



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 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.

The subject expert panel 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 |

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| | | | | | |
|----|-------|----|---|----------------------------|--------|
| 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 | Defer to separate proposal | 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 the 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 $1/20^{\text{th}}$ and $1/4^{\text{th}}$ were considered to be same as alphabetic letters ஸ and வ respectively. Symbol of UZHAKKU was considered to be same as one of the fractions $3/4^{\text{th}}$.

The subject expert panel evaluated these and confirmed that the 4 items listed in the table below have distinct shapes 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 | | ஔ | 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 ஈஓ- TAMIL FRACTION THREE SIXTEENTHS
= muuviisam/mummaamukkaani

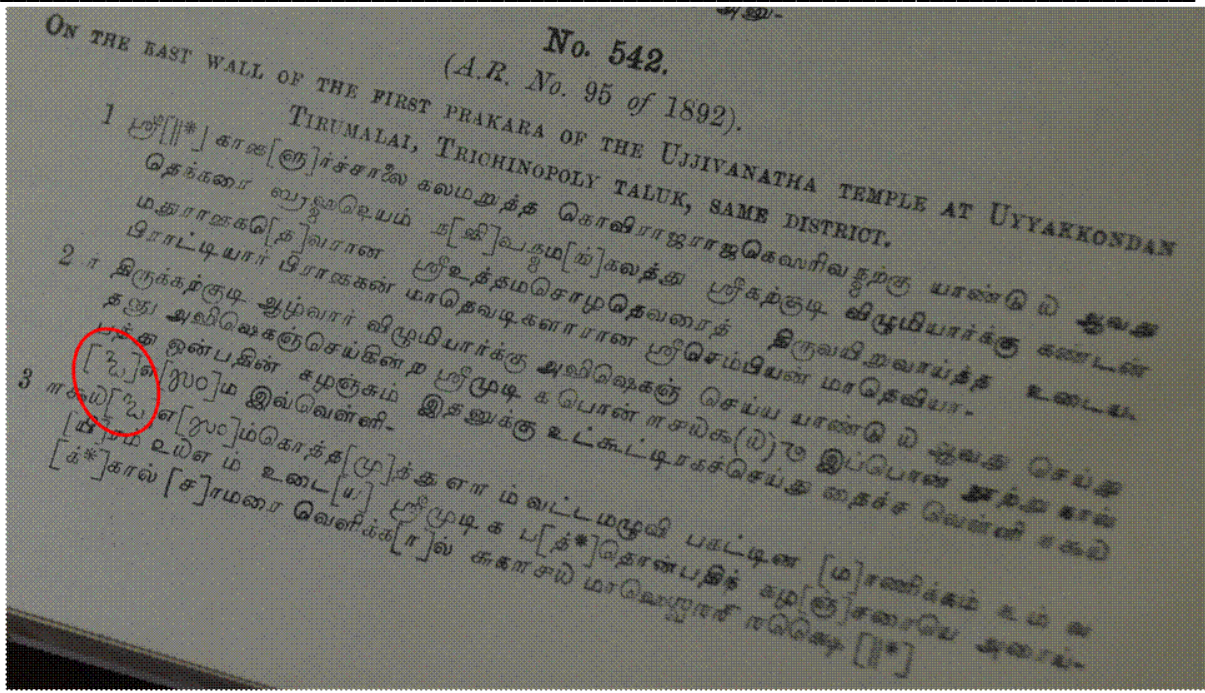
முவிசம் = MUUVIICAM(muuviisam).

Section 4.4 of the proposal L2/12231 is observed to be providing justification for this symbol. According to that proposal, this symbol is derived by fusing two different symbols with an assumption (proposed 11FCB + existing 0BF3) and the derivation provided is quoted below.

$$\text{mūvīcam } \frac{3}{16} = \text{mummā } \frac{3}{20} + \text{mukkāṇi } \frac{3}{80} = \text{முகு} \rightarrow \text{ம} + \text{க} = \text{மக}$$

The subject expert panel observed that, “the glyph for $\frac{3}{16}^{\text{th}}$ does not reflect the actual glyph; It is possible that the glyph is handwritten in the attestations to represent this glyph. It is not uncommon for various publications of old inscriptions to use handwritten or near-representative glyph, to denote a particular glyph. This practice may have set precedence for subsequent publications. Unfortunately, such glyphs cannot be used for encoding and only those found in the original root documents like estampages are the right candidates.”

And thus, the “South Indian Inscriptions (SII)”¹ published by Archaeological Survey of India (<http://asi.nic.in/>) (ASI), provides evidence for the correct glyph for this fraction that is found in the inscription on the wall of “Ujjivanatha Temple” in the outskirts of Thiruchirapalli city of Tamil Nadu. Following is the picture of the page# 180 from SII-Vol.4 showing the text of Inscription# 542. The lines 2 and 3 round-marked in red shows the symbol for $\frac{3}{16}^{\text{th}}$ (muuviicam).



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” (“MUUVIICAM”) 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 indicates that it denotes “mummaakaani”.





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




வீசம் = VIICAM(viisam).

Considering the discussion in 4.4.2 of L2/12231, the expert panel agrees with the glyph selection; however it 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:

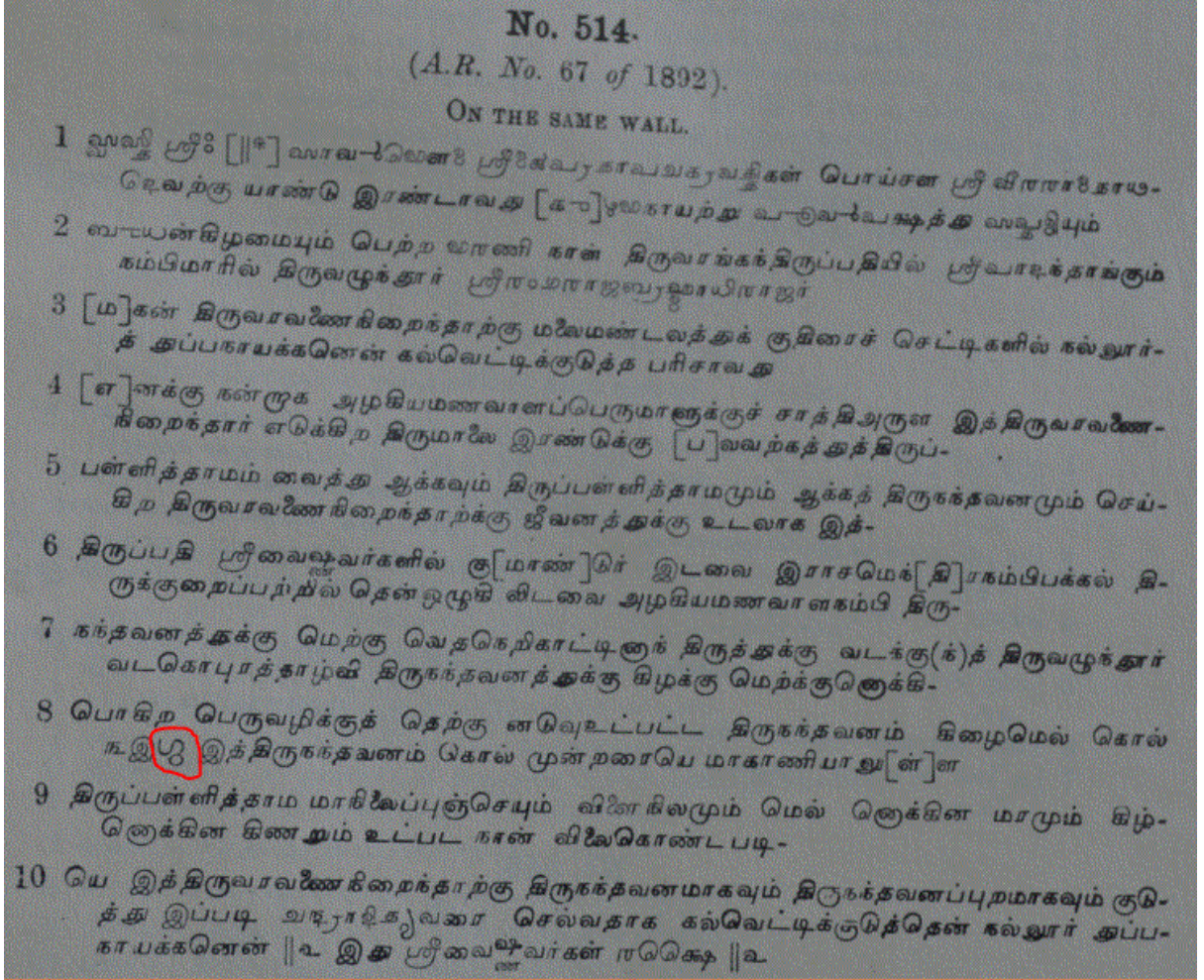
MAA () + KAANI () = MAAKAANI ( ). Both these symbols individually are discussed in separate sections 3.1.6 and 3.1.3 respectively).

The variants discussed in the section 4.4.2 of L2/12231 are valid to a larger extent. However, for VIICAM/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 MUUVIICAM 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 MUUVIICAM, VIICAM is ligated with TAMIL DIGIT THREE (OBE9). (MUUVIICAM = 3 VIICAM, $3 * 1/16^{\text{th}}$, 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).

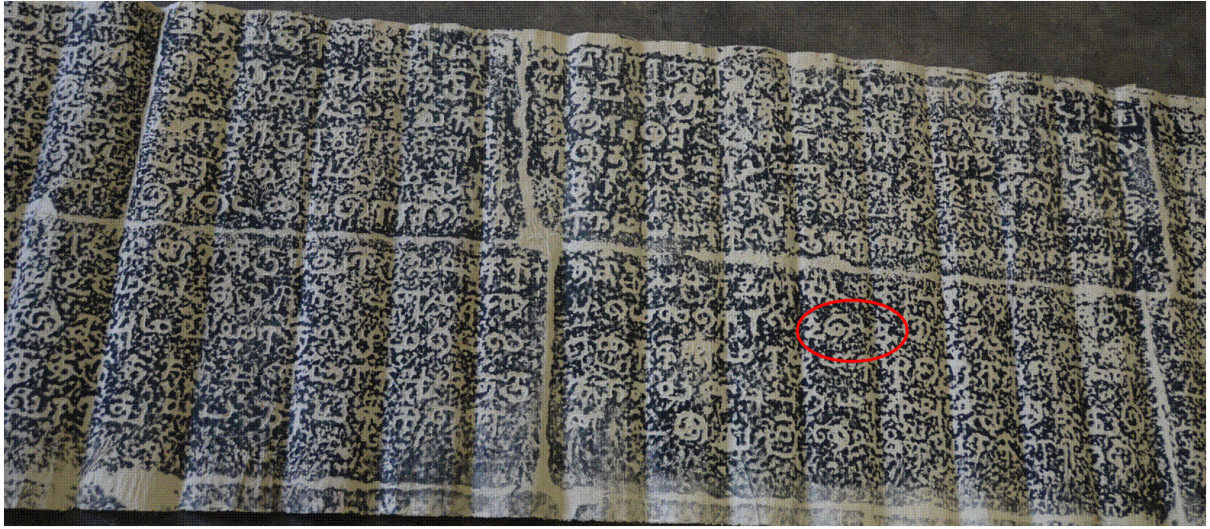
Therefore, a change in the shape of the glyph to reflect the natural usage of the fraction is recommended. ( is to be changed to ).

Now, when VIICAM/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 disjointed form can be seen in various documentations of SII. Further, this disjointed form has been approved by GoTN through their G.0.29 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 MUUVIICAM/MAAKAANI. This is the same form that was discussed in 4.4.2 of L2/12231.




The estampage below (ASI-AR 67/1892) further makes it evident. The inscription is very long and part of it is shown here.





For clear readability the 3 symbols/glyphs are focussed closely and the enlarged view is given below. This in Tamil is read as “முன்றரையே மாகாணி” (முன்று + அரை + மாகாணி). The மாகாணி part is drawn-over in blue in the following picture.




Therefore, it is recommended that this symbol be added as yet another symbol for VIICAM/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.

The panel 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 generate deviation 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 VIICAM/MAAKAANI should 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

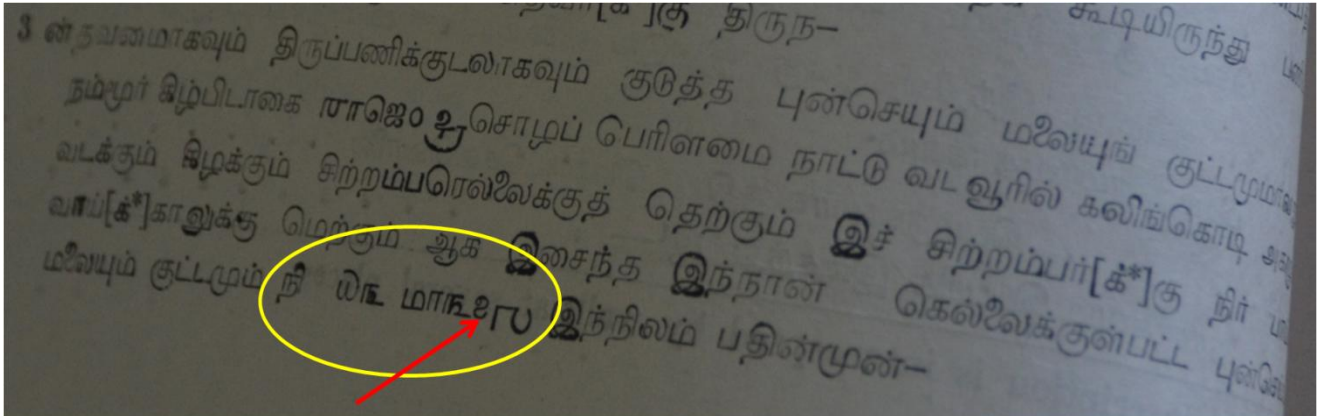
Tamil Code Chart as defined in L2/15078, describes this fraction as below:

11FC2 ஶ TAMIL FRACTION ONE EIGHTIETH
= kaani

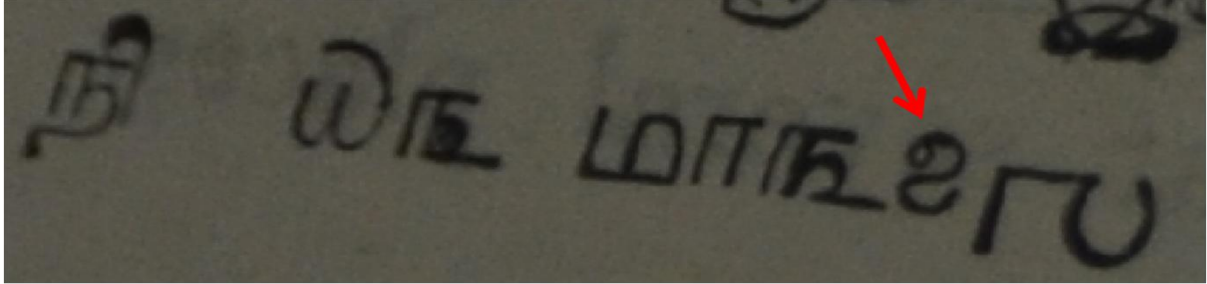
காணி = KAANI.

The expert panel agrees to this glyph; however it recommends a minor change to its 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.

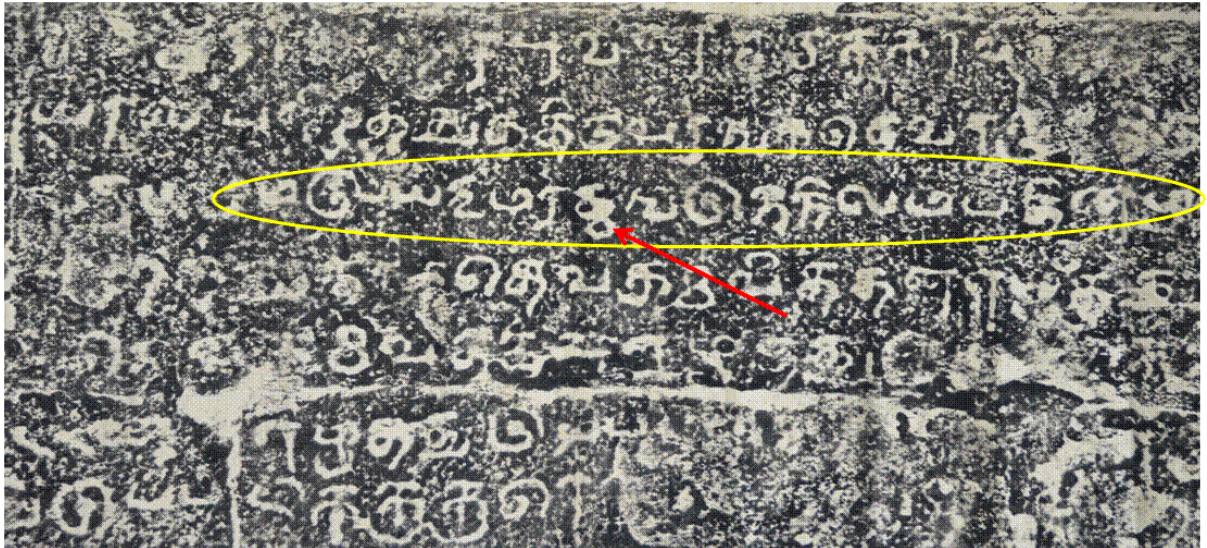
Following text is from SII-Vol.24, Inscription 24, Page 92. The third line of the inscription is as below.



Interesting symbols are here and it is worth noting as to 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 MUKKAANI is written as a fused form of TAMIL DIGIT



THREE and the symbol of KAANI. The arrow line in red colour points to MUKKAANI. The enlarged picture of MUKKAANI 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 MUKKAANI. 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 shape 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 MUKKAANI 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

முக்காணி = 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.

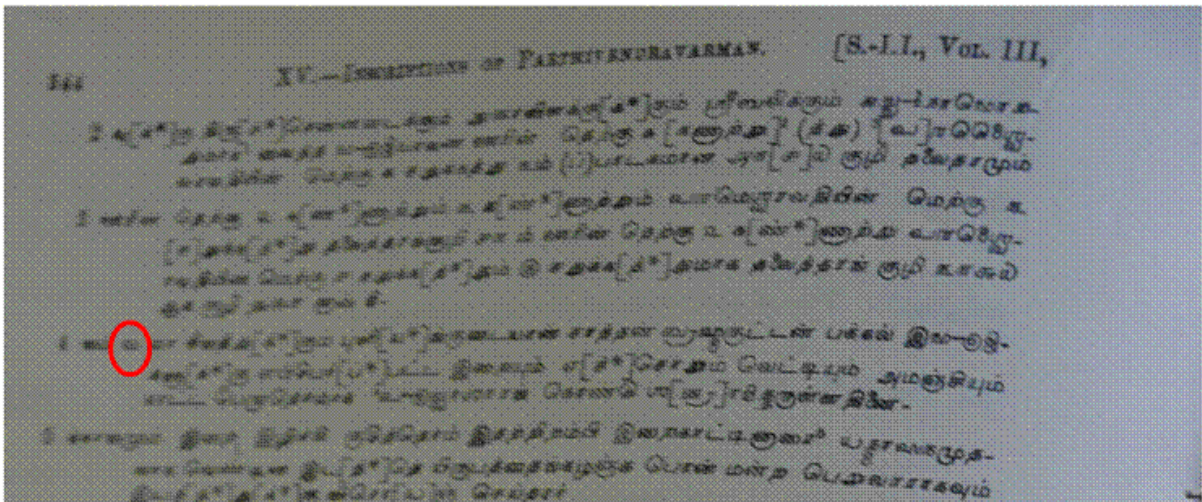
3.1.5 TAMIL FRACTION ONE QUARTER

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 the 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 might 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 given 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 “ஔ”. 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.

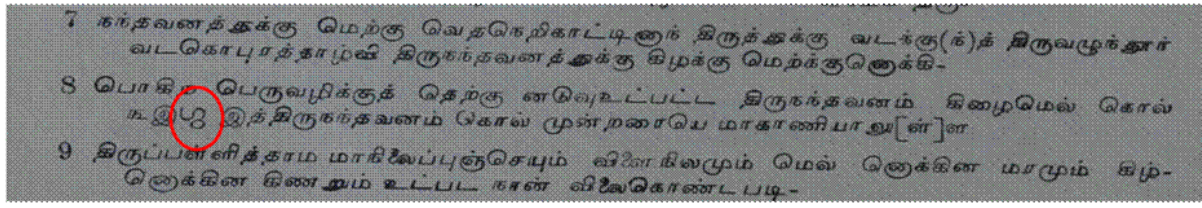
3.1.6 TAMIL FRACTION ONE TWENTIETH

1/20th = “஡ா” (MAA) in Tamil.

L2/12231 proposed this fraction to be encoded. However, L2/13028 disagreed as the symbol proposed for this fraction was declared to be same as the alphabetic character “TAMIL LETTER PA” (OBAA). Some of the discussions above for the fraction “ஔ”/Quarter(3.1.5) is applicable to this fraction also. Glyph of TAMIL LETTER PA “஡” is very different from the actual symbol of the fraction “஡ா”(). The alphabet “஡” is squared but symbol of “஡ா”(MAA) is more curved at the bottom and one of its arms is a bit more lengthy and 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 “஡”.



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 which 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 $1/20^{\text{th}}$ has to be encoded and the shape of the symbol of MAA is . 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 symbol is described at 11FC8.

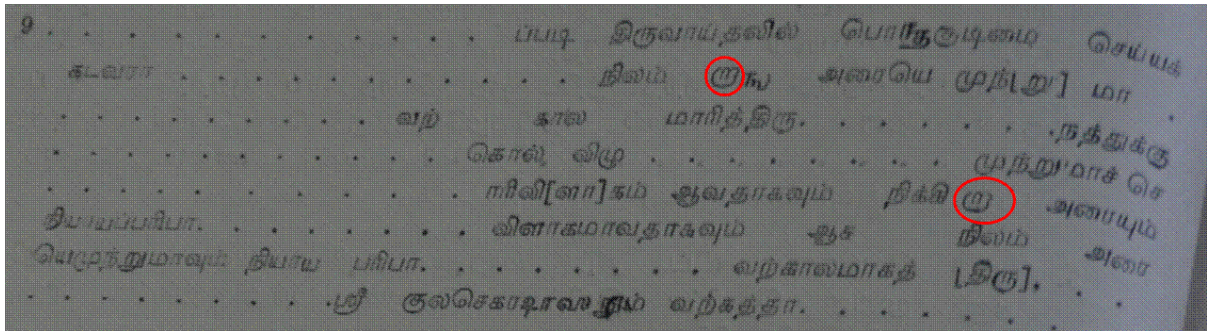
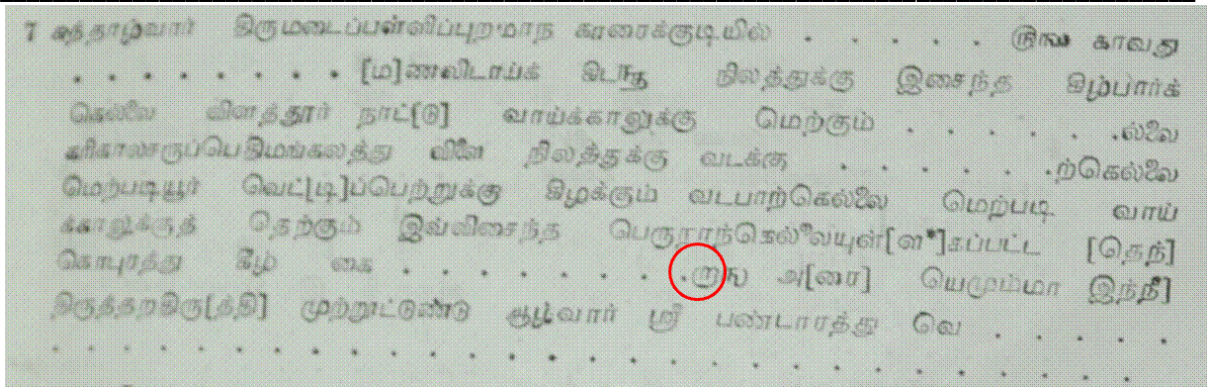
3.1.7 TAMIL FRACTION ONE HALF

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

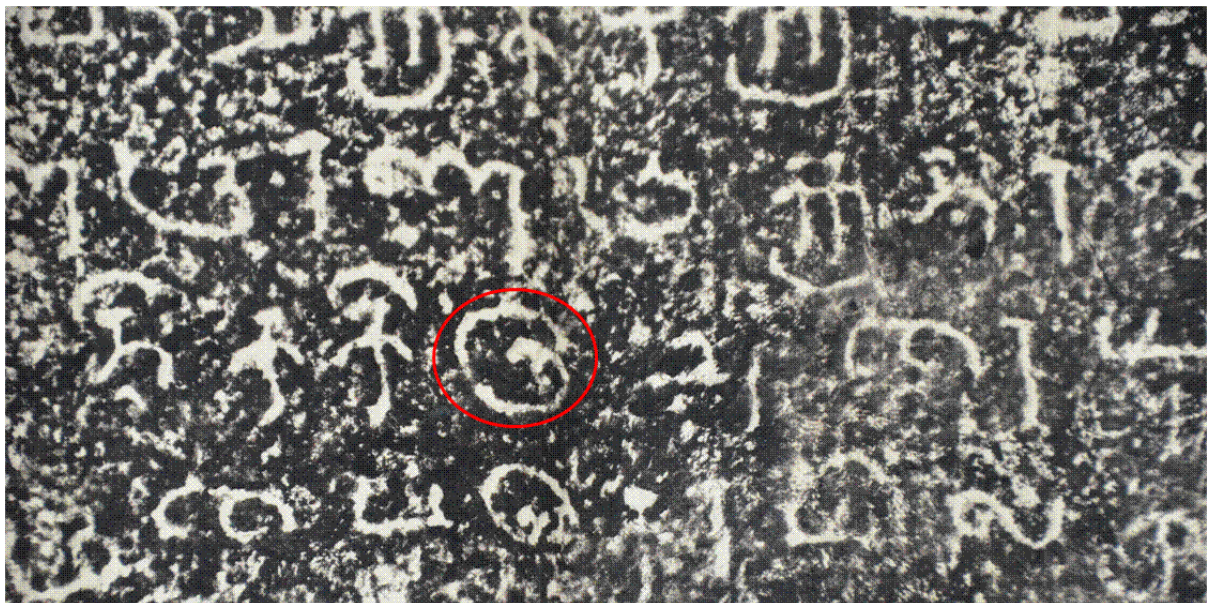
11FCE ௩ TAMIL FRACTION ONE HALF
= arai

With reference to the discussions in section 4.4.2 of L2/12231, while agreeing to the inclusion of the proposed symbol ௩ for ½ (“அரை” = “ARAI”), the panel recommends to include another symbol ௪ 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 a 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. VIICAM).

In the case of “ARAI”, a huge volume of old documents exist with the usage of the symbol ௪. 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 ௪. 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 (அ) அரை.....”.



Therefore, this symbol for ARAI/HALF also has to be encoded. As this symbol (அ) has earlier usage, this is named as “TAMIL FRACTION ARAI-1” and the other symbol (அ) is

“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:

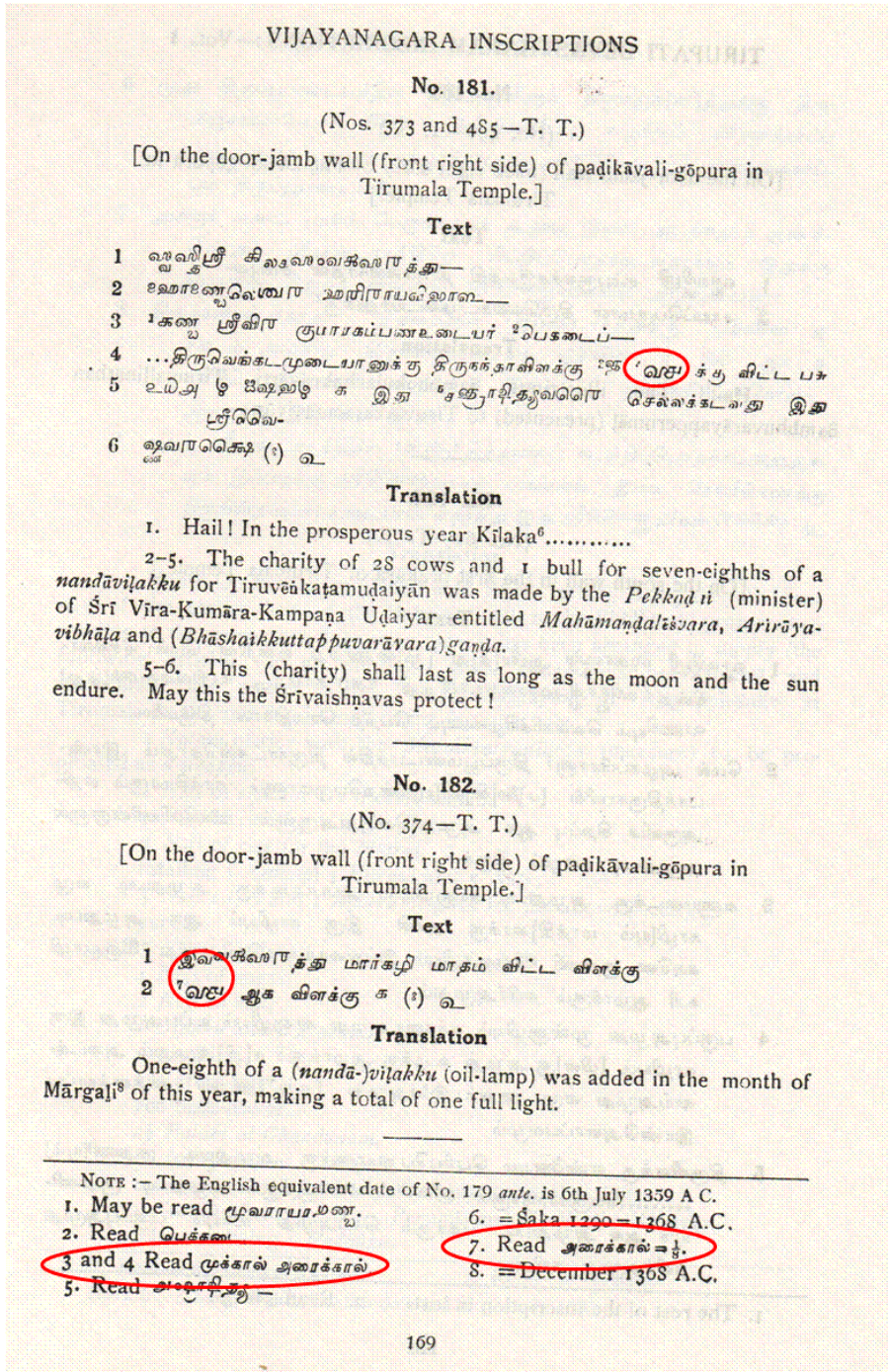
11FCA ஷு TAMIL FRACTION ONE EIGHTH
= araikkaal

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

The fraction அரைக்கால் = $1/8^{\text{th}} = \frac{1}{4}$ multiplied by $\frac{1}{2}$ (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 ஷு for $1/8^{\text{th}}$.

This symbol is the combination of glyph of $\frac{1}{4}$ and glyph of $\frac{1}{2}$. $\frac{1}{4}$ is represented in the section 3.1.5 as ஷு and $\frac{1}{2}$ is represented in the section 3.1.7 as the TAMIL FRACTION ARAI – 2(ஷு). In both ஷு as appearing in the Inscription text below, and ஷு as proposed by L2/12231, the second part representing HALF is a deformed symbol of TAMIL FRACTION ARAI–2(ஷு). Logically it will be correct to alter the symbol a bit to accommodate the shapes of $\frac{1}{4}$ and $\frac{1}{2}$ (2). Hence it is recommended to alter the shape to ஷு. In the

amended code chart (Annexure-2) this is described at 11FCC.

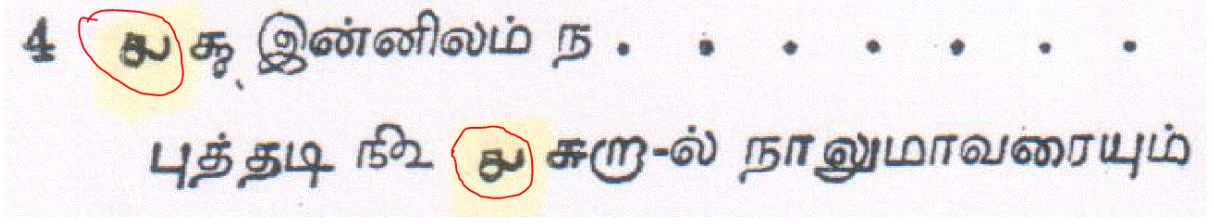


3.1.9 TAMIL FRACTION ONE FIFTH

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 OBB5 வ
→ OBB5 வ tamil letter va

நாலுமா = NAALUMAA = NAALU + MAA = 4 times MAA. According to the panel, the symbol ௪ is incorrect . Please refer to the section 3.1.6 for the symbol of MAA as 𑌵 . NAALUMAA is combination of the ௪ -like symbol (resembling TAMIL DIGIT FOUR), and the symbol of MAA. So, it is written as 𑌵 . 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 in font making; the symbol for four should have a nose while the symbol for half should not have the nose). Hence, the panel recommends to change the symbol to 𑌵 for NAALUMAA. In the amended code chart (Annexure-2) this is described at 11FCF.

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- 4 ஸும் வண்ட[ட]றும் இற[ஊ]றநாள் முதல் வைத்த சந்திவிளக்கு ஒன்றுக்கு இ[ஊ]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 மாமம் ஒன்று[ஊ]கு உகளைந தா[ஊ] நாமியால் அள[ஊ]க்கும் நெய் நாமிகரி [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 Alagiyāṅ Rājadvākara-Mūvēndiravēḷāṅ of Vīḷiyūr in Āvūr-kūrram, a subdivision of Nittavinōḍa-valanāḍu by Araiyan Purriḷaṅkoṇḍāṅ 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 உருவாபகத்த உஸ்தியும் திக்கெழிமையும் பெற்ற அனிமத்தநாள் நித்தவிநொதவளநாட்டு ஆலுக்கற்றத்த விழியுருடையான் [வ]தைவன் திருஞாநம்பந்தன் அழகிய[ர] னீராசதிவாகா முவெந்திரவெளாளுக்கு பாண்டிருமையினவளநாட்டு தஞ்சாவூர்கூற்றத்த குருதையாடிமுனை அரையன் புறிடக்கொண்டான்
- 2 தெவப்பெருமானெ றற திலமாவது [1] குலொத்துக்கசொழவள நாட்டு பிணையுநாட்டு செய்யின்குருதை[யாடியில்] நத்தமும் விளநீலமுமாவது [1] சீமைக்குரு தையாடியில் தெற்கில் மாளிகை நத்தத்தில் மனைக்கு எல்லையாவது சிழ்பாற்கெல்லி பட்டப்பாழுக்கு மெற்கும் தென்பாற்கெல்லி 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 சிழக்குவாய்த்த பெர்சொல்லப்பட்ட சி உய்கு-இந்நீலம் ஆறுமாவும் இதன் மெற்கு வாய்க்காலுக்கு பெற்கு [து]க்கைவ[ர]யக்கல் என்ற பெர்சொல்லப்பட்ட சி [வசு] இந்நீலம் காலெ முக்காணி[1] யும் பட்டப்பாழுக்குத் தெற்கு வானவன் [வா]யக்கா[1] சி
- 4 உய்கு இன்னிலம் வன் கொயிலுக்குத் தெற்கு அய்யன் திருப்பு புத்தடி சி உய்கு-ல நாலுமாவரையும் இதன் சிழக்குத்தடி விளாகம் சி ரு இன்னி ல் காலெணியும் இதன் சிழக்கு அரையன்கால் சி வசு இந்நீலம் க[ர]லெ முக்காணியும் இ[ன]தன் தெற்கு சி சபு இந்நீலம் நாலுமக்காணி இக்கு விட்டு மெற்கு வடக்கைய பூப்பறியல் வாய்க்கா[1]லுக்குத் தெற்கு
- 5 பூப்பறியல்குட்ட ஸ்கு விடநக் சிழக்கு சீமைநத்தத்துக்கு தெற்கு [1] பெற்றாறு குடிக்குடி எல்லைக்கு வடக்கு மெலுமாக தான் கட்டின சி உய்கு இன்னிலம் முக்காலெ இரண்டு மாமுக்கணியும் உடையார் புறநிடக்கொண்டநாயினூர் திருக்குப்புக்கு வடக்கு சி ரு உய்கு இந்நீலம் 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 = ARAVIICAM(araviisam) = Half of 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 were not any valid symbol could be found in the sources he has referred to. 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 VIICAM part of the symbol now has logical uniformity among VIICAM (1/16th, section 3.1.2), and MUUVIICAM (3/16th, section 3.1.1) as below.

$$\text{VIICAM} = \text{வூ}, \text{ARAVIICAM} = \text{சூ}, \text{MUUVIICAM} = \text{மூ};$$

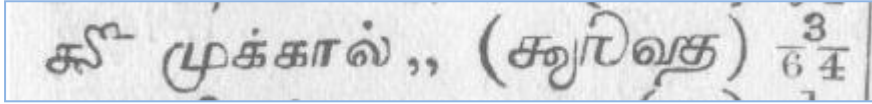
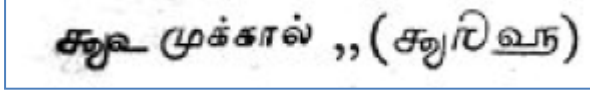
3.1.11 TAMIL FRACTION THREE SIXTY-FOURTHS

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 = MUKKAAL VIICAM = 3/4 VIICAM.


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 looks like matching a symbol in the attestation forcefully.

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

→ சுடு + வடு = கல



The panel does not suggest this way of creating a symbol. Also, during the research on this symbol, the panel had observed various issues relating to this symbol. Though, it could find a symbol of the shape  (SII-Vol.10, Inscription# 174, Page 102), it also found 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 symbol 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:

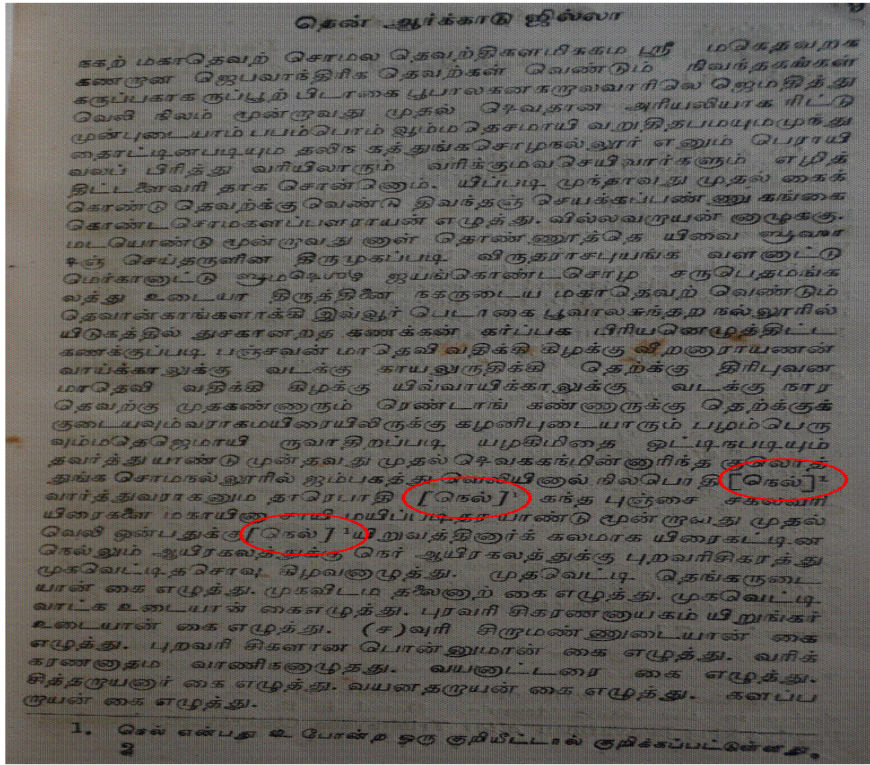
11FD1 ஐ TAMIL SIGN NEL
• one grain of paddy

Panel evaluated the glyph and the discussion on NEL(நெல்) 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 ” = “ஆள் 2 க்கு நெல்” (AAL 2 Kku 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

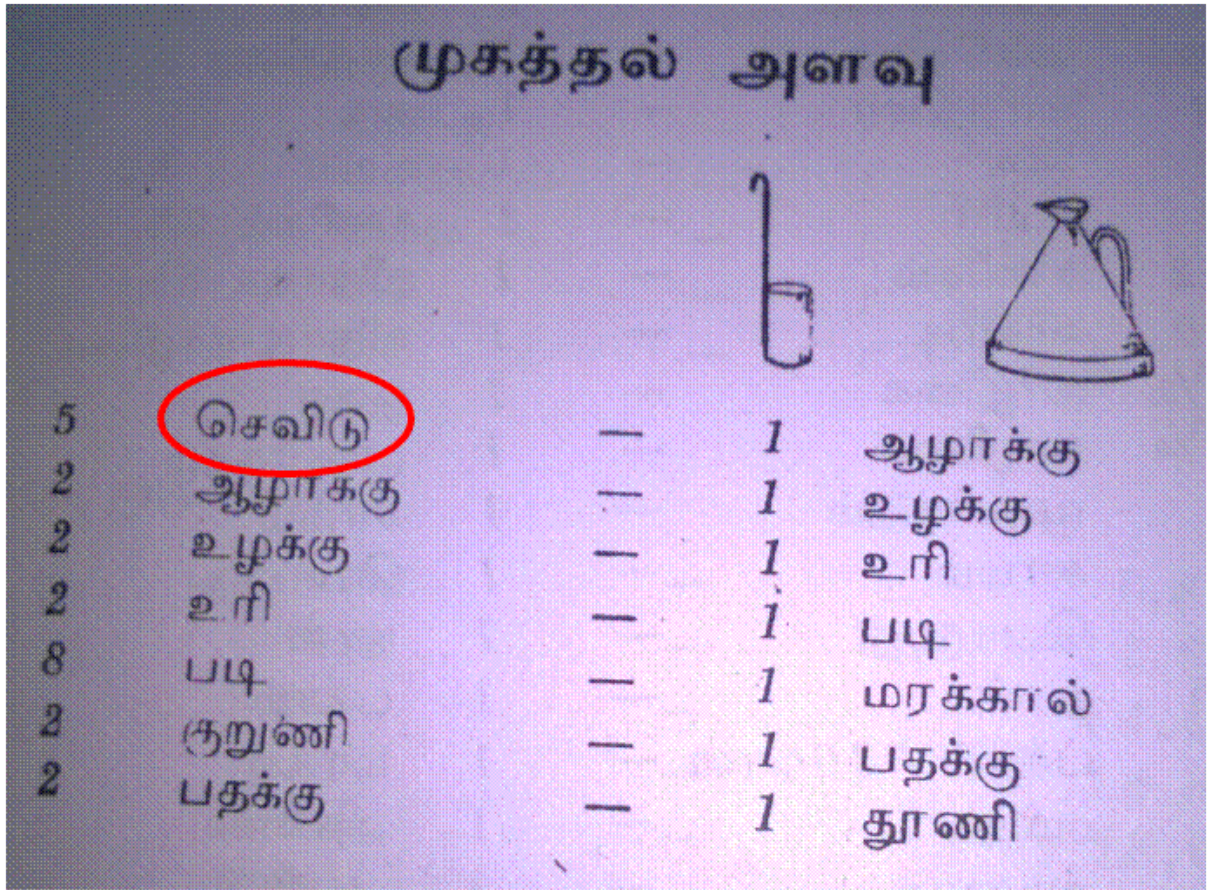
Tamil Code Chart as defined in L2/15078, describes this measure as below:

11FD2 ஸ்ரீ TAMIL SIGN SUVADU
• equals 360 nel

The name of this measure “SUVADU” is varying over an extended period and regions. 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 “Kanakadhikaram (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 that of measure UZHAKKU (உழக்கு) 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 absence of frontal curl here should be noted. 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 **௩௩** representing MUUVUZHAKKU.

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- 11 தொறும் ஸ்ரீபண்டாரத்திலே இந்த வகைப்படியே விட்டுப்பொகக்கடவது ஆகவும் திருமலைமெல் அமுதுசெய்தருளின ப்ரஸாதத்திலே தம்முடைய பொது-
- 12 ப்ரஸாதம் உயிசு உ **௩௩** இதில் அரகாணலயந் மடத்துக்கு செஷம் ஆக பெறும் ப்ரஸாதம் யரு உ **௩௩** நிக்கி தாம் தாநத்தாற்குக் குடுத்த ப்ரஸாதம் பதி[னெ]ருநாழியும்
- 13 தானத்தார் திருப்பதி ஸ்ரீவைஷ்ணவர்கள் நிவ-ஶாஶ்ட நாலும் திருச்சக-னாரில் ஸபையார் நிவ-ஶாஶ்ட முன்றும் நம்பிமார் நிவ-ஶாஶ்ட ஒன்-றும் கொயில்கெட்கும்
- 14 ஶசியர்கள் நிவ-ஶாஶ்ட இரண்டும் கொயிற்கணக்கு திருநின்றணிடையார்-கள் நிவ-ஶாஶ்ட இரண்டும் ஆ[க] இந்த பன்னிரண்டு நிவ-ஶாஶ்டத்-திலும் பெறக்கடவர்-
- 15 களாகவும் ஸ்ரீகொவிந்தப்பெருமாள் அமுதுசெய்தருளின ப்ரஸாதத்தில் தம்முடைய விழுக்காடு ப்ரஸாதம் யா உ **௩௩** இதில் இந்த மடத்துக்கு ப்ரஸாதம் ரு உ **௩௩**
- 16 நிக்கி ப்ரஸாதம் [யஉ] உ ம் இந்த பன்னிரண்டு நிவ-ஶாஶ்டத்திலும் பெறக்கடவதுஆகவும் ஶதம்உடைய ஶரிராவலானத்துக்கு பின்பும் மட-
- 17 செஷப்ரஸாதம் இந்த மடம் கைக்கொண்ட ஶனமாபி ஸ்ரீவைஷ்ணவ்ர பெறக்கடவர்ஆகவும் இப்படிக்கு அநாடிதழுவரை நடக்க-
- 18 க்கடவதுஆகவும் இப்படிக்கு ஸ்ரீவைஷ்ணவர்கள் ஶபணியில் கொயில்கணக்கு திருநின்றணருடையான் 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 ஶ்ரீவைஷ்ணவரகெஷ உ **௩௩** ஆயிரத்து முன்னூற்று ஒரு பத்து நாலின் மெல் செல்லாரின்ற ஆங்கிர^௩வ்வற்றவர^௩த்து பங்குனி மாதம் [உ-^௩தீ] நாள் திருமலையில் ^௩தானத்தாரோம்

1. This figure stands for **௩௩** முல்-வழக்கு.
2. Read ஜியர்கள்.
3. Read தம்முடைய.
4. Read வாகாசி.
5. Read பணியால்.
6. Read ஶ்ரீவைஷ்ணவ்ர.
7. Read ஶகாஷ்ட.
8. Read—^௩வ்வற்றவர^௩த்து.
9. This figure stands for தேதி.
10. Read ஶ்ரீநத்தாரோம்.

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MUUVUZHAKKU means 3 times UZHAKKU. Digit 3 in Tamil is **௩** (TAMIL DIGIT THREE (OBE9)). Therefore, logically, **௩௩** is written combining **௩** (3) and **௩**. It can be

observed here that the symbol $\frac{1}{4}$ of $\frac{3}{4}$ is not combined with $\frac{1}{2}$ to get MUUVUZHAKKU, and hence as per the expert panel both the symbols ($\frac{3}{4}$ and UZHAKKU) are different.

Hence, the panel recommends to include $\frac{3}{4}$ for UZHAKKU into encoding and provide a separate codepoint to UZHAKKU. In the amended code chart (Annexure-2) this is described at 11FDA.

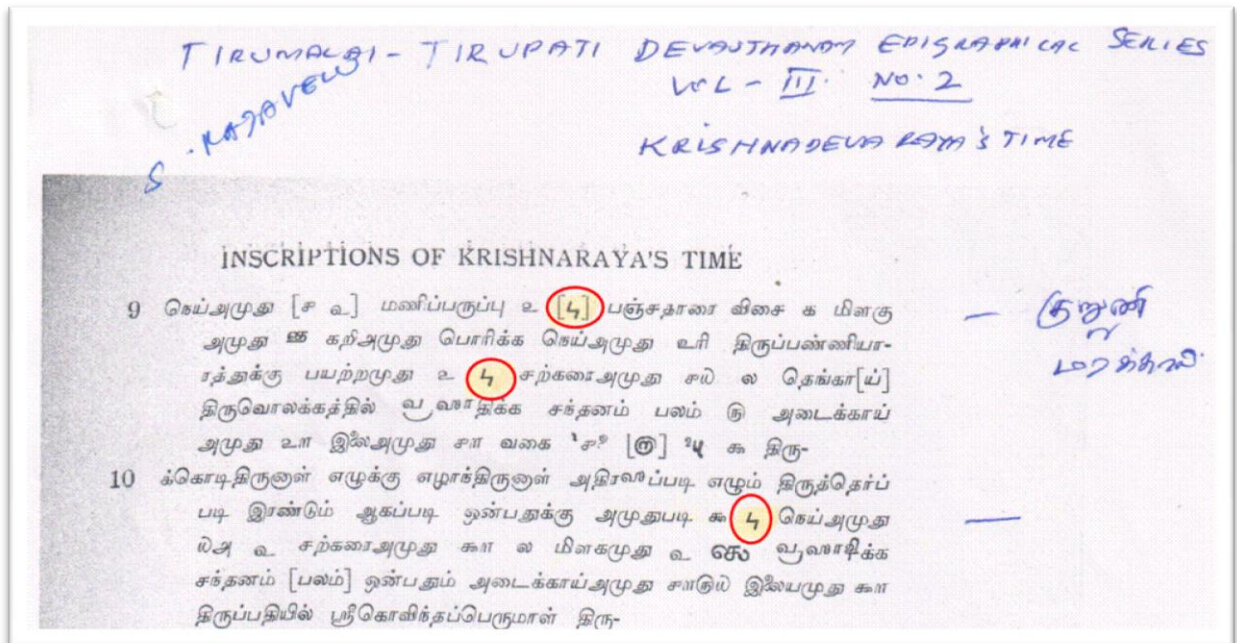
3.2.4 TAMIL SIGN KURUNI

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 $\frac{1}{2}$ TAMIL LETTER NGA

- also denotes the measure kuruni/marackkaal
→ 11FD5 $\frac{1}{2}$ tamil sign muuvuzhakku

But, the symbol of TAMIL LETTER NGA and the symbol of KURUNI (குறுணி) 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 ழ. 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 ழு TAMIL SIGN PADAKKU
• equals 2 kuruni/marakkaal

Though, the printed books show the symbol of PATHAKKU (padakku) as ழு , the subject expert panel, in its reserach has observed the occurrences of the symbol in the form of ழு 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 ழு TAMIL SIGN MUUVUZHAKKU
• equals 3 uzhakku
• for the measure naazhi/padi which equals 2 uri or 4 uzhakku, use 0BF3 ழ
→ 0BF3 ழ tamil day sign
• for the measure kuruni/marakkaal which equals 8 naazhi/padi, use 0B99 ழ
→ 0B99 ழ tamil letter nga

மூவுழக்கு = MUUVUZHAKKU = 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 ௩. The first part of symbol of MUUVUZHAKKU should reflect the “three” correctly. It should clearly distinguish it from ௩ and ௩.

Hence, the symbol is modified a bit to the form of ௩௩. 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

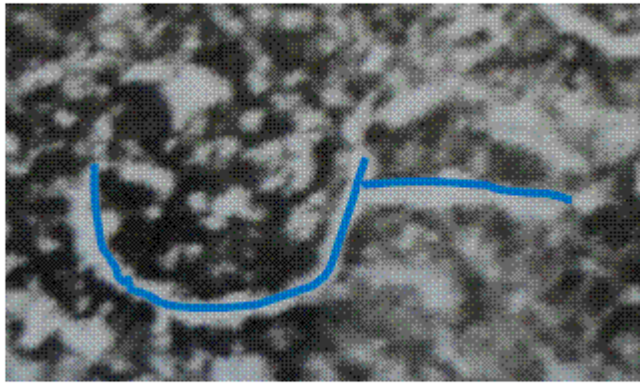
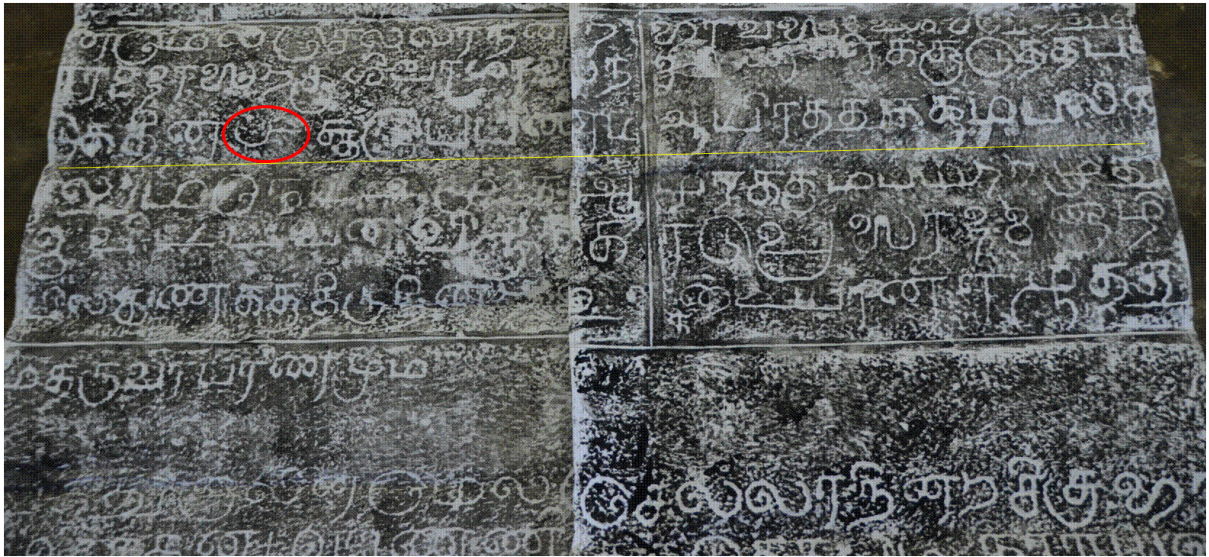
3.3.1 TAMIL SIGN PANAM

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

11FDB ௩௩ TAMIL SIGN PANAM
• equals 80 kaasu

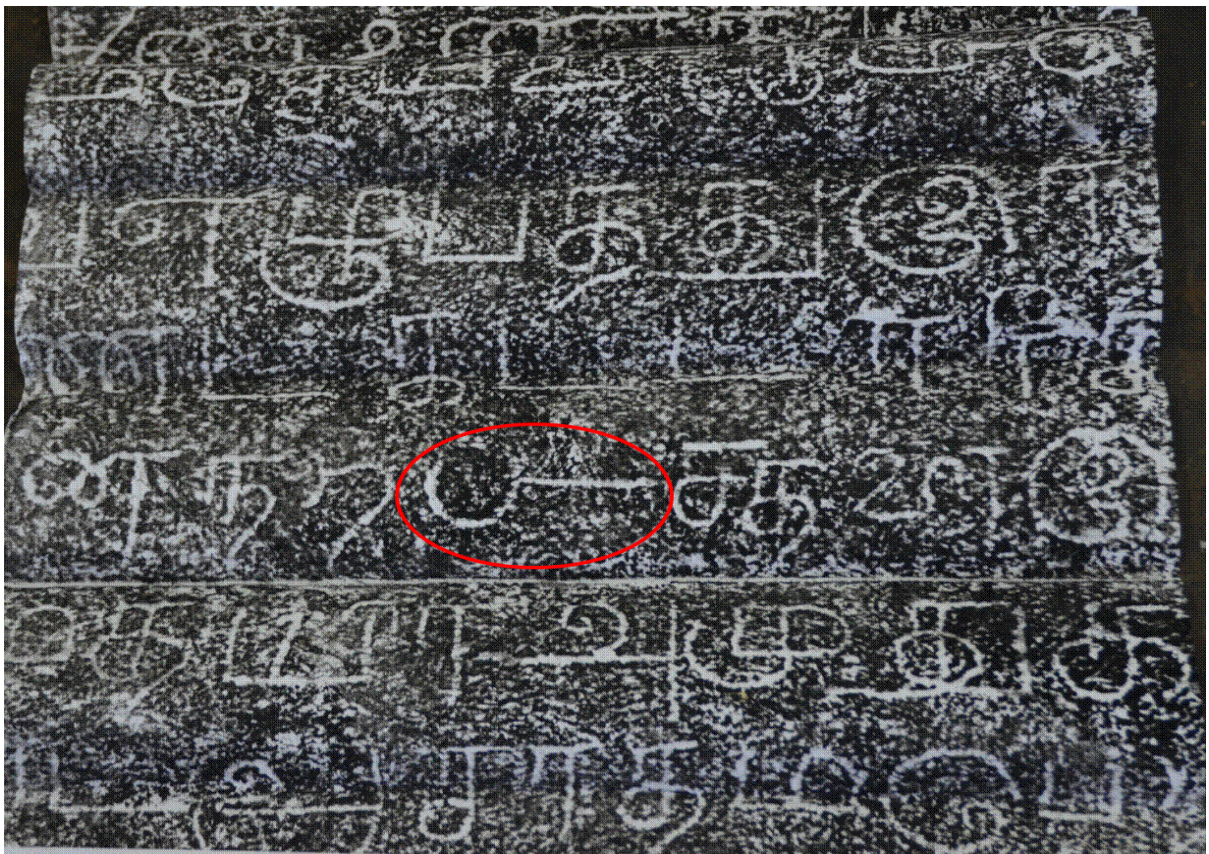
பணம் = PANAM; Its general meaning is “money/currency/coins”. In olden days the currencies were made of gold or silver or copper. Normally the metal used in the coin is not mentioned. But many a times, it might have implicitly meant gold coins.

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 ௩. This is the symbol for PANAM. The inscription text is “(௨) டுக்கின பணம்[௩] [ஆயிரம்] இப்பணம் ஆயிரத்து....”.

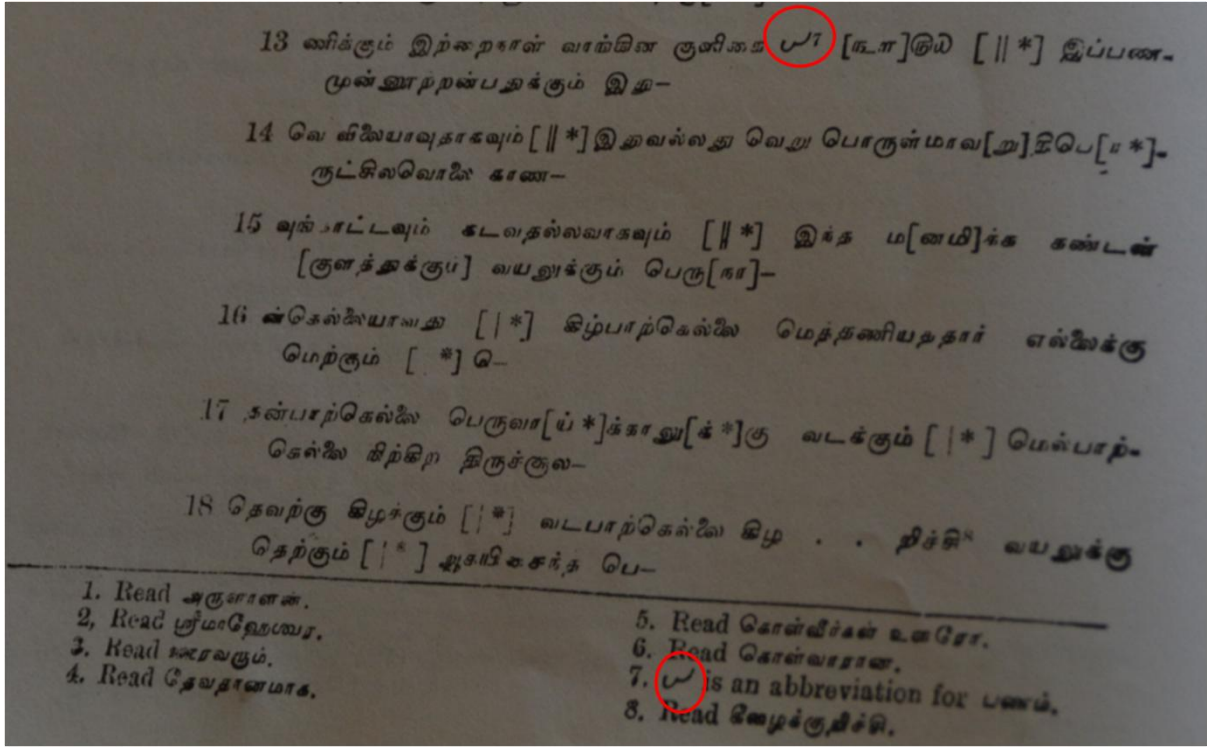


This is the picture enlarging the symbol in the previous estampage. For readability it is drawn-over in blue.

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. ୪ shown in Pudukkottai State inscription, and ୪ 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 ୪ be encoded in place of ୪. The glyph ୪ looks like a variation of ୪.

Though, it has some presence in the printed texts, encoding based on the symbol ୪ 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 KAACU. 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 Chozha 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 KALANCU (கழஞ்சு). Often enough PON and KALANCU 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 ஸ” is mentioned to denote silver coins. Likewise, “செப்பு ஸ” also was used in other historical times.

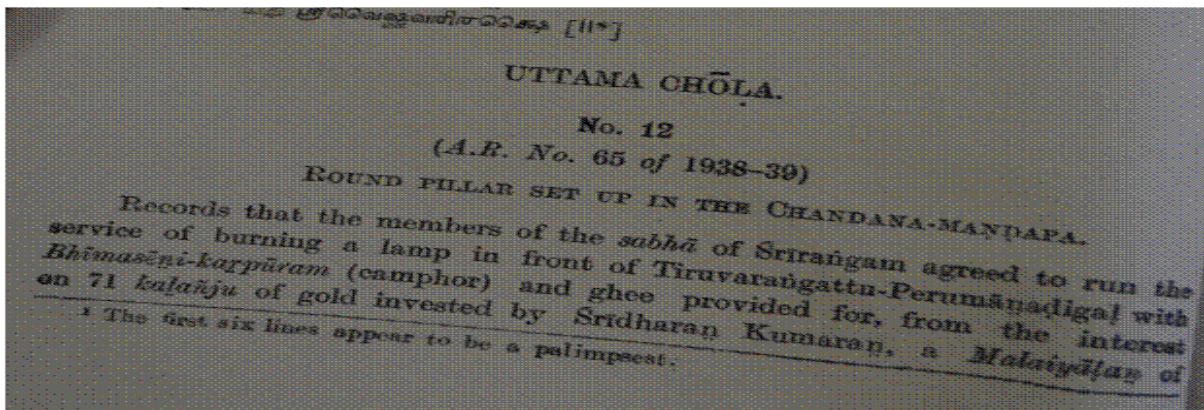
In the amended code chart (Annexure-2) PANAM is described at 11FE1.

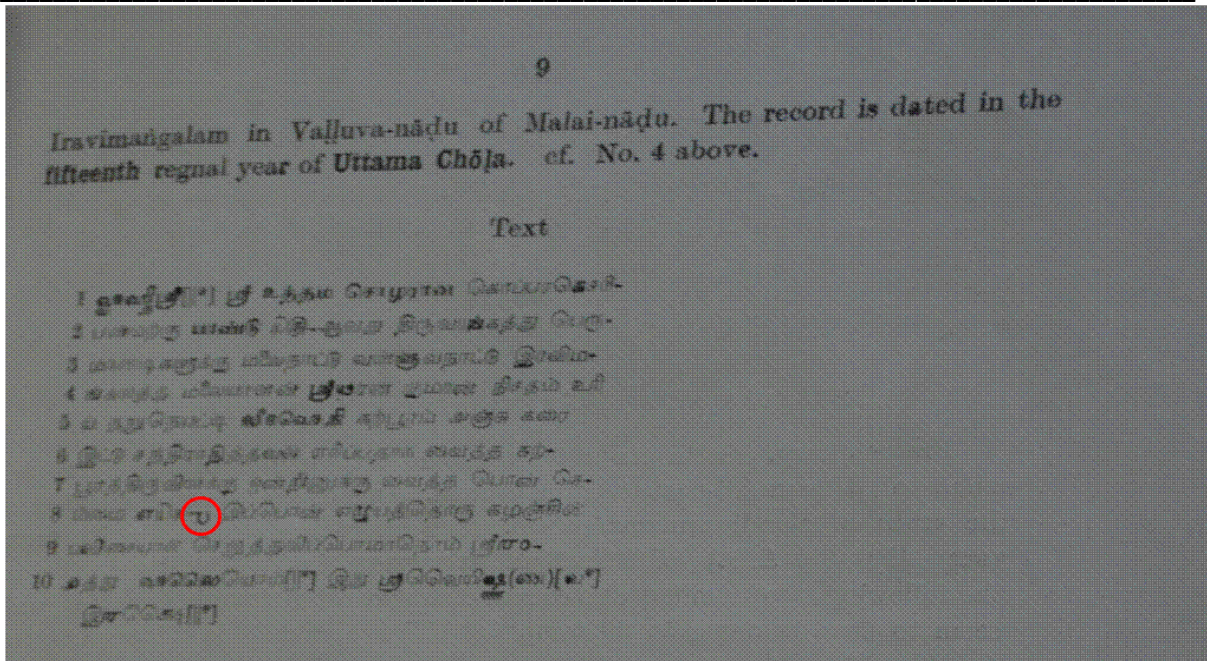
3.3.2 TAMIL SIGN PON

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

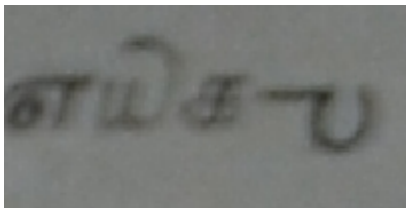
11FDC ௫ TAMIL SIGN PON
• equals 10 panam

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



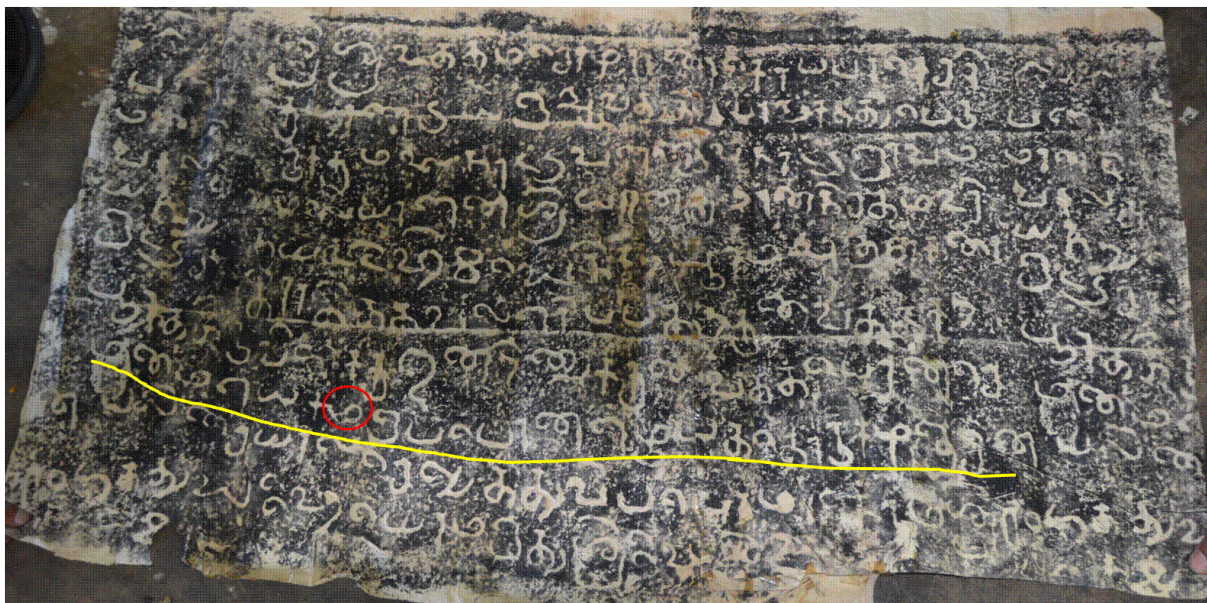


Line 8 of this text shows the symbol of PON. The text reads as “(செ)... ம்மை 71 பொன் இப்பொன் எழுபத்தொரு கழஞ்சின்”. In the enlarged picture below,



70, 1, PON are the three interpretations from the symbols there. This means $70+1+PON = \text{“71 PON”}$.



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 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 (KALANCU). So the annotation has to refer this equivalence of PON with KALANCU.

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 வர 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 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.

- 4 பண்ணி[க்*]ருவத்தபடி தென்னியசின்கப்பெருமாள் [தி]ருக்கொழில் திருமழிசையாழ்வார் திருபதுஷ்ட்டைகொண்டருளுகையில் அவருக்கு நிற்றைபடி அமு[க்*] செய்மத்தகு காசு[ற்]ன
- 5 தனிகையாக நிற்றைபடி ஒரு தனிகை [அமுது] செய்மத்தக்காக அனுமஞ்சிபல்லை எயம்பெருமானார் [ச]மைப்பித்த கெழு லீ உயி யிந்த வராகன் இருவதும் திருக்கொழிவி-
- 6 வெ பற்ற[க்*]கொண்டு நிறை தனிகை ஒன்றும் ஆழ்வார் திரு[அமுது]செய்மத்தகு ஆக அனுமஞ்சைபல்லை எம்பெருமானாராசாரியர் சிலர் மூணைய[க்]சார் ஆழ்வார் கயி[ற்]கிரியத்தகுஆக
- 7 சமந்தித் . . . தெய் திருபது வராகனும் கொழிலிலெ பற்றிக்கொண்டெ [நாம்] ஆழ்வார் அமுதுசெய்ம தனிகை ஒன்றுகி சிலவு தானத்தாரு [இ]ருழியும் பரிசாலக-
- 8 னுகி னுழியும் சயம்பாகி னுழியும் திருமா[ல்] திருமெனிகாவல் திருவதிருவ வீராமன்முன்னுழியும் திருவிளகு [நி]ற்றை திருமா[லையும்] தாசரிநம்பி னு[ழியும்] ஆ[க்*] பிறசாதம் குறுணியும் ஆற்சந்சிர-
- 9 ஆற்கதாயி ஆக நடத்த[க்*]கடவொமா[வு]ம் இ[ப்*]படி சிலாசாசனம் பண்ணி பொலிவெட்டு பொடுவித்தொம் கொப்பூரி ஓபயதெவமகாராசாவும் தானசமையமும் *]ப[ப்*] [டி]
- 10 யிவர்கள் [ச]ரா[ன்ன]படி பொ[வி]வெட்டு எழுதின . . . க .
- 11 . . சொக்கன[ச]ாரி எழுத்தவ யி[க்]த பொலிவெட்டு ஆ[க்*]செய்த கெ[டி] [நீ] உயி இந்த வராகன் யிருபதும் எம்பெருமானார்*]ஆசாரியர் சிலர் மூணையங்காரையில் பற்றி[க்*]கொண்டொம்[||*]

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 KALANCU). It became popular during 19th and 20th century. One may refer to Tamil Lexican⁷, Vol.6, page 3512 to understand the meaning of VARAAKAN. It is mentioned there 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 = PUNCEY (புன்செய்); And the Wet cultivation land = NANCEY(நன்செய்) which is defined as below in L2/15078.

11FE2 னஞ்சு TAMIL WET CULTIVATION SIGN
= nansey

Comparing the symbols of PUNCEY(புஞ்சு) and NANCEY(நஞ்சு), it can be understood that both the symbols are derived by suffixing ஈ-like glyph with the letters of ப(PUNCEY) and ந(NANCEY) respectively. ஈ-like glyph stands here for செ(CE)/செய்(CEY). In the case of NANCEY, the symbol னஞ்சு evolves by fusing ஈ-like glyph at the end of “ந” (0BA8). “ந” is the first letter of the word நன்செய். (It should be noted that the symbol for NANCEY is accepted by the panel as it is).


But, in the case of PUNCEY, instead of using “பு” – the first letter, “பு” is suffixed with ஈ-like glyph. Hence, the suffix part has risen upwards(புஞ்சு). 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 (=புன்செய்) and the symbol of it. It can be observed that the suffixing 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 PUNCEY 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

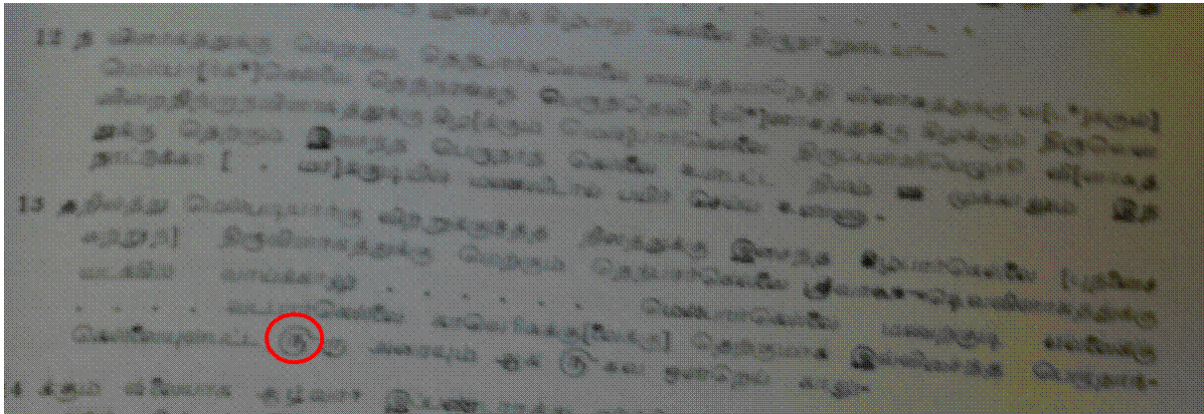
Tamil Code Chart as defined in L2/15078, describes this land symbol as below:



11FE4  TAMIL LAND SIGN
= nilam

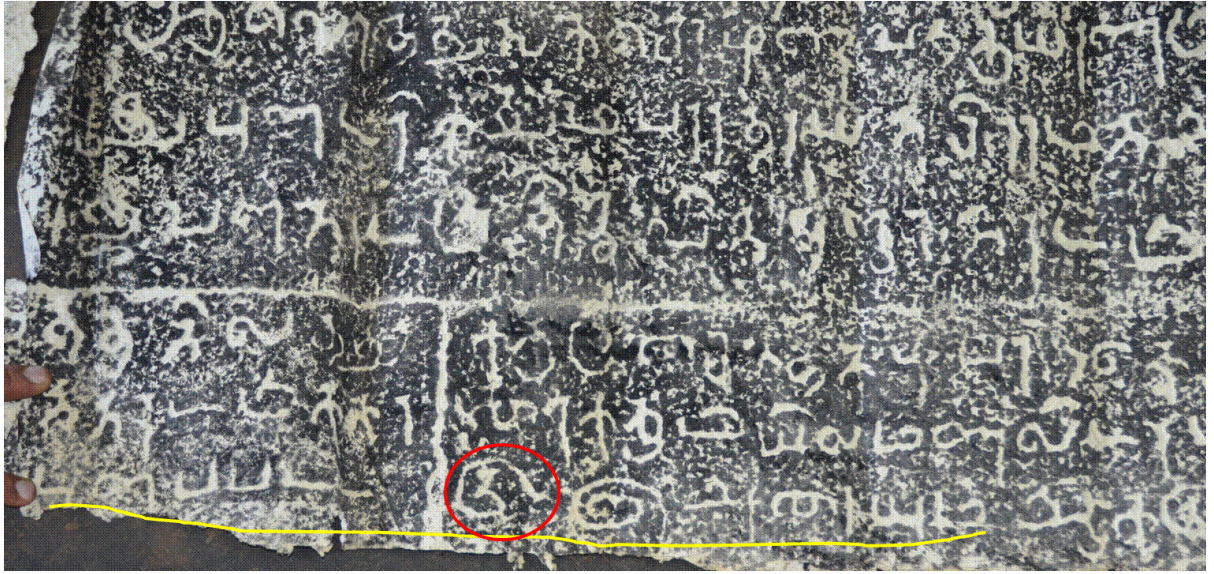
நிலம் = NILAM; The symbol of 11FE4 above is close to the first letter “நி” in “நிலம்”.

However, the actual symbol used in the inscriptions is not so. It is actually a -like glyph.

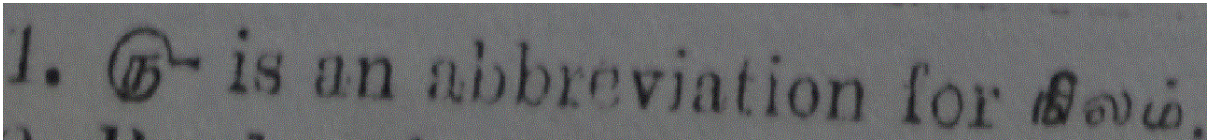
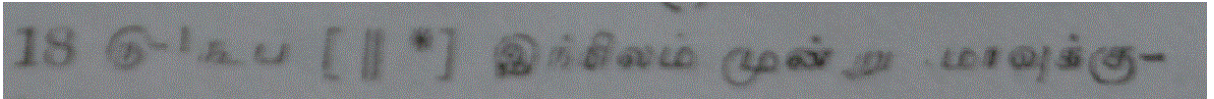
The following picture is of the text from SII-Vol.24, Inscription# 92 in pages 109-111. The 13th line has the -like symbol meaning “NILAM”.



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.

583

10 ததும் அண்ணியாயுடை
11 யா திருவையாறையா-
12 ன் இடத்திந்தர்[?]கு வகிகா
13 கிரித்த பரிசுவது [?] இக்காய-
14 லர் தெவநாயாய் இவர்கள் பிரதாக்க-
15 னுக்கு குடிநிக்காததெவநாயாக குடுத
16 பலகமதியாதகண்டன் குடிக்காநி பு-
17 வந்தாந்நெக்கிக்குட்ட
18 ௫-௩ப [||*] இந்நிலம் முன்று மாயுக்கு-
19 ம யாகை காட்டுகாலாய மா-
20 தா . . . [௫] . . மும்² மாத[தால்] . .
21 க² ஒன்றமாயும் வெள்ளச்சா-
22 கி வறட்சாமி பரிப்பாத்து தெ-
23 ன்ள நடவொமாகவும் [||*] குழை-
24 வ என்ரு வாகு தீண்டு கால்
25 வரிசை கொள்ள்கூடவொமா-
26 கவும் [||*] இப்படிக்கிலை இயத்-
27 து சந்திராதித்தவறை அ-
28 னுபவிக்க கடவரா . . .

ஸ்வரவ
 Library
 நிராக பூரண காரியவ
 Office of the Director (Epigraphy)
 भारतीय पुरातत्व सर्वेक्षण
 Archaeological Survey of India
 மீது - ௫௩ - ௦௦௫
 MYSORE - 570 003

536. மேற்படி தாலுகா, கொடும்பாளூர், முசுஞண்டேயூர் கோவிலில் றறதுமார்கோவிலின் வடபுறம் சுவரிலுள்ள சாஸநம்,—

- 1 ஸ்வஸி ஸ்ரீ [||*] கொமாறுபன்மரான திரிபுவனச்சக்கரவத்திகள் ஸ்ரீகுலசெகர-தேவற்கு
- 2 யாண்டி று வது கொளுடான கடலடையாத இலங்கைகொண்*]டசொ-
- 3 முவளாண்டு உறத்தாற்குற்றத்த வடகொண்டு உடையார் திருமுது-
- 4 குன்றமுடைய லயலர் திருக்கொயில் விசையபஞ்சரந் திருமடைப்பன்-
- 5 னி முதுசொல்குடிண்டு னுட்டவர் தம்ம உ

537. மேற்படி தாலுகா, வீரைக்குடி, திருவேடகாதர்கோவிலில் ஓப்பிலாராயகி அம்மன் கோவிலின் முன்மண்டபத்து மேல்புறம் சுவரிலுள்ள சாஸநம்,—

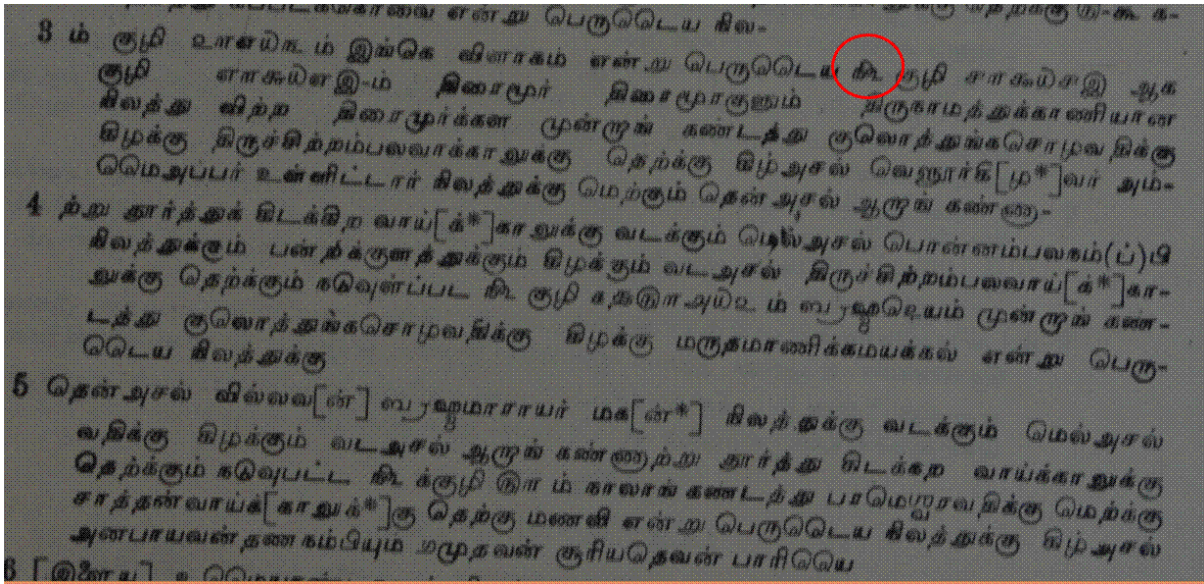
- 1 [ஸ*]வீசிரி [||*] கொமாறுபன்மரான திரிபுவ[வ*]னச்சக்கரவத்திகள் [சிரி] . லசெகரதேவ்
- 2 கு⁶ யாண்டி று வது செ[ய*]சிக்ககுலகாலவளநாட்டு வட . .
- 3 . ட்டு சுணையக்குடி உடையார் அருமொழிசுசாமுடைய நா . .
- 4 [ண்]டெசுரதேவகன்மி கொயிற்கணக்க[ற்*]கு குளமங்கலநாட்டுக்
- 5 ிர்கள்கொம் பிடிபாடு குடுத்த பரிசாவது இன்னுயலர் தெவதா⁶
- 6 . . வெ . . ன் சொக்கவுன

538. மேற்படி தாலுகா, பெருமாநாடு, ஸவரன்கோவிலில் ஸ்ரீமிகே⁶வீலின் தென்புறம் சுவரி-லுள்ள சாஸநம்,—

- 1 ஸ்வஸி ஸ்ரீ [||*] கொமாறுபன்மரான திரிபுவனச்சக்கரவத்திகள் ஸ்ரீகுல-செகரதேவற்கு யாண்டு
- 2 [ஆ]றவது செயசிக்ககுலகாலவளநாட்டு பெருவாயில்நாட்டு நாடாய் இசை-
- 3 ந்த நாட்டொம் இந்நாட்டுத்திருவெங்கைவாயில் திருகாடக [ஆ]டம் வல்லநா-


1. ௫- is an abbreviation for கிலம்
2. Read probably மாததால் கெல்லை கலமும்,
3. Read காசு.
4. Read கடவராகவும். Rest defaced.
5. Rest missing.
6. Read ஸ்ரீ குலசெகரதேவற்கு.

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

முதல் = MUTHAL(mudal); 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 is recorded in the 6th line of inscription. The glyph  as found in the inscription is closer to the first letter in the word “முதல்”. This is more relevant than using the other symbol which takes -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.

TIRUPATI DEVASTHANAM INSCRIPTIONS :—VOL. I

No. 81.

(No. 170—T. T.)

[On the south base (left inner side) of the first or inner gōpura in
Tirumala Temple.]

Text

- 1 ஷ்ஷீஸ்ரீ ஸகலஹுவநஜ்ஜீயகாஸ்ய ஸஷ்வனிஷெஜிஷஜிநாதகஸக-
- 2 ணீஸ்ரீகாஷஹ[ஸ்ரீஸ]அஸநாராவிஷயுகாஸ்ர ஸ்ரீஸக[வெஓட,மிசி]வாஸ-
- 3 வாஸுக வெஓடரிவாஸுக [வெஓகி]-
- 4 ஜஹநாயக விஸாஷெவிஸுவஸுவாஷ மொஷாவஸீஸூஸ கஸுவாக-
- 5 வஸுவாஸயீஸாஸ்ர ஸிஷஜ்ஜெநாத-
- 6 ல (ஸி) மொவகாஸுவாஸயீஸூ வரிஸூதஸாஜாஸ்ய அஸகூஸூதீயுக
- 7 அ[ஸூக],நாஸாயண ஸகலமூண-
- 8 ஸஓமூஜ ஜஹநாஜாயிராஜ யாஷவ[ஸா*]ஜ ஸ்ரீஸகலஹுவஸூ திருக்-
- 9 காளத்திஷெவன்(ஸூ) திருமலைத்தா-
- 10 [ஸத்தா]ர் கண்டு அஸிலாஸி பத்தொன்பதாவது முட¹ ஸஸெஸ்யில்
- 11 தேவதானம் நிச்சித் திருவெ-
- 12 ங்கடமுடையான் கோ[யில்காணிநிமந்தத்து]க்கு ருடலூர் நாற்பாலெல்லைக்கு
- 13 உட்ப[ட்*]ட நஞ்சை
- 14 புஞ்சை நிலமும் [கடமை] ஆயம் பாடிகாவல் [வெட்டிச்சரிகை].....
- 15 கொள்வரி பட்டம்பொன்னும் உ-
- 16 ட்பட்ட பல வரிகளும் பொன்வரி காணிக்கையும்.....காணிக்கை உட்-
- 17 பட(ப்) பொற்கலன்]களும் திருவெவ்-
- 18 கடமுடையான் கோயிலுக்கு நாம் நிச்சயித்த நிமந்தம்.....இப்படிக்கு
- 19 நிமந்த[த்துக்கு],க்
- 20 தாரை வார்த்து(ஃ) திருவாழிக்கல்லு னாற்பாலெல்லையும் நாட்டிக்கொள்வ-
- 21 தாகச் சொன்னெ-
- 22 ம் இப்படி செய்வதெ [||*]

Translation

Hail! Prosperity! (This is) the arrangement ordered (settled) for the temple of Tiruvēikatamūḍaiyān, on the request of the *Sthānatār* of Tirumala,

by me, Tirukkāḷattidāvan, entitled the sole shelter of the terrestrial globe, the proud cuckoo of the royal park of all learning, the honey-bee (sucking) at the lotus-feet of (God) Śrīkālahastīṣa, the ruler of the prosperous Vēṇṭagīripura (the city of huntsmen), the chief of huntsmen, the overlord of Vēṅgi, the recipient of the excellent grace obtained from Piṭharadevī (Piṭari-

1. This figure stands for முடல்.

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 the contents.

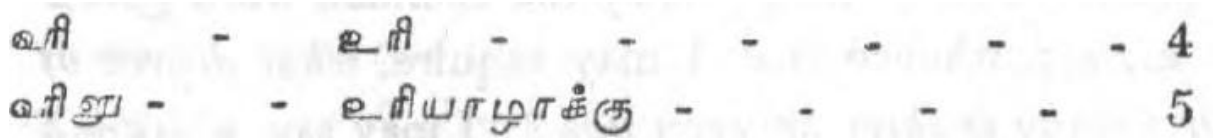
3.6.2 TAMIL SIGN URI

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 characters 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 வரி 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 = PAICAA (paisaa). 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 PAICAA does not require encoding and the same can be written using the character “பை”(0BAA+ 0BC8) when required.

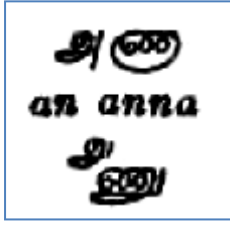
3.6.4 TAMIL SIGN ANAA

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 get 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 அண்ணா written in a varying handwriting style. It just alters the ணா 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(அண்ணா), 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 கீ 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 into each and every language block.

Hence the panel is of the opinion that GEJAM need not be encoded as part of Tamil encoding; and suggests that the relevant original source of this unit needs to be identified and encode it as part of the original system. Therefore, the panel recommends to take this symbol out of this proposal for further research to identify the original source.

3.6.6 TAMIL SIGN CIRANJIIVI

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

11FEA சீ TAMIL SIGN CIRANJIIVI

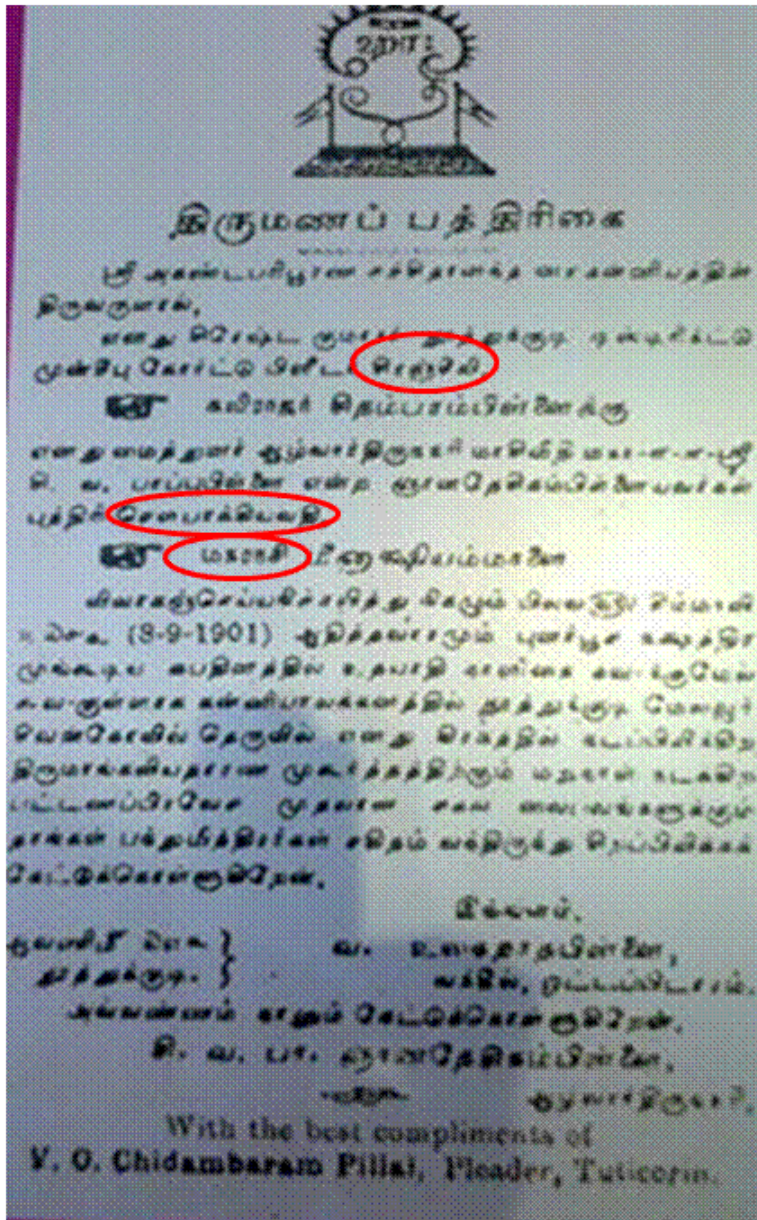
- a polite title for a young person
- not to be confused with the sign for “and odd”

சிரஞ்சீவி = CHIRANCIIVI (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 = SAUBHAAKYAVATHI 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 CHIRANCIIVI 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” (CELVAN), “செல்வி” (CELVI), “குமாரன்” (KUMAARAN), “குமாரி” (KUMAARI), “திருவளர்ச்செல்வன்” (THIRUVALARCELVAN), “திருவளர்ச்செல்வி” (THIRUVALARCELVI), மகராசி(MAKARAASI) 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 CHIRANCIIVI are written fully and not with symbols.



If CHIRANCIIVI is encoded, there are several such First-Letter based words and titles which will qualify for encoding. Therefore, the panel is of the opinion that this is just a styled First-Letter and not a valid symbol. And hence it recommends not to encode it. However, the users may use a font solution using the letter-சீ(0B9A+ 0BBF) (or letter-சீ) for any specific requirement.

3.6.7 TAMIL SIGN PILLAI

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

11FEB ஸ்ரீ TAMIL SIGN PILLAI

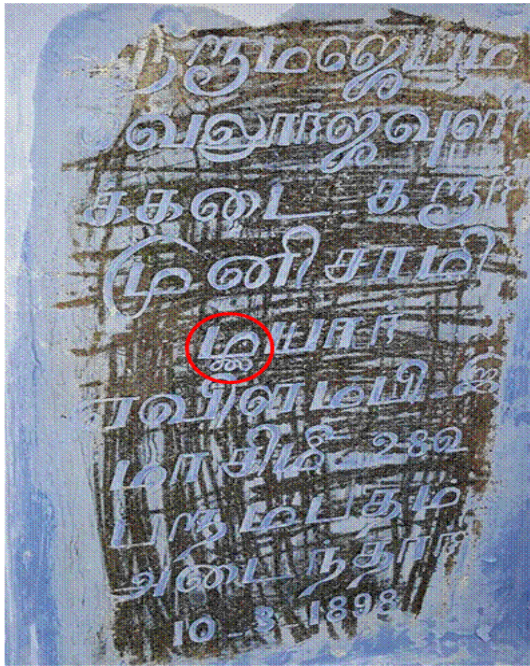
- not to be confused with the sign for “spent”

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 NAYINAAR, NAAYAKKAR, MUTHALI, PILLAI, KAUNTAN, and CHETTI(as part of muththaya chetti) .

| | | | | | | | | |
|---------|----|------|--------------|----|--------|---------|----|---|
| நயினார் | .. | ஷா | நாயக்கர் | .. | யூ | முதலி | .. | ழ |
| பிள்ளை | .. | ஸ்ரீ | கவந்தர் கீயூ | .. | செட்டி | சூய்யயெ | .. | |



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.MUNISAAMY MUTHALIYAAR. It can be observed that a short-form for the caste title MUTHALI 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 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, there can be 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 ஸ்ரீ TAMIL SIGN RAAJA

- in the phrase mahaa raaja raaja shrii
- OBF1 ஸ்ரீ is often used as a substitute
→ OBF1 ஸ்ரீ 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 ஸ்ரீ TAMIL NUMBER ONE HUNDRED (OBF1) and ஸ்ரீ TAMIL DAY SIGN (OBF3).

Alternately, as discussed in the section 4.8.3 of L2/12231, OBF1 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 is conservative on encoding all of them as most of such titles will only 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 ௸ TAMIL ABBREVIATION KKU
• used especially with numerals for the dative suffix
- 11FEE யு TAMIL ABBREVIATION YUM
• and
- 11FEF வு TAMIL ABBREVIATION VUM
• and

78

கூட்டுமுத்து

| | |
|-----------|-------------|
| அம் - ஆ | த்து - து |
| கம் - கூ | ந்த - நு |
| கீழ் - கீ | ந்திரு - நு |
| கூடி - கூ | ந்து - நு |
| க்க - க | ட - டு |
| க்கி - கி | டி - டு |
| க்கு - கு | ப் - ப |
| க்கை - கை | ப் - ப |
| க் - க | மு - மு |
| ட்ட - ட | யு - யு |
| ட்டி - டி | ராம - ர |
| ட்டு - டு | யும் - யு |
| ணம் - ண | யும் - யு |
| ண்ட - ண | ளம் - ள |
| தும் - து | ளும் - ளு |
| ந்த - நு | ற்றி - றி |
| ந்தி - நு | ளம் - ள |
| | ளும் - ளு |

க்கு = KKU; யும் = YUM; வும் = VUM;

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.

It is not just “KKU”, it shows KKA, KKI, KKU, KKA. 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.

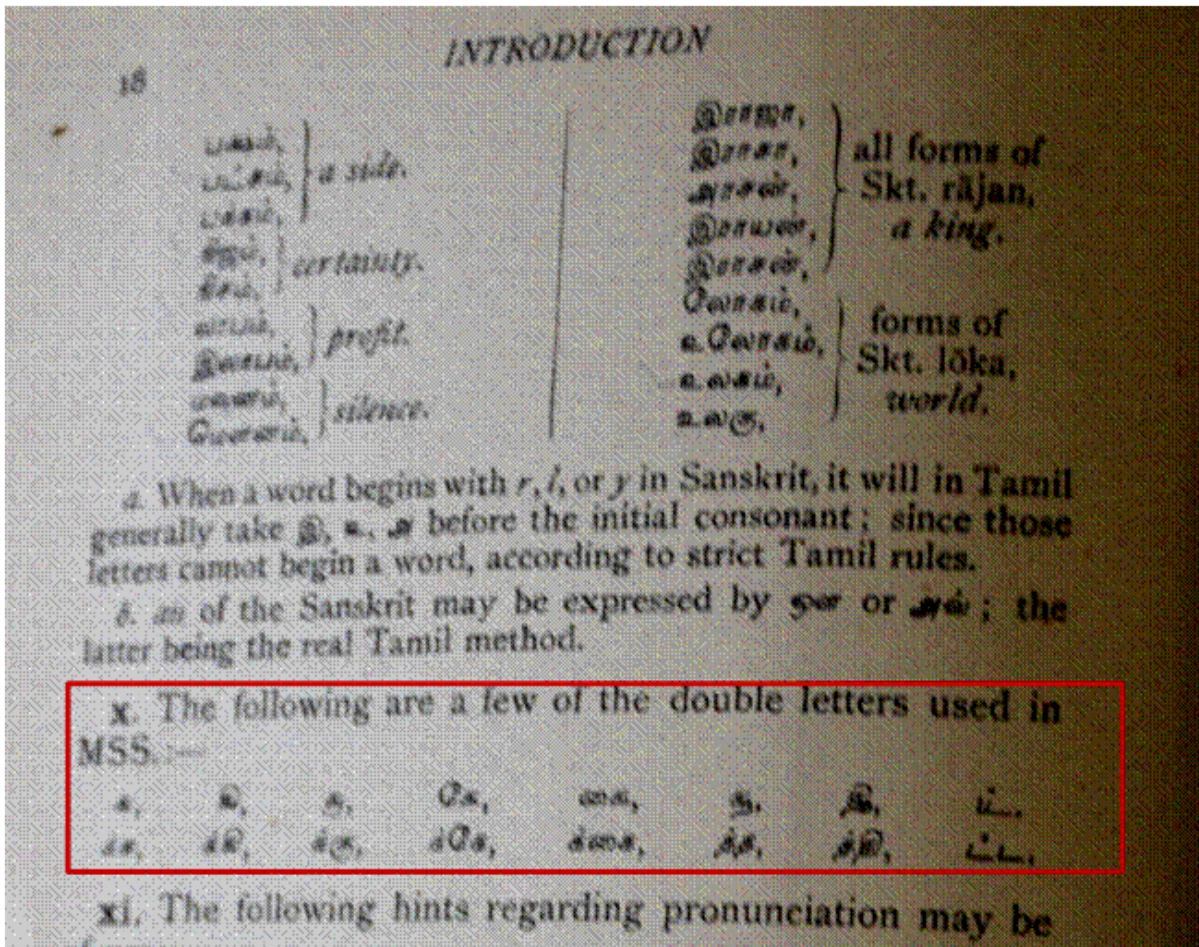
Further, It is not only, YUM and VUM, but THUM, MUM, LUM, NUM also can be found within blue-circles.

Further, the green-circles show a slightly different pattern - NTHA, NTHIRU, NTHU.

The red-squares have yet another pattern LAM, NNNAM, NNAM. These have to be read along with the AM(அம்) and 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. There are 18 consonants in Tamil. MEYMMAYAKKAM-rules talk about the validity of two consonants occurring consecutively. The preliminary research on this shows that there can be 997 valid-combinations of such occurrences. Tamil Grammar scholars may vary on this by some numbers.

But, the fact relevant to encoding is that, these are mostly the combinations of letters based on the natural alphabet-rules of Tamil. When writing, varying hand-writing styles have produced such double-letter that appear to be symbols but not symbols. The picture above proves the existence and possibility of number of such double letters.

It should be noted that, while the attestation from Pope presented in the page 48 of



L2/12231, tabulating these letters under abbreviations/symbols, page 18 of Pope⁵ as above clarifies that these are double-letters. In this page also, it can be observed that, Pope mentions not only “KKU”, but also many others as well.

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.

79

கூட்டெழுத்து

| | | | |
|---------------------|---------------------|--------------|--------------|
| ஆண்டுகளம் | ஆண்டுகளம் | பட்டவிருத்தி | யுட்பிடுக்கு |
| க்கருப்பன் | கிருப்பன் | பத்திரம் | பத்திரம் |
| கல்வாசனாட்டில் | கல்வாசனாட்டில் | பாத்தியம் | பாத்தியம் |
| கைவளைந்து | கைவளைந்து | பிரட்டாசி | பிரட்டாசி |
| கோட்டையூர் | கோட்டையூர் | பேறுக்கு | பேறுக்கு |
| கொண்டபடி | கொண்டபடி | பொண்டாட்டி | பொண்டாட்டி |
| சக்கரைவட்டு | சக்கரைவட்டு | மிட்டா | மிட்டா |
| சத்திரம் | சத்திரம் | முத்து | முத்து |
| சித்தார்த்தி | சித்தார்த்தி | முத்தயசெட்டி | முத்தயசெட்டி |
| செல்லப்பன் | செல்லப்பன் | யிரெட்டி | யிரெட்டி |
| திண்ணைக்குடுக்கவும் | திண்ணைக்குடுக்கவும் | வந்து | வந்து |
| தேவிரெல்லாம் | தேவிரெல்லாம் | வறப்பட்ட | வறப்பட்ட |
| நாலுதிக்குள் | நாலுதிக்குள் | வேண்டியது | வேண்டியது |
| பட்டி | பட்டி | | |

சுருக்கெழுத்து

| | | | |
|-----------------------|-----------------------|---------|---------|
| அத்தியாயம் | அத்தியாயம் | புள்ளி | புள்ளி |
| கிறயம் | கிறயம் | மகள் | மகள் |
| மாலையம் | மாலையம் | பிள்ளை | பிள்ளை |
| ராமய்யன் | ராமய்யன் | அம்பலம் | அம்பலம் |
| ஆக | ஆக | கவண்டன் | கவண்டன் |
| நிலவிலைக்கிறயபத்திரம் | நிலவிலைக்கிறயபத்திரம் | | |

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, கிறய are all 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 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, the subject expert panel 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 VACAM 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, MUKKAAL, ARAIKAAL etc., are still in use at large, and it gives more comfort to the native language users. The professions such as epigraphy also refer them with the Tamil name only.

Besides, in the case of archaic fractions and symbols, there are multiple occurrences and these are likely to add up in the future 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) the need to name in Tamil, b) correct interpretation, c) multiple occurrences, and d) a tentative format for the names, the names of the codepoints have been changed for the symbols in this amendment 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-2 defines the new names accordingly. Following table shows the mapping between old names and revised names.

| Code point Name as per L2/15078 | Code Point Name - Revised |
|---|--|
| TAMIL FRACTION ONE THREE-HUNDRED-ANDTWENTIETH | TAMIL FRACTION MUNTHIRI |
| TAMIL FRACTION ONE ONE-HUNDRED-ANDSIXTIETH | TAMIL FRACTION ARAIKKAANI |
| TAMIL FRACTION ONE EIGHTIETH | TAMIL FRACTION KAANI |
| TAMIL FRACTION ONE SIXTY-FOURTH | TAMIL FRACTION KAALVIICAM |
| TAMIL FRACTION ONE FORTIETH | TAMIL FRACTION ARAIMAA |
| TAMIL FRACTION ONE THIRTY-SECOND | TAMIL FRACTION ARAVIICAM |
| TAMIL FRACTION THREE EIGHTIETHS | <not in this> |
| TAMIL FRACTION THREE SIXTY-FOURTHS | <not in this> |
| <not in this> | TAMIL FRACTION MAA |
| TAMIL FRACTION ONE SIXTEENTH | TAMIL FRACTION VIICAM-1 |
| <not in this> | TAMIL FRACTION VIICAM-2 |
| TAMIL FRACTION ONE TENTH | TAMIL FRACTION IRUMAA |
| TAMIL FRACTION ONE EIGHTH | TAMIL FRACTION ARAIKKAAL |
| TAMIL FRACTION THREE TWENTIETHS | TAMIL FRACTION MUMMAA |
| TAMIL FRACTION THREE SIXTEENTHS | TAMIL FRACTION MUUVIICAM |
| TAMIL FRACTION ONE FIFTH | TAMIL FRACTION NAALUMAA |
| <not in this> | TAMIL FRACTION KAAL |
| <not in this> | TAMIL FRACTION ARAI-1 |
| TAMIL FRACTION ONE HALF | TAMIL FRACTION ARAI-2 |
| TAMIL FRACTION THREE QUARTERS | TAMIL FRACTION MUKKAAL |
| TAMIL FRACTION DOWNSCALING FACTOR KIIZH | TAMIL FRACTION DOWN SCALING FACTOR KIIZH |
| TAMIL SIGN NEL | TAMIL GRAIN SYMBOL NEL |
| TAMIL SIGN SUVADU | TAMIL MEASURE SYMBOL CHEVIDU |
| TAMIL SIGN AAZHAAKKU | TAMIL MEASURE SYMBOL AAZHAAKKU |
| <not in this> | TAMIL MEASURE SYMBOL UZHAKKU |
| TAMIL SIGN URI | <not in this> |
| TAMIL SIGN MUUVUZHAKKU | TAMIL MEASURE SYMBOL MUUVUZHAKKU |
| TAMIL SIGN PDAKKU | <not in this> |
| | TAMIL MEASURE SYMBOL KURUNI |
| TAMIL SIGN MUKKURUNI | TAMIL MEASURE SYMBOL MUKKURUNI |
| TAMIL SIGN PAISAA | <not in this> |
| TAMIL SIGN ANAA | <not in this> |
| TAMIL SIGN KAASU | TAMIL CURRENCY SYMBOL KAACU |
| TAMIL SIGN PANAM | TAMIL CURRENCY SYMBOL PANAM |
| TAMIL SIGN PON | TAMIL CURRENCY SYMBOL PON |
| TAMIL SIGN VARAAGAN | TAMIL CURRENCY SYMBOL VARAAKAN |
| TAMIL SIGN BAARAM | TAMIL WEIGHT SYMBOL PAARAM |
| TAMIL SIGN GEJAM | <not in this> |
| TAMIL SIGN KUZHI | TAMIL AREA SYMBOL KUZHI |
| TAMIL SIGN VELI | TAMIL AREA SYMBOL VELI |
| TAMIL LAND SIGN | TAMIL SYMBOL NILAM |

| | |
|-------------------------------|--------------------------------------|
| TAMIL WET CULTIVATION SIGN | TAMIL LAND SYMBOL NANCEY |
| TAMIL DRY CULTIVATION SIGN | TAMIL LAND SYMBOL PUNCEY |
| TAMIL SALT PAN SIGN | TAMIL LAND SYMBOL UPPALAM |
| TAMIL CHARGE SIGN | TAMIL COMMON SYMBOL VACAM |
| TAMIL FIRST SIGN | TAMIL COMMON SYMBOL MUTHAL |
| TAMIL SIGN MUDALIYA | TAMIL COMMON SYMBOL MUTHALIYA |
| TAMIL SIGN VAGAIYARAA | TAMIL COMMON SYMBOL VAKAIYARAA |
| TAMIL SIGN CIRANJIIVI | <not in this> |
| TAMIL SIGN PILLAI | <not in this> |
| TAMIL SIGN RAAJA | <not in this> |
| TAMIL ABBREVIATION KKU | <not in this> |
| TAMIL ABBREVIATION YUM | <not in this> |
| TAMIL ABBREVIATION VUM | <not in this> |
| TAMIL CURRENT SIGN | TAMIL CLERICAL SYMBOL NAALATHU |
| TAMIL TRADITIONAL NUMBER SIGN | TAMIL NUMBER SIGN-2 |
| TAMIL TRADITIONAL CREDIT SIGN | TAMIL CREDIT SIGN-2 |
| TAMIL AND ODD SIGN | TAMIL ACCOUNTING SYMBOL CHILLARAI |
| TAMIL SPENT SIGN | TAMIL ACCOUNTING SYMBOL POKA |
| TAMIL TOTAL SIGN | TAMIL ACCOUNTING SYMBOL AAKA |
| TAMIL PUNCTUATION END OF TEXT | TAMIL PUNCTUATION SYMBOL AAVANAMUTRU |

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.

- 0B99 **ந** TAMIL LETTER NGA – Following two annotations to be removed as, kuruni/marakkaal is proposed to have a separate codepoint; and other one is not encoded.

also denotes the measure kuruni/marakkaal
→11FD5 **஠** tamil sign muuvuzhakku

- 0BA4 **த** TAMIL LETTER TA – code point “11FD7” in the annotation is to be changed to “11FDD”
- 0BAA **ப** 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
- 0BB3 ஶ TAMIL LETTER LLA - code point “11FD7” in the annotation is to be changed to “11FDD”
- 0BB5 ஶ 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 ஶ 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 ஶ 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

Code 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

11th Feb 2016

5. Requester's reference (if applicable)

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 Technology, 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, and L2/16039

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, Thanchavur, 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 Tamil Researchers, Engineers, and Software Engineers were also contacted

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 | Engineer, Tamil/Historical Researcher, |

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

| | | |
|----|--|---|
| | Former Project Director of SPIC Petrochemicals, Chennai | Member-Tamil Computing Standards Committee of TVA |
| 9 | Dr.K.Vijaya Venugopal | Former Professor Madurai Kamaraj 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 | வக | வ | க | வக |
| 1 | ந | ந | க | ந |
| 2 | க | க | க | க |
| 3 | க | க | க | க |
| 4 | க | க | | க |
| 5 | க | | | க |
| 6 | | | க | க |
| 7 | | க | க | க |
| 8 | க | க | க | க |
| 9 | க | க | | க |
| A | க | க | | |
| B | க | க | க | |
| C | க | க | க | |
| D | க | க | க | |
| E | க | | க | |
| F | க | | | க |

Fractions

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

= முக்கால் = $3/4$

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

Measures

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

Currency symbols

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

= பொன்

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

11FE3  **TAMIL CURRENCY SYMBOL VARAAKAN**

= வராகன் = 28 panam

- also used as a weight unit
- 1 varaakan = 3 kalancu 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

→ 0BFA நீ tamil number sign

11FF6  **TAMIL CREDIT SIGN-2**

= வரவு

→ 0BF7 னை 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 AAVANAMUTRU**

= ஆவணமுற்று

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