



QIBLA DIRECTION ACCURACY ANALYSIS BASED ON ASTRONOMY (GOOGLE EARTH), PERSPECTIVE OF ISLAMIC LAW

Sri Wahyuni^{1*}, Samsuddin¹, Ekawati Hamzah¹

Faculty of Sharia and Law, Institut Agama Islam (IAI) As'adiyah Sengkang
Veteran Street No. 46, Wajo, Indonesia, 90914

*Email: unhyunus26@gmail.com

Abstract: Qibla is defined as the building of the Ka'bah or the direction of Muslims in carrying out a worship, especially prayer, so we need a method that can be used as a guide in determining the direction of Qibla in worship. This study aims to determine the accuracy of the Qibla direction of mosques in Tanete Riattang and Tanete Riattang Barat Districts as measured using astronomy (Google Earth), and the study of Islamic law views the measurement of Qibla direction using astronomy. The method used in this study is a qualitative method, namely the method used to process ideas, reviews and views of experts, as well as descriptive qualitative data analysis methods, namely comparing theoretical studies and realities in the field. The results showed that the method of determining the Qibla direction used in this study using the Google Earth software is relatively easy, very accurate and efficient, but people prefer to determine the Qibla direction by using a compass and also by using the sun's shadow which is known to have quite a difference significant (less accurate). Therefore, the involvement and concern of the government, in this case the Ministry of Religion, as well as competent parties in the field of astrology (determination of the Qibla direction) are needed. Qibla is the direction of the Muslims in worship, therefore we must try our best to determine the direction of Qibla as accurately as possible, considering the growing development of intellectual civilization, especially in the field of astronomy. So that in the future uniformity of direction in worship can be achieved.

Keywords: astronomy, Google Earth, Islamic law perspective, Qibla direction accuracy

Abstrak: Kiblat diartikan sebagai bangunan Ka'bah atau arah umat Islam dalam melaksanakan suatu ibadah khususnya shalat, sehingga diperlukan suatu metode yang dapat dijadikan pedoman dalam menentukan arah kiblat dalam beribadah. Penelitian ini bertujuan untuk mengetahui ketepatan arah kiblat masjid-masjid di Kecamatan Tanete Riattang dan Tanete Riattang Barat yang diukur menggunakan ilmu astronomi (Google Earth), dan kajian hukum Islam memandang pengukuran arah kiblat menggunakan ilmu falak. Metode yang digunakan pada penelitian ini adalah metode kualitatif yaitu metode yang digunakan dengan mengolah gagasan, tinjauan dan pandangan para ahli, serta metode analisis data kualitatif deskriptif, yaitu membandingkan kajian teoritis dan kenyataan di lapangan. Hasil penelitian menunjukkan bahwa metode penentuan arah kiblat yang digunakan dalam penelitian ini yaitu dengan menggunakan *software* Google Earth tergolong mudah, sangat akurat dan efisien, namun masyarakat lebih memilih untuk menentukan arah kiblat dengan menggunakan kompas dan juga dengan menggunakan bayangan matahari yang diketahui terdapat perbedaan yang cukup signifikan (kurang akurat). Oleh karena itu, keterlibatan dan kepedulian dari pemerintah, dalam hal ini Kementerian Agama, serta pihak-pihak yang berkompeten di bidang astrologi (penentuan arah kiblat) sangat diperlukan. Kiblat adalah arah umat Islam dalam beribadah, oleh karena itu kita harus berusaha sebaik mungkin untuk menentukan arah kiblat seakurat mungkin, mengingat semakin berkembangnya peradaban intelektual khususnya di bidang astronomi. Sehingga ke depannya keseragaman arah dalam beribadah dapat tercapai.

Kata Kunci: astronomi, Google Earth, ketepatan arah kiblat, perspektif hukum Islam

Introduction

The main discussion in astronomy is the determination of the beginning of prayer times, the direction of the Qibla, the *Hijri* calendar, the beginning of the lunar month and eclipses. One of the most urgent discussions and should receive more attention by astronomers today is the determination of the direction of the Qibla which is increasingly experiencing a shift in its main place to old mosques in an area, while the command in determining the direction of Qibla has existed since the time of the Prophet Muhammad SAW, the Messenger of Allah himself in his *ijtihad* had prayed by facing the Bait Al-Maqdis as had been done by the previous Prophets (Mustafa, 2013). Not only that, considering that the word *Al-Kiblah* is repeated 4 (four) times in the Al-Quran, and it has been confirmed that Qibla is an important

issue to consider before praying. Facing the Qibla direction means that the whole body is upright facing the Ka'bah which is located inside the Grand Mosque of *Makkah Al-Mukarramah*. While astronomy is the science of reckoning that is used to measure the Qibla direction with various methods that have astronomical calculations related to the position of the sun and moon. And the entire orientation is aimed at Muslim worship activities.

In the study of the history of science, it is known that astronomy has developed since the time of the Prophet Muhammad SAW until today. According to the history of determining the Qibla direction at the time of the Prophet Muhammad SAW, the companions believed that the Qibla direction used was the Qibla direction used by the Prophet Muhammad SAW as he is considered a person whose words, actions are the truth. So that the companions unanimously accepted the Prophet's decree, including the issue of determining the direction of the Qibla. However, after the Prophet died, not only the determination of the direction of the Qibla, the determination of other Islamic laws also experienced decadence, the determination of the direction of the Qibla outside the city of Mecca experienced many problems. In the end, the companions took advantage of the position of the stars, moon and sun as a guide in determining the direction of Qibla.

In its development, in the middle ages, in determining the direction of Qibla, the Najm Suhail star (conopus star) was used, because according to research by scientist David A King, the Conopus star rises more often in the southern part of the Earth, while in other places it is used as a guide for the rising direction of the solstice summer (Arifin, 2012). In Indonesia itself, it can be seen that its development is in accordance with the quality and capacity of intellectuals in the midst of the onslaught of the shadows of previous scholars. But historically the development of determining the direction of Qibla has grown rapidly because of the command and direction of Muhammad Arsyad Al-Banjari and Ahmad Dahlan, seen from the methods and props used in determining the direction of Qibla, which are modern, namely the special stick, compass, theodolite and *Rubu Mujayyab* (Azahari, 2001). The determination of the direction of Qibla is a treasure of Islamic scholarship which is learned from astronomy, while the *syar'i* rules are studied in *fiqh*, so astronomy and *fiqh* are an important part in determining the validity of a worship (Khazin, 2004).

Based on the above, the authors consider that research on determining the direction of Qibla using astronomy and *fiqh* is considered important to do in order to create scientific treasures that will be useful for worship purposes. In addition, it is also hoped that there will be no more conflict of understanding between science and *fiqh*, so that the science of astronomy can be taken into consideration in determining Islamic law. In the midst of the era of globalization and developing technology, it is actually possible for us to be able to see in determining the direction of the Qibla direction correctly without any doubt. However, in the midst of the development of science and technology, some people still adhere to the previous teachings which only rely on the cardinal directions.

Under these conditions, Muslims need decisions that do not cause friction and division among Muslims. Therefore this research is devoted to examining the anthropological and fiqhiyah sides about determining the direction of Qibla for groups with different views and the differences are quite significant between the pro-science and pro-mythology groups, they are able to examine the anthropological and fiqhiyah sides regarding the direction of Qibla for the two groups with different views.

Materials and Methods

This study uses a sociological approach, namely an approach that uses classical and modern sociological logic and theory, as an effort to describe religious social phenomena and their influence on other phenomena. So that this research can be classified as descriptive qualitative research, where the data collected is in the form of words, pictures and numbers. Researchers determined the direction of Qibla with Google Earth software. Data sources in this study are interviews, observations and empirical data taken from the Google Earth application, and the rest is taken from several related documents.

Related to this research, it can be classified as descriptive qualitative research, namely the data collected in the form of words, pictures and numbers, where the author not only examines the process of determining the direction of the Qibla in the mosque, but also tests the accuracy of the direction. Qibla

with the Google Earth application method. This research consists of two types of data, namely, field research and library research. And the focus of the research are several large mosques in Bone Regency, namely the Al Markas Al-Ma'arif Mosque, Bone Grand Mosque, Al Mujahidin Old Mosque and Al Rizkullah Mosque.

Result and Discussion

A. The View of Islamic Law Regarding the Determination of the Qibla Direction based on the Science of Astronomy

The process of determining the direction of Qibla is often a problem that can be categorized as complicated, because the long debate between scholars, which in this case refers to the context of *fiqh*, is always not in line with science which is always developing. As said by Ali Mustafa Yaqub Imam when he was interviewed on one of the private TV stations, he was of the opinion that to determine the direction of Qibla there is no need to refer to the science of astronomy, because the command in Islam says that wherever you come out turn your face towards the Masjid al-Haram which is the benchmark or the mecca of prayer. According to him, when you are in Indonesia, it means that the Masjid al-Haram is right in the western part of Indonesia, so just turn your face or your Qibla right to the west.

While the basis used by astronomy in this case is astronomy as the results of research conducted by students majoring in astronomy in Yogyakarta that every time there is a difference of 1° angle from the direction of Yogyakarta which has a distance of 8,330 km from the Masjid al-Haram, Mecca, there will be a deviation in the direction of Qibla as far as about 140 km away from the position of the Ka'bah (Abdullah, 1983).

So when we lead to the perception of Mustafa Ali Yaqub, then we can be sure that there will be a deviation from the direction of the Qibla from what it should be, because it is no longer based on the principle of calculation and empirical truth. Now, a process like this also occurs in many areas in Indonesia, because of the thick cultural customs or community beliefs about the previous people who have taken measurements of the Qibla direction as if they no longer want to change, let alone follow the direction of scientific developments.

As is the case in Bone Regency, especially in several large mosques in Bone Regency, there are still very many mosques whose Qibla direction does not match the actual one because the mosque management does not want to make changes on the grounds that measuring the direction of the mosque's Qibla is *tau panritana* or previous people who were believed to be pious scholars at that time. The closed eyes of the people's hearts about the development of science have caused a lot of discrepancies in the direction of the main Qibla in famous mosques in Bone Regency, and which is used as the basis of reference by scholars is the word of God in QS. Al-Baqarah: 150.

وَمِنْ حَيْثُ خَرَجْتَ فَوَلِّ وَجْهَكَ شَطْرَ الْمَسْجِدِ الْحَرَامِ وَحَيْثُ مَا كُنْتُمْ فَوَلُّوا وُجُوهَكُمْ شَطْرَهُ لِئَلَّا يَكُونَ لِلنَّاسِ عَلَيْكُمْ حُجَّةٌ إِلَّا الَّذِينَ ظَلَمُوا مِنْهُمْ فَلَا تَخْشَوْهُمْ وَاخْشَوْنِي وَلَا تَمْنَعِيَّ عَلَيْهِمْ وَلَعَلَّكُمْ تَهْتَدُونَ ﴿١٥٠﴾

Meaning:

“And from wherever you go out [for prayer], turn your face toward al-Masjid al-Haram. And wherever you [believers] may be, turn your faces toward it in order that the people will not have any argument against you, except for those of them who commit wrong; so fear them not but fear Me. And [it is] so I may complete My favor upon you and that you may be guided” (Departemen Agama RI, 1986).

Based on the interpretation of the QS. Al-Baqarah: 150., it has been concluded that facing the Qibla direction when praying is obligatory. But, in another narration, it is explained that the Messenger of Allah and his companions used to pray at night, and it was only in the morning that they realized that their Qibla direction was wrong, and they did not repeat their prayers. And in the interpretation of Ahkam it is said that the Qur'an confirms that the condition for the validity of prayer is facing the Qibla, namely the Ka'bah which is in the Masjid al-Haram and it is not lawful for them to pray facing the Qibla which

is not in accordance with what Allah has commanded in the Qur'an except for those who are on the vehicle and for those who are in a state of fear (*khauf*) (Nasution, 1992).

Imam Shafi'i in one of his narrations explains that the Qibla must face the Ka'bah, and the Ka'bah is in the Masjid al-Haram of Mecca. And according to Muzani, Imam Shafi'i said that this applies to those who are in the Masjid al-Haram, while those outside the Masjid al-Haram, only follow the direction, not the building. Meanwhile, Imam Abu Hanifah and Imam Malik have the same opinion, which is enough to face the direction, not the building (Kasim, 2008).

From some views of the scholars, the writer is more inclined to this opinion, because when it is fard to face the direction not the building, it means that it will make it easier for Muslims to determine the direction of the Qibla, especially in the midst of the era of the development of science and technology, it will make it easier for us to determine the direction of Qibla because there are so many methods that can be used to determine the right direction, such as the Google Earth software. Therefore, considering the current development of science and technology, should we still hope for the method of determining the Qibla direction of the previous people which is not based on calculating the truth from empirical data.

B. The Process of Measuring and Determining Qibla Direction with the Google Earth Application

In measuring the Qibla direction of the large mosques of Bone Regency, the sample was set at 4 mosques, namely Al Mujahidin Old Mosque, Al Markas Al-Ma'arif Mosque, Bone Grand Mosque, and Al Rizkullah Mosque (Biru Islamic Boarding School). The results of observations of the mosques that were sampled in this study are:

1. Al-Mujahidin Mosque in Bukaka Village

The Old Mosque of Al-Mujahidin was built during the royal era in 1632 AD. The mosque is located at Sungai Citarum street was the first mosque in Bone district, Bone kingdom at that time. The mosque with a land area of 30 m x 40 m, stands a mosque building with an area of 23 m x 24 m in diameter. Since its establishment, it has been renovated 5 times and the last renovation was in 1987 M. The direction of the Al-Mujahidin mosque's qibla was determined by the Qadi' king of Bone at that time who was known as "Petta Kalie". According to him, since the establishment of the mosque, the Qibla direction has never been tested. In addition to a place of prayer, Al-Mujahidin mosque functioned as a place of education and a place of information. One of the educational media such as Kindergarten/al-Quran Education Park, Raudhatul Athfal (RA) and Madrasah Diniyah (Madin) (Syahid, 2019).

The accuracy of the Qibla direction of the Mosque based on Google Earth software shows that the Qibla direction of the Al-Mujahidin Mosque in Bukaka Village deviates to the west. So it can be concluded that the mosque is categorized as a mosque that uses the wrong Qibla direction. An overview of the Qibla direction of the Old Mosque of Al-Mujahidin can be seen in Figure 1.

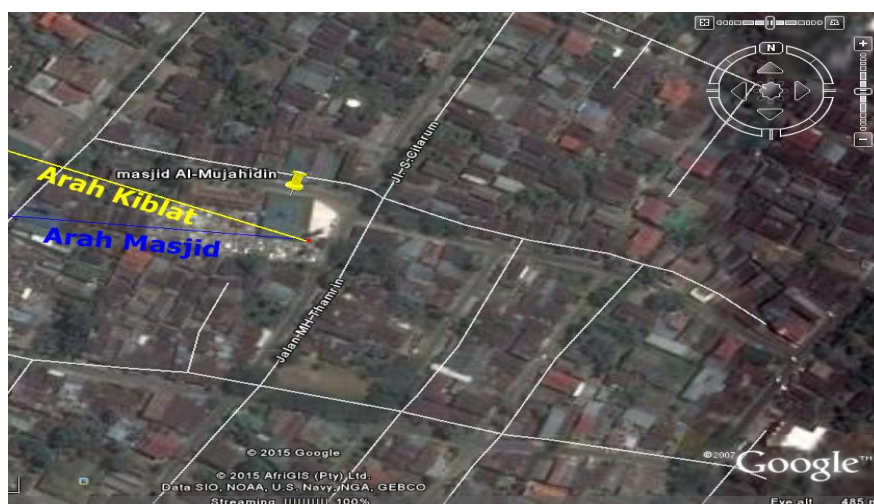


Figure 1. An overview of the Qibla direction of the Old Mosque of Al-Mujahidin

2. Al-Markas Al-Ma'arif Mosque

Al-Markaz Al-Ma'arif Mosque is a district mosque located on Jend. Ahmad Yani and HOS. Cokroaminoto street. The Al-Markaz Al-Ma'arif Mosque in Bone Regency was originally named the "As-Salam" Great Mosque of Bone Regency, which at that time the Regent was held by H. Andi Syamsuel Alam. The name change was carried out during the reign of Regent H. Andi Muh. Idris Galigo, S.H. The existence of the Al-Markaz Al-Ma'arif Mosque cannot be separated from the great role of the Regional Government of Bone Regency. Historically, the mosque that stands at the doorstep of the city of Watampone was built since the 80s. At that time the official of the Regent was H.P.B. please. The completion of the physical construction of the religious facilities was completed when the Regent's official at the time was H. Andi Syamsuel Alam (1988-1993).

The accuracy of the Qibla direction of Al-Markas Al-Ma'arif Mosque in Macanang Village shows that the Qibla direction of the Mosque deviates to the northwest. So that the mosque is categorized as a mosque that has an incorrect Qibla direction and is classified as severe because it no longer faces Saudi Arabia, but faces Cairo, Egypt. An overview of the Qibla direction of Al-Markas Al-Ma'arif Mosque can be seen in Figure 2.

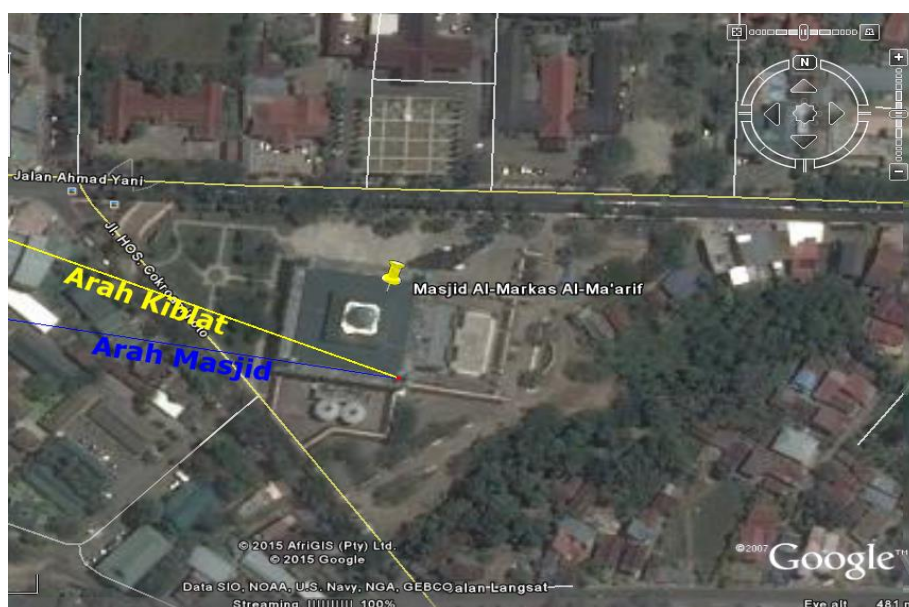


Figure 2. An overview of the Qibla direction of the Al-Markas Al-Ma'arif Mosque

3. Bone Grand Mosque

The Grand Mosque is a mosque located on Mesjid Raya street and is the second oldest mosque which is categorized as a large mosque in Bone Regency. Even this mosque is a mosque that was built on the orders of the *Qadi* "King of Bone". Regarding the size and related matters regarding the mosque, it is not yet known because none of the sources who are willing to be interviewed on the grounds that this mosque has been abandoned by the old management, there is no clarity about the history and size of the mosque.

The results of measuring the accuracy of the Qibla direction of the Bone Grand Mosque show that the Qibla of the mosque deviates to the west-north direction but is categorized as not too deviant from the actual Qibla direction. An overview of the Qibla direction of the Bone Grand Mosque can be seen in Figure 3.



Figure 3. An overview of the Qibla direction of the Bone Grand Mosque

4. Al Rizkullah Mosque (Biru Islamic Boarding School)

Rizkullah Mosque is a mosque located in the Biru Village, precisely in the Mahad Hadith Biru Islamic Boarding School complex and was built in 1993. This mosque was built on land belonging to an Islamic boarding school measuring 298 m² and was built at the same time as the construction of the Islamic boarding school. This mosque has many congregations and is always filled with worshipers at every prayer time with a total of about 300 worshipers. In addition to being a place of worship, it is also used by mothers and children as a place for *ta'lim* assemblies and a place to study for Kindergarten/al-Quran Education Park.

The results of the measurement of the level of accuracy of the Qibla direction of the Rizkullah Mosque show that the Qibla direction of the Rizkullah Mosque in Blue Village is exactly in the direction of the Ka'bah of the Masjid al-Haram. An overview of the Qibla direction of the Rizkullah Mosque can be seen in Figure 4.



Figure 4. An overview of the Qibla direction of the Al Rizkullah Mosque

Based on the results of the research above, of the four mosques there is only one mosque that leads accurately. And the other three mosques which are slightly deviated with a deviation of approximately 2°, but it can still be tolerated because it still leads to Saudi Arabia. But one mosque that can no longer be tolerated because its direction is facing outside of Saudi Arabia. Meanwhile, according to the results of research on the direction of the Qibla in 1990, the wrong direction of the mosque can be accepted as

proof of not exceeding 5°, of course this alternative is not in accordance with the rules of astronomy, especially if it is associated with the theory of latitude and longitude. When connected with the religious theory which states that for people who are far from Mecca, the direction of Qibla is the city of Mecca, but what is found is that there is a mosque that no longer leads to Saudi Arabia. Therefore, one must be careful in carrying out the tolerance limit, even if necessary not using the tolerance limit because the direction of the Qibla can be known with certainty what if it is done using equipment that meets the requirements, with the help of astronomy such as Google Earth software the results can be known and very accurate.

Conclusion

Google Earth can be used as an easy Qibla direction calibrator, which is not limited to theoretical and applicable abilities related to Qibla direction. Besides in addition, visual observations mostly cannot be carried out when the weather conditions are not allow. But Google Earth is not limited and depends on weather conditions, so that observing and calibrating the Qibla direction is more flexible and easier to measure conducted. The Qibla direction is the direction towards the Ka'bah (Baitullah) through the closest and it is a must for every Muslim to face in that direction at the time of prayer, wherever in this part of the world. Accuracy in facing the Qibla is a must for the people Muslims, especially in performing prayers. The *fuqaha'* agree that facing the Qibla is one of the conditions for a valid prayer. Therefore the people Muslims must understand the theoretical and applicable foundations in dealing with Mecca. So that the existence of Google Earth is an alternative that is very easy to apply to calibrate Qibla direction at a place. With the Google Earth application, we can directly take advantage of this software application without having to learn the various rules related to astronomy.

References

- Abdullah, Hassim. 1983. "Pengantar Ilmu Falak." Jakarta: Pustaka Dania.
- Amiruddin., & Asikin, Zainal. 2004. "Pengantar Metode Penelitian Hukum." Jakarta: Raja Grafindo Persada.
- Arifin, Zainul. 2012. "Ilmu Falak." Yogyakarta: Lukita.
- Azhari, Susiknan. 2007. "Ilmu Falak: Perjumpaan Khazanah Islam dan Sains Modern." Yogyakarta: Suara Muhammadiyah.
- Departemen Agama Republik Indonesia. 1989. "Al-Qur'an dan Terjemahnya." Surabaya: C.V. Jaya Sakti
- Interview with Mahyudin Syahid, Bukaka, Bone, May 27th, 2019.
- Kaharuddin. 2014. "Uji Akurasi Arah Kiblat Masjid Yang Ditentukan berdasarkan Rasdul Kiblat." [Minithesis]. Watampone: STAIN Watampone.
- Kasim, Andi Jusram. 2008. "Urgensi Perhitungan Arah Kiblat terhadap Pelaksanaan Ibadah." [Minithesis]. Watampone: STAIN Watampone.
- Khazin, Muhyiddin. 2008. "Ilmu Falak dalam Teori dan Praktek." Yogyakarta: Buana Pustaka.
- Mustafa, Ahsin Dinal. 2013. "Tinjauan Arah Kiblat Berdasarkan Hukum Islam." [Minithesis]. Yogyakarta: UIN Sunan Kalijaga Yogyakarta.
- Nasution, Harun. 1992. "Ensiklopedi Hukum Islam." Jakarta: Djambatan.