



Accuracy of the Qibla Direction of the Tomb of Imogiri in Yogyakarta with Google Earth

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Abstract: Among some of the guidelines of worship in Islam related to the Science of Falak is burying the body by positioning it towards the qibla. The majority of scholars are of the opinion that it is necessary for the burial of the body to face the direction of the Qibla. The deviation of the direction of the qibla in mosques and cemeteries is a classic problem that still persists. This requires an evaluation of the calibration accuracy of ancient tombs to measure the degree of astronomical deviation. One of the ancient burial sites in Java is the Imogiri Tomb Complex. This type of research uses field research. The source of data in this study is to directly measure the direction of the qibla of the Imogiri Tomb Complex. The data collection technique is using the documentation method, then it will be analyzed using the analytical-descriptive method. The results of this study show that; The entire area of the Imogiri Tomb Complex based on the level of accuracy of its Qibla direction can be classified into two groups; First, the Accurate which consists of 1 *kedhaton*; *Kedhaton* of Astana Luhur/ Kapingsangan. The measurement results showed that the accuracy level in this area was more accurate than the second area, which was 2° . Second, the Less accurate is the group of tombs of the Kings of the Sultanate of Yogyakarta and Surakarta, namely *Kedhaton* of Sutan Agungan, *Kedhaton* of Pakubuwanan, *Kedhaton* of Kasuwargan Surakarta, *Kedhaton* of Girimulyo, *Kedhaton* of Kasuwargan Yogyakarta, *Kedhaton* of Besiyaran, *Kedhaton* of Saptarengga. The measurement results show that the qibla direction in this area has a lower level of accuracy, which is 13° - 14° off. So the way the Qibla points in this area is somewhat "less accurate".

Keywords : *Imogiri, Qibla direction, Google Earth.*

Abstrak: Diantara beberapa tuntunan Ibadah dalam Islam yang berhubungan dengan Ilmu Falak ialah menguburkan jenazah dengan memposisikannya ke arah kiblat. Majoritas ulama berpendapat mengenai keharusan bagi penguburan jenazah untuk menghadap arah kiblat. Deviasi arah kiblat pada masjid dan pemakaman merupakan problematika klasik yang masih bertahan. Hal ini menuntut evaluasi terhadap akurasi kalibrasi makam kuno guna mengukur tingkat penyimpangan astronomisnya. Salah satu pemakaman kuno di Jawa yaitu Kompleks Makam Imogiri. Jenis penelitian ini menggunakan penelitian lapangan atau field research. Adapun sumber data dalam penelitian ini yaitu mengukur langsung arah kiblat Kompleks Makam Imogiri. Teknik pengumpulan data yaitu menggunakan teknik metode dokumentasi, kemudian akan dianalisis menggunakan metode analitis-deskriptif. Hasil dari penelitian ini menunjukkan bahwa; Keseluruhan area Kompleks Makam Imogiri berdasarkan tingkat akurasi arah kiblatnya dapat diklasifikasikan menjadi dua kelompok; *Pertama*, Akurat yang terdiri dari 1 *kedhaton*; *Kedhaton* of Astana Luhur/ Kapingsangan. Hasil pengukuran menunjukkan bahwa tingkat akurasi di area ini lebih akurat dibandingkan area kedua yaitu 2° . *Kedua*, yang kurang akurat adalah kelompok makam Raja-raja Kesultanan Yogyakarta dan Surakarta, yaitu *Kedhaton* Sutan Agungan, *Kedhaton* Pakubuwanan, *Kedhaton* Kasuwargan Surakarta, *Kedhaton* Girimulyo, *Kedhaton* Kasuwargan Yogyakarta, *Kedhaton* Besiyaran, *Kedhaton* Saptarengga. Hasil pengukuran menunjukkan bahwa arah kiblat di area ini memiliki tingkat akurasi yang lebih rendah, yaitu 13° - 14° . Jadi cara kiblat menunjuk di area ini agak "kurang akurat".

Kata kunci : *Imogiri, Arah Kiblat, Google Earth.*

A. Introduction

The science of falak is a very important science to be learned by Muslims. Especially when we are traveling long distances or sailing oceans and continents. The first thing we must know is to face the Qibla. Because we do prayers every day that require us to face the direction of the Qibla.

Facing the Qibla is a very important thing in the worship of Muslims. Facing the Qibla is facing towards the Kaaba at the Grand Mosque, Mecca.¹ Facing the Qibla is not only necessary when praying, some worship such as reading the Quran, slaughtering sacrificial animals, praying, dhikr, and learning is sunnah to face the Qiblah.² Another important thing that requires a person to face the qibla is when burying the body.

The problem from the past until now related to the accuracy of the qibla direction is the way the Qibla points of the mosque and the way the Qibla points of the tomb. Until now, there are still many directions of the qibla of mosques and cemeteries that deviate from the proper direction. Then what about the calibration of Islamic funerals first, whether the direction is getting more and more deviant.

¹ Ali Muchtar, *Buku Saku Hisab Rukyah*, (Tangerang: CV. Sejahtera Kita, 2013), 11.

² Ahsin w. Hafidz, *Kamus Ilmu Al-Quran*, (Jakarta: Amzah, 2012), 192.



Archaeoastronomical calibration of ancient tombs is essential to validate the level of scientific and technological sophistication of past civilizations. By measuring the level of deviation (deviation) of the orientation of the tomb to the current direction of the qibla, it is hoped that this study can reconstruct the observation method used by ancient peoples. These precise measurements provide empirical evidence of the extent to which civilizations had mastered geodesic and astronomical instruments before the invention of modern equipment..

Based on the various problems that have been raised, the author wants to conduct research on one of the ancient recordings in Java, namely the Imogiri Tomb Complex.

Sultan Agung built the Imogiri Tomb for himself, which is situated on Mount Merak. According to *Babad Alit*, Sultan Agung's uncle was given the task of building the Imogiri tomb.³ The construction of the tomb with multiple gates using Javanese Hindu architecture was finished in 1567 Dal, Javanese year, or 1632 AD, according to another literary book called *Babad Momana*.⁴ A king who was first buried in this complex became an ancestor and heirloom for the Mataram Royal dynasty.⁵

According to the above interpretation, Muslims are inextricably linked to the way the Qibla points. This is due to the fact that one of the conditions for a valid prayer is the way the Qibla points. In the meantime, determining and measuring the Qibla's actual direction has changed in step with advances in science and technology, which increasingly aid in establishing the Qibla's direction. in order to achieve a more precise direction. beginning with the most recent ideas and more advanced measuring tools like satellite help and theodolites.⁶

The technique for accurately determining the direction of the Qibla has advanced quickly throughout Indonesian history, and it is currently utilized to find the Qibla locations of mosques, prayer rooms, and graves as well as in accordance with the caliber and intelligence of Muslims. The methods used by Hisab Rukyat experts in determining the accuracy of the way the Qibla points include: utilizing celestial bodies (the shadow of the sun), *rubu' mujayyab*, *istiwa' sticks*, *yaumul rasdhul qibla*, location goals, *global positioning of syistem* (GPS) and *theodolite*. Each of these methods to identify the way the Qibla points must have its own advantages and disadvantages.⁷

The direction of the qibla of Indonesia to Arabia is not to the west (270°) but to the southwest (295°) there is a difference of 25 degrees based on data. The determination of the qibla in Indonesia has also been diverse and has even taken advantage of modern developments from modern science and technology.⁸

One simple way to calibrate Qibla directions is to use *Google Earth*. Which is not limited to theoretical or applicative abilities related to the way the Qibla points. In addition, visual observation is mostly not possible when weather conditions are not possible.⁹ However, *Google Earth* is

³ Prawirawinarsa, R., & Djajengpranata, R.. *Babad Alit*. (1921), Folk Reading.

⁴ Anonim. (n.d.). *Babad Momana*. Koleksi Badan Penerbit Soemodidjojo Mahadewa.

⁵ <https://budaya.jogjaprov.go.id/berita/detail/1306-makam-imogiri-oleh-sultan-agung-1632-m> accessed on 7 November 25

⁶ Ahmad Zuhul Fanani Fanani, "Validation of Qibla Direction of Raudhatul Jannah Mosque, Panceng Gresik," *AL - AFAQ : Jurnal Ilmu Falak Dan Astronomi* 6, no. 2 (2024): 151–62, <https://doi.org/10.20414/afaq.v6i2.11213>.

⁷ Ahmad Izzudin, *Ilmu Falak Praktis Metode Hisab-Rukyat Praktis dan Solisi Permasalahannya*, (Semarang: Pustaka Rizki Putra, 2012), 57.

⁸ Fattah Setiawan Santoso and Muthmainnah, "Pemanfaatan Sains Dan Teknologi Dalam Pengukuran Arah Kiblat di Indonesia," *Ulumuddin: Jurnal Ilmu-Ilmu Keislaman* 10, no. P-ISSN: 1907-2333 E-ISSN: 2685-9211 (2020): 149–62.

⁹ Burhan, *Penetapan Arah Kiblat melalui Media Online : Google Earth dan Qibla Locator*. 85.



unlimited and not depends on weather conditions, so observing and calibrating the way the Qibla points is more flexible and easy to do.¹⁰

Some previous research was only related to the direction of the qibla of ancient mosques and the direction of the qibla of the tomb complex of the current era, no one has discussed the direction of the qibla of ancient tombs based on the archaeological paradigm of astoronomis and the deviation of the orientation of the tomb towards the direction of the current qibla. The following include:

The thesis was written by Muhammad Mannan Ma'nawi, with the title "*Studi Analisis Metode Penentuan Aarah Kiblat Maqbarah BHRD Kabupaten Rembang*". The thesis explained that the BHRD of Rembang regency in calculating and checking the direction of the qibla of maqbarah-maqbarah in Rembang using contemporary/modern methods.¹¹

Kathon Bagus Kuncoro wrote a thesis entitled "*Arah Kiblat Komplek Pemakaman Sewulan Kabupaten Madiun Berdasarkan Metode Imam Nawawi Al-Bantani*".¹² This thesis explains that the surrounding community determines the direction of the qibla of the cemetery only based on approximations.

Thesis written by Munfiqotul Aliyah with the title "*Arah Kiblat Pemakaman Raden Fattah di Demak*". The history of measuring the Qibla direction of the Raden Fattah funeral complex cannot be separated from the history of the Qibla direction of the Great Mosque of Demak, because the building of the Raden Fattah funeral complex follows the direction of the Demak Grand Mosque building.¹³

The application of archaeoastronomy studies to measure the difference between the direction of ancient tombs and modern qibla is very important to appreciate the sincere efforts of ancestors in carrying out worship. By understanding the degree of deviation, we not only see the "error" of degrees, but also discover the story of the struggles of the propagators of Islam in the past.

Based on the above background, the author focuses the research on two problem formulations, namely: 1) What is the method used in measuring the direction of the qibla of the Imogiri Tomb Complex? 2) What are the results of measuring the Qibla direction of the Imogiri Tomb Complex using the Google Earth method?

B. Methods

The research methods that will be used are as follows: This study uses field research with quantitative approaches. The focus of the research is the Imogiri Tomb Complex, which is located in Bantul Regency, Yogyakarta Special Region. The exact coordinates are $110^{\circ} 22' 49.37''$ East and $7^{\circ} 55' 17.07''$ South. All the tombs within the Imogiri Tomb Complex will be studied. The complex is divided into three main groups and further into eight building areas called kedhaton. Each kedhaton will be measured in the direction of the qibla as a sample for testing, since they all belong to the same building structure. The data collection process involves using Google Earth for measurements, observing the qibla direction, and making detailed records. The tools used include scientific calculators, smartphones, laptops, and the Google Earth app. The researcher will use Google Earth to check the accuracy of the qibla direction by repeating the measurement times, once

¹⁰ Riza Afrian Mustaqim, "Penggunaan Google Earth Sebagai Calibrator Arah Kiblat," *Jurnal Justisia : Jurnal Ilmu Hukum, Perundang-Undangan dan Pranata Sosial* 6, no. 2 (2021): 194, <https://doi.org/10.22373/justisia.v6i2.11537>.

¹¹ M. Mannan Ma'nawi, Skripsi, "*Studi Analisis Metode penentuan Arah Kiblat Maqbarah BHRD Kabupaten Rembang*", (Semarang : UIN WALISONGO, 2021)

¹² Kathon Bagus Kuncoro, skripsi, "*Arah Kiblat Komplek Pemakaman Sewulan Kabupaten Madiun Berdasarkan Metode Imam Nawawi Al-Bantani*", (Malang : UIN Maulana Malik Ibrahim, 2016)

¹³ Munfiqotul Aliyah, "*Arah Kiblat Pemakaman Raden Fattah di Demak*", Skripsi (Semarang : UIN WALISONGO, 2021)



before and once after direct observation of the Imogiri Tomb Complex. The data processing will go through steps such as data reduction, data presentation, calculation verification, and drawing a final conclusion.

C. Results and Discussion

The word qibla itself comes from the Arabic '*qiblah*', one of the forms of masdar from *qabbala*, *yuqabbili*, *qiblah*, meaning to face, also meaning *al-jihah* means direction.¹⁴ According to Ahmad Izzuddin, the direction leading to the *Baitullah* (*Ka'bah*) where the direction can be determined in terms of the point on the surface of the earth where the *Kaaba* is located in the city of Mecca.¹⁵ In the meantime, Slamet Hambali claims that the qibla is the direction that leads to the Kaaba (*Baitullah*) by the closest path, and that every Muslim, wherever they may be in the world, must face that direction when offering prayers.¹⁶

According to the view of the three *madzhabs*; the Hanafi, Shafi'i, and Hanbali *madzhabs*, it is obligatory to face the body in its grave towards the qibla with an inclined position to the right.¹⁷ Meanwhile, the perspective of the Maliki *madzhabs* positions the body towards the qibla only *sunnah*, not to the extent that it is obliged to face the body towards the Qibla as he thinks about the inability to face the Qibla.¹⁸

The scholars of the four major sects have different views on the extent of the accuracy of facing the Kaaba during prayer, especially for those who are far from Makkah. Scholars of the *madzhabs* differ in defining the qibla as explained below: 1) The Shafi'iyyah school As quoted from the opinion of Imam Nawawi, a follower of the Shafi'i school, it is obligatory to face the '*ain Ka'bah* (building) when performing prayers. 2) The group of Jumhur Ulama (Hanafiyah, Malikiyah, Hanabilah) The obligation to face the Qibla for those who live far from the city of Mecca according to the Group of Jumhur Ulama Hanafiah, Malikiyah and Hanabilah only faces its *rah* (*jihat al-Ka'bah*) and not the building of the Kaaba as understood by the Shafiiyah *madzhabs*.¹⁹

MUI issued Fatwa Number 5 of 2010 as the institution's official response in response to developments and changes related to the accuracy of the qibla direction in mosques throughout Indonesia. The fatwa stipulates three main provisions regarding the direction of the Qibla:

- for those who are near the Kaaba, the prayer must face directly the physical building of the Kaaba ('*ainul Ka'bah*);
- for those who are far away or do not see it, it is enough to face the general direction (*jihat al-Ka'bah*); and
- for Muslims in Indonesia, the direction of the qibla is decided to face northwest with an angle of inclination adjusted according to the coordinates of their respective regions.²⁰

To understand the standardization of the accuracy side of a building. The author will be based on the right and correct direction of the qibla, which is really leading to the Kaaba. The level of accuracy in recalling the way the Qibla points is divided into 4 categories, which are as follows :

¹⁴ Ahmad Warson Munawwir, *Kamus Al Munawwir ;Arab Indonesia terlengkap*, cet ke-25, (Surabaya: Pustaka progressif, 1997), 1088.

¹⁵ Ahmad Izzuddin, *Metode Penentuan Arah Kiblat dan Akurasinya*, Materi ini disampaikan pada AICIS IAIN Sunan Ampel Surabaya, 2012.

¹⁶ S Hambali, *Ilmu Falak 1: Penentuan Awal Waktu Shalat & Arah Kiblat Seluruh Dunia*, (Semarang: Program Pascasarjana IAIN Walisongo, 2011), 167.

¹⁷ Abdurrahman Al-Juzairi, *Fikih Empat Madzhab Jilid 2*, (Jakarta: Pustaka Al-Kautsar, 2015), 294.

¹⁸ Muhammad Jawad Mughniyah, *Fiqh Lima Mazhab* (Jakarta: Pt Lentera Basritama Anggota Ikapi, 2001), 58.

¹⁹ Ahmad Nizam, *Perbedaan Pendapat Dalam Penentuan Arah Dan Waktu Ibadah (Perbandingan Metodologi Syar'i dan Sains)*, Jurnal Muqaranah Vol. 5 No. 1 ,Juni 2021

²⁰ Ismail et al., "Toleransi Pelencengan Arah Kiblat Di Indonesia Perspektif Ilmu Falak Dan Hukum Islam" 17, no. 1 (2021): 115–38.



- Very accurate is the result of measuring the way the Qibla points to obtain the results of the way the Qibla points that is really right in the direction of the Kaaba (*al-Mail Haram*),
- Accurate is the result of measuring the way the Qibla points difference or difference does not come out of the criteria of Prof. Dr. H. Thomas Djamiluddin, which is as long as the distance is not more than $0^{\circ}2'46.43''$.
- Less accurate is the measurement of the way the Qibla points between $0^{\circ}2'46.43''$ to $22^{\circ}30'$, because if there is a deviation reaching more than $22^{\circ}30'$, the way the Qibla points for the territory of Indonesia will tend to be straight west.
- Inaccurate is the result of measuring the way the Qibla points if there is a deviation at $22^{\circ}30'$, because if there is a deviation above $22^{\circ}30'$ the way the Qibla points for the territory of Indonesia will tend to the south ansh from the western point.²¹

Most scholars allow the dismantling of the tomb for certain reasons such as not facing the qibla, not yet bathed, not yet prayed, or other important reasons. However, for Hanafiyah scholars, this kind of thing is not allowed, because it is an act of damaging the body and it is prohibited in Islam, so it is not allowed to be dismantled.²²

1. *Google Earth As A Qibla Direction Calibrator*

a. *Definition of Google Earth*

Google created *Google Earth*, a mapping and geographic data mining application. It gives users access to road maps, satellite photos, aerial photos, and other global geographic data. *Google Earth* provides users with realistic and detailed interactive maps that let them explore the Earth's surface.²³ In Efistek.com it is explained that *Google Earth (GE)* is a virtual globe application that can show every image in the world taken by satellites, aerial photography, and *Geographic Information System (GIS)* applications.²⁴ *Google Earth* is available in two versions, the web version and the application version for both pc and *smartphone*. Both versions tend to be easier to operational.

Google Earth displays the actual shape of the earth's surface, which is captured via satellite. The *Google Earth* display is updated or *updated* every quarter of a month to show the latest picture of the earth's surface. For example, in place A, at the last time it was *updated*, there was no building, in the following month the construction of a building was carried out, after an *update was carried out* in four months afterwards, it was seen that there was a building at that location.²⁵

Google Earth The level of resolution provided in google earth is determined by the level of attractiveness of the city. Cities that have high resolution levels include Las Vegas, Cambridge, Fulton Country, and New York. *Google earth* makes it easy to find a location based on its address, knowing the topography of a place, the height of an area and knowing the coordinate points. Users can move the mouse to the desired places.²⁶ But currently, some points in Indonesian cities can also display these images in detail. The level of resolution provided in *Google Earth* is determined by the level of attractiveness of the city. Cities that have high resolution levels include Las Vegas, Cambridge, Fulton Country, and New York. *Google Earth* makes it easy to find a location based

²¹ Siti Tatmainul Qulub, *Ilmu Falak dari Sejarah ke Teori dan Aplikasi*, (Depok: PT Raja Grafindo Persada, 2017), 177 -180.

²² Sayyid Sabiq, *Fiqih Sunnah Sayyid Sabiq Jilid 2* (Jakarta: Al- I'tishom, 2008), 182.

²³ Khairul Anaam, Ma'rifatul Ilmiyah, and Muhammad Zaidan Saajid, "Uji Akurasi Arah Kiblat Masjid Laju Sumenep," *AL - AFAQ : Jurnal Ilmu Falak Dan Astronomi* 5, no. 2 (2023): 223–32, <https://doi.org/10.20414/afaq.v5i2.7608>.

²⁴ Efistek, *Menjelajah Dunia dengan Google Earth dan Maps*, Bandung: CV. Yrama Widya, 2006, 25.

²⁵ Mustaqim, "Penggunaan Google Earth Sebagai Calibrator Arah Kiblat."

²⁶ Efistek.com, *Menjelajah Dunia dengan Google Earth dan Maps*, Bandung: CV. Yrama Widya, 2006, 38-39.

on its address, knowing the topography of a place, the height of an area and knowing the coordinate points. *Users* can move the mouse to the desired places.²⁷

The existence of *Google Earth* can be an initial alternative to ensure the accuracy of the Qibla direction of a place, both prayer rooms, mosques and places of worship in offices and other places. Furthermore, if there is an inconsistency in the way the Qibla points, further measurements can be made using conventional methods.²⁸ Despite the aforementioned restrictions and limitations, *Google Earth* presents a virtual image of the actual Earth. in order to make using *Google Earth* to calibrate the Qibla points more efficient and user-friendly. In this instance, *Google Earth* will display the direction of a location's Qibla. In order to give an indication of whether or not a qibla has led appropriately, even if it does not achieve the necessary accuracy. In this instance, *Google Earth* contributes to the process of figuring out how the Qibla points.²⁹

b. Steps to calibrate the Qibla direction with *Google Earth*

The steps taken for measurement using the *Google Earth* Application are as follows:

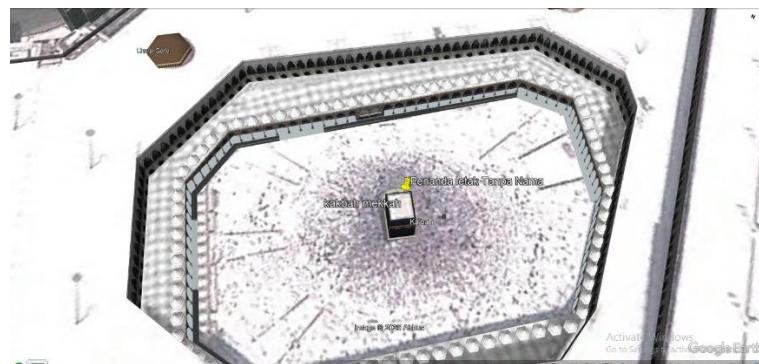
- 1) Open the *Google Earth* application on your laptop.
- 2) Search for the location of the Mosque in the search field of the Application, and mark the location of the Mosque using the *Add Placemark* menu in the *Add Toolbar*, then add a *Placemark* (yellow pin) to the location of the Tomb Complex.

Figure 1. Cemetery Locations



- 3) Mark the Kaaba structure in the Grand Mosque of Mecca, Saudi Arabia, using the same procedures.

Figure 2. Kaaba of the Grand Mosque



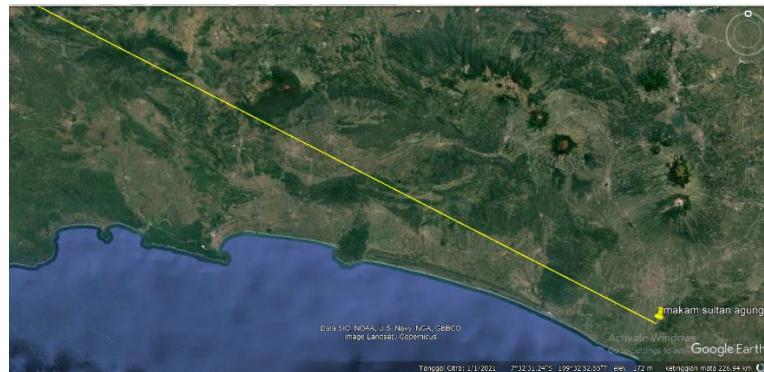
- 4) The next step is to draw a straight line using the *Ruler* menu in the *tools* or path in the *add* toolbar from the middle of the Kaaba building to the Tomb building.

²⁷ Efistik, *Menjelajah....* 38-39.

²⁸ Riza Afrian Mustaqim, *Penggunaan...* 199.

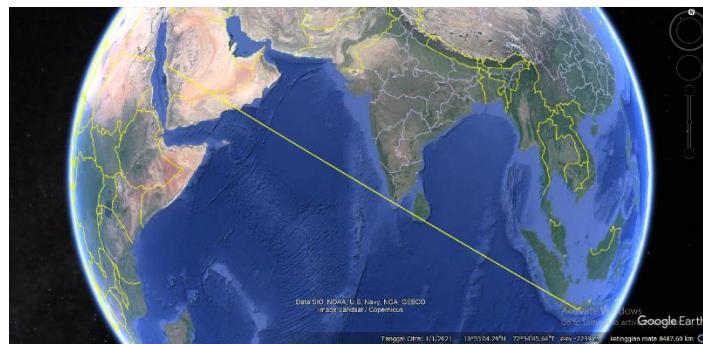
²⁹ *Ibid.* 200.

Figure 3. Qibla Withdrawal Process



5) The Process of Drawing a Straight Line in the way the Qibla points After measurements were made using the *Google Earth* Application and a straight line was drawn from the Tomb Building to the Grand Mosque Kaaba Building, it can be found that the physical building of the Mosque in the way the Qibla points has a straight line with the Kaaba.

Figure 4. Qibla Direction



c. Use of *Google Earth* for Qibla Direction

Determination In the use of *Google Earth*, there are differences in use when measuring the direction of the Qibla from the location side, namely;

- 1) The method of measuring the direction of the qibla with *Google Earth* is divided into 2, namely in buildings and vacant land.
 - a) The method of measuring the Qibla direction with *Google Earth* tools in buildings, namely: (1) Seeing the azimuth of the qibla in the desired building, (2) Seeing the azimuth of the desired building by aiming at the building, (3) Seeing deviations from the direction of the desired building. Deviation = azimuth of the qiblah - azimuth of the building.³⁰
 - b) The method of measuring the direction of the Qibla with the *Google Earth* tool on empty land, namely: (1) Measurement of the direction of the Qibla by connecting the show ruler from the Kaaba to the desired place, (2) Add a sign from add placemark in front of it, (3) Viewing the azimuth of the qibla of the desired place with a show ruler.
- 2) To see the accuracy of *Google Earth* in measuring the direction of the Qibla, it can be divided into three, namely: the accuracy of the measurement of the direction of the Qibla in large buildings, the accuracy of the measurement of the direction of the Qibla in small buildings and the accuracy of the measurement of the direction of the Qibla in the empty land.

³⁰ Muammar al-Khoiri, *Uji Akurasi Citra Google Earth Dalam Menentukan Arah Kiblat Masjid di Kecamatan Langsa Timur*, (Skripsi UIN Walisongo Semarang, 2023) 43.



Measuring the direction of the Qibla with the *Google Earth* tool on large buildings where the image is clearly visible is still accurate.³¹

2. ***Makam Imogiri Complex***

a. **Historical Background**

The Imogiri tomb complex was first built by Sultan Agung, when the center of government of the Mataram-Islam Kingdom was located in Kotagede. During the reign of Sultan Agung (1613 - 1646 TU), in addition to Imogiri, the Girilaya tomb complex was also built. This tomb complex was built in 1511 Caka (1629 - 1630 TU) with the supervisor Panembahan Juminah who was later buried in the place.³²

The Imogiri Tomb Complex on Mount Merak, located in Bantul Regency, Special Region of Yogyakarta, was built by the King of the Islamic Mataram Kingdom, namely Sultan Agung (1613 AD-1646 AD). This cemetery complex is known as Pajimatan. The name Pajimatan comes from the word "*Amulet*" which means heirloom, a place for heirloom. In this context, the figure of the King of the Islamic Kingdom of Mataram, namely Sultan Agung, a king who was first buried in this complex became an ancestor and heirloom for the dynasty of the Kingdom of Mataram.³³

The Imogiri tomb complex is located on the top of the Merak hill at an altitude of 85 - 100 meters above sea level. In this complex, most of the kings of Mataram-Islam were buried from the early period (Kotagede) to the late period (Surakarta and Yogyakarta) along with their close relatives. Some names can be mentioned, including: Sunan Paku Buwana I and III to XI, Sultan Agung, Sunan Amangkurat II and IV, and Sultan Hamengku Buwana I and III to IX. Especially Sultan Agung's mausoleum (the most respected figure) is located in the highest and most backward place³⁴ of all Merak hills, and is bordered to the east by the tombs of the Yogyakarta sultans (east) and to the west by the tombs of the Sunan Surakarta kings (west).

This tomb complex was established as a burial place for the kings of Mataram and their descendants, the kings of the Yogyakarta Palace and the kings of the Surakarta Palace. Sultan Agung as the first king to be buried in this tomb complex is in the highest place and is considered the most sacred. The tombs of the Yogyakarta Palace's monarchs line the Sultan Agung in the complex's eastern section. The western part of the Sultan Agung's tomb complex is lined with the tombs of kings from the Surakarta palace. Royal relatives such as the empress, garwa ampeyan, prince, and other relatives are also buried in this Imogiri tomb complex.³⁵

In 1755, precisely since the Giyanti Agreement which divided the Kingdom of Mataram into two, namely the Sultanate of Yogyakarta and the Sunanan of Surakarta made there were several differences in territorial boundaries. However, this does not change the status of the Pajimatan Imogiri Tomb Complex as the "Sacred Treasure" of the two kingdoms. Both the Sultanate of Yogyakarta and the Sunanan of Surakarta have the same rights and obligations in carrying out the maintenance of the tomb complex.

b. **Overview of the Imogiri Tomb Complex**

³¹ Zainul Arifin, *Akurasi Google Earth Dalam Pengukuran Arah Kiblat*, Jurnal Ulumuddin Volume 7, Nomor 2, Desember 2017.

³² Adrisijanti, Inajati. *Arkeologi Perkotaan Mataram Islam*. (Yogyakarta: Penerbit Jendela, 2000), 60.

³³ <https://budaya.jogjaprov.go.id/berita/detail/1306-makam-imogiri-oleh-sultan-agung-1632-m> accessed on date 7 November 25

³⁴ Ambary, Hasan Muarif. *Menemukan Peradaban: Arkeologi dan Islam di Indonesia*. (Jakarta: Pusat Penelitian Arkeologi Nasional, 1998), 100.

³⁵ Tim Ahli Cagar Budaya Kabupaten Bantul, *Kompleks Makam Imogiri Sebagai Situs Cagar Budaya Peringkat Kabupaten*, 2016, 6.

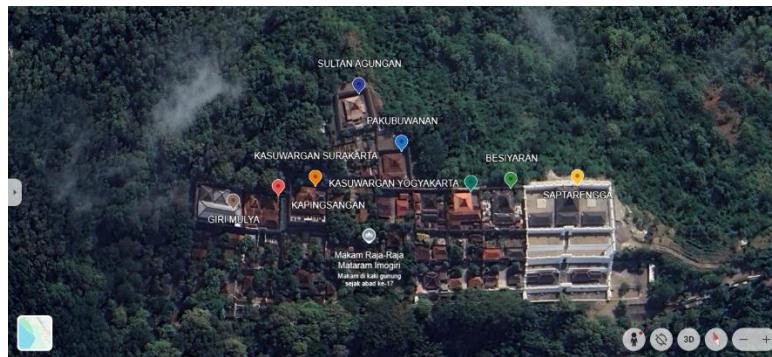
The first king to be buried in Imogiri was Kanjeng Prabu Anjakrakusuma who was usually called Sultan Agung. He was the king of the Mataram Palace, the son of Prabu Anjakrawati the king of the Pleret Palace, or the grandson of Kanjeng Panembahan Senopati in Ngalaga.

Visitors must pass through the stairs to get to the tomb of Kanjeng Sultan Agung. The stairs are 364 with a height of 69.16 m from the Pajimatan mosque. The Pajimatan Mosque is located to the south of Imogiri's tomb. The Imogiri Tomb is located at the top of Mount Merak.

The Imogiri Tomb Complex is divided into three large groups which are lined from the west side to the east side. The three complexes are³⁶ :

- 1) The group of the tombs of Mataram's kings Islam consists of 2 *palaces*; *Kedhaton* of Sutan Agungan and Pakubuwanan. The *Kedhaton* group of Sultan Agungan and Pakubuwanan is located in the middle and contains the tombs of the kings of Mataram who came from before the division of the kingdom (Giyanti Agreement). This group is managed by the courtiers of the Surakarta and Yogyakarta Palaces.
- 2) The group of tombs of the Kings of the Sultanate of Yogyakarta consists of 3 palaces; *Kedhaton* of Kasuwargan, *Kedhaton* of Besiyaran and *Kedhaton* of Saptarengga. The *Kaswargan-Saptarengga group* is located in the eastern wing and contains the tombs of Yogyakarta's kings. This group is managed by the courtiers of the Yogyakarta Palace.
- 3) The group of tombs of the Kings of the Surakarta Sunanan consists of 3 *Kedhaton*; Astana Luhur, Bagusan, and Girimulya. The Bagusan - Girimulya group is located in the west wing and contains the tombs of Surakarta's kings. This group is managed by the courtiers of the Surakarta Palace.

Figure 5. Map of the Tomb of the Imogiri Tomb Complex³⁷



The following is the data of the kings buried in the Imogiri Tomb Complex³⁸:

- 1) *Kedhaton* of Sutan Agungan: Sri Sultan Agung, Sri Ratu Batang Sunan Amangkurat II, Sunan Amangkurat III.
- 2) *Kedhaton* of Pakubuwanan: Sunan Paku Buwana I, Sunan Amangkurat IV, Sunan Paku Buwana II.
- 3) *Kedhaton* of Kasuwargan Surakarta: Sunan Paku Buwana III, Sunan Paku Buwana IV, Sunan Paku Buwana V
- 4) *Kedhaton* of Astana Luhur/ Kapingsangan: Sunan Paku Buwana VI, Sunan Paku Buwana VII, Sunan Paku Buwana VIII, Sunan Paku Buwana IX
- 5) *Kedhaton* of Girimulyo : Sunan Paku Buwana X, Sunan Paku Buwana XI, Sunan Paku Buwana XII

³⁶ <https://budaya.jogjaprov.go.id/berita/detail/1306-makam-imogiri-oleh-sultan-agung-1632-m> accessed on date 7 November 25

³⁷ Image satelit with *Google Earth* accessed on date 29 November 25

³⁸ The author's data was obtained when he visited the Imogiri Tomb Complex on December 10, 2025.



- 6) *Kedhaton* of Kasuwargan Yogyakarta: Sultan Hamengku Buwana I and III
- 7) *Kedhaton* of Besiyaran: Sultan Hamengku Buwana IV, Sultan Hamengku Buwana V, Sultan Hamengku Buwana VI
- 8) *Kedhaton* of Saptarengga: Sultan Hamengku Buwana VII, Sultan Hamengku Buwana VIII, Sultan Hamengku Buwana IX

c. Geographical Data of the Imogiri Tomb Complex

The Imogiri Tomb Complex is located in Pajimatan Hamlet, Wukirsari Village, Imogiri District, Bantul Regency, Yogyakarta Regional Province. It is astronomically located at $110^{\circ} 22' 49.37''$ E and $7^{\circ} 55' 17.07''$ S. This tomb complex is approximately 16.3 km from Yogyakarta City to the south. To reach this place, it can be reached by private vehicle or public transportation from the bus terminal in Giwangan to the south for approximately 11.6 km (Distance calculation based on Topographic Map of Yogyakarta and Bantul).³⁹

The following is the geographical data of the Imogiri Tomb Complex⁴⁰ :

Location	:	Makam Imogiri Complex
Address	:	Dusun Pajimatan
Neighborhoods	:	Girirejo
District	:	Imogiri
Regency	:	Bantul
Province	:	Daerah Istimewa Yogyakarta
Koordinat	:	$110^{\circ} 22' 49.37''$ E and $7^{\circ} 55' 17.07''$ S
Boundaries	:	<ul style="list-style-type: none">• North : Karang Kulon-Karang Wetan Hamlet Road Wukir Sari Village• South : Pajimatan-Kedung Buweng Hamlet• West : Wukirsari-Giri Rejo Village Road• East : Road Dusun Kedung Buweng, Wukirsari

d. The History of Figuring Out the Qibla's direction of the Imogiri Tomb Complex

There is an interesting thing in the process of determining the initial direction of the Qibla of the Imogiri Tomb Complex mentioned in the Fiber Manuscript of the Celebration *Serat Jasan Dalem Para Nata*. *Serat Pengetan Jasan Dalem Para Nata*'s is a manuscript obtained from the Radya Pustaka Museum Surakarta with the call number RP 91. The author is R.M.Ng. Prajakintaka. The manuscript contains three texts. The first text discusses the history of the establishment of the Surakarta Palace, the second text contains the history of the establishment of the Great Mosque of Demak, and the third text contains the history of the establishment of the Imogiri tomb. However, the author only discusses the third text about the history of the establishment of the Imogiri tomb.⁴¹

The story begins with Sultan Agung's request to be buried in Mecca. In the manuscript of *Serat Pengetan Jasan Dalem, Para Nata* explained that the request was rejected by Kyai Imam Safingi as the ruler of Mecca on the grounds that only Muslims who behave well can be buried in Mecca. While in folklore it is explained that the request was rejected by Kyai Imam Safingi on the

³⁹ Muhammad Chawari, *Studi Kelayakan Arkeologi di Kompleks Makam Imogiri, Yogyakarta*, Studi Awal Dalam Rangka Perencanaan Penelitian Arkeologi, Berkala Arkeologi Tahun XXVIII Edisi No. 1 / Mei 2008.

⁴⁰ Tim Ahli Cagar Budaya Kabupaten Bantul, *Kompleks* 3.

⁴¹ F Umi, "Serat Pangetan Jasan Dalem Para Nata (Suntingan Teks Dan Kajian Pragmatik)," 2020, <http://eprints.undip.ac.id/80465/> %0A http://eprints.undip.ac.id/80465/1/JURNAL_UMI_FADILAH_13010113120035.pdf.



grounds that only saints can be buried in Mecca, Kyai Imam Safingi considers that Sultan Agung is a mixed group of humans and jinn who only pollute Mecca.⁴²

Every time after the Fajr prayer in Mecca, Kanjeng Sultan Agung and Kanjeng Kyai Imam Safingi discuss the chapter of Guardianship and Islam. Kanjeng Kyai Imam Safingi explained that those who are allowed to be buried in Mecca are Muslims who have good behavior. If when asked "what is your name?" and then answers "I," it means that his spirit is accepted by Allah. The spirit that is not received by God when asked "what is your name"? He will not answer. Then Kanjeng Sultan Agung asked Kyai Imam Safingi "where is the land suitable for my burial later in the land of Java"? Kanjeng Imam Safingi told Kanjeng Sultan Agung to stand to the east of the Kaaba, then Kanjeng Sultan saw the hint that he would be buried near his house, namely on Mount Pleret, surrounded by many plants and there was also a peacock there. Kanjeng Kyai Imam Safingi invited Kanjeng Sultan Agung to follow the course of the land that was clenched and would be thrown into Java. Kanjeng Sultan Agung followed the path of the earth that fell at the top of Mount Merak and was thrown slightly to the southeast of Girilaya. The construction of the tomb was actually planned by Sultan Agung in Girilaya, but when the construction of the tomb took place, Sultan Agung's uncle (Kanjeng Panembahan Juminah) who helped build the tomb, fell ill and finally died, then was buried in Girilaya. The cemetery for Sultan Agung and his descendants was moved to Imogiri because Girilaya was used as the tomb of Sultan Agung's uncle.⁴³

It is told in folklore that Sultan Agung was disappointed and angry at Kyai Imam Safingi's remarks so he complained of his hurt feelings to Ratu Kidul. Ratu Kidul did not accept Kyai Imam Safingi's treatment of her husband. Finally, Ratu Kidul told her father, Nyai Rara Kidul, to go to Mecca and spread the disease outbreak so that the people of Mecca suffered from disease and many died.⁴⁴

However, there is a difference between folklore and what is written in the manuscript of *Serat Pengetan Jasan Dalem Para Nata*. Initially, Sri Paduka Sultan Agung was in Mecca at that time, but at half past 12 o'clock he was still in the mosque here, but it was not too late to reach Mecca. At the end of the meeting, the congregation greeted the Mecca dignitaries Imam Safi'i and Sunan Kalijaga. Then Sultan Agung said: "Tomorrow if I am no longer there, please be buried here. Kyai Imam Safi'i replied: "It cannot be later if the land of Java has rampant worries about who will overcome it if not Sultan Agung. But if, but if you want the land from here, take a lump of soil and continue to be thrown by Sunan Kalijaga to fall in Girilaya which is located northeast of here. Then, Sultan Agung ordered his courtiers to quickly build a tomb. But before the construction of the tomb was completed, Sultan Agung's uncle, Gusti Pangeran Panembahan Juminah, had first submitted a request, he said. Shortly afterwards his uncle died. Then, Sultan Agung threw the remaining ground, and fell here. The place where Sultan Agung's tomb is fragrant, not because of perfume or flowers because it is native to the land of Mecca. After 13 years of commanding in Mataram, Sultan Agung continued to fall ill and died. When the Sultan Agung was buried in 1632.⁴⁵

In contrast to the script, in folklore it is explained that Sunan Kalijaga wanted Sultan Agung to be buried in the land of Java because if there was a rampant worry, no one would overcome it. *Serat Pengetan Jasan Dalem Para Nata*'s manuscript also does not explain as in folklore that Kyai Imam Safingi apologized for his treatment of Sultan Agung and allowed him to be buried in Mecca close to the Prophets.⁴⁶

⁴² *Ibid*, p. 4.

⁴³ *Ibid*, 5.

⁴⁴ *Ibid*, 6.

⁴⁵ *Ibid*, 6.

⁴⁶ *Ibid*,

3. Analysis and Measurement Results

The Imogiri Tomb Complex is located at longitude $110^{\circ} 22' 49.37''$ E and latitude $7^{\circ} 55' 17.07''$ S, with the Kaaba at a distance of 8365 km. At first glance, the Imogiri Tomb Complex is located on the hills and has to climb the stairs totaling 364 with a height of 69.16 m from the Pajimatan mosque. The Pajimatan Mosque is located to the south of Imogiri's tomb. The Imogiri Tomb is located at the top of Mount Merak with a road position that leads to the Southwest and Southeast. This position is not researched with a compass or google earth. It is as if all the complexes point in the same direction, namely the West-South direction. However, after checking, the area of the Imogiri Tomb Complex turned out to be different in the direction of the building, some were close to the azimuth point of the qibla, some were deviating far from the azimuth point of the qibla.

So the author will divide the measurement of the way the Qibla points of the Imogiri Tomb Complex into two groups:

- The Accurate which consists of 1 *kedhaton*; *Kedhaton* of Astana Luhur/ Kapingsangan.
- The Less accurate is the group of tombs of the Kings of the Sultanate of Yogyakarta and Surakarta, namely *Kedhaton* of Sutan Agungan, *Kedhaton* of Pakubuwanan, *Kedhaton* of Kasuwargan Surakarta, *Kedhaton* of Girimulyo, *Kedhaton* of Kasuwargan Yogyakarta, *Kedhaton* of Besiyaran, *Kedhaton* of Saptarengga.

Before checking the way the Qibla points is carried out with calculations, the author first uses *Google Earth* satellite imagery. From the image, it is clear that not all areas of the tomb complex point in the same direction. The azimuth of the Qibla from the Imogiri Tomb to Mecca is about 295° north (measured clockwise) or about 25° from west to north.

To test the accuracy of the *Google Earth* method in determining the way the Qibla points, the author will make an initial measurement of the way the Qibla points using the calculation method and *Qibla Connect* software which is an application that is often used by the Islamic Guidance of the Ministry of Religion in determining the way the Qibla points, then a comparison is made with the *Google Earth* method to prove the level of accuracy.

Figure 6. Measurement of the direction of the Qibla and the Direction of the building of the *Kedhaton* of Sutan Agungan

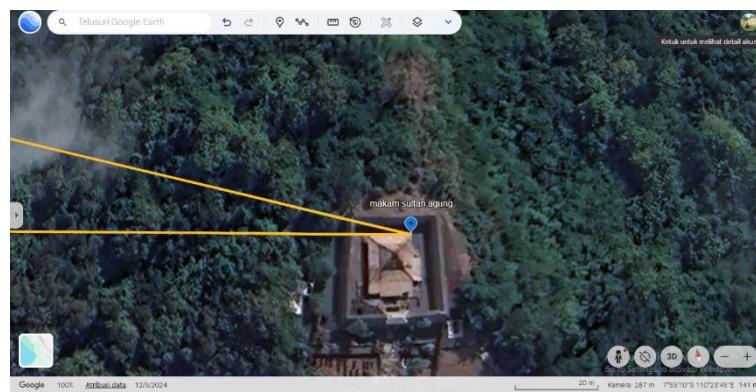
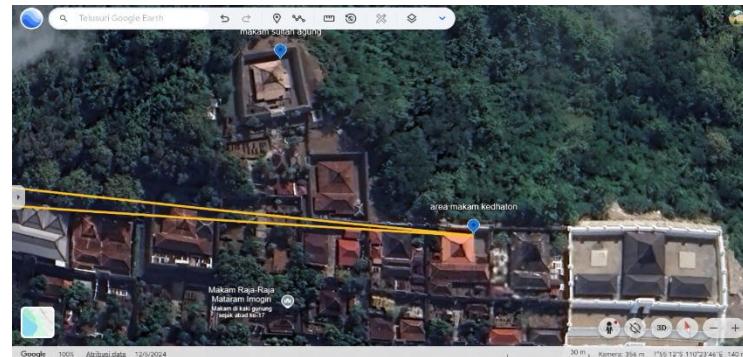


Figure 7. Measurement of the direction of the Qibla and the Direction of the building of the *Kedhaton* of Kasuwargan Yogyakarta



The following are the results of measuring the direction of the qibla of the imogiri tomb complex using *Google Earth* for each *kedhaton*:

Table 1. Results of Measuring the Direction of the Qibla of the Imogiri Tomb Complex using *Google Earth* for Each *Kedhaton*

No	Nama	Titik Koordinat		Arah Bangunan	Arah Kiblat	Selisih
		Lintang	Bujur			
1.	<i>Kedhaton of Sutan Agungan</i>	7°55'10"S	110°23'45"E	280° 23' 24"	294°44'4.3"	14°20'24"
2.	<i>Kedhaton of Pakubuwanan</i>	7°55'12"S	110°23'46"E	287° 14' 24"	294°44'4.5"	07°30'21"
3.	<i>Kedhaton of Kasuwargan Surakarta</i>	7°55'12"S	110°23'44"E	299° 05' 24"	294°44'5.0"	05°01'19"
4.	<i>Kedhaton of Astana Luhur/ Kapingsangan</i>	7°55'12"S	110°23'43"E	297° 22' 48"	294°44'5.3"	02°37'55"
5.	<i>Kedhaton of Girimulyo</i>	7°55'12"S	110°23'42"E	299° 36' 36"	294°44'5.5"	04°51'41"
6.	<i>Kedhaton of Kasuwargan Yogyakarta</i>	7°55'13"S	110°23'47"E	288° 02' 24"	294°44'4.5"	06°42'21"
7.	<i>Kedhaton of Besiyaran</i>	7°55'13"S	110°23'48"E	290° 42' 0"	294°44'4.3"	04°02'43"
8.	<i>Kedhaton of Saptarengga</i>	7°55'14"S	110°23'49"E	291° 38' 24"	294°44'4.3"	03°06'19"

The level of accuracy the Imogiri Tomb Complex in recalling the way the Qibla points is divided into 4 categories, which are as follows :

Very accurate : None

Accurate : *Kedhaton of Astana Luhur/ Kapingsangan*

Less accurate : *Kedhaton of Sutan Agungan*, *Kedhaton of Pakubuwanan*, *Kedhaton of Kasuwargan Surakarta*, *Kedhaton of Girimulyo*, *Kedhaton of Kasuwargan Yogyakarta*, *Kedhaton of Besiyaran*, *Kedhaton of Saptarengga*

Inaccurate : None

The entire area of the Imogiri Tomb Complex based on the determination and direction of the qibla according to the author can be classified into two groups, namely:

a. The Accurate which consists of 1 *kedhaton*; *Kedhaton of Astana Luhur/ Kapingsangan*.

The result of measuring the way the Qibla points difference or difference does not come out of the criteria of Prof. Dr. H. Thomas Djamaruddin, which is as long as the distance is not more



than $0^{\circ}2'46.43"$.⁴⁷ If you stick to the above standardization, then the way the Qibla points complex of is "The accurate".

From the results of the research on the way the Qibla points of the Imogiri Tomb Complex with the Calculation and *Google Earth* methods, these two methods have different levels of accuracy more accurately using calculations. Measurement applications using *Google Earth* are easier to apply anywhere, both independently and for the public, especially if they are in remote places such as forests, mountains, and other places that are not accessible by the network because tools are now online-based that require an internet network such as *Google Earth*, and other applications.

b. The Less accurate is the group of tombs of the Sultanate of Yogyakarta and Surakarta, namely *Kedhaton* of Sutan Agungan, *Kedhaton* of Pakubuwanan, *Kedhaton* of Kasuwargan Surakarta, *Kedhaton* of Girimulyo, *Kedhaton* of Kasuwargan Yogyakarta, *Kedhaton* of Besiyaran, *Kedhaton* of Saptarengga.

The measurement of the way the Qibla points between $0^{\circ}2'46.43"$ to $22^{\circ}30'$, because if there is a deviation reaching more than $22^{\circ}30'$, the way the Qibla points for the territory of Indonesia will tend to be straight west.⁴⁸ If you stick to the above standardization, then the way the Qibla points complex area is "less accurate".

This can happen because, as the author has mentioned above, it is based on the *Serat Pengetan Jasan Dalem Para Nata*'s manuscript. The process of showing the way the Qibla points in the tomb complex of this area is very simple, namely Kanjeng Kyai Imam Safingi invited Kanjeng Sultan Agung to follow the course of the ground that was clenched and would be thrown into Java. Kanjeng Sultan Agung followed the path of the earth that fell at the top of Mount Merak and was thrown slightly to the southeast of Girilaya. So then the tomb of Girilaya was built but because suddenly Sultan Agung's uncle fell ill, died and Girilaya's tomb was used to bury his uncle, then the Imogiri cemetery was also built for Sultan Agung and his descendants.

From a socio-cultural perspective, the community's understanding of the way the Qibla points is the direction facing west, so the local people believe that if the tomb is facing west, the tomb is facing the Qibla so there is no need to re-dismantle it. In addition, the Imogiri Tomb Complex Site is one of the heritage sites of the Majapahit kingdom and is included in the cultural heritage, so the authenticity of this tomb is very well maintained by the community and highly respected both by local residents and visitors to religious tourism.

Additionally, there is no set protocol or standard that mandates the use of a certain instrument to determine the way the Qibla points in this cemetery. Grave orientation varies when people are not compelled or encouraged to use the same tools. Because of variable tools or techniques, some tombs may be built precisely while others may not be. The challenging environmental circumstances of the cemetery, such as its mountainous terrain and dense foliage, might make it difficult to make the best use of contemporary tools, which further complicates this inconsistent tool utilization. conventional techniques that are less precise.⁴⁹

D. Conclusion

The study's findings demonstrate that; The entire area of the Imogiri Tomb Complex based on the level of accuracy of the way the Qibla points can be classified into two groups; First, the Accurate

⁴⁷ Siti Tatmainul Qulub, *Ilmu Falak dari Sejarah ke Teori dan Aplikasi*, (Depok: PT Raja Grafindo Persada, 2017), 177 -180.

⁴⁸ Siti Tatmainul Qulub, *Ilmu*.....

⁴⁹ A L Afaq and Jundil Ikrom, "Analysis of Determination and Deviation of Qibla Direction in Telaga Ngembeng Cemetery , Nyurlembang , Narmada 7 تَلْبِقُهُ بِعَلَامَكَ اَوْكَمَ حَمَّ" , no. 1 (2025): 20-33.



which consists of 1 *kedhaton*; *Kedhaton* of Astana Luhur/ Kapingsangan. The measurement results showed that the accuracy level in this area was more accurate than the second area, which was 2° . Second, the Less accurate is the group of tombs of the Kings of the Sultanate of Yogyakarta and Surakarta, namely *Kedhaton* of Sutan Agungan, *Kedhaton* of Pakubuwanan, *Kedhaton* of Kasuwargan Surakarta, *Kedhaton* of Girimulyo, *Kedhaton* of Kasuwargan Yogyakarta, *Kedhaton* of Besiyanan, *Kedhaton* of Saptarengga. The measurement results show that the qibla direction in this area has a lower level of accuracy, which is 13° - 14° off. So the way the Qibla points in this area is somewhat "less accurate".

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