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Astronomical Perspective in Determining the Traditional Daling System Of The Nias Tribe in Bawodobara Village

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Abstract. *The Traditional Nias Calendar in Bawodobara Village refers to a Moon cycle or Moon phases consisting of the first 15 days called the bright Moon and the last 15 days the dark Moon, this calendar system is classified as a lunisolar calendar with astronomical calculations. In addition to using the phases of the Moon and Sun, the Nias people use the Star Orion to determine the seasons each year (Sara Wangahalö). This study aims to (1) understand the Nias tribe's calendar system in Bawodobara Village from an astronomical perspective and (2) determine why the Nias Bawodobara community uses a calendar system. This study used a qualitative approach with descriptive analysis. Data collection methods and sources include documentation, interviews, and observations. This data analysis uses three stages: data reduction, data presentation, and drawing conclusions. This study shows that the Nias Tribe Calendar in Bawodobara Village uses celestial bodies such as the Moon and Sun phases as a reference for the changing seasons. The calendar from the perspective of astronomy helps the Nias people carry out daily activities such as farming, raising livestock, cooking, eating, and sleeping schedules. The Calendar System in the Nias Tribe in Bawodobara Village has the names of the months in the traditional Nias language, so that it becomes a characteristic and unique feature of the Nias Tribe Calendar System.*

Keywords*: Astronomical perspective, Nias tribe calendar in Bawodobara Village, Nias Culture*

1. INTRODUCTION

Aspects of human life related to the spiritual and physical are never free from change, repetition, and the calculation of time. The description of time plays a very important role in seeing the conceptual framework of human relations with its history, both in terms of human aspects (social) and non-human aspects (animate and inanimate). The reality of the change and repetition of time has inspired humans to create a form of notation marked by numbers in a certain unit called the calendar.

Calendaring can develop well in societies that have experienced progress in civilization. A society with an advanced civilization, both in terms of economy and culture, has a great interest in a good time organization system (Longstaff, 2005). The existence of a calendar makes it easier for humans to identify and mark past events and incidents.

Based on the Sun's orbit, the Moon's orbit, and those that combine the Moon and the Sun's orbit. The calendar has existed throughout history; according to a 1987 study, there are 40 calendar systems currently developing in the world. The Nias tribe's calendar system in Bawodobara Village is based on their knowledge of the natural cycle and seasonal changes obtained through astronomical observations.

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Calendars, also known as almanacs, have become an important part of everyday life. The development of community life is increasingly complex, and a definite calendar system is needed to regulate activities. The calendar tradition of the Nias Bawodobara community is also closely related to beliefs and myths using knowledge of eclipses and the movement of the moon and stars to determine the calendar system.

The traditional Nias calendar in Bawodobara Village refers to the lunar cycle or phases of the moon, which consist of the first 15 days, called the bright moon, and the last 15 days, called the dark moon..This calendar system is classified as a luni-solar calendar with astronomical calculations. This astronomical calculation method is based on continuous observations and astronomical calculations (Soderi, 2018). In addition to using the phases of the Moon and Sun, the traditional Nias calendar also uses the Star Orion as a determination of the seasons each year (Sara Wangahalo).

The Nias tribe is a community that lives on Nias Island, in their native language the Nias people call themselves Ono Niha (Ono: child/descendant, Niha: human) and Tano Niha (Tano: land) and the native language used is called Li Niha which literally means people's language or human language. The Nias tribe mostly lives on Nias Island, which is regionally located in North Sumatra. The traditional Nias community has a time-naming system that they call the daily calendar, namely, Fanotoi ginoto (Lase, 2011). In addition to the Gregorian calendar, there is also a calendar.

The Fanotoi ginoto Nias people have an annual leisure period calendar used for agricultural activities that refers to the movement of the Orion Star, or the Sara Wangahalo Star. In addition to agricultural activities, this calendar is closely related to tribal customs (Azhari, 2013). The calendar has long been used as a time marker for carrying out various activities in daily life, including religious rituals. The use of a calendar is also related to human civilization because it plays an important role in various time determinations, including hunting, farming, migrating, and determining certain celebrations (Azhari, 2007). Even the daily work of families in Nias is based on factors such as season, ability, and age. The working season in the fields is between April and June and July and September in the rice fields. Villagers plant sweet potatoes and various vegetables in the fields. The harvest season, which is followed by cleaning the fields, usually ranges from January to March.

In addition to referring to the phases of the moon, the traditional Nias community in Bawodobara Village uses the circulation of the Orion Star (Sara Wangahalo) to mark the agricultural seasons. So, the traditional Nias calendar system or what is commonly called the Ndrofi sara calendar (Sara Wangahalo Star Year) is a lunisolar calendar, namely a combined

calendar between the Sun and the Moon where the change of the Moon is based on the Synodic cycle (the time required for the next new Moon, 29 days 13 hours long) and every few years an additional month (Intercelacy Month) is inserted so that the calendar is the same as the length of the Sun's tropical cycle. However, uniquely, this calendar does not have a month name for one cycle of 29 or 30 days; there are only the names of the days, which they call months. Therefore, the journey of one lunar cycle is based on the phases of the Moon, which continue for 30 or 29 days.

2. LITERATURE REVIEW

The research refers to previously conducted research because it is used as a reference in a study. The following is previous research that can be used for the literature review: Research conducted by (Syam, 2021) entitled The Essentiality of The Nusantara Traditional Calendar discusses several traditional calendar systems in Indonesia and the meaning of each calendar used by its users. The study also discusses the Nias tribal calendar used by the Nias community to determine good and bad days. The fundamental difference between this research and the research that will be conducted by the author is that it focuses more on the Nias tribal calendar system and the analysis of the Nias tribal calendar from an astronomical perspective.

Thesis Research (Firdaus, 2013) entitled Analysis of the Sundanese Calendar in an Astronomical Review. In this study, the Sundanese calendar system is explained in an astronomical review and its astronomical accuracy. The similarity between the research conducted by Jannatun Firdausi and the author lies in the analysis of astronomical perspectives. The difference is that Jannatun Firdaus' thesis discusses the Sundanese calendar, while the author discusses the Nias Tribe Calendar System in Bawodobara Village, Teluk Dalam District.

In the thesis Research (Ramdhani, 2017) entitled "Analysis of the Balinese Pawukon Calendar System, the Balinese Pawukon calendar system, which is a calendar that rotates cyclically (nemu gelang), is explained. The Balinese Pawukon calendar consists of 30 wuku, each consisting of seven days (saptawara). In this calendar system, a day cycle called wewaran is used. Wewaran has 10 weekly types. The Balinese Pawukon calendar system does not use celestial bodies as a reference.

3. METHODS

This study was conducted in Bawodobara Village, Teluk Dalam District, South Nias Regency. The method used in this study was qualitative research that produced descriptive data. The collected data were then analyzed by the researchers using descriptive analysis methods. A descriptive analysis describes the nature or condition used as the object of the study. Researchers will descriptively analyze the calendar system of the Nias community in Bawodobara Village and its relationship with the astronomical approach.

4. RESULTS AND DISCUSSIONS

Based on the results of the interviews and observations conducted in Bawodobara Village, Teluk Dalam District, South Nias Regency, several main points can be concluded regarding the calendar system used by the Nias people in this village and its relationship with their traditional activities. The following conclusions can be drawn:

Understanding the Nias Tribe's Calendar System

- **Use of Celestial Bodies**: The people of Bawodobara Village still use a traditional calendar system that refers to celestial bodies, such as stars and the moon, in various aspects of their lives. For example, when fishing, they pay attention to the position of the stars or the moon to predict the weather and sea conditions. This demonstrates the influence of astronomy on their daily lives.
- **Moon and Rice Planting**: In agricultural activities, such as farming or cultivating, they use the lunar cycle to determine the best time to plant rice. They believe that by following this traditional calendar system, their agricultural products will be abundant and will bring happiness.

Calendar System in Social Activities

- **Good and Bad Days**: People also use this calendar system to determine good and bad days, especially for important ceremonies such as weddings. For example, they choose a day to get married based on the phases of the moon (Simewaludesa'a and Simeweldruadesa'a), which are believed to bring happiness and harmony to the marriage.
- **Taboos in Agriculture**: There are also taboos in the calendar system, such as the prohibition on planting rice in certain months which are considered to bring disaster (rat months), where the plants will be eaten by rats.

Concept of Time and New Year

- **Determination of the New Year**: The Nias people in Bawodobara Village also set time based on star sightings, with the year starting when a certain star appears after sunset. This concept is closely related to the natural phenomena they observe and use as a reference for various activities.

Attachment to Astronomical Traditions and Values

- **Preservation of Cultural Heritage**: Although modern technology has been widely adopted, this traditional calendar system is still maintained by some communities as a cultural heritage that must be preserved. They believe that this knowledge was inherited from their ancestors and must be maintained so that the next generation can understand their perspective on nature and its influence on life.

Names of the Months in Nias Language

The Nias people also have very distinctive month names that are closely related to their calendar system, such as "Bawa Siöfa" for April and "Bawa Sidua" for February, which reflect their relationship with the lunar cycle and agricultural seasons.

Agricultural Term

Agricultural Cycle: Based on the interview results, the agricultural period in Bawodobara Village is determined by the movement of the moon and other natural phenomena. Agricultural activities begin in April and continue with planting rice seeds, until harvesting in December. This shows that the community is very dependent on the natural cycles that they observe.

Belief in the Calendar System

People still believe that following this traditional calendar system can bring blessings and good results, both in terms of agriculture, hunting, and traditional ceremonies. However, they also do not feel bound to follow this system because of the advancement of technology that is more practical and efficient

The calendar system of the Nias people in Bawodobara Village reflects a blend of traditional astronomical knowledge and a rich local culture. Although most people have now

adopted modern technology, these traditional values are still highly valued and maintained by those who want to preserve their ancestral heritage. Belief in the cycle of the moon and the movement of the stars shows the importance of human relationships with nature in their daily lives, and how they organize time and activities based on natural phenomena. Overall, this study shows that the people of Bawodobara Village have a calendar system that is very closely related to nature and celestial bodies. Although many people have used modern technology, this traditional system still survives, and is believed to provide blessings and abundance in their lives.

The interesting thing about the calendar system of the Nias people in Bawodobara village is that they use the concept of "month" as the basis for calculating time. The Nias people in this village observe the lunar cycle, from new moon to full moon, to determine the beginning and end of each month in their calendar. A deep understanding of the movement of the moon allows us to accurately predict when important events will occur, such as planting time, harvest time, and traditional ceremonies.

Combining modern economic knowledge with local observations and traditions, we find how the calendar system of the Nias people in Bawodobara village is not only a time management tool, but also reflects the community's deep connection with the living universe. This shows the importance of understanding and preserving cultural heritage, including astronomical calendar systems, as part of the diversity of human knowledge and wisdom throughout the world.

5. CONCLUSION AND SUGGESTIONS

The calendar of the Nias Tribe of Bawodobara Village uses the Lunisolar system because it has a lunar cycle that is matched with the seasonal cycle that is influenced by the position of the Sun with the reference of the Star Orion. Then the Nias community of Bawodobara Village carries out agricultural activities in April when the seasons change and winter to summer. After that, the Nias community, especially Bawodobara Village, carries out agricultural activities by planting rice in June when the Star Orion appears.

1. The Nias community of Bawodobara Village still uses a calendar system with an annual slack period according to the traditions and culture of Ono Niha in ancient times, namely the Sara Wangahalö or Ndröfi zara calendar (Orion Star Year as a sign of the agricultural season).

2. It should be noted that the moon phases are still used today, not only to determine good and bad days in the daily habits of the Nias people, but also as a reference in agricultural activities.
3. The importance of astronomy in maintaining the Nias calendar system. With a deep understanding of the movement of the sky and changes in nature, the Nias people are able to update and calibrate their calendar system to remain accurate and consistent with current natural conditions.

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