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An Examination of The Practical Implementation of The Neo Mabims Criteria in the Determination of the New Islamic Month in Indonesia

Farras Fathan Hikam[1*], Ahmad Adib Rofiuddin[2], Mohammad Zulfaiz Akbar bin Abdul Rahman[3]

[1,2]Universitas Islam Negeri Walisongo
[3]University of Malaya
[*1]farrasfathan03@gmail.com, [2]adibudin08@walisongo.ac.id, [3]zulfaizakbar@gmail.com

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Abstract

The Ministers of Religious Affairs of Brunei Darussalam, Indonesia, Malaysia, and Singapore (MABIMS) have reached a consensus to modify the existing criteria (criteria [2, 3, 8]) by employing the recently developed MABIMS criteria (criteria [3° - 6,4°]) as the foundation for determining the onset of the Hijri month. Following its implementation in 2022, the Neo MABIMS criteria have encountered numerous challenges and intricate implementation challenges. The application of these criteria has been met with both advantages and disadvantages. This study aims to analyze the application of the Neo MABIMS criteria by the Ministry of Religious Affairs in determining the beginning of the Hijri month in Indonesia. The study will assess the effectiveness of the policy in harmonizing differences and addressing implementation challenges. This research explores the dynamics of applying the new criteria, including technical and social aspects that affect the implementation process in the field. The research method employed is qualitative-descriptive with a documentary research approach. The analysis technique entailed three stages: data presentation, data condensation, and interpretation. The findings indicate that the implementation of these criteria has been hindered by persistent differences in determining the start of the Hijri month in Indonesia. The utilization of the Neo MABIMS criteria is characterized by inconsistency, which is a substantial impediment to this process. This finding underscores the necessity for a comprehensive evaluation of the consistency and application of the Neo MABIMS criteria, particularly in addressing rukyat reports that deviate from the established astronomical parameters.

Key Words: Neo MABIMS Criteria; Determination of the Beginning of the Hijri Month; MABIMS Pros and Cons

Introduction

The Ministry of Religious Affairs of the Republic of Indonesia, in concert with Brunei Darussalam, Malaysia, and Singapore (MABIMS), has implemented a novel *hilal* visibility criteria to serve as a reference point for determining the beginning of the Hijri month. These criteria stipulate that the minimum moon altitude is 3 degrees, and the minimum elongation is 6.4 degrees at sunset. This initiative is expected to enhance the precision of determining the start of the month and to fortify the objective and rational foundation for decision-making. This consensus emerged following extensive deliberations since 2012 and has garnered support through various academic forums, including the International Seminar on Falak Jurisprudence in 2017 (Azhari, 2021). The initial implementation of these criteria occurred during the determination of the beginning of Ramadan 1443 H, and it is anticipated that this modification will serve to mitigate discrepancies in the determination of religious holidays and fortify the correlation between the determination of the beginning of the Hijri month and the reality of *hilal* visibility, in accordance with the advancements in modern falak science.

The determination of the beginning of the months of Ramadan, Shawwal, and Zulhijjah in Indonesia is often a contentious issue because the dates can only be confirmed after rukyatul *hilal*, which is the direct observation of the young crescent moon (*hilal*) after sunset (Nurkhanif et al., 2022). This method dictates that the official declaration of the commencement of each month be postponed until the observation is concluded. Consequently, individuals often find themselves compelled to wait until a relatively advanced stage to ascertain the precise worship schedule. This predicament poses a significant challenge, particularly for groups that require earlier certainty to effectively organize religious and social activities. The situation is further complicated by the presence of discrepancies in observation results across different regions, which often yield contradictory results. These discrepancies have the potential to result in a variation of up to two days in the implementation of fasting and Eid, which can give rise to criticism directed towards the authorities responsible for the determination (Muslifah, 2020).

One of the primary challenges in determining the beginning of the Hijri month is the underutilization of astronomical data as the primary basis for decision-making, despite the fact that modern technology has enabled highly accurate predictions. Conventional practices that place significant emphasis on individual visual testimonies continue to serve as the primary reference point, despite their susceptibility to errors arising from factors such as optical illusions or atmospheric conditions.(Sopwan et al., 2024) Although oath procedures before religious court officials are often regarded as sufficient to legitimize testimony reports, the scientific verification process remains inadequate.(Djamaluddin, 2001) This predicament leaves the public in a dilemma, compelled to choose between data-driven scientific perspectives and the decisions of religious authorities that are rooted in tradition. This uncertainty is further compounded by the public's limited understanding of the astronomical and Sharia-related aspects that underpin the issue (Nur Robaniyah et al., 2024). Addressing this gap necessitates a concerted effort to integrate modern scientific methodologies with religious traditions. This integration is imperative to mitigate the conflict and confusion that often arise on an annual basis.

The Neo MABIMS *hilal* visibility criteria integrate contemporary scientific methodologies with religious traditions to improve the accuracy of determining the beginning of the Hijri month. Under these criteria, the minimum elongation of the moon is set at 6.4 degrees, while the minimum altitude is 3 degrees (3°–6.4°) (Anas & Chotban, 2023). These parameters were established to address the limitations of human vision in observing the *hilal*, thereby providing a scientifically grounded framework supported by empirical data (Djamaluddin, 2001; Schaefer, 1991; Suleman & Usup, 2021). The transition from the previous criteria—where the new moon's altitude at sunset was 2°, the elongation angle was 3°, and the moon's age was 8 hours from *ijtimā'*—to the Neo MABIMS criteria was based on a comprehensive analysis of observational reports and empirical research (Djamaluddin, 2017; Maskufa et al., 2022). However, the implementation of these new criteria presents challenges, particularly regarding inconsistencies in practical application. A notable issue arose during the determination of 1 Shawwal 1443 AH, when the calculated elongation did not meet the required 6.4° threshold. This discrepancy led to expert criticism, highlighting ambiguities in the geocentric and topocentric calculation models (Kasim et al., 2024).

Another significant challenge in the implementation of the Neo MABIMS *hilal* visibility criteria is the reported sighting of the *hilal* at altitudes below 3°, which presents substantial verification difficulties from an astronomical perspective. This issue arises primarily due to the low contrast between the *hilal* and the sky background, as well as frequently unfavorable atmospheric conditions (Fatoohi et al., 1998). Additionally, factors such as observer proficiency and the potential misidentification of celestial objects further contribute to inconsistencies in reported observations (Soderi & Izuddin, 2020). Despite these challenges, the Neo MABIMS criteria have been recognized by some as a progressive advancement in improving the accuracy of Hijri month determinations. However, their dissemination among Indonesian Muslim organizations and institutions has been insufficient, leading to limited adoption. This gap in awareness and implementation has contributed to ongoing debates regarding the validity and applicability of the criteria, highlighting the need for clearer communication and broader engagement with relevant stakeholders.

This study analyzes the application of the Neo MABIMS criteria by the Ministry of Religious Affairs in determining the beginning of the Hijri month in Indonesia. The study focuses on the effectiveness of the policy in harmonizing differences and facing implementation challenges. The study delves into the intricacies of the novel criteria, encompassing both technical and social dimensions that influence the implementation process in practical settings.

This paper undertakes a dual task: first, it meticulously maps the obstacles and challenges of implementing the Neo MABIMS criteria; and second, it provides a critical analysis of the problems that arise in this policy. The objective of this study is to provide in-depth insights into the technical challenges, including the discrepancy between theoretical criteria and rukyat practice, as well as non-technical aspects, such as public acceptance and the harmonization between Islamic organizations. By adopting this comprehensive approach, the study endeavors to proffer constructive solutions that are designed to enhance the implementation of the Neo MABIMS policy. These solutions are expected to contribute meaningfully to the enhancement of the consistency of the determination of the beginning of the Hijri month in Indonesia.

Literature Review/Analytical Framework

Neo-MABIMS Criteria

The government of Indonesia has established novel criteria, termed "*imkanurrukyah,*" to determine the beginning of the Hijri month. These criteria stipulate that the presence of the *hilal* is confirmed when it attains a minimum altitude of 3 degrees and an elongation of at least 6.4 degrees. The *hilal* visibility criterion (*imkanurrukyah*) is defined as the likelihood of the *hilal* being visible after sunset under ideal weather conditions. This is determined by analyzing *rukyat* data, which includes geographic data, variations in astronomical parameters, and environmental factors (Nawawi et al., 2012; Taher & Abdulla, 2024). The validity and reliability of the resulting criteria are contingent upon the breadth and diversity of the data collected. The Ministers of Religious Affairs from Malaysia, Brunei Darussalam, Indonesia, and Singapore, who are members of the MABIMS forum (Ministers of Religious Affairs of Brunei, Indonesia, Malaysia, and Singapore), reached an agreement on these criteria. The implementation of these criteria occurred in 2022, coinciding with the commencement of Ramadan 1443 H, as stipulated in the Decree of the Ministry of Religious Affairs No. B-79/DJ.III/HM.00/02/2022.

The Neo-MABIMS 3°-6.4° criteria have emerged as a culmination of meticulous academic inquiry, encompassing diverse seminars, conferences, and deliberations at both domestic and international levels. These criteria were initially incorporated into the 2017 Jakarta Recommendations and were put forth as a unifying solution for the Hijri calendar in Indonesia and the Southeast Asian region. This revision was necessitated by the perceived inadequacy of the prior criteria, which stipulated a minimum moon altitude of 2°, a minimum elongation of 3°, and an age of the moon of 8 hours. However, the advent of modern rukyat data has prompted a reevaluation of these criteria, leading to the conclusion that they are no longer as pertinent (Faid et al., 2024). A re-examination of these criteria is warranted, particularly in light of global data indicating that there exists no astronomically valid *hilal* testimony if the moon's elongation is less than 6.4° and the altitude is less than 3° (Nawawi et al., 2012). The implementation of the Neo-MABIMS criteria is expected to reduce inter-religious differences in the determination of the beginning of the month while enhancing the precision of astronomy-based decisions.

The scientific basis of this criterion is explained through theoretical analysis in the academic paper proposing the new standard (Thomas Djamaluddin et al., 2016). The minimum moon altitude parameter of 3° is derived from global observations of *hilal* visibility, a perspective that is further reinforced by Mohammad Ilyas, who asserts that the visibility of the new moon necessitates a minimum height of 4° between the moon and the sun at sunset.(Ilyas, 1988) A similar approach is employed by the South African Astronomical Observatory (SAAO), as evidenced by Caldwell and Laney's research, which utilizes empirical data on *hilal* visibility based on historical new moon observations.(Caldwell & Laney, 2000) This research provides a valid basis for predicting *hilal* visibility scientifically and systematically.

In addition to altitude and elongation, other factors must be considered when predicting the visibility of the moon's crescent, or *hilal*. These include the age of the moon, the time difference between sun and moon setting (lag time), and the altitude distance between the moon and the sun (arc of vision). The width of the crescent and the angle of separation between the center of the moon and the sun (arc of light curvature, ARLC) also play a role, while the difference in azimuth between the moon and the sun (delta azimuth, DAZ) of about 4° is another key element.(Thomas Djamaluddin et al., 2016) All these parameters support the scientific approach in determining the visibility of the *hilal*, making the Neo-MABIMS criteria scientifically reliable.

The minimum elongation criterion of 6.4°, as outlined in Odeh's (2006) paper, has been adopted as one of the main references in determining Neo MABIMS *hilal* visibility. Odeh elucidates that this elongation value, calculated topocentrically, signifies the minimum threshold for the crescent moon to possess sufficient thickness for observation (Odeh, 2006). The validity of this criterion is further substantiated through an analysis of 180 years of hisab data in Banda Aceh and Pelabuhan Ratu regions. The findings indicate that when the elongation reaches 6.4°, the *hilal* consistently surpasses the horizon at sunset.(Djamaluddin, 2017; Raharto et al., 2019) The selection of these two locations is based on significant considerations. Pelabuhan Ratu, West Java, has been identified as the location point for the calculation of the Indonesian Hijri calendar (*Taqwim Standar Indonesia*). This determination was made by the Ministry of Religious Affairs, and the selection of Banda Aceh was driven by its strategic position along the western border of Indonesia.(Sopwan & Raharto, 2013) It is hypothesized that analogous patterns will be observed in other regions of Indonesia.

The objective of direct observation (*rukyah al-hilal*) is to generate precise and accurate new moon sighting data (Junaidi, 2018). In pursuit of this objective, astronomers have devised calculation methods that are customized to the characteristics of the observation location. A notable approach is the topocentric method, which is designed to address the requirements of direct observation (*rukyah*). This approach is significant because it considers local coordinates, such as the altitutude of the moon and its azimuth, thereby yielding results that are more pertinent to the actual conditions at the observation location (Cercel & Iftene, 2021).

Topocentric parameters are of critical importance in the formulation of *imkan rukyat* or *hilal* visibility criteria. In analyzing the position of the moon for rukyat, the illustration of the moon's position above the horizon must be based on topocentric parameters. The elongation, or angular distance between the Moon and the Sun (Arc of Light/ArcL), as well as the height difference between the Moon and the Sun (Arc of Vision/ArcV), are calculated in topocentric terms relative to the horizon (Fatmawati et al., 2022). Consequently, geocentric elongation cannot be directly compared with the lunar height parameter in the topocentric system, either in geometric illustrations or imkan rukyat calculations, due to the different coordinate systems used.

Elongation is a pivotal parameter in determining the visibility of the *hilal*, or the moon's phase during the month of Ramadan. The greater the elongation value, the higher the probability of observing the *hilal*. Elongation calculations are classified into two types:

geocentric elongation and topocentric elongation. Geocentric elongation quantifies the angular distance between the Moon and the Sun from the Earth's center. In contrast, topocentric elongation measures the angular distance from the Earth's surface. It is noteworthy that geocentric elongation values tend to exceed those of topocentric elongation. This disparity can be attributed to the influence of the Moon's parallax, which arises from the discrepancy in viewing angle between an observer on the Earth's surface and the Earth's center (Schlyter, 1979). Consequently, the discrepancy between geocentric and topocentric elongation serves as a reliable indicator of the Moon's parallax, thereby enhancing the precision of *hilal* visibility predictions.

Research Method

This research examines the Neo MABIMS criteria in the context of determining the beginning of the Hijri month and analyzes the problems that arise during its implementation. The research method used is qualitative-descriptive, aiming to describe and analyze phenomena in depth based on relevant data. The research approach focuses on *documentary research*, which involves analyzing official documents, previous research results, and related literature to understand the implementation of the Neo MABIMS *hilal* visibility criteria in Indonesia, adjusted to the latest dynamics.

Primary data was obtained through a study of regulations, official policies, and reports on the results of *isbat* hearings issued by the Ministry of Religious Affairs. In addition, secondary data was strengthened through critical reading of the results of literature reviews and relevant previous research to increase the relevance of the study topic. Data analysis was conducted through a deductive-inductive approach, drawing general conclusions based on various specific phenomena found in the field. The data analysis technique includes three main stages: data presentation to provide an initial overview, data condensation to filter out important information, and interpretation to interpret the findings in depth (Fadjarajani et al., 2020; Miles et al., 2014). This approach is designed to provide a comprehensive understanding of the implementation of the Neo MABIMS criteria, as well as identify challenges and opportunities in its application in Indonesia.

Analysis

Implementation Dynamics of Neo Mabims Criteria.

Since its implementation in 2022 for the determination of 1 Ramadan 1443 AH, the Neo MABIMS *hilal* visibility criteria have presented several technical challenges and sparked debates among various stakeholders. A notable example is the determination of 1 Shawwal 1443 AH, where the report from the Hijri Calendar Unification Team highlighted significant variability in moonsighting data across different regions of Indonesia. The observed altitudes of the visible crescent moon (*hilal mar'i*) ranged from 4°0.59' to 5°33.57', indicating that the minimum altitude threshold of 3° set by the Neo MABIMS criteria was consistently met.(Indah, 2022) In the eastern regions of Indonesia, the *hilal* was recorded at an altitude of

3°47.27', while in the western regions, it reached 5°56', further confirming compliance with the stipulated altitude requirement.

A key challenge in the implementation of the Neo MABIMS criteria concerns the elongation parameter, which requires a minimum value of 6.4°. Geocentric elongation calculations across Indonesia range from 5.2° to 7.2°, while topocentric elongation values range from 4.9° to 6.4°. Although the western region of Indonesia meets the minimum elongation requirement, the eastern region falls short, with geocentric elongation reaching only 5.2° and topocentric elongation recorded at 4.9°. This discrepancy highlights a fundamental issue: while the observed *hilal* altitude aligns with the Neo MABIMS standard, the elongation criterion remains a significant challenge, particularly in eastern Indonesia.

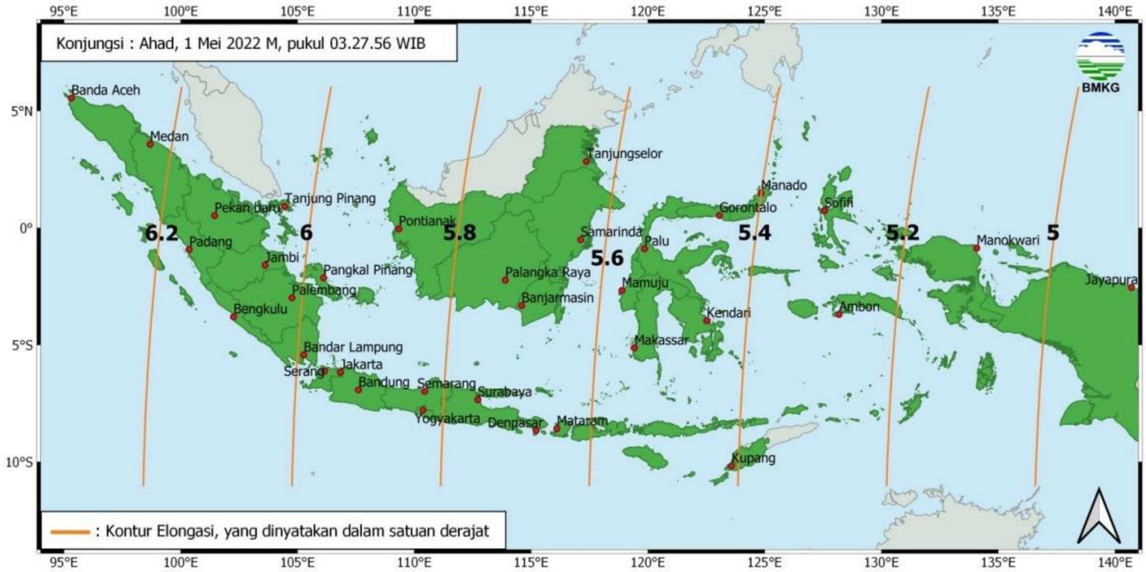

Figure 1 Map of elongation at sunset to determine the beginning of the month of Shawwal 1443 AH on May 1, 2024. source: Badan Meteorologi Klimatologi dan Geofisika (*Informasi Prakiraan Hilal Saat Matahari Terbenam Tanggal 1 Mei 2022 (Penentu Awal Bulan Syawal 1443 H)*, 2022).

The results of the *isbat* session, as outlined in the Minister of Religion of the Republic of Indonesia's Decision No. 435 of 2022, established the beginning of Shawwal 1443 Hijri based on rukyat reports from various *hilal* observation points across Indonesia. Among the 99 documented monitoring locations, nine observers from five distinct sites reported successful sightings of the *hilal*.(Keputusan Menteri Agama Republik Indonesia Nomor 435 Tahun 2022 Tentang Penetapan 1 Syawal 1443, 2022) These reports formed the basis of the isbat session's decision, determining the start of Shawwal in accordance with field observation findings.

At the isbat session, the results of which were outlined in the decision of the Minister of Religion of the Republic of Indonesia Number 435 of 2022, the beginning of the month of Shawwal 1443 Hijri was determined based on rukyat reports from various *hilal* monitoring points spread throughout Indonesia. Of the 99 monitoring locations recorded, 9 observers in 5 different locations reported success in seeing the *hilal*. This report was the foundation used in the isbat session to determine the beginning of the month of Shawwal according to the results of observations in the field.

The subsequent table presents astronomical calculation data from the locations where successful *rukyat* was reported. This data serves to support the analysis and evaluation of the Minister of Religious Affairs' decision regarding the determination of 1 Shawwal 1443 Hijri. Sourced from the ALFALAK 2025 application, the data includes a detailed description of the *hilal* visibility parameters.(Khafid, 2025) The objective of presenting this information is to provide a comprehensive understanding of the challenges encountered in determining the commencement of the Hijri month.

Location	Latitude and Longitude	Moon Altitude	Geocentric Elongation	Topocentric Elongation	FI
Kupang, East Nusa Tenggara	10° 9′ 47.88″ S, 123° 34′ 40.08″ E	3° 56′00″	6° 13′45″	5° 24′26″	0,22%
Lamongan, East Java	6° 51′ 0,050″ S, 112° 21′ 0,028″ E	4° 24′16″	6° 36′23″	5° 45′52″	0,25%
Gresik, East Java	7°10'11,1"S 112°37'2,5"E	4° 22′51″	6° 35′43″	5° 45′20″	0,25%
Jombang, East Java	7° 32'S, 112° 13′ 04″E	4° 22′23″	6° 36′17″	5° 46′03″	0,25%
Kubu Raya, West Kalimantan	0° 0′ 58.93″ N, 109° 20′ 14.32″ E	4° 47′34″	6° 45′29″	5° 52′42″	0,26%

Table 1 Astronomical data from the location of hilal observation results for the determination of 1 Shawwal 1443 H in several locations in Indonesia, including Kupang (East Nusa Tenggara), Lamongan, Gresik, Jombang (East Java), and Kubu Raya (West Kalimantan) including Moon Altitude, Moon Elongation (topocentric and geocentric), and Moon illumination phase (FI).

The data reveals an increase in both geocentric and topocentric *hilal* altitude and elongation from eastern to western Indonesia. Specifically, the *hilal* altitude rose from 3° 56' in Kupang to 4° 47' in Kubu Raya, while the geocentric elongation increased from 6° 13' to 6° 45', and the topocentric elongation ranged from 5° 24' to 5° 52'. However, *hilal* observation data from Kupang, East Nusa Tenggara, indicate that although the *hilal* altitude reached 3° 56', both the geocentric (6° 13') and topocentric (5° 24') elongation values remained below the minimum elongation threshold of 6.4° set by the Neo MABIMS criteria.

The observation report in Kupang indicated that the *hilal* was observed in the northern position, which is above the position of the sun.(Faisal, 2022; Suni, 2022) This testimony was provided by Jamaludin Malik, S.Ag., Subcoordinator of Sharia Religious Affairs and Sharia Development, who had previously taken the oath of allegiance before Rasyid Muzhar, S.Ag., M.H., Judge of the Kupang Religious Court. This data was subsequently reported to the Ministry of Religious Affairs for consideration in the isbat session, which is tasked with determining the beginning of Shawwal 1443 AH.

A similar phenomenon has the potential to occur in the future, especially in the application of the Neo MABIMS criteria. Analysis using the ALFALAK 2025 program over a

50-year time span shows a critical condition where the *hilal* altitude has reached or exceeded 3°, but the elongation is still below the minimum limit of 6.4°.

Determination	Month	Location	Latitude and Longitude	Moon Altitude	Geocentric Elongation	Topocentric Elongation	FI
Ramadan 1446/2025	29 Syaban/ 28 Februari	Merauke	8° 29′ 38″ S, 140° 24′ 02″ E	2°44'19"	4°49'38″	3°52'50"	0,12%
		Pelabuhan Ratu	6° 59′ 18″ S, 106° 33′ 01″ E	3°49'37"	6°03'14"	5°07'17"	0,20%
		Banda Aceh	5° 33′ 13″ N, 95° 19′ 03″ E	4°28'02"	6°24'18"	5°24'58"	0,22%
Dzulhijjah 1446/2025	29 Zulqoddah /27 Mei	Merauke	8° 29′ 38″ S, 140° 24′ 02″ E	-0°26'46"	5°47'50"	5°37'46"	0,24%
		Pelabuhan Ratu	6° 59′ 18″ S, 106° 33′ 01″ E	0°59'19"	6°39'07"	6°16'50"	0,30%
		Banda Aceh	5° 33′ 13″ N, 95° 19′ 03″ E	2°56'01"	7°06'15"	6°27'50"	0,32%
Ramadan 1455/2033	29 Syaban/22 November	Merauke	8° 29′ 38″ S, 140° 24′ 02″ E	1°42'10"	5°12'47"	4°39'31"	0,17%
		Pelabuhan Ratu	6° 59′ 18″ S, 106° 33′ 01″ E	1°42'10"	5°12'47"	4°39'31"	0,17%
		Banda Aceh	5° 33′ 13″ N, 95° 19′ 03″ E	3°47'39"	6°07'08"	5°18'31"	0,22%
Ramadan 1456/2034	29 Syaban/11 November	Merauke	8° 29′ 38″ S, 140° 24′ 02″ E	2°04'11"	5°30'16"	4°55'36"	0,19%
		Pelabuhan Ratu	6° 59′ 18″ S, 106° 33′ 01″ E	3°10'37"	6°11'53"	5°30'55"	0,23%
		Banda Aceh	5° 33′ 13″ N, 95° 19′ 03″ E	4°06'53"	6°21'36"	5°32'55"	0,24%
Ramadan 1457/2035	29 Syaban/31 Oktober	Merauke	8° 29′ 38″ S, 140° 24′ 02″ E	1°42'22"	5°23'14"	4°50'23"	0,18%
		Pelabuhan Ratu	6° 59′ 18″ S, 106° 33′ 01″ E	2°53'01"	6°02'18"	5°21'26"	0,22%

		Banda Aceh	5° 33′ 13″ N, 95° 19′ 03″ E	3°52'00"	6°12'47"	5°23'21"	0,22%
Syawal 1460/2038	29 Ramadan/ 28 Oktober	Merauke	8° 29′ 38″ S, 140° 24′ 02″ E	1°36'36"	5°00'59"	4°21'46"	0,15%
		Pelabuhan Ratu	6° 59′ 18″ S, 106° 33′ 01″ E	2°59'8"	5°48'37"	4°58'58"	0,19%
		Banda Aceh	5° 33′ 13″ N, 95° 19′ 03″ E	3°51'21"	6°02'07"	5°04'25"	0,20%
Zulhijjah 1460/2038	29 Zulqoddah /26 Desember	Merauke	8° 29′ 38″ S, 140° 24′ 02″ E	2°41'17"	4°33'49"	3°33'58"	0,10%
		Pelabuhan Ratu	6° 59′ 18″ S, 106° 33′ 01″ E	3°56'50"	5°49'11"	4°49'25"	0,18%
		Banda Aceh	5° 33′ 13″ N, 95° 19′ 03″ E	4°02'10"	6°02'20"	5°04'07"	0,20%
Ramadan 1465/2043	29 Syaban/ 5 Agustus	Merauke	8° 29′ 38″ S, 140° 24′ 02″ E	1°58'26"	4°54'27"	4°11'59"	0,13%
		Pelabuhan Ratu	6° 59′ 18″ S, 106° 33′ 01″ E	3°15'06"	5°45'37"	4°55'40"	0,19%
		Banda Aceh	5° 33′ 13″ N, 95° 19′ 03″ E	4°12'52"	6°10'24"	5°13'54"	0,21%
Syawal 1466/2044	29 Ramadan/ 23 Agustus	Merauke	8° 29′ 38″ S, 140° 24′ 02″ E	2°23'24"	4°16'27"	3°17'12"	0,08%
		Pelabuhan Ratu	6° 59′ 18″ S, 106° 33′ 01″ E	3°35'19"	5°31'51"	4°33'25"	0,16%
		Banda Aceh	5° 33′ 13″ N, 95° 19′ 03″ E	3°41'13"	6°02'14"	5°08'28"	0,20%
Zulhijjah 1466/2044	29 Zulqoddah /21 October	Merauke	8° 29′ 38″ S, 140° 24′ 02″ E	1°44'24"	6°04'14"	5°34'41"	0,24%
		Pelabuhan Ratu	6° 59′ 18″ S, 106° 33′ 01″ E	2°40'38"	6°58'33"	6°25'01"	0,31%

		Banda Aceh	5° 33′ 13″ N, 95° 19′ 03″ E	1°38'17"	7°31'19"	6°49'34"	0,36%
Syawwal 1469/2047	29 Ramadan/ 23 Juli	Merauke	8° 29′ 38″ S, 140° 24′ 02″ E	3°03'37"	5°18'00"	4°26'32"	0,15%
		Pelabuhan Ratu	6° 59′ 18″ S, 106° 33′ 01″ E	4°09'36"	6°27'16"	5°35'14"	0,24%
		Banda Aceh	5° 33′ 13″ N, 95° 19′ 03″ E	3°55'51"	6°59'22"	6°13'53"	0,30%
Ramadan 1474/2052	29 Sya'ban/29 April	Merauke	8° 29′ 38″ S, 140° 24′ 02″ E	1°57'51"	3°57'36"	2°58'25"	0,07%
		Pelabuhan Ratu	6° 59′ 18″ S, 106° 33′ 01″ E	3°12'40"	5°08'12"	4°07'29"	0,13%
		Banda Aceh	5° 33′ 13″ N, 95° 19′ 03″ E	3°32'35"	5°39'41"	4°41'26"	0,17%
Zulhijjah 1474/2052	29 Zulqoddah /26 Juli	Merauke	8° 29′ 38″ S, 140° 24′ 02″ E	1°41'21"	5°52'01"	5°19'59"	0,22%
		Pelabuhan Ratu	6° 59′ 18″ S, 106° 33′ 01″ E	2°49'05"	6°44'32"	6°06'19"	0,28%
		Banda Aceh	5° 33′ 13″ N, 95° 19′ 03″ E	2°07'27"	7°10'37"	6°41'01"	0,34%
Syawwal 1475/2053	29 Ramadan/ 18 Mei	Merauke	8° 29′ 38″ S, 140° 24′ 02″ E	2°23'01"	5°24'05"	4°38'52"	0,17%
		Pelabuhan Ratu	6° 59′ 18″ S, 106° 33′ 01″ E	3°33'26"	6°13'31"	5°22'06"	0,22%
		Banda Aceh	5° 33′ 13″ N, 95° 19′ 03″ E	3°19'21"	6°39'28"	5°54'12"	0,27%
Zulhijjah 1477/2055	29 Zulqoddah /25 Juni	Merauke	8° 29′ 38″ S, 140° 24′ 02″ E	2°48'56"	5°08'27"	4°17'41"	0,14%
		Pelabuhan Ratu	6° 59′ 18″ S, 106° 33′ 01″ E	3°56'37"	6°09'03"	5°15'40"	0,21%
		Banda Aceh	5° 33′ 13″ N, 95° 19′ 03″ E	3°51'35"	6°39'50"	5°51'56"	0,26%

Syawwal 1479/2057	29 Ramadan/ 48 Ramadan	Merauke	8° 29′ 38″ S, 140° 24′ 02″ E	3°43'51"	6°00'13"	5°10'29"	0,20%
		Pelabuhan Ratu	6° 59′ 18″ S, 106° 33′ 01″ E	4°36'15"	6°40'39"	5°48'28"	0,26%
		Banda Aceh	5° 33′ 13″ N, 95° 19′ 03″ E	4°23'44"	6°57'08"	6°09'10"	0,29%

Table 2. Data on hilal observations at several locations in Indonesia for the months of Ramadan, Shawwal and Zulhijjah in the period 1443/2023 – 1483/2061.

The determination of the beginning of Ramadan 1446 AH reveals variations in *hilal* altitude and elongation between eastern and western Indonesia. In Merauke, the recorded *hilal* altitude was 2°44'18", which did not meet the Neo MABIMS criteria as it was below the 3° threshold. Conversely, in Pelabuhan Ratu and Banda Aceh, the *hilal* altitude reached 3°49'36" and 4°28'02", respectively, satisfying the required standard. However, while the geocentric elongation in Merauke was only 4°49'38", falling short of the 6.4° threshold, the geocentric elongations in Pelabuhan Ratu (6°24'18") and Banda Aceh (6°24'11") were near the critical limit.

Similarly, during the determination of Zulhijjah 1446 AH, the *hilal* altitude in Merauke was recorded at 0°26'46", indicating that the *hilal* was still below the horizon. In Pelabuhan Ratu and Banda Aceh, the *hilal* altitudes were 0°59'19" and 2°56'01", respectively, failing to meet the 3° minimum requirement. However, the geocentric elongations in Pelabuhan Ratu (6°39'07") and Banda Aceh (7°06'15") met the Neo MABIMS standard, whereas the elongation in Merauke (5°47'50") remained below the required threshold.

A similar pattern emerged in the determination of Zulhijjah 1474 AH, where the *hilal* altitude at all observation sites did not meet Neo MABIMS standards. In Merauke, the *hilal* altitude was recorded at 1°41'21", lower than in Banda Aceh (2°12'58") and Pelabuhan Ratu (2°49'05"). Furthermore, the geocentric elongations in Banda Aceh (7°10'37") and Pelabuhan Ratu (6°44'32") also fell below the required 6.4° threshold. Meanwhile, Merauke recorded an even lower elongation value of 5°52'01", further failing to meet the stipulated criteria.

Conversely, in determining the beginning of Shawwal 1469 AH, *hilal* altitude measurements across different locations met the Neo MABIMS criteria. The recorded altitudes in Merauke (3°03'37"), Pelabuhan Ratu (4°09'36"), and Banda Aceh (3°55'51") were all above the 3° requirement. However, despite meeting this criterion, the geocentric elongations in Merauke (5°18'00") and Pelabuhan Ratu (6°27'16") remained below the 6.4° threshold. Notably, Banda Aceh, with a geocentric elongation of 6°59'22", was the only location that fully met the Neo MABIMS minimum elongation requirement.

These findings illustrate the significant variation in *hilal* visibility across different regions in Indonesia, with the western region generally having a higher likelihood of meeting the elongation criteria. In contrast, eastern regions, particularly Merauke, continue to face considerable challenges in fulfilling both the *hilal* altitude and elongation requirements.

The potential for polemics arises when the *hilal* is not visible during *rukyatul hilal*, despite its position meeting the *imkan rukyat* criteria, which signifies the theoretical possibility of sighting. This situation leads to a divergence of opinions regarding the determination of the new month—whether it should begin based on the *imkan rukyat* criteria or if the current month should be completed to 30 full days (i*stikmal*) due to the absence of a visible *hilal*. Such debates have been particularly pronounced, especially in the determination of 1 Muharram 1445 AH.

The first day of Muharram holds significant religious and historical importance in Islam, commemorating the Prophet Muhammad's hijrah to Medina.(Lestari et al., 2023) However, the determination of 1 Muharram 1445 AH created public confusion. On 29 Zulhijah 1445 AH (July 6, 2024), *hilal* altitude measurements across Indonesia ranged from 2°47' in Merauke to 5°40' in Sabang, with elongation values between 6°19' and 7°19'. Despite meeting the Neo MABIMS *imkan rukyat* criteria, observation reports indicated that the *hilal* remained unseen due to unfavorable weather conditions, such as cloudy skies, rain, and fog. (*Pengumuman Lembaga Falakiyah Pengurus Besar Nahdlatul Ulama Tentang Awal Bulan Muharram 1446 H Nomor : 046/LF–PBNU/VII/2024*, 2024)

The Indonesian government determined that Muharram 1445 AH would commence on Sunday, July 7, 2024, based on the fulfillment of the Neo MABIMS *imkan rukyat* criteria. This decision aligns with the Indonesian Hijri Calendar Year 2024, as published by the Ministry of Religious Affairs, as well as the Joint Decree (SKB) of Three Ministers on National Holidays and Joint Leave in 2024.(*Kapan 1 Muharram 1446 H? Ini Penjelasan Kemenag*, n.d.) However, the Falakiyah Institute of the Nahdlatul Ulama (LFNU) adopted a different approach, opting to complete the month of Zulhijah to 30 days (*istikmal*) due to the absence of a visible *hilal*. According to the LFNU method, 1 Muharram 1445 AH would instead fall on Monday, July 8, 2024 (Aziz et al., 2024). This discrepancy resulted in a divergence between the Nahdlatul Ulama Calendar and the official Indonesian Hijri Calendar, which both designated July 7, 2024, as the beginning of the new month.

A similar issue occurred in 2017 concerning the month of Jumadil Akhir 1438 AH in the Nahdlatul Ulama Hijri Calendar, which had an unusual duration of only 28 days. This anomaly stemmed from the absence of a visible *hilal* during the determination of the month's beginning, despite its altitude meeting the criteria. On 29 Jumadil Awal (February 27, 2017), *hilal* altitude in Indonesia ranged from 7°3' in Merauke to 9°12' in Sabang, with elongation values between 8°45' and 10°13'. However, the beginning of Jumadil Akhir 1438 AH was determined based on the *istikmal* method, as the *hilal* was not observed. On 28 Jumadil Akhir 1438 AH (March 28, 2017), a comprehensive *hilal* observation was conducted, successfully detecting the *hilal* in Pelabuhan Ratu and Condrodipo Gresik (Haq, 2022). At that time, the *hilal*'s position in Pelabuhan Ratu was at an altitude of 3°41', with an elongation of 4°36', while in Condrodipo Gresik, it was at an altitude of 3°29', with an elongation of 4°25'. Consequently, the previous determination of *istikma*l for Jumadil Awal

1438 AH was annulled, as the fundamental principle of the Hijri calendar stipulates that a lunar month must consist of either 29 or 30 days.(Wafa, 2021)

These cases illustrate the ongoing challenges in the standardization of Hijri calendar determinations in Indonesia, particularly regarding the interplay between *imkan rukyat* criteria and empirical *rukyat* observations. The discrepancies between government-issued calendars and alternative calculations by religious organizations highlight the complexity of integrating astronomical data, observational feasibility, and religious jurisprudence in determining the Islamic lunar calendar.

The Implementation of New MABIMS Criteria: A Study of the Relationship between Reality and Ideality

Direct observations (*rukyatul hilal*) based on the Neo MABIMS criteria have significantly improved the accuracy and reliability of *hilal* sightings. This advancement is primarily due to the application of two key parameters: *hilal* altitude and elongation. The Neo MABIMS criteria enable precise identification of the crescent moon's position during observation, thereby enhancing the validity of sighting reports. The effectiveness of this approach has been demonstrated in the determination of 1 Ramadan 1444 AH (March 22, 2023) and 1 Zulhijjah 1445 AH (June 7, 2024), during which the *hilal* was successfully observed and recorded. However, on 1 Muharram 1446 AH, the crescent moon was not visible in Indonesia due to unfavorable weather conditions. Despite this, confirmed sightings from Malaysia and other international locations validate the robustness of this methodology. Furthermore, the documented unaided-eye observation of the crescent moon on Saturday, July 6, 2024, in multiple locations underscores the reliability of the Neo MABIMS criteria (*Galeri Pengamatan Hilal Awal Bulan Ramadan 1444 H, n.d.; Galeri Pengamatan Hilal Awal Bulan Zulhijah 1445 H*, n.d.).

The Neo MABIMS criteria serve as a rigorous screening mechanism for rukyat reports, particularly in the determination of key Islamic dates, such as the beginning of Ramadan, Eid al-Fitr, and Eid al-Adha. This framework seeks to bridge the divide between *shar'i* (Islamic legal) and astronomical *hilal* considerations by establishing standardized and dependable criteria. In practice, modern astronomical calculations (*hisab*) guide observations toward designated areas in the western sky, ensuring that all reported sightings undergo verification by an authorized authority before acceptance. By integrating an empirical approach supported by comprehensive scientific data, the Neo MABIMS criteria provide a robust methodological foundation for *hilal* observations. This synthesis of scientific principles and Islamic jurisprudence not only enhances the precision of Hijri calendar determinations but also strengthens the legitimacy of decision-making processes based on verifiable data and standardized methodologies.

From an astronomical perspective, the Neo MABIMS criteria are considered both viable and methodologically sound. However, the practical implementation of the 3°-6.4° threshold continues to generate debate among experts and the general public. The controversy primarily arises from inconsistencies in the application of these criteria when determining the beginning of the Hijri month. A prominent example of this issue was observed in the determination of 1 Shawwal 1443 AH, where astronomical data indicated that while the *hilal* altitude in some locations met the Neo MABIMS visibility threshold of 3°, the topocentric elongation in most regions of Indonesia did not reach the required 6.4°. In fact, in several locations, the topocentric elongation remained below this criterion, raising questions about the consistency of its application.

According to the Decision of the Minister of Religious Affairs of the Republic of Indonesia Number 435 of 2022, the *hilal* was successfully observed in Kupang, East Nusa Tenggara. The recorded data from Kupang showed that although the *hilal* altitude reached 3°56', the geocentric elongation was 6°13', and the topocentric elongation was only 5°24', both of which did not satisfy the minimum elongation criterion of 6.4° as stipulated by Neo MABIMS. This decision highlights the government's tendency to prioritize geocentric elongation data over topocentric elongation in determining the start of the Hijri month. The acceptance of visual *hilal* reports that do not fully meet the elongation criteria, whether geocentrically or topocentrically, further suggests a preference for *rukyat* (direct observation) over strict adherence to the calculated parameters. This situation underscores the need for a comprehensive evaluation of the consistency and application of the Neo MABIMS criteria, particularly in cases where *rukyat* reports conflict with established astronomical benchmarks.

The implementation of the Neo MABIMS criteria in the field presents a complex reality, particularly in terms of its technical application. A major challenge arises from the ambiguity surrounding the use of the elongation calculation model. In determining the start of Shawwal 1443 H in Indonesia, geocentric elongation was used as the primary reference, despite the Neo MABIMS criteria explicitly recommending the topocentric model. This inconsistency highlights a lack of clarity in the technical aspects of the criteria, particularly concerning astronomical calculations. The existing guidelines do not provide sufficient detail on handling borderline cases where the *hilal*'s position nearly meets or fails to meet the minimum altitude of 3° and elongation of 6.4°.

Moreover, there are instances where hisab calculations indicate that the *hilal* does not meet the Neo MABIMS criteria, or only one parameter is satisfied, yet *rukyat* testimony is still accepted by the authorities. Such testimonies are formally recognized after the observer swears an oath before a religious court judge, even in the absence of photographic evidence. This practice suggests a prioritization of *shari'ah*-based procedures over strict scientific validation. The inconsistency between hisab results, which do not fully align with the criteria, and *rukyat* reports, which are accepted without thorough verification, further complicates the application of the Neo MABIMS framework.

This situation suggests that the implementation of the Neo MABIMS criteria follows a pragmatic approach that aims to simplify decision-making. However, the lack of adequate simulation and field testing prior to its adoption indicates an insufficiently rigorous design process. Therefore, a comprehensive evaluation and refinement of the criteria are necessary to ensure a consistent, scientifically robust, and accountable approach to *hilal* visibility determination, both in the context of astronomical precision and *shari'ah* compliance.

In Indonesia, the altitude of the Moon (*hilal*) remains the primary factor in determining the commencement of the Hijri month. However, several additional factors influence the likelihood of observing the *hilal*. These include the geometric positions of the Moon and Sun, atmospheric conditions, the observation location, the instruments used, the preparedness of the observers (perukyat), and other relevant parameters. (Soderi & Izuddin, 2020; Taher & Abdulla, 2024) Despite meeting the minimum altitude criteria, the challenge of elongation values falling below the required standard persists as a significant obstacle in direct *hilal* observation. This highlights the necessity of simultaneously considering both *hilal* altitude and elongation to improve the accuracy of *hilal* visibility predictions, particularly in eastern Indonesia, where elongation values tend to be lower than in western regions.

The topocentric calculation approach proposed in the Neo MABIMS criteria represents a significant advancement in supporting direct observation (*rukyatul hilal*). This method aids in classifying *hilal* visibility based on optimal conditions.(Sudibyo, 2014) Furthermore, the Ad-Referendum document, which serves as the foundation for the Neo MABIMS criteria, explicitly states that the minimum hilal altitude of 3 degrees and elongation of 6.4 degrees must be applied cumulatively rather than separately. This is reinforced through the use of the conjunction "and" in the Ad-Referendum statement: "... *telah bersetuju dan mengesahkan bagi pelaksanaan kriteria imkanur rukyah MABIMS yang baru (tinggi 3 darjah dan elongasi 6.4 darjah).*" (*Persetujuan Kriteria Imkanur Rukyah Baharu* MABIMS, 2022) Consequently, the implementation of these criteria underscores the importance of maintaining harmony between astronomical parameters to ensure consistency and accuracy in determining the beginning of the Hijri month.

The government must ensure consistency and commitment in applying the Neo MABIMS criteria as the primary reference for determining the beginning of the Hijri month. Addressing controversies related to the implementation of these criteria, particularly regarding the calculation methods used, is essential to maintaining public trust. A review of hisab calculations over the past 50 years indicates that 16 instances exist where the determination of Ramadan, Shawwal, and Zulhijjah would have been classified as critical if analyzed using the Neo MABIMS criteria. The precise and consistent application of these criteria is crucial, as any ambiguity may lead to confusion within the Muslim community and potentially disrupt religious harmony.

To address concerns regarding elongation, a discussion forum was convened, bringing together the Ministry of Religious Affairs of the Republic of Indonesia, astronomers, *falak* science experts, and representatives of Islamic organizations.(Thomas Djamaluddin, 2023) The forum resulted in a provisional agreement to incorporate geocentric elongation as a parameter in determining the Hijri month in Indonesia. However, this agreement remains non-binding, as no official decision has been issued by either the Ministry of Religious Affairs or the MABIMS Ministerial Council to formally authorize its implementation.

The Neo MABIMS criteria, formulated as a collective policy by the ministers of religion from Malaysia, Brunei Darussalam, Indonesia, and Singapore, should ideally be applied uniformly across all member countries. However, in practice, their implementation faces challenges due to variations in calculation models used by each nation. Resolving these differences requires joint dialogue to reach a mutually acceptable solution rather than relying on unilateral approaches. Although MABIMS member countries have agreed to adopt the same criteria as the standard for determining the beginning of the Hijri month, each country still adjusts its application based on regional conditions and the local visibility of the new moon. As a result, discrepancies in determining the start of Ramadan, Eid al-Fitr, Eid al-Adha, and other religious observances persist among MABIMS nations.

To address these inconsistencies, the Ministry of Religious Affairs must take a proactive role in accommodating diverse inputs, scientific studies, and expert recommendations to refine the Neo MABIMS criteria, ensuring they become more optimized and widely applicable. These criteria are not only essential for national implementation but also hold potential for broader regional adoption among MABIMS countries. Therefore, a periodic evaluation of the Neo MABIMS criteria is necessary, incorporating the latest data from *hilal* observations, particularly those that challenge previous visibility records. This iterative approach enables continuous refinement of the criteria, leveraging advancements in technology to enhance crescent visibility predictions while expanding the scope of observational data.

The Neo MABIMS criteria can also serve as a foundation for legitimizing the use of optical aids and imaging techniques in *rukyatul hilal*, provided that observations are conducted after sunset in accordance with *shar'i* provisions. This integration highlights the necessity of aligning *imkan rukyat* criteria with scientific principles to ensure that observational results are logically and scientifically substantiated while remaining consistent with shar'i doctrine. In this context, transparent and accurate reporting of *rukyat* results plays a crucial role in strengthening the credibility of the applied criteria.

To implement this directive effectively, MABIMS must assess the receptiveness of the Muslim community and Islamic organizations toward embracing and operationalizing this policy. Conflict management—considering its nature, scale, and resolution strategies—should be a priority to ensure the successful unification of these criteria (Mufid & Djamaluddin, 2023). Additionally, comprehensive outreach and education efforts targeting religious judges are essential, particularly regarding the application of the new *imkan rukyat* criteria in the *isbat* process. By adhering to these criteria, religious judges can verify *rukyat* testimonies with greater accuracy using valid astronomical data and image evidence. This structured approach is expected to enhance public confidence in the government's determination of the Hijri month's commencement, fostering a stronger consensus and exerting a positive influence on the Muslim community.

Conclusions

This study aims to analyze the implementation of the Neo MABIMS criteria by the Ministry of Religious Affairs in determining the beginning of the Hijri month. The findings reveal that the application of these criteria faces numerous challenges, particularly concerning technical aspects in the field. A major obstacle is the inconsistency in their implementation, both in *rukyatul hilal* practices and in the official determination of the Hijri month. While the Neo MABIMS criteria—defined by the 3° altitude and 6.4° elongation parameters—have significantly contributed to improving the validity and accuracy of *hilal* observations, their practical application remains a subject of debate among experts and the general public. This ongoing discourse stems primarily from the misalignment between theoretical frameworks and the technical challenges encountered in actual observation practices.

This study highlights the critical importance of consistency and commitment from the government, particularly the Ministry of Religious Affairs, in adopting the Neo MABIMS criteria as the primary guideline for determining the beginning of the Hijri month. A proactive approach is essential to incorporate input, studies, and recommendations from various stakeholders, ensuring the development of criteria that are more refined and broadly applicable. Additionally, the study underscores the necessity of periodic evaluations of the Neo MABIMS criteria, integrating the latest *hilal* observation data, particularly those that introduce new visibility records. A thorough review of *rukyat* reports that deviate from the established astronomical parameters is also imperative, enabling the formulation of criteria that align with contemporary technological advancements.

Furthermore, the study emphasizes the paramount importance of transparency and accuracy in *rukyat* reports, reinforcing their role in legitimizing the applied criteria. It advocates for an integrative approach that harmonizes scientific principles with *shar'i* considerations in the implementation of the Neo MABIMS criteria, facilitating the unification of methods for determining the Hijri month. Consequently, the findings of this study contribute strategically to the development of more adaptive and solution-oriented policies regarding variations in the determination of the Hijri calendar. This integrated framework is expected to promote the unification of the Hijri calendar in Indonesia, thereby fostering religious harmony and strengthening social cohesion within the Indonesian community.

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