L2/14-086

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:** *Proposal to Encode Nepaalalipi Script in ISO/IEC 10646*
2. Requester's name: *Dev Dass Manandhar, Samir Karmacharya and Bishnu Chitrakar*
3. Requester type (Member body/Liaison/Individual contribution): *Individual contribution*
4. Submission date: *2014/04/10*
5. Requester's reference (if applicable): *Annex-I*
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): *76*
      Proposed name of script: *NEPAALALIPI*
   b. The proposal is for addition of character(s) to an existing block:
      Name of the existing block:
2. Number of characters in proposal: *76*
3. Proposed category (select one from below - see section 2.2 of P&P document):
   A-Contemporary *A* 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?
   Samir Karmacharya
   b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.):
   Samir Karmacharya, Kalimati, Kathmandu, Nepal, saneer@gmail.com and saneer@hotmail.co.uk
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*
   Collation order,Rendering the Nepaalalipi script and Building characters from UCS

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: N4102-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? *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.)? *YES*
   If YES, with whom? *Buddhist communities, Archeological departmet Government of Nepal, Raja Shakya(former script lecturer Tribhuwan University. and librarian , Asha Saphu Kuthi), Nepal lipi Guth*
   If YES, available relevant documents: *NO*
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included? *YES*
   Reference: *Introduction*
4. The context of use for the proposed characters (type of use; common or rare) *Common*
   Reference: *Annex-II*
5. Are the proposed characters in current use by the user community? *YES*
   If YES, where? Reference: *Manuscripts, Books, Magazine, Letterheads, Signboards Annex-II*
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)? *YES*
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? *NO*
    If YES, is a rationale for its inclusion provided?
    If YES, reference:
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? *NO*
    If YES, reference:
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:

Please add the attached document to the document registry.

Proposal to Encode Nepaalalipi Script in ISO/IEC 10646
Authors Dev DassManandhar, Samir Karmacharya and Bishnu Chitrakar
March 10th, 2014

1 Introduction

This proposal is based on the proposals L2/13-243(presented to encode Ranjana script in ISO/IEC 10646), L2/12-349 and L2/12-120. The characters presented here are similar as presented in L2/12-349 and L2/13-120 with an approach eliminating dual representation of vowel characters.

It is believed that the script was created and used by native people(Newaa: community) of Nepal. More than a millennia old manuscripts were preserved in the department of Archeology, Ministry of Culture in Kathmandu, Nepal libraries(like Asha Safukuthi Archives and others) and personal collections. About five-hundred thousand folios of manuscript written in this script are preserved in Nepal alone.

The script has served to preserve Sanskrit based knowledge in both Buddhist and Hindu religions. The manuscripts are destroyed and burned in a massive scale and few were taken away by Mr. Hughson and are distributed in the libraries of European countries. Local people have not stopped using this Nwpaalalipi script despite the banned imposed by the then Prime Minister Chandra Shamsher Rana.

Newaa: community (1,321,933, Census 2011) is the major users of this script in the past and at the present.

A monthly magazine named LIPIPAU has been in publication for the past few years.

This proposal is based on the native monosyllabic language of the Newaa: community, Nepaalabhaasaa. Classical Nepaalabhaasaa uses six vowels, thirty consonants and two semivowels.

Each vowel is used in four different forms of pronunciation to represent independent words. For example, the four different forms of a vowel /𑐀A/ are: Normal sound/𑐀/, Long sound/𑐀𑐵/, Nasalized sound/𑐀𑐴/ and Long nasalized sound/𑐀𑐵𑐴/. Thus the proposal contains twenty-four vowels that includes all the four forms of six vowels.

Consonant as independent character, does not exist in the native writing system. Characters are understood as alphasyllabic with a vowel /𑐀A/ at the end. Thirty-two characters with a vowel /𑐀A/ are known as /Baa-aakha:/ in Nepaalabhaasaa that includes two semivowels.

The thirty characters with a vowel /𑐀A/ are:
𑐎KA, 𑐏 KHA, 𑐐 GA, 𑐑 GHA, 𑐒 NGA, 𑐓 NGHA, 𑐔 CA, 𑐕 CHA, 𑐖 JA, 𑐗 JHA, 𑐘 NJA, 𑐙 NJHA, 𑐚 TA, 𑐛 THA, 𑐜 DA, 𑐝 DHA, 𑐞 NA, 𑐟 NHA, 𑐠 PA, 𑐡 PHA, 𑐢 BA, 𑐣 BHA, 𑐤 MA, 𑐥 MHA, 𑐦 RA,𑐧 RHA, 𑐨 LA, 𑐩 LHA, 𑐪 SA and 𑐫 HA.

Two semivowel characters with a vowel /𑐀A/ are: 𑐬 YA(EA) and 𑐭 WA(OA).

The modern Nepaalabhaasaa uses seven allographs to represent different pronunciations for borrowed/foreign / loan / words. The seven allograph characters with a vowel /𑐀A/ are:
𑐯 TTA allograph of 𑐚TA, 𑐰TTHA allograph of 𑐛THA, 𑐱DDA allograph of 𑐜DA, 𑐲DDHA allograph of 𑐝DHA, 𑐳NNA allograph of 𑐞NA, 𑐴SHA and 𑐵SSA allograph of 𑐪SA.

The thirty-nine alphasyllabic characters/Baa-aakha:/ are the basic characters pronounced with a vowel /अA/. Their shape, size and look are different when used with different vowels as alphasyllabic characters.

For example, character /कKA/ with a vowel other than /अA/ are different. Different shapes of the base character /क/ as alphasyllabic characters are listed in the Table T-1.

Table-1 Different shapes and looks of Alphasyllabic character/क/.

Character /K/	with a vowel	With a long vowel	With a nasalized vowel	With a long nasalized vowel
Vowel /अA/	क	कः	कं	कँ
Vowel /आAA/	का	काः	कां	काँ
Vowel /ि I/	कि	की	किं	किँ
Vowel /ु U/	कु	कू	कुं	कुँ
Vowel /ॅ E/	कॅ	कः	कॅं	कॅँ
Vowel /ा O/	का	काः	कां	काँ

From the Table-1, it is clear that the alphasyllabic characters have different looks with different vowels. Most of the alphasyllabic characters are independently used.

On the the basis of thirty-nine alphasyllabic characters from the Nepaalalipi script, characters without a vowel /अA/ are proposed for encoding as atomic characters in UNIVERSAL CHARACTER SET (UCS).

The other required characters are reproduced by the combination of proposed UCS characters.

Many characters used in this script are excluded because of their non-atomic nature. They are reproduced by the combination of proposed atomic characters.

For example, from the proposed vowel /अA/, ligatures like /ै AI/ is re-constructed with a vowel /ि I/ and /ौAU/ with a vowel /ाU/.

For example from the proposed character /क K /, other required characters such as clusters/क्कKK(कK and कK)/, a ligatures/क्ष(कK and षSS)/ and alphasyllabic characters/का…क्ा क्ाः…क्ँ,/ are re-constructed by the proposed rendering process for the Nepaalalipi script.

(Two symbols /:/ and /ँ/ are used to represent long sound and nasalized sound respectively.)

2 Universal Character Set (UCS)

The presented code chart is accordence to L2/13-243. The current proposal is based on the users' requirements. The code presented in this proposal contains seventy six characters which includes Vowels(24), Consonants(37), Semi-vowels(2), Punctuation marks(2), Numerals(10) and Symbol(1).

2.1 Vowels

The user community has six prime vowels. They are 𑐀A,𑐁AA ,𑐂I ,𑐃U ,𑐄E and 𑐅O.

Each vowel has three more formats. They are long, nasalized and long nasalized vowels.
These are the following:

Long Vowels : 𑐀𑐳A:, 𑐁𑐳AA:, 𑐂𑐳 I:, 𑐃𑐳U: ,𑐄𑐳E: and 𑐅𑐳O:.

Nasalized Vowels : 𑐀𑐴 A, 𑐁𑐴 AA , 𑐂𑐴 I , 𑐃𑐴 U , 𑐄𑐴 E and 𑐅𑐴O.

Nasalized Long Vowels : 𑐀𑐴 A:, 𑐁𑐴 AA: ,𑐂𑐴 I: , 𑐃𑐴U:, 𑐄𑐴 E: and 𑐅𑐴O:.

Code Point	Character	Character name
XX00	𑐀	NEPAALALIPI LETTER A
XX01	𑐀𑐳	NEPAALALIPI LETTER LONG A
XX02	𑐀	NEPAALALIPI LETTER NASAL A
XX03	𑐀𑐴	NEPAALALIPI LETTER LONG NASAL A
XX04	𑐁	NEPAALALIPI LETTER AA
XX05	𑐁𑐳	NEPAALALIPI LETTER LONG AA
XX06	𑐁𑐴	NEPAALALIPI LETTER NASAL AA
XX07	𑐁𑐴	NEPAALALIPI LETTER LONG NASAL AA
XX08	𑐂	NEPAALALIPI LETTER I
XX09	𑐂𑐳	NEPAALALIPI LETTER LONG I
XX0A	𑐂𑐴	NEPAALALIPI LETTER NASAL I
XX0B	𑐂𑐴	NEPAALALIPI LETTER LONG NASAL I
XX0C	𑐃	NEPAALALIPI LETTER U
XX0D	𑐃	NEPAALALIPI LETTER LONG U
XX0E	𑐃𑐴	NEPAALALIPI LETTER NASAL U

XX0F	𑐏	NEPAALALIPI LETTER LONG NASAL U
XX10	𑐐	NEPAALALIPI LETTER E
XX11	𑐐𑐵	NEPAALALIPI LETTER LONG E
XX12	𑐑	NEPAALALIPI LETTER NASAL E
XX13	𑐑𑐵	NEPAALALIPI LETTER LONG NASAL E
XX14	𑐒	NEPAALALIPI LETTER O
XX15	𑐒𑐵	NEPAALALIPI LETTER LONG O
XX16	𑐓	NEPAALALIPI LETTER NASAL O
XX17	𑐓𑐵	NEPAALALIPI LETTER LONG NASAL O

2.2 Consonants

Characters represented in the UCS chart are the characters without a vowel /𑐁A/.Thirty-seven characters of Nepaalalipi script presented in this proposal as consonants, each has a unique sound with a unique meaning.

They are :

𑐎 K, 𑐏KH, 𑐐G, 𑐑GH, 𑐒NG, 𑐓 NGH,;

𑐔C, 𑐕CH, 𑐖 J, 𑐗JH, 𑐘 NJ, 𑐙 NJH,;

𑐚T, 𑐛TT, 𑐜TH, 𑐝TTH, 𑐞D, 𑐟 DD, 𑐠 DH, 𑐡 DDH, 𑐢 N, 𑐣NN, 𑐤 NH,;

𑐥P, 𑐦PH, 𑐧 B, 𑐨BH , 𑐩 M, 𑐪 MH,;

𑐫 R, 𑐬RH,𑐭L, 𑐮LH,;

𑐯S, 𑐰 SH, 𑐱SS, 𑐲H.

Code Point	Character	Character name
XX18	𑐎	NEPAALALIPI LETTER K
XX19	𑐏	NEPAALALIPI LETTER KH
XX1A	𑐐	NEPAALALIPI LETTER G
XX1B	𑐑	NEPAALALIPI LETTER GH
XX1C	𑐒	NEPAALALIPI LETTER NG
XX1D	𑐓	NEPAALALIPI LETTER NGH
XX1E	𑐔	NEPAALALIPI LETTER C
XX1F	𑐕	NEPAALALIPI LETTER CH
XX20	𑐖	NEPAALALIPI LETTER J
XX21	𑐗	NEPAALALIPI LETTER JH
XX22	𑐘	NEPAALALIPI LETTER NJ

XX23	𑐜	NEPAALALIPI LETTER NJH
XX24	𑐝	NEPAALALIPI LETTER T
XX25	𑐞	NEPAALALIPI LETTER TT
XX26	𑐟	NEPAALALIPI LETTER TH
XX27	𑐠	NEPAALALIPI LETTER TTH
XX28	𑐡	NEPAALALIPI LETTER D
XX29	𑐢	NEPAALALIPI LETTER DD
XX2A	𑐣	NEPAALALIPI LETTER DH
XX2B	𑐤	NEPAALALIPI LETTER DDH
XX2C	𑐥	NEPAALALIPI LETTER N
XX2D	𑐦	NEPAALALIPI LETTER NN
XX2E	𑐧	NEPAALALIPI LETTER NH
XX2F	𑐨	NEPAALALIPI LETTER P
XX30	𑐩	NEPAALALIPI LETTER PH
XX31	𑐪	NEPAALALIPI LETTER B
XX32	𑐫	NEPAALALIPI LETTER BH
XX33	𑐬	NEPAALALIPI LETTER M
XX34	𑐭	NEPAALALIPI LETTER MH
XX36	𑐮	NEPAALALIPI LETTER R
XX37	𑐯	NEPAALALIPI LETTER RH
XX38	𑐰	NEPAALALIPI LETTER L
XX39	𑐱	NEPAALALIPI LETTER LH
XX3B	𑐳	NEPAALALIPI LETTER S
XX3C	𑐴	NEPAALALIPI LETTER SH
XX3D	𑐵	NEPAALALIPI LETTER SS
XX3E	𑐶	NEPAALALIPI LETTER H

2.3 Semivowels

Semivowels 𑐷 Y and 𑐸W in the UCS chart are the characters without a vowel /𑐁A/. All consonants are combined with semivowels to form monosyllabic characters.

Consonant /𑐎K/ with a semivowel /𑐷Y/ is a monosyllabic character represented by a cluster /𑐎𑑂𑐷 KY(to grind)/. Consonant /𑐔 KH/ with a semivowel /𑐸 W/ is a monosyllabic character represented by a cluster / 𑐔𑑂𑐸 KHW(to cry)/.

Code Point	Character	Character name
XX35	𑐷	NEPAALALIPI LETTER Y
XX3A	𑐸	NEPAALALIPI LETTER W

2.4 Punctuation Marks

Line breaking symbols, /𑐍 TWAATHALAA/ and end of a sentence are marked by a broken vertical line and a single vertical line respectively. The mark is / 𑐥 /. The multiple use of the same character is very common in Nepaalalipi script. Double marks /𑐥𑐥 / represents a stop. The interpretation is different as per their use. For example, a word written in between double characters /𑐥𑐥 / like / 𑐥𑐃𑐥𑐥 / is interpreted at the end of 5th verse. The interpretation varies depending on the users.

The punctuation mark / / is known as TUTISALAA in Newaa community. The traditional use of the character is to place it in-between characters as a word separator (𑐎K 𑐔KH).

The character has two more ways of its uses. The first use is to change a character into a consonant and the second is to turn a character into a vowel.

The following characters 𑐎K, 𑐔KH, 𑐏G, 𑐖GH, 𑐗NG, 𑐘 NGH,𑐙C, 𑐚CH, 𑐛 J, 𑐜JH, 𑐝 NJ, 𑐞 NJH, 𑐟T, 𑐠TT, 𑐡TH, 𑐢TTH, 𑐣D, 𑐤 DD, 𑐥 DH, 𑐦 DDH, 𑐧 N, 𑐨NN, 𑐩 NH,;

𑐪P, 𑐫PH, 𑐬 B, 𑐭BH , 𑐮 M, 𑐯 MH, 𑐰 R, 𑐱RH,𑐲L, 𑐳LH, 𑐴S, 𑐵 SH, 𑐶SS, 𑐷H) are changed into consonants when the mark/ 𑑂 / is placed .

For example, a character /𑐎K/ with the mark / 𑑂 / is / 𑐎𑑂 K/ (interpreted as a consonant).

The mark / 𑑂 / is used to turn a character /𑐛 Y/ into a vowel /𑐋E/.

For example, a character /𑐛 Y/ with the mark / 𑑂 / is /𑐛𑑂 Y/ (recognized as a vowel /𑐋E/).

Code Point	Character	Character name
XX3F	𑑂	NEPAALALIPI LETTER MARK TUTISAALAA
XX4A	𑐥	NEPAALALIPI LETTER DIPU

2.5 Numerals

Nepaalalipi script has its own numeric characters from zero to nine.

The numerals are: 𑑐Zero, 𑑑One, 𑑒Two, 𑑓Three, 𑑔Four, 𑑕Five, 𑑖Six,𑑗Seven, 𑑘Eight and 𑑙Nine.

Code Point	Character	Character name
XX40	𑑐	NEPAALALIPI DIGIT 0
XX41	𑑑	NEPAALALIPI DIGIT 1
XX42	𑑒	NEPAALALIPI DIGIT 2
XX43	𑑓	NEPAALALIPI DIGIT 3

XX44	𑐴	NEPAALALIPI DIGIT 4
XX45	𑐵	NEPAALALIPI DIGIT 5
XX46	𑐶	NEPAALALIPI DIGIT 6
XX47	𑐷	NEPAALALIPI DIGIT 7
XX48	𑐸	NEPAALALIPI DIGIT 8
XX49	𑐹	NEPAALALIPI DIGIT 9

2.6 Symbol

The Symbol XX4B is introduced to form other symbols. With the combination of characters, other different symbols will be reproduced as glyphs.

Code Point	Character	Character name
XX4B	𑐋	NEPAALALIPI LETTER SYMBOL SIDDHA

2.7 Collation order

The collation order is arranged as per the modern requirement of the user community.
The precedence order of characters are as presented in the UCS chart. The prime order of characters is :

𑐀A<𑐁A:<𑐂A<𑐃A:<𑐄AA<𑐅AA:<𑐆AA<𑐇AA:<𑐈 I<𑐉I:<𑐊 I<𑐋I:<𑐌U<𑐍U:<𑐎U<𑐏U:;

<𑐐I I:<𑐑E<𑐒E:<𑐓E<𑐔E:<𑐕O<𑐖O:<𑐗O<𑐘O:;

<𑐙K<𑐚KH<𑐛G<𑐜GH<𑐝NG<𑐞 NGH<𑐟C<𑐠CH<𑐡 J<𑐢JH<𑐣 NJ<𑐤 NJH<𑐥T<𑐦TT<𑐧TH;

<𑐨TTH<𑐩D<𑐪 DD<𑐫DH<𑐬 DDH<𑐭 N<𑐮NN<𑐯 NH<𑐰P<𑐱PH<𑐲B<𑐳BH<𑐴M<𑐵MH;

𑐶Y<𑐷R<𑐸RH<𑐹L<𑐺LH<𑐻W<𑐼S<𑐽 SH<𑐾SS<𑐿H

3 Rendering the Nepaalalipi Script

The atomic characters presented in Universal Character Set(UCS) are indispensable for the representation of the Nepaalalipi script. With the help of Nepaalalipi-Non-Space-Joiner(NNSJ) and Nepaalalipi-Space-Joiner(NSJ), the atomic characters are rendered to construct the required characters known as glyphs. NNSJ and NSJ are also used to represent symbols.

For example, consonant character /कK/ with a vowel character /ाAA/ when placed together, remain as they are /कK/ाAA/ but with the use of NNSJ they will be represented by an independent glyph /काKAA/.

It should be noted that clusters are the characters vertically stacked. The vertical space provided by a font is limited. Therefore the representation of multiple characters as a glyph is limited. The possibility of number of characters used for stacking together are limited by a font. Two to three characters are presented as a cluster, and characters not supported are presented as they are.

Nepaalalipi- Non-Space-Joiner(NNSJ) joins two characters in between. The character so formed is represented by a glyph. A Nepaalalipi-Space-Joiner(NSJ) is used where multiple representation of combined characters are possible.
For example:

The combination of characters /नR/ and /ि I/ are represented by two different glyphs. They are separated by the use of NNSJ and NSJ.

/नR/+NNSJ+/ि I/=/निRI/

/नR/+NSJ +/ि I/=/नृRI/

Rendering Nepaalalipi script with Nepaalalipi-Non-Space-Joiner(NNSJ) and Nepaalalipi-Space-Joiner(NSJ)
The rules are :
Rule number one :
3.1 If a* Nepaalalipi-*Non-Space-Joiner or a* Nepaalalipi-*Space-Joiner is placed in between characters then the characters are represented by a single glyph.

3.1.1 Placement of atomic chracter and Nepaalalipi-Non-Space-Joiner(NNSJ)

Nepaalalipi-Non-Space-Joiner is used for representation of Vowel-vowel(VV), Consonant-vowel(CV), consonant-consonant(CC), consonant-consonant-vowel(CCV) and symbols.

Example of vowel-vowel glyph:
Vowel/V/ character + NNSJ+ vowel/V/ character =/VV/ Diphthong character

a) /अA/ + NNSJ+ /ि I/ =/ैAI/
b) /अA/ + NNSJ+ /ऊU/ =/औAU/

Example of consonant-vowel:
Consonant/C/ character + NNSJ+ vowel/V/ character =/CV/ alphasyllabic character

a) /कK/ + NNSJ+ /ाAA/ =/काKAA, take/
b) /कMH/ +NNSJ+/अA/ = /कMHA, body/
c) /कMH/ +NNSJ+/ाःAA:/ = /काःMHAA:, refuge to participate/
d) /कMH/ +NNSJ+/ंॅ:/ =/कंॅMHॅ:, by body/
e) /कMH/ +NNSJ+/ऊU/ =/कृMHU, dig/
f) /नNH/ +NNSJ+/ऊU/ =/नू NHU, step on/

g) /न्हNH/ +NNSJ+/ाAA/ =/न्हाNHAA, to mix, to mould /

h) /ल्हLH/ +NNSJ+/ुU/ =/ल्हु LHU, to wash/

i) /ल्हLH/ +NNSJ+/ाAA/ =/ल्हाLHAA, tp fill/

Example of consonant-consonant cluster

a) /कK/ + NNSJ+ /कK/ =/क्कKK/ ,(cluster from a word pakka/surprise/)

b) /नN/ + NNSJ+ /टT/ =/न्टNT/ ,(from a word anta/end/)

Example of consonant-semivowel cluster:

Almost all consonant characters are joined with semivowels to make clusters.

Consonant character + NNSJ+ Semivowel character = cluster

Consonant with a semivowel /यY/

a) /कK/ + NNSJ+/यY/ =/क्यKY,to grind/

b) /रPH/ +NNSJ+/यY/ =/र्यPHY,to lick/

c) /ल्हLH/ +NNSJ+/यY/ =/ल्ह्यLHY, to transfer/

Consonant with a semivowel /वW/

a) /रH/ + NNSJ+/वW/ =/ह्वHW,to spread/

b) /नN/ + NNSJ+/वW/ =/न्वNW, mouth/

c) /ल्हLH/ +NNSJ+/वW/ =/ल्ह्वLHW, to vomit/

d) /म्हMH/ +NNSJ+/वW/ =/म्ह्वMHW, less quantity/

A symbol is included in UCS to represent other symbols with the combination of other atomic characters.

For examples symbol character / ?XX4B/ along with other characters and a NNSJ in between is selected for the representation of other symbols.

a) / ?XX4**B**/ + NNSJ+ /कK/ =/ॐ Symbol OM/.

b) / ?XX4B/ + NNSJ+ /खKH/ =/॥꧁॥Symbol Flower / - a symbol used to represent the end of a verse.

c) / ?XX4B/ + /गG/ =/ऻTWAATHALAA / - a symbol used to represent a line break .

3.1.2 Placement of Nepaalalipi-Space-Joiner(NSJ)

Nepaalalipi-Space-Joiner is used in special cases where dual representation is possible.

Two glyphs /क्षKSS/ and /ज्ञJNJ/ are commonly used in manuscripts. They are recognized as ligatures. Character /क्षKSS/ is a ligature of /कK/ and /षSS/, and /ज्ञ JNJ/ is a ligature of two characters /जJ/ and /ञNJ/. Both the ligatures have equivalent clusters. The dual representation of two characters are separated by the use of NNSJ and NSJ.

The examples are follows:

1- The case of characters /कK/and /षSS/

/कK/ +NNSJ+ /षSS/= /क्ष KSS/ - cluster

/कK/ +NSJ+ /षSS/= /क्षKSS/ - a ligature

2- A case of characters /जJ/ and /ञNJ/

/जJ/ +NNSJ+ /ञNJ/ = / ज्ञ JJYN/ -a cluster

/जJ/ +NSJ + /ञNJ/ = /ज्ञJNJ/ - a ligature

The glyph /क्षKSS/ is a part of a goddess name लक्ष्मि LAKSSMI.

The ligature /ज्ञJNJ/ is a part of a word/ज्ञानJNJAAN/ knowledge.

3.2 Rule number two :

If a Nepaalalipi-Non-Space-Joiner or Nepaalalipi-Space-Joiner is placed in between a glyph and a character, then the glyph and a character are represented by a new glyph.

Glyph/क्वKW/ is a representation of two atomic characters with NSJ(/कK/, NNSJ and /वW/) in between. /क्वKW/ +NNSJ+/ँĂ/ = /क्वँKWĂ /. The new glyph /क्वँKWĂ / represents a multiple characters with NNSJ in between.

For example :

Glyph +NNSJ+ vowel = glyph

Glyph /क्वाKW/ + NNSJ+ /ाAA/ = /क्वाKWAA, dig to; (कK/, NNSJ, /वW/,NNSJ and /ाAA/)/

Glyph /क्वाKW/ + NNSJ+ /ाि A:/ = /क्वाि KWA:, burnt; (कK/, NNSJ, /वW/,NNSJ and A:)/

Glyph /क्वँKW/ + NNSJ+ /ँĂ/ = /क्वँ KWAĂ, younger; (कK/, NNSJ, /वW/,NNSJ and ँĂ)/

Glyph /क्वँKW/ + NNSJ+ /ँĂ:/ = /क्वँKWAĂ:, from downward; (कK/, NNSJ, /वW/,NNSJ and ँĂ:)/

Gly[h /ल्यLYA/ + NNSJ+ /ॅ I/ = /ल्येLYAI, will select; (कK/, NNSJ, /वW/,NNSJ and ॅI)/

3.3 Rule number three :

Only predefined glyphs will be represented when Non-Space Nepaalalipi-Joiner or Nepaalalipi-Space-Joiner are used in between characters.

The glyphs like / न्ट्र NTR, / स्ट्रSSSTRAA/ represent multiple characters. Not all the multiple characters are pre-defined. For example multiple characters of /KKK/ is not required and not supported for forming a cluster. Non supported characters are left alone as if NNSJ or NSJ are not used.

For example:

The supported multiple characters like /NTRAA/, / SSTRA/ are in use and supported by regular fonts.

/ न N/ +NNSJ+/ट T/+ NNSJ+/र R/= /न्ट्र NTR/

/ष SS/+ NNSJ+ /ट T/+ NNSJ+ /र R/+NNSJ+/ा AA/=/स्ट्रा SSTR/

The non supported clusters like triple /कK/ will be /क् K/ and / क्क KK/.

/कK/+NNSJ+/कK/=/क्कKK/

The cluster will be broken into character with a /TUTISALE/ and the last two characters will be joined as a cluster. /क्कKK/+NNSJ+/कK/=/क्क्कKKK/

4 Building characters from UCS

The atomic characters in UCS chart are combined to make a alphasyllabic character, cluster or a ligature depending on the nature of their use.

The changes that occur in a character after the combination of consonant and vowel are presented in the Table-2. This change occurs with each and every character when joined with another character. Depending on the character's structure, the building of a glyph are presented. The combination of characters are divided into three groups, one as CV(consonant-vowel), CC(consonant-consonant) and CCV(consonant-consonant-vowel).

Table-2 presents the possible combination of a consonant and a vowel.
Whenever a character is combined with another character, the characters are represented by a new glyphs.

The pictorial change in the shape of one atomic character /कK/ is presented in Table 1.

A consonant (atomic character) /कK/ with a Nepaalalipi-Non-Space-Joiner and a vowel /काKAA/ are represented by a glyph /काKAA/.

Table 2- An atomic character /कK/ and with other 24 atomic characters (vowels) as glyphs.

UCS character /कK/			
with a prime Vowel-a glyph	with a long Vowel-a glyph	with a nasalized Vowel –a glyph	with a long nasalized Vowel –a glyph
कK अA-कKA	कK अ◌A:-क◌ KA: (solid from mixture)	कK अँA -कँKA (tell !)	कK अँA:-कKAँ:
कK आAA-काKAA(take!)	कK आ◌AA:-का◌KAA: (do take)	कK आँAA-काँKAAँ	कK आAAँ:-काँKAAँ: v(blind)
कK ◌ि I-किKI	कK ◌ी I: -कीKI: (insect, obstacle)	कK ◌ि̃ I- किँKIँ	कK ◌ी̃ I: -कीँKIँ:
कK ◌ु U-कु KU (carrying load)	कK ◌ू U: -कूKU: (field digger)	कK ◌ु̃ U- कुँKUँ (smoke)	कK ◌ू̃ U: -कूँKUँ: (corner, by smoke)
कK ◌े E-के KE	कK ◌ै E:-क◌ KE:	कK कैँEF-कैँKEँ (pulse)	कK ◌ै̃ E: -कैँKEँ: (by the pulse)
कK ◌ो O-को KO	कK का◌O:- का◌KO: (crow)	कK कौँO- कौँ KOँ (younger)	कK ◌ौँ O: -कौँKOँ: (from down)

The structure of the atomic character /कK / changes into the following shapes

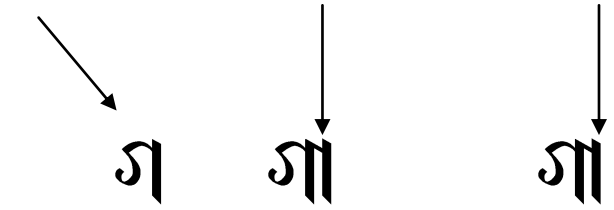
का का◌ कौं कौं कि की किँ किँ कु कू कुँ कं क◌ कँ कँ का का◌ कौं कौं

by retaining its basic look in a syllable after the application of different forms of six vowels. This is true for other characters also. Characters are grouped for similar changes according to their structural forms.

4.1 Combination of a consonant and a vowel /आ AA/:

4.1.1 The seven characters are categorized under head stroke group. They are changed by the addition of a slanted joining line followed by a vertical line.

Atomic character a joining line(Jani, a belt) vertical line



/गा GAA,ञा NJAA,था THAA,ठाTTHAA,धा DHAA,णा NNAA and षा SHAA/.

4.1.3 The remaining characters with a a vowel/आAA/.

All the other consonants with a **/आAA/** vowel have a head stroke extended line and a vertical line.

For example : Character घ GH

Atomic character Head stroke extension vertical line

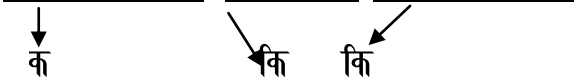
The glyphs of atomic characters with a vowel **/आAA/** are :

,/काKAA/,खाKHAA,घाGHAA/,/ाNGAA/,/ाNGHAA/,चा CAA/,/छाCHAA/, /जाJAA/, माJHAA/,;
ञा NJAA/,झाNJHAA/, /टाTAA/, /ठाTTAA/, /दाAA/, /ाDDAA/, /ढाDDHAA/, /नाNAA/, ना NHAA/, /पाAA/,;
/फाPHAA/, /वाWAA/, /णAA/, /माAA/, /माMHAA/, /याAA/, /राRAA/,/ रा RHAA/, /लाLAA/, /ळा LHAA/,;
/साSAA/, /षाSSAA/, /हाHAA/.

4.2 Combination with a vowel /ि I/:

Consonants are added with a vertical line in front and a semi curve at the top of a character.
For example:

Atomic character vertical line a semi curve line



The characters with a vowel /ि I/ are :
/कि KI/,/ खिKHI/,/ गिGI/,/ घिGHI/, /ाNGI/, /ाि NGHI/,/चिCI/,/ छिCHI/, / जिJI/, / मिJHI/, / ञि NJI /, / झि NJHI/, /टिTI/, /ठिTTI/, /थि THI /, /ठि TTHI /, /दि DI /, /ाDDI/, /धिDHI/, /ढिDDHI/, /थिTHI/,/ ठिTHI/,/ दिDI/, / ाDDI/, / धिDHI/, / ढिDDHI/, /निNI/,/ ाNNI/, / ाNHI/,/ पि PI/,/ फि PHI/,/ वि BI/, /एBHI/,;
/मिMI/, / ाMHI/, /यिYI/, /रिRI/, /ाRHI/, /लिLI/, /ाLHI/, /विWI/, /सिSI/, / शिSHI/, / षिSSI/ and /हिHI/.

4.3 Combination with a vowel /ऊU/:
Three different symbols are added to atomic characters depending on characters.

Two symbols are in use for vowel **/ऊU/**. They are the followings: / , /. The third is used with a character /ऋR/.
The small curve line is added at the bottom of a character.
Atomic character added symbol

4.3.1 The characters with a vowel U are:
कुKU, खुKHU, घु GHU,ङुNGU, ङ्घु NGHU, चुCHU, छु CHHU, झुJU,ञुKU,ञ्चुNYU,ञ्छु NYHU, टुTTU,; ठुTTHU, दु DU, ढुDDU, धुDHU, ढ्ढुDDHU, नुNU, ण्णुNNU, ऩ्हुNHU, पुPU, फु PHU, बु BU, भुBHU, मुMU, म्हुMHU, युYU, रु RU, र्हु RHU, लुLU,ल्हु LHU, वु WU, सु SU, ष्षुSSU, हुHU.

4.3.2 Consonants like G,T,BH,SH have different shapes other than two characters when presented with a vowel U. They are : गुGU, तुTU, भु BHU and शु SHU

4.4 Combination with a vowel /ेE/ :
A small curve is added in front of a character to represent a syllable.
For example, a head stroke is replaced by a small curve line to a character /कK/ to form a glyph / केKE/.
Atomic character Upper curve line

4.4.1 The following Consonants and a vowel /ेE/ are represented as glyphs.
And they are: /केKE, /खेKHE, /घेGHE/, /ङेNGE/,/ ङ्घेNGHE/, /चेCE/, /छे CHE/, /झेE/, /ञेJHE/,; /ञ्छेNJHE/, /टेTE/, /ठेTTE/, /देDE/, /ढेDDE/, /ढ्ढे DDHE/, /णेNE/, /ऩ्हेNHE/, / पेPE/, /फेPHE/, / वे BE/, /भेBHE/, / मे ME/, / म्हे MHE/, /येYE/, /रेRE/, /र्हेRHE/, /लेLE/, /ल्हेLHE/ , /वे WE/, /सेSE/, /ष्षेSSE/ and /हेHE/

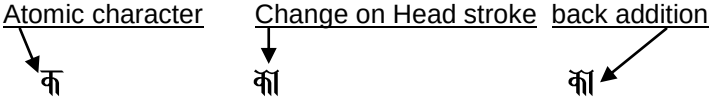
4.4.2 The seven non-head stroke characters presented as alphasyllabic characters with a vowel /ेE/ will have a long curve line added in front of the atomic character.
For example :
Atomic character front line

The seven characters are:

गेGE, ञेNJE, थे THE, ठेTHE, धेDHE, ण्णेNNE and शे SHE.

4.5 Consonants with a vowel /ो O/ :

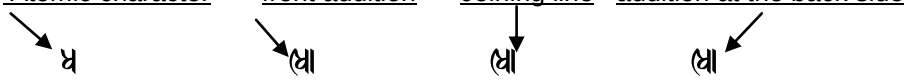
Atomic characters are added with lines at front, top and back of their major shapes.



4.5.1 The above changes are applicable only to atomic characters with head stroke. The glyphs are:
/का KO, /खा KHO, /घा GHO/, /ङा NGO/, /ङ्घा NGHO/, /चा CO/, /छा CHO/, /जा O/, /झा JHO/, /ञ्झा NJHO/, /ट TO/,;
/ठा TTO/, /डा DO/, /ढा DDO/, /ढ्ढा DDHO/, /णा NO/, /न्हा NHO/, /पा PE/, /फा PHO/, /बा BO/, /भा BHO/,;
/मा MO/, /म्हा MHO/, /या YO/, /रा RO/, /र्हा RHO/, /ला LO/, /ल्हा LHO/, /वा WO/, /सा SO/, /षा SSO/ and /हा HO/

4.5.2 The seven characters without head-stroke after the addition of /ो O/ vowel are presented by the addition of front line, joining line and a vertical line at their back sides.

For example character /ध DH/ with a vowel /ो O/ is given bellow.



The above changes are applicable only to the seven atomic characters / ग G, ञ NJ, थ TH, ण NN, थ TH, ठ TTH, ध DH, and श SH /.

The seven characters with vowel /ो O/ are :

गा GE, ञा NJE, था THE, ठा THE, धा DHE, णा NNE and शा SHE.

4.6 Multiple consonants with a vowel : A glyph

Multiple consonants are merged to form a single character(cluster or ligature). The character will have the properties of upper character if any of the vowels /ा AA/ or /ै E/ or /ो O/ is merged with it.
For example with the merged characters:

1-If upper character is a head stroke character/द D/ and lower character is a non-head stroke character /ध DH/ and if both the characters are merged with a vowel /ा AA/ or /ै E/ or /ो O/, a single character / द्धा D,DHAA/, /द्धि D,DHE/ or /द्धो D,DHO/ is formed respectively as a head stroke character.

1-If upper character is a non-head stroke character/ग G/ and lower character is a head atroke character/व W/ and if both the characters are merged with a vowel /ा AA/ or /ै E/ or /ो O/, a single character /ग्वा GWAA/, / ग्वे GWE/ or / ग्वो GWO/ is formed respectively as a non-head stroke character.

5 Acknowledgement

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5 References

1. Chitrakar Bishnu,2013, Nepāalabhāsā A Monosyllabic Language, Newa: Sikshya Guthi.
2. Shakyavansa Hemarāj, 1993, Nepalese Alphabet, Mandas Lumanti Prakāshan.
3. Lipi Thapu Guthi,2000, Nepaalalipi Prachalit and Bhujimol, Lipi Thapu Guthi.
4. Prachalita Lipi Varnamālā, 1100(NE), Nepāla Lipi Guthi.
5. Hale Austin, Shrestha P. Kedār,2006, Newār(Nepal Bhāsā), Lincom Europa
6. Manandhar, Dev Dass,2013, Proposal to encode Ranjana script in ISO/IEC 10646

UNIVERSAL CHARACTER SET NEPAALALIPI

	XXX0	XXX1	XXX2	XXX3	XXX4	XXX5
0	XXX00	XXX10	XXX20	XXX30	XXX40	
1	XXX01	XXX11	XXX21	XXX31	XXX41	
2	XXX02	XXX12	XXX22	XXX32	XXX42	
3	XXX03	XXX13	XXX23	XXX33	XXX43	
4	XXX04	XXX14	XXX24	XXX34	XXX44	
5	XXX05	XXX15	XXX25	XXX35	XXX45	
6	XXX06	XXX16	XXX26	XXX36	XXX46	
7	XXX07	XXX17	XXX27	XXX37	XXX47	
8	XXX08	XXX18	XXX28	XXX38	XXX48	
9	XXX09	XXX19	XXX29	XXX39	XXX49	
A	XXX0A	XXX1A	XXX2A	XXX3A	XXX4A	
B	XXX0B	XXX1B	XXX2B	XXX3B	XXX4B	
C	XXX0C	XXX1C	XXX2C	XXX3C		
D	XXX0D	XXX1D	XXX2D	XXX3D		
E	XXX0E	XXX1E	XXX2E	XXX3E		
F	XXX0F	XXX1F	XXX2F	XXX3F		

Annex-I Requesters' reference

Dev Dass Manandhar

Education: MSc (Chemicko Technologicka Faculta, Bratislava, Czechoslovakia, Europe, 1979)
Related work:
Maker of thanNhiti. Software (transliteration- Roman to Debanagari,)
Co-author of "Nepaalalipi Thahiti" (transliteration- Roman to Nepaalalipi) and "Nepal Lipi Thahiti" (transliteration- Roman
To Nepaalalipi).
Communication :
Residence :
Thahity, Kathmandu, Nepal.
Postal:
P.O.Box No 471. GPO Kathmandu Nepal.
Telephonic:
LAN Line : 00977-1-4221360; 00977-1-4229211;
Mobile No: 9741116569, 9851166569
Electronic:
e-mail: ddmanandhar@gmail.com

Samir Karmacharya

Education:
Bachelor in Information Technology(Informatics School, Kathmandu ,Nepal . affiliated with University of Portsmouth)
Related work:
Maker of "Kalimati" UNICODE font for Debanagari. Co-Author of "Nepaalalipi Thahiti" and "Nepal Lipi Thahiti"

Residence :
Kalimati, Kathmandu, Nepal

Telephonic: LAN Line : 00977-1-4270780; 00977-1-4282878
Mobile No: 9840050339, 980107078

e-mail: saneer@gmail.com and saneer@hotmail.co.uk

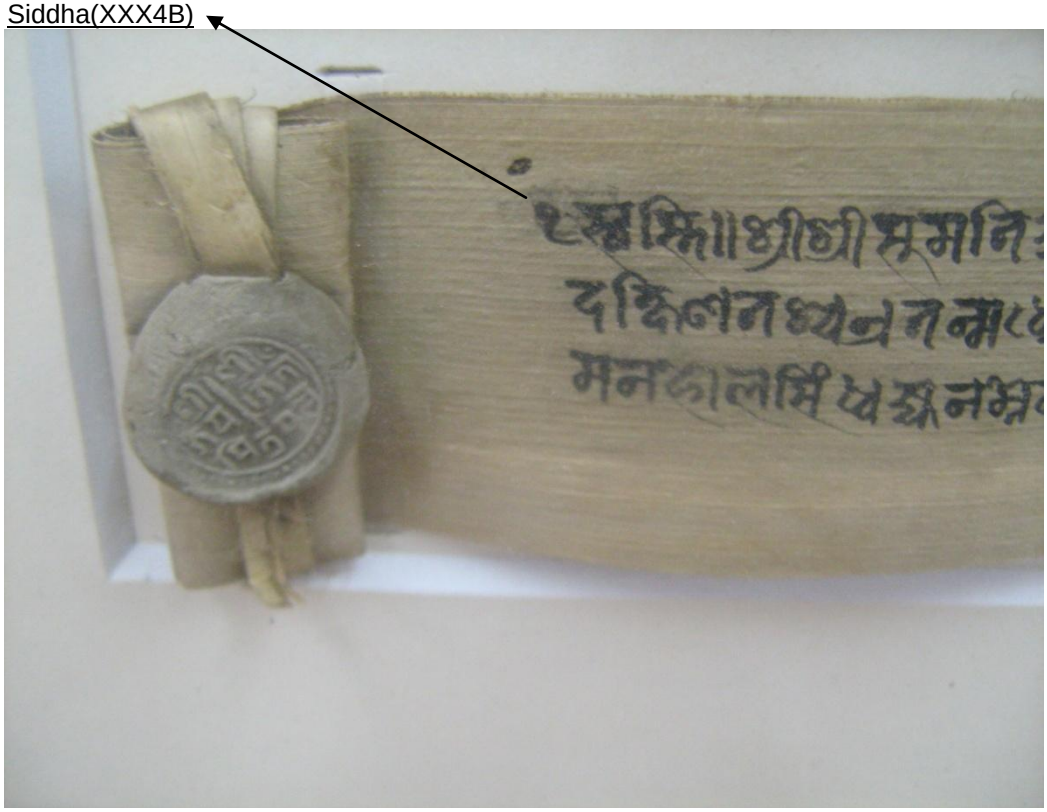
Bishnu Chitrakar

Related work:
Some Views On Grammatical Problems in Nepaala Bhaasaa
Nepaalabhaasaa (Alphabetic Book)
Nepaalalipi wa Nepaalabhaasaa (Nepaalalipi script and Nepaalabhaasaa language)
Nepaalabhaasaa A Monosyllabic Language,(2013)
Residence :
Daloo Aawaashiya Chhetra
Kathmandu Nepal
Telephonic:
LAN Line : 00977-1-4289998
Mobile No: 9841169130
e-mail:
bishnuchitrakar@hotmail.com

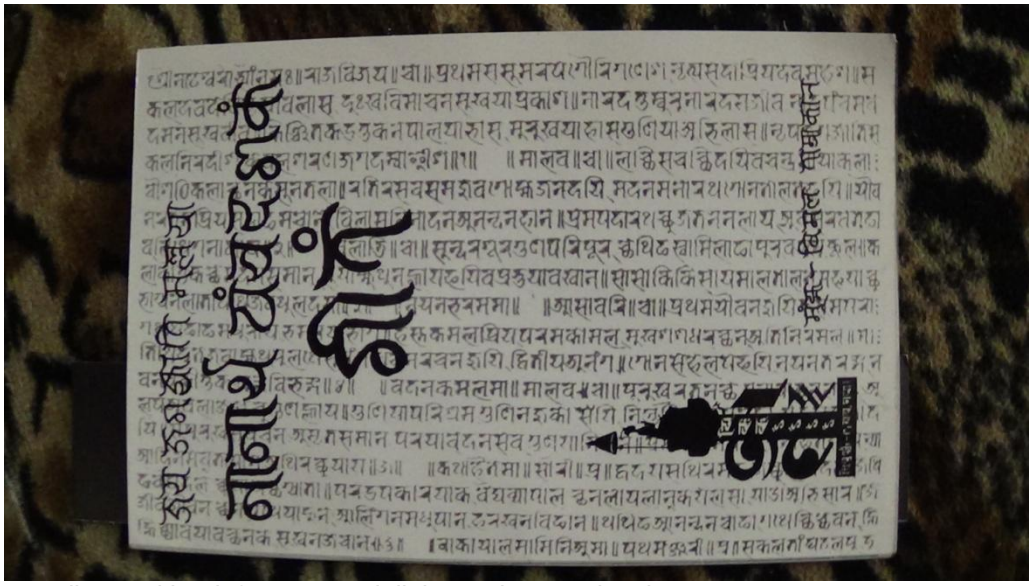
Annex-II Nepaalalipi script on display

Lotus Pond inauguration stone inscription (2005) written in three different languages and four different scripts including Nepaalalipi, at the birth place of Lord Buddha, Nepal .

Siddha(XXX4B)

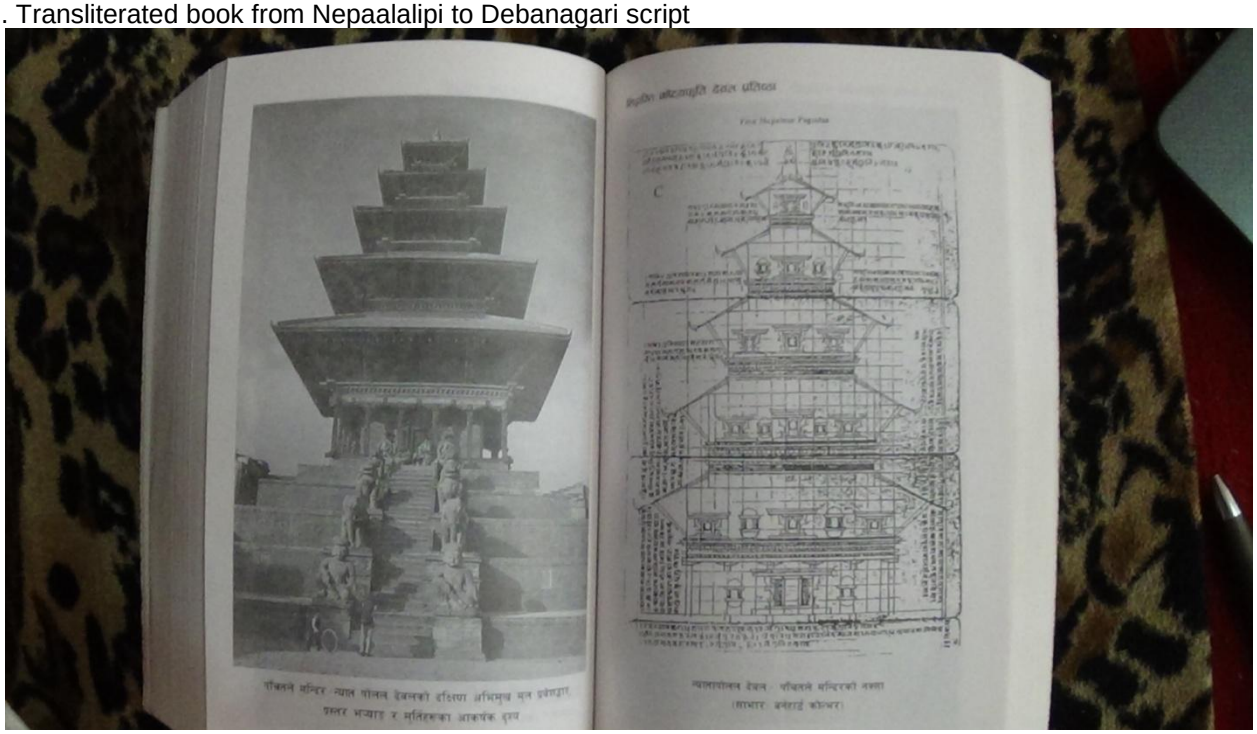


Palm leaf manuscript with a clay stamp of King Jitamitr Malla and Siddha(XXX4B) character at the beginning of writing, displayed in Āshā Archives, Kathmandu, Nepal



Transliterated book from Nepaalalipi to Debanagari script :
Jagajyoti Malla's Nanartha Panchadashakam Geetam,(2000), Bimal Tamrakar

. Transliterated book from Nepaalalipi to Debanagari script



Illustrative description(Nepaalalipi script) of Nyatapola degala in Bhaktapur (Khwapa) from the book Siddhagni Kotyahuti Deval Pratishtha,(2004), Dr. Janakalaal Baidya. ISBN : 99933-50-99-0