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Taklîf of Lunar and Solar Eclipse Prayers According to Fiqh and Scientific Perspective

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Abstract:

The motion of earth, moon and sun result in natural phenomena which people can directly see and tangibly experience. They occur globally yet are experienced locally, such as the phenomenon of solar and lunar eclipses. In Islamic studies discussion, this leads to specific consequence relating to *taklîf* (compulsion) of worship to perform eclipse prayers. Therefore, this study aims to elaborate whether the local eclipse phenomenon could apply the *taklîf* globally. Another question is on when the obligation is urged to Moslem. Using the approach of *fiqh* and science through descriptive-analytic method, this study finds that in scientific perspective, both solar and lunar eclipses are *sunnatullah* or natural phenomenon relating to rotation of earth, moon and sun. From the earth, this phenomenon comes in two types of condition. *First*, it could be both computed and witnessed, while *second*, it could only computed but not everyone could eye-nakedly witness it. In fact, solar eclipse, for instance, although globally accessible through digital instruments, could be only manually seen in any local and limited area. Therefore, in the *fiqh* based perspective, the *taklîf* of eclipse prayers only applies based on *mathla` wilâyah al-hukm*. It is based on the strong belief that *hisâb* indicates the occurrence of eclipse on any certain area in Indonesia and is empirically proved. The *taklîf*, therefore, only applies for those who see the phenomenon.

Keywords:

Eclipse Prayers; Local Mathla`; Kusûf; Khusûf

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Abstrak:

Pergerakan bumi, bulan dan matahari mengakibatkan terjadi fenomena alam yang dapat dilihat dan dirasakan secara nyata. Fenomena ini bersifat global, akan tetapi dirasakan secara lokal seperti fenomena gerhana matahari dan bulan. Dalam kajian keislaman, fenomena ini memunculkan akibat khusus yang berkaitan dengan *taklîf* ibadah, yakni salat gerhana matahari dan bulan. Apakah fenomena gerhana yang bersifat lokal tersebut dapat berlaku secara global, dan kapan *taklîf* tersebut terbebaskan pada setiap umat muslim. Dengan pendekatan fiqh dan sains secara deskriptif analitis, artikel ini menemukan bahwa dalam perspektif sains, fenomena gerhana matahari dan bulan adalah sunnatullah yang berkaitan dengan rotasi bumi, bulan dan matahari. Bagi penduduk bumi, fenomena ini dapat dialami dalam dua kondisi, yaitu pertama, dikomputasi sekaligus disaksikan, dan kedua dikomputasi, akan tetapi tidak semua semua orang bisa menyaksikan. Karena itu, fenomena gerhana matahari walaupun dapat dikomputasi secara global, akan tetapi hanya dapat disaksikan secara lokal. Dengan demikian, dalam perspektif fiqh, *taklîf* ibadah salat gerhana diberlakukan berdasarkan *mathla` wilâyah al-hukm*, yaitu apabila diyakinkan bahwa secara hisâb menunjukkan terjadi gerhana dalam kawasan tertentu di Indonesia dan dapat dibuktikan dengan fenomena empiriknya, maka *taklîf* shalat gerhana tersebut hanya berlaku bagi mereka yang menyaksikan fenomena gerhana tersebut.

Kata Kunci:

Eclipse Prayers; Local Mathla` ; Kusuf; Khusuf

Introduction

Astronomic phenomenon is natural events related to the motion, position and the condition of celestial objects. As a consequence of earth rotation and its own shape, the phenomenon could be either observable or no depending on the location of observer. Among others, there found the phenomenon of night sky, meteor rain, Mars approaching the Earth, solar eclipse and others as the result of rotation of earth, moon and sun.¹

¹ LPMA and LIPI, *Penciptaan Jagat Raya dalam Perspektif al-Quran dan Sains* (Jakarta: Kemenag RI, 2012), 85-86.

The phenomenon is literally amazing as it leads to other phenomena useful for human's life, such as timing reference of sun clock to determine prayers' time, crescent moon indicating the beginning of months, eclipse as an alarm to perform eclipse prayers and so forth. These astronomic phenomena are local, as they depend on the location of observers. Therefore, it is important to discuss on how to enforce worship obligation to the eclipse phenomenon which locally takes place.

Technically, eclipse is a phenomenon where shadow of an object covers another object. Relating to the moon's orbit surrounding the earth, there found two popular types of eclipse, solar and lunar eclipses. The former happens when either some or the whole part of the sun surface is covered by the moon, while the latter is when the moon, either the cut or the whole part of it, is covered by the sun. In other words, it would be counted as a solar eclipse when the moon is in conjunction to the sun while the lunar eclipse is when the moon is in the opposite line to the sun. However, because the slope of moon orbit filed is only 5 degree to the ecliptically part, not every moon conjunction results in solar eclipse. And likewise, not every opposition of moon and sun results a lunar eclipse.²

From the cutting point of moon and ecliptically orbit field, there found two cutting spots called *node*, which is the point where the moon cuts the ecliptically field. The eclipse would happen when the moon is in conjunction, at the exact position, or not far from the node points. Indeed, the moon needs 29.5 days to move from both a conjunction and opposition to the next one. Therefore, when an eclipse happens, let say the solar eclipse, a lunar eclipse would also take place because two node points are in a line connecting the sun and the earth.³ A solar eclipse is actually a visible conjunction phenomenon, while conjunction or what is popular as *ijtimâ`*, is a sign of the shift of month in calendar system which is based on the moon phases such as *Hijriyah* calendar system. Relating to this, the solar

²Hendro Setyanto, *Membaca Langit* (Jakarta Pusat; al-Ghuraba, 2008), 97.

³Uum Jumsa, *Ilmu Falak: Panduan Praktis Menentukan Hilal* (Bandung: Humaniora, 2006), 59.

eclipse could be a reference to determine *hilâl* position which is literally a crescent moon.⁴

In the eclipse phenomenon, both solar and lunar, there found some related facts. Particularly to the solar eclipse, there found four types of eclipse. *First*, the total solar eclipse; happens when the whole part of solar is covered by the whole body of the moon. *Second*, the annular eclipse; happens when the moon only covers the middle part of sun's disk in the summit of eclipse or when the moon surface is narrower than surface of sun that it causes sun light appears like a bright ring around the surface of moon. *Third*, the hybrid (annular/total eclipse); happens when the total solar eclipse is visible from another edge of central shadow of the earth. *Fourth*; partial eclipse; happens when solar eclipse is caused by the coverage of surface of moon to some parts of surface of sun.⁵

Meanwhile in the lunar eclipse, there found three related facts. *First*, panumbra lunar eclipse; when the moon enters the pseudo shadow of earth. *Second*, partial lunar eclipse; when some parts of moon surface get into the central shadow of the earth (*umbra*) then get out again. *Third*, total lunar eclipse; when the whole surface of moon get into the central shadow of earth.⁶

Eclipse Phenomena and Prayers in The Prophet Era

The eclipse prayer is one of some un-compulsory worship in Islam. It was regulated after the regulation of five compulsory prayers in the event of *Isra'-Mi'raj*. The event itself, according to the calendar calculation, happened at *Legi* Monday, 27 Rajab at the third year of *Hijriyah* or March 19th, AM. Six years later, and specifically six years and two months ahead, the eclipse prayer was regulated. It was exactly at the fifth year of *Hijriah* when the total lunar eclipse took

⁴Hasna Tuddar Putri, "Redefinisi Hilal dalam Perspektif Fiqh dan Astronomi", *Journal al-Ahkam*, p-ISSN: 0854-4603/e-ISSN: 2502-3209, Vol. 22, No. 1, April 2012.

⁵ T. Djamaluddin, *Semesta Pun Bertawaf* (Bandung: Mizan, 2018), 80.

⁶ Uum Jumsa, *Ilmu Falak.*, pp. 60-61. See also Muhtar Salimi, "Visibilitas Minimum: Studi Komparatif antara Kriteria Depag dan Astronomi", *Jurnal Penelitian Humaniora*, Vol. 6, no. 1, 2005, 1-13.

place at Wednesday, 14th day of *Jumadal Akhirah*, 4th year of *Hijriyah* or November 20th, 625 AM.⁷

Since then, there were three events of performing the eclipse prayers until the death of Prophet at *Legi Monday*, 14th of *Rabi'ul Awwal* 11 H/June 8th, 632 as the following table mentions:

First Lunar and Solar Eclipses after the Regulation of Eclipse Prayers
14 *Jumadal Akhirah* 4 H/November 20th, 625 M to 14th of *Rabi'ul Awwal* 11 H/June 8th, 632 M.

Date		Day	Eclipse Type	The First Eclipse	The First Eclipse Totally	The End of Eclipse Totally	The End of Eclipse	Eclipse Duration	Total Duration	%
Higriyah	AM									
14 Jum. Akhir 4	20/11/625	Wage Wednesday	Lunar T	00:50:48	01:52:15	03:20:26	04:31:53	03:41:04	01:38:11	100%
15 Dzulhijjah 4	17/05/626	Pahing Saturday	Lunar T	03:24:59			06:44:44	03:19:45		95%
29 Dzulqo'dah 5	21/04/627	Legi Tuesday	Solar T	10:32:04			11:21:39	00:49:35		5%
14 Dzulqo'dah 6	25/03/628	Kliwon Friday	Lunar P	17:31:00			19:38:01	02:07:01		31%
29 Jumadal Ula 7	03/10/628	Pahing Monday	Solar C	05:58:37			06:57:42	00:59:05		12%
14 Dzulqo'dah 7	15/03/629	Kliwon Wednesday	Lunar T	01:12:43	02:11:48	03:52:20	04:51:25	03:38:42	01:40:31	100%
15 Dzulqo'dah 8	04/03/630	Wage Sunday	Lunar P	16:09:51			18:52:39	02:42:47		68%
29 Syawal 10	27/01/632	Pon Monday	Solar C	07:15:20			09:53:40	02:38:20		82%

Historically, there found some explanation about the mentioned data. *First*, six months after the lunar eclipse in which the eclipse regulation took place, particularly at 15th of *Dzulhijjah* 4 H/May 17th, 262 AD, there happened a partial lunar eclipse. It began right before

⁷http://www.kompasiana.com/moeidzahid/sekelumit-sejarah-dan-fiqih-gerhana_56cd312e81afbd010c1ed5f4. Accessed on February 24, 2016

the dawn and ended after the dawn, exactly when the moon set in eclipse condition. *Second*, the next eleven months, specifically at 29th of *Dzul Qa'dah* 5 H/April 21st 627 AD, a solar eclipse happened, but only 5% of the surface of sun was covered so it was invisible by naked eyes. *Third*, another next eleven months later, at 14 *Dzulqo'dah* 6 H/March 25th, 628 AD, a 31% moon took place about the sunset (*maghrib*) time. It began before the rise of moon so when it rose, it came in the eclipse condition.

Then, it finally ended some minutes before *isya*. *Fourth*, next six months, at 29 *Jumadal Ula* 7 H/October 3rd, 628 M, another solar eclipse happened, but the covered surface was only 12% so probably, it was invisible by naked eyes. The beginning of eclipse was before the sunrise at *Madinah* so the sun rose in eclipse while the ending of it was some minutes after the sunrise. *Fifth*, next five months, at 14 *Dzulqo'dah* 7 H/March 15th, 629 M, a total moon eclipse happened at the midnight. March is the end of winter season so there were less of Arabian activities due to the weather. Besides, the rest of cloud might remain a lot so the eclipse was unnoticeable by Arabians.

Sixth, next twelve months, particularly at 15 *Dzulqo'dah* 8H/March 4th 630 AD, there happened a partial eclipse with the summit percentage reaching about 68% at sunset (*maghrib*) time. It began before the moon rose so it rose in eclipse. In about 23 minutes after the rise, eclipse had ended. *Seventh*, next twenty three months, at 29 *Syawal* 10 H/January 27th 632 M, there occurred a solar eclipse with summit percentage reaching 82%. The day was the death of Sayyid Ibrahim, the son of Rasulullah and Maria Al-Qibtiyyah. It was also the first and last time in which Rasulullah performed the solar eclipse prayer.⁸

Therefore, among others, there found some significantly related notes. *First*, although calendar calculation noted the occurrence of eclipses both moon and sun many times, some of them happened closely right to the rise or the set of either moon or sun and it made the duration very short. *Second*, during some eclipses, Rasulullah only

⁸ The analysis result of Ibnu Zahid Abdo el-Moeid on the calculation of eclipse prayers is as listed at the table above. See also, Alimuddin, *Gerhana Matahari Perspektif Astronomi*, Jurnal Ad-Daulah, p-ISSN: 2303-050X/e-ISSN: 2580-5797 Vol. 3, No.1, June 2014: 72-79.

performed the prayers two times; the lunar eclipse at 14 *Jumadal Akhirah* 4 H or November 20th 625 M and the solar eclipse at 29 Syawal 10 H or Januari 27th, 632 M. The interesting point of this data is the distinction between the eclipse prayers that Rasulullah performed (two times) and the frequency of eclipses (four times for moon eclipse and three times for solar eclipse).⁹

The Fiqh Perspective of Eclipse Prayers

Any visible eclipse phenomenon provides special chances for Moslem as it comes as a rare moment where they could do special worship by reciting much *takbîr* and performing the eclipse prayers. In the study of *fiqh*, the term of solar eclipse is called *kusûf*, while lunar eclipse refers to *khusûf*. However, some Islamic scholars mentioned that *kusûf* is the synonym of *khusûf*.¹⁰ *Kusûf* happens when the light of moon and sun disappears either fully or partially then they turn to be black.¹¹ Meanwhile, the definition of *kusûf* prayer is the one performed using the specific manner when there happens an eclipse of either sun or moon, totally or partially. According to the most of Islamic scholars (*jumhûr ulamâ'*), performing the eclipse prayer is very much recommended just like 'Eid prayers. The Malikiyah and Hanafiyah schools consider the lunar eclipse prayer as the *sunnah mandûbah*, different from the solar eclipse prayers which they mentioned as *sunnah mu'akkadah*. Additionally, some Islamic scholars mention that the eclipse prayers are *fardl kifâyah* as the same as the funeral prayers.¹²

It is much preferable to perform eclipse prayer together (*jamâ'ah*) in a mosque, while the performers are suggested to take a bath before the prayers. However, different from other types of prayer, it is not recommended to deliver *azan* and *iqâmah* before the

⁹ Historical notes about eclipse prayers that Rasulullah performed are fully mentioned in *Sahih Bukhari*. See Masyhar, M.A, et al (translator), *Eksiklopedia Hadits I: Abu Abdullah Muhammad bin Ismail al-Bukhari, Shahih al-Bukhari I*, (Jakarta; Al Mahira, 2011), 30-237.

¹⁰ Wahbah al-Zuhaylî, *Al-Fiqh al-Islâmî wa Adillatuhu* (Damaskus: Dar al-Fikr, 2006), Vol. II, 1421.

¹¹ Sayyid Sabiq, *Fiqh al-Sunnah* (Beirut: Dar al-Fikr, 1981), Vol. I, 180-181.

¹² Sihabuddin ar-Romli, *Nihayah al-Muhtaj Ila Syarh al-Minhaj* (Beirut: Dar al-Kutub al-Ilmiyyah, tt), II: 394.

prayers. Instead, it is suggested to recite such a slow calling. The leader of prayer, additionally, is obliged to recite *al-Fâtiḥah* and short Qur'anic *surahs* loudly in lunar eclipse, while the slow voice is for solar eclipse.¹³

According to calendar calculation theory (*ḥisâb*), in the lunar eclipse, the shadow covering moon has two types. *First*, the shadow of penumbra and the second is many umbras. Umbra shadow is the central image of the earth, while penumbra is the biased image of the earth. Therefore, when the penumbra shadow touches the surface of moon, it could not be easily identified by naked eyes. The moon looks likes as it usually does, full but somewhat grim. The lunar eclipse, therefore, can be identified by naked eyes only when the umbra shadow touches the surface of moon. To sum up, it could be concluded that the lunar eclipse begins since the umbra shadow (central image) touches the surface of moon until all of the shadow out of it.¹⁴

Meanwhile, the solar eclipse happens since umbra shadow of the moon touches the surface of sun until all part of umbra out of it. Therefore, according to *fiqh* perspective, the time to perform eclipse moon prayer counts from the time when umbra (central) shadow of the earth touches the surface of moon until all part of umbra out of it. While for the solar eclipse, it counts since the umbra shadow of the moon touches the surface of sun until the whole part of umbra out of it. The duration ends at the full recovery of solar eclipse or the sunset time, although it is still in eclipse position. While for the lunar eclipse, the time also ends at the full recovery of eclipse or the rise of the sun, although the moon still goes on in the eclipse.¹⁵

¹³According to Hambaliyah school, Khattabi and Ibnu Mundzir, it is also obliged to up the voice in performing the solar eclipse. Sayyid Sabiq, *Fiqh*. 60. See also, Syaeful Mujab, "Gerhana: Antara Mitos, Sains dan Islam", *Yudisia: Jurnal Pemikiran Hukum dan Hukum Islam*, ISSN: 1907-7172/e-ISSN:2477-5339, Vol. 5. No. 1, 2014.

¹⁴ Muh. Rusywan Syarif, *Islam Fenomenalis Gerhana Matahari di Indonesia: Studi Budaya 'Siemme Matanna Essoe' pada Perempuan Bugis Bone*, Proceedings ARICIS, No. 1, 2016: 520-534.

¹⁵ According to Imam Syafi'ie and Imam Malik, it is allowed to perform eclipse prayers in non-recommended times (*makruhah*) because it is categorized as prayers due to certain causes. However, Imam Hanafi and Imam Achmad said that it is not

According to *fiqh* perspective, the performance of eclipse prayer is on dispute among the Islamic scholars. Bakhit Al-Muthi'¹⁶ commented that it could be based on the *hisâb qath'î* (exact calculation) provided the fact that the objects (moon or sun) could not be seen because of the cloud. This opinion was relied on the analogical perspective (*qiyâs*) on the determination of the beginning of the month through the *hisâb qath'î*. It applies when *hilâl* already rises and probably would be visible after the dawn (*maghrib*) but later, it turns out that *hilâl* is out of reach of vision because of the cloud. When this condition happens, the calendar calculation is the alternative to determine the beginning of the month. If it goes that way for determination of beginning of the month which is something compulsory (*wajib*), it also goes the same for un-compulsory things (*sunnah*) such as eclipse prayers. This also closely relates to the similarity among the *hisâb* (calendar calculation) of *hilâl*, moon and solar eclipses which involve trustworthy and fully sure calculation.

On the other hand, Ibnu Hajar said that it does not give any consequence when the cloud covers sun or moon before the eclipse happens although *hisâb* expert confirms the occurrence of eclipse. In other words, there is no obligation to perform eclipse prayers because the initial condition is normal without eclipse. However, when the eclipse is clear before the cloud comes and people are doubt whether it is finished—although the experts say it is finished already—, it is still recommended to perform eclipse prayers because the initial law is the visibility of eclipse. He mentioned that there is no space for experts in this kind of condition and consequently, depending only the *hisâb* calculation is not allowed, including the *qath'î hisâb*. To sum up, for him, eclipse prayer is obliged when eclipse condition is visible by naked eyes (*ru'ya*).

All by all, the cloudy weather making eclipse invisible makes the prayers obligation invalid. It accords to the explanation of Ibn Utsaymin saying that, it might happen a time when Allah makes eclipse visible for certain areas and makes it invisible for the rest.

allowed to do so and they said it is enough to replace the prayer with reciting *tasbih*. *Fiqh*. 60.

¹⁶Ibn Hajar al-Haytamî, *Tuhfah al-Muhtaj bi Syarh al-Minhaj*, (Beirut: Dar al-Kutub al-Ilmiyyah, s.a), 94.

There must be *hikmah*/lesson learnt beyond.¹⁷ At the same condition, anyone who has just noticed the eclipse condition when it had already gone is not obliged to do so because the obligation relates to the time when the eclipse is visible.¹⁸

The Concept of *Mathla`* in Worship Obligation

1. *Mathla`* Concept in Determination of the Beginning of the Hijriyah Month According to *Fiqh* Perspective

In the *fiqh* discourse, *mathla`* concept is known from two theories. The first is *ittifâq al-mathâli`*. It suggests that the rise of *hilâl* which is visible from a certain spot of the earth could apply the same for rest of the planet. It is based on a general meaning of a *hadith* addressed for all people prevalently. As the consequence, if there found anyone who has witnessed the *hilâl*, anywhere in the earth s/he is, then it applies for the rest of people as well. *Second* is what is called as *ikhtilâf al-mathâli`* theory which suggests that rise of *hilâl* accessible from any part of the earth only applies for the limited location, which is the location in which the *hilâl* is visible and the nearby location particularly at the West side of the spot. This theory relies on a story of Kuraib, narrated by Muslim that Ibn `Abbâs who lived in Madinah did not take Syam people's *ru'yat* into account although it had been approved by the ruling *khalîfah* (leader), Mu'awiyah.¹⁹

Global *mathla`* theory suggested that the rise and visibility of *hilâl* in Ramadan and Syawal at a specific area needs to be followed by others which have not done so. Therefore, the difference of location in which the *hilâl* appears does not give any impact of different dates to begin fasting or to celebrate the *Eid* for other areas. It also leads to a logical consequence that if a certain area had already witnessed the *hilâl*, then other areas could rely on the *hilâl* visibility (*ru'yat*) on it no matter the distance, geographical location and other astronomical factors are. This theory is based on the *hadith* narrated by Kuraib.

The *hadith* implied as if Ibn `Abbâs was the one who very firstly began to determine the *mathla`* differences between Madinah and

¹⁷Abu Malik Kamal bin al-Sayyid Salim, *Shahih Fikih Sunnah*, (Jakarta: Pustaka Azzam, s.a), 309.

¹⁸*Ibid.*, 434.

¹⁹al-Nawawî, "Kitab al-Shiyâm", Chapter 5, *Hadith* Number. 28-[1087] in *Syarh Shahih Muslim*

Syam and therefore, Moslem would determine the start and the end of Ramadan based on the *ru'yat* applied in a certain territorial limit of each region or country. However, the story of Kurayb had actually indicated that what made the differences of the day to begin fasting between Madinah and Syam was the absence of direct news to Madinah people from Kurayb who, at that time, was witnessing *hilâl* at the Tuesday night. That was why, Ibn `Abbâs was sure that *hilâl* had not rose at Madinah at that evening (Tuesday night) and would had risen the day after (Friday night).²⁰ The hadith, therefore, showed the obligation to do fasting for all Moslems based on an unbound/unlimited *ru'yat*. As a consequence, *ru'yat* could be fulfilled from the group or individuals whose testimonies are approved.

Furthermore, according to al-Syawkanî, what could be relied on as the basic of this is the saying of Prophet pbuh instead of the *ijtihad* (critical thinking) of Ibn `Abbâs. The hadith by Kurayb was considered as Ibn `Abbâs' *ijtihad* relying on Prophet Muhammad as indicated in Ibn `Abbâs' saying, *hakaza amarana Rasulullah* (this is exactly what Rasulullah told us to do) and *fala nazalu nasumu hatta nukmila salasina* (we do not begin fasting until it completely reaches the day 30). The hadith of Umar r.a did not indicate that the result of *rukayah* is personal (locally applicable), because the interlocutor applies for all Moslem, so that the result of *rukayah* in any certain country also applies for other countries. On the other hand, according to Abu Hanifah, Malik and Ahmad, the determination of the beginning of the fasting at Ramadan and the celebration of Eid is only based on the arrival/deliverability of news about *ru'yat hilâl* without considering the difference of *mathla`*. *Ru'yat hilâl* applies for all areas, be it far or near. *Hilâl* which was witnessed from a certain area would apply the same (obligation to do fasting) for others as long as the news about the *hilâl* visibility is delivered.²¹

Meanwhile, the local or regional *mathla`* theory suggests that the successful observation of visibility on the crescent only applies for the observation area and nearby areas in single law category. This opinion, used by some scholars, confirms that *ru'yat* applies for each

²⁰ Imam Abi Zakariya Muhyiddin ibnu Syaraf-Nawawi, *Syarh Shahih Muslim* vol. VII, (Beirut: Dar al-Kutub al-Ilmiah, s.a), p. 172.

²¹Ibnu Hajar, *Fathul Bari* vol. IV (Beirut; Dar al-Fikr, s.a), p. 47.

area because of the differences of *mathla`* or *ikhtilaf al mathla`*.²² It takes the following hadiths by Ibu `Umar and Ibn Kurayb as basic.

عن عبد الله بن عمر رضى الله عنهما قال : قال رسول الله صلى الله عليه و سلم : الشهر تسع و عشرون فإذا رأيتم الهلال فصوموا وإذا رأيتموه فافطروا فإن غم عليكم فاقدروا له (رواه مسلم)

Narrated from Abdullah Ibnu Umar that Prophet Muhammad pbuh said: A month consists of twenty nine days. Do not do fasting before seeing hilâl and do not break the fast (celebrate the Eid) before seeing another next hilâl. If you cannot witness it because it is covered by something else, make a prediction.²³

حد ثنا موسى بن إسماعيل حد ثنا إسماعيل يعني ابن جعفر أخبرني محمد بن أبي حرملة أخبرني كريب أن أم الفضل ابنة الحرث بعثتها إلى معاوية بالشام قال : فقدمت الشام فقضيت حاجتها واستهل رمضان وأنا بالشام فرأينا الهلال ليلة الجمعة ثم قدمت المدينة في آخر الشهر فسألني ابن عباس ثم ذكر الهلال فقال متى رأيتم الهلال؟ قلت : رأيت ليلة الجمعة , قال أنت رأيت؟ فقلت نعم ورأه الناس و صاموا وصام معاوية , قال : لكننا رأيناه ليلة السبت فلا نزال نصومها حتى نكمل الثلاثين أو نراه , فقلت : أفلا تكتفي برؤية معاوية و صيامه ؟ قال لا هكذا أمرنا رسول الله صلى الله عليه و سلم (رواه ابو داود)

...Narrated from Kuraib, that Ummu Fadhl bint Harits delegated him to see Mu'awiyah in Syam (Suriah: Damascus). He mentioned: I arrived at Syam then I finished her business. People were searching for hilâl of Ramadan while I was at Syam. We witnessed the hilâl at Tuesday night then I returned to Madinah and arrived there at the end of Ramadan. At that time, Ibnu Abbas asked me a question then he remembered about hilâl of

²²Wahbah az-Zuhaili, *al-Fiqhu al-Islam wa Adillatuhu* vol. II (Damaskus: Dar al-Fikr ,2006), pp: 1660-1661.

²³ The hadith was narrated by Muslim, number: 1522.

Ramadan and asked: When did you witness the hilâl? I answered: I witnessed at the Tuesday night. He replied, did you witness it by yourself? I said: I did, and so did other people, so they did fasting the next day, including Mu'awiyah. He continued, However, we, the Madinah people, witnessed it at Friday night then we do fasting at the 30th day or until we see another next hilâl of Syawal. I commented: Is not it enough for you with Mu'awiyah's ru'yat and fasting? He replied, It is not the way the Prophet told us to do (Narrated by Abu Dawud).²⁴

Meanwhile, Syafi'iyah school mentioned that when people in a certain area already witnessed the *hilâl*, the the surrounding area inside 24 *farsakhs* (about 120 kilometres) from the spot of *rukayah*, could follow the *rukayah* result.²⁵ As for the area outside the radius, its people could do another *rukayah* process and are allowed not to follow the first *ru'yat* result. The *mathla`* parameter in Syafi'iyah school, at least, is presented in four following opinions. *First*: the distance is equal to 24 *farsakhs*. This was told by Syaikh Tajuddin Al-Tibrisi and considered *shahîh* by Al-Nawawi. 1 *farsakh* is equal to 5.544 m x 24 =133.056 m (about 13 km). There is also another opinion determining that 1 *farsakh* is equal to 3 meters, while 1 mile is 1.6093 km. Therefore, 1 *mathla`* is equal to 3 x 24 x 1.6093 = 115.8696 km. *Second*, the distance is not further than *masâfah al-qashr* to the area in which the *hilâl* is clearly visible.

This second theory belongs to Al-Fawrani, Imam Haramain, Al-Gazali, Al-Bagawi and Khurasan scholars. *Masâfah al-qashr* is equal to 4 *barids* (the plural form is 2517 *burud*) or 16 *farsakhs* (1 *farsakh* = 5.544 m), so the *masafah al-qasr* is about 4 x16 x 5.544 = 88.704 meters. Another opinion said that 1 *farsakh* is about 3 miles (1 mile = 1.6093 km), so *masafah al-qasr* is equal to 16 x 3 x 1.6093 km = 77.2464 km. *Third*, the same chance to experience or witness the visibility of *hilâl*. This theory is mentioned by Sarakhsi.²⁶ Meanwhile, the four which is

²⁴Muslih Husein, "Hadis Kuraib dalam Konsep Rukyatul Hilal", Jurnal Penelitian, p-ISSN: 1826-9903/e-ISSN: 2541-6944, Vol. 13 No. 2. 2016, 211-224.

²⁵Abdu ar-Rahman al-Jazari, *al-Fiqhu 'ala al-Mazahibi al-Arba'ah* vol. I (Beirut: Dar al-Kutub al-Ilmiah, 1990), 500.

²⁶Imam Abi Zakariya Muhyiddin ibnu Syaraf Al-Nawawi, *al-Majmu' Syarhu al-Muhazzab* Vol. VI, (Beirut: Dar al-Fikr, s.a), 272.

the last theory said it was the difference of 8 degrees longitude as mentioned in a book entitled *Bughyah al-Mustarsyidîn*.²⁷

The difference of *mathla`* among some countries is logically reasonable. However, Islamic scholars are still on dispute on the condition when *hilâl* is visibly seen in certain countries. The dispute is about whether the *ru'yat* result applies for all Moslem in the world or each country is based on their own *ru'yat* results. There are at least two different opinions regarding with this as the following;

First, most of Islamic scholars, including Abu Hanifah and Imam Ahmad, think that *ru'yat* in a certain country would apply the same for all Moslems in other countries, so the *mathla`* differences cause no influence to the determination of *ru'yatul hilâl*. This opinion is based on some *hadithes*, such as a hadith narrated by Umar r.a indicating that although *ru'yat* result is personal (locally applicable), the interlocutor is all Moslems and therefore, the result of *ru'yat al-hilâl* (witnessing the *hilâl*) would apply the same to the global world. Based on this, some of *fiqh* experts, such as Abu Hanifah, Mâlik and Ahmad said that determination of the beginning of the fasting and *Eid* only relies on the deliverability of news about the result of *ru'yat al-hilâl* without considering differences of *mathla`*. *Rukya al-hilâl* applies for all areas, be it near or far. Once the *hilâl* is visible in a certain area, then the rest of the world (which could get the news about the visibility) applies the same law, i.e. the obligation to follow the result of *ru'yat al-hilâl* in the area applies.

Second, opinion delivered by al-Syâfi'î and some traditional scholars that determination of the beginning of the *Hijriyah* month considers the differences of *mathla`*, so each country determines the beginning of every month based on their own result of *ru'yat al-hilâl*. This is based on the context of hadith of Abu Hurayrah which is considered relative, giving the consequence that it is addressed for those who witness *hilâl*, so for those who do not, they are excluded from the category. This opinion is quite reasonable from the perspective of *dalîl naqlî* (logical thinking) and astronomical science. The time calculation of each day is different, be it either in fasting or non-fasting period based on the texts (*nash*) and agreement (*ijmâ'*).

²⁷ Abdurrahman bin Muhammad Ba 'Alawi, *Bughyah Al-Mustarsyidin*, (Beirut: Dar Al-Fikr, 1997), 70.

This kind of *mathla`* difference is the agreement of astronomic experts. Therefore, if *mathla`* is found the same, the result of *ru'yat* also applies and otherwise. This opinion relies on a hadith narrated by Ibnu Abbas and compiled by Muslim.²⁸

2. *Mathla`* Concept in Determination of The Beginning of Hijriyah Month According to Astronomical Perspective

In the perspective of astronomy, the concept of *mathla`i`²⁹* is a limit of any geographical location which experiences/witnesses the rise of *hilâl* at the top horizon of West after the sunset. Consequently, all spots at the area have the same date on the beginning of each month. This *mathla`* concept, although clearly elaborated, still leads to a dispute on the application, particularly whether the rise of *hilâl* applies to all areas at the earth or only for limited areas which witness the *hilâl* at the same time. Therefore, this concept of *mathla`* could not be discussed merely from the normative perspective by involving Qur'anic verses and *hadith* as the basic for drawing *fiqh* based conclusion, but also from the perspective of astronomy. It is literally because the rise of *hilâl* closely relates to the lunar, solar and earth circular system.³⁰

Astronomically, the motion system of earth, moon and solar leads the monthly change of *hilâl* rise condition, time, position and the height. As a consequence, any area on the earth in which the *hilâl* rises at the very first time also regularly changes. Nevertheless, the application of this *mathla`* concept is not without any limit. The *mathla`* limit from the spot of observation result from considering the speed motion of the earth around its axis, the speed of moon moving around the earth, and the speed of pseudo motion of sun all through the ecliptically circle.³¹

According to its motion system, the earth moves around its axis from the West to the East once in a single lap (360 degrees) during 24

²⁸ Ibnu Hajar, *Fathul Bari* vol. IV (Beirut; Dar al-Fikr, s.a), p. 147.

²⁹ The meaning of *matlak* is the time or place of rising, be it solar, dawn or moon. See Depdikbud, *Kamus Besar Bahasa Indonesia* (Jakarta; Depdikbud, 2006), 108.

³⁰ Muhtar Salimi, 'Rukyat, Hisab, dan Matlak'. Paper was presented in 25th of Munas Tarjih, July 6-7, 2000, 22.

³¹ Salam Nawawi, *Rukyat Hisab di Kalangan NU-Muhammadiyah*, (Surabaya: Diantama, 2004) p.104.

hours, so it could be calculated that the speed of earth's move in a hour is 15 degrees. Meanwhile, the moon moves around the earth from the West to the East during one month or about 27.32 days (27 days, 7 hours and 43 minutes). This time is called a sideral month. Therefore, the daily speed of moon move is 13 degrees, 10 minutes and 34,89 seconds. Meanwhile, the motion of sun (influenced by the moves of earth surrounding it) is pseudotic among the stars in the sky from the West to the East. The pseudo moves of sun, from one point until coming back to it (a single lap) occurs about 365,242199 days (365 days 5 hours 45 minutes 46 seconds). To sum up, in the end, the speed of pseudo moves of sun every day (24 hours) is 0 degree, 59 minutes and 8.33 seconds and every hour is 0 degree, 2 minutes and 27.85 seconds.

From the above calculation, it could be compared that the moon is faster in moving to the East than the sun does with the difference number about 12 degrees, 11 minutes and 26.56 seconds every day or 0 degree, 30 minutes 28,6 seconds for every hour. If the speed of moon move keeping away from the solar to the East numbering 0 degree, 30 minutes and 28.6 seconds every hour is attributed to the speed of earth move to the East around its axis numbering 15 degrees for every hour, it would be found that the move of earth numbers 1 degree or equal to 0 degree, 2 minutes, 1.91 month moves.

Otherwise, the move of moon numbers 1 degree and is equal to 20 degrees 31 minutes 50.84 seconds of the earth move. Based on the data mentioned, the limit of *mathla`* to the East from the spot of *ru'yat* could be calculated using one of these two formulations:

- a. Degree of *irtifâ'* hilâl, subtracted with degree limit of *imkan ru'yat* (visibility), divided with 0 degree, 30 minutes, 28.6 seconds, then multiplied with 15.
- b. Degree of *irtifâ'* hilâl, subtracted with the limit of *imkan ru'yat* (visibility), multiplied with 29 degrees, 31 minutes, 50.84 seconds.³²

The above mentioned two formulations show that the limit of *mathla`* at the East side of *markaz ru'yat* would be longer when the limit of *imkanur rukyah* which becomes the basic is 2 degrees smaller.

³² Salam Nawawi, *Rukyat Hisab.*, 106-110.

Otherwise, it would be shorter if the limit of *imkanur rukyah* which becomes the basic is 2 degrees bigger.

3. The Application of *Mathla`* Concept of The Beginning of the *Hijriyah* Month in Eclipse Prayers Obligation

The command to perform the eclipse prayers, as mentioned before, at least, is based on two hadith(es) narrated by Muslim, Ahmad and Bukhari.³³ The hadith(es) are as follow:

First, a hadith narrated by Muslim

فَإِذَا رَأَيْتُمْ مِنْهَا شَيْئًا، فَصَلُّوا، وَادْعُوا اللَّهَ حَتَّى يَكْشِفَ مَا بِكُمْ

Second, a hadith narrated by Bukhari

إِنَّ الشَّمْسَ وَالْقَمَرَ آيَاتَانِ مِنْ آيَاتِ اللَّهِ لَا يَنْكَسِفَانِ لِمَوْتِ أَحَدٍ وَلَا لِحَيَاتِهِ فَإِذَا رَأَيْتُمُوهَا فَادْعُوا اللَّهَ وَصَلُّوا حَتَّى يَنْجِلِي

Those two hadith(es) relate to the lunar and solar eclipses. In a quite deep reading, it could be noticed that the contents imply the sign about two coinciding things, i.e witnessing the eclipses and performing prayers due to the sign.³⁴

Furthermore, the hadith(es) have same characteristics with another hadith on the beginning of the month determination at the phrase رَأَيْتُمُوهَا as it is clear as follows:

عن عبد الله بن عمر رضى الله عنهما قال : قال رسول الله صلى الله عليه و سلم : الشهر تسع و عشرون فإذا رأيتم الهلال فصوموا وإذا رأيتموه فافطروا فإن غم عليكم فاقدروا له (رواه مسلم)

Therefore, discussing the eclipse phenomenon using the keyword رَأَيْتُمُوهَا would lead to the study on *ru'yat* and *hisâb*. It means that witnessing the eclipse could be done through the direct observation (*ru'yat*) as well as based on the calendar calculation

³³ Salam Nawawi, *Rukyat Hisab.*, 106-110.

³⁴ There found six hadithes on the events of solar and lunar eclipses. Although they were narrated by different narrators (*rawi*), there are some similarities among the texts, particularly at the word *ra'a* which means to see carefully or to witness. See Masyhar, M.A, et al (translator), *Ensiklopedia Hadits*, Vol. I, 230-237.

(*hisâb*).³⁵ This discussion had generally reached the very deep analysis and got so much attention. *Rukyat* study, for example, had formulated systematic concept and methods on studying celestial objects empirically. Meanwhile, *hisâb* studies had already created system and methods for calculation or computation/digitization of celestial objects. In the studies on earth, moon and sun rotation or moves, those two also had become main topics for discussion on prayers schedule determination, the beginning of the *hijriyah* month and the eclipse. There found a general agreement for the use of prayers time locally, while topics on the beginning of the *hijriyah* month determination and the eclipse are still on dispute particularly whether it applies locally or globally.³⁶

The very urgent problem about determination of the beginning of the *hijriyah* months and eclipse phenomenon is the spot location in which the observation takes place since it serves as the basic in the calculation. This needs to get much attention because the round shape of the earth causes the differences on the observation process and computation of the moon and sun position depending on the spot location of the *markaz* reference. As an elaboration that the very first look of the month above the earth (forming as *hilâl*) after the conjunction of solar eclipse phenomenon is limited, it does not always cover all part of earth surface. This also means that at the very first look of the eclipse, there are some parts of the earth which its people can see it, while some others cannot. Considering the fact about some areas in the earth which can see the very first look and some others which cannot, a problem appears for the second area. Relating to the problem of determination, it could be further studied particularly on

³⁵Ahmad Izzuddin, *Ilmu Falak Praktis; Metode Hisab-Rukyat Praktis, dan Solusi Permasalahannya*, (Semarang; PT. Pustaka Rizki Putra, 2012), 1.

³⁶*Ru'yat* (witnessing the *hilâl*) and *hisâb* (calendar calculation) had become inseparable part of studies about determination of the beginning of the month of Hijriyah. Therefore, *ru'yat* is considered as a method to determine the beginning of the month by looking at or observing the appearance of *hilâl* when the sun sets upcoming the beginning of month of hijriyah using naked eyes or telescope. This method was firstly used since the era of Prophet Muhammad. As the time went on, there also used another method called *hisâb*, which determines the beginning of month of hijriyah using calendar calculation. See Nugroho Eko Atmanto, *ELFALAKY: Jurnal Ilmu Falak*, Vol. 1. No. 1. Tahun 2017 M/1438 H.

into how far the eclipse phenomenon, either solar or lunar, would take place and give any consequence.³⁷

In the context of area relating to obligation to perform eclipse prayers, it could be compared to the enforcement of *law area* in which the *falak* terminology calls it *mathla`*. If the last conclusion on whether eclipse phenomenon could be witnessed or not and the obligation to perform eclipse could apply, it would depend on the certain *mathla`*. The difference of *mathla`* could be the main reason for differences in performing eclipse prayers.

The *mathla`* of obligation enforcement to perform eclipse prayers could also be well compared to the concept of *mathla`* on the enforcement of *ru'yat* and *hisâb* globally. In the context of the similarity of *mathla`*, it could be used global *mathla`*. If that is so, any area in the earth could get the same command to perform eclipse prayers. However, if the enforcement is based on the different *mathla`*, these following three concepts of *mathla`* could be used. *First*, it applies as far as the *qasar* rule could not be used, which is about 80 km. *Second*, it applies as far as 8 degree longitude as used in Brunei Darussalam. *Third*, it applies as far as the law area (*mathla` wilayah al-hukmi*) reaches and consequently, no matter where the *ru'yat* or *hisâb* takes place, the result applies for all law area of a nation/government.³⁸

The next discussion is about how could the enforcement be scientifically defended? This could start by understanding the system of the running time, particularly whether it is logically or globally minded. As explained before, comparing to the conception of beginning of the month determination, *mathla`* on the perspective of *fiqh* could be explained using two types of theory, which are *ittifâq al-Mathâli'* (formulated by Hanafi, Maliki and Hanbali school) and *ikhtilâf al-Mathâli'* (formulated by Syafi'i school). According to the former, lunar or solar eclipse phenomenon which could be witnessed from the earth would result the global enforcement of eclipse prayers

³⁷ Rusydi Sulaiman, "Gerhana dan Keharusan Kosmologi Manusia: Tinjauan Filsafat Wujud", *Eduagama: Jurnal Kependidikan dan Sosial Keagamaan*, p-ISSN: 2598-8115/e-ISSN: 2614-0217, vol. 3 No.1 2017, 1-22.

³⁸ Ruskanda, Farid, dkk. *Rukyat dengan Teknologi: Upaya Mencari Kesamaan* (Jakarta: Gema Insani Press, 1995), 59.

obligation to the whole area of the earth. While for the later, the local observable eclipse phenomenon would enforce obligation for the local area as well as the area in the same *mathla`* or inside the same *mathla`* border. When the eclipse only occurs in a certain area, according to this second theory, it could not apply for the rest of the world because the differences in diverse areas make it impossible to make all areas in the earth under the single *mathla`*.

However, it needs a closer and more proportional look relating to the time because it would affect on the understanding of implementation which needs to adjust to the running time instead of logic or language understanding. *Sunnatullah* about the running time system at the earth is based on locus or place (partial or local) instead of global. At the earth, the time runs from the East to the West in line with the stream of day and night. The East areas experience *syurûq* and *ghurûb* of the sun earlier than those at the West. The further distance of West and East between two areas is, the bigger differences in time between them would be. Therefore, it comes not a surprise that those who have a long trip would deal with difficulties relating to the time differences. The term 'times' in all religious texts could be logically understood in line with the systematic running time at the earth which is partial and locus based. If, for instance, at the sunset (*ghurûb*) in Indonesia, any lunar eclipse could not be seen, it is illogical to follow other countries which perform the eclipse prayers because they already witnessed it. The same thing happens when understanding the beginning of *dzuhr* time in Indonesia about 4 PM based on the time of slipping sun at the Mecca or at 10 AM based on the time of slipping sun at Tokyo.³⁹

The above illustration shows that it is not only illogical to apply the principle of global enforcement, but also could not guarantee the same day for the beginning and the end time of eclipse to the whole area of the earth. Therefore, on the perspective of *syarî'ah* and scientific, it is not relevant to make any unification of the day of worship using the *ru'yat* global issue.

³⁹ Ros Maimunah Haji Yahya Zikri, "Cerapan GMT di Palembang, Indonesia dan Simulasi Menggunakan Perisian Stellarium: Satu Pengalaman", *Jurnal Reflektika*, p-ISSN: 2337-6821/e-ISSN: 2580-4006 Vol. 11, No. 2 August, 2016, 102-126.

Conclusion

The motion of earth, moon and sun causes unique natural phenomenon. The shift of day and night is one of the results. This leads to more specific consequences related to the obligation of worship, including the eclipse prayers. In the perspective of science, solar eclipse phenomenon could be experienced in two types of condition. The first is being able to be both computed and witnessed, while the second is being able to be computed but not nakedly observable by everyone. Therefore, although it could be globally computed, it is still accessible limited in any local area. Meanwhile in the perspective of *fiqh* (Islamic law), the obligation applies for those who witness it directly or depending on the calendar calculation or computation (*hisâb*). Based on the *mathla` wilayah al-hukm*, or in other words, if it is convicted – through the calendar calculation – that there occurs eclipse in certain areas in Indonesia and ensured by the empirical phenomenon, the obligation to perform the eclipse prayers applies. However, it is limited for those who witness the phenomenon no matter it is total eclipse, annular eclipse, annular/total eclipse, partial eclipse or panumbra lunar eclipse.

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