



DEPARTMENT OF INFORMATION TECHNOLOGY
Government of Tamil Nadu, India

ABSTRACT

Tamil Fraction and symbols encoding proposal – Extended feedbacks - Experts from GoTN and user communities involved – Proposal evaluated from the required perspectives – Amendment proposal submitted.

1 Background

1.1 Proposal Reference

- 1) L2/12-231 - Proposal to encode Tamil fractions and symbols, 17th July 2012, by Dr.Shriramana Sharma – (<http://www.unicode.org/L2/L2012/12231-tamil-fractions-symbols-proposal.pdf>)
- 2) L2/12-232 – Letter of Dr.Shriramana Sharma on his proposal 12-231 – (<http://www.unicode.org/L2/L2012/12232-tamil-fractions-symbols-proposal-aux-doc.pdf>)
- 3) L2/13-028 - Recommendations to UTC on Script Proposals, 25th January 2013, Deborah Anderson, et al – (<http://www.unicode.org/L2/L2013/13028-script-rept.pdf>)
- 4) L2/13-047 - Revised proposal to encode Tamil fractions and symbols, 5th March 2013, by Dr.Shriramana Sharma – (<http://www.unicode.org/L2/L2013/13047-tamil-frac-rev.pdf>)
- 5) SC2/WG2 N4462 – Attestations for Tamil fractions and symbols, 12th June 2013, by Dr.Shriramana Sharma - <http://std.dkuug.dk/jtc1/sc2/wg2/docs/n4462.pdf>
- 6) ISO/IEC JTC1 SC2/WG2 N4623 – Response to the ICTA's doc L2/14-048 on Tamil fractions and Symbols – 10th September 2014, by Dr.Shriramana Sharma – (<http://std.dkuug.dk/JTC1/SC2/WG2/docs/n4623.pdf>)
- 7) L2/15-078 - Tamil and Tamil Supplement (proposed) Code Charts, Michel Suignard – (<http://www.unicode.org/L2/L2015/15078-tamil.pdf>)
- 8) L2/15-079 - Proposed name changes to Tamil Supplement block characters, Roobeh Pournader, et al – (<http://www.unicode.org/L2/L2015/15079-tamil-name-chg.pdf>)
- 9) L2/13051r- Proposal to encode Malayalam minor fractions , 25th April 2013, of Dr.Shriramana Sharma , <http://www.unicode.org/L2/L2013/13051r-malayalam-fractions.pdf>

10) L2/14218, Unification of Tamil and Grantha numerals , 11th September 2014,
Dr.Shriramana Sharma, <http://www.unicode.org/L2/L2014/14218-grantha-tamil-numeral.pdf>

1.2 Introduction

Tamil Virtual Academy (TVA) of Government of Tamilnadu (GoTN) along with relevant scholars has reviewed these proposals, documents, and has obtained feedbacks from a variety of user communities. It has been very encouraging and satisfying to see a great participation of users from India and abroad on this proposal as it presents a sizeable number of symbols of interest, from old Tamil documents of various categories. While many feedbacks and communications in this regard are present in the document register of the Unicode consortium (UC), TVA and the Department of Information Technology, GoTN and Gol have also received feedbacks. Some of the feedbacks and discussions that came from the users may not be in the UC's document register but can be found at, <http://218.248.16.18/unidoc/index.html>, a page of TVA's portal.

Considering the variety of feedbacks and extended observations on the proposal, the Department of Information Technology of GoTN organized an extensive analysis covering the Functional, Language and Technology aspects involved in the proposal. Wherever required the Department of Information Technology of GoTN also consulted the Department of Electronics and Information Technology of Gol.

Inline with the communications of

- GoTN (L2/15-185, <http://www.unicode.org/L2/L2015/15185-tamil-letter.html>) and
- Gol (L2/15-176, <http://www.unicode.org/L2/L2015/15176-goi-tamil-frac.pdf>)

to UC, the Department of Information Technology, GoTN, had set up a panel consisting of scholars from different Tamil related fields/functions in order to review the proposal and to obtain feedbacks from Functional, Language and Technology perspectives. Annexure-1 has the details of the panel of subject experts. This panel had evaluated the proposal and feedbacks through Functional perspectives viz.,

- Name of the symbols
- Suitability of the symbols
- Shape-appropriateness of the symbols

- Possible Time variations of the symbols
- Possible Regional variations of the symbols
- Possible Handwriting style variations of the symbols
- Annotations for the symbols
- Historical evolution of the fractions and symbols etc.

From a technical-language perspective, the Unicode committee of TVA, also inspected various transliteration schemes and the issues and feedbacks related to Romanization requirements.

Subsequent to several meetings, the subject expert panel and other committees have submitted their decisions and final recommendations. Based on these recommendations, the Department of Information Technology, GoTN, submits this Amendment (draft) to the Tamil Fractions and Symbols encoding proposals and documents referred to in section 1.1.

1.3 General observation on the proposal L2/12-231

During the evaluation process, various scholars expressed a few common observations that may be of interest to note before proceeding further.

- It was through a collective assessment that encoding of such symbols be guided by a combined evidence of printed publications, estampages, photographs, logic in the derivation of the shapes and sometimes even personal vouching by the learned scholar or expert; and it should be as close to reality as possible.
- In some cases where there are more than one valid symbol for a particular item, the proposals to UC on fractions and symbols seem to have selected one while dropping others. And, there are items that have been incorrectly understood in the proposals to be a symbol or an abbreviation but actually they are neither.
- Considering the possibilities of more encoding needs in the future, it may be a good idea to have standards for naming the codepoints, and annotations.

2 Summary of Evaluations and Amendments

The evaluations of the subject expert panel has resulted in a number of decisions, recommendations and actions. The various results can be classified as below:

- Symbols accepted as they are
- Symbols accepted but their shapes to be changed with minor variations
- Symbols accepted but their entire shapes have to be changed
- Symbols accepted but their names have to be changed
- Symbols accepted but the annotations on them have to be changed
- Symbols accepted, but adding additional symbols to a particular item
- Symbols dropped from the encoding proposal
- Symbols postponed from encoding for now
- Symbols added that were dropped earlier in L2/13-047, L2/13028

2.1 On the Code Chart L2/15-078 & L2/13-047

Following table summarizes the evaluations and amendments on the 55 symbols as found in the revised proposal L2/13047 and the code chart L2/15078. While the summary addresses the recommendations, the discussions and explanations for the changed or dropped items can be seen in the section-3 of this document.

Subject expert panel of GoTN does not have any comment on the symbols other than the symbols listed in this table.

Srl	Details as per L2/15078			Recommendations of subject expert panel of GoTN	Cross Ref. (click)
	Code Point	Symbol	Name		
1	11FC2	ூ	TAMIL FRACTION 1/80 th	Shape to be altered	3.1.3
2	11FC6	௃	TAMIL FRACTION 3/80 th	Defer to separate proposal	3.1.4
3	11FC8	௄	TAMIL FRACTION 1/16 th	Shape to be altered	3.1.2
4			TAMIL FRACTION 1/16 th - 2	New Symbol to be added	3.1.2
5	11FCA	௅	TAMIL FRACTION 1/8 th	Shape to be altered	3.1.8
6	11FCC	ெ	TAMIL FRACTION 3/16 th	Shape to be Changed	3.1.1

Tamil Fractions and Symbols – Amendment Proposal
Government of Tamilnadu, India

7			TAMIL FRACTION $\frac{1}{2}$ - 2	New Symbol to be added	3.1.7
8	11FCD	௧	TAMIL FRACTION $\frac{1}{5}$ th	Shape to be Changed	3.1.9
9	11FC5	௧௩	TAMIL FRACTION $\frac{1}{32}$ nd	Shape to be Changed	3.1.10
10	11FC7	௧௬	TAMIL FRACTION $\frac{3}{64}$ th	Defer to separate proposal	3.1.11
11	11FD1	௪	TAMIL SIGN NEL	Shape to be changed	3.2.1
12	11FD2	௪௩	TAMIL SIGN SUVADU	Name to be changed	3.2.2
13	11FD6	௪௪	TAMIL SIGN PADAKKU	Defer to separate proposal	3.2.5
14	11FD4	௪௫	TAMIL SIGN URI	No encoding required	3.6.2
15	11FD5	௪௬	TAMIL SIGN MUUVUZHAKKU	Shape to be altered	3.2.6
16	11FD8	௪௭	TAMIL SIGN PAISAA	No encoding required	3.6.3
17	11FD9	௪௮	TAMIL SIGN ANAA	No encoding required	3.6.4
18	11FDB	௪௯	TAMIL SIGN PANAM	Shape to be changed	3.3.1
19	11FDC	௫௦	TAMIL SIGN PON	Shape to be changed	3.3.2
20	11FDD	௫௧	TAMIL SIGN VARAAGAN	Shape to be changed	3.3.3
21	11FDF	௫௨	TAMIL SIGN GEJAM	No encoding required	3.6.5
22	11FE3	௫௩	TAMIL DRY CULTIVATION SIGN	Shape to be altered	3.4.1
23	11FE4	௫௪	TAMIL LAND SIGN	Shape to be changed	3.4.2
24	11FE7	௫௫	TAMIL FIRST SIGN	Shape to be changed	3.5.1
25	11FEA	௫௬	TAMIL SIGN CIRANJIIVI	No encoding required	3.6.6
26	11FEB	௫௭	TAMIL SIGN PILLAI	No encoding required	3.6.7
27	11FEC	௫௮	TAMIL SIGN RAAJA	No encoding required	3.6.8
28	11FED	௫௯	TAMIL ABBREVIATION KKU	No encoding required	3.6.9
29	11FEE	௬௦	TAMIL ABBREVIATION YUM	No encoding required	3.6.9
30	11FEF	௬௧	TAMIL ABBREVIATION VUM	No encoding required	3.6.9

2.2 On Recommendations to UTC L2/13-028 & L2/12-231

The document “Recommendation to UTC” L2/13028 (Item 17) disagreed on 7 symbols proposed through L2/12231 due to a few reasons. Symbols for fractions 1/20th and 1/4th were considered to be same as alphabetic letters ஸ and வ respectively. Symbol of UZHAKKU was considered to be same as the one of the fraction 3/4th.

The subject expert panel of GoTN evaluated these and confirmed that the 4 items listed in the table below have distinct shape and significance and has provided the appropriate symbols for encoding. These are discussed in the sections down below. The other 3 symbols, that are pending for further research, will be handled later by taking them out of this proposal.

Srl	Details as per L2/13028 & L2/12231			Recommendations of subject expert panel of GoTN	Cross Ref. (click)
	Code Point	Symbol	Name		
1		ஸ	TAMIL FRACTION ONE TWENTIETH	Correct symbol provided for encoding	3.1.6
2		வ	TAMIL FRACTION ONE QUARTER	Correct symbol provided for encoding	3.1.5
3		ஐ	TAMIL SIGN UZHAKKU	Correct symbol provided for encoding	3.2.3
4		ங	TAMIL SIGN KURUNI	Correct symbol provided for encoding	3.2.4

3 Amendment Details

3.1 TAMIL FRACTIONS

FRACTION is to be called as “கீழ்வாய் இலக்கம்” in Tamil. The modern usage has been “பின்னம்”.


3.1.1 TAMIL FRACTION THREE SIXTEENTHS

Tamil Code Chart as defined in L2/15078, describes this fraction as below:

11FCC ஈஐ- TAMIL FRACTION THREE SIXTEENTHS
= muuviisam/mummaamukkaani

Further, the estampage (ASI-AR 95/1892) of the same inscription is also provided here for easy reference.







Hence, it is recommended that this changed symbol/glyph be encoded for denoting “TAMIL FRACTION THREE SIXTEENTHS” replacing the one proposed in the code chart L2/15078. The picture of the symbol is . In the amended code chart (Annexure-2) this is described at 11FCE. Further the annotation should indicate that it denotes “mummaakani”.

3.1.2 TAMIL FRACTION ONE SIXTEENTH



Tamil Code Chart as defined in L2/15078, describes this fraction as below:



11FC8  TAMIL FRACTION ONE SIXTEENTH
= viisam/maakaani




Considering the discussion in 4.4.2 of L2/12231, the expert panel agrees with the glyph selection but recommends a minor change in the shape, and also recommends adding one more symbol to denote $1/16^{\text{th}}$. The glyph of $1/16^{\text{th}}$ has two components:

MAA () + KAANI () = MAAKAANI ( ). Both these symbols individually are discussed in separate sections 3.1.6 and 3.1.3 respectively).

The variants discussed in the section 4.4.2 of L2/12231 are valid to a larger extent. However, for VIIS(C)AM/MAAKAANI, there are two other usages found normally in the old documents. One is through individual occurrence of MAA and KAANI occurring side-by-side, and another through a ligated form with some other symbol/digit. The symbol for MUUVIISAM recommended in the earlier section 3.1.1 of this document is an example for the ligated form when used with another symbol/digit. In the case of MUUVIISAM, VIISAM is ligated with TAMIL DIGIT THREE (0BE9). (MUUVIISAM = 3 VIISAM, $3 * 1/16^{\text{th}}$, MUU = THREE). It can be observed from the estampage in the section 3.1.1 that the ligature

following the TAMIL DIGIT THREE has resemblance to the proposed symbol , but not close to it. The orthography is not a proper join of two MAA glyphs, but a form of . In this glyph, one can observe two arms and a ridge in-between. The height of the ridge is not same as that of the arms. Further the whole shape is slightly tilted anti-clock wise. Similarity of this form can be observed by the attestation from Caa.Ganesan (page 33 of L2/12231).

Therefore, a change in the shape of the glyph to reflect the natural usage of the fraction is recommended. ( to be changed to ).


Now, when VIISAM/MAAKAANI is individually used, it takes the form of . This is well discussed in the section 4.4.2 of L2/12231(, ). Usage of this form can be seen in the documentations in SII. Further, this disjointed form has been approved by GoTN through G.O.29 dated 23 June 2010 (L2/10-318).

SII-Vol.3, Inscription# 514, Page# 149 is shown below for clear evidence; The line 8 shows the evidence of the individual usage of MUUVIISAM/MAAKAANI. This is the same form that was discussed in 4.4.2 of L2/12231.

For clear readability the 3 symbols/glyphs are focussed closely and the enlarged view is below. This in Tamil is read as “மூன்றையே மாகாணி” (மூன்று + அரை + மாகாணி).



The மாகாணி part is drawn-over in blue.




Therefore, it is recommended that this symbol be added as yet another symbol for VIISAM/MAAKAANI. The glyph is close to the one found in 4.4.2 of L2/12231 (), but needs to change on the square-character of the MAA-part. A proper form is provided.

The panel of GoTN believes that both these forms will be used when dealing with the texts of old documents. Therefore, it is essential that both are encoded rather than replacing one with another leading to wrong recording/reading of old texts. The expert community is cautious that encoding doesn't deviate from history. When the historical records have more than one valid symbols for a particular item, it makes it appropriate to add them rather than replace one of them by another.

Therefore, to sum up, the VIISAM/MAAKAANI can have two symbols.

1) The proposed  is modified a little to be  so that it can be used as the ligature while using it with other symbols/digits. In the amended code chart (Annexure-2) this is described at 11FC9.

2) A new symbol  is added to the chart (the front portion of this symbol should not be square-like. It is more curved.) so that it can be used when the fraction is found individually. In the amended code chart (Annexure-2) this is described at 11FCA.

The former is called as “TAMIL FRACTION VIICAM-1” and the later is called as “TAMIL FRACTION VIICAM-2”. Both have annotations “= MAAKAANI” and “= 1/16th”.

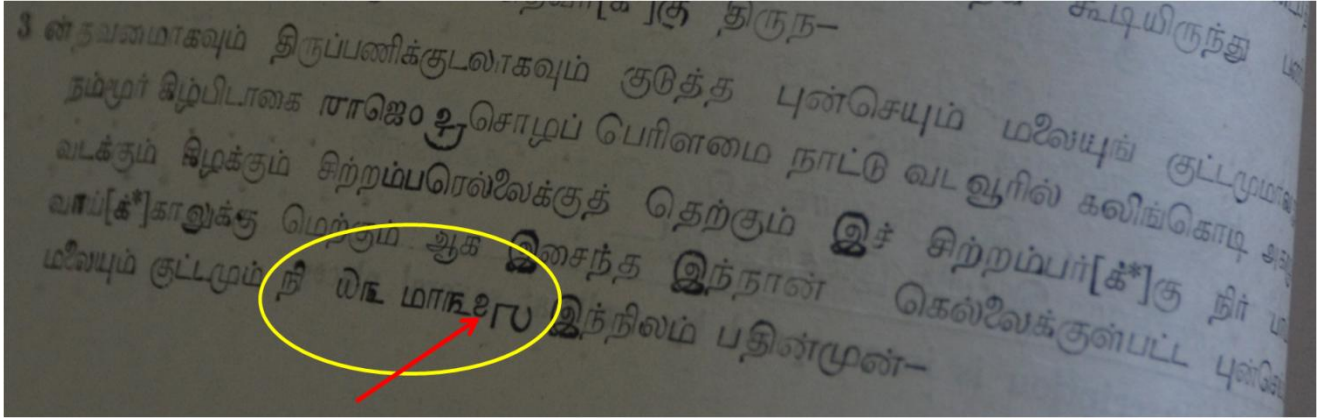
3.1.3 TAMIL FRACTION ONE EIGHTIETH

Tamil Code Chart as defined in L2/15078, describes this fraction as below:

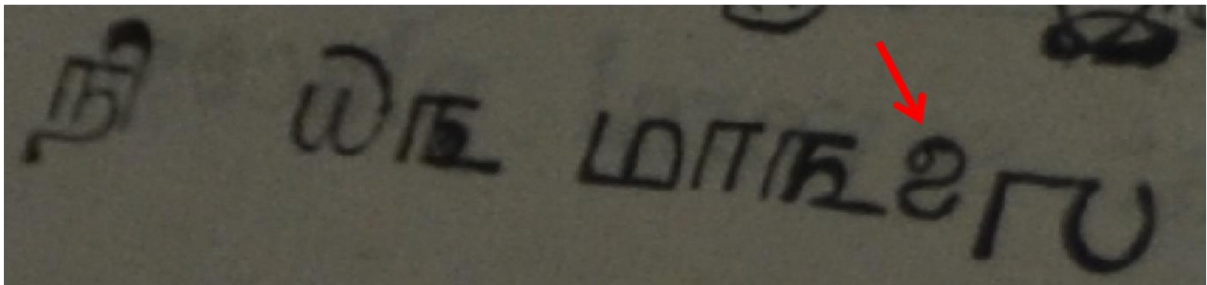
11FC2 ஶ TAMIL FRACTION ONE EIGHTIETH
= kaani

Panel of GoTN agrees to this glyph but recommends however a minor change to the shape. It has also carefully considered the discussion found in L2/12231 in this context. The actual glyph widely found in the old documents is ூ. The proposed symbol ஶ (through L2/12231, L2/13047) has a long vertical line stemming up from the bottom causing a deviation to the actual shape. Trimming the vertical line will match it with the actual. This is important because, this symbol/glyph is used alone, and in some cases ligated also with other digits/symbols. So, this error should not get propagated into the future.

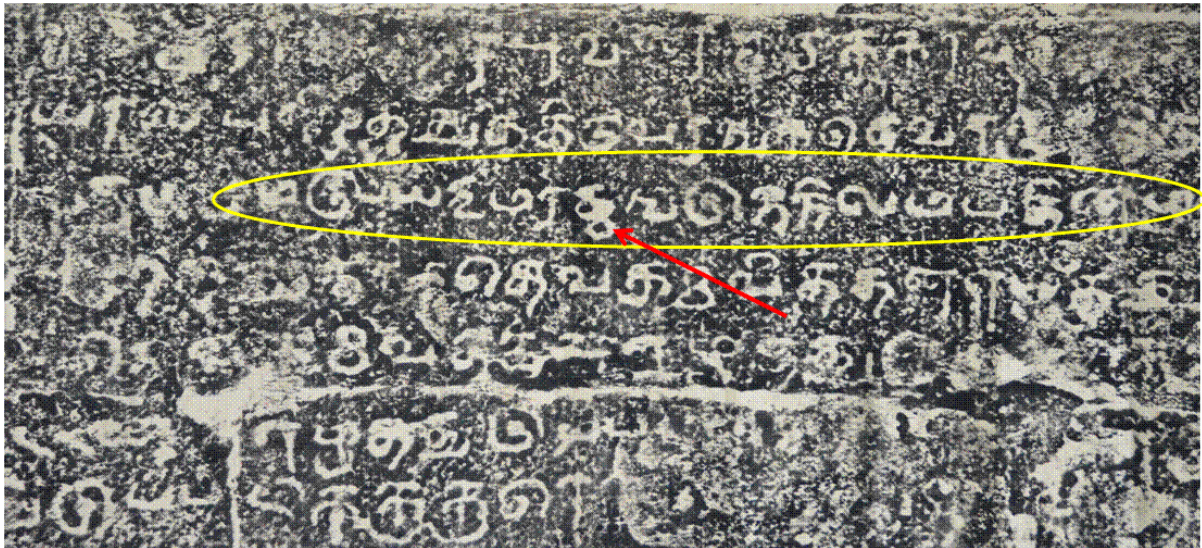
Following text is from SII-Vol.24, Inscription 24, Page 92. The third line of the inscription is as below.



Interesting symbols are here and it is worth noting as how they are written in this printed text. “நிலம் 13 மா முக்காணி அரைக்காணி” is the meaning of the symbols within the yellow-circle. Here, MUKKAANI is printed using separate symbols of TAMIL DIGIT THREE (0BE9) and KAANI. To enable more clarity, the yellow-circled part of the text is enlarged and presented below. This printed text shows correct shape of KAANI.




Further, the corresponding estampage from ASI-AR 129/1938-39 is as below.



Here it can be observed that MUKKANI is written in the fused form of TAMIL DIGIT THREE and the symbol of KAANI. The arrow line in red colour points to MUKKAANI. The enlarged picture of MUKKANI from the estampage below enables better understanding of KAANI part of the glyph in the MUKKAANI.



The drawn up blue coloured line shows the KAANI part of the MUKKANI. It can be observed that there is no vertical line stemming upwards. This is exactly the symbol of KAANI. (Unfortunately, the blue-line curve is not smooth, as it is hand-drawn over; please bear with it.).

Therefore, it is recommended to alter the symbol of KAANI a little. The correct picture of KAANI is . In the amended code chart (Annexure-2) this is described at 11FC2.


As said earlier, this will impact other symbols also. In that regard the symbol of MUKKANI will also need the minor alteration, trimming the vertical line of KAANI part.

3.1.4 TAMIL FRACTION THREE EIGHTIETH

Tamil Code Chart as defined in L2/15078, describes this fraction as below:

11FC6 க்யு TAMIL FRACTION THREE EIGHTIETHS
= mukkaani

As the shape of the symbol of KAANI is recommended to have minor alteration, this symbol will also be impacted. This has been discussed in the earlier section 3.1.3 as it is a common issue for both the symbols. In this symbol there are two parts, one representing Tamil digit 3 and the next representing KAANI. The first part of the symbol should represent 3 (TAMIL DIGIT THREE, 0BE9) properly. The symbol at 11FC6 of L2/15078 does not represent digit 3 correctly.

The correct symbol for the fraction is . However, in the estampages in the research of the panel were found to have scratches that could not identify correct shape representing digit 3. Therefore, the panel has proposed a wider research for this symbol.

Hence, at this stage, the panel recommends to postpone the encoding of the symbol by removing it from the current proposal. Encoding for this will be proposed through a separate proposal at a later period.

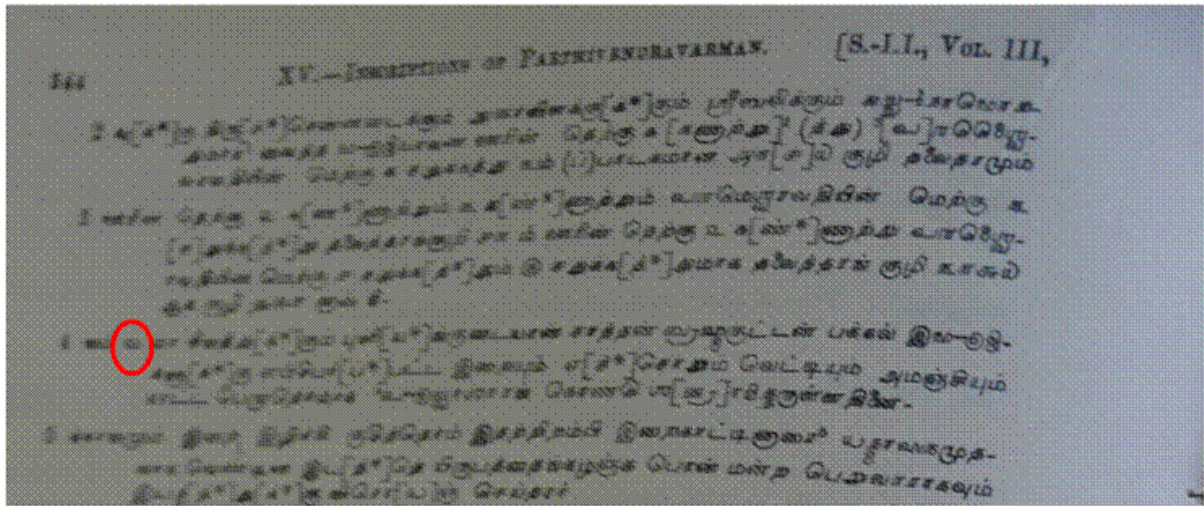
3.1.5 TAMIL FRACTION ONE QUARTER

QUARTER = கால் (KAAL) in Tamil.

L2/12231 proposed this fraction to be encoded. However, the “Recommendation to UTC” document L2/13028 (Item 17) disagreed as the symbol proposed for this fraction was declared to be same as the alphabetic character “TAMIL LETTER VA” (0BB5).


The expert panel evaluated the proposal and this recommendation, and conveys that the glyph of Tamil alphabetic letter “வ” (“VA”) is slightly different from the glyph of Tamil fraction “கால்” (KAAL). Since the printed texts commonly use the easily available typefaces, they have used the alphabetic “வ” and its variants as representative glyph for this fraction instead of making a separate typeface and hence this confusion has occurred.

SII-Vol.3, Inscription# 167, Page 343-344, Line# 4 has a text that uses Tamil fraction KAAL/Quarter.



The line 4 should be read as continuation of Line 3 (நிலம் வ மா நிலத்து). While the printed text above shows the symbol for quarter as “வ”, the corresponding estampage below shows the actual symbol of Quarter.





It can be observed from this inscription that the symbol of fraction KAAL/Quarter is very different from the alphabetic letter “வ”. And hence, it is recommended to add this symbol for TAMIL FRACTION ONE QUARTER. The picture for the symbol is .

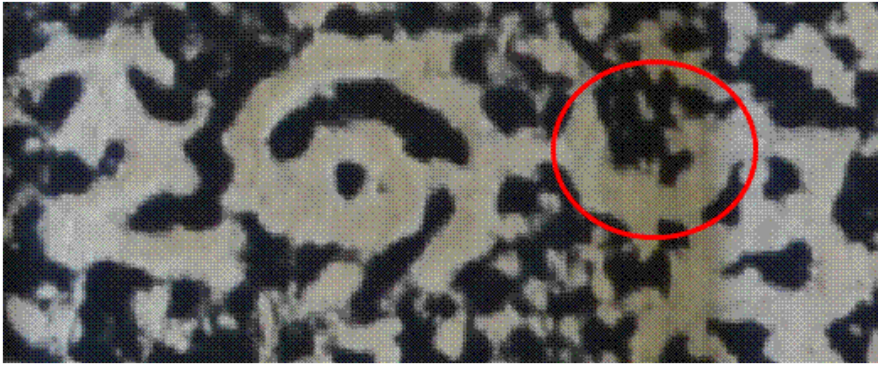
Besides , the annotations “also denotes the fraction one quarter” and “= kaal” of OBB5 should be dropped. In the amended code chart (Annexure-2) this is described at 11FD0.

3.1.6 TAMIL FRACTION ONE TWENTIETH

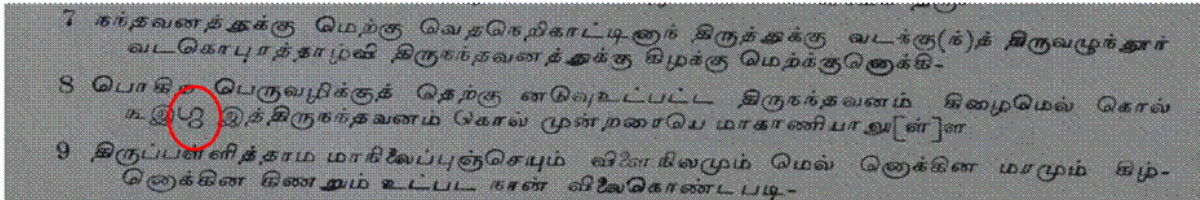
1/20th = “மா” (MAA) in Tamil.

L2/12231 proposed this fraction to be encoded. L2/13028 disagreed as the symbol proposed for this fraction was declared to be same as the alphabetic character “TAMIL LETTER PA” (OBAA). The discussions we had above for the fraction “கால்”/Quarter(3.1.5) is

applicable to this fraction also. Glyph of TAMIL LETTER PA “ப” is very different from the actual symbol of the fraction “மா”(). The alphabet “ப” is squared but symbol of “மா”(MAA) is more curved at the bottom and one of its arms is a bit more obtuse than the other. This can easily be understood through the earlier estampage in the section 3.1.2. Some of the discussions related to “MAA” there, are also relevant here. Here, the same estampage is reproduced to show the difference between  and alphabet “ப”.



The red-circled symbol is for MAA. The text related to this as shown in 3.1.2 is also reproduced here for reference.



Please note the word “உட்பட்ட” in the same line(8th) of the inscription where “MAA+KAANI” exists. And also note the word “உட்பட” in the 9th line. Both the words in these lines use the letter “ப”.

The inscription being very long, the leading part from the MAA symbol (8th line) and the trailing part (of 8th and 9th line) are given below for easier reading. Observe how the letter “ப” is written in the word “உட்பட்ட” in the leading part, and the same in the word “உட்பட” in the next part. The symbol representing MAA is red-circled and the “ப” is yellow-circled.



It can be observed that in both the places letter “**ப**” is same with its square shape, and different from MAA as it is rounded at the bottom with its arms obtuse. (Please zoom up for more clarity).

Therefore, it is recommended that a separate symbol for the fraction $1/20^{\text{th}}$ be encoded and the shape of the symbol of MAA is **ப**. Besides, the annotations “ also denotes the fraction one twentieth” and “= maa”, given under TAMIL LETTER PA (OBAA) has to be removed. In the amended code chart (Annexure-2) this is described at 11FC8.



3.1.7 TAMIL FRACTION ONE HALF

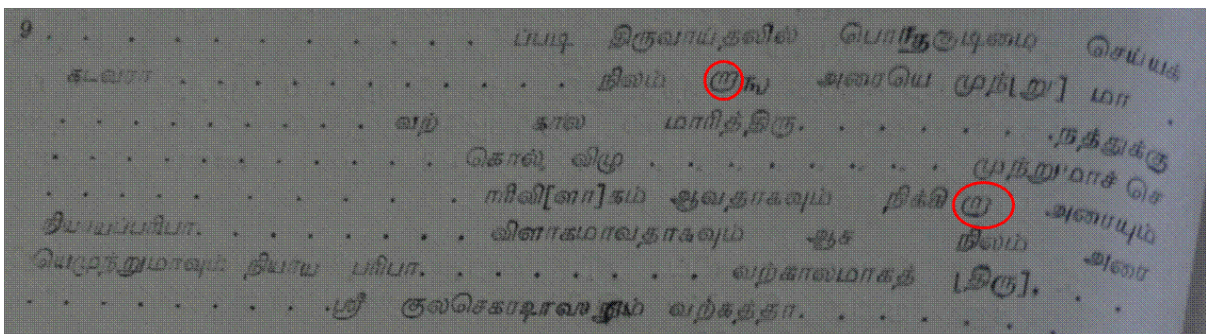
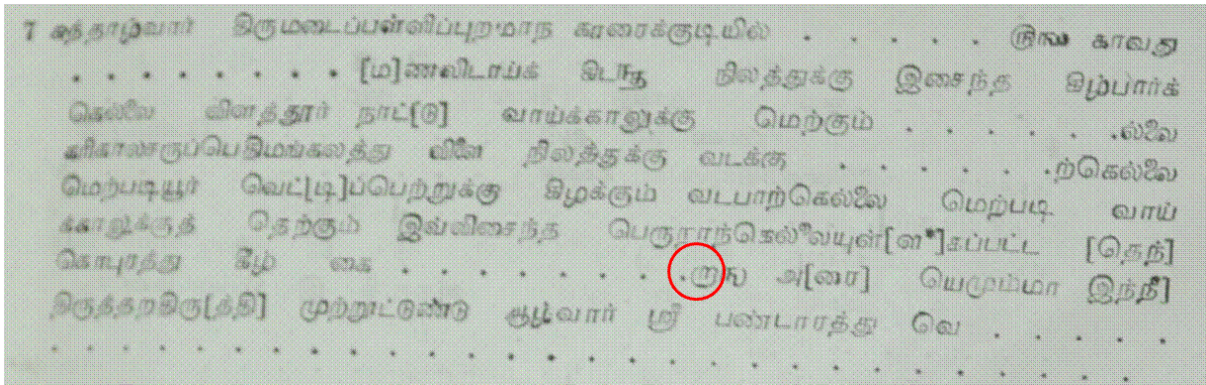
Tamil Code Chart as defined in L2/15078, describes this fraction as below:


11FCE **ப** TAMIL FRACTION ONE HALF
= arai

With reference to the discussions in section 4.4.2 of L2/12231, while agreeing to the inclusion of the proposed symbol **ப** for $1/2$ (“அரை” = “ARAI”), the panel recommends to include the symbol **ப** also for encoding. “When more than one valid-symbol exist in the history, it is incorrect to select only one out of many”. As long as the symbol is valid and has sizeable formal usage it can be considered for encoding, evaluating various other parameters. It is important to note that in the case of old-texts valid symbols represent various dates or regional differences. In the context of publications and e-textualization, representing one valid symbol with other valid symbol will lead to confusion and distortion



of documents and history. Instead of dropping one valid-symbol for another, encoding should accommodate both so that it truly helps publication and e-textualization. It will be a good practice to identify with care and caution the validity of a symbol through relevant primary sources rather than secondary sources so that the right encoding helps the old documents of different nature. And, it is important to mention that the panel disagrees with the font substitution solution for such valid, significant and important symbols. This discussion is applicable to other symbols that have more than one valid-symbols also (ex. VIISAM).

In the case of “ARAI”, a huge volume of old documents exist with the usage of the symbol . For example, the SII-Vol.24 has the text of Inscription# 31 in the pages 28 to 30 that has occurrences of ARAI with the symbol resembling . The screen shot of line 7 and 8 are given below. It should be noted that, ARAI/HALF is represented in this print text using the old-alphabetic letter “RAA” (வல்லின றகாரம்).



Following is the estampage (ASI- AR 131 of 1947-48) showing a portion of the 9th line where the second occurrence of ARAI/HALF can be seen in the string “ நீக்கி  அரை.....”.





Therefore, this symbol for ARAI/HALF also has to be encoded. As this symbol () has earlier usage (10-11 Century CE), this can be named “TAMIL FRACTION ARAI-1” and the other symbol () can be “TAMIL FRACTION ARAI-2”. In the amended code chart (Annexure-2) these are described at 11FD1 and 11FD2 respectively.


3.1.8 TAMIL FRACTION ONE EIGHTH






Tamil Code Chart as defined in L2/15078, describes this fraction as below:

11FCA  TAMIL FRACTION ONE EIGHTH
= araikkaal

Evaluating the discussion on this symbol in section 4.4.1 of L2/12231, the shape of the glyph is almost correct but needs minor alteration.

The fraction  = $1/8^{\text{th}}$ is = $1/4$ multiplied by $1/2$ (quarter of half). The following picture is page 169 from the Vijayanagara Inscription part of “Tirumala Tirupati Devasthanam Inscriptions – Vol.1 / 1988”⁴. It presents the Inscription# 181, 182 (#373 & 485-TT). It has occurrences of symbol  for $1/8^{\text{th}}$.

This symbol is the combination of glyph of $1/4$ and glyph of $1/2$. $1/4$ is represented in the section 3.1.5 as  and $1/2$ is represented in the section 3.1.7 as the TAMIL FRACTION ARAI

– 2(). In both  as appearing in the Inscription text below and  as proposed by L2/12231, the second part representing HALF is a deformed symbol of TAMIL FRACTION ARAI–2  . Logically it will be correct to alter the symbol a bit to accommodate the shapes of ¼ and ½(2). Hence it is recommended to alter the shape to  . In the amended code chart (Annexure-2) this is described at 11FCC.


VIJAYANAGARA INSCRIPTIONS

No. 181.

(Nos. 373 and 485—T. T.)

[On the door-jamb wall (front right side) of paḍikāvali-gōpura in Tirumala Temple.]

Text

- 1 ஸ்வஸிஸ்ரீ சிவஸௌவகஸௌரத்தா—
- 2 உமாமஹாலையா உமபிராயவலாஸ—
- 3 1கண ஸ்ரீஸிர குபாயகம்பனாஉடையர் 2பெகடைப்—
- 4 ...திருவிவங்கடமுடையானுக்கு திருநகர்காவிளக்கு 28  க்கு விட்ட பசு
- 5 உயஅ ஓ பிஷஹ ஓ இது 8சூராதிகுலவெரெ செல்லக்கடவது இது ஸ்ரீவெ-
- 6 ஷவாரகெஷ (ஃ) உ-

Translation

1. Hail! In the prosperous year Kilaka⁶.....

2-5. The charity of 28 cows and 1 bull for seven-eighths of a *nandāvilakku* for Tiruvēkaṭamuḍaiyān was made by the *Pekkaḍi* (minister) of Śrī Vira-Kumāra-Kampaṇa Uḍaiyar entitled *Mahāmaṇḍalāvara*, *Arirōyavibhāṭa* and (*Bhāṣhaikkuttapṭuvarāvāra*)*gaṇḍa*.


5-6. This (charity) shall last as long as the moon and the sun endure. May this the Śrivaishnavas protect!

No. 182.

(No. 374—T. T.)

[On the door-jamb wall (front right side) of paḍikāvali-gōpura in Tirumala Temple.]

Text

- 1 ஸ்வஸிஸ்ரீ மாரகழி மாதம் விட்ட விளக்கு
- 2  ஆக விளக்கு க (ஃ) உ-

Translation

One-eighth of a (*nandā*-*vilakku* (oil-lamp) was added in the month of Mārgajī⁸ of this year, making a total of one full light.

NOTE :- The English equivalent date of No. 179 *ante*. is 6th July 1359 A.C.

1. May be read ஸுவராயாஸை.	6. = Saka 1290 = 1368 A.C.
2. Read பெக்கண	7. Read அரைக்கால் = 1/8.
3 and 4 Read முக்கால் அரைக்கால்	8. = December 1368 A.C.
5. Read அஷ்டாதித்ய -	

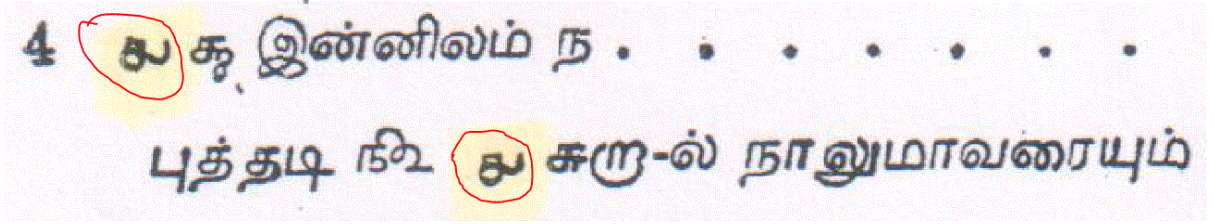
169

3.1.9 TAMIL FRACTION ONE FIFTH

Tamil Code Chart as defined in L2/15078, describes this fraction as below:

11FCD ழ TAMIL FRACTION ONE FIFTH
= naalumaa
• for one quarter “kaal” use 0BB5 வ
→ 0BB5 வ tamil letter va

நாலுமா = NAALUMAA = NAALU + MAA = 4 time MAA. According to the panel the symbol ழ is incorrect . Please refer to the section 3.1.6 for the symbol of MAA as ூ . NAALUMAA is combination of the ழ-like symbol (resembling TAMIL DIGIT FOUR), and the symbol of MAA. So, it is written as ூ . This can be seen in the 4th line of the text of SII-Vol.12, Inscription# 148, Page 76 shown here. This is the enlarged view of the 4th line.



The full page can be seen below. Any symbol other than this could be a possible variation due to hand writing style. (Often enough the symbol for 4 and the symbol for Half are not differentiated; the symbol for four should have a nose while the symbol for half doesn't have). Hence, the panel recommends to change the symbol to ூ for NAALUMAA. In the amended code chart (Annexure-2) this is described at 11FCF.

S. RAJAVELU

SSS vol 11 No. 148

15.11.09

76

- 4 ஸும் வண்ட[ட]றும் இற[சு]றநாள் முதல் வைத்த சந்திவிளக்கு ஒன்றுக்கு இ[சு]கொடில் காணியாளர் கைக்கொண்டு வையிராவணக்கொள் உள்ளிட்டார் பக்கல் விட்ட பசு ஆறு
- 5 இப்பசு ஆறும் கைக்கொண்டு சந்திராதித்தவரை திருவிளக்கு செல்வதாகக் கல்வெட்டி விட்டொம் காணியாளரொம்[1] இது ஸ்ரீவைஷ்ணவ ஈடுகொடி [1] இப்பசு ஆறுக்கும் மாடம் ஒன்று[சு]கு உகளைந தா[சு] நாழியால் அள[சு]க்கும் நெய் நாழிஉரி [1]

No. 148.

(A.R. No. 530 of 1922).

TIRUKKANĀPURAM, NANĪLAM TALUK, TANJORE DISTRICT.

ON THE EAST WALL OF THE SECOND PRĀKĀRA IN THE SAURIRĀJA-PERUMĀL TEMPLE.

This is an incomplete record of Peruñjīgadēva dated in the 5th year and is called a *mīlasādhana*¹ of the chief. It records a sale of land in Sembīyan Kurudaiyāḍi, situated in Panaiyūr-nāḍu, a subdivision of Kulōttuṅgaśōla-valanāḍu to Uḍaiyan Tiruñānasambandan Alagiyān Rājadvākara-Mūvēndiravēḷāṅ of Vīḷiyūr in Āvūr-kūrram, a subdivision of Nittavinōda-valanāḍu by Araiyan Purriḍaḱkoṇḍān Dēvapperumā, the headman of Kurudaiyāḍi in Taiñjāvūr-kūrram, a subdivision of Pāṇḍikulāśaṅi-valanāḍu. As the record is incomplete further details as to the purpose of the transaction are not clear.

The details of date given in the inscription are not regular.

Text.

- 1 முலசாதனம் [1] ஸ்ரீசீ பெருஞ்சிங்கதெவற்கு யாண்டு [௫-வது] மகாநாயந்து உருவாக்கப்பட்டது உஸ்தியும் திக்கச்சிழமையும் பெற்ற அனிமத்தநாள் நித்தவிநொதவளநாட்டு ஆலுக்கற்றத்த விழியுருடையான் [வ]தைவன் திருஞாநம்பந்தன் அழகிய[ர] னீராசதிவாகா முவெந்திரவெளாளுக்கு பாண்டிசுவலிவளநாட்டு தஞ்சாவூர்க்கற்றத்த குருதையாடிமுனை அரையன் புறிடக்கொண்டான்
- 2 தெவப்பெருமானே றற திலமாவது [1] குலொத்துக்கசொழுவள நாட்டு பிணையுநாட்டு செய்யின்குருதையாடியில் நத்தமும் விளநீலமுமாவது [1] சீமைக்குரு தையாடியில் தெந்கில் மாளிகை நத்தத்தில் மனைக்கு எல்லையாவது சிழ்பாற்கெலில் பட்டப்பாழுக்கு மெற்கும் தென்பாற்கெலில் நத்தம் குழி ஈடி இது[வு]ம் மனறுக்கு வடக்கில் சிழ்திடல் நத்தம் குழி உய்கு இக்குழி இருபத்தஞ்சம் ஆக ந-
- 3 தத்தம் [௫] உய்கு இக்குழி உயூஉய்கு குழி இருநூற்றிருபத்தஞ்சம் இவற்கு விற்ற விளநீலமாவது மெலைநத்த[1]த்துக்குத் தெற்கு பட்டப்பாழ் நத்தத்துக்குத் சிழக்குவாய்த்து பெர்சொல்லப்பட்ட சிவ வப-இந்நிலம் ஆறுமாவும் இதன் மெற்கு வாய்க்காலுக்கு பெற்கு [து]க்கைவ[1]யக்கல் என்ற பெர்சொல்லப்பட்ட சிவ [வசு] இந்நிலம் காலெ முக்காணி[1] யும் பட்டப்பாழுக்குத் தெற்கு வானவன் [வா]யக்கா[1] சிவ
- 4 உய்கு இன்னிலம் வன் கொயிலுக்குத் தெற்கு அய்யன் திருப்பு புத்தடி சிவ உய்கு-ல நாலுமாவரையும் இதன் சிழக்குத்தடி விளாகம் சிவ ரு இன்னிலம் காலெணியும் இதன் சிழக்கு அரையன்கால் சிவ வசு இந்நிலம் க[1]ர[1]லெ முக்காணியும் இ[1]தன் தெற்கு சிவ சபு இந்நிலம் நாலுமக்காணி இக்கு விட்டு மெற்கு வடக்கைய பூப்பறியல் வாய்க்கா[1]லுக்குத் தெற்கு
- 5 பூப்பறியல்க்குட்ட ஸ்கு விடந்க சிழக்கு சீமைநத்தத்துக்கு தெற்கு [1] பெற்றாறு குடிக்குடி எல்லைக்கு வடக்கு மெலுமாக தான் கட்டின சிவ உய்கு இன்னிலம் முக்காலெ இரண்டு மாமுக்கணியும் உடையார் புறநிடக்கொண்டநாயினூர் திருக்குப்புக்கு வடக்கு சிவ உய்கு இந்நிலம் முக்காலெ[1]முக்காணியும் இதன் சிழக்கு அருந்த

சாஸ்திர

¹ Compare such terms as *sādhana*, *śai*, *tirumandira-śai*, *niyōgam*, *tirumugam* or *śrīmukha śippu* and *śālimugam* used in inscriptions.
• The inscription stops here.

3.1.10 TAMIL FRACTION ONE THIRTY-SECOND

Tamil Code Chart as defined in L2/15078, describes this fraction as below:

11FC5 சூ TAMIL FRACTION ONE THIRTY-SECOND
= araviisam

அரைவீசம் = ARAVIIS(C)AM = Half of VIISAM/VIICAM.

The derivation found in the Section 4.4 of L2/12231 is un acceptable as it is incorrect.

$$\text{araivīcam } \frac{1}{32} = \text{araimā } \frac{1}{40} + \text{araikkāṇi } \frac{1}{160} = \text{சாடு} \rightarrow \text{சா} + \text{உ} = \text{சூ}$$

It looks like that the author of L2/12231 has chosen to derive it this way as there was not any valid symbol could be found in the sources he has referred. It is also observed from the discussion in the section 4.4.3 (Errant attestations) of L2/12231, that, getting proper glyph for this fraction had been a concern. Further, it is observed that the symbol has been forcefully matched with an available collection.

ARAVIICAM = ARAI + VIICAM = HALF-like symbol + VIICAM symbol. Symbol of VIICAM can be understood from section 3.1.2 of this document. Therefore, the panel is providing the right symbol சூ by combining Half-like symbol and the proposed symbol of VIICAM(Annexure-2, 11FC9). In the amended code chart (Annexure-2) this is described at 11FC5.

It can be observed that the VIISAM part of the symbol now has the logical uniformity among VIICAM (1/16th, section 3.1.2), and MUUVIICAM (3/16th, section 3.1.1) as below.

$$\text{VIISAM} = \text{வூ}, \text{ ARAI-VIISAM} = \text{சூ}, \text{ MUU-VIISAM} = \text{மூ};$$

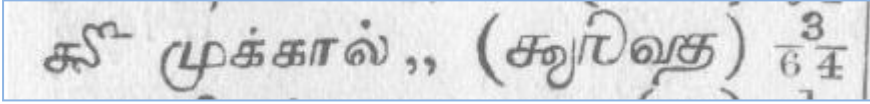
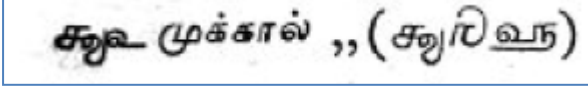
3.1.11 TAMIL FRACTION THREE SIXTY-FOURTHS

Tamil Code Chart as defined in L2/15078, describes this fraction as below:

.....
11FC7 சூ TAMIL FRACTION THREE SIXTY-FOURTHS
= mukkaalviisam
• for one twentieth "maa" use 0BAA ட
→ 0BAA ட tamil letter pa

மூக்கால் வீசம் = MUKKAL VIIS(C)AM = 3/4 VIIS(C)AM.


Following two pictures are from the attestations of L2/12231, available at pages 38 and 35 respectively. It can be observed that, a) the symbols in both differ a lot; b) the symbol represents a sequence of symbols .



In the actual usage, it is very normal that multiple fractions occur in sequence. But, combining all of them to make another symbol is incorrect. It can be understood that L2/12231 (section 4.4, page 8) derives such a symbol as below through an equation with some assumption. It also looks like matching a symbol in the attestation forcefully.

$$\text{mukkāl̥vīcam } \frac{3}{64} = \text{mukkāṇi } \frac{3}{80} + \text{araikkāṇi } \frac{1}{160} + \text{muntiri } \frac{1}{320} = \text{க்ஷடுவந}$$

→ க்ஷ + வ = க்ஷ



The panel of GoTN does not suggest this way of creating a symbol. Also, during the research on this symbol, the panel observes various issues related to this symbol. Though, it could find a symbol of the shape  (SII-Vol.10, Inscription# 174, Page 102), it also finds differences/variations in the documents. The panel is of the opinion that the lineage and usage of this symbol worth wider research. Hence, at this stage, the panel recommends to postpone the encoding of the symbol by removing it from the current proposal. Encoding for this will be proposed through a separate proposal at a later period.

3.2 TAMIL MEASURES OF GRAINS

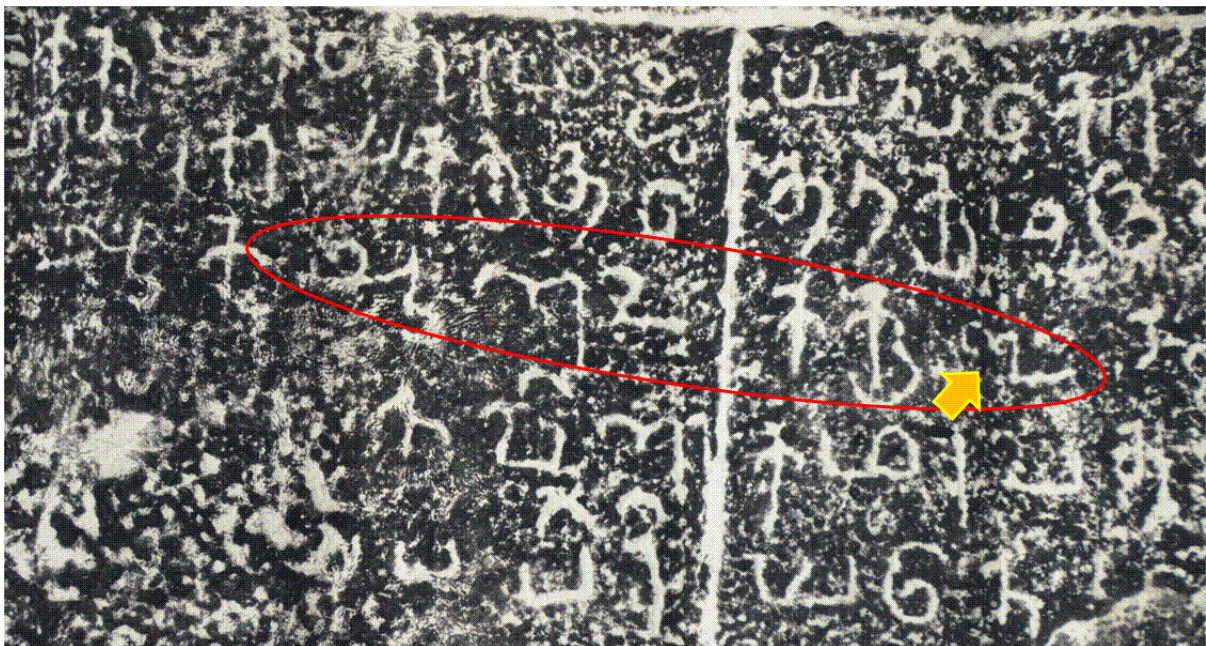
3.2.1 TAMIL SIGN NEL



Tamil Code Chart as defined in L2/15078, describes this measure as below:

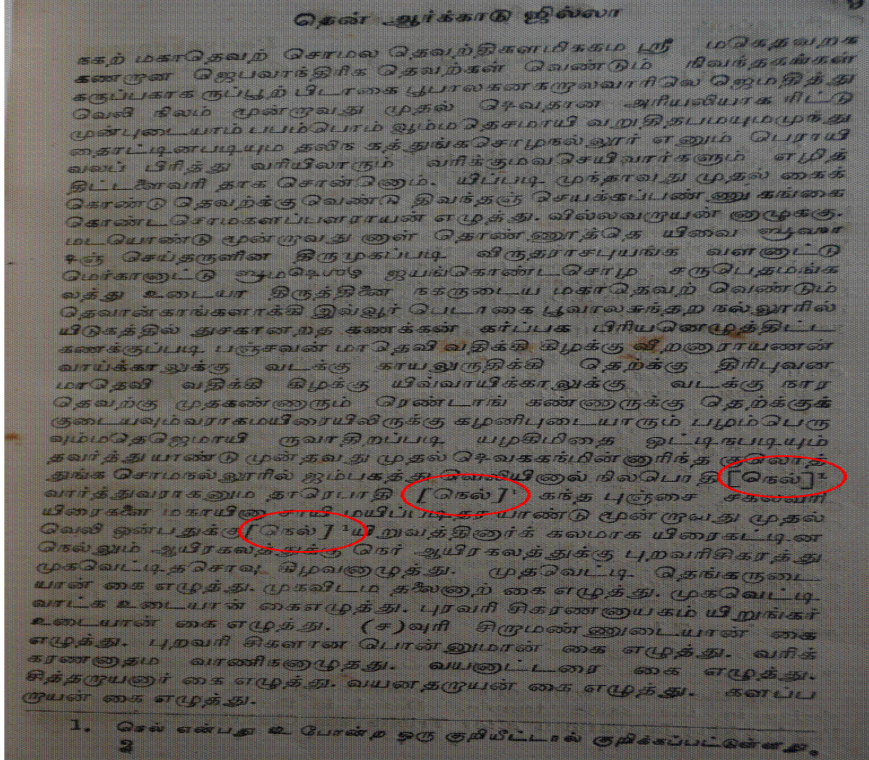
11FD1 ஐ TAMIL SIGN NEL
• one grain of paddy

Panel of GoTN evaluated the glyph and the discussion on NEL in the section 4.6.1 of L2/12231. It also understands the observations of the author of the proposal L2/12231 mentioning, “A case, not of proper glyphic variants but of difficulty in identifying the proper glyph, is in the case of nel, one grain, the least measure of volume”. The panel provides the glyph  from the primary sources and recommends to encode it in place of . In the amended code chart (Annexure-2) this is described at 11FD7.

This changed symbol is also indicated in “கணித நூல் Treatise on Mathematics”⁶ page 298. The estampage (ASI-AR 129 / 1938-39), corresponding to the SII-Vol.24, Inscription# 81, is given below. The red-circled string “ஆள் 2 க்கு ஐ” = “ஆள் 2 க்கு நெல்” (AAL 2 K KU NEL). The NEL symbol is shown by the yellow-arrow. Many occurrences of NEL can be seen in SII-Vol.4.




Further, the “Inscriptions (texts) of The Pudukkottai State”², Inscription# D3655, Sasanam-5, in the page# 7-9 has occurrences of the text NEL. Though it doesn’t record the symbol as it is, it leaves a foot note in Tamil meaning “Symbol  is used for NEL”. It can be understood that the symbol  has been used very widely in the primary sources. The picture of the page is: (please zoom up for more clarity)




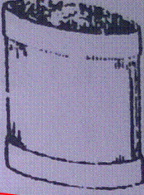
3.2.2 TAMIL SIGN SUVADU

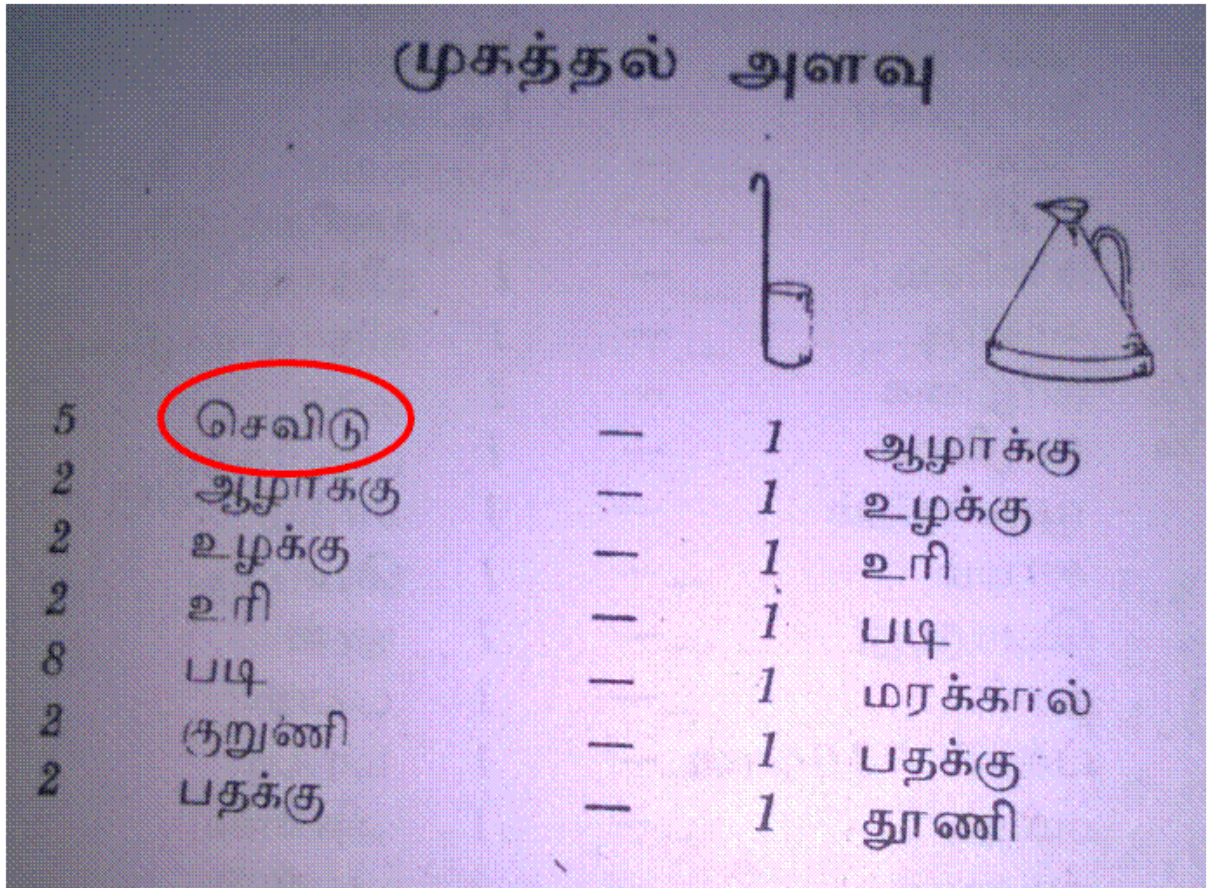
Tamil Code Chart as defined in L2/15078, describes this measure as below:

11FD2  TAMIL SIGN SUVADU
• equals 360 nel

The name of this measure “SUVADU” is varying over an extended period. The right name of this measure is “CHEVIDU” (செவிடு). “Tamil Ennum Eluththum”³ – a book published by Saraswathi Mahal Library, Thanchavur (pages 72 and 74) provides attestation for this. L2/12231, section 7.2, page 39 also provides an attestation from the book “Kanakkadhikaram (1958)” for CHEVIDU. The Panel recommends to change the name for this measure from SUVADU to **CHEVIDU**. In the amended code chart (Annexure-2) this is described at 11FD8.

பெய்தல் அளவு

					
360	நெல்	—	1	செவிடு	
5	செவிடு	—	1	ஆழாக்கு	
2	ஆழாக்கு	—	1	உழக்கு	
2	உழக்கு	—	1	உரி	
2	உரி	—	1	படி	
8	படி	—	1	மரக்கால் (குறுணி)	
2	குறுணி	—	1	பதக்கு	
2	பதக்கு	—	1	தூணி	
5	மரக்கால்	—	1	பறை	
80	பறை	—	1	கரிசை	
48-96	படி	—	1	கலம்	
120	படி	—	1	பொதி	



3.2.3 TAMIL SIGN UZHAKKU

L2/12231 (Section 3.2, Item 4, U+11FD6) proposed this measure to be encoded. However, the “Recommendation to UTC” document L2/13028 (Item 17) disagreed as the symbol proposed for this measure was same as the Fraction $\frac{3}{4}$ (L2/15078, 11FCF, TAMIL FRACTION THREE QUARTERS).

The symbol of fraction $\frac{3}{4}$ and measure UZHAKKU are different. Tamil Code Chart as defined in L2/15078, describes fraction $\frac{3}{4}$ as below:

11FCF $\frac{3}{4}$ TAMIL FRACTION THREE QUARTERS
= mukkaal

The symbol for $\frac{3}{4}$ shown as $\frac{3}{4}$ is found to be correct. However, the symbol of

UZHAKKU is $\frac{3}{4}$. The following picture is page 178 from the Vijayanagara Inscription part of “Tirumala Tirupati Devasthanam Inscriptions – Vol.1 / 1988”⁴. It presents the Inscription# 189 (#52-GT). It has multiple occurrences of symbol $\frac{3}{4}$ for MUU-UZHAKKU.

TIRUPATI DEVASTHANAM INSCRIPTIONS:—Vol. 1

- 11 தொறும் ஸ்ரீபண்டாரத்திலே இந்த வகைப்படியே விட்டுப்பொதக்கடவது ஆகவும் திருமலைமெல் அமுதுசெய்தருளின ப்ரஸாதத்திலே தம்முடைய பொது-
- 12 ப்ரஸாதம் உயசு உ ¹நுது இதில் அரசாணையர் மடத்துக்கு செஷம் ஆக பெறும் ப்ரஸாதம் யிரு உ ²நுது நிக்கி தாம் தாநத்தாற்குக் குடுத்த ப்ரஸாதம் பதி[னெ]ருநாழியும்
- 13 தானத்தார் திருப்பதி ஸ்ரீவைஷ்ணவர்கள் நிவ-ஹமலு நாலும் திருச்சக-னூரில் ஸபையார் நிவ-ஹமலு முன்றும் நம்பிமார் நிவ-ஹமலு ஒன்-றும் கோயில்கெட்கும்
- 14 ³செயர்கள் நிவ-ஹமலு இரண்டும் கோயிற்கணக்கு திருநின்றஹண்டையார்க்கள் நிவ-ஹமலு இரண்டும் ஆ[க] இந்த பன்னிரண்டு நிவ-ஹமலுத்திலும் பெறக்கடவர்-
- 15 களாகவும் ஸ்ரீகொவிந்தப்பெருமாள் அமுதுசெய்தருளின ப்ரஸாதத்தில் தம்முடைய விழுக்காடு ப்ரஸாதம் யா உ ⁴நுது இதில் இந்த மடத்துக்கு ப்ரஸாதம் ரு உ ⁵நுது
- 16 நிக்கி ப்ரஸாதம் [யெ] உ ம் இந்த பன்னிரண்டு நிவ-ஹமலுத்திலும் பெறக்கடவதுஆகவும் ⁶தம்முடைய ஸாரிராவஸானத்துக்கு பின்பும் மட-
- 17 செஷப்ப்ரஸாதம் இந்த மடம் கைக்கொண்ட ⁷வாமாமி ஸ்ரீவைஷ்ணவர் பெறக்கடவர்ஆகவும் இப்படிக்கு அநாஜிதீவரை நடக்க-
- 18 க்கடவதுஆகவும் இப்படிக்கு ஸ்ரீவைஷ்ணவர்கள் ⁸பணியில் கோயில்கணக்கு திருநின்றஹருடையான் எழுத்து இது
- 19 ஸ்ரீவைஷ்ணவரகெஷ உ

Translation

Vide Translation of No. 187 (No. 57—T.T.) of which it is a copy.

No. 190.

(No. 43—T. T.)

[On the west wall of the first prakāra of Tirumala Temple.]

Text

- 1 ஸ்ரீவைஷ்ணவரகெஷ உ ¹ஸகாவலு ஆயிரத்து முன்னூற்று ஒரு பத்து நாலின் மெல் செல்லாநின்ற ஆங்கிர²வஹ்வஹஸுத்து பங்குனி மாதம் [உ-³தீ] நாள் திருமலையில் ⁴தானத்தாரோம்

1. This figure stands for நாழி முவ்-வழக்கு.

2. Read ஜீயர்கள்.

3. Read தம்முடைய.

4. Read வாகாசி.

5. Read பணியால்.

6. Read ஸ்ரீவைஷ்ணவர்.

7. Read ஸகாவலு.

8. Read—வஹ்வஹஸுத்து.

9. This figure stands for தேதி.

10. Read ஸ்ரீவைஷ்ணவரகெஷ.

MUU-UZHAKKU means 3 times UZHAKKU. Digit 3 in Tamil is ௩ (TAMIL DIGIT THREE (0BE9)). Therefore, logically, ௩௩௩ is written combining ௩ (3) and ௩ . It can be observed here that the symbol ௩ of $\frac{3}{4}$ is not combined with ௩ , and hence as per the expert panel both the symbols are different.

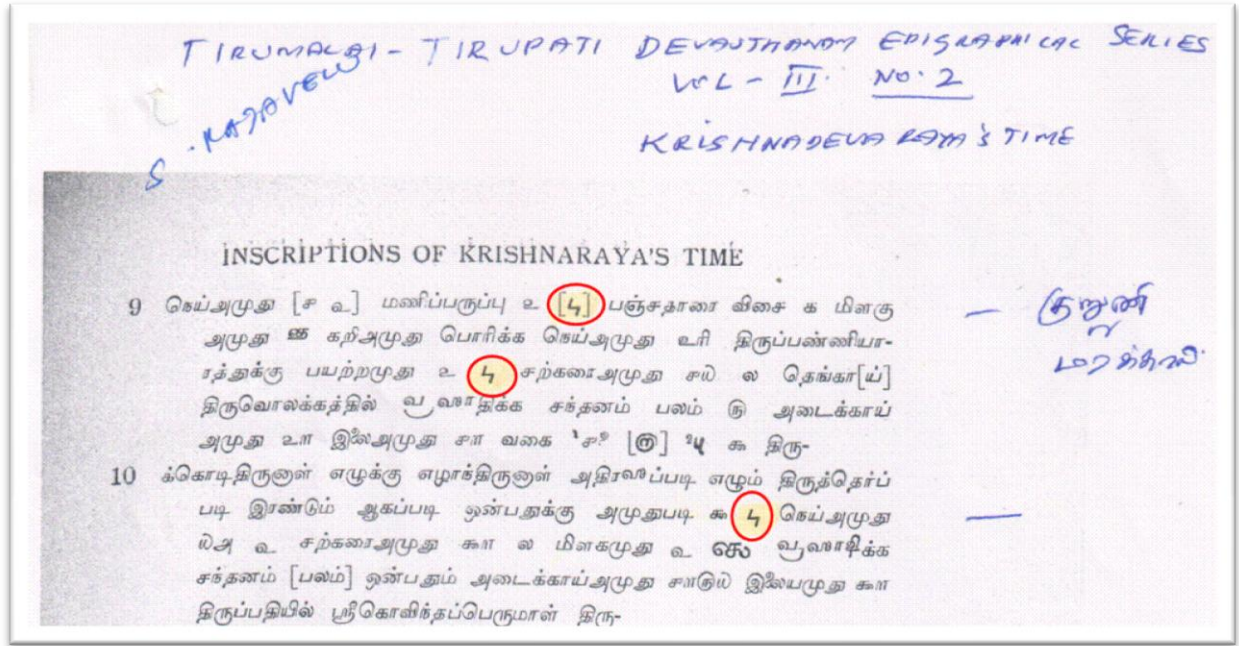
Hence, the panel recommends to include ௩ into encoding and provide separate codepoint for UZHAKKU. In the amended code chart (Annexure-2) this is described at 11FDA.

3.2.4 TAMIL SIGN KURUNI


L2/12231 (Section 3.2, Item 8) proposed this measure to be encoded. However, the “Recommendation to UTC” document L2/13028 (Item 17) disagreed as the symbol proposed for this measure was same as the TAMIL LETTER NGA (L2/15078, 0B99).

0B99 ௩ TAMIL LETTER NGA
• also denotes the measure kuruni/marakkaal
→ 11FD5 ௩௩ tamil sign muuvuzhakku

But, the symbol of TAMIL LETTER NGA and the symbol of KURUNI are different. Symbol of KURUNI can be seen in the Inscription text in the 9th an 10th lines of Tirumalai Tirupathi Epigraphic Series – Vol.3, No.2, Page 5.





The 9th line occurrences read as “மணிப்பருப்பு 2 [குறுணி]” and “பயற்றமுது 2 குறுணி”, and the 10th line occurrence reads as “அமுதுபடு 9 [குறுணி]”.


Hence, the panel recommends that the symbol for KURUNI is encoded and the symbol is . In the amended code chart (Annexure-2) this is described at 11FDC.

3.2.5 TAMIL SIGN PADAKKU

Tamil Code Chart as defined in L2/15078, describes this measure as below:

11FD6  TAMIL SIGN PADAKKU
• equals 2 kuruni/marakkaal

Though, the printed books show the symbol as , the subject expert panel, in

its reserach has observed the occurrences of the symbol in the form of  in the primary resources. Also, some research worthy variations observed. Investigating the lineage and the true form has been a bit complex, and hence it requires further research.

Hence, at this stage, the panel recommends to postpone the encoding of the symbol by removing it from the current proposal. Encoding for this will be proposed through a separate proposal at a later period.

3.2.6 TAMIL SIGN MUUVUZHAKKU

Tamil Code Chart as defined in L2/15078, describes this symbol as below:

- 11FD5 ஈத TAMIL SIGN MUUVUZHAKKU
- equals 3 uzhakku
 - for the measure naazhi/padi which equals 2 uri or 4 uzhakku, use 0BF3 உ
→ 0BF3 உ tamil day sign
 - for the measure kuruni/marakkaal which equals 8 naazhi/padi, use 0B99 ங
→ 0B99 ங tamil letter nga

மூ-வுழக்கு = MUU-VUZHAKKU = மூன்று உழக்கு;

The symbol of MUUVUZHAKKU is very close to the actual; but still needs a minor alteration. Here “MUU” means “three”. Three is represented as ங. The first part of symbol of MUUVUZHAKKU should reflect the “three” correctly. It should clearly distinguish it from ங and ங.

Hence, the symbol is modified a bit to the form of ஈத . The panel recommends this symbol for encoding. In the amended code chart (Annexure-2) this is described at 11FDB.



3.3 TAMIL OLD CURRENCY SYMBOLS

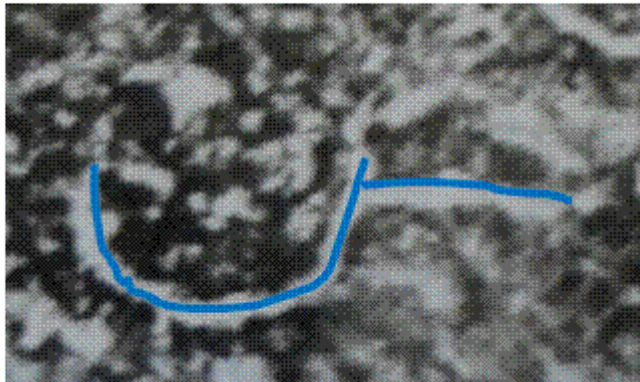
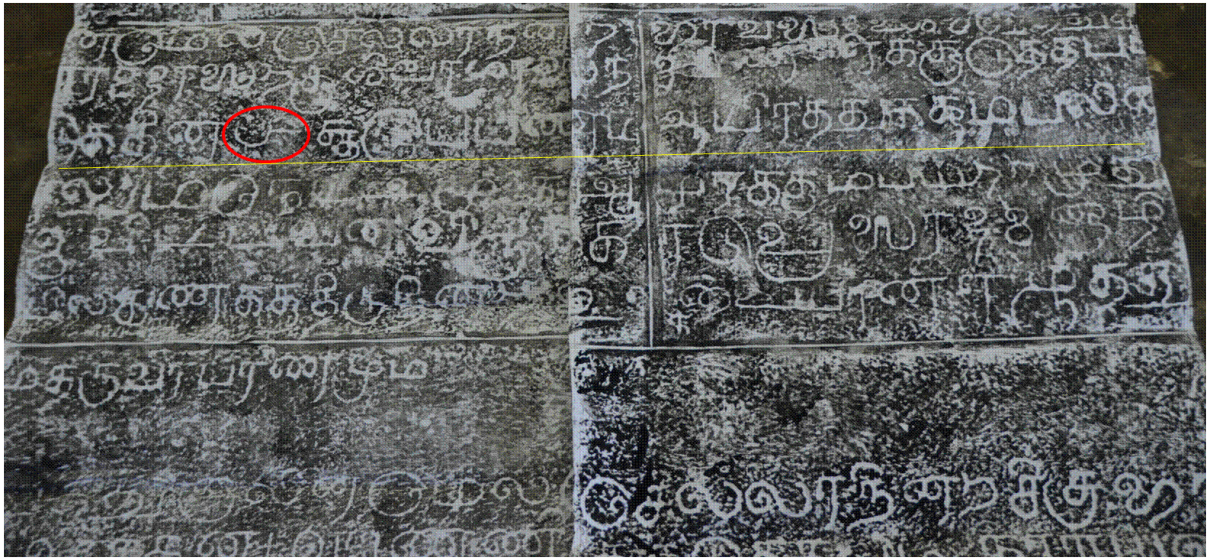
3.3.1 TAMIL SIGN PANAM

Tamil Code Chart as defined in L2/15078, describes this old currency symbol as below:

- 11FDB ட TAMIL SIGN PANAM
- equals 80 kaasu

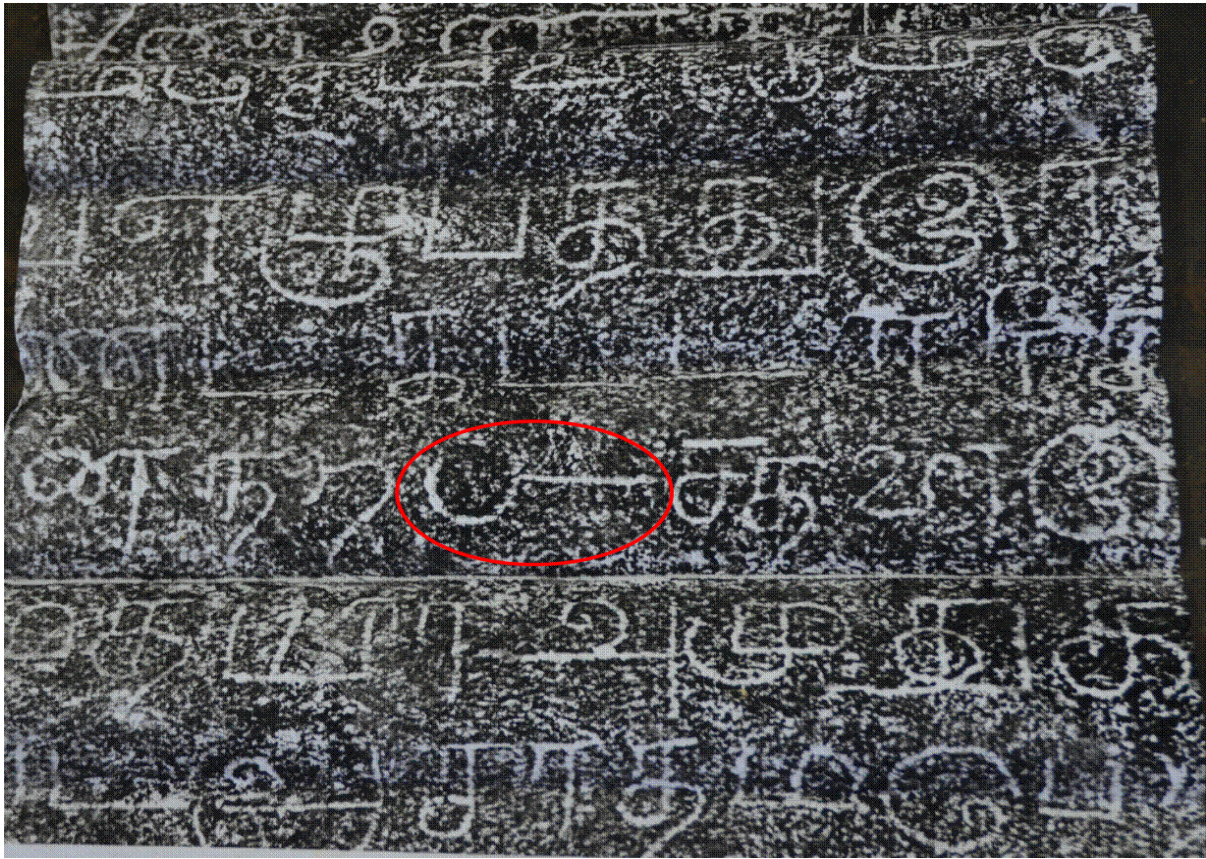
பணம் = PANAM; Its general meaning is “money/currency/coins”. In olden days the currencies were made of gold or silver or copper. Normally the metal used in the coin is not mentioned. But many a time, it might have implicitly meant the gold coins.

The following estampage belongs to Tirupathi inscriptions that are available with ASI. It can be observed from the text with yellow-underline that it has the symbol . This is the symbol for PANAM. The inscription text is “(ஒ) ஓக்கின பணம்[] [ஆயிரம்] இப்பணம் ஆயிரத்து....”.

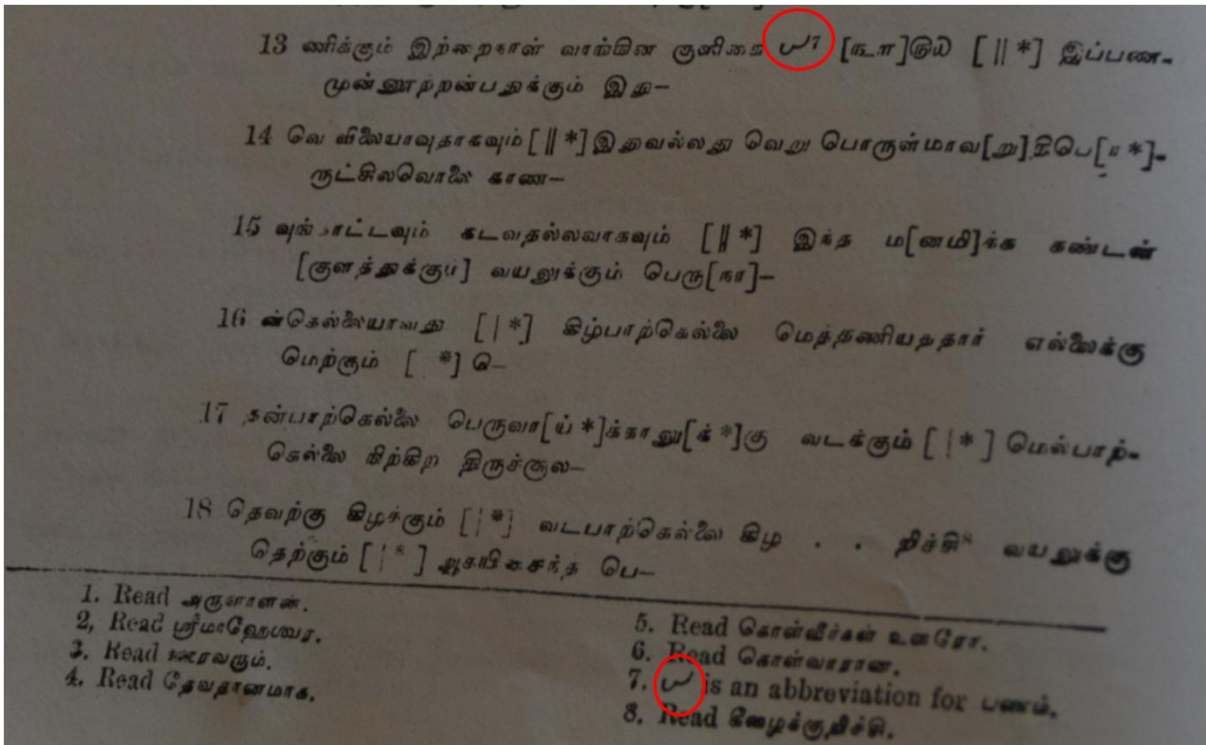








This is the picture enlarging the symbol in the previous estampage. For readability it is drawn-over in blue.


The following estampage is another example for the symbol of PANAM.





The Inscription# 441 of “Inscriptions (texts) of The Pudukkottai State”² also shows the occurrence of the symbol of PANAM. 13th line has the symbol as shown in the picture.



The footnote of this page is worth noting. Footnote# 7 states that the highlighted symbol is an abbreviation for **பணம்**.  shown in Pudukottai State inscription, and  shown in Thirupathi inscriptions are same; The only difference is that the horizontal line of the former is shorter and also flagging upwards. This may be due to writing style variation. Hence, the panel recommends the symbol  be encoded in place of . The glyph  looks like a variation of .


Though, it has some presence in the printed texts, encoding based on the symbol  as seen from the primary sources is recommended.

Further, In L2/15-078, It is mentioned, in the annotation of PANAM, that it is equal to 80 KAASU. This wording may be dispensed with, since a particular value is relevant only to a particular period. For example, in 19th and 20th centuries, a PANAM was referred to be equal to 1/8 of a Rupee. Today such a value is not referred to at all. As mentioned before, during imperial Chola times, the word PANAM was meant to represent gold coins and as mentioned elsewhere, 10 PANAMs were equivalent to 1 PON (பொன்). The weight measure of PANAM was referred to as PANAVEDAI, while the weight measure of 1 PON was usually 1 KALANCHU (கழஞ்சு). Often enough PON and KALANCHU were used in place of one another. A discerned observer would differentiate the money-value part and the weight measure. Wherever coins other than gold were in currency, they were explicitly referred to in the inscriptions. For example, in one of the inscription (S.I.I.. Vol.8, p.148, No.258) occurring in the Parijatavanesvarasvami temple of Tirukkalar, Mannargudi Taluk Tanjavur District, “வெள்ளை ” is mentioned to denote silver coins. Likewise, “செப்பு ” also was used in other historical times.

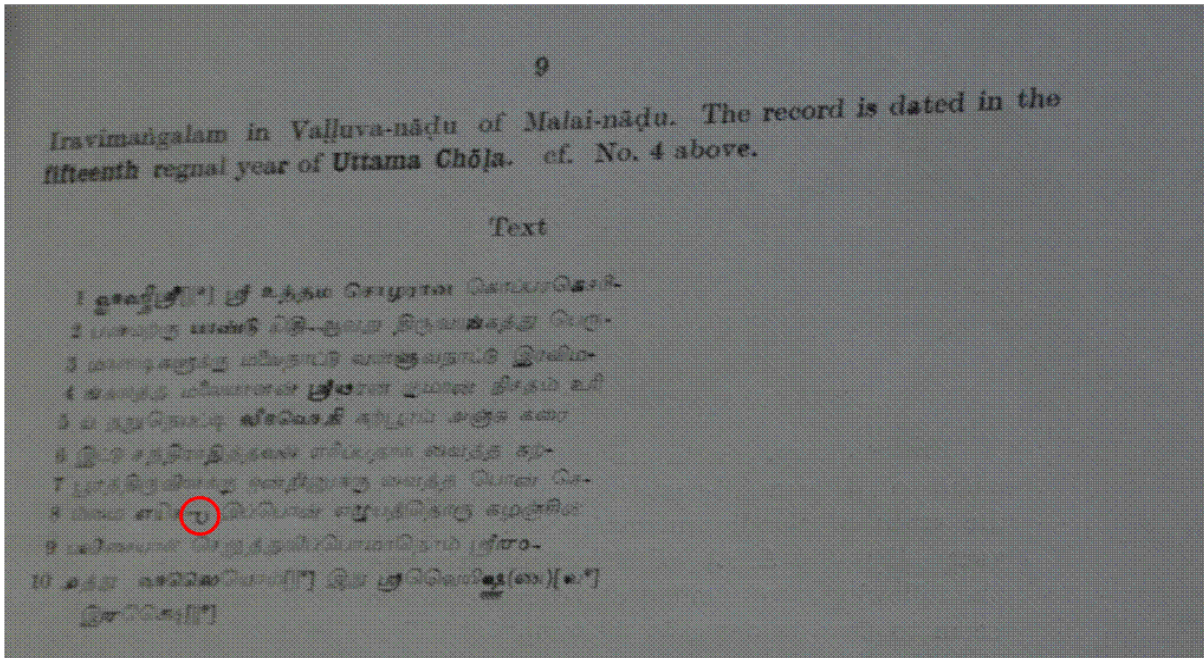
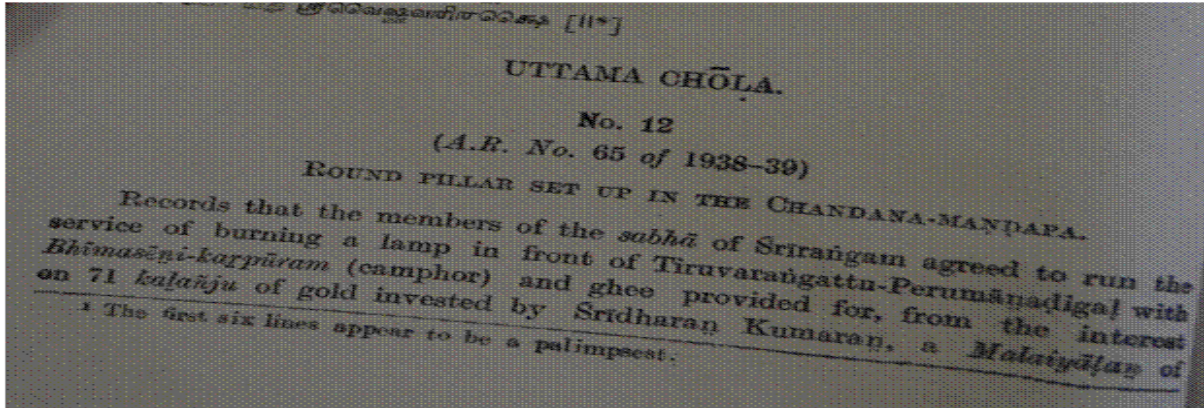
In the amended code chart (Annexure-2) this is described at 11FE1.

3.3.2 TAMIL SIGN PON

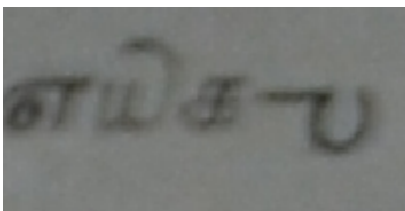
Tamil Code Chart as defined in L2/15078, describes this old gold currency symbol as below:

11FDC  TAMIL SIGN PON
• equals 10 panam

பொன் = PON; The following two pictures are from the text of SII-Vol.24, Inscription# 12 described in the pages 8 and 9.

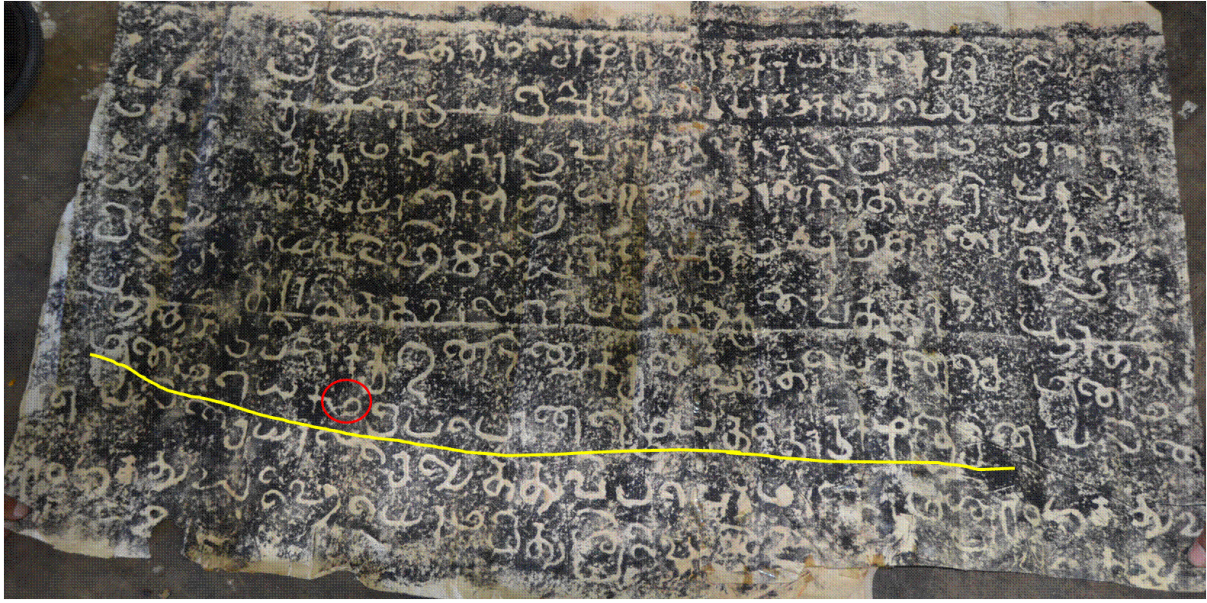


Line 8 of this text shows the symbol of PON. The text reads as “(செ)... ம்மை 71 பொன் இப்பொன் எழுபத்தொரு கழஞ்சின்”. In the enlarged picture below,



70, 1, PON are the three interpretations from the symbols there. This means 70+1+PON = “71 PON”.



The picture of corresponding estampage (ASI-AR 65/ 1938-39) is given below.



The text “... ம்மை 71 பொன் இப்பொன் எழுபத்தொரு கழஞ்சின்” can be seen there yellow-underlined; And the symbol of PON marked in red. It can be observed that the digit one and PON are written in continuation.



The same is enlarged in this picture and the PON part is illustrated with drawn-over line in blue.

Therefore, the panel of GoTN recommends to encode the glyph  in place of the glyph  for

PON. As mentioned in the discussion on Panam, the weight unit of 1 Pon was 1 கழஞ்சு (KALANCHU). So the annotation has to refer this equivalence of Pon with Kalanchu.

In the amended code chart (Annexure-2) this is described at 11FE2.

3.3.3 TAMIL SIGN VARAAGAN

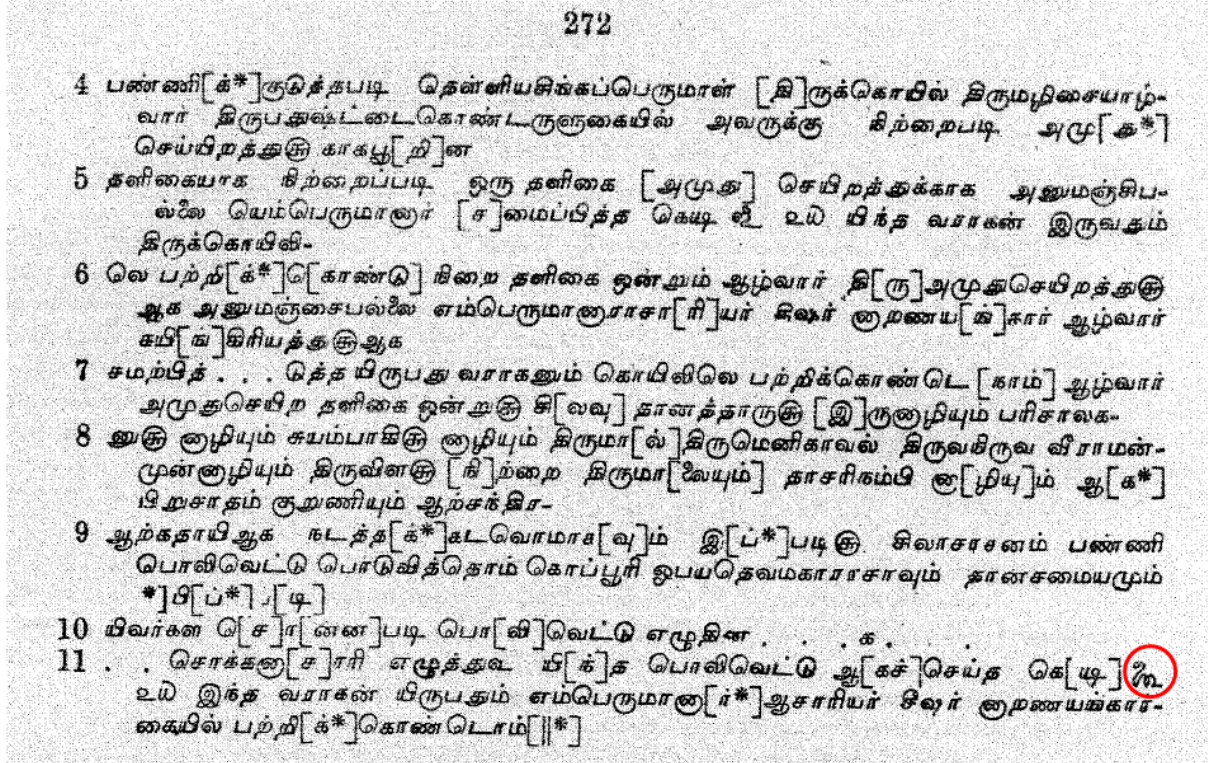
Tamil Code Chart as defined in L2/15078, describes this old currency symbol as below:


11FDD வு TAMIL SIGN VARAAGAN

- equals 42 panam
- equals 3½ rupee, 3¾ as per some

வராகன் = VARAAKAN/VARAAGAN;

The symbol chosen for VARAAKAN is observed to be a bit far away from the actual. Also, there are variations to the symbols of VARAAKAN found. However, the panel of GoTN observes that the one shown by, the SII Vol.8, Inscription# 535, page 271-272 is the right form of the symbol. The line 11 at page 272 of the inscription can be seen in the picture below.



The symbol before the text “[20] இந்த வராகன் யிருபதும்” is . The panel values this as the fitting symbol for VARAAKAN. Hence it is recommended to encode this symbol for VARAAKAN.

Further, VARAAKAN is a cash unit that was mostly prevalent during and after Vijayanagar times. (VARAAKANEDAI had been used as a weight measure which is equivalent to 3 KALANCHU). It became popular during 19th and 20th century. One may refer to Tamil

Lexican⁷, Vol.6, page 3512 to understand the money meaning of Varaagan. It is mentioned as 1 Pagoda, a gold coin, = 3 ½ Rupees, மூன்றரை ரூபாய் மதிப்புள்ளதும் பன்றி முத்திரை கொண்டதுமான ஒருவகைப் பொன் நாணயம். The boar insignia was after Chalukya Emperors in Karnataka and Maharaastra. Vijayanagara Kingdom arose after Chalukya times. Taking the definition of 1 Rupee = 8 panam (Treatise on Mathematics⁶ Part I, page 301), a Varaakan will be equal to 28 PANAM, if we consider 1 Varaakan = 3.5 Rupees. It will be equal to 30 panam if a Varaakan equals 3.75 Rupees. It is not 42 PANAM as mentioned in the annotation (L2/15078). (VARAAKAN is also used as a weight unit). Hence it is recommended to change the annotation accordingly. In the amended code chart (Annexure-2) this is described at 11FE3.

3.4 TAMIL AGRICULTURAL SYMBOLS

3.4.1 TAMIL DRY CULTIVATION SIGN

Tamil Code Chart as defined in L2/15078, describes this land symbol as below:

11FE3 பஞ்சு TAMIL DRY CULTIVATION SIGN
= punsey

Dry cultivation land = PUNSEY (புன்செய்) = PUNCHAI(புஞ்சை); And the Wet cultivation land = NANSEY(நன்செய்) = NANCHAI(நஞ்சை) is defined as below in L2/15078.

11FE2 னஞ்சு TAMIL WET CULTIVATION SIGN
= nansey

Comparing the symbols of PUNCHAI(புஞ்சு) and NANCHAI(நஞ்சு), it can be understood that both the symbols are derived by suffixing ச-like glyph with the letters of ப(PUNCHAI) and ந(NANCHAI) respectively. ச-like glyph stands here for சை(CHAI)/ஞ்சை(NCHAI). In the case of NANCHAI, the symbol னஞ்சு evolves by

fusing ூ-like glyph at the end of “ந” (0BA8). “ந” is the first letter of the word நஞ்சை. (It should be noted that the symbol for NANCHAI is accepted by the panel as it is).


But, in the case of PUNCHAI, instead of using “ப” – the first letter, “ப” is suffixed with ூ-like glyph. Hence, the suffix part has risen upwards(பஞ்சை). This is the problem with the symbol. The correct form can also be seen in the book “Tamil Ennum Eluththum”³. The picture of page 82 of the book is below.

82

குறியீடுகள்


வருடம்	௨௬	வசம்	௨௬
வருடம்	௨௭	சிலவு	௨௭
வருடம்	௨௮	ராம	௨௮
வருடம்	௨௯	மாதம் ஒன்றுக்கு	௨௯
மாதம்	௩௦	வரவு	௩௦
மாதம்	௩௧	மாதம் ஒன்றுக்கு	௩௧
மாதம்	௩௨	வரவு	௩௨
மாதம்	௩௩	பற்று	௩௩
மாதம்	௩௪	முனுக்கு	௩௪
தேதி	௩௫	இதுவும்பற்று	௩௫
தேதி	௩௬	நாளதுதேதியில்	௩௬
தேதி	௩௭	முதல்	௩௭
தேதி	௩௮	மேற்படி	௩௮
நிம்பர்	௩௯	நாளது	௩௯
நம்பர்	௪௦	பஞ்சை	௪௦
க்கு பணம்	௪௧	குழி	௪௧
க்கு பணம்	௪௨	நிலம்	௪௨
யிந்தகிரல்	௪௩		

The red-boxed area has the text of புஞ்சை and the symbol of it. It can be observed that the sufficing is at the bottom end of the “பு”. The same form also is found in the attestations of L2/12231 in the pages 43, 45 and 48. Hence, it is recommended by the panel to change the shape of the symbol of PUNCHAI to the



glyph  which is actually discussed in L2/12231 itself in the section 4.8.2. In the amended code chart (Annexure-2) this is described at 11FED.

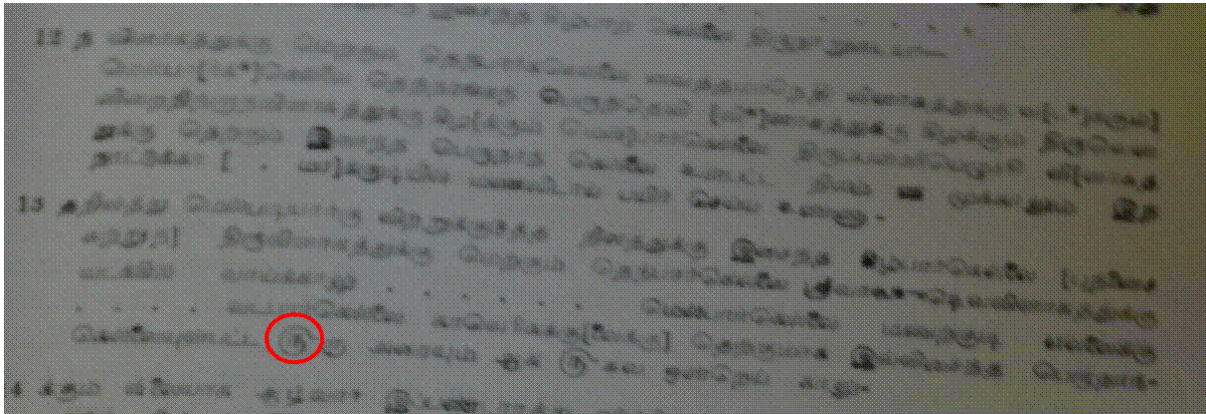
3.4.2 TAMIL LAND SIGN



Tamil Code Chart as defined in L2/15078, describes this land symbol as below:

11FE4  TAMIL LAND SIGN
= nilam

நிலம் = NILAM; The symbol of 11FE4 above is close to the first letter “நி” in “நிலம்”.

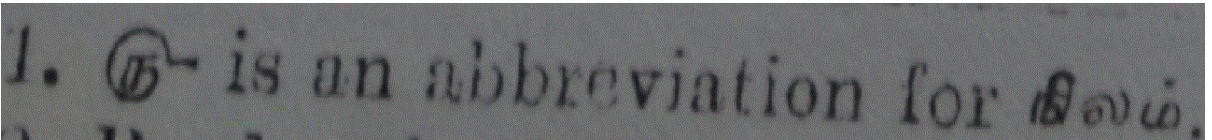
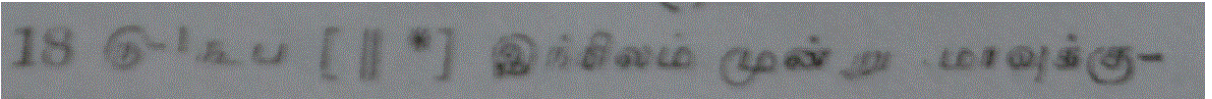
However, the actual symbol used in the inscriptions is not so. It is actually a -like glyph. The following picture is of the text from SII-Vol.24, Inscription# 92 in pages 109-111. The 13th line has the -like symbol meaning “NILAM”.



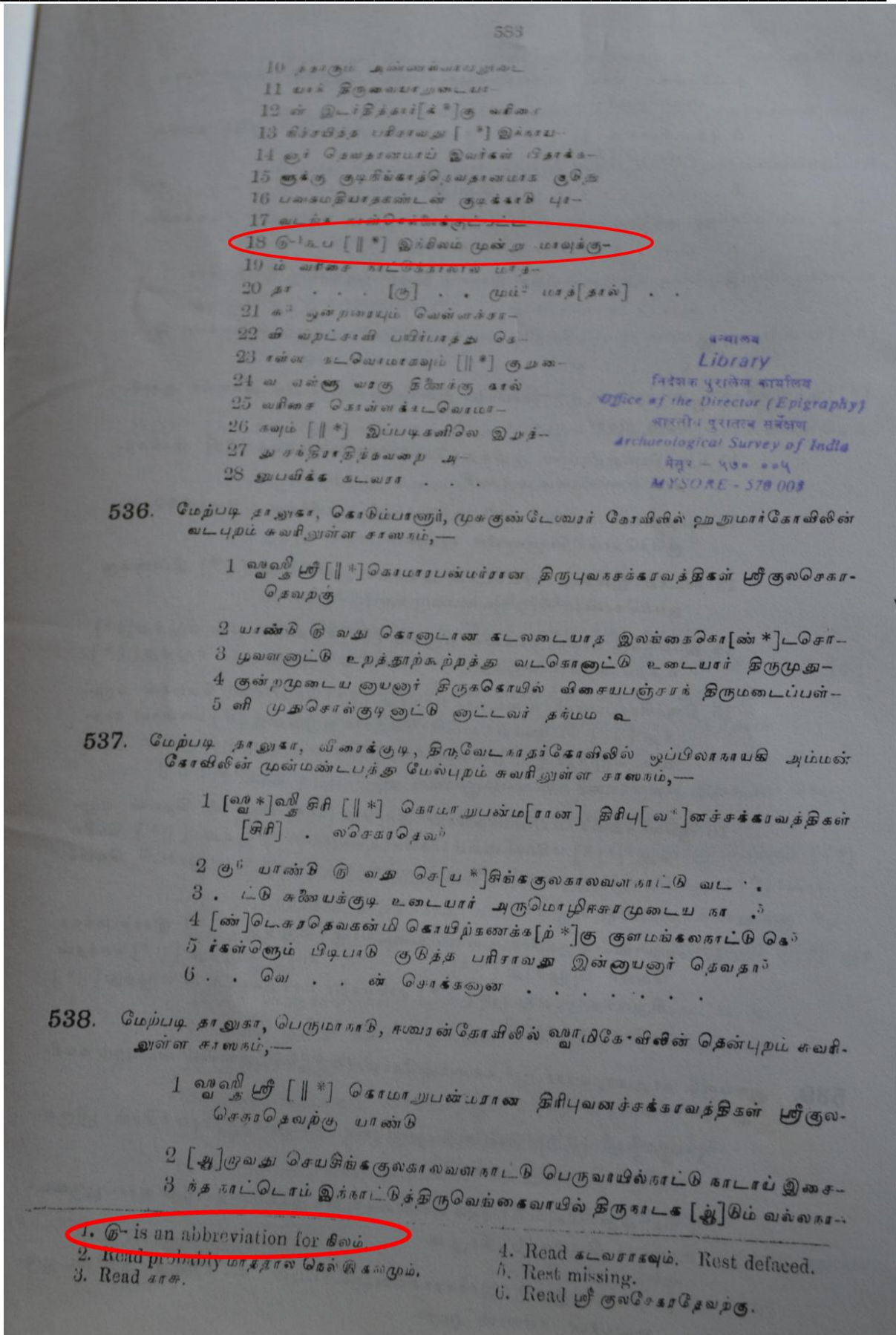
It can be confirmed with the corresponding estampage (ASI-AR 106/1947-48) shown below. The inscription is a long one and hence the relevant part is presented here. The interpretation of the yellow-underlined line is “...யுள்ப்பட்ட [நிலம்] [அரை] அரையும் ஆக...”. [நிலம்] and [அரை] are written as symbols. That -like symbol is for NILAM. This inscription has multiple occurrences of NILAM with -like symbol.



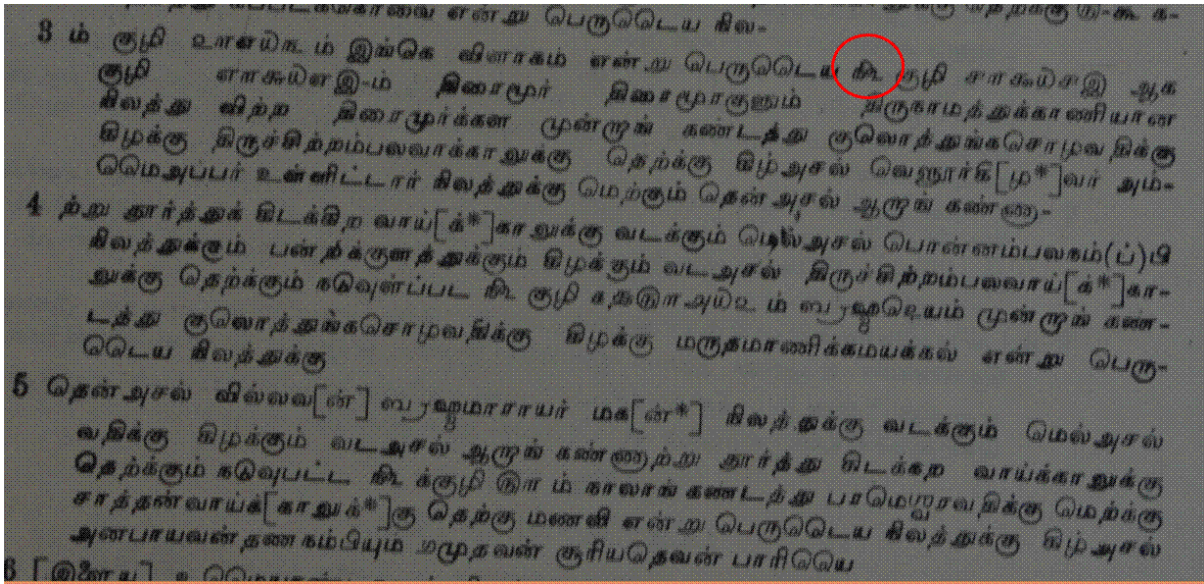
Further, the “Inscriptions (texts) of The Pudukkottai State”² provides the text of Inscription# 535. The enlarged view of the 18th line of the text below has the occurrence of ூ-like symbol referring to NILAM. Also, the footnote next to it mentions that ூ-like symbol is for NILAM.



The page# 588 of the book is furnished below.




As the னி-like glyph is close to the first letter in “நிலம்” , it has been widely used in the printed texts just as a representative symbol but not as the actual symbol. Also same printed text/book shows inconsistencies between estampage and the printed version. The text of SII and estampage were the same earlier in this discussion; however, for another inscription the print-text uses னி-like glyph but actual estampage is of ரு-like symbol. This indicates that the authors or printers of the texts have used different sets of glyphs. For example, SII-Vol.5, Inscription# 707, Page 297 has னி-like glyph in 3rd line as shown below.



But, the corresponding estampage (ASI-AR 143/1895) has proper ரு-like symbol as shown below. So, in the case of old symbols there exist a lot of differences between publications and actual inscription.





Hence, it is recommended by the panel that the glyph of the form “” be encoded for NILAM. Please note that this does not conflict with the TAMIL RUPEE SIGN(0BF9), and both are different. In the amended code chart (Annexure-2) this is described at 11FEB.



3.5 OTHER SYMBOLS AND ABBREVIATIONS


3.5.1 TAMIL FIRST SIGN

Tamil Code Chart as defined in L2/15078, describes this symbol as below:

11FE7  TAMIL FIRST SIGN
= mudal

 = MUDAL/MUTHAL; The right meaning of this symbol is not FIRST; but it denotes “starting from or commencing from”. The picture following this discussion is from page 114 of the Vijayanagara Inscription part of “Tirumala Tirupati Devasthanam Inscriptions – Vol.1 / 1988”⁴. It presents the Inscription# 81 (#170-TT).

The symbol for MUTHAL/MUDAL is recorded in the 6th line of inscription. The glyph  as found in the inscription is closer to the first letter in the word “”. This is more relevant than using the other symbol which takes **μ-like** form.

Hence, the glyph, name, annotations change for this symbol is recommended. The picture of the symbol is “”. In the amended code chart (Annexure-2) this is described at 11FF1.

3.6 SYMBOLS OF NO INTEREST

This section discusses a few symbols that

- can be derived using existing codepoints
- are invalid symbols
- does not merit encoding

3.6.1 <null>

This section is intentionally left blank after removing some contents.

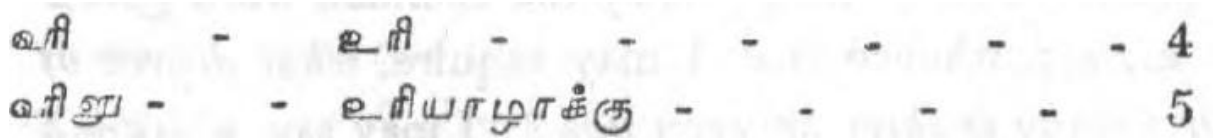
3.6.2 TAMIL SIGN URI

Tamil Code Chart as defined in L2/15078, describes this symbol as below:

11FD4 வரி TAMIL SIGN URI
• equals 2 uzhakku

உரி = URI. It is a two letter word in Tamil. The symbol that reads as “வரி” is out of the way. It can be written much easier as “உரி” itself using the alphabets உ and ரி. Some attestations showing it as வரி is probably a wrong collection. It may be due to the misunderstanding of the writing styles in old documents.

This is well explained by the attestation from Beschi, available in L2/12231 (page 40) itself. It reads the usage of URI as below.



வரி - - - உரி - - - - - 4
வரினு - - - உரியாழாக்கு - - - - - 5

It can be understood from Beschi's two lines above that உரி is written as உரி itself. It is just join-handwriting. Therefore, the panel considers this symbol as Invalid and recommends to drop from encoding.

3.6.3 TAMIL SIGN PAISAA

Tamil Code Chart as defined in L2/15078, describes this symbol as below:

- 11FD8 டௌ TAMIL SIGN PAISAA
- old paisa equals 3 pai and equals 1/64 of a rupee
 - new or naya paisa equals 1/100 of a rupee

பைசா = PAISAA/PAICAA. It is often written as “பை” even in today’s context. The justification discussed in the section 4.7 of L2/12231 is not strong enough to encode a symbol. For both the denominations in annotation, பைசா has been the name, and the predominant usage is பை in the past and also now.

For this, L2/12231 considers a symbol from பை, டௌ, டபை, டு found in various publications. But for பை, all others do not represent பைசா. They are probably erroneous collections or interpretations from hand-written documents.

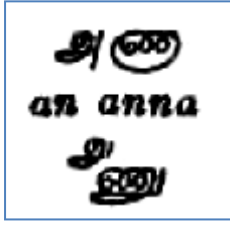
Therefore, the panel is of the opinion that PAISAA does not require encoding and the same can be written using the alphabet “பை”(0BAA+ 0BC8) when required.

3.6.4 TAMIL SIGN ANAA

Tamil Code Chart as defined in L2/15078, describes this symbol as below:

- 11FD9 அணு TAMIL SIGN ANAA
- equals 4 old paisa

This is another dissatisfying symbol. அணா = ANAA; அணா is a two letter Tamil word. The symbol replaces the second letter ணா(0BA3+0BBE) with ணு(0BA3+0BC1) and combines with அ (0B85) to be a symbol. The letter ணா was written as ணு (old-ணா) until recent decades.



The part of the attestation from page 48 of L2/12231 shows how ANAA was written using the old-**ணா**. Down below in the picture is the **அணா** written in a varying handwriting style. It just alters the **ண** a bit to look like **ணு**. So, it is just a handwriting variation that cannot be considered

as a symbol. For a proper, two-lettered word(**அணா**), another improper two-lettered word(**அணு**) cannot be considered as a symbol worth encoding.

The ANAA has been represented by a simple letter-**அ** in common usage until few decades ago. If there is a need, letter-**அ**(0B85) can be used and the panel does not recommend the encoding.

3.6.5 TAMIL SIGN GEJAM

Tamil Code Chart as defined in L2/15078, describes this symbol as below:

11FDF க TAMIL SIGN GEJAM
• approximately equals 3 feet

GEJAM = YARD; Yard is not a unit of Tamil Systems of Measurements. Yard's origin is from western sources. It was part of British Imperial Units of Measurement, and US Customary Systems of Measurement (<https://en.wikipedia.org/wiki/Yard>). In India it was used due to Persian or Mugal or North Indian practice.

In North Indian Unit of Measure, it is called as GAZ. GAZ in Devanagari/Hindi is Yard. https://en.wikipedia.org/wiki/Indian_weights_and_measures describes the Units of Measures of North India, British Units, and Unit of Measures during the period of Akbar the Great. It can be observed that GAZ (Yard) = 2 Hath = 3 feet in Indian unit of measure, 3 feet in British System, and there were 4 different GAZ(Yard) existed during Akbar and Shah Jahan periods.

As Yard is used with different names in several Indic Languages and as it also exists in the system of measurement of other countries, encoding GEJAM in Tamil Unit of Measure

will be erroneous. Yard should find proper encoding slot as part of its original system. From the original system, it can be used by Tamil or any other languages.

Though meter/metre is used in Tamil Nadu now, it cannot be the System of Units of Tamil. It has its own original system. The case of Yard/GEJAM is also similar to meter/metre. We cannot be reproducing a whole lot of measures in each and every language block.

Hence the panel of GoTN recommends not to encode GEJAM as part of Tamil encoding; and suggests that relevant original source organizations may identify and encode it as part of their original system.

3.6.6 TAMIL SIGN CIRANJIIVI

Tamil Code Chart as defined in L2/15078, describes this symbol as below:

- 11FEA சீ TAMIL SIGN CIRANJIIVI
- a polite title for a young person
 - not to be confused with the sign for “and odd”

சிரஞ்சீவி = CHIRANCHEEVI/CIRANJIIVI; As mentioned it is a title for a young person particularly man. In Tamil community there are many such titles in practice. For example, செளபாக்யவதி = SOWBHAGYAVATHI is such a title for a woman/girl. It is also written using the first letter “சௌ”. Similarly people write the first letter “சி” for சிரஞ்சீவி. What is shown as symbol for CIRANJIIVI is not a symbol but just the first letter of சிரஞ்சீவி with a curl added to it. A curl on top of the letter சி is due to hand-writing style. Assuming it as symbol is incorrect from an encoding perspective.

Like it was said earlier, there are other similar such titles in Tamil language Community. They are “செல்வன்” (SELVAN), “செல்வி” (SELVI), “குமாரன்” (KUMAARAN), “குமாரி” (KUMAARI), “திருவளர்ச்செல்வன்” (THIRUVALARCHELVAN), “திருவளர்ச்செல்வி” (THIRUVALARCHELVI), மகராசி(MAKARASI) etc. Such titles are used mostly in marriage-invitations or other such invites. Some books also have used this titles. The marriage invite

of a highly respected Tamil Icon and freedom fighter Mr.V.O.Chidambaram Pillai ([https://en.wikipedia.org/wiki/V. O. Chidambaram Pillai](https://en.wikipedia.org/wiki/V._O._Chidambaram_Pillai)) is presented below. The invitation is of the year 1901 CE.

It can be observed that there are 3 titles out of the titles mentioned above are used in the invite. They are “சிரஞ்சீவி”- the subject of this discussion, “சௌபாக்யவதி” and “மகராசி”. It should be noted that all these titles including CHIRANCHEEVI are written fully and not with symbols.

11FEB ஸ்ரீ TAMIL SIGN PILLAI

- not to be confused with the sign for “spent”

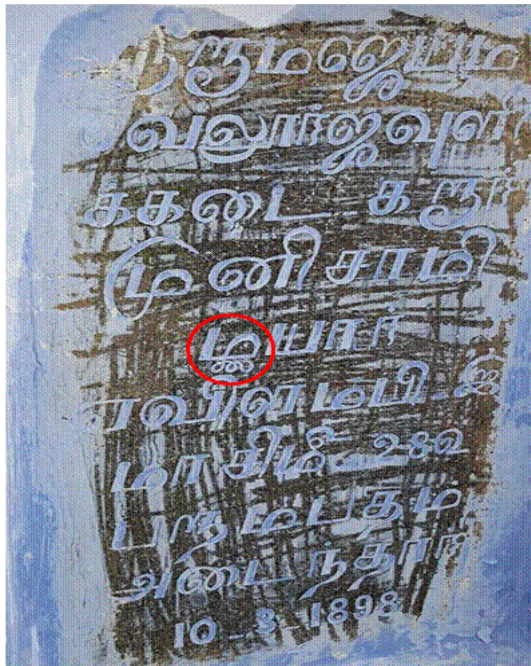
பிள்ளை = PILLAI. As described rightly by Wickremasinghe(page 50 of L2/12231), this is a caste title(= சாதிப்பெயர்) representing a part of Tamil Community.



Caste means “சாதி” in Tamil. The Tamil Lexicon⁷ describes “சாதி/Caste” as 1. Family, clan, race; குலம். (பிங்.). 2. Hindu caste. <http://dsalrv02.uchicago.edu/cgi-bin/philologic/getobject.pl?c.4:1:4886.tamillex>

There are hundreds of castes in Tamil Community. Many of them have such short-forms if not symbols, to represent their castes. For example, “Tamil Ennum Eluththum”³ lists 6 of the castes namely NAYINAR, NAAAYAKKAR, MUDHALI, PILLAI, KAUNDAN, and CHETTI(as part of muththaya chetti) .

நயினார்	-	ஷா	நாயக்கர்	-	ஷா	முதலி	-	மு
பிள்ளை	-	பி	கவண்டர்	-	கி	செட்டி	-	செ



Besides the evidence from the book(s), the caste titles are scribed even on cemeteries. The picture here is an inscription on the cemetery of one Mr.MUNISAMY MUDHALIYAR. It can be observed that a short-form for the caste title MUDHALI is scribed.

However, for several social reasons, the caste titles are discouraged in the Tamil Society. There is a possibility that if one caste title is encoded then some other caste will also demand that its title be encoded. It may be a situation to encode

a particular title even if it doesn't have any text related to it. Therefore, apart from the intellectual reasons, there are other priorities for social reasons. Considering the complexities in encoding one particular caste title, the panel of GoTN recommends not to

encode this title. Should a compelling reason arises to encode this or some or all the available caste titles in the future, GoTN assures that it will be open enough to further research on it and make appropriate decision.

3.6.8 TAMIL SIGN RAAJA

Tamil Code Chart as defined in L2/15078, describes this symbol as below:

- 11FEC ராஜா TAMIL SIGN RAAJA
- in the phrase mahaa raaja raaja shrii
 - 0BF1 ரா is often used as a substitute
 - 0BF1 ரா tamil number one hundred

This is another type of title specially for Kings or Royal community of the past times. Technically, looking at the symbol above, the panel observes that the symbol can be derived by combining ரா TAMIL NUMBER ONE HUNDRED (0BF1) and ஶ TAMIL DAY SIGN (0BF3).

Alternately, as discussed in the section 4.8.3 of L2/12231, 0BF1 alone can also be made use of to represent RAAJA.

As there is a technical way of deriving the symbol, the panel recommends to go by that strategy and drop this symbol from encoding. Further, on the titles, be it Polite title or Caste Title or Royal Title, the panel of GoTN is a bit conservative on encoding all of them as most of such titles will crowd the coding chart rather than having clear evolution/lineage and usage.

3.6.9 ABBREVIATIONS OF WORD-ENDINGS

This discussion below refers to the following symbols described in L2/15078.

- 11FED க்கு TAMIL ABBREVIATION K KU
• used especially with numerals for the dative suffix
- 11FEE யும் TAMIL ABBREVIATION Y U M
• and
- 11FEF வும் TAMIL ABBREVIATION V U M
• and

க்கு = K KU; யும் = Y U M; வும் = V U M;

Such letters are called double-letters (or compound letters). They are not proper abbreviations or symbols. They are the result of various hand-writing styles or patterns found in the last two or three centuries. There are tens of or even few hundreds of, them are there in Tamil documents.

Following picture of the page 78 of “Tamil Ennum Eluththum”³ presents a few of such double letters.

78

கூட்டெழுத்து

அம் - அ	க்து - க
கம் - க	ந்த - ந
கீழ் - கீ	ந்திரு - ந
கூடி - கூ	ந்து - ந
க்க - க	ப - ப
க்கி - கி	படி - ப
க்கு - க	ப்ப - ப
க்கை - கை	ப்பா - ப
ச்ச - ச	மும் - மு
ட்ட - ட	யும் - ய
ட்டி - டி	ராம - ர
ட்டு - டு	ஷம் - ஷ
ணம் - ண	ளம் - ள
ண்ட - ண	ளும் - ள
தும் - த	ற்றி - ற
ந்த - ந	ளம் - ள
ந்தி - நி	ஹம் - ஹ

It is not just “KKU”, it shows KKA, KKI, K KU, KKAI. Not only க/K-series, ட/T-series, த/TH-series, ப/P-series can also be seen that are red-circled (TA, TI, TU, THA, THI, THU, PA, PAA). Existence of a grammar logic can be seen in those.

Further, It is not only, YUM and VUM, THUM, MUM, LUM, NUM also are found within blue-circles.

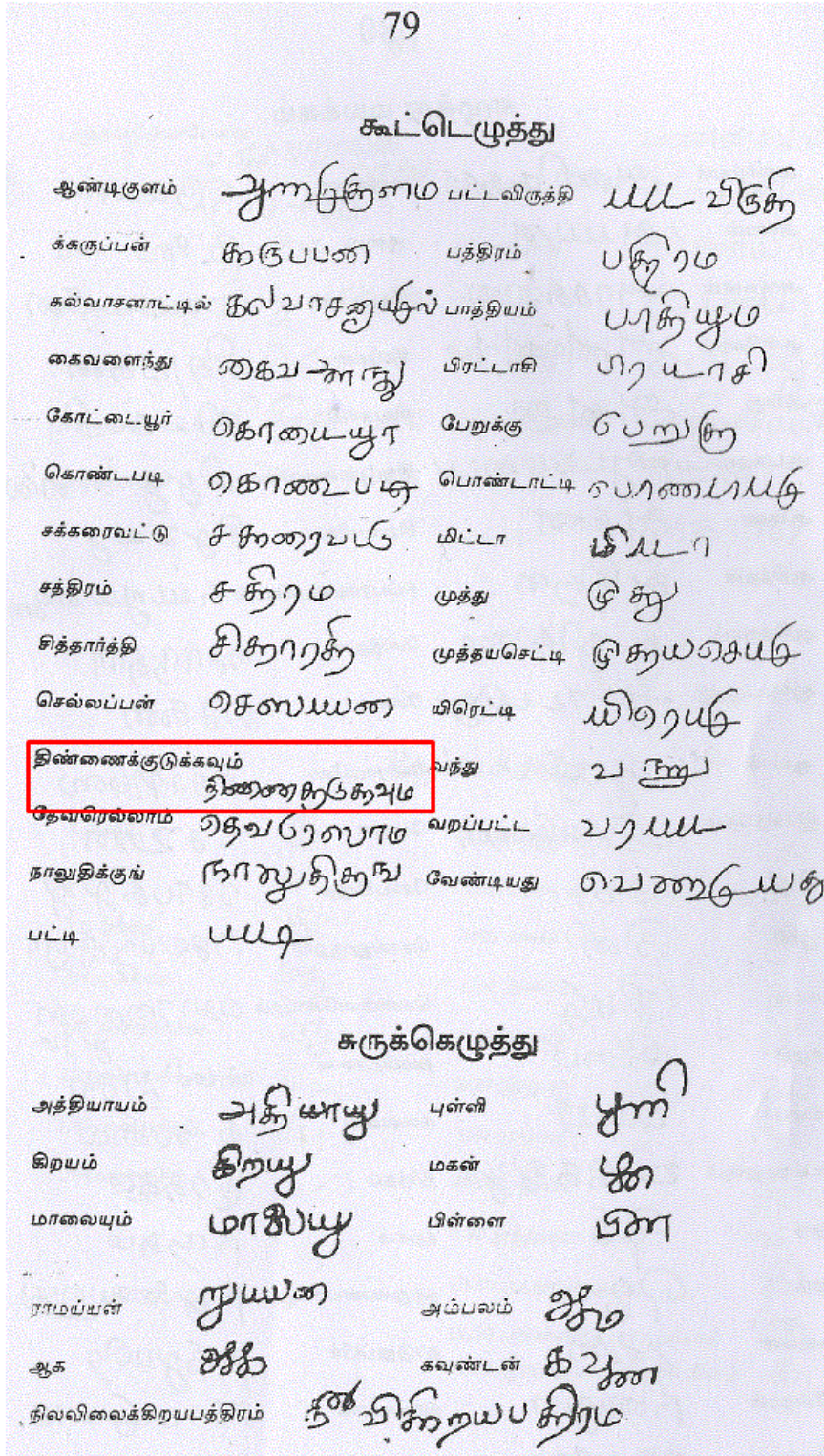
Further, the green-circles show a slightly different pattern - NDHA, NDHIRU, NDHU.

The red-squares have yet another pattern LAM, NNNAM, NNAM.

These have to be read along with the AM(அம்), KAM(கம்). Similarly, there are some more in this picture and outside the picture there can be much more. Looking at these patterns, it can be observed that such writings follow a pattern. The pattern evolves from the Tamil grammar rule called

MEYMMAYAKKAM. It can be understood referring to Tholkaappiyam, the Tamil Grammar.

Further, it is not that all such letters occur at the end of the word. Some, for example “KKU” occurs even in the middle of a word. Following picture of the page 79 of “Tamil Ennum Eluththum”³ presents the usage of such letters.



In the picture, the text/word within red-square,

“திண்ணைக்குடுக்கவும்”

has 2 double-letters (KKU, VUM) that are proposed for encoding and one another double letter (KKA) as well. It should be noted that, while KKU is used in the middle of the word, VUM is written in the regular way. Therefore, it should be noted that such letters can occur in any part of the word subject to the Tamil grammar rules; And they can be written in regular way also.

Further, a careful reading of the words in the picture will indicate that many words are more of informal way of writing. For example, the words குடுக்கவும்,

பொண்டாட்டி,

பிரட்டாசி, கிறயம் are all very informal way of writing and speaking in Tamil. It is possible that such letters are used more in informal writings than the formal one.

Therefore, if such letters are encoded, there will be no end to encoding and it is possible that these will crowd the coding chart and make it less meaningful. Panel of GoTN does not recommend these 3 symbols for encoding.

4 Others

4.1 CHANGES TO CODEPOINT NAMES

With reference to L2/15078, L2/15079 and L2/13047, subject expert panel of the GoTN observes that the names of the codepoints have different issues.

For example, TAMIL LETTER NA (OBA8) has the structure as *[language]+[category]+[subject]*, where as TAMIL AU LENGTH MARK (OBD7) has the structure as *[language]+[subject]+[category]*. (*category* is referred here as LETTER, LENGTH MARK, SIGN, SYMBOL etc. and *subject* is the item in *encoding*). It can be observed that TAMIL OM doesn't have any qualifier.

Though the panel understands that these cannot be changed now, as they are already encoded in BMP, it is a bit concerned that the similar issues are seen in the characters/symbols proposed in the current proposal as well.

For example, in L2/15078, 11FD1 has the name as TAMIL SIGN NEL, where as 11FE4 has the name as TAMIL LAND SIGN. Here the category "SIGN" is at the middle of the name of the former, and at the end of the later. Besides, it appears that SIGN and SYMBOL are different in their meanings and in the case of archaic symbols, naming it as SYMBOL seems to be more appropriate.

Further, the names of the symbols are in English, that does not reflect the actual meaning of the same in Tamil. For example, in the case of TAMIL FIRST SIGN (11FE7), FIRST refers to "starting from or commencing from" in the actual usage. But, calling it as FIRST interprets it differently. In the case of TAMIL CHARGE SIGN(11FE6), also CHARGE does not mean VASAM in Tamil.

Also, in the case of fractions, calling a Tamil Fraction in its own name in the local language gives more comfort in reading and understanding. Though many fractions are archaic in nature, the names like ARAI, KAAL, MUKKAL, ARAIKAAL etc., are still in use at large, and it gives more comfort to the native language users. The professions such as epigraphists also refer them with the Tamil name only.

Besides, in the case of archaic fractions and symbols, there are multiple occurrences exist and are likely to add up in the future also when more researches are done in this area.


For example, There are two number signs (one already in BMP), two credit signs(one already in BMP), two one-half symbols and two viicam symbols are found,


Considering a) need to name in Tamil b) correct interpretation c) multiple occurrences d) a tentative format for the names, the names of the codepoints have been changed for the symbols in this proposal. The panel believes that it will benefit this set of symbols and also for the future proposals. Further, in order to understand the names in Roman, the names are also written in Tamil as annotation. This will help understanding the name without spelling issues. The code chart in Annexure defines the new names accordingly.



4.2 ANNOTATION CHANGES

In the context of discussions on glyph changes and name changes annotations also have undergone changes. While some of the annotations are retained from L2/13047 and L2/15078, some have undergone changes. In these, some are mentioned in this document, and some are directly included in the code chart (Annexure-2). Significant changes are highlighted.



Here, changes required in the already encoded BMP codepoints are mentioned.

- OB99  TAMIL LETTER NGA – Following two annotations to be removed as, kurunu/marakkal is proposed to have a separate codepoint; and other one is not encoded.

also denotes the measure kuruni/marakkaal
→11FD5 

- OBA4  TAMIL LETTER TA – code point “11FD7” in the annotation is to be changed to “11FDD”
- OBAA  TAMIL LETTER PA – the following annotation is to be dropped as the symbol for MAA is proposed through this amendment proposal.

- also denotes the fraction one twentieth
- = maa

- OBB3  TAMIL LETTER LLA - code point “11FD7” in the annotation is to be changed to “11FDD”
- OBB5  TAMIL LETTER VA – the following annotation is to be dropped as the symbol for KAAL is proposed through this amendment proposal.
 - • also denotes the fraction one quarter
 - = kaal

- 0BF3 ௩ TAMIL DAY SIGN – the following annotation is to be dropped as the symbol for URI is recommended to be dropped.
 - → 11FD4 □ tamil sign uri
- 0BF7 ௩ TAMIL CREDIT SIGN – the following annotation to be changed.
 - “→ 11FF5 □ tamil traditional credit sign” to be changed to “→ 11FF2 □ tamil traditional credit sign-2”

5 References

- 1] South India Inscriptions (SII) - Volumes- 1,3,4,5,8,12,24, published by Archaeological Survey of India, (<http://asi.nic.in/>).
- 2] Inscriptions (Texts) of The Pudukkottai State-Arranged according to Dynasties, Published by The commisioner of Museums, Government Museum, Chennai-600008, 2012.
- 3] Tamil Ennum Eluththum – Mani.Maran, Published by Saraswathi Mahal Library, Thanchavur, Tamilnadu, India, 2015.
- 4] Tirumala Tirupati Devasthanam Inscriptions – Vol.1 / 1988, Part-Vijayanagara Inscriptions.
- 5] A handbook of the ordinary dialects of the Tamil language, 7th Edition – Rev.G.U.Pope, Oxford University Press, London.
- 6] Treatise on Mathematics - The Institute of Asian Studies, Chemmancherry, Chennai 600119.
- 7] Tamil Lexican, University of Madras, 1982.

6 Technical Details

Font set and other technical details will be provided shortly.

7 Code Chart

Coed chart of Supplement block is available in the Annexure-2.

8 Official Summary form

A. Administrative

1. Title

Tamil Fractions and Symbols – Amendment Proposal

2. Requester's name

Department of Information Technology, Government of Tamil Nadu, India

3. Requester type (Member body/Liaison/Individual contribution)

Institutional Member - Unicode Consortium

4. Submission date

14th January 2016

5. Requester's reference (if applicable)

Dr.Lisa Moore requested to send to the UTC, our comments on the proposal L2/12-231, L2/13-047 and related other documents, no later than January 15, 2016 to enable the UTC and its members to consider our feedback before UTC will need to vote on the addition of the characters into ISO/IEC 10646.

6. Choose one of the following: This is a complete proposal (or) More information will be provided later

More information will be provided based on the feedbacks from UTC for this document

B. Technical – General

1. Choose one of the following:

1a. This proposal is for a new script (set of characters), Proposed name of script

No

1b. The proposal is for addition of character(s) to an existing block, Name of the existing block

These characters are additions to the Tamil encoding, but they cannot all be encoded in the existing BMP Tamil block due to lack of space. As a result, a new Tamil Supplement block is requested.

2. Number of characters in proposal

48 (Forty Eight)

3. Proposed category

Category B1, specialized small

4. Is a repertoire including character names provided?

No

4a. If YES, are the names in accordance with the “character naming guidelines” in Annex L of P&P document?

4b. Are the character shapes attached in a legible form suitable for review?

Yes. However, most of them are hand-written; Font set will be provided shortly.

5. Fonts related:

a. Who will provide the appropriate computerized font to the Project Editor of 10646 for publishing the standard?

Tamil Virtual Academy, Chennai, India – <http://tamilvu.org> – On behalf of department of Information Technolgy, GoTN, India

b. Identify the party granting a license for use of the font by the editors (include address, e-mail etc.)

Department of Information Technology, Government of Tamil Nadu, India

6a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided?

Yes.

6b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached?

Yes.

7. 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)?

Will be provided as part of final proposal.

8. 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.

Discussed in detail in the document.

C. Technical – Justification

1. Has this proposal for addition of character(s) been submitted before? If YES, explain.

This document places the amendmendts for L2/12-231, L2/13-047 and L2/13028

2a. 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

2b. If YES, with whom?

1. Department of Information Technology, GoTN, Chennai, India - <http://www.tn.gov.in/department/17>
2. Department of Ancient History & Archaeology, Madras Univesity, Chennai, India, <http://www.unom.ac.in/>
3. Department of Maritime History and Marine Archaeology, Tamil University, Thanchavur, Tamilnadu, India, <http://www.tamiluniversity.ac.in/>

-
4. Department of Manuscriptology, Tamil University, Thanjavur, Tamilnadu, India, <http://www.tamiluniversity.ac.in/>
 5. Tamilnadu State Department of Archaeology, Chennai, India - <http://www.tnarch.gov.in/>
 6. Tamil Computing specialists of Tamil Virtual Academy – <http://tamilvu.org>
 7. Individual s like Journalists, Tamil Researchers, Engineers, and Software Engineers were also communicated

2c. If YES, available relevant documents.

Discussed through several meetings

3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included?

Those who desire to store as digital text of old Tamil manuscripts, inscriptions that involve these characters.

4a. The context of use for the proposed characters (type of use; common or rare)

Rare.

4b. Reference

5a. Are the proposed characters in current use by the user community?

Scholars who work with manuscripts will use these characters.

5b. If YES, where?

Largely in Research institutions, Tamil related Universities, MSS Libraries and Archaeological departments.

6a. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP?

No

6b. If YES, is a rationale provided?

6c. If YES, reference

7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)?

Yes

8a. Can any of the proposed characters be considered a presentation form of an existing character or character sequence?

No.

8b. If YES, is a rationale for its inclusion provided?

8c. If YES, reference

9a. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters?

No. But, Identified few characters in the proposal L2/15078 that they can be composed of existing characters or other proposed characters.

9b. If YES, is a rationale for its inclusion provided?

9c. If YES, reference

10a. Can any of the proposed character(s) be considered to be similar (in appearance or function) to an existing character?

No. Discussed in detail.

10b. If YES, is a rationale for its inclusion provided?

10c. If YES, reference

11a. Does the proposal include use of combining characters and/or use of composite sequences?

Yes

11b. If YES, is a rationale for such use provided?

Yes

11c. If YES, reference

Discussed in few sub sections of section 3.

11d. Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided?

12a. Does the proposal contain characters with any special properties such as control function or similar semantics?

No.

12b. If YES, describe in detail (include attachment if necessary)

13a. Does the proposal contain any Ideographic compatibility character(s)?

No.

13b. If YES, is the equivalent corresponding unified ideographic character(s) identified?

13c. If YES, reference:

.....end of proposal.....



DEPARTMENT OF INFORMATION TECHNOLOGY
Government of Tamil Nadu, India

ANNEXURE-1 - Details of Panel of Subject Experts

Department of Information Technology (<http://www.tn.gov.in/department/17>) constituted the Panel of experts from different fields to evaluate the Tamil Fractions and Symbols proposal and feedbacks, under the joint coordination of Tamil Virtual Academy, <http://tamilvu.org/>, Chennai, India and University of Madras, <http://www.unom.ac.in/>, Chennai, India.

This panel was Chaired by Dr.M.Ponnaivaikko , Vice Chancellor of Bharath University and Coordinated by Dr.P.D.Balaji , Head of Department - Ancient History and Archaeology, University of Madras. The details of the panel are as under:

Srl	Name	Expertise / Remarks
1	Dr.M.Ponnaivaikko Vice Chancellor, Bharath University, Chennai	Tamil Computing expert , Member-Tamil Computing Standards Committee of TVA , Chair of the Panel.
2	Dr.P.D.Balaji Professor, University of Madras, Chennai	Head of Department - Department of Ancient History & Archaeology, Coordinator of the panel.
3	Dr.S.Rajavelu Professor, Tamil University, Thanjavur	Dean – Faculty of Manuscriptology Head of Department – Maritime History and Marine Archaeology
4	Dr. Natana Kasinathan	Former Director – Tamilnadu State Department of Archaeology, GoTN
5	Mr.Naga.Elangovan	Software Engineer, Member-Tamil Computing Standards Committee of TVA, Tamil Researcher
6	Dr.A.Padmavathy	Former Assistant Superintendent of Epigraphy – State Department of Archaeology , GoTN.
7	Dr.S.Rajagopal	Assistant Director (Former) - Tamilnadu State Department of Archaeology
8	Dr.Krishnan Ramasamy, a.k.a Iraamaki Former Project Director of SPIC Petrochemicals, Chennai	Engineer, Tamil/Historical Researcher, Member-Tamil Computing Standards Committee of TVA
9	Dr.K.Vijaya Venugopal	Former Professor Madurai Kamaraj

**Tamil Fractions and Symbols – Amendment Proposal
Government of Tamilnadu, India**

		Univeristy, (Tamil department) and Eminent Archaeolgy expert.
10	Dr.R.Vasudevean	Eminent Tamil Literature & Medicinal Literature Scholar, Banker, Founder - Tamizhayam Research Foundation & Data Cure Technologies.
11	Dr.C.Santhalingam	Former Archaeological Officer - State Department of Archaeology, GoTN
12	Dr.T.Kalasridhar Professor, Tamil University, Thanjavur	Head of Department - Manuscripts
13	Dr.Thamizhappan Bangalore	Scholar in Tamil Accounting , Tamil Researcher
14	Dr.C.K.Sivaprakasam	Historian, Former Professor of History, Poondi Pushpam College, Thanchavur
15	Dr.K.Kulandaivel Tamilcholai	Epigraphist, State Department of Archaeology, GOTN
16	Dr.N.Marxia Gandhi	Former Assistant Superintendent of Epigraphy – State Department of Archaeology , GoTN
17	Dr.A.James Assistant Director, Tamil Virtual Academy	Officer - Tamil Computing , Tamil Linguistics
18	Dr.K.Venkatachalam	Engineer, Expert in Measurements of Chozha period
19	Mr.P.Venkatesan	Former Superintendent Archaeologist - Archaeological Survey of India

...end of Annexure-1

Annexure-2 - Tamil Supplement (Proposed) Code Chart

	11FC	11FD	11FE	11FF
0	வத	வ	கூ	வூ
1	ந	கு	ப	கூ
2	சி	உ	ஊ	யி
3	ஜை	தூ	கூ	வூ
4	சு	கூ		நூ
5	சூ			நூ
6			பூ	வூ
7		கூ	கூ	சூ
8	ப	கூ	கூ	பூ
9	ய	கூ		கூ
A	கூ	கூ		
B	கூ	கூ	கூ	
C	கூ	கூ	கூ	
D	கூ	கூ	கூ	
E	கூ		கூ	
F	கூ			கூ

Fractions

- 11FC0 ஷு TAMIL FRACTION MUNTHIRI
= முந்திரி = 1/320th
- 11FC1 று TAMIL FRACTION ARAIKKAANI
= அரைக்காணி = 1/160th
- 11FC2 று TAMIL FRACTION KAANI
= காணி = 1/80th
- 11FC3 று TAMIL FRACTION KAALVIICAM
= கால்வீசம் = 1/64th
- 11FC4 று TAMIL FRACTION ARAIMAA
= அரைமா = 1/40th
- 11FC5 று TAMIL FRACTION ARAIVIICAM
= அரைவீசம் = 1/32nd
- 11FC8 று TAMIL FRACTION MAA
= மா = 1/20th
- 11FC9 று TAMIL FRACTION VIICAM-1
= வீசம் = 1/16th
= மாகாணி / maakaani
- 11FCA று TAMIL FRACTION VIICAM-2
= வீசம் = 1/16th
= மாகாணி / maakaani
- 11FCB று TAMIL FRACTION IRUMAA
= இருமா = 1/10th
- 11FCC று TAMIL FRACTION ARAIKKAAL
= அரைக்கால் = 1/8th
- 11FCD று TAMIL FRACTION MUMMAA
= மும்மா = 3/20th
- 11FCE று TAMIL FRACTION MUUVIICAM
= முவீசம் = 3/16th
= மும்மாகாணி / mummaakaani
- 11FCF று TAMIL FRACTION NAALUMAA
= நாலுமா = 1/5th
- 11FD0 று TAMIL FRACTION KAAL
= கால் = 1/4
- 11FD1 று TAMIL FRACTION ARAI-1
= அரை = 1/2
- 11FD2 று TAMIL FRACTION ARAI-2
= அரை = 1/2
- 11FD3 று TAMIL FRACTION MUKKAAL
= முக்கால் = 3/4

- 11FD4 று TAMIL FRACTION DOWN SCALING
FACTOR KIIZH
= கீழ்
• when prefixed to a tamil fraction,
reduces its value by a factor 1/320

Measures

- 11FD7 று TAMIL GRAIN SYMBOL NEL
= நெல்
- 11FD8 று TAMIL MEASURE SYMBOL CHEVIDU
= செவிடு = 360 nel
- 11FD9 று TAMIL MEASURE SYMBOL
AAZHAAKKU
= ஆழாக்கு = 5 chevidu
- 11FDA று TAMIL MEASURE SYMBOL
UZHAKKU
= உழாக்கு = 2 aazhaakku
• for the measure uri use text உரி
which equals 2 uzhakku
• for the measure naazhi/padi which
equals 2 uri
→ 0BF3 று tamil day sign
- 11FDB று TAMIL MEASURE SYMBOL
MUUVUZHAKKU
= முவுழாக்கு
• equals 3 uzhakku
- 11FDC று TAMIL MEASURE SYMBOL KURUNI
= குறுணி = 8 naazhi/padi
= மரக்கால்
- 11FDD று TAMIL MEASURE SYMBOL
MUKKURUNI
= முக்குறுணி = 3 kuruni

Currency symbols

- 11FE0 று TAMIL CURRENCY SYMBOL KAACU
= காசு
- 11FE1 று TAMIL CURRENCY SYMBOL PANAM
= பணம்
• also used as a weight unit
- 11FE2 று TAMIL CURRENCY SYMBOL PON
= பொன்

- 1 pon was equivalent to 1 kalanchu during certain historical period

11FE3  **TAMIL CURRENCY SYMBOL VARAAKAN**

= வராகன் = 28 panam

- also used as a weight unit
- 1 varaakan = 3 kalanchu in weight unit

Weight and Area symbols

11FE6  **TAMIL WEIGHT SYMBOL PAARAM**

= பாரம்

- approximately equals 500 pounds during certain historical period

11FE7  **TAMIL AREA SYMBOL KUZHI**

= குழி

- equals 1 square thandam
- 1 thandam equals 16-spans
- 16-span = 11 feet at most places

11FE8  **TAMIL AREA SYMBOL VELI**

= வேலி

- equals 2000 kuzhi

Land and Agricultural symbols

11FEB  **TAMIL SYMBOL NILAM**

= நிலம்

11FEC  **TAMIL LAND SYMBOL NANCEY**

= நன்செய் = cultivable wet land

11FED  **TAMIL LAND SYMBOL PUNCEY**

= புன்செய் = cultivable dry land

11FEE  **TAMIL LAND SYMBOL UPPALAM**

= உப்பளம் = salt pan

...end of Annexure-2...

Other symbols and abbreviations

11FF0  **TAMIL COMMON SYMBOL VACAM**

= வசம் = possession

11FF1  **TAMIL COMMON SYMBOL MUTHAL**

= முதல் = starting from or commencing from

11FF2  **TAMIL COMMON SYMBOL MUTHALIYA**

= முதலிய = et cetera

- indicates items in series

11FF3  **TAMIL COMMON SYMBOL VAKAIYARAA**

= வகையறா


- indicates items of a kind

11FF4  **TAMIL CLERICAL SYMBOL NAALATHU**

= நாளது


11FF5  **TAMIL NUMBER SIGN-2**


= எண் = enn

→ 0BF7  tamil number sign

11FF6  **TAMIL CREDIT SIGN-2**

= வரவு

→ 0BF7  tamil credit sign

11FF7  **TAMIL ACCOUNTING SYMBOL CHILLARAI**

= சில்லரை = chillarai/chilvaanam

- indicates 'and odd'


11FF8  **TAMIL ACCOUNTING SYMBOL POKA**

= போக

11FF9  **TAMIL ACCOUNTING SYMBOL AAKA**

= ஆக

Punctuation

11FFF  **TAMIL PUNCTUATION SYMBOL AVANAMUTRU**

= ஆவணமுற்று

- end-of-text / end-of-document