

# Ethnomathematical Exploration of Lontara Manuscripts Sure' Eja and Sure' Kutika

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# Ethnomathematical Exploration of Lontara Manuscripts Sure' Eja and Sure' Kutika

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**Abstract:** Local culture-based mathematics learning or ethnomathematics is a term used to associate mathematics and culture, which aims to attract cultural experiences and broaden students' horizons so that mathematical knowledge coexists in a social and cultural environment. This thesis discusses the mathematical exploration in the Lontara manuscript, especially sure' eja and sure' kutika. This study aims to: 1) discover the philosophical meanings in sure' eja and sure' kutika; 2) know the ethnomathematical concepts contained in sure' spelling and sure' kutika. This type of research is qualitative, with an ethnographic approach with data sources obtained from observations, interviews, and documentation studies. This research was conducted at the Batara Guru Museum in Palopo City in July 2022. The results of the study show that: 1) The philosophical meanings contained in the sure' eja script are, first, a fragment of the Telaga Munajat poem, which is that this poem contains Sufism teachings that describe the reality of worldly life which is temporary, confronted with the eternal afterlife. Second, sure' eja, classified as elong kallolo, contains hidden and deep meanings in riddles to express one's feelings towards the person he loves. While sure' kutika means determining good or bad days and times for Bugis people in carrying out various activities/works that are believed to bring safety or reinforcements. 2) The structure of sure' eja, there are concepts of number patterns and arithmetic sequences, while calculating days in sure' kutika contains the concept of positive integers.

**Keywords:** Ethnomathematics, Lontara, Sure' Eja, Sure' Kutika.

## 1. Introduction

South Sulawesi Province is rich in cultural, religious, customary, linguistic, and ethnic diversity. Makassar, Bugis, Toraja, and Mandar tribes are the four tribes that inhabit the province. And the Bugis tribe became one of the dominating ones. Geographically, the Bugis community is spread in the areas of Bulukumba, Bone, Soppeng, Sinjai, Enrekang, Luwu, Parepare, Pangkajene Islands (Pangkep), Wajo, Polewali Mamasa (Polmas), Barru, Sindereng Rappang (Sidrap), and Maros.

To Ugi or Bugis, people have an oral and written literary tradition. Pelras revealed that Bugis oral literature predates the written literary form. Various kinds of Bugis literature developed with oral tradition; it is now read and rewritten. The tradition of To Ugi's writing is contained in many manuscripts or manuscripts known as Lontara.

Lontara can be interpreted as a palm leaf and, broadly, any written work. In Lontara's writing, various kinds of necessary information are usually contained. Lontara contains genealogies of noble families, royal regions, diaries, and various other kinds of information such as royal names, manuscripts of treaties with other kingdoms or agreements that have been held intra-kingdom between the ruler and the people. Roger Tol revealed that the Lontara script is often written alongside Arabic or Latin in Bugis manuscripts. Various kinds of Lontara manuscripts that have survived to this day are spread in the South Sulawesi region, many of which have been inventoried, digitized and microfilmed by official government institutions. In South Sulawesi there are several types of Lontara including, Lontara attoriolong, pappaseng, panggalung, sure'-sure', pattuangan and so on.

Currently, there is a tendency that, generally, the younger generation of the Bugis tribe is less interested in studying their

local culture, including Lontara. This has resulted in local cultural observers being concerned about this condition. Andi Zainal Abidin complained that some Bugis people today are less interested in reading and writing about local culture. Still, they are more likely to have the habit of watching and listening to electronic media. Therefore, it is necessary to actualize optimally to pass this cultural heritage on to the next generation without time and space limits.

One of the efforts in cultural preservation is to integrate culture into the world of education. Education and culture are elements that support each other. One of the objectives of education is to preserve and develop culture. A multifaceted culture will support educational programs and implementation. Based on this statement, in other words, preserving a culture means improving education. No exception, mathematics education also has the same role in preserving culture; this can be seen from a mathematical concept integrated with culture or other terms, namely ethnomathematics.

Local culture-based mathematics learning or ethnomathematics is used to associate mathematics and culture. Ethnomathematics aims to attract cultural experiences and applications of mathematics to make learning mathematics more meaningful and broaden students' horizons further so that mathematical knowledge coexists in social and cultural environments and they can appreciate the use of mathematics in everyday life. The utilization of the local cultural potential of each region can be used as an alternative in the world of education to facilitate the process of transferring knowledge from teachers to students to make it easier to understand. The role of local culture is expected to support success in the teaching and learning process.

Based on this, researchers are interested in conducting a research entitled "Ethnomathematical Exploration on Lontara Manuscripts Sure' Eja and Sure' Kutika". The Lontara script

that was then chosen as one of *sure'* spelling and *sure'* kutika was based on the results of a research interview with one of the culturalists on February 17, 2022, Andi Oddang Opu To Sesungriu said that of all types of Lontara manuscripts that only have mathematical elements, these two manuscripts are the two manuscripts. It is interesting to be researched because this research encourages two interests at once, not only as a form of cultural preservation, especially Lontara manuscripts but also as an effort to broaden students' horizons to be more motivated in learning mathematics.

## 2. Theory Description

### 2.1 Exploration

According to Septi Indriyani, exploration means studying, analysing and researching something in depth to discover more about a problem [1].

According to Dewi Yuaniarti Bayu, exploration is an activity to explore a new area or area that has yet to be discovered to learn everything contained in it. This activity allows anyone to explore everything new and beneficial for themselves and others, whether commercial or not [2].

### 2.2 Ethnomathematics

Ethnomathematics is a term that describes the integration of mathematical concepts or ideas in culture. The term ethnomathematics was first proposed by Brazilian mathematician D' Ambrosio in 1977; he stated that:

"The ethno prefix is currently accepted as a broad word that refers to a socio-cultural context and includes language slogans, codes of conduct, myths and symbols. Mathematical derivation is difficult but tends to mean expressing, knowing, understanding, and carrying out activities such as ciphering, measuring, classifying, inferring, and modelling. The suffix comes from *teche* and has the same root as *teachingnigue*." [3]

It can be interpreted that ethnomathematics comes from the prefix *ethno*, which refers to socio-cultural contexts such as language, codes, behaviour, slogans, myths, and symbols. Then *mathema* is a root word that means explaining, knowing, doing an activity of coding, measuring, inferring, and modeling. At the same time, the suffix *tics* comes from *techné*, which means technique.

The opinion expressed by Gerdes, quoted by Alfonsa M. Abi, ethnomathematics is mathematics applied by certain cultural community groups, labour/peasant groups, children from certain class societies, professional classes, and so on [4], according to Moh. Zayyadi considers ethnomathematics as a result of mathematical activities owned or developed in cultural groups, including mathematical concepts, for example, in cultural relics in the form of temples and inscriptions, pottery and traditional tools, local units, batik cloth motifs and embroidery, traditional games, and community settlement patterns. Or it can be interpreted as an activity involving numbers, geometric patterns, calculations, and so on, which is referred to as the application of knowledge in the field of mathematics involving local culture [5].

Based on some of these expert opinions, it can be concluded that ethnomathematics is a term to associate, integrate or combine a mathematical concept and cultural concepts, be it in the form of community activities, literary results, such as artefacts, sacred motifs, written works and so on.

### 2.3 Lontara Script

According to Andi Zainal Abidin, Lontara, the lontar syllable (Javanese/Malay) is a change in the word *rontal*, a combination of the words *ron*, leaf, and *tal*. *Tal* is a *Borassus Flabelliformis* tree whose leaves can be used as writing media. Lontara can be interpreted as palm leaf and broadly means any written work [6]. Or in another sense, Lontara is a record of events written initially using sharp tools on Lontarak leaves [7]. The word Lontara is still used today even though paper, a writing medium, has replaced it. Meanwhile, according to Matthes in Kamaruddin et al., Lontara refers to the understanding of writing, documents, books, letters, and manuscripts [8].

In Lontara writing, various kinds of important information are usually contained. Lontara contains genealogies of noble families, royal regions, diaries, and other information such as names of works, manuscripts of treaties between other kingdoms or agreements made intra-kingdom between the ruler and the people [9]. Roger Tol reveals that in Bugis manuscripts, Lontara the script is often written alongside Arabic or Latin script [10].

From some of these expert opinions, it can be concluded that Lontara script is the result of the written culture of the Bugis and Makassar tribes containing information from the past, which is usually written in Lontara script but always side by side with Arabic and Latin scripts.

The Lontara script, as a result of Bugis literature, is estimated to have begun around the XVI century, when Islam was not yet generally adopted by the people of South Sulawesi; according to the culturalist Mattulada, the form of the Lontara script comes from *sulapa 'eppa' wolasuji* (rhombic quadrangle)[7]. *Wala* means separator/fence/guard, while *suji* means daughter *Wala Suji* is a kind of bamboo fence in a rhombus-shaped ritual event. *Sulapa eppa* means four-sided; it is a mystical form of classical Bugis-Makassar belief that symbolizes the universe, namely, fire, water, wind and earth [11].

The best-known *Lontara* manuscript has even become one of the longest stories in the world, namely *sure' galigo* or *I La Galigo* script, a verse *nakah* in ancient Bugis language in high language style. The manuscript tells the story of hundreds of descendants of gods who lived at one time for six generations for generations [11], which is estimated to have been written during the reign of King *Batara Lattu*, in 900 AD by a son of *Sawerigading* named *I Lagaligo*. The manuscript of *I Lagaligo* reaches  $\pm 6000$  page that was later preserved at Leiden State University of Netherlands [12]. Various kinds of *Lontara* manuscripts that have survived to this day are spread in the South Sulawesi region, many of which have even been inventoried, digitized, and *microfilmed* by official governance institutions.

From the results of research by Bahri and Andi Dewi Riang Tati that there are types of *Lontara* in South Sulawesi [12] as follows:

- 1) *Lontara Pappaseng* is a collection of messages or messages of wise people mandated from generation to generation, written and then lettered. *Paseng* is then maintained and made a rule of life in a highly respected society. Sometimes it contains the way of implementing good government and so on. One example of a *paseng* that reads:

"*Rebba sipatokkong, malik siparappe, sirui menrek tesiruno, malilu sipakaingek, maingekpi napaja*"

Means:

"Lying down upholding each other, drifting on each other's faces, pulling up instead of pulling each other down, khilaf reminds each other until they come to their senses." [13]

- 2) *Lontara Paggalung* is a *Lontara* that contains weather conditions, rainy season conditions and plants that are good for planting.

- 3) *Sure'-sure'* is *Lontara* whose contents and sheets are not much and small in size which are divided into several types, namely:

- a) *Sure' eja*, contains a collection of *elong* (verses or lyrical prose) that are usually sung when ascending a new house, holding weddings and other important trips and ceremonies. In it there are guidelines about attitudes, behavior and something that must be done by a person in the face of an event, for example (1) *elong osong*, is a song to face war, (2) *elong padodo ana'*, a verse sung to put a child to sleep, (3) *elong massagala*, sung to ward off smallpox, and (4) *elong kallolo*, that is a poem used by young people to satirize each other. Here's one example of *elong*:

*Pitu lebba makkelebba*

*Na ia upolebba*

*Lebbana lebba e*

Means:

Seven hatreds over hatred

The hatred I have

Hate over hate [14].

- b) *Sure' kutika determines good and bad days*, good or bad steps such as on a trip, trading profits and losses, determining compatibility between the bride and groom, and others. Including being a guideline in knowing the meaning of dreams, movements in body parts and so on.

The following example is a piece of the contents of *kutika ugi sekke' rupa*:

"... iyana talknna angolonna naga loppoe/ article pannessaengngi a'gulilinna naga loppoe monroi ri tanae/ weka eppamigilling nasitaung... makunniro bicaranna naga loppoe masue ri kitta' Syamsul Ma'arif..."

Means:

"... This is the talk about the Great Dragon turning/ The chapter that describes the spinning of the Great Dragon that dwells on the ground/ Four times it spins in a year... thus the story of the great dragon taken from the book of Shamsul Ma'arif..." [15]

- 4) *Lontara Pattuangan* contains problems in personal life, family and neighbors, and general problems such as death and birth. Example:

"*Akko engka tau ri uno riwirinna alek e, pura masebbuni tapauno na engka tau irapi malai agaganna to riwuno e ia natu masapu to ri rapi e koro.*"

Means:

"If someone is killed on the edge of the forest and then the murderer hides and after that someone else is caught taking the property of the murdered person, then even if no property has been taken, that person is accused of murder."

- 5) *Lontara Pangajak* is a collection of parental advice mandated to children and their descendants, sometimes containing a series of stories or stories. Example:

"*Makkedai sininna tommissengnge na ia tanvanna dance agellie ri Allah taalaha eppak I rupanna, mula-mulanna maega pangisengenna, na padek araing nekek na, mattelluna rekko araingngi arajanna na padek araing napakaraja alena, ma eppanna rekko ri warengi umuruk na lamoek na pedek masaro kallang.*"

Means:

"The pious say, the sign of one whom Allah hates the Exalted consists of four things. First, if his knowledge is high, the more his evil increases; second, if his wealth increases, third, if his rank increases, his arrogance increases, fourth, if he is given a long life, his greed increases."

- 6) *Lontara Attoriolong* contains a collection of records about the origins or genealogies of descendants of kings, noble families and certain people. *This Lontara* is usually used as material to compile historical events; besides that it serves as a record of historical events that have been experienced or done by previous people. The following example is a piece of this *Lontara attoriolong ri Wajo*.

"*Namate Arung Matoae Topalappu, aruai taunna makkarung namate. Na Settiware tolai Arung matoa. Nasetaung Arung Matoa Settiware naengka muttama ri Wajo Datu ri Luwu, riasengnge Raja Dewang, sita eppona Settiware...*"

Means:

"Died Arung Matoa Topalappu after ruling for eight years. And the sattiware that replaced it as a matoa rafter. A year into his reign, Datu Luwu named King Dewang came to Wajo to meet his grandson, Settiware..." [16]

### 3. Methodology

The type of research used is qualitative research. Qualitative research reveals, explores, describes something based on the findings. Qualitative research methods are often called naturalistic research methods because the research is carried out on natural conditions, also referred to as ethnographic methods because initially, this method was more widely used for research in the field of cultural anthropology [17].

Ethnographic approach is used in this study because this approach is empirical and theoretical which seeks to describe and analyze in depth the cultural results of a group, especially literary works owned by the Bugis-Makassar tribe.

The location of this research was conducted at the Batara Guru Museum, located on Jl. Andi Jemma No. 1, Batu Pasi Village, North Wara District, Palopo City. This research was conducted in July 2022.

The source of data in this study is divided into two types, namely: primary data in the study came from the interview results, one of the translators of Lontara manuscripts, namely Andi Oddang Opu To Sessungriu or matoa cenrana seppulo dua Kedadua Luwu, the data obtained was in the form of data about the philosophical meaning of sure' spelling and sure' kutika, while data on ethnomathematical concepts were obtained from the results of documentary studies of sure' eja and sure' kutika. While the secondary data researchers obtain by searching and tracing materials or literature reviews related to this study.

The data analysis technique used in this study uses interactive analysis with Spradley models. The stages of data analysis described by Spradley in Sugiyono are domain analysis, taxonomic analysis, componential analysis and cultural theme analysis [18].

#### 4. Analysis and Discussion

##### 4.1 The philosophical meaning found in sure' spell and sure' kutika

###### Sure'eja

Sure' eja contains a collection of *elong* (verses or lyrical prose) that are usually sung when boarding a new house, holding weddings, trips and other important ceremonies as well as to put children to sleep or educate and so on. These poems have a smooth, beautiful language and deep meaning, so they are sometimes difficult to understand or understand without an adequate language repertoire and high accent knowledge. This form of literature is called lyrics, meaning free unbound, the language used is free and rhythmic. Although it is said to be *elong* but not always sung or sung, giving tone when reading *elong* is free without any rules. What is often found in Bugis literary books, there is no mention of the poet or maker of these poems, this is because, *elong* is oral literature. But some have added their names after copying them onto paper.

This oral literary work generally consists of three lines and has rules in its writing. According to the results of an interview with the source, Opu matoa cenrana kedadua luwu stated that: "In writing, *elong*/verse, in general, has an 8-7-6 rule. This means that the first line consists of 8 syllables, the second line consists of 7, and the third line consists of 6. The syllables in question are in the Lontara script, or it can also be said that the first line is 8 letters of Lontara, the second line is 7 letters, and the third line is 6 letters. But some do not follow this rule, such as 8-8-6; this depends on the *elong* poet. In addition, some write one verse in three sentences, which separates each sentence is the # sign; others write one verse consisting of three lines."

The rules of the writing pattern do not have a special meaning or reason in determining it, but the number of letters patterned is only used to meet the neatness and aesthetic values. So that other patterns are possible, this depends on the poet alone. The

*elong* manuscript, in general, found by researchers, has a writing pattern of 876.

The function of *elong-kelong*, depends on the type or content. If the *elong* is in the form of *pangaja* then its function is advice, but if the *elong* is in the form of romantic *elong*, which is usually sung by young people, then its function is as solace.

###### 1) Syair Telaga Muanajat

The fragment of the telaga munajat poem is a poem that contains Sufism, describing the reality of worldly life that is temporary, faced with the eternal afterlife, so that it should be interpreted with vigilance of worldly temptations [19]. This poem implies always remembering the god, namely Allah swt. with all the attributes of His greatness, always knowing all the actions done by man; whoever does good will be rewarded by heaven while hell is for those who desire evil. Observance of worship for the Bugis community as a form of fear of Allah SWT. In the hope of obtaining the rewards of heaven in Akirat in the future. This poem has rules or rules sure' 886. This means that the first line consists of 8 syllables, the second line also consists of 8, and the third line consists of 6. The syllables in question are syllables in Lontara script. The verse form in one stanza consists of three sentences that have continuous meaning between the following stanzas.

###### 2) Elong Kallolo

*Elong kallolo's contents are veiled and deep, in the form of puzzles to express one's feelings for the person he loves. It consists of three lines in one stanza that follow the rules of 8-7-6. The first line consists of 8 syllables, 7 on the second line and 6 on the third line. The syllables in question are syllables in the Lontara script. In the process of translating puzzle verses, identifying the phrases in the poem is needed; for that, the translator will look for possible meanings or true meanings of words by finding the actual word. The meaning of *elong kallolo* is as follows:*

*Gellang riwatak majEkko*

*AnrEna menre-EdE*

*Bali ulu balE [20].*

In the first line, *Gellang riwatak majEkko* means copper with curved ends, referring to the context of the Bugis language "mEng" or hook eye. The second line *AnrEna menre-EdE* means food of the mandar people referring to the context of the Bugis language, "loka" or banana. The third line, *Bali ulu balE*, means the opposite or pair of fish heads if referring to the context of the Bugis language which is "Ikko" or tail. Then the result of transliterating the phrase from the first to the third line will be "me-loka-iko", which translates in Indonesian means I want you/I want you.

###### Sure' Kutika

*Sure' Kutika* is a determination of good and bad days, whose function is to know the quality of time during the day in doing a job, for example, traveling, building houses, trading, farming and so on. In the Bugis community, the right time to start or do a job can determine the business's success. The Bugis community still believes this, although it has been relatively small. *Sure' kutika* that researchers discuss in this study as follows:

###### 1) Pannessa Esso'/day-defining

*Pannessa esso' explains the quality of the days of the month; the calculation of days in pannessa esso' follows the Qamariah*

lunar calendar. Each month consists of 29 or 30 days following Islamic calculation conventions, but in *pannessa esso* it is still adapted to the sound system of the Bugis language. This text describes the good quality / *makessing* and bad / *nakkase* of an event or starting an activity in a day that is believed to get salvation or disaster. The change of day for the Bugis community is the same as the change of day in Islam, marked by the sun's setting. Therefore, in determining the day for the Bugis community, the word day is mentioned with *wenni / penni* even though the word day refers to the context of the Bugis language, namely *esso*.

An example of determining the day in *panessa esso* is as follows: August 3, 2022, coincides with 5 Muharram 1444 Hijri or on the *panessa esso* system 'counts the 5th day which means *wenni lampa*/night of wild animals. On that day it was explained about bad events or activities / *nickase* to do that if a person is affected by a disease, it will be challenging to get healing, the birth of a child can make the child disobedient to his parents, any work that starts on this day will be bad for the result, and it is also bad for farmers to start harvesting their rice.

The naming of the day by the community group is taken from the names of animals; this is adjusted to the nature or character of the animal. Another reason is that it tends to adjust to people's livelihoods at that time. Suppose the work of the community is mostly farming. In that case, it tends to be named after animals or birds, and if the community is predominantly fishermen, the naming of days tends to be taken from the names of fish, or in other words, the application or guidelines in the calculation of *panessa esso* adjust to geographical conditions and social conditions at that time [1].

2) *Nakkase Uleng* and *Nalowang Uleng*

*Nakkase Uleng* and *Nalowang Uleng* are unfortunate days each month; just like *panessa esso*, *nakkase* and *nalowang uleng* also follow the Islamic calendar system, namely the Hijri year. The names of the Hijri months are also mentioned but in the context of the Bugis language. In these fateful days, it is abstinent for the Bugis to make or make a journey.

For example, the 12th day of Muharram coincides with August 10, 2022, which is one of the bad days in *nakkase* uleng and every Sunday in the month of Muharram coincides with July 31, 7, 14, 21 August 28, 2022 which is one of the bad days in *nalowang uleng*. In the belief of the Bugis people, those days will not do something or make a trip because they think they will get a disaster or disaster. So, it continued into the following months and years.

The determination of the days of misfortune is written on the basis of repeated experiences by previous people. This is based on the results of an interview with Opu Matoa Cenrana, "Philosophically, the reason for the determination of the fateful day is based on the experience and observations of the previous Bugis community that have been repeated over a span of more than 10 years. So they recorded it as a bad day [21]."

3) Quality of days of the week

The final part of the manuscript explains the quality of the day of the week which is divided into five times, namely *EIE* (morning) starting at 06.00-08.00, *Abu Eng* (dhuha) between 08.01-11.59, *Tangngasso* (noon) at 12.00, *Lessangngesso* (after dzuhur) between 12.00-15.29 and *ArawEng* (afternoon) starts at 15.30-17.59. The division of these times is an estimate of the earlier people who then converted those

times to the calculation of hours as they are today. It is in harmony that in a day and night divided into seven times, such as a) *Denniari*, estimated at 01.00-04.00, b) *Fajr*, estimated at 04.00-06.00, c) *Ele*, estimated at 06.00-07.00, d) *Abbuweng* estimated at 07.00-11.00, e) *Tengasso*, estimated at 11.00-13.00, f) *Lessangesso (loro)*, estimated at 13.00-15.00 and g) *Aruweng (Assara)*, estimated at 15.00-18.00 [21]. So that there is no specific reason or meaning in writing the division of time listed in the sure' *kutika script*, but only limited to the division of time.

*Mallise* time is a day filled which means very good. *matE* time is a dead day which means bad. *Tuo* time is a day of life that means good. *Maddara* time is a bloody day which means bad day. The *centipede* time is empty which means neutral, it can be good or bad. The day starts with *worong porangE* which is Friday, followed by *wara-warangE* which is Saturday, *tanra telluE* which is Sunday, *manu'E* which is Monday, *wattampatuE* which is Tuesday, *weppangE* which is Wednesday and ends with *waluE* which is Thursday.

Every activity, especially in working for a living, must be chosen the right times to start or do work, so that times that have *tuo* (life) and *mallise* (contained) qualities are sought and avoid times that have *matE* (dead) or *maddara* (bloody) qualities, this means safe and obtain good or satisfactory results, such as:

"For example, a farmer wants to start planting rice, then Tuesday is chosen in the morning, which is contained, then the farmer can start at that time because it is considered a good time, even though for example only planting one seed the most important thing is to start a job."

4.2 Ethnomathematical concepts found in sure' spell and sure' kutika

After the researcher explored, observed and examined the research data, the researcher found the concept of ethnomathematics contained in sure' spelling and sure' kutika as follows:

Sure' Spell

*Elong*/poem from Telaga Munajat written by Opu KH. Andi Ramly Petta Manangkasi technically writes following the rule of "sure'886" which means, the structure of three series of sentences in one stanza consists of 8 syllables of *Lontara* script on the first line, 8 syllables of *Lontara* script on the second line and 6 syllables of *Lontara* script on the third line.

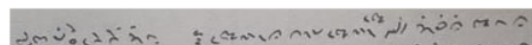
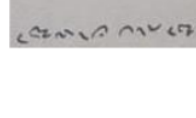
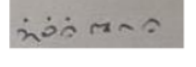


Figure 1: Elong rule 886

Temple	Transliteration	Translation	Number of Letters
	puwemisEeG ritu pu-wang-mi- sseng-ngEng- ngi-ri-tu	All-knowing God	8

	Ealontomeal oea <i>EE-lo-na-to- ma-E-lo-E</i>	At the whim of the willed person	8
	Riisiniatan <i>ri-si-ning-a- ta-nna</i>	To all His servants	6

In addition, there is also an *elong kallolo* which contains puzzles as a tangible manifestation of one's feelings for the person he loves. This *elong* follows the rule of 8-7-6 which means, the structure of one stanza consists of 8 syllables of Lontara script on the first line, 7 syllables of Lontara script on the second line and 6 syllables of Lontara script on the third line.

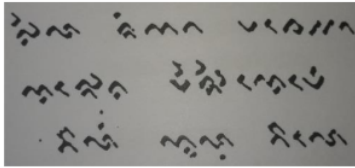





Figure 2: Elong rule 876

Temple	Transliteration	Translation	Total Huruf
	<sup>1</sup> gEl riwt mejko ge-llang- ri-wa-tak- ma-jE-kko	copper with curved ends (hook=me ng)	8
	<sup>1</sup> aeRn mEREeaed a-nrE-na- me-nre-E- dE	Food of the mandar (banana=l oka)	7
	<sup>1</sup> bli aulu bel ba-li-u-lu- ba-lE	Reverse tofish nutmeg (tail = ikko)	6

Based on the results of a review of the two *sure' spelling* manuscripts, the researcher found the mention of positive integers, namely the numbers 8, 7, 6 and counting or numerical activities, especially the operation of adding positive integers in the process of selecting words / diction in verse / *elong* that follows the rules of 8-8-6 and 8-7-6. The addition operation in question relates to the addition operation of positive integers, which is the addition of two or more numbers whose two numbers have positive values, thus producing positive integers as well.

<sup>1</sup> Opu Andi Oddang Opu To Sessungru considers that *telaga munajat* and *elong kallolo* poetry is the poet's ability to verse with neat calculations according to the number of letters

consistently. This is related to the researchers' findings that in the process of choosing diction and words related to the activity of counting or numbering, in other words there is a process of adding words, even though at that time the Bugis community did not know the concept of positive integer addition in detail.

Example: *elong* that follows the 8-8-6 rule  
Number of first line syllables: 8(positive integer)  
Number of second-line syllables: 8(positive integer)  
Number of third-line syllables: 6(positive integer)

Researchers found the 8-7-6 rule related to number patterns which include straight line patterns depicted with spots that follow straight lines,



In addition, the rule 8,7,6 in *elong kallolo* follows a series of arithmetic, which if observed will form a series of numbers that have a difference or difference between two terms of a fixed sequence. So that the rule 8,7,6 in *elong kallolo* satisfies the notion of arithmetic rows.

Suppose

$$U_1, U_2, U_3, \dots = 8, 7, 6, \dots$$

So obtained,

$$b = U_3 - U_2 = U_2 - U_1$$

$$b = 8 - 7 = 7 - 6 = 1$$

Example:

If it is known that the number of first, second and third line syllables in *elong bugis* is 8,7,6 respectively. Then determine the number of syllables of the fifth line?

Known:

$$a = 8$$

$$b = U_2 - U_1 = 7 - 8$$

Asked:  $U_5$ ?

Settlement:

$$U_5 = a + (n - 1)b$$

$$U_5 = 8 + (5 - 1)(-1)$$

$$U_5 = 8 + (-4)$$

$$U_5 = 4$$

So the number of fifth line syllables in the *elong* is 4.

**Sure' Kutika**

<sup>1</sup> *Sure' kutika* in this study explained related to *pannesa esso*, *Nakkase' uleng*, *Nalawang uleng* and *Tanra wettu*. *Pannesa esso* outlines the good and bad things to do in a day, which is the calculation of days based on the Qamaria month calendar, consisting of 29 or 30 days in a month. *Nakkase' uleng* and *Nalawang uleng* discuss the days of the month that the Bugis say abstain from traveling and starting to do a job. While *Tanra wettu* explained the quality of the days of the week which are divided into five different times.

Based on the results of the study, researchers found the existence of mathematical concepts, namely counting activities and positive integer concepts in *pannesa esso*, *Nakkase' uleng*, *Nalawang uleng* and *Tanra wettu*, as follows:

*Panessa Ezzo'*

1. Wenni nyareng, 2. Wenni jonga, 3. Wenni macang, 4. Wenni Coki, 5. Wenni lampa, 6. Wenni Tedong, 7. Wenni balao, 8. Wenni saping, 9. Wenni asu, 10. Wenni dragon, 11. Wenni manu'-manu', 12. Wenni bembe', 13. Wenni gaja', 14. Wenni lion, 15. Wenni Anuang, 16. Wenni bawi, 17. Wenni garuda, 18. Wenni balipang, 19. Wenni ceba, 20. Wenni dongi, 21. Wenni tau, 22. Foreign Wenni, 23. Wenni charcoal, 24. Wenni pari, 25. Wenni Titang, 26. Wenni Serra, 27. Wenni ule, 28. Wenni kalapua, 29. Wenni lion, 30. Wenni manu'.

#### 1 Nakkase Uleng

1. 12 Muharrang, 2. 10 Safare', 3. 14Rabiule awale, 4. 20 Rabiule awale, 5. 1 Jumadil awale, 6. 3 Jumadil ahire, 7. 28 Rajab, 8. 20 Sabban, 9. 14 Ramadang, 10. 1 Sawale, 11. 28 Sulekaida, 12. 3 Sulehijja.

#### 1 Nalowang Uleng

1. Esso' aha' ri lalenna uleng muharran, 2. Esso araba' ri lalenna uleng safare, 3. Esso juma' ri lalenna uleng rabiule awale', 4. Esso salasa ri lalenna uleng rabiule end, 5. Esso kammissi' ri lalenna uleng jumadil awale, 6. Esso sattu' ri lalenna jumadil akhire, 7. Esso juma' ri lalenna uleng rajab, 8. Esso kammissi ri lalenna uleng sabban, 9. Esso salasa ri lalenna uleng ramalang, 10. Esso sEnEng' ri lalenna sulekaidah, 11. Esso araba' ri lalenna uleng sulehijja.

#### Tanra Wettu

1. Ele, 2. Abuwang, 3. Tanggasso, 4. Lessang esso, 5. Aruweng.

From the data above about numerical or counting activities that are closely related to the question of "how much" but in the context of *sure' kutika* is related to "how many days" or "what days" because it refers to the concept of dating. This activity generally demonstrates the use and understanding of numbers. In *pannesa esso* explain the concept of positive integers, the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30 are days of the month that have different meanings every day. Then it contains mathematical elements in determining bad days in *nakkase' uleng*, namely positive integers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12. Similarly, *nalowang uleng* contains the concept of positive integers, namely 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11. At the same time, *Tanra Wettu* discusses the division of 5 times daily or in a mathematical concept called time measurement.

Ele	= 06.00-08.00
Abuwang	= 08.01-11.59
Tanggasso	= 12.00
Lessang esso	= 12.00-15.29
Aruweng	= 15.30-17.59

According to Opu Andi Oddang Opu To Sessungriu, the discussion related to *sure' kutika* is directly related to the number of moons rising in a month, named "*siuleng*".<sup>1</sup> This proves the existence of numeracy activities in the Bugis community. In determining the day or date it reaches 29 or 30 days, there is no evidence that the previous Bugis community has known the concept of positive integers as it is today.

<sup>1</sup> Interview with matoa cenrana, custom 12 Kedaduan Luwu on September 25, 2022.

## 5. Conclusion

Based on the results of the study and analysis, researchers can conclude:

The philosophical meaning in the *sure'* eja text is, first, the words of Telaga Munajat's poem. That this poem contains Sufism teachings that describe the reality of worldly life that is temporary, faced with the eternal afterlife, second, *sure'* spelling, classified as *elong kallolo*, contains a hidden and deep meaning in the form of a puzzle, as a form of expressing one's feelings for the person he loves. While *sure'* kutika means determining the day and time, good or bad, for the Bugis community in carrying out various activities/jobs that are believed to bring salvation or reinforcements.

Researchers found the concept of number patterns and arithmetic rows in the structure of *sure'* spelling, while the calculation of days in *sure'* kutika contains the concept of positive integers.

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### Author Profile



**Sumardin Raupu**, the author, began his duty as a Mathematics Education Study Program lecturer on March 1, 2015. The academic position of the expert assistant writer was obtained in May 2017, and is now temporarily managing the academic position file of the Lecturer. In addition to actively teaching, the author is also active in writing scientific articles.

Until now, the author produced three articles published in national journals. The first article, entitled "Analysis of the Quality of Learning for Mathematics Teachers Using the Ecop Model at SMK Teknologi Tri Tunggal '45' Makassar", was published in the journal *Al-Khwarizmi*, belonging to the Mathematics Education Study Program IAIN Palopo, the second article with the title "Analysis of Integral Learning Outcomes Using Multiple Choice Questions and Essay Questions (Comparative Study on Second Semester Students of IAIN Palopo Mathematics Tadris Study Program)" was published in the journal *Pedagogy*, belonging to the Mathematics Education Study Program of Cokroaminoto Palopo University and the third article entitled "The Effect of the Number of Study Hours and Learning Facilities on the Mathematics Learning Outcomes of SMP Negeri 4 Ajangale Students" published in the journal *Al-Khwarizmi*, belonging to the Mathematics Education Study Program IAIN Palopo. The author's love for writing articles makes the author often attend good writing training; the last one was a scientific article writing workshop at Gadjah Mada University (UGM) and produced an article during the publication process in the *Scopus* journal.

# Ethnomathematical Exploration of Lontara Manuscripts Sure' Eja and Sure' Kutika

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