INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES

Vol 12, Issue 8, (2022) E-ISSN: 2222-6990

Implications of Uniform Time Zone for ASEAN Countries on Muslim Prayer (Solah) Timings in Malaysia

Mohd Hafiz Safiai[1], Ibnor Azli Ibrahim[2], Salmah Abu Hasan[3], Ezad Azraai Jamsari[4] & Mohd Izhar Ariff Mohd Kashim[5]

[1]Research Centre for Sharia, Faculty of Islamic Studies & Institute of Islam Hadhari, Universiti Kebangsaan Malaysia, Selangor, Malaysia, [2]Faculty of Shariah and Law & The Mazhab Shafi'i Research Centre, Universiti Islam Sultan Sharif Ali, Bandar Seri Begawan, Brunei Darussalam, [3]Research Centre for Sharia, Faculty of Islamic Studies, Universiti Kebangsaan Malaysia, Selangor, Malaysia, [4]Research Centre for Arabic Language and Islamic Civilization, Faculty of Islamic Studies, Universiti Kebangsaan Malaysia, Selangor, Malaysia, [5]Research Centre for Sharia, Faculty of Islamic Studies & Institute of Islam Hadhari, Universiti Kebangsaan Malaysia, Selangor, Malaysia

Email: hafizsafiai@ukm.edu.my (Corresponding Author), tesyekkur@gmail.com, eajsti@gmail.com, izhar@ukm.edu.my

To Link this Article: http://dx.doi.org/10.6007/IJARBSS/v12-i8/14241 DOI:10.6007/IJARBSS/v12-i8/14241

Published Date: *09* August 2022

Abstract

A time zone is an area on the Earth globe that observes a uniform or standard time in its area, better known as local time. The time zones worldwide differ according to the longitude of a country and ASEAN countries have four time zones, namely, GMT+6.5, GMT+7, GMT+8 and GMT+9. Time zones result in different environments in the aspects of socio-ibadah (religious worship), working hours and timings for other purposes. Indeed, there have been many suggestions to standardize the time zones of ASEAN countries in order to facilitate the ideal directness of economic activity, however a thorough study needs to be conducted so that any decision taken will harmonize all parties. Therefore, the purpose of this research is to assess the Muslim prayer time schedule in Malaysia by analyzing the Muslim prayer times for ASEAN countries compared to if the time zones were converted to a standard or uniform time zone, namely GMT+7. This is qualitative research using the methods of document analysis, interview and observation. This research focused on the prayer schedule of the easternmost state time zone and westernmost state time zone in Malaysia. Research results finds that a change in the time zone of Malaysia to GMT+7 would delay prayer timings in Malaysia by one hour. This would more or less change social activity and working hours for society in Malaysia. This research indirectly gives an early picture of the effect of applying a uniform time zone, GMT+7, so that ASEAN countries, including Malaysia, may be prepared.

Keywords: Astrofiqh, Islamic Astronomy, Time Zone, GMT, Prayer Timings, ASEAN

Introduction

Initially, Malaysia used two time zones, namely, Greenwich Mean Time (GMT) +7 and +8. However, from the year 1982, time zone GMT+8 is used for the whole of Malaysia, namely, Peninsular Malaysia, Sabah and Sarawak. This decision was the initiative of Tun Dr. Mahathir, then Prime Minister, who viewed that a standardised time zone for the whole country facilitates daily transactions. More interestingly, the issue of a standard or a uniform time zone for ASEAN suggested by Malaysia has become the subject of discussion of other member countries (Hamdan et al., 2017).

The goal of a uniform time zone is for smooth running of economic activity and systematic communications relations between ASEAN countries, parallel with world economic activity (Grigoryev, 2018; Zerubavel, 1982). Should the time zone agreed upon be GMT+8, then it would be more comfortable for Malaysia which is already using the said time zone. However, if the time zone is converted to GMT+7, there would certainly be quite substantial implications, particularly involving Muslim prayer time schedule in Malaysia (Safiai et al., 2021).

The purpose of this research is to assess the Muslim prayer time schedule in Malaysia by analyzing the Muslim prayer times for ASEAN countries compared to if the time zones were converted to a standard or uniform time zone, namely GMT+7. This is qualitative research using the methods of document analysis, interview and observation. This research focused on the prayer schedule of the easternmost state time zone and westernmost state time zone in Malaysia.

GMT time zones of ASEAN countries: A Literature Review

As is commonly known, ASEAN comprises of ten countries, namely Malaysia, Indonesia, Singapore, Brunei, Thailand, Phillipines, Vietnam, Laos, Cambodia and Myanmar (KLNM, 2008). It is generally known that the use of time zone follows the longitude and political authority of a particular country. ASEAN's area covers the time zones GMT +6.50, +7, +8, and +9 as shown in Table 1 as follows (Bikos et al., 2020a):

Table 1
ASEAN countries according to respective GMT

GMT +6.5	GMT +7	GMT +8	GMT+ 9
Myanmar	Vietnam Laos Cambodia West Indonesia Thailand	Malaysia Singapore Brunei Phillipines Central Indonesia	East Indonesia

Table 1 shows the country in west ASEAN is Myanmar which uses GMT+6.5. This means the time difference between Myanmar and Malaysia is 1 hour 30 minutes, Myanmar slower or Malaysia ahead in time. This is illustrated by Diagram 1 as follows (Bikos et al., 2020b):

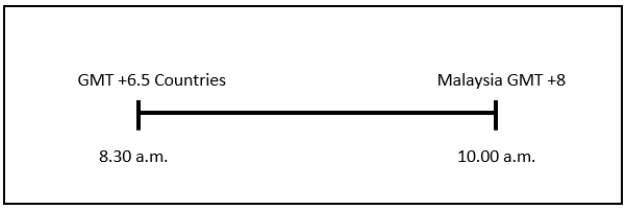

Diagram 1: Time difference between Myanmar GMT+6.5 and Malaysia GMT+8

Next, the ASEAN countries of Indochina, namely, Vietnam, Laos, Cambodia and Thailand, all use GMT+7. Similarly, the provinces of (West) Indonesia Barat such as Aceh, Sumatera Utara, Sumatera Barat, Riau, Kepulauan Riau, Kepulauan Bangka, Belitung, Jambi, Bengkulu, Sumatera Selatan, Lampung, Banten, Jakarta, Jawa Barat, Jawa Tengah, Yogyakarta, Jawa Timur, Kalimantan Barat and Kalimantan Tengah, also use GMT+7, known as Waktu Indonesia Barat (WIB). The difference between GMT+7 and Malaysia time is one hour slower or behind Malaysia. This is illustrated by Diagram 2 below (Republik Indonesia, 1987):

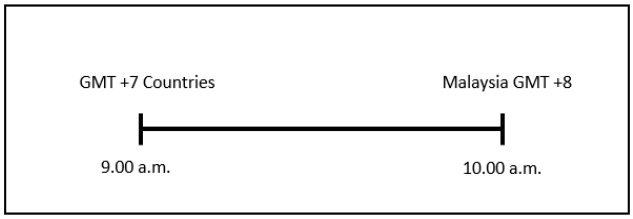

Diagram 2: Time difference between GMT+7 countries and Malaysia GMT+8

Next, there is only one ASEAN country that uses GMT+9, namely, (East) Indonesia Timur. It is the easternmost country in ASEAN and the time there is known as Waktu Indonesia Timur (WIT). The time difference is one hour, ahead of Malaysia as illustrated in Diagram 4 as follows (Republik Indonesia 1987).

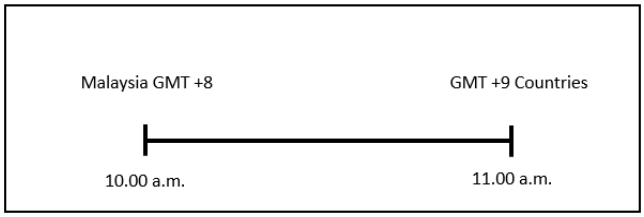

Diagram 3: Time difference between Malaysia GMT+8 and East Indonesia GMT +9

Result and Discussion

Current time schedule for Muslim prayer in ASEAN countries according to respective GMT

In Myanmar which uses GMT+6.5, the westernmost province is Rakhine where there is a Muslim community (Ratinawati, 2017). The prayer timings in Rakhine are: Subh at 4.15 a.m., Zuhr at 12.16 p.m., Asr at 3.38 p.m., Maghrib at 6.54 p.m. and Isya' 8.12 p.m (Islamic Finder, 2022). While for prayer timings at GMT+7, Jakarta, Indonesia is chosen as reference. In view of Indonesia's vastness, it can be the 'king maker' in selecting GMT+7 as the uniform time zone for ASEAN countries. In Jakarta, the prayer timings are: Subh at 4:39 a.m., Zuhr at 11:56 a.m., Asr at 3:18 p.m., Maghrib at 5:59 p.m. and Isya' at 7:04 p.m (Kementerian Agama Republik Indonesia, 2022).

As mentioned, Malaysia uses GMT+8 time zone. Therefore, the prayer timings in Malaysia are: Subh at 5:44 a.m., Zuhur at 1:19 p.m., Asr at 4:45 p.m., Maghrib at 7:28 p.m. and Isya' at 8:43 p.m. (JAKIM, 2022). As an area that uses GMT+9, Papua is chosen as the easternmost province in Indonesia, as reference for the whole ASEAN area. After examining, the prayer timings for Papua are: Subh at 4:45 a.m., Zuhr at 11:43 a.m., Asr at 3:06 p.m., Maghrib at 5:38 p.m. and Isya' at 6:53 p.m. Table 2 shows the prayer time schedule for each country according to the respective GMT (Islamic Finder, 2022):

Table 2
Prayer times schedule according to GMT

Country/ Prayer Timings	**Rakhine GMT +6.5**	**Indonesia GMT +7**	**Malaysia GMT +8**	**Papua GMT +9**
Subh	4:15	4:39	5:44	4:45
Zuhr	12:16	11:56	1:19	11:43
Asr	3:38	3:18	4:45	3:06
Maghrib	6.54	5:59	7:28	5:38
Isya'	8.12	7:04	8:43	6:53

Change in prayer timings if GMT+7 were used

If there is a change in GMT, the prayer timings would also be subject to change, except for (West) Indonesia Barat. Table 3 below shows the projected change in prayer timings for every GMT:

Table 3
Change in prayer timings based on GMT+7

Country/ Prayer Timings	**Myanmar (Rakhine) GMT +6.5**	**Malaysia (Kuala Lumpur) GMT +8**	**Indonesia (Papua) GMT +9**	**Timur**
Subh	4:45	4:44	2:45	
Zuhr	12:46	12:19	9:43	
Asr	4:08	3:45	1:06	
Maghrib	7:24	6:28	3:38	
Isya'	8:42	7:43	4: 53	

Based on Table 3, the prayer timing at Rakhine which uses GMT+6.5 for Subh is at 4:15 a.m. and if the time zone were changed to GMT+7, the prayer timing would change to 4:45 a.m., meaning 30 minutes later than the current timing. Similarly, other prayer timings would change: for Zuhr from 12.26 p.m. to 12.46 p.m., Asr from 3.38 p.m. to 4.08 p.m., Maghrib from 6.54 p.m. to 7.24 p.m. and Isya' from 8.12 p.m to 8.42 p.m.

As for Malaysia, a change from GMT+8 to GMT+7 would cause the prayer timing to shift one hour earlier from before. As example, for Subh from 5.44 to 4.44 a.m., for Zuhr to 12.19 p.m., Asr to 3.45 p.m., Maghrib to 6.28 p.m. and to 7:43 p.m. The area using GMT+9, namely (East) Indonesia Timur would be two hours earlier than the current timing, namely, Subh would be 2.45 a.m. instead of 4.45 a.m., Zuhr would be 9.43 a.m. instead of 11.43 a.m., Zuhr currently at 3.06 p.m. would be at 1.06 p.m., Maghrib would be 3.38 p.m. rather than 5.38 p.m. and Isya' would be 4.53 p.m. instead of 6.53 p.m.

Calculation of prayer timings from difference between East and West Malaysia

In order to see the effect of change in time zone on prayer time schedule of the Muslim society in Malaysia, prayer time is calculated based on two places of reference, namely, Tanjung Atiam, Sabah and Pulau Langkawi, Kedah. Pulau Langkawi is chosen for its westernmost location and represents the western area of Malaysia. It enables the researcher to see the difference in prayer timing between that area and Tanjung Atiam, Sabah.

Tanjung Atiam is chosen to represent the eastern area of Malaysia and to examine the difference in prayer timings between it and Pulau Langkawi in western area of Malaysia. Calculation for each place is based on GMT +8 and +7. GMT+7 is chosen as in (West) Indonesia Barat is located the Indonesian capital, Jakarta as the administrative centre of the government, and thus Indonesia has a bigger say in selecting a standard or uniform time zone for ASEAN. Calculation for each area using time zones GMT+8 and +7 is to examine the difference in prayer timings for the year 2022. For Pulau Langkawi using GMT+8, the earliest and the latest in prayer timings of the year 2022 are as follows:

Table 4
Prayer timings at Pulau Langkawi according to GMT+8

Prayer/ Timings	**Subh**	**Zuhr**	**Asr**	**Maghrib**	**Isya'**
Earliest Timing	5:50 (28/5/2022)	1:06 (29/10/2022)	4:22 (7/9/2022)	7:02 (1/11/2022)	8:13 (31/10/2022)
Latest Timing	6:29 (1/2/2022)	1:37 (3/2/2022)	4:57 (27/1/2022)	7:42 (6/7/2022)	8:58 (7/7/2022)

Source: JAKIM Waktu Solat (Prayer Timing)

For Pulau Langkawi if GMT+7 is used, the earliest and the latest prayer timings in one year (2022) would be as follows:

Table 5
Change in Prayer Timings according to GMT+7

Prayer/Timings	**Subh**	**Zuhr**	**Asr**	**Maghrib**	**Isya'**
Earliest Timing	4:50	12:06	3:22	6:02	8:13
Latest Timing	5:29	12:37	4:57	6:42	7:58

Source: JAKIM Waktu Solat (Prayer Timings)

For Tanjung Atiam using GMT+8, the earliest and the latest prayer timings are as follows:

Table 6
Prayer timings at Tanjung Atiam, Sabah

Prayer/ Timings	**Subh**	**Zuhr**	**Asr**	**Maghrib**	**Isya'**
Earliest Timing	4:39 (20/5/2022)	11:52 (29/10/2022)	3:06 (9/9/2022)	5:49 (2/11/2022)	7:01 (24/10/2022)
Latest Timing	5:13 (7/2/2022)	12:23 (4/2/2022)	3:43 (26/1/2022)	6:25 (7/7/2022)	7:40 (1/7/2022)

Source: JAKIM Waktu Solat (Prayer Timings)

Table 7 shows the earliest and latest prayer timings at Tanjung Atiam, Sabah if GMT+7 were used:

Table 7

Changes in Prayer Timings according to GMT+7

Prayer/Timings	**Subh**	**Zuhr**	**Asr**	**Maghrib**	**Isya'**
Earliest Timing	3:39	10:52	2:06	4:49	6:01
Latest Timing	4:13	11:23	2:43	5:25	6:40

Source: JAKIM Waktu Solat (Prayer Timings)

Implications of change in time zone on local time in Malaysia

The problem relating to change in local time based on time zone has indeed occurred in all countries. A time zone should not cover too broad an area, so as to cause the local time to become substantially different from what the public have been long used to (Malys et al., 2016). Practical living is mostly regulated by daylight and darkness of night. An ideal system of time calculation should align with or be parallel to the sun's daily movements (Frost, 1992). For the public, including non-Muslims, the timings of Syuruk (sunrise) and Maghrib (sunset) actually regulate human daily activities as a timeline separating daytime from night time, at once determining daily working hours (Audoin & Guinot, 2001). A time zone is created to correspond with life activities such as work, school and so on parallel to daytime compared to night time (Seigo & Seidelmann, 2017).

Countries in high latitude experience difference in length for day and night hours according to season, so these countries add hours in summer, known as Daylight Saving Time, to achieve time alignment (Roenneberg et al., 2019). The advantage of this alignment is to save energy as it reduces use of artificial lighting if working time starts when the day is bright and ends before it gets dark (Barnes & Wagner, 2009). Similarly, Muslim five-times daily prayer times are spread over a balanced division of time, and this requires to be observed in determining the time zone of a country. Is there an ideal division of time? Maybe not, but perhaps a beneficial division of time in terms of ease and well-being. Usually, a country attempts to choose a longitudinal reference based on the time of sunset at about 6.00 p.m., sunrise at about 6.00 a.m. and sun transit (local noon when sun is highest in the sky) at about 12.00 noon.

If sunrise is too early, for example, at 4.30 a.m., and sunset at 4.30 p.m., afternoon school session would end when it is already dark. Similarly, Asr prayer time would come while people are still working, and Maghrib prayer would also come before work ends. This is because office hours for the government and public in Malaysia are from about 8.00 a.m. to 5.00 p.m. So, the schedule would be very difficult or untimely for society.

A worse effect when a time zone is changed is when Muslims have to wake up at about 3.30 a.m. to pray Subh. If on average a person needs one hour to prepare and finish Subh prayer, then a significant consequence would be having to wait a long time before work starts at about 8.00 a.m. or 9.00 a.m. These are some scenarios that must be considered when drawing a broader time zone because the decision is subject to the meridian of the chosen time zone. A change of time zone before National Independence was perhaps not quite felt by the many Muslim inhabitants, especially those not commuting yo work, as their activities

were mainly agricultural, and not in business as nowadays for which standard time is important. Prayer times are usually set by the sundial or such equipment and constitute significant local time.

However, after the process of industrialisation took place, many Muslim inhabitants began working in offices or getting involved in business, thus using standard time became essential. For those working in town centres or big cities such as Kuala Lumpur, Georgetown and Johor Bahru, they usually reside in suburbs not near to the workplace. This means that they need to use public transport or their own vehicle to get to the workplace. They need to leave home earlier than 6.00 a.m. to arrive at the office or workplace before 8.00 a.m. This situation also takes into account sending the wife to work and children to the babysitter or school and avoiding traffic congestion on the road.

In big cities of Peninsular Malaysia, converting the time zone from GMT+8 to GMT+7 will cause difficulty for Muslim workers. Those who work from 8.00 a.m. to 5.00 p.m. are forced to sacrifice Maghrib prayer because they will most likely be stuck in traffic jam on the way home. If GMT+7 is used in Peninsular Malaysia, Subh prayer probably can be done at home before leaving for work as Subh is from about 4:37 a.m. to 5:08 a.m. in a year. This is 30 minutes earlier than Subh when the time zone is GMT+7.5. Prayer timing for time zone GMT+7.5 is given as comparison. This time zone was used before the year 1982 as mentioned earlier. When Malaysia first began using time zone GMT+8 in the year 1982, the issue then was that factory and office workers faced the problem of inability to pray Subh because of the factor explained earlier.

For the Muslim society in the East Coast, conversion to GMT+7 would mean that their prayer timings would be one hour earlier than the current schedule. This would cause mid-day to no longer be at about 12.00 noon, but earlier at about 11.00 a.m. This is far from the traditional division of time which sets mid-day at about 12.00 p.m. Since long ago, past astronomers had set division of time relating to Syuruk (sunrise) at about 6.00 in the morning and Ghurub (sunset) at about 6.00 in the evening. For the East Coast area, according to GMT+ 7 would mean sunset will occur between 4.47 p.m. and 5.19 p.m., Asr between 2.08 and 2.38 p.m. Daytime would be reduced too short, and this would limit social activities, recreation and sports for workers still working during office hours.

Conclusion

Research results find that there are positive and negative effects from a change in time zone in view of ASEAN countries having four different time zones. It is hoped that this research will be of benefit to all parties and increase motivation for further in-depth research. There are many fields yet to be explored in research involving time zone. Various aspects need to be comprehensively or holistically examined to see the effectiveness and understanding among nations involved in order to avoid future confusion. This is because for Muslims, the condition for prayers to be valid is absolute certainty about prayer time. Therefore, efforts by astronomers to determine the exact timing for prayers are highly praised. However, if Malaysia agrees to change its time zone to GMT+7, then new research needs to be done by taking into account that the conversion will effect change in local time to perform prayers as well as change in social activities of society in Malaysia.

Acknowledgement
This article is part of the research funded by *Geran Universiti Penyelidikan* (GUP-2020-068), Universiti Kebangsaan Malaysia.

References

Abdullah, A., Hassan, N. A., and Lyndon, N. (2019). Ethnicity at workplace: Value and culture of Malaysian Malay tradition in organization. *International Journal of Advanced and Applied Sciences* 6(11): 92-101.

Audoin, C., & Guinot, B. (2001). *The Measurement of Time - Time, Frequency and the Atomic Clock.* Cambridge: Cambridge University Press.

Barnes, C. M., & Wagner, D. T. (2009). Changing to daylight saving time cuts into sleep and increases workplace injuries. *Journal of Applied Psychology* 94(5): 1305-1317.

Bikos, K., Buckle, A., Hocken, V., & Kher, A. (2020a). Time Zone Abbreviations-Worldwide List (1995-2020). http://www.timeanddate.com/time/zones [7 March 2022].

Bikos, K., Buckle, A., Hocken, V., & Kher. A. (2020b). Time Zone in Yangon, Myammar (1995-2020). https://www.timeanddate.com/time/zone/myanmar/yangon [7 March 2022].

Frost, A. (1992). *Prinsip dan Amalan Ilmu Pelayaran*. (Terj.) Wan Ahmad Wan Omar & Zainal Ashirin Shahardin. Kuala Lumpur: Dewan Bahasa dan Pustaka.

Grigoryev, R. A. (2018). Prime meridian: Consequences for modeling financial nonsynchronous time series. *Terra Economicus* 16(3): 16-34.

Hamdan, A., Syahrin, S., Peter, W. S. O., Hailan, S., & Razi, Y. (2017). The change of Malaysian standard time: A motion and debate in the Malaysian parliament. *International Journal of Academic Research in Business and Social Sciences* 7(12): 962-971.

Islamic Finder. (2022). Prayer times in Rakhine State. https://www.islamicfinder.org/world/myanmar-burma/40992400/rakhine-state-prayer-times/?language=m [7 March 2022].

Jabatan Kemajuan Islam Malaysia. (2022). Aplikasi e-solat. http://www.e-solat.gov.my [29 January 2022].

Kementerian Agama Republik Indonesia. (2022). Bimas Islam: Jadual Solat Jakarta. https://bimasislam.kemenag.go.id/jadwalshalat [7 March 2022].

Malys, S., Seago, J. H., Pavlis, N. K., Seidelmann, P. K., & Kaplan G. H. (2017). How gravity and continuity in UT1 moved the Greenwich meridian. *Astrophysic and Space Science Proceedings* 50: 227-241.

Ratinawati, R. (2017). Rohinya Penduduk Asal Rakhine. *Berita Harian Online*. https://www.bharian.com.my/dunia/asia/2017/09/323439/rohingya-penduduk-asal-rakhine [15 March 2022].

Republik Indonesia. (1987). *Keputusan Presiden Republik Indonesia.* Pembahagian Wilayah Republik Indonesia menjadi 3 bahagian (3 Wilayah Waktu). No.41. Jakarta: Indonesia.

Roenneberg, T., Winnebeck, E. C., & Klerman, E. B. (2019). Daylight saving time and artificial time zones - A battle between biological and social times. *Frontiers in Phisiology* 10(July): 544.

Safiai, M. H., Ashari, M. Z. A. H., & Jamsari, E. A. (2021). Astrolabe alternative learning based on software and interactive application. *International Journal of Advanced and Applied Sciences* 8(6): 103-109.

Seago, J. H., & Seidelmann, P. K. (2017). Mean solar time and its connection to universal time. *Astrophysic and Space Science Proceedings* 50: 205-226.

Zerubavel, E. (1982). The standardization of time: A sociohistorical perspective. *American Journal of Sociology* 88(1): 1-23.