is proposed for encoding as a separate character.

5. Approach for encoding


The 'Buginese' block contains 30 characters: 23 consonant letters, 5 vowel signs, and 2 punctuation signs. Representing Bima in Unicode requires 31 characters: 23 letters, 4 combining vowel signs, a killer sign, a reduplication sign, a gemination sign and a punctuation sign. Of these letters, 5 are

distinctive, while 18 can be represented using existing Buginese characters. Of the vowel signs, 2 are identical, 2 are alternate forms, and 1 does not occur in Bima. The following actions are required:

a. Encode the following Bima characters in ‘Buginese Extensions’.

U+16EA0		BUGINESE LETTER YA BIMA
U+16EA1		BUGINESE LETTER LA BIMA
U+16EA2		BUGINESE LETTER NCA BIMA
U+16EA3		BUGINESE LETTER NTA BIMA
U+16EA4		BUGINESE LETTER FA BIMA
U+16EA5		BUGINESE REDUPLICATION SIGN
U+16EA6		BUGINESE GEMINATION SIGN
U+16EA7		BUGINESE KILLER SIGN

b. Add the following annotation to the names list for the ‘Buginese’ block:

1A10  BUGINESE LETTER YA
 • used in Bima for /h/

6. Character data

UnicodeData.txt

```
16EA0;BUGINESE LETTER YA BIMA;Lo;0;L;;;;N;;;;;
16EA1;BUGINESE LETTER LA BIMA;Lo;0;L;;;;N;;;;;
16EA2;BUGINESE LETTER NCA BIMA;Lo;0;L;;;;N;;;;;
16EA3;BUGINESE LETTER NTA BIMA;Lo;0;L;;;;N;;;;;
16EA4;BUGINESE LETTER FA BIMA;Lo;0;L;;;;N;;;;;
16EA5;BUGINESE REDUPLICATION SIGN;Lo;0;L;;;;N;;;;;
16EA6;BUGINESE GEMINATION SIGN;Mn;0;NSM;;;;N;;;;;
16EA7;BUGINESE KILLER SIGN;Mn;9;NSM;;;;N;;;;;
```

Bibliography

[Sensus Penduduk] Jumlah Penduduk Nusa Tenggara Barat Menurut Kabupaten/Kota dan Jenis Kelamin (Jiwa), 2010-2020. (2022, May 15). Retrieved from Badan Pusat Statistik Nusa Tenggara Barat: <https://ntb.bps.go.id/indicator/12/348/1/-sensus-penduduk-jumlah-penduduk-nusa-tenggara-barat-menurut-kabupaten-kota-dan-jenis-kelamin.html>

Holle, K. F. 1882. *Tabel van Oud- en Nieuw- Indische Alphetten*. Bijdrage tot de palaeographie van Nederlandsch-Indië. Batavia: W. Bruining & Co.; 's Hage: M. Nijhoff.

Zollinger, H. (1851). *Verslag van eene reis naar Bima en Soembawa, en naar eenige plaatsen op Celebes, Saleijer en Floris, gedurende de maanden Mei tot December 1847*. Batavia: Bataviaasch Genootschap van Kunsten en Wetenschappen.

Source of Manuscripts

Object	Documentation/Current Location	Ref. number	Place of origin
Paper	BL EAP	EAP988/1/4	Samparaja Museum, Bima, Indonesia
Paper	BL EAP	EAP988/1/29	Samparaja Museum, Bima, Indonesia
Paper	BL EAP	EAP988/1/145	Samparaja Museum, Bima, Indonesia
Paper	BL EAP	EAP988/1/10	Samparaja Museum, Bima, Indonesia

Documentation

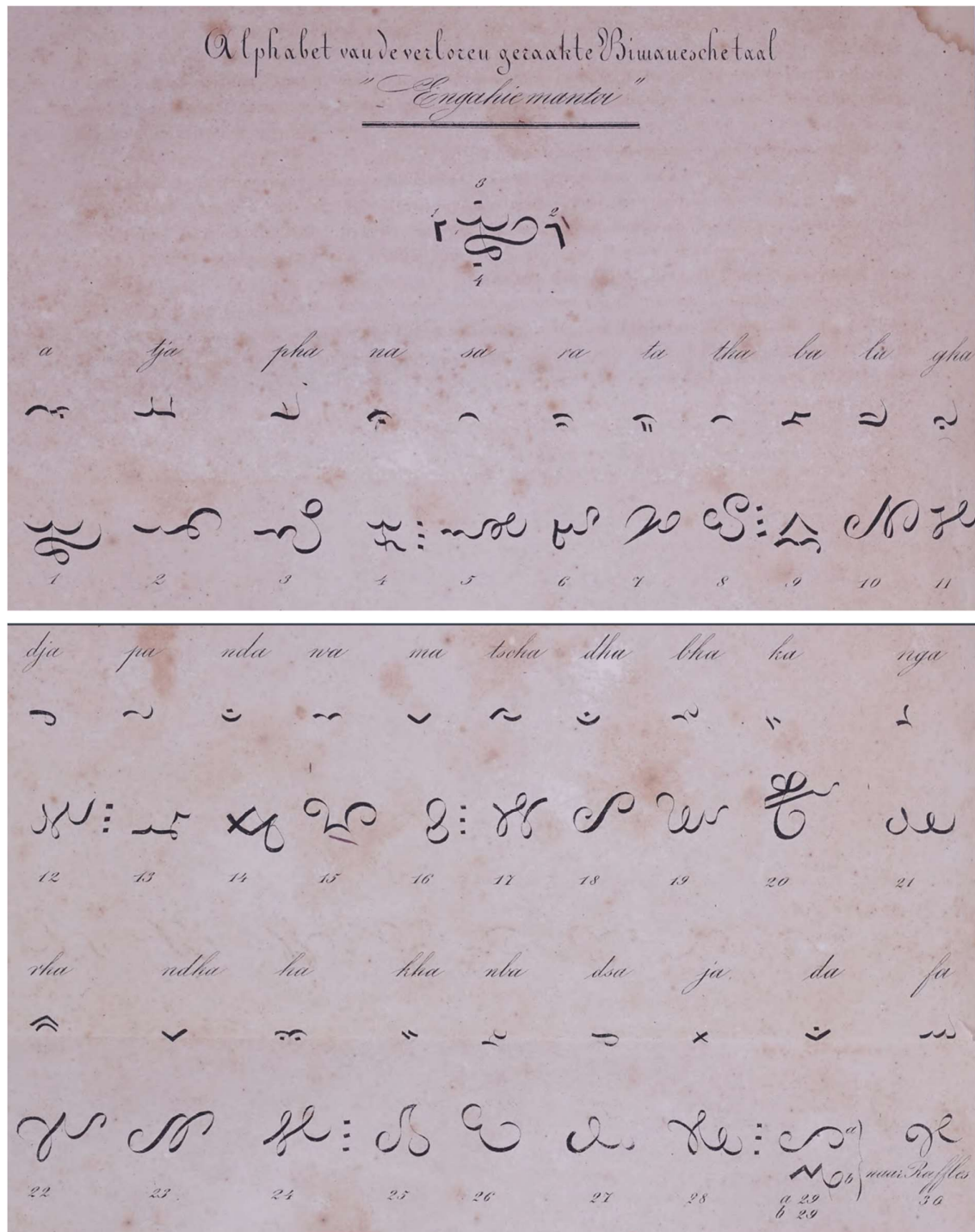


Figure 2: Bima characters in Zollinger (1851:134).

Noted that LETTER NCA mistakenly identified as TJA (CA) and TA as THA.

Volgorde der Letters	SUMATRA							F. [CELEBES]				G. [BIMA]			H. J. BOR. PHILIP. NEOPIJNEN	
	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142
	Pasemah	Redjang, Ommelanden Bengkoele		Kroeing	Man- deling	Ang- kola	Toba	Daeng	Makassar	Boegis	Oud Makass. Alph. volgens Matthes Raffles	Oud in onbruik geraakt Alph. volgens Friedrich Raffles		Jer. Alph. Lanten Marta- pura		
K																
K _H	ngka															
G	kan															
G _H	ngga															
N _G																
-N _G																
T _J																
T _{J_H}	ngja															
D _J																
D _{J_H}	ndja															
N _J																
Ṫ																
Ṫ _H																
Ḋ																
Ḋ _H																
Ṅ																
T																
T _H	nta															
D																

Figure 3: Chart showing scripts from "Bima" (from Holle 1882: 11). Columns 138 show the Bima script. The column showing transliteration ("Volgorde der Letters") has been stitched from the previous page in Holle. Noted that LETTER NCA mistakenly identified as TJA (CA) and TA as THA.

Volgorde der Letters	E. [SUMATRA]						F. [CELEBES]				G. [BIMA]			H. J. BORPHILIP NEOLINEN		
	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142
	Pase- mah	Redjang Omme- Lunden Beng- Koeleu	Man- deling Kroemg	Ang- kola	Toba Daer			Makassar	Bogga	Oud. Makass. Alph. volgens Matthes	Raffles	Oud in onbruik geraakt Alph. volgens Friedrich	Raffles			
D _H												ndha				
N																
P	n =															
P _H	mpa							mpa								
B																
B _H	mba															
M												nb				
I																
-J																
R																
-R																
-R																
L																
V																
C																
S _J																
S _H																
H																
-H																

Figure 4: Chart showing scripts from "Bima" (from Holle 1882: 11). Columns 138 show the Bima script.

Volgorde der Letters	A T R A]					F. [CELEBES]				G. [B I M A]			H. BORNEO	J. PHILIPPINEN
	129	130	131	132	133	134	135	136	137	138	139	140	141	142
	jang. Kroening	Man- deling	Angkola	Toba	Daer	Makassar	Boegis	Ond Makassar volgens Matthes	Alph. Raffles	Ond in onbruik geraakt volgens Friedrich	Alph. Raffles		Jav. Alph. op balken kraton, Martapoera	
D J N J														
Rě													ŕ	
Lě														
A		~	~	~	~	~	~	~	~	~	~	~		
-a														
E														
e_		-	-	-	-	-	-	-	-			~	~	
ai														
I		~	~	~	~									
-i		^	o	o	o	o	o	o	o			-	o	o
-î														
0														
-0		x	x	x	x	x	x	x	x			~	~	~
0e		~	~	~	~									
-oe		~	~	~	~	~	~	~	~			-	~	
-oè														
Ē														
-ēr														
Klinkerdooder (Paten)		o	o	o	o	o	o	o	o				o	

Figure 5: Chart showing scripts from "Bima" (from Holle 1882: 11). Columns 138 show the Bima script.

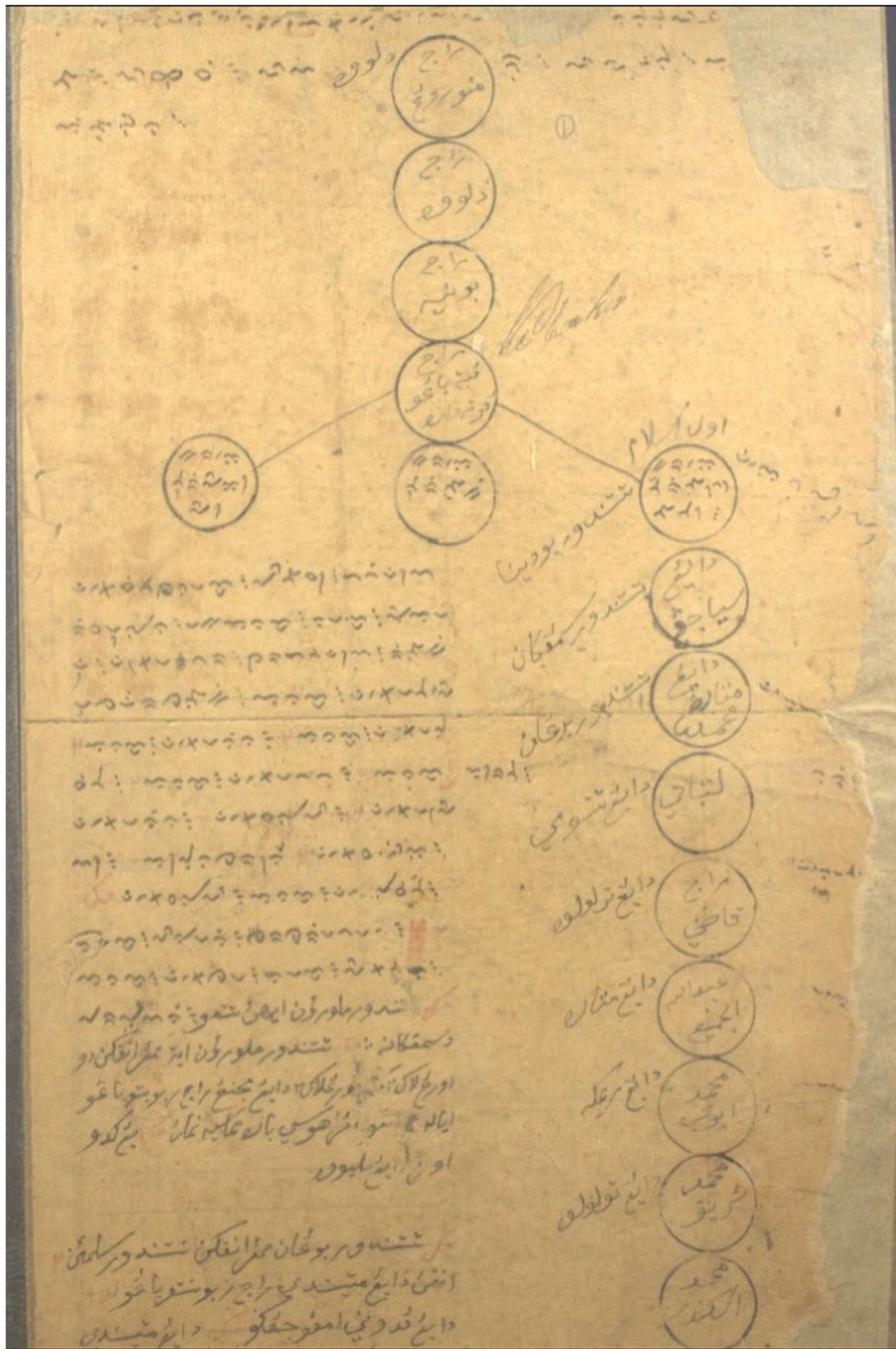


Figure 6: Excerpt from a handwritten genealogical record in the Buginese, Bima, and Jawi script ([EAP988/1/145](#)).

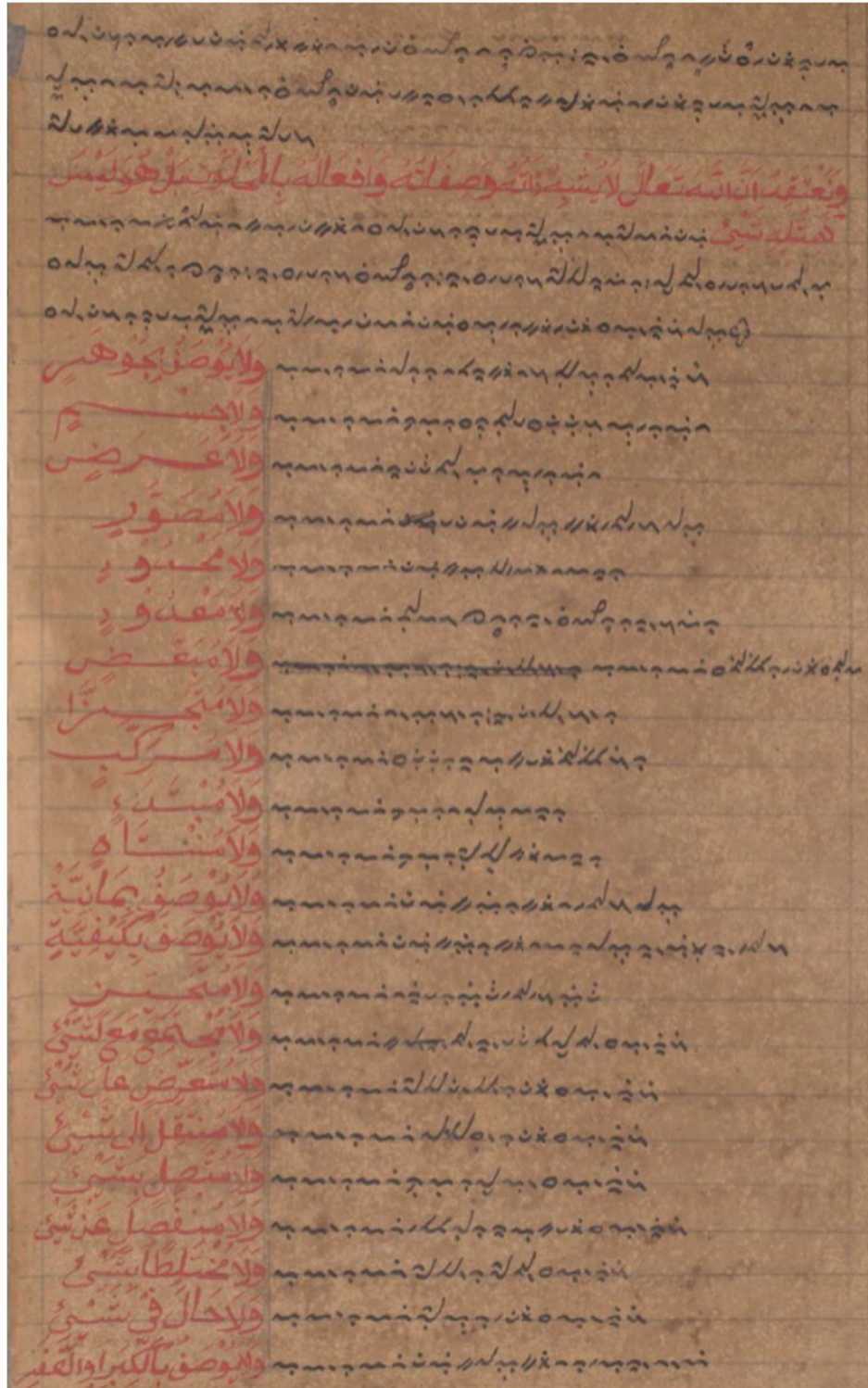


Figure 7: Excerpt from a handwritten religious book in the Bima and Arabic script ([EAP988/1/29](#)).



Figure 8: Calligraphy in Bima script. Source: <https://t.co/hWlyjlvRbM>



Figure 9: Bima script class at elementary school. Source: <https://t.co/1MsBqGx46b>



Figure 10: A Bimanese proverb in Bima and Latin script. Source: <https://t.co/6MuYvIMwld>



Figure 11: The tri-scriptural street signs in Bima city. Source: <https://t.co/vwkg30GZ2d>

ISO/IEC JTC 1/SC 2/WG 2

PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646⁴.

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:	Proposal to Encode Bima Characters in the UCS	
2. Requester's name:	Febri Muhammad Nasrullah	
3. Requester type (Member body/Liaison/Individual contribution):	Individual contribution	
4. Submission date:	15 May 2022	
5. Requester's reference (if applicable):		
6. Choose one of the following:		
This is a complete proposal:	Yes	
(or) More information will be provided later:		

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:	Yes	
Name of the existing block:	Buginese Supplement	
2. Number of characters in proposal:	8	
3. Proposed category (select one from below - see section 2.2 of P&P document):		
A-Contemporary	B.1-Specialized (small collection)	<input checked="" type="checkbox"/> 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?	Aditya Bayu Perdana	

⁴Form 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)

b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.):	
Aditya Bayu Perdana, OFL	
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)?	Yes
8. Additional Information:	
<p>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.</p>	

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before?	No
If YES explain	
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.)?	No
If YES, with whom?	
If YES, available relevant documents:	
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included?	Yes
Reference:	This document
4. The context of use for the proposed characters (type of use; common or rare)	Common
Reference:	This document
5. Are the proposed characters in current use by the user community?	Yes
If YES, where? Reference:	This document
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?		
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:		This document
11. Does the proposal include use of combining characters and/or use of composite sequences?		
		No
If YES, is a rationale for such use provided?		
If YES, reference:		
Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided?		Yes
If YES, reference:		This document
12. Does the proposal contain characters with any special properties such as control function or similar semantics?		
		No
If YES, describe in detail (include attachment if necessary)		
13. Does the proposal contain any Ideographic compatibility characters?		
		No
If YES, are the equivalent corresponding unified ideographic characters identified?		
If YES, reference:		