

# Astronomy in Buginese–Makassarese culture based on historical and ethnographical sources

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**Abstract.** Our research has been looking for astronomical aspects in Buginese-Makassarese culture from historical to ethnographical sources. We found from history that astronomy had been used by Buginese – Makassar society long before Islam came to South Sulawesi at early 17th century and had their own first telescope at the time of Gowa's Prime Minister, Karaeng Pattingaloang. Meanwhile from ethnographical source, utilization of astronomy penetrated not only at Islamic calendar and worship time, but also at agriculture, sailing navigation, and weather prediction. Some of our literature were taken from *Lontaraq* (ancient manuscript) which now the experts are not many and old, especially in the field of astronomy. It was found that *Lontaraq* was using lunar period to characterize local weather [called: *Pananrang*]. Therefore, we need to excavate immediately more about this matter before the experts reduced in number.

## 1. Introduction

In 17<sup>th</sup> century, Makassar was the busiest port in entire region of eastern among seafarers. Since the time as famous city with spice trade, Makassar has been inhabited by multi ethnics (indigenous people, Malay, Arabs, Persian, Indian, Chinese), although most of them are still dominated by two the largest ethnics in South Sulawesi, i.e. Buginese and Makassarese.

In spite of having different words in use, two ethnics Buginese-Makassarese have been sharing the same traditions and culture, particularly in their script called *Lontaraq*. The named *Lontaraq* to their scripts was due to number of records written on the leaves of palm trees (*Borassus Flabellifera*) [1]. Based on earlier sources, Kathryn G. Anderson [2] explained that: “*The Buginese script is derived from an Indian prototype, the Pallawa script of southern India that spread to Southeast Asia in the fourth or fifth century.*” *Lontaraq* contained a wide range of knowledge that govern their social life, such as agriculture, commerce, and weather forecasting [3]. In Javanese society, weather forecasting was known as *Pranatamangsa* [4], whilst in *Lontaraq* Buginese-Makassarese was called *Pananrang* or *Kutika*. This *Pananrang* explains the characterization of annual local weather over period of eight years which is called *Sipariyama* period [3]. Several studies had tried to analyze the relationship between *Sipariyama* period with Dipole Mode [5], ENSO [6], and Lunar motion period [7]. On the other hand, Ammarel [8] had described astronomical aspects contained in Buginese navigation system by tabulating some local stars and asterisms. The story behind some of the stars (stars in Buginese and Makassarese word is ‘*bintoéng*’) had similarity with Greek myths [9]. Perhaps it was due to universal information from Greek myths about asterisms that got into the thought of Buginese sailor and eventually grown into local myths. However, to adapt the paradigm of universal science needed not



only acceptance, but also needed a very critical look at mathematical elaboration and physical background [10].

Until recently, number of researchers who have tried to analyze scientifically the background knowledges of *Lontaraq* was still few, particularly in traditional astronomy. Quite different to Javanese society, the *Pranatamangsa* had been widely studied for its usage as guidance for agriculture activities [11]; cosmological, meteorological, and bio-climatological aspects [4]; and its dependency to the presence of certain stars [12]. Whilst from archeology side, Javanese had solar gnomon called *Bencet* [13] and *Lingga* [14] that been used as solar time marker. Through simple comparison that had been mentioned above, it obviously needs to be considered that astronomical aspects in Buginese-Makassarese culture should be explored more widely as interdisciplinary studies. Therefore, this paper would like to write some historical and ethnographical aspects of astronomy in Buginese-Makassar culture.

## 2. Historical aspects

The existence of *Lontaraq* was already began in South Sulawesi long before Islam arrived in early 17<sup>th</sup> century. In this pre-Islamic times, *Lontaraq* manuscript never mentioned the dates for events [1]. Kathryn G. Anderson [2] also said that: "... the precise date when writing reached South Sulawesi cannot be determined with certainty..." Basically, pre-Islamic *Lontaraq* only reckoned the length of events. For example, the length of the first ruler's reign was lasted for four *pariyamas*. Owing to one *pariyama* was equal to eight years, so that the ruler's reign was 32 years. It didn't mean that Buginese-Makassarese society do not own calendar system, but caring to the time of events was assumed to be not important. Abidin [1] in his paper stated that Buginese calendar consisted of 12 solar months with Sanskrit names but had different arrangement sequence with Indian and Javanese calendars. They divided one month into weeks of five days. This five-day 'week' was called '*sipasa*', means one market cycle (Javanese and Balinese society called it *Pancawara*: *Legi*, *Pahing*, *Pon*, *Wage*, and *Kliwon*). Apart of five-day 'week', seven-day week also existed in *Lontaraq*, but it did not had name (Javanese and Balinese society called it *Saptawara*). When Islam came, *Lontaraq* had written the dates in Islamic calendar and used Arabic to write Arab-Malay language.

*Lontaraq* itself consists of a wide variety of documents. The one which included astronomy was *Lontaraq Pananrang*. Figure 1 depicts a sample of the *Lontaraq Pananrang*'s tabulation which is written in 1907 [15]. Although the original *Lontaraq* had been rewritten in Latin alphabet, it was still very difficult to translate the used Buginese language into Indonesian, because some of the words are not in use anymore by Buginese modern society today.

There were some points that can be noticed from figure 1. (1) Firstly, column-1 can be translated as the Name of Seven Guidance (N7G). Looking at Ammarel's table of Buginese stars and asterisms [8], four of it were mentioned in N7G, which is {a} *Oromporong* (Pleiades), {b} *Warawarae* (Venus: morning), {c} *Tanratellué* (Delta, Epsilon, and Zeta Orionis), and {g} *Walue* (Alpha and Beta Centauri). So it means that the guidance in N7G was celestial objects. Meanwhile, {d} *Manu'e* and {f} *Empang* were mentioned by Saleh [16]. He stated that *Manu'e* was an asterism that visualized as a chicken, but he did not tell the shape of *Empang*. Only {e} *Etapatae* did not have a reference. (2) Secondly, it seems that the table in figure 1 was used to determine the name of a day based on N7G's position at a certain time. Column 2 – 6 respectively meant afternoon (*asara*), sunset (*orowe*), midday (*tengasso*), sunrise (*abuwe*), and morning (*ele*). The last column gave the name of the day in Arabic alphabet: Friday – Thursday (up to down). This day determination probably had intention to be used as one of indicator which day was considered auspicious. This idea was still uncertain because we could not understand the meaning of signs in column 2 – 6. It needs some epoch time to confirm the position of N7G. This works need further research.

Aside from *Lontaraq*, Arsuka [17] explained that in the mid of 17<sup>th</sup> century, a Galilean telescope had been possessed by Gowa's Kingdom as a tool to observe stars in Makassar land's sky. Their Prime Minister, named Karaeng Pattingalloang (Karaeng mean Prince), used it to explore Moon's position and evolution. It was so unfortunate that the story about the telescope existence could not be found in any museum in Makassar. We assumed that there was likely other party who took over and look after

the telescope during the colonial period, as for the original manuscripts of *Lontaraq* which is now widely claimed to be in Leiden, Netherlands.

{a}			X		/	جاء
{b}			/		X	سب
{c}				X	X	احد
{d}				/	X	اثنين
{e}				X	/	ثلاثة
{f}				/	X	اربع
{g}			X		/	خمسة

**Figure 1.** An example of *Lontaraq Pananrang* manuscript [15].

### 3. Ethnography aspects

Astronomy in Buginese-Makassarese had already established in navigation sector. Ammarel [8] had described some of it that been used by the Buginese in Balobaloang (small island located midway between Makassar and Bima of Sumbawa). Buginese - Makassarese had a sharing view that the universe was not an empty space, but all the contents and the space were proceeded naturally, while oceans was part of the cosmos that fulfilled with magicians and wonders [16].

Besides being used for navigation, the Buginese - Makassarese also used celestial objects to predict the weather. *Lontaraq Pananrang* accommodated a method to predict the weather for the purposes of agriculture, travel, trade, and even in building houses. The Forecasting was based on characterization of local weather within eight years period (*Sipariyama*). All of the years in *Sipariyama* period was named with Arabic letters. It was tailored from Islamic calendar which used Lunar's motion. The eight-year term was also used in Javanese Islamic calendar which one year had 354.375 days and became full cycle after eight years (2835 days) [18]. *Sipariyama* adopted this eight-year period probably because it had same background with Javanese Islamic calendar which is originated from Islamic culture, even though the name of the year and the number of days in some years had little difference. However, retrospect from history, the eight years period had been used by Buginese - Makassarese long before Islam arrived. This fact indicated that they had been aware with the regularity of celestial bodies.

It should be recognized that the results from study to evaluate the *Sipariyama* as a scientific term was still inadequate. This possibly was due to the oldness of *Lontaraq* manuscript so that the letters were hard to read and to interpret. It also needed a wider interdisciplinary studies that involved all expert in natural science, social science, and humanities. Therefore, more study to assess *Lontaraq* still needs to be improved so that the knowledge contained in *Lontaraq* as cultural heritage is maintained its glory.

### 4. Summary

This paper has presented some usages of astronomical aspect in Buginese-Makassarese culture based on historical and ethnographical sources. *Lontaraq* manuscript is one of the authentic evidence at how

Buginese- Makassar society understood and used it in their daily life. *Oromporong*, *warawarae*, *tanratellue*, *walue*, and *Manu'e* were some of examples of celestial object's name that flourished the record of Buginese – Makassar culture. The benefit of these celestial objects are not only for navigation purpose, but also for predicting weather to begin agricultural activities. Discussing the weather for the next 4 to 6 months is very beneficial to reduce some risk economically in calculating a cost of production. The discussion itself becomes a traditional events called '*tudang sipulung*' attending by farmers, climatological experts, and readers of *Lontaraq* (*palontaraq*) to decide when the agriculture activities (particularly to grow rice in paddy fields) should begin and how to manage collectively water in watering paddy fields. Using lunar calendar, *Lontaraq* characterized the local weather within eight years period called *Sipariyama*. It was little different from *Pranatamangsa* in Javanese that used solar calendar with one year period. Now the existence of *Lontaraq* and its knowledge are endangered because of the rareness. Therefore, from our consideration a wide research on *Lontaraq* is still necessary to be performed.

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