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A Comparative Study of Islamic Astronomy and Jurisprudence on the Qibla Direction of Historical Mosques in Cirebon Indonesia

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Abstract: Determining the correct *Qibla* direction is of utmost importance for Muslims. However, it is ironic that many people are indifferent to the accuracy of the *Qibla* direction in local mosques, often relying on religious figures without consulting experts in the field. This negligence often results in inaccurate *Qibla* directions, especially in historical mosques that still stand today. This study examines several historical mosques in Cirebon, Indonesia, including Pesantren Benda Kerep Mosque, Kramat Kalilunyu Mosque, Kramat Kalijaga Mosque, Masjid Merah Panjunan, and Jagabayan Mosque. Among these, only the Pesantren Benda Kerep Mosque has an accurate *Qibla* direction according to Islamic astronomy (*Ilmu Falak*). From a jurisprudential perspective (*Fiqh*), according to the Hanafi, Maliki, and Hanbali schools of thought, the *Qibla* directions of the historical mosques—except for Jagabayan Mosque—are still acceptable, as they are classified as facing the general direction of the Kaaba (*Jihat al-Ka'bah*). In contrast, the Pesantren Benda Kerep Mosque's *Qibla* precisely faces the physical structure of the Kaaba (*'Ain al-Ka'bah*). However, Jagabayan Mosque's *Qibla* cannot be tolerated as it deviates beyond the acceptable range according to the Hanafi school's concept of *jihat sughra*. In the Shafi'i school, the strongest opinion is that only the Pesantren Benda Kerep Mosque qualifies as properly aligned with the *Qibla*, while the others deviate from the correct direction.

Keywords: *Qibla Direction, Historical Mosques of Cirebon, Islamic Astronomy, Islamic Jurisprudence*

Abstrak: Mengetahui arah *kiblat* merupakan hal yang sangat penting bagi umat Islam. Namun, ironisnya, sebagian besar masyarakat acuh terhadap kebenaran arah *kiblat* di masjid setempat dan cenderung mempercayakannya pada tokoh agama tanpa berkonsultasi dengan ahli yang berkompeten. Akibatnya, penentuan arah *kiblat* sering kali kurang tepat, terutama pada masjid-masjid bersejarah yang masih ada hingga saat ini. Penelitian ini meninjau beberapa masjid bersejarah di kota Cirebon, Indonesia, termasuk Masjid Pesantren Benda Kerep, Masjid Kramat Kalilunyu, Masjid Kramat Kalijaga, Masjid Merah Panjunan, dan Masjid Jagabayan. Dari kelima masjid tersebut, hanya Masjid Pesantren Benda Kerep yang arah *kiblat*-nya sudah tepat menurut perhitungan *ilmu falak*. Dalam tinjauan *fikih*, menurut mazhab Hanafi, Maliki, dan Hambali, arah *kiblat* masjid-masjid bersejarah tersebut—kecuali Masjid Jagabayan—masih dapat ditoleransi karena dianggap menghadap ke arah *kiblat* (*Jihat al-Ka'bah*). Sebaliknya, arah *kiblat* Masjid Pesantren Benda Kerep tepat mengarah ke bangunan fisik Ka'bah (*'Ain al-Ka'bah*). Namun, arah *kiblat* Masjid Jagabayan tidak dapat ditoleransi karena menyimpang di luar konsep *jihat sughra* menurut mazhab Hanafi. Dalam pandangan terkuat dari mazhab Syafii, hanya Masjid Pesantren Benda Kerep yang memenuhi kategori menghadap *kiblat*, sedangkan masjid lainnya melenceng dari arah yang benar.

Kata Kunci: *Arah Kiblat, Masjid Bersejarah Cirebon, Ilmu Falak, Fikih*

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Introduction

Shalat, as one of the pillars of Islam, holds a significant position in the life of Muslims. It is not merely a ritual but represents profound devotion to Allah SWT. Performed five times a day—*Subuh*, *Dhuhr*, *Asr*, *Maghrib*, and *Isha*—each prayer has its own meaning and purpose in shaping the character and spirituality of a Muslim.[1] In this regard, *Shalat* serves as both a reminder and a connection between the worshiper and Allah, as well as a means to attain mercy and blessings.[2]

Etymologically, the term "Shalat" is derived from the Arabic word meaning prayer and mercy. In *Sharia*, *Shalat* refers to a set of prescribed verbal and physical actions, starting with *Takbir* and ending with *Salam*, emphasizing its structured nature that must be fulfilled with sincerity.[3] Sheikh Najmuddin Amin al-Kurdi, in his work *Tanwirul Qulub*, underscores the primacy of *Shalat* over other material acts of worship, highlighting its utmost importance in the life of a Muslim.[4]

In the Qur'an, Allah SWT commands the observance of *Shalat* and the giving of *Zakat* in Surah Al-Baqarah (2:43), underlining that these two pillars are vital in constructing a just and prosperous society.[5] The Prophet Muhammad (PBUH) also emphasized the obligation to face the *Qibla* while praying, as it is one of the prerequisites for valid *Shalat*. He stated that before performing *Shalat*, one must complete ablution and face the *Qibla*.[6]

With the expansion of Islam across the globe, determining the *Qibla* became increasingly complex, especially after the spread of Islam beyond Mecca. During the Prophet's time, orienting towards the *Qibla* was not a significant issue as most Muslims resided in Mecca. However, as Islam spread, companions began using stars and the sun to guide them in finding the *Qibla*.[7] The Polaris star, known as the North Star, became a common reference point for determining the *Qibla* direction.[8]

There are diverse opinions among scholars regarding the obligation of facing the Kaaba for those who cannot physically see it. Scholars such as Imam Hanafi, Imam Hanbali, Imam Maliki, and certain Imami groups argue that for those distant from the Kaaba, it is sufficient to face the general direction where the Kaaba is located. In contrast, Imam Shafi'i and some Imami scholars hold that one must face the Kaaba directly, regardless of distance. This highlights the necessity of deep understanding and considerable effort in

[1] Muhajir Muhajir, Imam Yahya, and Frangky Suleman, 'Analysis of Qicblat Direction at Jami Al Iman Mosque Sunan Geseng Loano Purworejo', *Jurnal Ilmiah Al-Syir Ah*, 2022, doi:10.30984/jis.v20i2.2013.

[2] 'Historical Analysis and Calibration of the Oldest Al-Mujahidin Mosque, Parepare City', *Al-Marshad Jurnal Astronomi Islam Dan Ilmu-Ilmu Berkaitan*, 2023, doi:10.30596/jam.v9i2.16982.

[3] Widyastuti Nurjayanti, 'Historical, Philosophical, and Contextual Values in Al-Wustho Mangkunegaran Mosque, Surakarta', *Journal of Islamic Architecture*, 2022, doi:10.18860/jia.v7i2.15609.

[4] A B D Karim Faiz, 'MODERASI FIQH PENENTUAN ARAH KIBLAT: Akurasi Yang Fleksibel', *Journal of Islamic Law*, 2020, doi:10.24260/jil.v1i1.23.

[5] Arwin Juli Rakhmadi and Junaidi Junaidi, 'Qibla Accurary of the Mahligai and Papan Tinggi Tomb Complexes at Central Tapanuli', *Journal of Contemporary Islam and Muslim Societies*, 2022, doi:10.30821/jcims.v6i1.11077.

[6] Fahrul Fauzi, 'Juridical Normative Review of Conversion Conventional Banks Into Islamic Bank After the Promulgation of Qanun Aceh Concerning Sharia Financial Institutions', *Berumpun International Journal of Social Politics and Humanities*, 2020, doi:10.33019/berumpun.v3i2.31.

[7] Saddam Hussain, Zheng Chunrou, and Fu Juan, 'The Mosque's Primary Spaces and the Required Direction of the Mosque Building', *Journal of Islamic Architecture*, 2023, doi:10.18860/jia.v7i4.21497.

[8] Firdaus Firdaus and others, 'ONE MOSQUE, TWO QIBLAHS: Understanding the Difference in Qiblah Direction of the Nagari Suayan Mosque in West Sumatera, Indonesia', *Journal of Indonesian Islam*, 2019, doi:10.15642/jiis.2019.13.1.73-95.

accurately determining the *Qibla* direction.[9]

The importance of the *Qibla* in worship should not be underestimated. Many communities neglect the accuracy of the *Qibla* direction in local mosques, often relying solely on local leaders without proper verification.[10] Consequently, research focused on *Qibla* determination using the approaches of Islamic astronomy (*Ilmu Falak*) is highly relevant. This not only addresses doubts surrounding the correct *Qibla* direction but also provides a significant contribution to the community in ensuring precise *Qibla* determination.[11]

This research focuses on historical mosques in Cirebon, such as Pesantren Benda Kerep Mosque, Merah Panjunan Mosque, Jami Nurul Hidayah Kalilunyu Mosque, Kramat Kalijaga Mosque, and Jagabayan Mosque. Through scientific approaches and modern technological tools, this study aims to gather accurate data regarding the *Qibla* direction of these mosques.[12] Therefore, the community can gain a deeper understanding of the significance of accurate *Qibla* direction in performing *Shalat*.[13]

Various methods can be employed to determine the *Qibla* direction, such as using solar shadow observations or utilizing technological devices like GPS and digital compasses. Previous research has demonstrated that many mosques exhibit varying degrees of misalignment with the *Qibla*, necessitating re-measurements to ensure accuracy (Wafiroh, 2019).[14] This study aims not only to determine the correct *Qibla* direction but also to raise community awareness about the importance of precision in determining the *Qibla*.[15]

Furthermore, this study considers the perspectives of religious scholars and leaders regarding the *Qibla* direction and how communities can be more active in ensuring the accuracy of *Qibla* direction in their local mosques.[16] By involving the community in this process, collective awareness regarding the importance of correct *Shalat* practices, aligned with *Sharia* requirements, can be cultivated.[17] This research also offers recommendations to mosque administrators for re-assessing and correcting the *Qibla* direction, if necessary.[18]

In conclusion, *Shalat* is an essential act of worship in Islam, and determining the *Qibla* is a critical aspect of its observance. This

[9] Muhammad Thoyfur, 'Digitalization of Local Rashdul Qibla by Qibla Diagram', *Al-Hilal Journal of Islamic Astronomy*, 2021, doi:10.21580/al-hilal.2021.3.1.7697.

[10] Khalifatus Shalihah, 'Pandangan Tokoh Agama Terhadap Tingkat Akurasi Arah Kiblat Masjid-Masjid Se-Kecamatan Batu Layar Kabupaten Lombok Barat Menggunakan Istiwaaini', *Al - Afaq Jurnal Ilmu Falak Dan Astronomi*, 2021, doi:10.20414/afaq.v2i2.2919.

[11] Nur Hazliza Ariffin and Norhana Arsad, 'MEMS Gyro and Accelerometer as North-Finding System for Bulk Direction Marking', *Ieee Access*, 2022, doi:10.1109/access.2022.3217494.

[12] Luh Kesuma Wardhani and others, 'IoT-Based Integrated System Portable Prayer Mat and DailyWorship Monitoring System', *Matrik Jurnal Manajemen Teknik Informatika Dan Rekayasa Komputer*, 2023, doi:10.30812/matrik.v22i3.3058.

[13] W S Mada Sanjaya and others, 'Implementation of Ibn Al-Haytham's Method for Determining Qibla Direction Using Raspberry Pi', *Kinetik Game Technology Information System Computer Network Computing Electronics and Control*, 2022, doi:10.22219/kinetik.v7i1.1342.

[14] Ani Wafiroh, 'Accurate the Direction of Qibla Mosque in the Island of a Thousand Mosques Using Theodolite', *Al-Ihkam Jurnal Hukum Keluarga Jurusan Ahwal Al-Syakhshiyyah Fakultas Syariah Iain Mataram*, 2019, doi:10.20414/alihkam.v11i1.2117.

[15] Andi Muh. Akhyar and others, 'Astronomical Analysis: Viral Video of the Sun Rising From the North in Jeneponto', *Jurnal Ilmiah Al-Syir Ah*, 2021, doi:10.30984/jis.v19i2.1645.

[16] Asmianti Asrin, Gita Indah Hapsari, and Giva Andriana Mutiara, 'Development of Qibla Direction Cane for Blind Using Interactive Voice Command', 2018, doi:10.1109/icoict.2018.8528769.

[17] 'The Enigmatic Orientation of the Great Mosque of Córdoba', *Suhayl International Journal for the History of the Exact and Natural Sciences in Islamic Civilisation*, 2019, doi:10.1344/suhayl2019.16-17.2.

[18] Shubham Jaiswal, Mohd Arif, and Aman Gupta, 'Reinventing the Mosque Architecture in the Indian Context', 2024, doi:10.22541/essoar.171560878.83661662/v1.

research aims to provide a substantial contribution to improving the understanding and awareness of communities regarding accurate *Qibla* direction, while encouraging the use of scientific methods to determine the *Qibla* in historical mosques in Cirebon.[19] This will enhance the validity and acceptance of *Shalat* in the eyes of Allah SWT.[20]

Literature Review

The theoretical foundation of this study revolves around two key concepts in Islamic jurisprudence (*fiqh*) and astronomical science (*ilmu falak*): the obligation to face the *Qibla* during *Shalat* and the methodologies for determining the accurate *Qibla* direction, particularly in regions far from Mecca. These theoretical frameworks are deeply embedded within the classical and contemporary scholarship of Islamic thought, which combines religious, legal, and scientific dimensions.[21]

The Obligation of Facing the *Qibla*

Facing the *Qibla* is a well-established requirement for the validity of *Shalat*, grounded in the Qur'an and Hadith. Allah SWT explicitly commands Muslims to face the Kaaba in Mecca during prayer, as mentioned in Surah Al-Baqarah (2:144): "So turn your face toward the Sacred Mosque. Wherever you are, turn your faces toward it." This directive emphasizes that orienting oneself towards the *Qibla* is not merely symbolic but an obligatory physical act integral to *Shalat*.[22] Classical scholars from different schools of thought (*madhhab*) such as Hanafi, Maliki, Shafi'i, and Hanbali have agreed on the necessity of facing the *Qibla* during *Shalat*, though they offer varying interpretations on how this is applied in practice, particularly for those located far from the Kaaba.[23]

The Hanafi and Maliki schools allow for flexibility in facing the general direction of the Kaaba (*Jihat al-Ka'bah*) when exact alignment is challenging due to distance, while the Shafi'i school tends to require a stricter alignment, particularly when the *Qibla* can be precisely determined using modern methods. This reflects a broader debate within *fiqh* on how to balance religious obligations with practical considerations, a theme that remains relevant in contemporary discussions on *Shalat*.[24]

Ilmu Falak and Methods for Determining the *Qibla*

The science of Islamic astronomy, known as *ilmu falak*, provides the technical framework for determining the *Qibla* accurately. Historically, Muslim scholars such as Al-Battani, Ibn Yunus, and Ulugh Beg made significant contributions to the field of astronomy, which included the development of methods for calculating the direction of the *Qibla* using celestial bodies. These scholars laid the groundwork for subsequent generations of Muslim astronomers who devised mathematical and observational techniques to locate the Kaaba's exact

[19] Febria Roosita Dwi, 'Ios Application for Finding Halal Food, Mosque, Qibla Direction and Prayer Time', *Jurnal Informatika*, 2016, doi:10.9744/informatika.13.2.63-70.

[20] Mega Wati, 'Akurasi Arah Kiblat Masjid Di Desa Tindang Kecamatan Bontonompo Selatan Kabupaten Gowa (Studi Pengukuran Dengan Metode Segitiga Bola)', 2022, doi:10.24252/hisabuna.v3i2.24441.

[21] Mutmainnah, 'Kiblat Dan Kakbah Dalam Sejarah Perkembangan Fikih,"Jurnal Ilmu-Ilmu Keislaman 7'.

[22] 'Fiqh and Astronomical Rashdul Qibla; Determining the Direction of the Qibla by Using a Stellarium', *Al-Marshad: Jurnal Astronomi Islam Dan Ilmu-Ilmu Berkaitan*, 9.1 (2023), doi:10.30596/jam.v9i1.14554.

[23] Abdul Jalil and Hosen Hosen, 'QIBLA JURISPRUDENCE: Deviation of Mosques' Qibla in Pamekasan Madura', *Islamuna: Jurnal Studi Islam*, 7.2 (2020), doi:10.19105/islamuna.v7i2.3381.

[24] Jayusman, 'Akurasi Metode Penentuan Arah Kiblat: Kajian Fiqh Al-Ikhtilaf Dan Sains', *Asas*, 6.1 (2014).

direction.[25]

In contemporary times, modern tools such as GPS, compasses, and satellite technology have revolutionized the process of *Qibla* determination, enabling more precise measurements even in remote locations. However, despite these advancements, there remains a significant gap in the accuracy of *Qibla* direction in various mosques, particularly historical ones. This discrepancy often arises from reliance on traditional, less precise methods and the absence of verification by experts in *ilmu falak*.[26]

The Role of *Fiqh* in Addressing *Qibla* Misalignment

Islamic legal thought addresses the potential misalignment of the *Qibla* with a nuanced approach. Classical *fiqh* scholars, such as those from the Hanafi and Maliki traditions, argue that slight deviations are permissible as long as the mosque's orientation generally faces Mecca. However, the Shafi'i school of thought, which is dominant in Southeast Asia, holds that more precise alignment is necessary when it is feasible, particularly with the availability of advanced technologies.[27] This has important implications for historical mosques, where realignment may be required to ensure compliance with *fiqh* standards.[28]

The concept of *ijtihad* (independent reasoning) within Islamic jurisprudence allows for modern reinterpretations of classical rulings, especially when new information or technologies emerge. This principle supports the need for re-evaluating the *Qibla* direction in mosques, especially in light of scientific advancements in *ilmu falak* that enable more accurate measurements.[29]

The Interplay of Tradition and Modernity in *Qibla* Determination

The tension between traditional approaches to *Qibla* determination and the application of modern scientific methods forms a central theme in this study. While traditional Islamic scholars relied on natural observations, such as the position of the sun and stars, the introduction of technology offers greater precision but also challenges long-established practices. This study explores how these two approaches—traditional *fiqh* perspectives and contemporary astronomical techniques—can coexist and complement each other in ensuring accurate *Qibla* orientation.[30]

Understanding the theoretical underpinnings of both religious and scientific approaches to *Qibla* determination is crucial for resolving current discrepancies in mosque alignments. By drawing on both *fiqh* and *ilmu falak*, this study aims to provide a comprehensive framework that respects Islamic legal requirements while leveraging modern scientific tools to ensure the accuracy of the *Qibla* direction in

[25] Muhammad Faishol Amin, 'Global Rasdhul Qibla: The Probability of Four Times in A Year Study', *JURNAL PENELITIAN*, 2018, doi:10.28918/jupe.v15i2.1651.

[26] 'Mīqāt: Timekeeping and Qibla', *Handbook of Oriental Studies. Section 1, The Near and Middle East*, 144 (2020), pp. 44 – 151, doi:10.1163/9789004436589_003.

[27] Shalihah.

[28] Kusdiyana, Samsudin, and Muhammad Wildan Nur Akmal, 'Accuracy of Qibla Direction Mosque at Rest Area Toll Road on the Qibla Jurisprudence Perspective', *NUSANTARA: Journal Of Law Studies*, 2.1 SE-Articles (2023), pp. 31–39 <https://juna.nusantarajournal.com/index.php/juna/article/view/42>.

[29] M. Z. Ibrahim and M. Z. Norashikin, 'Universal Qibla and Prayer Time Finder', *World Academy of Science, Engineering and Technology*, 58 (2009).

[30] Hajar, Johari, and Syahpawi, 'Determination of Qibla Directions According to Islamic Astronomic Science (Case Study of Qibla Directions in Indonesia)', *International Journal of Innovation, Creativity and Change*, 4, 2020, pp. 205 – 217 <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85081277411&partnerID=40&md5=9213273ea4d28160fb8806ce68e685e4>.

historical mosques in Cirebon.[31]

Through this theoretical framework, the research addresses the intersection of religion, law, and science, providing a holistic approach to the problem of *Qibla* misalignment and offering practical solutions grounded in both traditional Islamic jurisprudence and contemporary astronomical practices.[32]

Methods

This study adopts a field research design with a qualitative approach and descriptive method. [33] The descriptive method aims to investigate a group of people or objects, a system of thought, or current events. According to Moh. Nazir, citing Whitney, the descriptive method involves obtaining factual data accompanied by accurate interpretation. It studies societal issues along with the existing norms and practices, including specific situations concerning relationships, activities, attitudes, viewpoints, ongoing processes, and the effects of a phenomenon.

In this study, the researcher seeks to uncover and understand the accuracy of the *qibla* direction in ancient mosques located in Cirebon, while also analyzing the perspectives of scholars from various *madhhab* (Islamic legal schools) regarding the *qibla* as the prescribed direction in performing *shalat* (prayers). Through this approach, the study aims to explore the factors contributing to potential deviations in the *qibla* orientation of these mosques and to examine the religious and technical interpretations provided by *fiqh* (Islamic jurisprudence) [34] and astronomical methodologies.[35]

This qualitative approach allows for an in-depth analysis of both the historical and contemporary practices related to *qibla* determination, particularly in the context of Islamic architecture and community practices in Cirebon. The research not only examines the religious rulings (fatwas) and opinions of scholars but also considers the role of modern technology, such as GPS and digital compasses, in providing more precise measurements of the *qibla* direction.

By employing the descriptive method, this study systematically addresses the discrepancies in *qibla* orientation and seeks to provide practical solutions grounded in both religious scholarship and modern scientific methods. The ultimate goal is to contribute to a better understanding of how to ensure the proper alignment of mosques in accordance with Islamic teachings, as well as to offer recommendations for mosque administrators and the broader Muslim community regarding *qibla* accuracy.

Results and Discussion

Profile of Historical Mosques in Cirebon City

The historic mosques of Cirebon serve as vital representations of Indonesia's rich religious and cultural heritage, particularly in the context of Islamic propagation in Java. Each mosque not only reflects architectural styles but also embodies the historical narratives associated with the spread of Islam in the region.

One of the oldest religious educational

[31] I. Salleh and others, 'A Qibla Compass for Visually Impaired Muslims', *Journal of Telecommunication, Electronic and Computer Engineering*, 8.7 (2016).

[32] Hosen and others, 'Tagyîr Mawdhî' Inhirâf Qiblat al-Masjid Fî Bamîkasân 'Alâ Asasi al-Tiknôlôjiyya al-Mutaqaddimah: Al-Tahlîla al-Ijtimâ'î Wa al-Tsaqafî', *Al-Ihkam: Jurnal Hukum Dan Pranata Sosial*, 18.2 (2023), pp. 591 – 625, doi:10.19105/al-Ihkam.v18i2.8939.

[33] Michael Trumbull and K Watson, 'Qualitative Research Method. Integrating Quantitative and Qualitative Methods in Research', in *G. R Taylor, Ed.*, 2010.

[34] Muhammad Hasan, 'Imkan Ar-Ru'yah Di Indonesia (Memadukan Perspektif Fiqih Dan Astronomi)', *Disertasi, Semarang: IAIN Walisongo*, 2012.

[35] Siti Mufarokah1, 'Pendekatan Astronomis Dalam Studi Islam Siti', *Journal of the Japan Welding Society*, 91.5 (2022).

institutions in Cirebon, Pesantren Benda Kerep, was established in 1826 by KH Maulana Muhammad Sholeh, a significant figure in the Islamic community and a descendant of Sunan Gunung Djati. The Benda Kerep Mosque, located within this pesantren, is a testament to Mbah Sholeh's efforts in promoting Islam in Cirebon. The mosque's traditional wooden flooring and window shutters exemplify the classic architectural style of the region, while the ceramic flooring added by Mbah Sholeh's sons signifies the evolution of the mosque over time.[36] The mosque's designation as a religious tourism site in 2019 further emphasizes its cultural significance and the role of heritage in contemporary tourism practices in Cirebon.[37]

In contrast, the Kramat Kalilunyu Mosque, which predates Benda Kerep, showcases the historical depth of Islamic architecture in Cirebon. Founded by Kyai Nursyafin, this mosque is notable for its well, which is believed to bring blessings and is a focal point for local rituals. The mosque's architecture, featuring classic Javanese wooden pillars, reflects the region's cultural heritage and the continuity of Islamic practices through its sermons and prayers delivered in Arabic.[38] The mosque's ongoing adaptations to accommodate a growing congregation highlight the dynamic nature of religious spaces in response to community needs.[39]

The Kramat Kalijaga Mosque, associated with the pilgrimage site of Sunan Kalijaga, further illustrates the intertwining of natural and spiritual elements in Cirebon's Islamic heritage. The site, which includes a preserved well and a cemetery, is steeped in local lore, including the belief that resident monkeys are transformed students. The mosque underwent significant renovations to maintain its historical integrity, underscoring the importance of preserving such sites for future generations.[40]

The Panjunan Red Mosque, constructed in 1480 by Maulana Abdul Rahman, reflects the syncretic influences of Hindu and Chinese aesthetics, indicative of Cirebon's multicultural heritage. Its distinctive brick-red walls and ceramic tiles symbolize the historical connections between the Islamic community and other cultural groups, [41] particularly following the marriage of Sunan Gunung Jati to a Chinese princess.[42] The architectural features, including thick walls constructed using a unique rubbing technique, demonstrate the mosque's resilience and the cultural blending that characterizes Cirebon's Islamic architecture.[43]

Lastly, the Jagabayan Mosque, built by Prince Nalarasa around 1437, serves as a

[36] Kuat Ismanto and Ahmaq Rofiq, 'Religious Tourism as a Halal Tourism Attractions', *Khatulistiwa*, 2022, doi:10.24260/khatulistiwa.v12i2.2273.

[37] Tanti Kustiari, 'Destination Management of Religious Tourism in Cirebon Indonesia', 2017, doi:10.2991/icet-17.2017.5.

[38] Ina Helena Agustina, 'Socio-Cultural Heritage for Tourism at Cirebon Palaces Indonesia', *Mimbar Jurnal Sosial Dan Pembangunan*, 2020, doi:10.29313/mimbar.v36i2.6876.

[39] Didin Nurul Rosidin, Asep Safullah, and Ihsan Sa'dudin, 'The Rise of At-Taqwa as the Grand Mosque and Authority Contested in Cirebon-Indonesia', *Journal of Islamic Architecture*, 2022, doi:10.18860/jia.v7i1.13123.

[40] Anwar Sanusi; Hajam; Aditia Muara Padiarta, 'Sufism Meanings in the Brai Art in Cirebon', *Epistemé Jurnal Pengembangan Ilmu Keislaman*, 2019, doi:10.21274/epis.2019.14.1.157-180.

[41] Nyai Kartika and others, 'The Visual Arts of Masjid Agung Sang Cipta Rasa Cirebon: Hybrid Culture Identity', *Harmonia Journal of Arts Research and Education*, 2020, doi:10.15294/harmonia.v20i1.17525.

[42] Hermana Hermana, 'Arsitektur Masjid Merah Panjunan Kota Cirebon', *Patanjala Jurnal Penelitian Sejarah Dan Budaya*, 2012, doi:10.30959/patanjala.v4i2.143.

[43] Tata Kartasudjana and Fadhly Abdillah, 'The Nawa Gapura Marga Raja Gate as a Representation of the Cirebon Islamic Monarchy in Indonesia During the 17th Century', *Jomantara Indonesian Journal of Art and Culture*, 2023, doi:10.23969/jijac.v3i2.

historical marker of the early Islamic influence in Cirebon. Originally a watch post, it evolved into a significant religious site, reflecting the transformation of Cirebon from a royal center to a hub of Islamic learning and practice.[44] This evolution is emblematic of the broader narrative of Islamic propagation in Java, where mosques function not only as places of worship but also as centers of community and cultural identity.[45]

The historic mosques of Cirebon encapsulate the region's Islamic heritage through their architectural styles, historical significance, and cultural narratives. They serve as crucial sites for understanding the interplay between religion, culture, and community in the development of Cirebon as a center of Islamic learning and practice in Indonesia

Qibla Direction Assessment of Historic Mosques in Cirebon City

The qibla direction assessment for several historic mosques in Cirebon City reveals valuable insights about their alignment with the qibla. Calculations performed using mizwala.xls indicate that Pesantren Benda Kerep Mosque is aligned correctly, as its structure points directly to the qibla at 294°.

Kramat Kalilunyu Mosque, however, shows a deviation from the qibla, with its structure misaligned by 9° to the south. Similarly, Kramat Kalijaga Mosque's alignment is 14° off to the south, indicating a significant need for realignment. Panjunan Red Mosque shows an 8° deviation south of the qibla direction, which, while smaller, still points to some misalignment.

The most significant deviation is observed in Jagabayan Mosque, where the structure is 49° off from the qibla, pointing southward.

This assessment is summarized in the following data: Pesantren Benda Kerep Mosque is properly aligned at 294°, matching its mizwah value of 197°. Kramat Kalilunyu, with a mizwah value of 130°, shows a 9° deviation, as its building orientation is 285°. Kramat Kalijaga, with a mizwah of 213°, deviates by 14°, pointing to a 280° building orientation. Panjunan Red Mosque, with a mizwah of 138°, deviates by 8° from the qibla as its building orientation is 286°. Lastly, Jagabayan Mosque, with a mizwah of 118°, shows the most significant misalignment, with its building orientation at 245°.

Based on these observations, each mosque's alignment data is summarized in the following table:

Table 1. Qibla Direction Assessments for Historic Mosques in Cirebon City

No	Mosque Name	Latitude / Longitude	Mizwah Value	Building Orientation	Qibla Azimuth
1	Pesantren Benda Kerep	6°47'20"/ 108°32'47"	197°	294°	294°
2	Kramat Kalilunyu	6°46'17"/ 108°33'3"	130°	285°	294°
3	Kramat Kalijaga	6°44'55"/ 108°33'2"	213°	280°	294°
4	Panjunan Red Mosque	6°43'3"/ 108°33'57"	138°	286°	294°
5	Jagabayan Mosque	6°43'10"/ 108°33'56"	118°	245°	294°

This assessment provides valuable insight into the alignment of historic mosques in Cirebon with the qibla direction.

[44] Michala Michala, Wisnuh Adi Arianto, and Maulida Fauziyah, 'Wisata Religi Situs Balong Pangeran Mancur Jaya Desa Kertawinangun Kecamatan Kedawung Kabupaten Cirebon', *Etos Jurnal Pengabdian Masyarakat*, 2021, doi:10.47453/etos.v3i1.349.

[45] Aan Jaelani, 'Islamic Tourism Development in Cirebon: The Study Heritage Tourism in Islamic Economic Perspective', 2016, doi:10.5281/zenodo.165043.

Analysis of Astronomical Science

In the context of analyzing the Qibla orientation of various mosques, the use of the Mizwala Qibla Finder has proven to be an effective tool for determining the accurate direction of prayer towards the Kaaba in Mecca. The study of the Mosque of Pesantren Benda Kerep revealed that its geographic coordinates are 6°47'20" S latitude and 108°32'47" E longitude. The Mizwah value calculated at 11:15 AM WIB was 197°, leading to a Qibla direction of 294°. This finding was corroborated by measurements taken at the mosque, which showed no deviation between the calculated Qibla and the physical direction of the mosque itself, as indicated by the three-thread method employed in the analysis.[46]

Similarly, the Mosque of Kramat Kalilunyu demonstrated geographic coordinates of 6°46'17" S latitude and 108°33'3" E longitude, with a Mizwah value of 130° and a Qibla direction again set at 294°. However, the analysis revealed a deviation of -9° between the calculated Qibla and the actual building direction, indicating a slight misalignment that could be attributed to various factors such as local topography or architectural design choices. The consistent use of the three-thread method across different mosques provides a reliable framework for assessing Qibla orientation, as seen in the subsequent analyses of the Mosque of Kramat Kalijaga and the Mosque of Merah Panjunan, which exhibited deviations of -14° and -8°, respectively.[47]

The Mosque of Jagabayan presented a more significant deviation of -49°, with its Mizwah value recorded at 118° and the building direction at 245°. This substantial misalignment raises questions about the architectural decisions made during the mosque's construction and the potential influences of local cultural practices on its orientation.[48] The findings across these various mosques underscore the importance of precise measurements and the potential for discrepancies in Qibla orientation, which can be influenced by a range of factors including historical practices, geographical considerations, and the methodologies employed in determining Qibla direction.[49]

The reliability of the Mizwala Qibla Finder has been supported by comparative studies that highlight its accuracy in determining Qibla direction, particularly when juxtaposed with other instruments like the Qibla Tracker. This reinforces the significance of using advanced tools and methodologies in the study of mosque orientations to ensure that they align with Islamic teachings regarding prayer direction.[50] Furthermore, the architectural implications of Qibla orientation are profound, as they not only affect the spiritual experience of worshippers but also influence the overall design and functionality of mosque spaces.[51]

In conclusion, the analysis of Qibla orientation in the mosques studied demonstrates the efficacy of the Mizwala Qibla Finder in providing accurate measurements while also revealing the complexities and variations in mosque orientations that can arise from a multitude of factors. Future research should continue

[46] Maulidin Maulidin and Abdullah Abdullah, 'Uji Komparasi Instrumen Arah Kiblat Antara Qibla Tracker Dan Mizwala Qibla Finder', *Astroislamica Journal of Islamic Astronomy*, 2022, doi:10.47766/astroislamica.v1i1.899.

[47] Maulidin and Abdullah.

[48] Maulidin and Abdullah.

[49] Yasirul Amin and Sutopo Sutopo, 'Uji Akurasi Arah Kiblat Masjid Pondok Pesantren Sunan Drajat Kecamatan Paciran Kabupaten Lamongan Dengan Metode Mizwala Qibla Finder', *Josh Journal of Sharia*, 2022, doi:10.55352/josh.v1i1.154.

[50] Amin and Sutopo.

[51] Saddam Hussain, Zheng Chunrou, and Fu Juan, 'The Mosque's Primary Spaces and the Required Direction of the Mosque Building', *Journal of Islamic Architecture*, 2023, doi:10.18860/jia.v7i4.21497.

to explore these discrepancies and the implications they hold for both architectural practice and religious observance within the Islamic community.

Analysis of Fiqh

In the discourse surrounding the Fiqh perspective on the Qibla direction, it is essential to recognize the consensus among scholars regarding the requirement for those at the Masjidil Haram to face the Ka'bah directly. However, the situation becomes more complex for individuals situated far from the Ka'bah, such as in Indonesia, where differing opinions emerge among the four major Islamic schools of thought: Shafi'i, Hanafi, Maliki, and Hanbali.

Within the Shafi'i school, there are at least two notable opinions regarding the Qibla direction for those distanced from the Ka'bah. The first opinion, attributed to Imam Muzanni, suggests that it is sufficient for distant individuals to face the general direction of the Ka'bah. This perspective aligns with the views held by the Hanafi, Maliki, and Hanbali schools, which emphasize the importance of facing the direction of the Ka'bah (*jiha al-ka'bah*) rather than the physical structure itself. The second opinion, articulated by Imam Nawawi, posits that individuals must possess a strong conviction that they are indeed facing the Ka'bah. Nawawi's assertion, supported by Imam Shafi'i, underscores the significance of facing the actual Ka'bah, regardless of distance, reflecting a stricter interpretation within the Shafi'i framework.

Conversely, the Hanafi, Maliki, and Hanbali schools maintain that for those unable to see the Ka'bah, the requirement is to face the direction of the Ka'bah (*jiha al-ka'bah*). This stance is grounded in the principle of performing what is possible (*al-maqdur alaih*), recognizing that physically facing the Ka'bah may not always be feasible. The Hanafi school, in particular, delineates between jihat sughra (the smaller Qibla direction) and *jihat kubra* (the larger Qibla direction). Jihat sughra allows for a permissible deviation of up to 45° from the true Qibla, thus permitting valid prayers,[52] while *jihat kubra* signifies a deviation beyond this threshold, which would invalidate the prayer.[53]

The analysis of historic mosques in Cirebon further illustrates these principles. According to the Hanafi, Maliki, and Hanbali schools, the Qibla directions of several historic mosques, including Masjid Merah Panjunan, Masjid Kramat Kalilunyu, and Masjid Kramat Kalijaga, remain acceptable as they are oriented toward the Qibla (*jiha al-ka'bah*). Notably, the Mosque of Pesantren Benda Kerep faces directly toward the Ka'bah (*'ainul Ka'bah*), qualifying it as accurately oriented according to the strongest perspective within the Shafi'i school. In contrast, the Mosque of Jagabayan's Qibla direction is deemed unacceptable,[54] as it deviates beyond the permissible limits outlined by the Hanafi school.[55]

The Fiqh perspectives on Qibla direction reveal a nuanced understanding among the various Islamic schools of thought, particularly when considering the challenges

[52] Reza Akbar and Asman Asman, 'Social Conflict Due to the Controversy of Mosque's Qibla Direction in Sejiram Village, Sambas Regency', *Jurnal Ilmiah Al-Syir Ah*, 2020, doi:10.30984/jis.v18i1.926.

[53] Ismail Ismail, Dikson T Yasin, and Zulfiah, 'Toleransi Pelencengan Arah Kiblat Di Indonesia Perspektif Ilmu Falak Dan Hukum Islam', *Al-Mizan*, 2021, doi:10.30603/am.v17i1.2070.

[54] Maesyaroh Maesyaroh, Erni Zuhriyati, and Andri Martiana, 'Increased Understanding of Qibla Direction Through Hisab Training and Qibla Direction Determination Method', 2023, doi:10.18196/iccs.v1i2.168.

[55] Fahmi Fatwa Rosyadi Satria Hamdani, Ramdan Fawzi, and Rifki Gapuraning Syahid, 'Pendampingan Pengukuran Arah Kiblat Masjid Di Rancabango Garut', *Dimas Jurnal Pemikiran Agama Untuk Pemberdayaan*, 2018, doi:10.21580/dms.2018.181.2911.

faced by Muslims situated far from the Ka'bah. The consensus on facing the Ka'bah directly at the Masjidil Haram contrasts with the diverse interpretations regarding the Qibla direction for distant worshippers, highlighting the importance of both scholarly opinion and practical considerations in determining the appropriate direction for prayer.

Conclusion

Masjid Pesantren Benda Kerep is located at coordinates 6°47'20" S and 108°32'47" E, with the building facing a direction of 294°. There is no deviation or misalignment from the qibla direction. Masjid Kramat Kalilunyu has coordinates 6°46'17" S and 108°33'3" E. At 13:20 WIB, the measured mizwah value was 130°, and the qibla direction was 294°, while the building's orientation was 285°, indicating a deviation of -9°. Masjid Kramat Kalijaga is situated at 6°44'55" S and 108°33'2" E. At 10:43 WIB, with a mizwah value of 213°, the qibla direction remained 294°, whereas the building direction was 280°, resulting in a deviation of -14°. Masjid Merah Panjunan is at 6°43'3" S and 108°33'57" E. At 13:05 WIB, the mizwah value was 138°, maintaining a qibla direction of 294° against a building direction of 286°, showing a deviation of -8°. Lastly, Masjid Jagabayan has coordinates 6°43'10" S and 108°33'56" E. At 14:37 WIB, the mizwah value recorded was 197°, with a qibla direction of 294°, while the building faced 118°, indicating a significant deviation of -49°.

In the context of fiqh, according to the Hanafi, Maliki, and Hanbali schools, all the mosques mentioned (excluding Masjid Jagabayan) are still considered to align with the qibla direction. Although not perfectly aligned, they are directed towards the ka'bah (*jihat sughro*). Notably, Masjid Pesantren Benda Kerep is precisely aligned with the physical Ka'bah (*'ainul Ka'bah*). In contrast, the significant deviation of -49° for Masjid Jagabayan places it outside the acceptable range of *jihat sughro* as per Hanafi principles, rendering the prayer of its congregants (*mushalli*) invalid.

Meanwhile, according to the Shafi'i school, particularly in accordance with the opinions of its founding scholars, only Masjid Pesantren Benda Kerep meets the criteria for proper qibla alignment. This is because the dominant opinion in Shafi'i jurisprudence emphasizes the necessity to face the *'ainul Ka'bah*, even for individuals situated far from it, utilizing scholarly expertise and reasoning (*ijtihad*) as support for their determination.

Credit Authorship Contribution

Kusdiyana: Conceptualization, Methodology, Investigation, Writing - Original Draft, and Supervision. Samsudin: Methodology, Data Collection, and Writing - Review & Editing. Muhammad Buchori: Formal Analysis, Resources, and Writing - Review & Editing. Roqiyul Ma'arif Syam: Formal Analysis, Writing - Review & Editing, and Project Administration.

Declaration of Competing Interest

The authors declare no competing interests related to this study. No financial or personal conflicts of interest are present.

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