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Shahadah 'Ilmy; Integrating Fiqh and Astronomy Paradigm in Determining The Arrival of Lunar Months in Indonesia

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Abstract:

Formulating the fixed methodology for determining the beginning of Ramadan month and Islamic Feast in Indonesia is still ongoing. This article attempts to offer an integration between sharia and scientific views through 1) the concept of shahadah (witnessing) in the paradigm of fiqh and astronomy, and 2) the integration of those paradigms in determining the beginning of lunar months, particularly Ramadan and Syawal.

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This study uses qualitative methods in gaining the data then analyzes it using the approach of Miles & Huberman on interdisciplinary study. The findings of this research are as follows: 1) the concept of shahadah in the paradigm of fiqh is based on religious vows and factual evidence, while the astronomical paradigm perceives it from the certainty of external factors (weather, climate, environment, etc.). 2) Integration of those two paradigms results in better methods. It can turn the shahadah into the quality of qat'i (fixed) while the astronomic perspective gains more legitimacy. The integration is therefore called shahadah-'ilmi which potentially integrates the criteria of crescent visibility (imkan al-rukyah) in Indonesia to minimize the common occurrence on differences in determining those days.

Keywords:

Integration; Astronomy; Fiqh;
Shahadah al-'Ilmi

Abstract:

Penetapan awal bulan Ramadhan dan Hari Raya di Indonesia masih terus dirumuskan metodologinya. Artikel ini menawarkan integrasi antara sudut pandang syari'ah dan saintifik melalui kajian atas 1) konsep syahadah dalam paradigma fiqh dan astronomi, 2) integrasi paradigma fiqh dan astronomi dalam menetapkan awal bulan Islam, utamanya Ramadhan dan Syawal. Penelitian ini menggali data dengan metode kualitatif kemudian menganalisisnya dengan pendekatan Miles & Huberman tentang kajian interdisipliner. Temuan penelitian ini adalah sebagai berikut: 1) Konsep shahadah dalam paradigma fiqh adalah penglihatan yang disertai dengan sumpah dan bukti faktual, sementara dalam paradigma astronomi, shahadah didasarkan pada kepastian ukuran dari faktor-faktor eksternal meliputi cuaca, iklim dan lingkungan. 2) Integrasi dua paradigma tersebut menghasilkan metode yang lebih baik dalam penentuan awal Ramadhan dan Syawal. Shahadah dalam sudut pandang fiqh berubah menjadi qath'i (pasti), sementara hasil persaksian astronomi semakin memperoleh legitimasi. Integrasi kedua paradigma melahirkan konsep shahadah-'ilmi yang dapat digunakan untuk menentukan tampaknya hilal (rukyah hilal) awal Ramadhan

dan Syawal di Indonesia sehingga perbedaan yang kerap terjadi dalam menentukan dua awal bulan tersebut dapat diminalisir.

Keywords:

Integrasi; Fiqh; Astronomi; Shahadah 'ilmi

Introduction

Determining the first day of Ramadan and Syawal (Islamic Feast) is an annual event where the Indonesian mass organizations typically release different decisions.¹ It is mainly based on diverse methods in deciding the criteria for lunar months. Some use the *rukyyat hilal* (eye watching of the crescent) while some others choose *hisab* (calculating the calendar). Furthermore, they even have respective calendars, such as Muhammadiyah Calendar, PBNU Almanac, Indonesian Standard Taqwim, MABIMS Taqwim, PERSIS Islamic Almanac, *Menara Kudus*, LDII Calendar, and Hijri Syamsi Calendar (Ahmadiyah).²

As a consequence, they tend to favor their respective decision based on the understanding of *fiqh* with either considering scientific instruments or not. This is clear from the way they highlight their identity and existence through the issued decision while maintaining the chosen method. Furthermore, they usually like to announce the decision while urging each follower to massively comply with it.

¹ Nihayaturrohmah, "Hukum Sumpah Bagi Orang Yang Melihat Hilal Kurang Dari Dua Derajat," *El-Wasathiya: Jurnal Studi Agama* 1, no. 1 (2013): 112–36. Compare to Sakirman Sakirman, "MENELISIK METODOLOGI HISAB-RUKYAT DI INDONESIA," *HUNAF: Jurnal Studia Islamika* 8, no. 2 (2011): 341, <https://doi.org/10.24239/jsi.v8i2.368.341-362>. Thomas Djamaluddin, "Menggagas Fiqh Astronomi," *Kaki Langit, Bandung*, 2005. Syamsul Anwar, "Metode Usul Fikih Untuk Kontekstualisasi Pemahaman Hadis-Hadis Rukyyat," *Tarjih: Jurnal Tarjih Dan Pengembangan Pemikiran Islam* 11, no. 1 (2013): 113–30.

² Fadholi, Ahmad. 2019. "Akseptabilitas Draf Kriteria Baru Penentuan Kalender Hijriah Menurut Ahli Falak Di Indonesia". *Edugama: Jurnal Kependidikan Dan Sosial Keagamaan* 5 (1), 101-14. <https://doi.org/10.32923/edugama.v5i1.961>. 103. Qulub, Siti Tatmainul. 2015. "Telaah Kritis Putusan Sidang Itsbat Penetapan Awal Bulan Qamariyah di Indonesia dalam Perspektif Ushul Fikih." *Jurnal Al-Ahkam* 25(1): 109–32. DOI: <http://dx.doi.org/10.21580/ahkam.2015.1.25.196>

On the other hand, the government as the institution that decides *itsbat* (formal determination of the first days of lunar months) has not yet been able to comprehensively accommodate the ideas of all Islamic mass organizations. They even seem unable to create a basic formula for either accepting or rejecting the *shahadah rukyah* (the witnessing of eye watching) result. This can be seen from several relevant cases which often lead to controversy.

Two clearest examples are the Decree of the Indonesian Minister of Religious Affair in accepting the *shahadah rukyah hilal* for determining days of Islamic Feast or *Idul Fitri* at 1413 H/1993 AD and 1418 H/1998 AD. In those two cases, the position of the crescent was surely known to be below the horizon according to accurate astronomical *hisab* and *shahadah* of *hilal* from Bawean and Cakung. The government, however, decided to determine the Feast at the days when the crescent was still in the position.

Another controversy over the witnesses of the new moon occurred in determining the first day of Dzulhijah in 1422 H/2002 AD. At that time, the position of the new moon was the same as previously mentioned. However, the Minister of Religious Affair accepted the *shahadah rukyah* result because the witnesses (*shahid*) had been sworn in or had fulfilled the requirement of *syar'i*.³

Even so, the government continues to make efforts to find the right method and criteria so that it can be accepted by all parties. They established the Hisab Ru'yah Agency (BHR; *Badan Hisab Rukyat*) on January 20, 1972, based on the Decree of the Minister of Religious Affair No. 76. Its membership consists of astronomical experts, mass organization figures, *hisab* (mathematical calculation) experts and representatives from related government agencies. They range from the National Aeronautics and Space Agency (LAPAN; *Lembaga Penerbangan dan Antariksa Nasional*), the Meteorology, Climatology and Geophysics Agency (BMKG; *Badan Meteorologi, Klimatologi dan Geofisika*), to the Geospatial Information Agency (BIG; *Badan Informasi*

³ Asadurrahman, *Kebijakan Pemerintah Indonesia Tentang Hisab Dan Rukyat* (Jakarta, 2013).

Geospasial)⁴ and academics. One of its achievements is formulating a criterion called *imkan al-ru'yah* (hilal visibility).⁵

Upcoming the Eid Al-Adha, another Islamic Feast, in March 1998 AD (Dzulqa'dah 1418 H), experts, on *hisâb* and *rukayah* as well as representatives of Islamic organizations held a meeting on *imkan al-ru'yah* and resulted in some verdicts. *First*, the determination of lunar months' beginning is based on *imkan al-rukayah*, even though there is no report of *rukayah al-hilal*. *Second*, the *imkan al-ru'yah* is based on the height of the crescent which is 2 degrees above the horizon while its duration at the position is at least 8 hours from the time of *Ijtima'* to the sunset. *Third*, the height in question is based on the calculation results of the *Haqiqi Tahqiqi* reckoning system. *Fourth*, the report of *rukayah al-hilal* which is less than 2 degrees can be rejected.⁶

Unfortunately, it is considered only a means of confirming another method, namely *hisab*, which was commonly used in Indonesia. The criteria for *imkan al-ru'yah* as the legal basis for determining the arrival of new lunar months is also deemed still referring to those formulated by MABIMS (*Menteri-menteri Agama Brunie Darussalam, Indonesia, Malaysia dan Singapura*; Ministers of Religious Affairs from various countries in Southeast Asia).

In line with it, Nihayaturrohmah assumed that one point of the verdict is not quite clear and firm. She stressed on the last point particularly to the word "can" which, according to her, does not imply firmness but provides concessions instead. In addition, she suggested that the criteria for *imkan al-rukayah* need scientific legitimation instead of relying solely on customs. Thus, an alternative solution is needed to formulate the criteria for *imkan al-ru'yah* which is scientifically compatible.⁷

⁴ Bakosurtanal, "Rapat Koordinasi Penyusunan Rencana Aksi Nasional Informasi Geospasial," 2015.

⁵ Badan Hisab & Ru'yah. Islam, *Almanak Hisab Ru'yah* (Jakarta: Proyek Pembinaan Badan Peradilan Agama Islam, 1981). Compare to Ibnu Hajar Al-Haitami, *Ithāfu Ahli Al-Islām Bi Khusūsiyyāt Al-Shiyām*, Cet.1 (Madinah: Maktabah Thoyyibah, 1990).

⁶ Nihayaturrohmah, "Hukum Sumpah Bagi Orang Yang Melihat Hilal Kurang Dari Dua Derajat."

⁷ Nihayaturrohmah. 113

This is mainly important considering that the witness result of the crescent eye watching may not always be absolutely true. The human's sense of sight can be wrong at any time. Another object can be possibly seen as the moon. Therefore, the assumption for watching the moon needs to be strengthened by scientific knowledge and long-time experience. Moreover, the state of the crescent is indeed very dim and sometimes difficult to identify because it may only appear like a thin line.⁸

From the *fiqh* perspective, the decision is deemed valid because the witness has taken a vow. However, in terms of the truth of the object he/she saw, it needed further proof to decide whether it was the new moon or another bright object. Therefore, relying only on the vow is not enough. It needs scientific evidence mainly because, in the current context, pollution, climate, and weather disturbances on the western horizon can make it difficult to observe and identify celestial objects.⁹

Furthermore, in accordance with the vow-taking mechanism of the *shahadah rukyah hilal* in the *Rukyah* Technical Guidelines issued by the Ministry of Religious Affair in collaboration with the General Development of Islamic Religious Institutions and the Directorate of Development of the Islamic Religious Courts 1994/1995, witness' testimony needs a future inspection to ensure its suitability with the truth.¹⁰ This was pivotal considering the difficulty to watch the crescent, the frequent deceits by clouds resembling the crescent, or illusions (sensory error) coming from a strong desire to see the crescent successfully. Meanwhile, things to consider carefully in the witness examination are the time of watching and the crescent's position.¹¹ Therefore, the government needs to formulate the crescent criteria to comply with the concepts of *fiqh* and astronomy.

As far as we can say, the *imkan al-rukyah* criteria based on *fiqh* requirement integrated with factual astronomical data throughout the Month Observatory Center (POB; *Pusat Observatorium Bulan*) had not

⁸ Ibid. 113

⁹ Nihayaturrohmah.

¹⁰ Islam, *Almanak Hisab Ru'yah*.

¹¹ Nihayaturrohmah, "Hukum Sumpah Bagi Orang Yang Melihat Hilal Kurang Dari Dua Derajat." 134

been structurally confirmed yet. Therefore, the formulation of integrated scientific *shahadah rukyah hilal* was significant given the existence of *shahadah* as the basis for determining the beginning of the lunar months.

In general, research on the determination of the new moon using *hisab* and *rukayah* methods in Indonesia has been carried out by some previous researchers.¹² In addition, another study completely compares the method of determining the beginning of the Islamic months in Indonesia and Malaysia.¹³ Most of those previous studies illustrate that the two methods can be integrated and are strengthening each other.¹⁴

The research that specifically focuses on methodological aspects of *rukyyatul hilal* in determining the beginning of lunar months in Indonesia is still limited. Therefore, this article offers the concept of *shahadah 'ilmi* as a methodology in an effort to determine the *rukyyat hilal* at the beginning of lunar months in Indonesia by combining the paradigms of *fiqh* and astronomy.

Based on the above background, it becomes urgent to formulate an objective and proportional integration between *fiqh* and astronomical perspective in determining the first days of lunar months, particularly Ramadhan and Syawal.

Method

This research uses an integrative-interdisciplinary descriptive method in analyzing the concept of *syahadah rukyah al-hilal*. At first, the existing concept of *shahadah* was explained from the paradigm of

¹² Anwar, “Metode Usul Fikih Untuk Kontekstualisasi Pemahaman Hadis-Hadis Rukyat.” See also Niki Alma Febriana Fauzi, “Syamsul Anwar Dan Pemikirannya Dalam Bidang Hisab-Rukyat,” *Al-Marshad: Jurnal Astronomi Islam Dan Ilmu-Ilmu Berkaitan* 1, no. 1 (2017): 104–33. See also Fathor Rahman, Pujiono, and Siti Muslifah, “Penentuan Awal Bulan Kamariah Untuk Ibadah (Sebuah Pendekatan Terpadu)” 12, no. 2 (2020): 107–38, <https://doi.org/http://doi.org/10.21093/fj.v12i2.2264>.

¹³ Ahmad Wahidi, Noer Yasin, and Ali Kadarisman, “THE BEGINNING OF ISLAMIC MONTHS DETERMINATION IN INDONESIA AND MALAYSIA: Procedure and Social Condition,” *ULUL ALBAB Jurnal Studi Islam* 20, no. 2 (2019): 322–45, <https://doi.org/10.18860/ua.v20i2.5913>.

¹⁴ Sakirman, “MENELISIK METODOLOGI HISAB-RUKYAT DI INDONESIA.”

fiqh and astronomy. After that, it tries to integrate the two paradigms in an effort of formulating a new concept with a certain formula that can make it justified by *fiqh* and accepted from the scientific perspective.

The concept of *shahadah al-'ilmi* that we propose is based on an interdisciplinary study approach namely the interfield theory developed by Lindley Darden and Nancy Maull. This theory requires the principles of interdisciplinary integration through the following elements: 1) the main problem, 2) a domain consisting of some data taken into facts related to the main problem, 3) the facts to explain in the general scope containing possibility to overcome the problem, 4) the techniques and methods, and 5) various concepts, laws, and theories related to research problems and explanation of their use in accordance with research purpose.¹⁵

Discussion and Result

Shahadah Rukyah Hilal from *Fiqh* Perspective

As a product of Islamic law, *fiqh* deals with the issue of legal certainty over the *shahadah rukyah hilal* for the arrival of lunar months. In this context, according to as-Subki,¹⁶ *fiqh* needs to formulate a decision in terms of rejecting or accepting the *shahada rukyah hilal* result based on four conditions.

First, the witness must comply with the criteria of *hudhur* (present), *'adl* (fair) and *dhabit* (trustworthy) convincingly. *Second*, minimum criteria of witness acceptability according to the experts of *hisab*¹⁷ must be fulfilled so that the witness report can be convincing without any *tuhmah* (interest). *Third*, instead of based on the dispute on *shahadah*, the judge's decision must rely on explanation and proof as a requirement from the *ayqana* (convincing) point.

Relating to this, the history recorded Prophet Muhammad as an *ummi* (illiterate) figure who can't write or count (*la naktubu wa la*

¹⁵ Lindley Darden and Nancy Maull, "Interfield Theories," *Philosophy of Science* 44, no. 1 (1977).

¹⁶ As-Subki, *Kitab Al-'Alam Al-Mansyur Fi Isbat Asy-Syuhur* (Mesir: Mathba'ah Kurdistan al-'Ilmiyyah, 1911).

¹⁷ Nizar Mahmud Qasim, *Al-Ma'ayir Al-Fiqhiyyah Wal Falakiyyah Fi I'dad at-Taqa'wim Al-Hijriyyah* (Beirut: Dārul Basyāir al-Islāmiyyah, 2009).

nahsubu). However, this implies deep wisdom because Allah wants to show that the Qur'anic verses that the Prophet conveyed were not made by him, but were sourced directly from Allah.

In a different context, because the Prophet Muhammad could not count, Muslims at that time did *rukyyah* in determining the beginning of the Ramadan and Syawwal. Sayyid Uthman in the book titling *Iqodh an-Niyam fi Ma Yata'allaq bi al-Ahillah wa as-Shiyam* mentioned that the *rukyyah* command aimed to eliminate difficulties in determining the beginning of the months.¹⁸ However, this does not mean that any *rukyyah* result can be randomly accepted by the Prophet.

Historically, there was a companion who claimed to have seen the new moon even though at the same time, other companions did not do the same. The Prophet then came to him and asked, "Have you seen the new moon?" "Yes," replied the companion. The Prophet then took his eyelashes that fell right in front of his eyelids. "Are you still seeing the moon?" asked the Prophet. "No, O Prophet," replied the companion. "What you saw earlier was not the new moon, but your falling eyelashes," the Prophet explained.

The story clearly shows that the Prophet paid attention to the proof in either accepting or rejecting any *rukyyah* result of the new moon or crescent. He did not just accept the results randomly, but also helped to ensure that the object was the real new moon instead of other objects.

In another case, it is narrated that when the Prophet had confirmed that what the witness saw was the new moon, the Prophet then asked him with a creed, "*Atasyhadu an laa ilaha illa Allah wa anna Muhammad ar-rosul Allah?* (Do you confess that no God but Allah and that I (Muhammad) am his prophet?)" When the companion testified this, the results of his witness were then accepted.¹⁹

It is clear, therefore, that according to *fiqh* perspective, the existence of *shahadah* or scientifically convincing witness is very important as a prerequisite for the judges in either accepting or

¹⁸ Anwar, "Metode Usul Fikih Untuk Kontekstualisasi Pemahaman Hadis-Hadis Rukyat."126

¹⁹ Nihayaturrohmah, "Hukum Sumpah Bagi Orang Yang Melihat Hilal Kurang Dari Dua Derajat."134

rejecting *rukayah hilal* result from anybody.²⁰ *Shahadah* furthermore becomes a part of the *hujjah syar'iyah* (argument of law) and therefore a provision in all aspects of Islamic law. In the context of the first days of lunar months determination, *shahadah* is highly dependent on the witness' understanding of the crescent according to *fiqh* and scientific perspective as well as the physical look and movement of the Earth, the Moon, and the Sun both theoretically and practically.

In addition to it, *fiqh* conceptually requires two elements, namely *tahammul* (receiving specific information) and *adah* (forwarding the information). The former element depends on the existence of a burden or obligation to witness the *rukayah hilal*. Meanwhile, the later is optional, namely whether the *rukayah al-hilal* activity is based on either request or self willingness of the witness. Both *tahammul* and *ada'*, in this case, require the same conditions, namely the criteria of '*adil*, *dhabit*, '*adalah*, and *tsiqah*' *adamu at-tuhmah* which must be fulfilled.

Among the criteria, both the strong memory to remember or to memorize (*dhabit*) and religious integrity ('*adalah*) are deemed as a foundation to lead into the criteria of credibility (*tsiqahi*). *Dhabit* indicates the ability to well understand and record the thing that has just been hard as well as convey it other people. This can be tested through *i'tibar* (comparing what anyone tells) with the same trusted news.

While the *dhabit* criteria is relatively easy to measure, the '*adalah* is different due to its 'abstract' measurement. Like in the context of the hadith transmission, '*adalah* means a character which encourages a person to do positive things, consistent in goodness, and be religiously very committed. It also closely relates to consistent piety, integrity for the truth, avoidance of both major and minor sins as well as unpleasant yet permissible attitudes. Additionally, it obliges Islam

²⁰ Al-Asqalanī, 2014). See Nidham, *Al-Fatawa Al-Hindiyyah Fi Mazhabī Al-Imām Al-A'dham Abī Hanīfah Al-Nu'man* (Beirut: Darul Fikir, 1991). Compare to Ahmad Dasuqy, *Hāshiyah Al-Dāsuqy 'ala Al-Sharh Al-Kabīr*, Juz V (Beirut: Dar al-Kutub Ilmiah, 1996).

as the religious affiliation of the witness and maturity (*aqil baligh* in the context of age and behavior) as other requirements.²¹

Shahadah Rukyah Hilal from Astronomical Perspective

From the astronomical perspective, *shahadah* can be justified and deemed valid as long as it meets and takes into account to the following factors:

The first is weather factor.²² It, therefore, needs data from the Meteorology, Climatology, and Geophysics Agency (BMKG). Ahmed and Aziz also required data on the temperature and humidity of where the *rukya* takes place using the Sky Quality Meter.²³

The second is a possible tricking factor which can be discovered by relying on astronomical data.

Third is empirical factors or the setting of observation location. To find out this, an image or photo is required. Nawawi also paid attention to the sky's illumination factor and its measurement using a light meter.²⁴ Meanwhile, Shariff emphasized the light pollution in *rukya al-hilal*.²⁵

Fourth is a suitability with the logical reason or general knowledge (*al-'adah*) that the crescent's position is above the horizon with a certain distance and height according to the agreed criteria for *imkan al-ru'yah*.²⁶

²¹ Khairil Ikhsan Siregar and Sari Nurulita, *Ulumul Hadis Kompilasi* (Jakarta: LPP Press Universitas Negeri Jakarta, 2015).

²² Ahmed Kamil Aziz, Abdul Halim Abdul dan Ahmed, "A Unified Islamic Calendar Proposal for the World," *Middle-East Journal of Scientific Research* 22 (1) (2014): 115–20.

²³ Ahmed Kamil Ahmed, Abdul Halim, and Abdul Aziz, "Young Moon Visibility Criterion Based on Crescent Illumination and Sky Brightness Contrast Model," *Middle-East Journal of Scientific Research* 21, no. 9 (2014): 1–4, <https://doi.org/10.5829/idosi.mejsr.2014.21.09.21740>.

²⁴ Mohd Saiful Anwar Mohd Nawawi, "Application of Scientific Approach to Determine Lunar Crescent's Visibility," *Middle-East Journal of Scientific Research* 12 (1) (2012): 96–100.

²⁵ Dkk Shariff, Nur Nafhatun Md Shariff, "The Impact of Light Pollution on Islamic New Moon (Hilal) Observation," *International Journal of Sustainable Lighting* 19 (2017): 10–14.

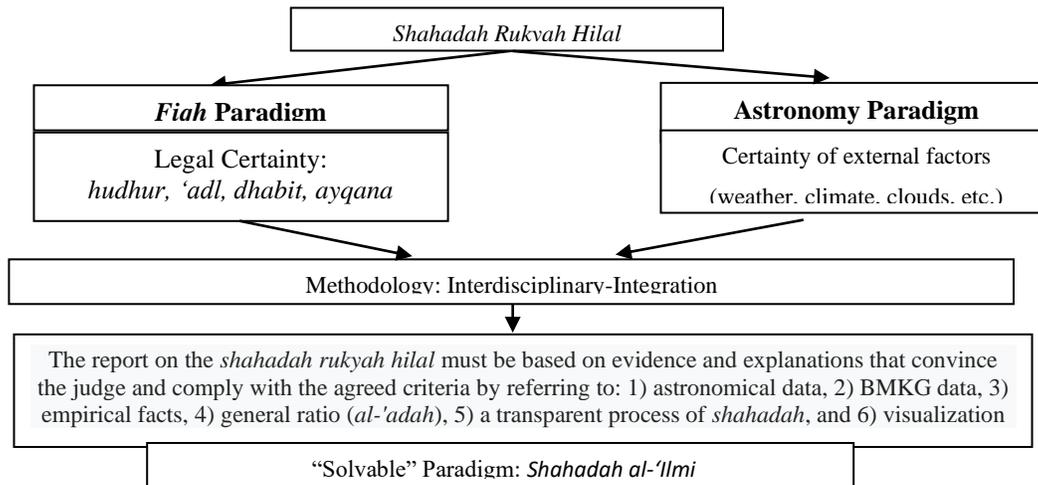
²⁶ Thomas Djamaluddin, *Hisab Rukyat Dan Perbedaannya* (Jakarta: Depag RI, 2004).

However, according to T. Djamaluddin, the criteria for *Imkan al Rukyah* of the Indonesian Ministry of Religious Affair still needs revision. According to him, while the height of the new Moon is supposed to be 2 degrees above the horizon, its distance from the Sun must also be at least 3 degrees. Additionally, if theof the crescent at the position is at least 8 hours long, the minimum height of the new Moon must be no longer uniform. Therefore, it needs to pay attention to the difference in azimuth of the Sun and the Moon.²⁷

Apart of it, if only there was a collective willingness of Indonesian people to observe the crescent from several spreading places, the result can serve as the main instrument in fulfilling scientific conditions for the *rukayah hilal*. In the international context, meanwhile, Odeh had given an example of the proposed *hilal* visibility criteria based on the results of previous observations.²⁸ This scientific requirement is crucial to get attention, particularly from Indonesian Islamic mass organizations so that they can consider astronomical aspects during observation of the crescent.

The Concept of *Shahadah al-'ilmi*

The interdisciplinary model that this research offers can be illustrated in the following scheme:



²⁷ Djamaluddin, "Menggagas Fiqih Astronomi."

²⁸ Mohammad Odeh, "New Criterion for Lunar Crescent Visibility," *Journal Experimental Astronomy* 18 (2004): 39–64.

Figure. 2.1. Integration of *Fiqh* and Astronomy in the *Shahadah Rukyah al-Hilal*

The *shahadah 'ilmi* can be practically further applied by taking the following points into account:

1. Practical Facts on *Shahadah al-'Ilmi*

Interviews with selected correspondents convey that the concept at least covers the following things;

a. Witness (*shahid*)

According to five witnesses whom we successfully interviewed, the common obstacle in conducting *hilal rukyah* when the position of the *hilal* had fulfilled the *imkan ar-ru'yah* criteria was the weather factor in sunset time.²⁹ However, even though the weather conditions have played a significant role in determining the results of *rukayah*, it had not really been taken into account in the preparation of the *rukayah* process.³⁰ The existence of BMKG, for instance, was still considered not giving much influence on the success of *rukayah*. As explained by Reni Kraningtyas, the data can really help the process because it has been very important to understand the foreground of the crescent. Additionally, considering that the weather data presented by BMKG was very detailed, it also becomes important in minimizing errors in watching crescent objects due to covering cloud gaps.³¹

Therefore, we believe that witnesses should be sensitive and knowledgeable about the relevant data whether regarding the position, character, or the foreground covering the crescent. Based on this fact, we also consider it necessary for them to hold the certification in fulfilling the requirements of *shahid* of *rukayah hilal* on both *'adl* and *dhabith* criteria.

²⁹ Interview, December 2020.

³⁰ Taufiq Hidayat, "Developing Information System on Lunar Crescent Observations," *ITB Journal of Science* 42 A (1) (2010): 67–80.

³¹ BMKG, "Data Prakiraan Cuaca Terbuka," 2021.

b. Judge Criteria

Regarding the controversial case of *hilal rukyah* report on August 29, 2011, by Saiful Mujab from POB (Pos Observasi Bulan, *Moon Observatory Post*) Kartini Beach, Jepara, Central Java, which as-Subki includes it as *istihalah ar-ru'yah* (invisibility of crescent), it is known that the result should not have been approved. This is mainly because according to *qath'i* calculations, the position of the *hilal* was under the horizon so that it is supposed to count that the new month had not yet to come. However, it had been eventually approved because not all parties provided support regarding the real position of the crescent. Therefore, although *hisab* system still matters, the *itsbat* procedure must also consider logical consequence to the *shahid* who have ventured to take their vows.

The case furthermore discovers that even though there was a verification procedure before a witness takes a vow, there were still remaining problems. Therefore, it is necessary for *hisab* experts and other relevant experts to formulate joint decisions on the condition of the crescent in both *imkan-al-ru'yah* and *istihalah ar-ru'yah* situation according to certain time and place either at the beginning or the end of *Ramadan*. Thus, it was hoped that the judge's decision in accepting or rejecting the *rukayah hilal* report based on *ijtihad* does not contradict public knowledge and the logical truth (*mustahil' aqlan*) as well as compatible from both *fiqh* and scientific perspectives.

In relation to this, As-Subki in his book titling *al-'Alam al-Mansyur fi Isbatasy-Shuhur*³² emphasized that in the case of assessing *rukayah hilal* result for *Ramadan* and The Feast, the judges need assess the witness based on the following criteria:

- 1) Morally fair
- 2) Ability to distinguish between the convincing and the dubious
- 3) Ability to distinguish between enthusiastic and non-enthusiastic ones

³² As-Subki, *Kitab Al-'Alam Al-Mansyur Fi Isbat Asy-Syuhur*.

- 4) Ability to distinguish which ones are physically healthy and not by using certain parameters.
- 5) Ability to distinguish between those who master the science about the horizon and those who do not
- 6) Ability to specifically identify the point of crescent location from the *rukayah* tool used (such as the location goalpost, telescope, or others)
- 7) Ability to identify the *manzilah* (moon's coordinates) position where the crescent will appear from
- 8) Ability to predict the possibility of crescent visibility and the impossibility

c. Reporting Mechanism of *Shahadah Rukyah Hilal*

The reporting mechanism for *shahadah rukyah hilal* had been via telephone, including when determining the beginning of *Ramadan* and the two Islamic feasts. However, as noted by Ahmad Izzuddin, the caller in charge of reporting the results of the *shahadah rukyah hilal* in POB spreading throughout Indonesia had not been a person who is good at astronomy, but merely office boys. Seeing such conditions, Ahmad Izzuddin then assigned a team of students from IAIN Walisongo Semarang for the Undergraduate and Postgraduate Program in Astronomy Major to take over the task.

It later turns out that the search for information on the result of *rukyah hilal* as the basis for determining the beginning of *Ramadan* and The Feasts in the *isbat* trial is still not optimal. This is mainly clear from very limited available facilities. It also needs to reexamine the procedure considering that not all POBs had been contacted by caller officers. In fact, it is possible for POBs who had not been contacted to watch the *hilal* successfully and convincingly.

d. *Imkan al-Rukyah* Criteria

The commonly used criteria for the guidelines in *hilal rukyah* practices has been *Imkan al-Rukyah* criteria from Cisarua II which was ratified after the meeting on 19-21 September 2011. It consists of; *first, hisab haqiqi* (real count of the calendar) *bi at-tahqiq hilal mar'i* (verification with eye-watching of the crescent) which is at least 2 degrees height above the horizon *Second*, the crescent's duration at the position is at least 8 hours

or 3⁰ elongations. This is in accordance with the Circular Letter of the Ministry of Religious Affairs, Regional Office of Central Java Province.

As time went by, the issue of change in the criteria on *Imkan al ruhyah* had ever occurred from 2015 to 2017. There was a long discussion about the draft of new criteria for determining lunar months in Indonesia, namely those of MUI (*Majelis Ulama' Indonesia*; Indonesian Ulama Council) and MABIMS. They set 3 degrees of the crescent's height with elongation of 6, 4 degrees aiming to create common benefit and mutual agreement for the sake of unification of the lunar calendar in Indonesia.³³ Both rukyat and *hisab* proponents accepted these criteria very well.³⁴

This is in line with the shift of MABIMS criteria. Initially, the *rukya*t witnesses can be accepted if the height of the new moon is 2 degrees with at least 8 hours duration of the Moon at the position since the *ijtima'* to the sunset.³⁵ However, it then changed to 3 degrees with an elongation of 6.4 degrees.³⁶ This shows how the development of criteria always refers to empirical factual data. As far as we can observe, until this research was completed, there were no new criteria except that called by "LAPAN Criteria" by Thomas Djamaluddin.

Thomas Djamaluddin's concept mainly relies on the redefinition of the new moon, the validity of the *rukya*h *al-hilal* or *matla'*, and the criteria for the visibility of the new moon (*imkan al-rukya*h) ratified in 2000 and 2011. The criteria for

³³ Thomas Djamaluddin, "Naskah Akademik Usulan Kriteria Astronomis Penentuan Awal Bulan Hijriyah", diakses 26 Septamber 2016, <http://tdjamaluddin.wodpress.com>

³⁴ Ahmad. Fadholi, "Akseptabilitas Draf Kriteria Baru Penentuan Kalender Hijriah Menurut Ahli Falak Di Indonesia," *Eduagama: Jurnal Kependidikan Dan Sosial Keagamaan* 5, Nomer 1 (2019): 101-14.

³⁵ wahidi, Yasin, And Kadarisman, "The Beginning Of Islamic Months Determination In Indonesia And Malaysia: Procedure And Social Condition."

³⁶ Fadholi, "Akseptabilitas Draf Kriteria Baru Penentuan Kalender Hijriah Menurut Ahli Falak Di Indonesia."

LAPAN 2000 consists of: (a) The duration of the moon at the determined position must be > 8 hours, (b) The Moon-Sun angular distance must be > 5.6°, but if the azimuth difference is < 6°, a higher height difference is required. If the azimuth difference is 0°, the height difference must be > 9°. These criteria were updated by Thomas Djamaluddin in 2011 into (a) Moon-Sun angular distance must be > 6.4°, and (b) Moon-Sun height difference must be > 4°. ³⁷

The LAPAN criteria therefore needs support from various related parties. A set of the criteria occupies an important position as a scientific standard for the witness of *rukayah hilal*, especially at the beginning of *Ramadan* and the Feasts in Indonesia. The criteria proposed by Thomas Djamaluddin should be considered as a temporary solution.

2. Supporting System of *Shahadah al-Ilmi* and the Conceptual Offer

The existing supporting system for *shahadah rukyah hilal* in Indonesia consists as follow:

- a. Guide to *Rukyah Hilal*
- b. *Hilal* imagery
- c. Indonesian Center for The Moon Observatory (POB; *Pusat Observasi Bulan*)

On the basis of it, we offer some relevant suggestions relating to the basic concept of *shahadah al-'ilmi*.

First, the witness' reports must be in accordance with the standard of *hisab qath'i* or fulfilling the *imkan al-rukayah* criteria approved by the Indonesian Ministry of Religious Affair.

Second, the witnesses must be able to explain: 1) position of *hilal*, 2) sky background, 3) weather conditions, and 4) position of celestial bodies other than the Moon.

Third, the witnesses must prove the form of *hilal* light by showing the visualization of the *hilal*.

³⁷ R Amri, "UPAYA PENYATUAN KALENDER ISLAM DI INDONESIA (Studi Atas Pemikiran Thomas Djamaluddin)," no. 3 (2012): 1-23.

Based on the suggestion and the existing procedure of eye-watching the crescent, the concept of *rukayah shahadah al-'ilmi* can be well described in the following form:

Table. 3.1. Blueprint of Form of *Shahadah al-'Ilmi* Crescent Eye-Watching Report.

<p style="text-align: center;">REPORT OF CRESCENT EYE-WATCHING RESULT THE ARRIVAL OF RAMADAN..... / 1 SHAWAL.... YEAR.... HIJRIYAH FROM THE RELIGIOUS COURT OF</p> <p>REPORTER: NAME: AGE: OCCUPATION: ADDRESS: AFFILIATION/INSTITUTION: EYE HEALTH: NORMAL / MINUS (...) CRESCENT EYE-WATCHING EXPERIENCE: times CONTENTS OF THE REPORT: HILAL VISIBLE/NOT SEEN <i>IF SUCCESSFUL, CONTINUE:</i> PLACE TO EYE-WATCH THE CRESCENT: TIME TO START EYE WATCHING THE CRESCENT: DURATION OF EYE-WATCHING HILAL: HEIGHT OF THE CRESCENT: WEATHER CONDITION: VERY GOOD / GOOD / FAIRLY GOOD / LESS GOOD / BAD. CRESCENTVISUALIZATION: DOCUMENTED / NOT DOCUMENTED WITNESSES WHO EYE WATCH THE CRESCENT 1. NAME:</p>
--

AGE:
 OCCUPATION:
 ADDRESS:
 2. NAME:
 AGE:
 OCCUPATION:
 ADDRESS:
 (etc).
 The testimony has been examined and certified by the judges of the Religious Court.

Meanwhile, functionally, the *shahadah 'ilmi* can be described in the following figure:

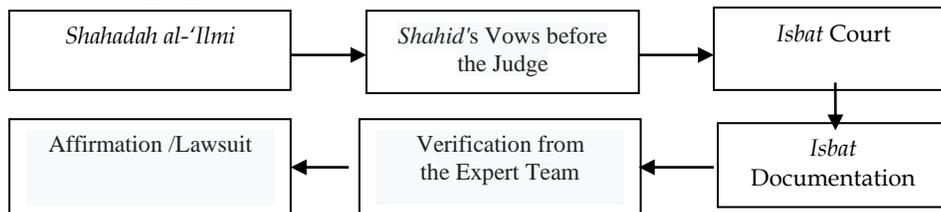


Figure. 3.2. Syahaadah al-'Ilmi Scheme

Additionally, both the form and the figure must comply with the following condition.

1. The witness, the judges, and the coordinators of *rukyyat al-hilal* must come from those who know and understand the discipline of astronomy well.
2. Any data about the crescent must be from the result of accurate calculations (ephemeris *hisab*) and is supported by data from BMKG.
3. The Moon Observatory Center (POB; *Pos Observasi Bulan*) as a place for making *rukyyat al-hilal* must be those certified by the Hisab Rukyah Team (THR).
4. The guided criteria used during the process must be those based on factual-empirical data from Indonesia.

5. The accepted witness (*shahadah*) must be accompanied by visual evidence in the form of a live streaming data record so that the Analysis Team which consists of astronomers can be convinced.

In short, the concept of *shahadah 'ilmi* that we offer is projected to help the Indonesian government in determining the arrival of lunar months, particularly Ramadhan and Syawal. By integrating the two most commonly used paradigms for the purpose, namely *fiqh*, and astronomy; it is wished that the confusion and controversy over the D-day of the first lunar months can be eradicated. Practically, the concept aims to help government in either accepting or rejecting the result of *rukyat al-hilal*.

Conclusion

Shahadah according to *fiqh* paradigm is the combination of factual evidence and religious vows. The witness, additionally, is required to fulfill some qualifications. Meanwhile, the astronomical paradigm requires scientifically proven empirical evidence to accept the *shahada*. Integration of those two paradigms through the concept of *shahadah 'ilmi* is projected to work well in determining the arrival of lunar months, particularly Ramadhan and Syawal which routinely leads to controversy among Indonesian Islamic mass organizations. In addition to it, the integration can strengthen the legitimacy of each paradigm.

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