

## Disclosure of Ijtihad: The Changes of the Early Time of Dawn as a Sharia and Science Integration Effort

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## ABSTRACT

This article elaborates how ijtihad to changes in the dawn as an effort to integrate sharia and science. With a bibliographic qualitative research method, the author wants to describe how the early dawn changes have been used as guidelines for Muslims. Fajr's schedule has been considered too fast so that it is not in line with the provisions of the texts and the findings of modern science. Muhammadiyah, in its *ijtihad*, responded openly by making changes to the previous decision compared to the Ministry of Religion and Nadhatul Ulama, which remained in the previous formulation. The study results concluded that reviewing the dawn error at Muhammadiyah had begun in 2016 until it reached maturity in 2020. The results were confirmed at the 31st Tarjih National Conference in 2021 and by the Muhammadiyah Central Executive on March 20, 2021. Effective starting from January 2021, together with the publication of the Muhammadiyah calendar. The Sun's height is the initial criterion for the dawn of time from the original  $-20^{\circ}$ . After review, it becomes  $-18^{\circ}$ . This change in criteria implies a delay of the early dawn of about eight minutes from the previous one. This change was made to combine aspects of sharia and science with an integrated approach of Bayani, Irfani, and Burhani, considering the benefit of the community.

**Keywords:** astronomy; reckoning *rukayah*; ijtihad; Muhammadiyah; dawn.

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## INTRODUCTION

Some experts found the dawn time used by Muslims too early in the morning. It is not in line with the instructions of *syara'* and the development of science and astronomy, especially the science of reckoning-*rukyyat*. This reckoning has been voiced since 1999, and some have even written to the minister of religion directly. Muhammadiyah responded by conducting intensive studies and observations for almost ten years. The final result changed the criteria for the dawn time from -200 to -180 because the time of dawn is one of the five daily prayers for every Muslim. The texts have determined the implementation time as described in the QS. an-Nisa' [4]: 103, al-Isra' [17]: 78, al-Takwir [81]: 18, al-Baqarah [2]: 187. This verse does not explain it in more detail but only in the form of provisions general by using natural phenomena. Details of the provisions of the time of Fajr are described in the hadith of the Prophet SAW, but in various narrations, as described in the hadith narrated by al-Bukhari, Muslim, an-Nasa'i, Ahmad, and at-(Al-Naisaburi, 2003; Al-Nasa'i, 1987; Hanbal, 2005; Ja'fi, 2005; Tirmidzi, 1996). The natural phenomenon used as a guide is in the form of the dawn of *sadiq*, a white light that appears and spreads on the eastern horizon that appears sometime after the dawn of Kazib (Al-Zuhaili, 1989; Manzur, 2014).

Nowadays, prayer times have been used digitally, including the beginning of Fajr time. This time is inseparable from science and technology's progress, developing rapidly. One of the most important parts in determining the beginning of Fajr time is related to the phenomenon of the Sun's movement that constantly occurs every day. Digitally, this movement can be calculated carefully and precisely in terms of height and sky brightness. An essential part of what is used in determining the start of Fajr time is related to the *sadiq* dawn, which is the time that begins when the Sun's position is still below the horizon. Still, the Sun's light begins to be scattered by the Earth's atmosphere until the Sun rises (Herdiwijaya, 2016). In this position, science and technology can contribute to determining and providing certainty for the early entry of Fajr time. The guidance of *syara'* is only up to the limit stating that the Sun rises until the Sunsets. Meanwhile, the tools to determine and certainty that the dawn is truly convincing are more scientific. Here, *ijtihad* must be open to the findings of science and technology.

In Indonesia, astronomy scientists have long used the Sun's altitude of -200 to determine the beginning of Fajr time criteria. This criterion was developed initially by Thaher Djalaluddin, then adopted and strengthened by Saaduddin Djambek and Abd. Rachim (Nur, 1986). Meanwhile, neighboring countries such as Malaysia and Singapore have gradually abandoned this criterion (Niri et al., 2019). However, lately, this criterion is seen as not having a solid scientific basis. The lawsuit in question was started in 1999, the writing of Hanafi S. Djamari in the *Republika Daily* providing an alternative to the altitude of the Sun -180 (Djamari, 2009). This lawsuit has not received a serious response from astronomy scientists, the government, and fatwa institutions such as MUI, Muhammadiyah and Nahdhatul Ulama, and the like. In 2009 this discourse was re-rolled by Mamduh

Farhan al-Buhari through Qiblatai magazine because Fajr's time, in his view, was too early and inaccurate.

In responding to the changing discourse, the Ministry of Religion has continued to stick with the previous criteria because it is considered correct, both from a fiqh and scientific perspective (Komarullah, 2021; Kurniawan, 2016). Nahdatul Ulama (NU) stated that the altitude criterion of -200 has a strong foundation in jurisprudence and astronomy under the guidance of the Prophet Muhammad. The companions, the *tabi'in*, the *tabi' tabi'in*, the *salafusshalih* and the *auliya*, and the data from the latest *sadiq dawn light* observations (Mughits, 2014; NU, 2021). The same opinion was expressed by Thomas Djamaluddin, Head of the National Institute of Aeronautics and Space (LAPAN), stating that the Sun -200 is in a reasonable condition because the equatorial atmosphere in Indonesia is higher (Siswandi & Prima, 2019). The support of observational data that the prayer schedule issued by the Ministry of Religion is not too fast (Djamaluddin, 2020). Meanwhile, MUI prefers a middle way by submitting to the community according to their respective beliefs; there is no need to make it a problem; it is even essential to conduct another study (Oktaviani, 2020). These dynamics appear in various ways among Muslims, as happened in the determination of the beginning of Ramadan (Wusqa et al., 2020).

Unlike the government, MUI and NU, Muhammadiyah responded by opening up and making it the material for the 27th Tarjih National Conference (Munas) in 2010 in Malang (Azhari, 2021). More than that, Muhammadiyah assigned an astronomical study institution to conduct studies and research in astronomy within its university environment. Meanwhile, in the field of sharia, Muhammadiyah assigns scholars who are members of the Tarjih and Tajdid Councils. The research results by Tarjih institutions and scholars continued to be finalized and eventually became the decision of the 31st Tarjih National Conference (Munas) in December 2020. The National Conference decision changed the initial criteria for Fajr time from -200 to -180 on the eastern horizon (P. P. Muhammadiyah, 2020a) The change in criteria implies that it was postponed about eight minutes from the beginning of the previous Fajr time. So that it impacted the refreshment of the Fajr prayer when hearing the call to prayer, the *imsak* limit in carrying out pasting, and the time limit for menstruating and postpartum women for performing prayers and fasting.

Abdul Mughits (2014) carried out a study of the time of Fajr from the perspective of fiqh regarding the problem of the schedule for the Fajr prayer in Indonesia. The results of his study illustrate that international experts use the initial criteria for Fajr time between -130 to -19.50, while the majority of Muslims in Indonesia use -200. This impacts legal certainty for Muslims in implementing religious teachings. Alimuddin (2012) and Susiknan Azhari (2018) conducted another study by exploring several views about the time of Fajr. His findings show that there are differences in the Islamic world regarding the time of dawn due to the standard and different factors of the hadith of Gabriel in understanding the hadith

"ghalas" and "isfar" by not considering weather conditions. On the other hand, Muslim astronomers ignore the text message by concentrating on the Sun.

Meanwhile, in the perspective of science and astronomy, among others, Siti Asma' Mohd Nor and Mohd Zambri Zainuddin did about the sky's brightness using the Sky Quality Meter (SKM). His findings show that the beginning of Fajr time is at an angle of 20° below the eastern horizon, and the size of the sky is 20mag/m<sup>2</sup> (Zainuddin, 2012). Dhani Herwijaya conducted another study by observing and measuring the sky's brightness in several places by producing an elevation angle of 170. This photometer's measurements can be used as the beginning of Fajr time because sunlight interacts with the upper layers of the Earth's atmosphere starting at that elevation angle (Herdiwijaya, 2017). Nihayatur Rohmah conducted another study by observing the humidity of the atmosphere in the determination of the time of Fajr. The results of his research illustrate that atmospheric humidity is one factor that makes it difficult to determine the appearance of dawn. In addition, his observations of the morning twilight image for early Fajr time obtained an average dip of -18°39'29.4" (Rohmah, 2021). A study that is more directed at the integration of sharia and science is carried out by Arino Bemis Sado with an emphasis on the results of the provisions on prayer times in the Koran and hadith that need to be explained and explained astronomically so that a cohesive understanding can be realized (Sado, 2015). Another study was carried out by Mohammad Abdul Niri and his friends from Malaysia to test the Fajr time criteria that have been used in their country. His research shows that the Sun -200 is not so strong both in terms of sharia and scientific aspects (Niri et al., 2019). This integration study explains the importance of combining aspects of sharia and science. The determination of Fajr time is by sharia provisions and, at the same time, in line with scientific developments.

Several writings from several experts above show that the study of Fajr time tends to be separate between aspects of sharia and science. This fact also shows that there is still a lack of studies conducted through an integrated approach. Even if Arino Bemis Sado does it, his study is not specifically about Fajr time but prayer times. Likewise, the study conducted by Mohammaddin Abdul Nir was in the case in Malaysia. This paper studies the renewal of the Subuh criteria with an integrated approach between sharia and science aspects in line with the rolling discourse of integrating and interconnecting religious studies with science. One another need each other without dichotomy and separate. In line with that, this paper describes three issues regarding the renewal of the Subuh time criteria. First, the form and process of reform carried out by Muhammadiyah in integrating aspects of sharia with science when setting the Subuh time criteria. This section describes the process carried out by Muhammadiyah in updating its ijtihad regarding the Subuh time criteria. Second, the factors that caused Muhammadiyah to update the Subuh time criteria. This section is closely related to the circumstances or events that led to the renewal of the Fajr time criteria. Third, the implications of the renewal of the Fajr time criteria for religious practices that are in line with sharia and science. The

answers to these three questions are the subject of this paper, which explains the integration of sharia and science in the renewal of Islamic law.

This paper is based on three arguments. First, the renewal of *ijtihad* in Islamic law occurs in *muamalat* and aspects of worship other than the procedures or *kaifiyat*. This argument becomes an option when faced with situations changing due to advances in science and technology, as the dawn time criteria. This scientific progress can directly affect the development and dynamics of Islamic law. Second, the form of reform of *ijtihad* in contemporary Islamic law is an integrated construction that involves aspects of sharia and science. Both greet each other and even need each other. The mono-disciplinary approach to law formulation cannot comprehensively solve the problems that arise in society today. More than that, this integration has become a very urgent need to do considering the problems that arise are complete. Third, the renewal of *ijtihad* requires a method that allows elements of science to be combined with aspects of sharia to answer the needs of people's lives comprehensively.

This study aims to analyze the three problems in terms of *fiqh* and astronomy by focusing on the openness of *ijtihad* to the early changes in the dawn time to integrate sharia and science.

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This paper is based on three arguments. First, the renewal of *ijtihad* in Islamic law does not only occur in the field of *muamalat* but in aspects of worship other than the procedures or *kaifiyat*. This argument becomes an option when faced with situations with changing advances in science and technology, criteria for the time of Fajr. This scientific progress can directly affect the development and

dynamics of Islamic law. Second, the form of reform of *ijtihad* in contemporary Islamic law is an integrated construction that involves aspects of sharia and science. Both greet each other and even need each other. The mono-disciplinary approach to law formulation cannot comprehensively solve the problems that arise in society today. More than that, this integration has become a very urgent need to do considering the problems that arise are complete. Third, the renewal of *ijtihad* requires a method that allows elements of science to be combined with aspects of sharia to answer the needs of people's lives comprehensively.

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## **METHODS**

This type of research is a literature study on changes in the criteria for the beginning of Fajr's time in Muhammadiyah. The data used are secondary. Data was collected using a documentation study. The author explores documents that correlate with the criteria beginning of Fajr's time, both before the birth of the Tarjih decision and after it. The documents in question consist of reports on the research results from the astronomy research institute of Muhammadiyah universities, writings and articles of reckoning experts and Muhammadiyah scholars, material for the Tarjih National Conference, and other articles scattered on the Muhammadiyah website and others. The data is constructed to be analyzed using a contextual-interpretative method. This method is used to see the process of changing the criteria for Fajr time and determine the circumstances or social settings that surround it behind the changes in these criteria. In addition, a comparative analysis is also used by looking at the current social context of society so that the analysis can be carried out comprehensively. The analysis was carried out by reducing the data obtained from the document, namely the categorization and coding processes. This method is used to see the factors that cause the renewal of the Fajr time criteria. The following analysis process is carried out by displaying and verifying data to be interpreted and then concluded.

## **RESULTS AND DISCUSSION**

### **The Process of Changes in the Early Dawn Criteria**

Every *mukallaf* is obliged to know the prayer time because it relates to the validity of a person's prayer (Al-Zuhaili, 1989; Rusyd, 2007; Sabiq, 2004). If the prayer is not performed on time, the prayer is considered invalid. Prayer times are clearly defined in the Qur'an and Hadith, using phenomena of the movement of the Sun and the brightness of the sky. The beginning of Fajr time starts from the sunrise of Sadiq until the sunset. The noontime starts with the Sun slipping until the shadow of an object is the same length as the object. Asr time from the shadow of an object is the same length as the object until it is the same as the actual height of the object. Maghrib time from sunset until the disappearance of the red *syafaq* on the western

horizon. The time of Isha starts from the disappearance of the red *syafaq* until the sunrises (Al-Shan'ani, 2009; Rusyd, 2007). This phenomenon can be observed and calculated accurately to arrange prayer times according to the factual movements. This is very easy and more practical for daily use by Muslims. However, there are still differences between fellow astronomers and scholars in some instances due to differences in using criteria, and instruments, understanding the proposition and using it. Moreover, determining the initial prayer times schedule is included in the scope of *ijtihadiah*.

The dawn is related to the movement of the Sun in terms of the height of the Sun. This height is used to determine the time of Fajr and the sky's brightness. So far, scholars or Muslim astronomers, both classical and contemporary, have used it variously from -140 to -200 (Ayatullah, 2018), although in different locations. The difference in criteria is due to the difference in altitude (Ardi, 2020) and the sky's brightness. Each country has differences in altitude and brightness according to its geographical location. In Indonesia, the -200 criterion has long been used by most scholars and reckoning experts, including among Muhammadiyah itself (M. T. dan T. P. P. Muhammadiyah, 2009). However, since 1999 this criterion has been questioned and challenged because it is considered too early. This result was marked by the writing of Hanafi S Djamari (2009) in the *Republika Daily*, which asked Muslims to re-examine the time of Fajr. He proposed changing it to -180. However, this thought did not get a good response from the government or Islamic organizations. Mamduh Farhan al-Buhari in *Suryadilaga* (2013) brought up the discourse on this review, published in *Qiblati* magazine on a serial basis in 2009. In his writings, he stated that the Fajr time used by Muslims, especially in Indonesia, was too early. His concern was conveyed several times in writing to the Minister of Religion, hoping that there would be a change in the Fajr prayer schedule published by the ministry. This lawsuit amid the Islamic community raises the pros and cons that lead to doubts about the Fajr schedule circulating and used so far. Responding to the lawsuit, the Ministry of Religion held seminars and discussions discussing the Subuh time criteria, but the tendency was to maintain the previous criteria.

Among Muhammadiyah circles, this discourse had already started before 2010, even long before Hanafi S Djamari and Mamduh Farhan al-Buhairi questioned it. Some Muhammadiyah reckoning experts want a re-evaluation due to the speed of the Fajr prayer time used so far. The decisive impulse was getting stronger and even unstoppable when the 27th Tarjih National Conference in 2010 was held in Malang, especially at the commission session. However, there is no agreement on the criteria used between -180 and -200, so the National Conference decision still returns to the previous decision, namely -200. These phenomena because Muhammadiyah did not yet have data on the results of scientific research and observations carried out by *hisab* scientists and good complete *syar'i* arguments to be used as reasons for making changes (Azhari, 2021). In this regard, the Tarjih deliberation forum recommends that the Tarjih Council and astronomical study institutions within the Muhammadiyah Higher Education environment conduct research and examine the *syar'i* arguments integrated between sharia aspects with

aspects of science and technology. The results are expected to be by the guidance of the texts and in line with the times.

In connection with the recommendation, this assembly continued to make efforts to deepen and mature, which in the end became Tarjih's decision. One of the most important parts of such an effort is to assign three astronomical and observational study institutions within Muhammadiyah, namely the Astronomy Observatory of the University of Muhammadiyah North Sumatra (OIF-UMSU), the Center for Astronomy Studies at Ahmad Dahlan University (Pastron UAD) and the Islamic Science Research Network of the University of North Sumatra. Muhammad Prof. Dr. Hamka (ISRN UHAMKA). Theoretically, these three institutions found various uses of the early dawn criteria by Muslim astronomers, namely -15, -170, and -180 (Herdiwijaya, 2017; Ma'rufin et al., 2016). Meanwhile, the results of the UAD Pastor's research were presented for the first time at the Muhammadiyah Hisab and Fiqh Expert Halaqah on 12-13 Ramadan 1437H/17-18 June 2016 at the UHAMKA Campus, along with the study of the international Islamic calendars (P. P. Muhammadiyah, 2016). The study of this astronomical institution describes the value of sky brightness as measured by the Sky Quality Meter tends to be constant. This result can be used as the beginning of Fajr time by using the Sun's altitude below -180 (Pramudya, 2018). This halaqah also presents the results of observations and research from the Astronomy Scientific Group and Bosscha Observatory, Bandung Institute of Technology (ITB), as a comparison. His research recommends Fajr time to be at an elevation angle of 17 degrees. This is because the interaction of sunlight and the upper layers of the Earth's atmosphere begins to occur at an elevation angle of 17 degrees or about 65 minutes before sunrise (Herdiwijaya, 2016). In addition, it also presents a study by a group of astronomy lecturers at STAIN Ngawi with data acquisition of the altitude of the early dawn sun is -180 with varying widths (Sudiby et al., 2016).

In the sharia aspect, this assembly assigns all Muhammadiyah scholars to study it both in terms of fiqh and hadith jointly. Meanwhile, from the aspect of sharia studies in halaqah, the findings from the fiqh and hadith aspects are presented. Studies in the field of fiqh found an understanding of fiqh scholars in understanding and determining the beginning of Fajr time starting from the sunrise of Sadiq until the sunrise (Isfar time). Based on many hadiths of the Prophet SAW (Fariadi, 2016). Meanwhile, from the aspect of hadith, it was found that the pattern of transmission and editorship of hadith was expressed with various explanations, such as *thala'a al-fajr*, *bariqa al-fajr*, *asfarat* or *asfarat al-ardh* or *asfarat jiddan*. Likewise, in practice, the Prophet SAW performed the Fajr prayer sometimes in the dark, and sometimes the morning was already bright (Zuhri, 2016).

Maturation continues to be carried out by the Tarjih Council by holding a Muhammadiyah reckoning expert halaqah on May 5-6, 2018. At this halaqah, the Tarjih Council presents the results of observations and research of OIF UMSU by producing various data ranging from -130 to -170 (Tim OIF UMSU, 2018). In addition, the Center for Astronomy Studies at Ahmad Dahlan University (Pastron

UAD) explained the results of research done on the calculation of accurate times and Muhammadiyah's Hisab using the Sun's height was -180 slower than the calculation results. Likewise, if it is done using the calculation of the height of the Sun -200 Fajr, time is too fast (Pramudya, 2018).

After the data is considered complete and comprehensive, in 2020, the Tarjih Assembly will hold the 31st Tarjih National Conference. Ahead of the National Conference, this assembly continues to finalize the criteria for the early dawn time, including the results of research institutes, which appear to be different from one another. First, ISRN UHAMKA, coordinated by Tono Saksono, concluded that the average early dawn time with the Sun's height was around -130. In addition, in research and observations at the beginning of Fajr time with an altitude of the Sun -180. However, if the Fajr prayer is performed in this position, then from 1000 times the Fajr prayer, there are only about 14 times whose time has entered Fajr time. Second, OIF UMSU, chaired by Arwin Juli Butar-Butar, concluded that the results of his research and observations on the average early dawn time with the Sun's height around -160. Third, the UAD Pastor, chaired by Yudiyakto, concluded that the average early dawn time with the Sun's height was around -180. In addition to presenting and discussing the research results of the three institutions, the Tarjih Assembly, in its discussion, also brought in independent researchers from the Bosscha Observatory ITB. This independent research revealed that based on the distribution of data collected from 2011-to 2020 in local time, there was a good relationship between the angle of depression and the sky's brightness. The maximum sky brightness has an angle of depression between -180<sd>-190 (Herdiwijaya, 2020a). This means that the altitude of the Sun at the beginning of Fajr time is between 180 and 190. These research institutions recommend re-evaluating the time of the beginning of Fajr by offering below the height of the Sun -200.

In discussing the initial criteria for the Fajr time ahead of the determination of the National Conference decision, there was a lot of debate and discussion among the participants, especially in the astronomical aspect. This is because the results of research and observations from several astronomical study institutions that are taken into consideration are still different in recommending the height of the Sun even though they are all below -200. After going through deliberation and discussion both in commission sessions and in the plenary session of the National Conference, in the end, the National Conference participants took a middle path by setting the Sun's altitude to -180 (P. Muhammadiyah, 2021a), although at first, they tended to set it below -180. The benefits, an agreement was made on the height not to be too different from the beginning of the previous Fajr time. If the lowest altitude was taken as recommended by ISRN UHAMKA, it was feared that there would be uproar in the community. The altitude will have implications for the early delay of Fajr time between 20-30 minutes. This is in line with the concept of *mashalah*, which aims to provide benefits and prevent harm (Salma, 2012).

The decision of this National Conference was then officially made into a decision and socialized to all leaders, business charities, citizens, and Muhammadiyah sympathizers after being confirmed by the Muhammadiyah Central Executive through Muhammadiyah Central Leadership Decree Number: 734/KEP/1.0B/2021 concerning Tanfidz Decision of the XXXI Tarjih Muhammadiyah National Deliberation regarding the Early Dawn Criteria on 7 Syakban 1442H/March 20, 2021. In socializing and enforcing this decision, this decision is carried out in two forms. First, the socialization program is by delegating all members of the Tarjih Council to regions and regions by dividing them into regional zones within a specific period. Since the socialization was carried out during the Covid-19 period, the socialization was carried out via zoom. In 2021 this decision cannot be implemented effectively and maximally because it is still in the socialization period (P. Muhammadiyah, 2021b). The second is the publication of the calendar. The effective enforcement of the Tarjih Decision has begun in line with the publication of the Muhammadiyah calendar, both issued by the Muhammadiyah Central Executive and in areas such as Muhammadiyah West Sumatra. The calendar containing the Gregorian calendar and the Hijri calendar with the al-hilal method is also equipped with a schedule of five prayers a day and night, plus the time for the dhuhur prayer and the shadow of the Qibla (Muhammadiyah, 2020; Wusqa et al., 2020). With these two forms, the Tarjih Decision related to the beginning of Fajr time can be applied equally to all leaders, business charities, and Muhammadiyah members.

Thus, the Tarjih Muhammadiyah decision officially applies to all components of Muhammadiyah, including Muslims who use the Muhammadiyah calendar. Based on that, it can also be seen that the process of changing the criteria for Fajr time has been heavily voiced since the 27th Tarjih National Conference in 2010. The process was carried out by involving all Muhammadiyah scholars who are members of the Tarjih Council, astronomical study institutions within Muhammadiyah universities, and independent researchers in conducting observations. And research to obtain empirical data. This process has enabled Muhammadiyah to change *ijtihad* in an integrated manner between sharia provisions and scientific findings.

### **Factors Causing Change**

The renewal of the Subuh time criteria is an inherent part of the character of the Muhammadiyah movement as a *tajdid* movement. In addition to responding and answering problems that arise in the community, *tajdid* is carried out by Muhammadiyah to re-evaluate Tarjih's previous decisions and fatwas to adapt them to new findings and developments (Rachmadani, 2018). For Muhammadiyah, the issue of criteria is a matter of *ijtihad* that requires the openness of *ijtihad* to scientific and technological discoveries. This openness paradigm will impact the space for change and development in line with the development of science and technology (P. P. Muhammadiyah, 2020a). Here it is necessary to integrate aspects of *syar'i* and science with relevant multi-disciplinary disciplines. Specifically, the

disclosure of the early dawn time in verses and hadiths is closely related to the state of the position of the Sun's circulation. In addition, it is now possible to access a broader range of classic and contemporary references. Likewise, sky brightness measuring and observation tools are increasingly modern, allowing for stronger and more accurate discoveries (Ibrahim & Norashikin, 2009).

In this regard, Muhammadiyah's change in the criteria for the beginning of Fajr time is influenced by three factors. First is the development and improvement of the Tarjih Judgment Association (HPT) (P. P. Muhammadiyah, 2020a). This factor is an inherent part of the *tajdid* design. This Tarjih is because decisions and fatwas issued previously continue to be evaluated along with the developments and changing times (Anwar, 2005). In this section, the old ruling stipulates that the Sun's altitude is -200, as contained in the HPT and the book "Guidelines for Hisab Muhammadiyah" to be -180. This development and change effort took place for a long time and continued to experience strengthening until the 31st Tarjih National Conference in 2020. This change was made after obtaining complete and comprehensive data from both the Islamic and astronomical aspects, which had implications for the addition of about eight minutes from the usual Fajr time (P. P. Muhammadiyah, 2020a).

Second, the debate between fiqh scholars and astronomers is still intense. The emergence of conceptual differences between these two aspects is due to each path separately. The understanding of the hadith about *ghalas* and *isfar* does not take into account the conditions and weather when this hadith appears. Likewise, in the astronomical perspective, focus on the brightness of the sky and the position of the Sun by ignoring the text messages (Azhari, 2018). On the one hand, the provisions of Fajr time in the perspective of fiqh from sunrise to sunset are final. Still, there are differences in understanding the state of natural phenomena between *galas* and *is far*. Likewise, in the astronomical perspective, there are differences in converting the provisions of Fajr time at dawn in the form of numbers for the height of the Sun ranging from -130 to -200 (Azhari, 2020; Fathurrohman, 2020). Even Fajr time in Indonesia using an altitude of -200 is considered too early (Djamari, 2009; Suryadilaga, 2013). The government represented by the Ministry of Religion tends to maintain the criteria used previously. This difference of opinion has triggered Muhammadiyah to conduct a more comprehensive and complete review involving study and research institutions within Muhammadiyah universities and other relevant parties.

Third, recommendations for research results from astronomical studies institutions. This factor appears to be more dominant in providing impetus for change. The results of the astronomical study recommend that Muhammadiyah review the criteria that have been used so far. First is the institution of astronomical studies in the Muhammadiyah Higher Education environment. ISRN UHAMKA conducted research for 750 days showing solid statistical evidence that dawn appears when the Sun is around -130. The results of this study, not only in Indonesia but also throughout the world. Likewise, OIF UMSU found data on the height of

the Sun at Fajr at -16,480 and proved that light pollution affected the Fajr dip. Meanwhile, the UAD Pastor found a tendency for Fajr time to occur lower than the Sun's height of -180 (P. P. Muhammadiyah, 2020b). Second, research from the Bossca Observatory ITB. Research by this astronomical institution shows that changes in sky brightness occur at an elevation angle of 17 degrees or about 65 minutes before sunrise. The state of this phenomenon has a relatively similar profile (Herdiwijaya, 2017; Rusmin & Syarifudin, 2020). Third individual research. In part Sudibyo et al. (2016) and Sriyatin Shodiq and Bahrul Ulum. This study proves that the overall height of the Sun at the beginning of the real dawn is -18° (Ma'rufin et al., 2016; Yusrizal, 2017). Almost all of these studies and expert opinions recommend an average Sun elevation of below -200, although the figures vary and there is no agreement.

### **Approach To Change In Early Dawn Criteria**

Muhammadiyah updating the Subuh time criteria uses several approaches. They are first combining aspects of sharia and science. Muhammadiyah carried out this reform by combining aspects of sharia and science, especially astronomy. Because the time of Fajr is a textual provision that is *tauqifiy*, namely the sunrise of *sadiq* until the sunset of the Sun, these provisions are final and have no chance of being changed for any reason. Therefore there is no difference of opinion among fiqh scholars in determining the time of Fajr. The difference arises in the realm of praxis because the state of natural phenomena greatly influences it. The hadiths that explain natural phenomena in the form of *galas* and *isfar* are not accompanied by an explanation of the existence of summer or winter. In summer, the natural conditions are brighter, while the natural phenomena will be dark in winter.

Meanwhile, the determination of the Subuh time criteria is *ijtihad* (Hazwan, 2016). In this aspect, changes can occur along with the discovery and development of science and technology to bring together aspects of sharia and science (Darmalaksana, 2020). In addition to being open to change, there are also opportunities for differences of opinion. To combine these two aspects, Muhammadiyah uses a Bayani approach. This approach is used as an effort to extract sharia texts in the form of the Qur'an and the hadith of the Prophet Muhammad related to dawn time. Because the time of Fajr is closely related to the problem of worship in Islam, in this realm, Muhammadiyah is stronger and more consistent in holding fiqh rules, the importance of having a solid backing on the arguments (Baharuddin, 2017). The results of the Muhammadiyah study through its Tarjih Council showed that the Qur'anic explanation of Fajr time was general, including QS. An-Nisa' [4]: 103, Al-Isra' [17]: 78, al-Takwir [81]: 18 and al-Baqarah [2]: 187.

The details are only mentioned in several hadiths of the Prophet, with various patterns and editorials referring to the state of natural phenomena. First, starting from sunrise to sunset (*thulu' al-fajr ila thulu' al-syams*). Second, dawn (*barqa al-fajr*) and the Earth have become bright (*asfarat al-ard*). Third, in the

morning, when it is still dark (*galas*) (P. P. Muhammadiyah, 2016). Based on the instructions of several hadiths, fiqh scholars agree that the time of Fajr starts from the sunrise of *sadiq* until the sunset. In practice, there are differences in understanding the meaning of *ghalas* and *isfar* as contained in the hadith of the Prophet (Sharrif et al., 2013). Muhammadiyah is more likely to understand downtime in a state of *ghalas* even though it is still dark (P. P. Muhammadiyah, 2020b). The state of *ghalas* is the possible and stronger boundary between night and morning, as mentioned in the hadith as the dawn of *sadiq*. *Ghalas* itself is intended as the darkness of the end of the night mixed with the light of Fajr at the dawn of *sadiq*, not before the dawn of *sadiq* (P. P. Muhammadiyah, 2020a; P. Muhammadiyah, 2021a). Likewise, in the historical aspect, the Muhammadiyah study found 29 Muslim astronomers who offered the Sun's altitude from -130 to -200. These criteria are based on observations using their instruments, adopting and utilizing, confirming, strengthening, and actualizing instruments developed by other parties (P. P. Muhammadiyah, 2020b).

In addition, Muhammadiyah also uses a Burhani approach. This approach is closely related to the development of knowledge and science, especially astronomy/astronomy, in measuring the sky's brightness and determining the height of the Sun at the dawn of *sadiq*. This approach is critical in transferring the provisions of the Fajr time contained in the text to the position of the Sun's elevation. This approach has made it possible for Fajr time to be arranged on a scheduled basis every day in a precise and correct manner without looking at natural phenomena directly. In the science of astronomy, the dawn of *sadiq* is called astronomical twilight, the sky is dark, and the eyes cannot distinguish between objects around it. They cannot be distinguished unless the eyes have adapted long enough to the dark situation (Herdiwijaya, 2020). *Sadiq* as Fajr was transferred to the value height of the Sun by taking into account the state of the light burst as used in astronomy. The value of the height of the Sun, which is the criterion for Fajr time, is obtained from observations made by astronomical research institutions within the Muhammadiyah environment and other independent researchers (P. P. Muhammadiyah, 2020b).

Furthermore, Muhammadiyah also uses the Irfani approach. This approach is used by considering the circumstances and wisdom surrounding them, where the changes are not made suddenly and haphazardly but through a long process and time. Determination of the altitude of the Sun -180 is seen as a middle way from the altitude value obtained from observations. Because Fajr time, as contained in the prayer schedule published by Muhammadiyah, is not only used for internal Muhammadiyah but is widely used outside Muhammadiyah. Applying the three approaches above shows an integration effort carried out in a unified whole and not separated from each other. This study provides a strong argument for Muhammadiyah to change the criteria used previously.

Second, considerations of benefit. The provisions of the Subuh time criteria for Muhammadiyah have a relationship with benefit. This consideration is because

the text's explanation regarding the provisions of the Fajr time is clear and firm. It no longer causes differences of opinion among scholars. However, in its practical form, the explanation of texts related to the state of natural phenomena still opens up space to be understood and practiced differently. Several narrations reveal that the companions of the Prophet (PBUH) returned from the Fajr prayer when it was still dark, and they did not know each other. In another narration, it is stated that when there was a question to the Prophet, he directly ordered Bilal to call the call to prayer. In addition, it was also mentioned that the Prophet prayed when the natural conditions were clear from the darkness so that they could get to know each other (Anshori & Mu, 2020; Yunus, 2014).

The appearance of the two hadiths does not seem to have considered the season's state that occurred at that time. The narration that describes the Prophet and his companions returning from the Fajr prayer was still in the dark when it was winter. In such dark conditions, the dawn of *sadiq* has risen, but the atmosphere is still dark. Likewise, when the Prophet and some of his companions prayed to Fajr when the natural conditions were clear, they were likely in the summer so that the situation became bright. When the Prophet prayed in the dark, it did not mean praying before the dawn of *sadiq*. Likewise, the prayers in the light of the Prophet and the Companions in the summer do not mean it is too late to do them. This phenomenon gives rise to different opinions, including the displacement of the value of the Sun's altitude.

However, the height of the Sun offered by astronomers appears varied, including the method of generating data. ISRN UHAMKA offers the Sun's altitude of -13,580 with a statistical mean approach (P. P. Muhammadiyah, 2020b). This statistical approach is considered inappropriate in determining the time of Fajr because the observation that should be sought is the earliest point of finding Fajr time. OIF-UMSU offers the Sun's altitude of -16,480 with pollution conditions, and the air is not so good when the observations are made so that it affects the Earth's light bias which results in the accuracy of the data. Pastron UAD offers the Sun's altitude of -180 with the condition of the Earth's light being biased when observed so that SQM cannot capture the Sun's secondary light. Bossca Observatory ITB and other independent researchers offer the Sun's height of -170 with light pollution conditions that affect the Sun's height (Herdiwijaya, 2017). The diversity of this data by the Tarjih Council is set at -180 after considering the benefits. The benefit here is that there is concern about the emergence of anxiety and even noise among the broader community if the lowest sun elevation value is set as offered by ISRN HAMKA. This phenomenon is because the height of the Sun has implications for the emergence of differences in the time of Fajr in a long period with the Fajr time set by the Ministry of Religion and other Islamic organizations. The difference can reach 24 minutes. Likewise, the Tarjih Council did not maintain or strengthen the altitude of the Sun -200 as still maintained by the Ministry of Religion and other Islamic organizations. The value of the height of the Sun is considered not in line with scientific developments, especially astronomical data generated from measurements of the brightness of the sky and the height of the Sun. Therefore, the

Sun's altitude of -180 is seen as a middle ground. The Fajr time between the previous and the new criteria is only about 8 minutes, so the changes are not too noticeable. This change is predicted not to cause anxiety in religious practice, mainly if the socialization is carried out massively by institutions or experts who have competence in both the sharia and science aspects, especially astronomy experts.

## CONCLUSION

The change in the initial criteria for Fajr time from the Sun's height -200 to -180 shows that Muhammadiyah in its *ijtihad* is open to accepting scientific and technological developments and findings that change old understandings that have been ingrained in the soul and understanding of society. This openness is carried out actively by encouraging study institutions in the higher education environment and presenting independent researchers from Bosscha ITB and other researchers. This change process has been going on for more than ten years until it was determined at the 31st Tarjih National Conference in 2020. This openness is due to the determination of the criteria for the beginning of Fajr's time, which is seen as *ijtihad* concerning the integrated Bayani, Istislahi, and Irfani methods. Its implementation is done by transferring the text's provisions in the form of Fajr time with a choice of bright limits (*ghalas*) to be the height of the Sun, which is the scientific aspect. In addition, openness is also closely related to considering the benefit of preventing the public from unrest in religious practice.

The use of contextual-interpretive methods in this study has made it possible to understand the changes in the criteria for Fajr time to adapt to sharia provisions and in line with scientific developments and findings. However, this paper cannot generalize the changes made by other organizations and experts. This paper suggests conducting research on other *ijtihad* institutions, both with the same method and approach or with other methods so that it looks more comprehensive.

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