THE VALUE OF *IḤTIYĀṬ*'S PRAYER TIMES IN SEMARANG CITY

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Abstract

The prayer schedule is usually applied to one area, such as Semarang City, considering the existing area, its area, and its height. The value of *iḥtiyāṭ* certainly has a role in implementing prayer times to accommodate all parts of one area as well as a safety measure against miscalculations; the method is carried out by taking into account prayer times in the eastern and the westernmost regions, as well as lowland and highland areas, then compared to the reference prayer time, in this case, the Great Mosque of Central Java. For the city of Semarang, with an east-west area of 24.2 km and an altitude of 0-405 meters above sea level, it is safe to use an *iḥtiyāṭ* of 2 minutes. However, considering the highland areas, it is necessary to use an *iḥtiyāṭ* value of 3 minutes for maghrib and evening prayer times.

Keywords: *Prayer Times, Iḥtiyāṭ, Altitude*

Abstrak

Jadwal waktu salat biasa diberlakukan untuk satu daerah, seperti halnya Kota Semarang, dengan mempertimbangkan daerah yang ada, dari luas wilayah dan ketinggiannya. Nilai *iḥtiyāṭ* tentunya mempunyai peran dalam pemberlakuan waktu salat tersebut, dengan tujuan bisa terakomodirnya semua bagian dalam satu daerah juga sebagai langkah pengaman akan adanya salah perhitungan, metode yang dilakukan dengan memperhitungkan waktu salat didaerah paling timur dan barat, juga daerah dataran rendah dan tinggi, lalu dibandingkan dengan waktu salat acuan, dalam hal ini Masjid Agung Jawa Tengah. Kota Semarang dengan luas wilayah timur-barat 24,2 km dan ketinggian 0-405 mdpl, aman kiranya menggunakan *iḥtiyāṭ* 2 menit, namun perlu menggunakan nilai *iḥtiyāṭ* 3 menit untuk waktu salat maghrib dan isya' dengan mempertimbangkan daerah dataran tinggi.

Kata Kunci: *Waktu Salat, Iḥtiyāṭ, Ketinggian Tempat*

A. Introduction

Semarang City is the capital of Central Java Province, which is located between 6˚50'-7˚10' South Latitude and 109˚35'-110˚50' East Longitude, with an area of 373.78 km consisting of 16 sub-districts and 177 sub-districts.[1]. The majority of the population of Semarang City embraces Islam, with a total of 1,485,169 people out of a total population of 1,696,366 people as of December 31, 2023.[2].

In determining prayer times, the City of Semarang uses a 2-minute *Iḥtiyāṭ* as a precaution against errors and to accommodate existing areas; the Semarang City area consists of lowlands and highlands, to the north is the lowlands; this is because the north is is the Java Sea, with a coastline of 13.6 km with a slope of 0-2 percent with a height varying between 0-3.5 M, the southern part is the foothills of Mount Ungaran and hills, with a slope of 2-40 percent making the land contour varied. Between 90-405 masl. This needs to be analyzed to realize appropriate prayer times.

As a large city, Semarang City is also usually used as a reference for neighboring towns/regencies; this can be seen in the imsakiyyah schedule, which the government and mass organizations generally issue; at the bottom, there are regional corrections.[3] Thus, Semarang City prayer times must be genuinely appropriate to be used purposefully.

B. Method

This paper is categorized as qualitative research employing descriptive analysis methods to explore and address the complexities of determining Semarang prayer times. The approach is grounded in direct observation and comparative analysis, providing a detailed examination of how geographical and topographical factors impact prayer time calculations in the city.

The data sources for this research include comprehensive observations conducted at various mosques and prayer rooms in both the easternmost and westernmost regions of Semarang and locations with the lowest and highest

[1] https://semarangkota.go.id/mainmenu/detail/profil accessed April 25 2024, 22:40.
[2] https://gis.dukcapil.kemendagri.go.id/peta/ accessed April 25 2024, 22:45.
[3] Jayusman, "Tinjauan Ilmu Falak dan Fiqh Hisab Rukyah Terhadap Koreksian Daerah Jadwal Salat," *Al-Marshad: Jurnal Astronomi Islam dan Ilmu-Ilmu Berkaitan* 7, no. 2 (2021): 149, http://jurnal.umsu.ac.id/index.php/almarshad/article/view/7501.

elevations within the city. This strategic selection of observation sites allows for robustly comparing prayer times across different geographic and topographic contexts. By gathering empirical data from these diverse locations, the study aims to highlight how local conditions affect the timing of prayers.

A critical analysis component involves comparing the observed prayer times with those from reference points, particularly the Great Mosque of Central Java. This mosque is frequently used by several local reckoners in Semarang City as a standard for determining prayer times. By comparing the prayer times recorded at the various observation sites with those from the Great Mosque, the research can identify discrepancies and assess the impact of Semarang's unique geographical and topographical features on prayer time calculations.

In addition to direct observations and comparisons, the research also incorporates literature on *iḥtiyāṭ*, the Islamic principle of caution used to ensure prayers are performed within their correct times. This literature review provides valuable context and theoretical grounding for the study, offering insights into how *iḥtiyāṭ* is applied in different contexts and how it might be adjusted based on local conditions. The methodology employed in this research reflects a multidisciplinary approach, integrating elements of jurisprudence, astronomy, and topography. The jurisprudential aspect involves understanding the religious guidelines and requirements for prayer times. At the same time, the astronomical component focuses on the precise calculations of solar positions and their variations based on geographical location. The topographical considerations account for how the city's elevation and land contours impact the timing of sunrise, sunset, and twilight.

By combining these perspectives, the research addresses the practical challenges in determining accurate prayer times in Semarang. Integrating jurisprudence and astronomy helps ensure that the prayer times align with religious obligations while considering the astronomical phenomena that influence these times. The topographical analysis refines this approach by accounting for local elevation and land contour variations.

This research aims to provide actionable insights and solutions for future applications. By understanding how different factors affect prayer times and applying a cautious approach (*iḥtiyāṭ*) based on empirical observations and

theoretical knowledge, the study hopes to contribute to more accurate and reliable prayer time calculations in Semarang. This comprehensive approach addresses current challenges and sets a foundation for future improvements in determining prayer times in diverse geographical contexts.

C. Result and Discussion

C.1. The Utilization of *Iḥtiyāṭ* on Prayer Times

فَاِذَا قَضَيْتُمُ الصَّلٰوةَ فَاذْكُرُوا اللّٰهَ قِيَامًا وَّقُعُوْدًا وَّعَلٰى جُنُوْبِكُمْۚ فَاِذَا اطْمَأْنَنْتُمْ فَاَقِيْمُوا الصَّلٰوةَۚ اِنَّ الصَّلٰوةَ كَانَتْ عَلَى الْمُؤْمِنِيْنَ كِتٰبًا مَّوْقُوْتًا

When you have finished the prayer, make dhikr of Allah (remember and mention Him), whether you are standing, sitting or lying down. When you feel safe, perform the prayer (perfectly). In fact, prayer is an obligation whose time has been determined for believers (QS. An-Nisa' (4): 103).

In *Tafsīr Al-Kashshāf*, Al-Zamakhshari interprets the verse that a person must not end the time and prioritize the prayer time at will, whether in a state of safety or fear, apart from that, determining this time also aims to ensure that believers always remember His God at various times so that negligence does not lead to actions that are not by Islamic teachings.[4] Thus, prayer times need to be known before carrying them out; they must not be haphazard, and a perfect prayer must be performed according to the time; based on this Qur'anic argument, astronomical experts rethink the prayer times that have been determined and clarify the verse above using calculations and observations. Natural phenomena indicating prayer times. They also believe that in calculating prayer times themselves, the final result must be added as an attention value, which, according to researchers, can be the basis for adding the *iḥtiyāṭ* value in calculating prayer times so that there are no errors or mistakes in determining prayer times, in line with the reason for the existence of *Iḥtiyāṭ* namely;

a. Security due to rounding in calculating data collection;

[4] Aḥmad Muṣṭafā Al-Maraghi, *Tafsīr Al-Maraghī,* Vol. *2*, (Beirut: Dar al-Fikr, tt), 145

b. Determining the coordinate data is usually at a point around the central city, *Iḥtiyāṭ* time is needed to anticipate the area to the west; this is because the area to the east will enter prayer time earlier than the area to the west);

c. Accommodate regions that have extreme heights.[5]

Iḥtiyāṭ merupakan langkah pengamanan dalam perhitungan waktu salat dengan cara menambah atau mengurangkan waktu agar jadwal waktu salat tidak mendahului awal waktu atau akhir waktu.[6] *Iḥtiyāṭ* is a security measure in calculating prayer times by adding or subtracting time so that the prayer schedule does not precede the beginning or end of time.[7]

دَعْ مَايَرِيْبُكَ إِلَى مَا لاَ يَرِيْبُكَ[8].

No human being is free from mistakes; people often do and produce things without hesitation. One example is using the *iḥtiyāṭ* value in prayer calculations to avoid doubts and make the calculator confident that the prayer times are correct. The use of *iḥtiyāṭ* in prayer time calculations serves as a safeguard against doubts and uncertainties that may arise due to various factors. For example, when determining the precise times for the five daily prayers, numerous variables are at play, including geographical location, topographical variations, and astronomical phenomena. These factors can cause slight discrepancies in the exact timings of prayers. To account for these potential variations and ensure that prayers are performed within their prescribed times, the principle of *iḥtiyāṭ* is employed.

Incorporating an *iḥtiyāṭ* value into the calculation process can introduce a buffer that addresses any uncertainties or variations. This approach provides a margin of safety and instills confidence that the prayer times being observed

[5] Sayful Mujab and Muslich Shabir, "The Use of Iḥtiyāṭ Data in Prayer Time Hisab: Perspectives on Islamic Law," *Ulul Albab: Jurnal Studi dan Penelitian Hukum Islam* 5, no. 2 (July 28, 2022): 105, https://doi.org/10.30659/JUA.V5I2.20699.

[6] Departemen Agama RI, *Pedoman Penentuan Jadwal Awal Waktu Shalat Sepanjang Masa*, (Jakarta: Depag RI, 1994), 39.

[7] Susiknan Azhari, *Ensiklopedia Hisab Rukyat* (Yogyakarta: Pustaka Pelajar, 2012), 74

[8] Imam Nawawi, *Arba'in Al-Nawawi*, (Surabaya: Pustaka Syabab, 2018), 35

are accurate and reliable. For instance, in a city or regency where prayer time calculations are used for the entire region, applying an *iḥtiyāṭ* value helps ensure that the times are appropriate and valid across different local contexts.

In essence, the principle of *iḥtiyāṭ* acknowledges human limitations and strives to minimize the impact of potential errors. It allows individuals and communities to confidently adhere to their religious practices, knowing that the prayer times they follow are based on a cautious and thorough approach. This practice not only upholds religious obligations but also fosters a sense of certainty and consistency in the observance of prayer times throughout the region. an be used throughout the region (City or Regency).

العبرة في العبادات بما في نفس الأمر وبما في ظن المكلف[9]

Prayers are carried out when the prayer time has arrived, meaning that Muslims who want to perform the prayer must know or have a strong suspicion that the prayer time has arrived; in reality, it must also be proven that the prayer time has entered correctly.

The timing of prayers in Islam is intricately linked to specific astronomical events, such as the sun's position in the sky. Each of the five daily prayers—Fajr, Zuhr, Asr, Maghrib, and Isha—has its designated time window, determined by the sun's movement. For instance, the Fajr prayer begins at dawn, when the first light of day appears, while the Maghrib prayer starts just after sunset. Precise astronomical conditions define each prayer time; thus, accurate observation and calculation are crucial.

Muslims often rely on various methods to determine prayer times and ensure prayers are performed correctly. These methods may include astronomical calculations, observing natural signs such as sunrise and sunset, or using established prayer timetables provided by local religious authorities. In addition, modern tools such as prayer time apps and websites provide calculated times based on geographic location, offering convenience and accuracy.

[9] Al Imam Abu Bakar Utsman bin Muhammad Ad Dimyathi Al Bakri, *I'ānat al-Ṭālibīn*, Vol. *3* (Beirut: Dar Al-Kutub Al-Ilmiyyah, 1995), 16.

Despite these tools, the principle of caution, or *iḥtiyāṭ*, is often applied to avoid any potential doubt or error in prayer time calculations. This principle involves allowing a margin of safety to ensure the prayer is performed within its correct time window. By doing so, Muslims can be confident that their prayers are performed at the right time and align with the religious requirements.

دَرْءُ الْمَفَاسِدِ أَوْلَى مِنْ جَلْبِ الْمَصَالِحِ[10]

In this context, what is meant by mahurat is if, when calculating prayer times, an error or mistake is found in entering the data, which results in it being different or almost the same as the actual prayer time (rarely found because in the field the reckoner still carries out tashlich or review), or what is more likely to be seen is if, in a city/district in the western part, the time has not yet entered. Still, the eastern part/reference point has already entered prayer time, which has become a problem for the western region. *Iḥtiyāṭ* is a solution to having a fixed prayer time to accommodate one area.

In calculating the *iḥtiyāṭ* value, Indonesia uses a benchmark of 2 minutes, assuming a radius of 55.54 km to the west, and does not take into account areas with extreme contours, even though the higher the location, the later the start of the prayer time, and the lower the location, the earlier the start of the prayer.[11]

Regarding the magnitude of the *iḥtiyāṭ* value itself, no basis can be used to strengthen or favor one criterion used. However, all the requirements have solid reasons for being used, regardless of all that. The concept of worship is space and time, and each place is different; you have to use *iḥtiyāṭ* to cover the entire region; if the eastern region has shown prayer times, then the western region has not yet entered prayer times, and to achieve the validity of worship, then *Iḥtiyāṭ* is used.

[10] Muhammad Shidqi Al Burnu, *Al-Wajīz fī Īḍāḥ Qawā'id Fiqh al-Kulliyyāt*, Maktabah Syamilah, 265

[11] Akatina and Fiki Nuafi Qurota Aini, "Optimalisasi Penentuan Nilai Iḥtiyāṭ dalam Waktu Salat Maghrib untuk Kabupaten Wonosobo" *Jurnal Syariah* 11, no. 1 (2022): 93.

C.2. Implementation of *Iḥtiyāṭ* Values in Semarang City

Iḥtiyāṭ's astronomical concept is that the Earth is a ball described as 360 degrees in its rotation. At the same time, the circumference of the Earth at the equator is 40,000 KM. To find one degree, divide 40,000 KM by 360, with the result 111,111 KM in degrees, for one minute 111,111 KM divided by 4 with the result 27, 7 Km, meaning that every 27.7 KM requires *Iḥtiyāṭ* 1 minute.

In carrying out the analysis, the researchers took several sample locations in the city of Semarang, of course adapting them to the concept of *Iḥtiyāṭ* itself, namely;

a. Area

The city of Semarang has an area of 373.70 km, where if you draw a line from the easternmost part to the westernmost part, you will find a distance of 24.2 km. The samples taken for further processing were the Jami' Al-Anwar Mosque Penggaron Lor Genuk with coordinates 6°58'31.86" South Latitude 110°30'02.71" East Longitude and a height of 8 meters above sea level, and the Baitul Iman Podorejo Ngaliyan Prayer Room with coordinates 7 °0'15.05" South Latitude 110°17'02.25" East Longitude and an altitude of 123 meters above sea level.

b. Altitude

Considering the varied land contours that the city of Semarang has with the lowlands on the northern coastline and the areas at the foot of Mount Ungaran in the south, this has an effect because it is related to the setting of the sun, the highland areas will be later, and the plains will be earlier, Also related to the sunrise, highland areas will be earlier than lowland areas. Researchers added samples associated with the altitude of the Baitul Amin Gunungpati Mosque with coordinates 7° 6' 13.72" South Latitude 110°21'37.81" East Longitude and an altitude of 400 meters above sea level, and the Al-Hidayah Mangkang Wetan Mosque with coordinates 6°57' 19.17" South Latitude 110°18'53.24" East Longitude and an altitude of 1 meter above sea level.

In its application, most people calculating prayer times in Semarang City use the Great Mosque of Central Java as a reference, like Ahmad Izzuddin, with

coordinates 6°59'00.71" South Latitude 110°26'43.02" East Longitude and an altitude of 95 meters above sea level. The existing sample data was then analyzed by taking into account the prayer times (not yet using *Iḥtiyāṭ*) on several dates, namely March 21, June 21, and December 22, 2024; these dates were taken based on the minimum, 0, and maximum solar declination.

Table I
The difference in prayer times for east-west and lowland-highlands March 21, 2024

No	Place	*Prayer Times*				
		Fajr	Zuhr	Ashr	Maghreb	Isya
1	Al-Anwar Mosque, Penggaron Lor Genuk	04:24:41	11:45:06	14:57:15	17:48:41	18:57:12
2	Baitul Iman Mosque, Podorejo Ngaliyan	04:25:33	11:45:58	14:58:09	17:50:36	18:59:07
3	Baitul Amin Gunungpati	04:25:14	11:45:39	14:57:59	17:51:26	18:59:58
4	Al-Hidayah Mosque Mangkang Wetan	04:25:26	11:45:50	14:57:58	17:49:14	18:57:45
5	Central Java Great Mosque	04:24:55	11:45:19	14:57:29	17:49:47	18:58:17

Table I shows the difference in prayer times at several locations in Semarang on March 21, 2024. The prayer times listed include Fajr, Zuhr, Ashr, Maghreb, and Isya. This table illustrates the slight variations in prayer times across different mosques at different altitudes and geographical positions. The locations listed include Al-Anwar Mosque in Penggaron Lor Genuk, Baitul Iman Mosque in Podorejo Ngaliyan, Baitul Amin Mosque in Gunungpati, Al-Hidayah Mosque in Mangkang Wetan, and the Central Java Great Mosque. For example, the Fajr prayer time at Al-Anwar Mosque is 04:24:41, while at Baitul Iman Mosque in Ngaliyan, it is 04:25:33. This difference shows how geographical position and elevation affect prayer times.

The Maghreb prayer time also shows similar variations, with Baitul Amin Mosque in Gunungpati having the latest Maghreb time at 17:51:26. In contrast, Al-Anwar Mosque in Penggaron Lor Genuk has an earlier Maghreb time at 17:48:41. This difference reflects the variations in elevation and location between lowland and highland areas as well as the east-west positions. Overall, this table provides insight into how geographical conditions influence

prayer times at different places in Semarang. Local communities need to adjust their prayer schedules accordingly.

Table II
The difference in prayer times for east-west and lowland-highlands June 21, 2024

No	Place	*Prayer Times*				
		Fajr	Zuhr	Ashr	Maghreb	Isya
1	Al-Anwar Mosque, Penggaron Lor Genuk	04:24:35	11:39:51	15:01:09	17:31:49	18:46:07
2	Baitul Iman Mosque, Podorejo Ngaliyan	04:25:30	11:40:43	15:02:00	17:33:45	18:48:04
3	Baitul Amin Gunungpati	04:25:21	11:40:24	15:01:36	17:34:32	18:48:50
4	Al-Hidayah Mosque Mangkang Wetan	04:25:18	11:40:35	15:01:54	17:32:23	18:47:17
5	Central Java Great Mosque	04:24:49	11:40:04	15:01:22	17:32:57	18:47:16

Table II presents the differences in prayer times across several locations in Semarang on June 21, 2024. The table lists the times for five daily prayers, Fajr, Zuhr, Ashr, Maghreb, and Isya, for various mosques positioned at different altitudes and geographical locations within the city.

The locations included in the table are Al-Anwar Mosque in Penggaron Lor Genuk, Baitul Iman Mosque in Podorejo Ngaliyan, Baitul Amin Mosque in Gunungpati, Al-Hidayah Mosque in Mangkang Wetan, and the Central Java Great Mosque. These locations have been chosen to illustrate how elevation and east-west positioning within Semarang affect the timing of each prayer. For instance, Fajr prayer time at Al-Anwar Mosque is the earliest, occurring at 04:24:35. In contrast, the latest Fajr prayer time is observed at Baitul Iman Mosque in Podorejo Ngaliyan at 04:25:30. This indicates that the difference in location and altitude, though slight, can still influence the exact time the prayer is due. When looking at the Maghreb prayer, which marks the sunset, the time varies from 17:31:49 at Al-Anwar Mosque to 17:34:32 at Baitul Amin Mosque in Gunungpati, situated at a higher altitude. This suggests that higher elevations and their positioning about the setting sun result in slightly later Maghreb prayer times.

Similarly, there is a variation for the Isya prayer, which follows after nightfall, with the earliest time being at 18:46:07 at Al-Anwar Mosque and the

latest at 18:48:50 at Baitul Amin Mosque. This reflects the same trend observed with the Maghreb, where higher altitudes slightly delay the timing of the prayer. The Zuhr and Ashr prayer times also demonstrate minor differences across the locations, confirming that altitude and geographical positioning influence the precise timing of these daily prayers.

In summary, Table II provides a detailed comparison of how Semarang's physical geography—its elevation variation and east-west positioning—affects the timing of daily prayers across different parts of the city on June 21, 2024. These differences, while small, are essential for local communities to consider when scheduling their prayers.

Table III
The difference in prayer times for east-west and lowland-highlands December 22, 2024

No	Place	*Prayer Times*				
		Fajr	Dzuhur	Ashar	Fajr	Isya’
1	Al-Anwar Mosque, Penggaron Lor Genuk	03:55:07	11:36:38	15:03:59	17:52:57	19:08:47
2	Baitul Iman Mosque, Podorejo Ngaliyan	03:55:56	11:37:30	15:04:51	17:55:01	19:10:54
3	Baitul Amin Gunungpati	03:55:25	11:37:12	15:04:33	17:56:09	19:12:06
4	Al-Hidayah Mosque Mangkang Wetan	03:55:54	11:37:23	15:04:43	17:53:28	19:09:17
5	Central Java Great Mosque	03:55:20	11:36:51	15:04:12	17:54:09	19:10:01

Table III illustrates the differences in prayer times at various locations in Semarang on December 22, 2024. The table details the times for Fajr, Zuhr (Dzuhur), Ashr, Maghreb, and Isya prayers across five different mosques positioned at varying altitudes and locations within the city. The mosques included are Al-Anwar Mosque in Penggaron Lor Genuk, Baitul Iman Mosque in Podorejo Ngaliyan, Baitul Amin Mosque in Gunungpati, Al-Hidayah Mosque in Mangkang Wetan, and the Central Java Great Mosque. The times listed reflect how geographical factors like altitude and east-west positioning within Semarang influence the timing of each prayer.

For the Fajr prayer, the earliest time is observed at Al-Anwar Mosque, occurring at 03:55:07, while the latest is at Baitul Iman Mosque in Podorejo

Ngaliyan, at 03:55:56. This demonstrates how minor differences in altitude and location can cause slight variations in the time the prayer begins. The Zuhr prayer times show similar differences, with the earliest at 11:36:38 at Al-Anwar Mosque and the latest at 11:37:30 at Baitul Iman Mosque. This variation reflects the impact of the mosque's geographical position within the city on the midday prayer time. Asher prayer times are also affected, with Al-Anwar Mosque holding the prayer at 15:03:59, while Baitul Iman Mosque, which is at a higher elevation, has it slightly later at 15:04:51. For the Maghreb prayer, which coincides with sunset, the time varies from 17:52:57 at Al-Anwar Mosque to 17:56:09 at Baitul Amin Mosque in Gunungpati. This indicates that higher altitudes, like those at Gunungpati, experience sunset later, thus delaying the Maghreb prayer time. The Isya prayer, which occurs after nightfall, shows the most considerable variation, with the earliest time at 19:08:47 at Al-Anwar Mosque and the latest at 19:12:06 at Baitul Amin Mosque. This variation again highlights the effect of elevation and geographical positioning on the timing of night prayers.

In conclusion, Table III provides insight into how the physical geography of Semarang, particularly the differences in altitude and east-west positioning, influences the precise timing of daily prayers at different mosques on December 22, 2024. These minor differences are essential for accurately scheduling prayers according to local conditions. From the prayer times on several calculated dates, differences were found, as shown in Table IV below;

Table IV
Difference between prayer times and references

No	Place	*Difference time*				
		Fajr	Dzuhur	Ashar	Fajr	Isya'
1	21 March 2024	42 s	29 s	40 s	1 m 39 s	1 m 41 s
2	21 June 2024	41 s	39 s	38 s	1 m 35 s	1 m 34 s
3	22 December 2024	36 s	39 s	39 s	2 s	2 m 5 s

An ideal *iḥtiyāṭ* value can be drawn from the existing difference to accommodate prayer times for the entire Semarang City area by rounding the

difference between reference and sample prayer times + 1 minute.[12] Thus, for the morning, midday, and Asr prayers, an *iḥtiyāṭ* value of 2 minutes is required, while specifically for Maghrib and Isha' times, 3 minutes of *iḥtiyāṭ* value needs to be added, taking into account the high altitude.

The practice of *iḥtiyāṭ*—a principle of caution in Islamic jurisprudence—holds particular significance when determining prayer times, especially in regions with varied geography, such as Semarang. As illustrated in the tables, the differences in prayer times across different dates and locations within Semarang are a direct consequence of astronomical phenomena influenced by geographical and seasonal variations. This analysis delves into the intricate relationship between these factors and the necessity of *iḥtiyāṭ* to ensure the precision and correctness of prayer times in Semarang.

Semarang's geographical diversity, spanning from the lowlands near the northern coastline to the highlands at the foot of Mount Ungaran in the south, creates a natural variance in prayer times across the city. The differences observed in prayer times between mosques situated at different elevations and latitudes can be attributed to two critical astronomical factors; firstly, Elevation: Higher elevations, such as those in the Gunungpati area, experience slightly different sunrise and sunset times compared to lower elevations. This difference arises because, at higher altitudes, the horizon is perceived differently, causing the sun to appear and disappear at different times relative to sea-level locations. For example, the Fajr time in higher altitudes tends to be slightly later because the sun takes longer to reach 18 degrees below the horizon. Conversely, the Maghreb time is delayed as the sun sets later. Another factor is Latitude: The east-west positioning of a location within the city also impacts prayer times. Locations further east will generally experience sunrise and sunset earlier than those further west due to the Earth's rotation. This factor is less pronounced than elevation but still contributes to the observed variations in prayer times.

C.3. *Iḥtiyāṭ* in Practice: Addressing Variances

[12] Sayful Mujab, "Tinggi Matahari dan Iḥtiyāṭ Awal Waktu Maghrib berdasarkan Topografi di Jawa Tengah", Disertasi, Program Pascasarjana UIN Walisongo Semarang, 2023, 203

Using *iḥtiyāṭ* to determine prayer times involves setting prayer schedules with a margin of safety to account for the natural variations caused by geographical and seasonal factors. This cautious approach ensures that each prayer is performed within its correct time window, regardless of minor discrepancies introduced by local conditions. The differences highlighted in the tables for Fajr, Maghreb, and Isya prayers are particularly relevant for applying *iḥtiyāṭ*:

a. Fajr: The pre-dawn prayer is most susceptible to variations in the sun's position below the horizon. By delaying Fajr by a few seconds or minutes, as indicated by the differences observed, the risk of performing the prayer too early is mitigated, aligning the practice with the actual appearance of dawn.

b. Maghreb: The sunset prayer must only be performed after the sun has fully set. Atmospheric refraction can cause the sun to appear above the horizon even when technically set. The delays noted in March and June emphasize the need for *iḥtiyāṭ*, where the prayer time is set slightly later to ensure the sun has wholly dipped below the horizon.

c. Isya: Twilight duration, which varies throughout the year, directly impacts Isya prayer times. The extended twilight during winter requires a later Isya time to ensure the sky is fully dark. Applying *iḥtiyāṭ* here involves extending the prayer time by a few minutes, as observed in December, to accommodate the lingering twilight.

The using of *iḥtiyāṭ* in Semarang has some implications, namely:

a. Consistency Across Locations: Despite the differences in elevation and east-west positioning, *iḥtiyāṭ* allows for a standardized approach to prayer times that accommodates these variances, ensuring that all community members, regardless of their specific location, are aligned in their observance.

b. Adjustment for Seasonal Changes: The significant changes in prayer times across the different seasons, particularly for Fajr and Isya, are carefully managed through *iḥtiyāṭ*, preventing any inadvertent deviations from the prescribed times.

c. Religious Assurance: For practitioners, *iḥtiyāṭ* offers peace of mind, ensuring that their prayers are conducted at the correct times, even when natural variances could otherwise lead to uncertainty.

Using *iḥtiyāṭ* to determine prayer times in Semarang is an essential practice considering the city's geographical diversity and the seasonal variations inherent in its climate. The differences observed in the prayer times across various dates and locations underscore the necessity of this cautious approach. By incorporating *iḥtiyāṭ*, the community can maintain the precision and correctness of their prayers, ensuring that they align with religious requirements and the natural rhythms dictated by the Earth's movement. This careful consideration of astronomical factors reflects a deep understanding of the interplay between natural phenomena and religious practice, allowing for a harmonious integration of faith and science in daily life.

D. Conclusion

Based on the analysis, the city of Semarang presents a unique case for determining prayer times due to its geographical and topographical characteristics. Although Semarang is not an extensively large city, it spans 24.2 kilometers between its eastern and western extremities. This relatively modest area means that the variation in prayer times across the city is generally not highly significant. However, the variation in elevation—from sea level in the coastal areas to 405 meters above sea level in the highland regions—introduces a notable factor that must be considered in the precise calculation of prayer times.

The city's diverse land contours contribute to varying local times for the five daily prayers. For instance, the time the sun reaches the horizon can differ based on the location's elevation. In areas closer to sea level, such as the lowlands, sunrise and sunset occur slightly earlier than the higher elevations in the southern part of the city. While seemingly small, this difference can have practical implications for ensuring that prayer times are observed accurately according to Islamic guidelines.

Given these factors, applying *iḥtiyāṭ*—a principle of caution in Islamic jurisprudence designed to ensure that prayers are performed within their designated times—is crucial. Based on the analysis, a default *iḥtiyāṭ* value of 2

minutes is adequate for most Semarang prayers. This value accounts for the minor discrepancies in prayer times arising from the city's east-west spread and moderate elevation changes. The 2-minute margin helps ensure that prayers are performed neither too early nor too late, adhering to the correct timing per Islamic regulations.

However, for specific prayers such as Maghrib and Isha', additional caution is necessary due to the more pronounced effects of the city's elevation on these times. Maghrib, observed immediately after sunset, and Isha', conducted when twilight has wholly vanished, are particularly sensitive to variations in elevation. In the highland areas, where the sunset occurs later and twilight persists longer, a more generous *iḥtiyāṭ* margin is required to ensure these prayers are performed correctly. Therefore, an additional *iḥtiyāṭ* value of 3 minutes is recommended for Maghrib and Isha's prayer times in these elevated areas.

In summary, while the standard *iḥtiyāṭ* of 2 minutes generally suffices for the city's prayer times, it is essential to apply an extended *iḥtiyāṭ* of 3 minutes specifically for Maghrib and Isha' prayers in higher elevations. This approach ensures that the prayers are performed within their designated time frames, reflecting a careful consideration of Semarang's geographical and topographical variations.

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