

**QIBLA DIRECTION MEASUREMENT AND CERTIFICATION
(MOSQUES IN BANJARAGUNG VILLAGE KAJORAN DISTRICT MAGELANG
REGENCY WEST JAVA)**

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Abstract - *This study aims to determine the method used and the measurement of the Qibla direction of mosques in Banjaragung Village, Kajoran, Magelang, Central Java. It is known that the determination of the Qibla direction of the mosques in Banjaragung Village, Kajoran, Magelang Regency, Central Java, was carried out by one of the famous scholars in the past and no measurement and certification of the Qibla direction have been done. This research was conducted as a follow-up activity to Kuliah Kerja Nyata (KKN) UIN Sunan Kalijaga Yogyakarta which was held in Banjaragung Village, Kajoran , Magelang, Central Java. This research was carried out using action research methods in the form of descriptive analysis, meanwhile, the data collection was carried out through interviews and field observations. The result of this study is that after measuring the Qibla direction in collaboration with the Ministry of Religion of Magelang Regency using the Mizwala Qibla Finder (MQF) method, it is known that there is a slight shift from the initial Qibla direction that has been used for decades. There are 3 out of a total of 4 mosques in Banjaragung Village experienced a correction to the west and another one experienced a correction to the east.*

Keywords: *Qibla Direction, Accuracy, Mizwala Qibla Finder (MQF)*

1. INTRODUCTION

Facing the Qibla (Baitullah) in Islam is one of the important conditions for praying. There are several propositions (*nash*) that command to face Qibla for people who pray. One of the propositions is coming from the Quran Surah al-Baqarah verse 144. In that verse Allah says:

فَدَرَى تَقَلُّبَ وَجْهِكَ فِي السَّمَاءِ فَلَنُوَلِّيَنَّكَ قِبْلَةً تَرْضَاهَا فَوَلِّ وَجْهَكَ شَطْرَ الْمَسْجِدِ الْحَرَامِ ۚ وَحَيْثُ مَا كُنْتُمْ فَوَلُّوا وُجُوهَكُمْ شَطْرَهُ ۗ وَإِنَّ الَّذِينَ أُوتُوا الْكِتَابَ لَيَعْلَمُونَ أَنَّهُ الْحَقُّ مِنْ رَبِّهِمْ ۗ وَمَا اللَّهُ بِغَافِلٍ عَمَّا يَعْمَلُونَ (البقرة: 144)

"We have certainly seen the turning of your face, [O Muhammad], toward heaven, and We will surely turn you to a qiblah with which you will be pleased. So turn your face [i.e., yourself] toward al-Masjid al-Haram. And wherever you [believers] are, turn your faces [i.e., yourselves] toward it [in prayer]. Indeed, those who have been given the Scripture [i.e., the Jews and the Christians] well know that it is the truth from their Lord. And Allah is not unaware of what they do." (al-Baqarah:144)

In the verse, it is explained that the Qibla changed from Masjidil Aqsa to Masjidil Haram, so that the Prophet was commanded by Allah to turn his face towards the Qibla (Masjid al-Haram). Another proposition that confirms the command to face the Qibla is a hadith narrated by Imam Bukhari: *"Ishaq bin Mansyur told us, Ubaidullah from Sa'id bin Abi Sa'i al-Maqbururiyi from Abu Hurairah R.A said the Messenger of Allah said: "When you want to pray, then complete your partial ablution (wudu) then face the Qibla and recite Takbir." (Narrated by Bukhari).* In the hadith there is an order to face the Qiblah for people who want to pray.

In fiqh itself, there is a rule that says: "الأصل في الأوامر هو الوجوب إلا أن يدل دليل على خلافه" ("The principle in commands is that it is obligatory unless there are propositions to the contrary"), so based on the mentioned proposition and the fiqh rules above, facing the Qibla is a must for everyone who wants to pray. Facing the Qibla for people who live in Mecca and its surroundings is not difficult, because they can see the shape and position of Kaaba. However, it is different for the Muslims who live far from Mecca who are not able to see the appearance of the Kaaba directly. Therefore, for those who live far from the city of Mecca, doing ijthihad to get an accurate Qibla direction is a need. Ulama (Islamic clergy) provides at least three rules to fulfill the qualification for facing the Qibla, they are:

- 1) *Ainul Kaaba*, for people who are around *Masjidil Haram* so that they can determine the direction of the Qibla directly by looking at the Kaaba or touching it, then they must face himself towards the Qibla (when worshipping) with full confidence.
- 2) *Jihatul Kaaba*, for people who are outside the *Masjidil Haram* or around Mecca so that they can not see the Kaaba building, then they are obliged to face towards the *Masjidil Haram* as a means of facing the Qibla in *dzanni* (correct prediction).

- 3) *Jihatul Qibla*, for people who are outside Mecca or even outside Saudi Arabia. For this group of Muslims, they have to do *ijtihad* to determine the direction of the Qibla, either by using constellations, shadows, and the direction of the sun or by calculating a spherical triangle (Aprilia Dwi, 2019:18-19). The measurement of the Qibla direction itself is very crucial for every Muslim all over the world, especially for Muslims who live outside Saudi Arabia because they have to face that direction when praying. Facing the Qibla is one of the conditions of *salat*, so determining the direction of the Qibla accurately is very important. That is, if the prayer is not facing the Qibla, then the prayer is not accepted. The definition of the Qibla direction according to Slamet Hambali is the direction to the Kaaba via the closest route where every Muslim who is praying have to face (Aprilia Dwi, 2019:14). The Ministry of Religion Affairs in Indonesia also provides a definition of the Qibla direction, it is a certain direction where Muslims direct their faces in prayer (Aprilia Dwi, 2019: 14). From the existing definition, it can be concluded that the Qibla direction is the closest direction to the Qibla (Kaaba).

The problem of the Qibla direction is measuring the direction itself. The direction of the Kaaba can be determined from any point or place on the earth's surface by calculating and measuring. Therefore, the calculation of the Qibla direction is a calculation to find out in order to determine which direction the Kaaba in Mecca is seen from somewhere on the earth's surface. So that all movements of people praying, whether standing, bowing, or prostration always coincide with the direction that leads to the Kaaba (Muhyiddin, 2004).

In determining the Qibla direction, Muslims in Indonesia usually determine the Qibla direction of the mosque by looking at a map or globe without taking a proper measurements. Because the city of Mecca is located in the northwest of Indonesia, Muslims who live in Indonesia face themselves to the northwest during prayer. This is a common mistake that still often happens in the community, they forget the fact that a one-degree slope will change the direction of several meters. This is a serious concern for Muslims, considering how crucial the Qibla direction is in the implementation of obligatory prayers. Therefore, for the territory of Indonesia, the discussion regarding the Qibla direction is clearly regulated in the MUI fatwa No. 5 of 2010. The contents of the fatwa are:

(1) kiblat bagi orang yang salat dan dapat melihat Ka'bah adalah menghadap ke bangunan Ka'bah ('Ainul Ka'bah); (2) kiblat bagi orang yang salat dan tidak dapat melihat Ka'bah adalah arah Ka'bah (Jihat Ka'bah); dan (3) kiblat Umat Islam Indonesia adalah menghadap ke barat laut dengan posisi bervariasi sesuai dengan letak kawasan masing-masing. Rekomendasi: bagi bangunan masjid/musala yang tidak tepat arah kiblatnya, maka perlu ditata ulang safnya tanpa membongkar bangunannya (Fatwa MUI No. 5 tahun 2010).

(1) the Qibla for those who pray and are able to see Kaaba is facing the building of Kaaba ('Ainul Kaaba); (2) the Qibla for those who pray and are not able to see Kaaba is the direction of the Kaaba (Jihat Kaaba); and (3) the Qibla for

Indonesian Muslims is facing northwest with varying positions according to the location of each region. Recommendation: for mosque/musalla buildings that do not have the correct Qibla direction, it is necessary to rearrange the saf (the rows of praying) without destroying the building. (Fatwa of MUI Number 5 of 2010).

Fatwa of MUI Number 5 of 2010 is a continuation of the Fatwa of MUI Number 3 of 2010 which states that the Qibla direction of Indonesian Muslims faces west. The previous fatwa is not in accordance with the astronomical principle which discusses the measurement of the Qibla direction. The point regarding the Qibla direction of Indonesian Muslims facing west was changed to northwest based on Fatwa Number 5 of 2010. The third point of the fatwa explains that the Qibla direction for Indonesian Muslims is facing northwest with positions varying according to the location of each region. It makes each region has a different variation for the Qibla direction. So, to find out the Qibla direction in each area, the Qibla direction needs to be measured.

Nowadays, methods for determining the Qibla direction are increasingly developing. There are many more practical and modern tools or technologies that can help Muslims to determine the direction of Qibla so that nowadays determining the Qibla direction is not a difficult thing to implement. Starting from using a compass, *istiwā* stick, theodolite, *mizwa la*, calculating the celestial triangle, *rashdul qibla*, to using an astronomy based application such as ephemeris and digital astronomy calculations which makes it easier to find out the Qibla direction of a mosque in an area (Izzudin, 2012).

Due to the many methods of measuring the Qibla direction that continue to develop, choosing the most accurate method is one of the important things that needs to be considered when measuring/checking the Qibla direction because each method must have its own advantages and disadvantages. In this study, the Mizwala Qibla Finder (MQF) was used as a measurement/determination of the Qibla direction because this method is one of the newest and most accurate methods of measuring the Qibla direction.

This research is located in several mosques in Banjaragung Village, Kajoran District, Magelang Regency, Central Java. Geographically, Banjaragung Village is located at 7°28'30" south latitude and 110°14'60" east longitude and is one of 29 villages in the Kajoran District. Banjaragung Village is an area near Mount Sumbing which makes the air feel cold in this area, with an average daily temperature of 24°C and annual rainfall of 4 mm/year. Banjaragung Village is an agrarian village where most of the residents make a living as farmers and farm laborers or cultivators of rice fields. Banjaragung Village has an area of 149.52 Ha, which is divided into 4 hamlet areas namely Banjaragung Hamlet (7 RT), Tuguran Hamlet (4 RT), Gondangan Hamlet (5 RT), and Merjoyo Hamlet (7 RT) so that a total of 23 RTs. The village boundaries are explained below:

- In the north, it is bordered by Sukomulyo Village, Kajoran District,
- In the south, it is bordered by Krumpakan Village, Kajoran District.

- In the east, it is bordered by Sangen Village, Kajoran District.
- In the west, it is bordered by Sukomulyo Village, Kajoran District.

Banjaragung is a village that holds Islamic values strongly because of the existence of Bodho Islamic Boarding School founded by Mbah Chamid Kajoran in this village, one of the famous scholars. Up until now, his fame is still maintained even though he has long passed away. This is shown by the Grave Tour of Mbah Chamid Kajoran which is always visited by pilgrims from various regions.

Mbah Chamid's fame cannot be separated from his many merits to the surrounding community. One of his merits is measuring the Qibla direction at the mosque in Banjaragung Village. The mosques that he had measured the Qibla direction are Gotong Royong Mosque located in Banjaragung Hamlet and Baitussalam Mosque in Gondangan Hamlet. Even though he has long died, the Qibla direction measured by Mbah Chamid Kajoran is still used today. Although it has been used for a long time, it is necessary to do re-measure and certify the Qibla direction again so that it can be ensured that the Qibla direction of the mosques are correct and officially certified by the Ministry of Religion of Magelang Regency.

Qibla direction measurements can be carried out individually by mosque administrators together with people who are qualified in the field of measuring Qibla direction or in collaboration with the Ministry of Religion in each district. In this study team KKN 105 Desa Banjaragung collaborates with the Ministry of Religion of Magelang Regency. Collaborating with the Ministry of Religion gives the advantage of being able to obtain a Qibla direction certificate which will be useful for mosque administration in the future. Qibla Direction Measurement Certification is the process of granting a certificate by “Kementerian Agama” (Ministry of Religion) after the re-measurement of the Qibla direction in the mosque (Anggraeni Puspitasari, 2015).

Although the Qibla direction certification is not a rule in the Quran, this certification activity gives benefits in an effort to ensure that the mosque is actually facing the Qibla. Facing the Qibla is one of the requirements in carrying out prayer, as the word in the Quran Surah Al-Baqarah verse 150 which says

“And from wheresoever you start forth, turn your face towards Al-Masjid-Al-Harâm; and wherever you are, turn your faces towards it, so that men may have no argument against you except those of them that are tyrants, so do not fear them and fear Me (fear that My Love upon you will be decreased), that I may complete My Blessings on you and that (so) you may attain Guidance”.

Therefore, team KKN 105 Desa Banjaragung had the urge to implement the Qibla direction certification program in Banjaragung Village. For this program, there are four mosques located in Banjaragung Village, Kajoran District, Magelang Regency, Central Java which the qibla directions are being recalibrated and are being certified. The procurement of Qibla direction certification is a solution from the Ministry of Religion in terms of perfection and solemnity of worship (Siti Ngizunafisah, 2016).

The mosques targeted in this study have been under construction for a long time and some of them have been renovated several times. Unfortunately, when the mosques were renovated, they did not re-check the Qibla direction and only followed the Qibla direction of the existing buildings. This lack of re-checking the Qibla direction is assumed because the local mosque administrators do not know the procedures for measuring the Qibla direction and still believe in the old calculations.

Based on the existing urgency, it is necessary to re-measure the Qibla direction to find out the Qibla direction precisely and reduce the gaps in the Qibla direction that may appear. This research was carried out in collaboration with the Ministry of Religion of Magelang Regency to carry out Calibration and Certification of the Qibla direction of the four mosques located in Banjaragung Village, Kajoran District, Magelang Regency, Central Java.

2. METHOD

A. Research Subject

The subjects of this research are four mosques located in Banjaragung Village. The first mosque is Gotong Royong Mosque in Banjaragung Hamlet under the management of Mr. Dausat. The second mosque is al-Barokah Mosque in Tuguran Hamlet which is under the management of Mr. Topo. The third mosque is Baitussalam Mosque in Gondangan Hamlet which is managed by Mr. Supadi. The last one is al-Ikhlas Mosque which is located in Merjoyo Hamlet with Mr. Amali as the head of the mosque management.

B. Research Design

This research uses an action research design. The design of this research is focused on the presence of knowledge through an action to create change in society (Darwis, 2016). Action research design can also be intended to overcome problems that occur in the field by taking action. O'Brien (in Hasan, 2009) suggests that the action research design process consists of four stages, problem diagnosis, action planning, action implementation, and action evaluation.

C. Research Procedure

The procedure of this research is carried out in four stages, first is the diagnosis of the problem, then the action planning, the implementation of the action, and also the evaluation of the action. The first step of this research is to diagnose the problem. In this step, the process that is carried out first is data collection. Data collection was carried out through a process of interviews and field observations. After getting information and some problems, a diagnosis of the problem is carried out. The focus of the researchers in this study was the problem of the Qibla direction found in the mosques in Banjaragung Village.

After the diagnosis is completed, the researcher begins to plan the actions to be taken. The researcher then plans to contact the local ministry of religion for assistance in recalibrating and certifying the Qibla direction. This is intended so that

the process of re-measurement of the Qibla direction can be carried out directly by those who are experts in this matter.

The next step is the implementation of the action. Researchers began to implement the plan that had been prepared with the Kementrian Agama Kabupaten Magelang. Qibla direction measurement is carried out using the Mizwala Qibla Finder (MQF), which is one of the Qibla measurement tools that can be recognized for its accuracy. The components in Mizwala Qibla Finder (MQF) include:

- 1) Level field, which is the field that serves as the base of the dial and level regulator. The level field is also equipped with a compass as a guide to the cardinal directions by the needle in it.
- 2) The field of the rotary dial, which is a tool that functions as a field to form an image that is used as a reference for measurement. This field is equipped with concentric circles as found in special sticks in general, as well as an arc scale with the smallest scale of 15 arc minutes which allows obtaining sufficient accuracy to determine the direction of Qibla.
- 3) Gnomon or Istiwa stick is a special stick in the form of ordinary sticks that are plugged perpendicular to a flat field in the open (unobstructed sunlight). Its purpose is to determine the exact direction by connecting two points (the distance between the two points to the stick must be the same), namely the end of the stick's shadow when the sun is in the east and the end of the shadow after the sun has shifted to the west. The function of this tool is also to determine the position and altitude of the sun. The size of the gnomon is adjusted to the circle diameter of the mizwala dial area.

For more perfect results and more accurate results of measurements or checking with this mizwala, other supporting tools are needed, such as a global positioning system (GPS) which functions to determine the position of a place (geographical coordinates/latitude and longitude of a place) at the observation location and a waterpass which works for measuring or determining an object or line in a flat position, both vertically and horizontally as a counterbalance to the flatness of the field or level (Hendro, 2010).

The steps in determining the Qibla direction using the Mizwala Qibla Finder (MQF) are as follows:

- 1) Make sure that the weather is very sunny and long to istiwa` time.
- 2) Determine the location of the mosque and the location of the Kaaba then look for the direction of the Qibla shadow.
- 3) After finding the Qibla direction from the mosque, place the Qibla measuring device under the sun.
- 4) Then point the Qibla pointer in the direction according to the Qibla direction number which is found in the Qibla shadow direction determination application.
- 5) When finished, draw a straight line using a thread to form the Qibla direction, then mark that direction with black duct tape indicating the Qibla direction from the measurement results.

After the process of implementing the action, in this case, measuring the direct Qibla direction, it is continued with an evaluation of the action.

3. RESULT AND DISCUSSION

Based on the level of accuracy, the method of Qibla direction measurement is divided into four methods. The first level is the method using the sun as a parameter, as well as using theodolite as an instrument to enhance the accuracy for measuring the Qibla direction up to the level of arcseconds. The second level used in this research is a method using the sun and the shadow of the sun as parameters with Mizwala Qibla Finder (MQF), Istiwa'aini, and the Qibla Tracker as the additional instruments. The third level is the method using the shadow of the sun as a parameter that is generated only by a stick without being equipped by azimuth value; the first shadow is the shadow of the daily Qibla and the second shadow is the shadow of the stick when the sun right at the meridian of the Kaaba. Shadow from the stick is the one that will be the direction of the Qibla. The fourth level is a method that is not based on celestial objects with the use of instruments such as magnetic compass or qibla direction software, but it is based on the concept of the earth's magnetic north pole only. The accuracy of this latter method can be influenced by the magnetic field around the instrument (Ismail, 2019: 96-97). Among the four methods that have been mentioned, the Ministry of Religion and the team of KKN 105 Desa Banjaragung choose to use the second method by utilizing the instruments Mizwala Qibla Finder (MQF) which has sufficient accuracy in determining the direction of qibla and does not cost that much.

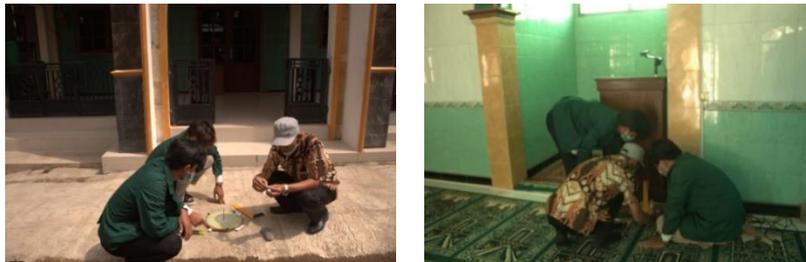
The aim of this qibla direction measurements is to do correction of qibla direction of the mosques in the Banjaragung Village, Kajoran District, Magelang. This research is a collaboration work with the Ministry of Religion of the Magelang Regency. This research was conducted after asking permission from each mosque administrator who is responsible for the management of the mosques. The research was conducted on August 19th, 2021, which began at half-past ten in the morning. The Qibla direction measuring team from the Ministry of Religion of the Magelang Regency consists of 2 people, they are Mr. Maskuri and Mr. Istiantoro.

The first qibla direction measurement is performed in Gotong Royong Mosque which is located in Banjaragung Hamlet. The measurement process in this mosque ran smoothly. The result says that the Qibla direction in this mosque is not shifted and it lies in the direction of $294^{\circ}42'14''$.



Figure 1, 2. The Process of Qibla Direction Measurement in Gotong Royong Mosque of Banjaragung Hamlet (Source: Personal Documents)

The second measurement is performed in Al-Barokah Mosque which is located in Tuguran Hamlet. Just like the Qibla direction in Gotong Royong Mosque of Banjaragung Hamlet, the Qibla direction in Al-Barokah Mosque is not much shifted from the previous direction. For Al-Barokah Mosque of Tuguran Hamlet, its Qibla lies in the direction of $294^{\circ}40'45''$. Based on the information from the management of Tuguran Hamlet, Qibla direction measurements has previously performed in al-Barokah Mosque so that the measurement result only shows little shifting.



Picture 3 and 4. The Process of Qibla Direction Measurement in Al-Barokah Mosque of Tuguran Hamlet (Source: Personal Documents)

After completing the measurement in Tuguran Hamlet, the measurement of Qibla direction proceed to Baitussalam Mosque located in Gondangan Hamlet. While the measurement was being proceeded, the researcher met the head of the mosque management, Mr. Supadi. Based on his explanation, it is known that qibla direction measurement in Baitussalam Mosque has been carried out directly by Mbah Chamid Kajoran. There is an interesting story behind the process of measuring Qibla direction in Baitussalam Mosque, that the mosque is supposed to do a shift towards the west, but this mosque is shifted to the east instead. Qibla direction of Baitussalam Mosque is $294^{\circ}42'22''$.



Picture 5 and 6. The Process of Qibla Direction Measurement in Baitussalam Mosque of Gondangan Hamlet (Source: Personal Documents)

The last mosque to be measured is Al-Ikhlash Mosque in Merjoyo Hamlet. The measurement of Qibla direction in this mosque faced a little obstacles because the measurement is done almost in a state of *istiwa'*. Nevertheless, the measurement of Qibla direction can still be done to finally obtain the result of the direction in figure $294^{\circ}42'25''$. After the measurement, it was found that the direction of the Qibla of al-Ikhlash Mosque is shifted towards the west a few degrees. This result is approved by the head of Al-Ikhlash Mosque management, Mr. Amali, who stated that the direction of the qibla of the Al-Ikhlash Mosque is supposed to be repaired.



Picture 7 and 8. The Process of Qibla Direction Measurement in Al-Ikhlas Mosque of Merjoyo Hamlet (Source: Personal Documents)

After the measurement process, team KKN 105 Desa Banjaragung grant a certificate of qibla direction to the four mosques' head managements. The certificate is an official document published by Ministry of Religion of Magelang Regency which is very helpful for the mosques' administrator in the future. The retrieval of the certificate is done on August 26, 2021 at the Office of Ministry of Religion of Magelang Regency. Here we present the data that is listed in the certificate Qibla direction:

Tabel 1. The Results of Qibla Direction Certification of Mosques in Banjaragung Village

No	Mosque Name	Certificate Number	Point Coordinate	Qibla Direction	Head Management
1.	Gotong Royong Mosque (Banjaragung)	9995/KK.11.08/7/BA.0 2.3/08/2021	7°29'43" NL/ 110°5'39" EL	294°42 '14"	Mr. Dausat
2.	Baitussalam Mosque (Gondangan)	9993/KK.11.08/7/BA.0 2.3/08/2021	7°30'02" SL/ 110°05'41" EL	294°42 '22"	Mr. Supadi
3.	Al-Barokah Mosque (Tuguran)	9997/KK.11.08/7/BA.0 2.3/08/2021	7°29'29" SL/ 110°5'37" EL	294°40 '45"	Mr. Topo
4.	Al-Ikhlas Mosque (Merjoyo)	9991/KK.11.08/7/BA.0 2.3/08/2021	7°30'10" NL/110° 05'34" EL	294°42 '25"	Mr. Amali

After granting the Qibla direction certificate to the heads of mosque management, team KKN 105 Desa Banjaragung left the decision and everything to them, whether they will do the changes to the Qibla direction or remain with the previous Qibla that has been determined since the beginning. Aside from determining the direction of the Qibla for prayer, this certification also aims to give the mosques an official certificate of qibla direction published by Ministry of Religion, which is useful to fulfill a conditional documents if the mosques wanted to apply for funding to official institutions such as the ministry of religion.

4. CONCLUSION

Qibla direction is a certain thing that should be a concern for all muslims in the world, including in Indonesia. It is based on the knowledge that facing the direction of qibla is valid in the implementation of prayer. One of the ways offered by Ministry of Religious in Indonesia about the qibla direction is to hold a certification Qibla direction. Based on the observations and the results of the research by team KKN 105 Desa Banjaragung, measurement and certification of Qibla direction for the mosques located in Banjaragung Village, Kajoran District, Magelang Regency needs to be done. It is proven by the results of measurements of Qibla direction. It was found that three of the total four mosques in Banjaragung Village experienced a shift correction to the west, while the other mosque experienced a correction to the east. Aside from measuring the direction of Qibla, the certification of Qibla direction is also considered to aim an official Qibla direction certificate for mosques in Banjaragung Village which is useful for the mosques.

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Interview Transcript with Takmir Gotong Royong Mosque

Interview Transcript with Takmir Al-Barokah Mosque

Interview Transcript with Takmir Al-Ikhlash Mosque

Interview Transcript with Takmir Baitussalam Mosque

Interview Transcript with Ministry of Religion of Magelang Regency