

# The Shape of The Earth in The Perspective of Islam and Hinduism

Jarman Arroisi\*

Universitas Darussalam Gontor  
Email: jarman@unida.gontor.ac.id

Rodhi Hakiki Bin Cecep Mustopa\*\*

Sekolah Menengah Agama Islam Darul Falah, Tawau, Sabah,  
Malaysia  
Email: rodhihakikibcm@gmail.com

Aflatun Muchtar\*

Universitas Darussalam Gontor  
Email: aflatunmuchtar@unida.gontor.ac.id

Fahman Mumtazi\*

Universitas Darussalam Gontor  
Email: fahmanmumtazi@unida.gontor.ac.id

Imroatul Istiqamah\*

Universitas Darussalam Gontor  
Email: imroatul.istiqomah@unida.gontor.ac.id

## Abstract

This research intends to know the shape of the earth through the perspective of Islam and Hinduism. With descriptive, analysis and comparative methods, the researcher produced three important conclusions. Firstly, the two scriptures agreed that the phenomenon

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\* Kampus Pusat UNIDA Gontor, Jl. Raya Siman Km. 06, Demangan, Siman, Ponorogo, 63471, Jawa Timur. Telp. (+62352) 483762

\*\* Sekolah Rendah & Menengah Agama Islam Darul Falah, Kampung Tanjung Batu Darat, Jalan Utara Baru, Peti Surat 1070, 91008, Tawau, Sabah, Malaysia, Tawau, Malaysia

of day and night is caused by sunlight. Rationally this phenomenon will not happen except by the globe earth. Secondly, in the perspective of Islam, it is not mentioned clearly about the shape of the earth but differs in the perspective of Hinduism which mentioned it clearly. This matter causes different views and interpretations. Thirdly, Al-Biruni that represent the Muslim scholar and Aryabhata represent Hindu, in study the shape of the earth, the both did their research by using the concept of a globe earth and the results were still in use today. Knowing more details, the research on the shape of the earth becomes very interesting.

**Keywords:** The Shape, The Earth, Globe, Flat, Islam, Hinduism

### Abstrak

Penelitian ini bertujuan untuk mengetahui bentuk bumi melalui perspektif Islam dan Hindu. Dengan metode deskriptif analisis dan komparatif, penelitian ini menghasilkan tiga kesimpulan penting. Pertama, kedua kitab suci sepakat bahwa fenomena siang dan malam disebabkan oleh cahaya matahari. Secara rasional fenomena ini tidak akan terjadi melainkan bumi berbentuk bulat. Kedua, dalam perspektif Islam tidak disebutkan dengan jelas tentang bentuk bumi tapi berbeda dalam perspektif Hindu yang menyebutnya secara jelas. Hal ini yang menyebabkan adanya perbedaan pandangan dan penafsiran. Ketiga, baik ilmuwan Muslim yang diwakili oleh Al-Biruni dan ilmuwan Hindu yang diwakili oleh Aryabhata, keduanya melakukan penelitian dengan menggunakan konsep bumi bulat dan hasilnya masih digunakan sampai saat ini. Mengetahui lebih detail, penelitian tentang bentuk bumi ini menjadi sangat menarik.

**Kata Kunci:** Bentuk, Bumi, Bulat, Datar, Islam, Hinduisme

### Introduction

Since in the school age, the writer has been taught and learnt about the earth is a large ball that spinning over 1,000 miles per hour in the space, circulating at 67,000 miles per hour around the sun in its orbit, with the entire solar system spiralling 500,000 miles per hour around the Milky Way, swaying and tilted 23.5 degrees on its vertical

axis, and careening at 670,000,000 miles per hour across the universe away from the “Big Bang”.<sup>1</sup> Those are recognized as heliocentric theory<sup>2</sup> by Nicolaus Copernicus in the 16<sup>th</sup> century<sup>3</sup>, who said that the earth surrounds the sun that indicates the shape of earth is globe. This theory was corroborated by Johannes Kepler in the next century which supported by using the Galileo Galilei’s telescope.<sup>4</sup> It was taught at all levels of education around the world. This taught is undeniable almost 500 years beginning with the emergence of the Western Renaissance in the 15<sup>th</sup> century.<sup>5</sup>

On November 15<sup>th</sup>, 2015, the flat earth issue has become a trending topic in the world. The world is overwhelmed by the discovery of facts and evidences which the shape of the earth is not globe but it is flat. Around July 2016, this issue has been grown by Boss Darling “Flat Earth 101” videos.<sup>6</sup> Then, Eric Dubay’s The Flat Earth Conspiracy book presents 27 titles which published in Indonesia by translation in early November 2016.<sup>7</sup> Actually, this issue started by a British inventor, Samuel Rowbotham (1816-1884) with his “*Zetetic Astronomy: Earth Not a Globe*” that published on 1865. According to the Rowbotham “*Zetetic Astronomy*”, the earth is a flat disk centred in the Arctic and surrounded by an Antarctic ice wall. While the sun and moon are about 4,800 km (3,000 miles) and the cosmos is 5,000 km (3,100 miles) above the earth.<sup>8</sup> Actually, it has been taught for centuries by the doctrines of the Catholic Church<sup>9</sup> and ancient civilizations as the geocentric theory. They believed that

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<sup>1</sup> Eric Dubay, *The Flat-Earth Conspiracy*. Translated by Indirani G., (Without place: Bumi Media, 2017), p. 7

<sup>2</sup> Earth is one of the eight planets in the solar system. The rest of the planet is thought to be like a giant gas ball which similar to the earth. The distance with the earth is millions of miles apart. The earth along with seven other planets circulate on a circular path around the Sun. See: J. Ardian, et. al. *Benarkah Bumi itu Datar?*, (Yogyakarta: Narasi, 2017), p. 102

<sup>3</sup> Rahmat Abdullah, *Benarkah Bumi Datar?*, (Karanganyar: Natural, 2017), p. 92

<sup>4</sup> Heliocentrism, accessed from <https://en.wikipedia.org/wiki/Heliocentrism> on August 20<sup>th</sup>, 2017 at 20.10

<sup>5</sup> Rahmat Abdullah, *Benarkah...*, p. 90

<sup>6</sup> *Ibid.*, p. 108

<sup>7</sup> Eric Dubay, *The Flat-Earth...*, p. 2-4

<sup>8</sup> Rahmat Abdullah, *Benarkah...*, p. 99

<sup>9</sup> *Ibid.*, p. 91

the earth is flat, immobile centre of the universe around which heavens revolved daily cycle in perfect circles.<sup>10</sup>

This flat earth issue raises several problems. The writer describes the problems to three different sides; in education, social and religion. From the educational side, it creates the intellectual generation of anti-science.<sup>11</sup> This generation of anti-science has a major impact on the development of science and has big potential of retarded nation. The next is from the social side, the commotion among flat group and globe group which not only cause division, but also can be life-threatening as happened in Nigeria. The extreme group of Boko Haram<sup>12</sup> (follower of flat-earth understanding) is eyeing and has killed 600 teachers since 2009 because of contradict view of the shape of the earth. About 19,000 teachers left their jobs because of threats and attacks.<sup>13</sup> While from the religious side, the majority of human beings still cling to the religion. This issue raises doubts in religion teaches in holy book about the science and which also affects to the *aqidah* and faith problem.<sup>14</sup> This form a belief system and able to become its own religion. In addition, this issue has big potential to create the new atheists which anti-religious and anti-science.

Hereby, the writer only focuses on the religious side by looking at the comparison between two religious variables, Islam and Hinduism. The writer chooses Islam and Hinduism because these two religions are the massive religion in the world and the different types. Islam is *Samawi* religion and Hinduism is *Thabi'y* religion. These two religions have spoken about the earth and also the science.

## The Shape of the Earth in the Perspective of Islam

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<sup>10</sup> Eric Dubay, *The Flat-Earth...*, p. 10

<sup>11</sup> **Anti-science** is a group of repellent science and scientific methods. They do not accept that science is an objective method of seeing an event.

<sup>12</sup> **Boko Haram** is a militant and terrorist organization based in north eastern Nigeria, northern Cameroon and Niger which founded in 2002 by Mohammed Yusuf with the purpose of establishing a "pure" Islamic state based on sharia law and stopping what is considered "Westernization".

<sup>13</sup> Alexander Lumbantobing, "*8 Kisah Orang yang Percaya Bumi itu Datar*". Accessed from <http://global.liputan6.com/read/2535342/8-kisah-orang-yang-percaya-bumi-itu-datar> on October 7<sup>th</sup>, 2017 at 15.15

<sup>14</sup> Rahmat Abdullah, *Benarkah...*, p. 98-99

In discussing the shape of the earth in the perspective of Islam, the writer sees from the main guide of Muslims, that is the holy book Qur'an and the Hadith. The Qur'an is the main source of Islamic teachings that every Muslim should be believed all of its text and contexts without exception. While the Hadith is the second source after the Qur'an which became the torch of the contents in the Qur'an through the words, acts, decisions of the Prophet Muhammad (pbuh). These both guide the lives of Muslims in this world.

In the Qur'an, the word *al-Ardh* (earth) is mentioned about 361 times and there are at least 461 *kauniyah* verses which talk about the earth.<sup>15</sup> Among the verses that represent the shape of the earth is in chapter az-Zumar verse number five;

"He created the heavens and the earth in truth. He wraps the night over the day and wraps the day over the night and has subjected the sun and the moon, each running (its course) for a specified term. Unquestionably, He is the Exalted in Might, the Perpetual Forgiver."<sup>16</sup>

Quraish Shihab in his Tafsir al-Misbah said, *yukawwiru* is taken from the word *kawwara*, which means surrounds something and collects it, like wrapping a turban on the head. It is understood also in the sense of "to cover an object upon another thing in a row". This word signals that the earth is a globe and always rotates. If only the earth is not a globe, the word was not used and certainly day and night in a place could be seen at the same time. If the earth were flat, the expression of *at-Takwir* in this verse would be inappropriate to use.

Through this *tafsir*, the real facts experienced by all human beings that day occurs in a hemisphere because the earth is exposed to sun shine. When the sun is not exposed, it will be the night. If the shape of the earth is not a globe, then the whole plain of the earth will be through the noon caused by the sunlight. This verse that described about the turn of the day and night is mentioned in Surah Luqman (31) verse 29.

"Do you not see that Allah causes the night to enter the day and causes the day to enter the night and has subjected the sun and the

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<sup>15</sup> *Ibid.*, p. 37

<sup>16</sup> The Qur'an, az-Zumar [39]:5

moon, each running (its course) for a specified term, and that Allah, with whatever you do, is Acquainted."<sup>17</sup>

Another verse that proves the shape of the earth is globe is in the chapter al-Furqan verse number 45 to 46 that relating to the shadows; "Have you not considered your Lord – how He extends the shadow, and if He willed, He could have made it stationary? Then We made the sun it an indication. Then We hold it in hand for a brief grasp."<sup>18</sup> Quraish Shihab explained that the long and short that occur in the shadow indicates the process of the rotation of the earth in a sloping position either on its axis or around the sun. If the two processes of the rotation are absent, the shadows will be idle because the sun only illuminates one of the earth's side, while the other half will be dark and night all year long. As the result, the balance of the air temperature becomes damaged and life becomes impossible. Furthermore, it can also occur when the tempo of motion of the earth on its axis (rotation) is directly proportional to the tempo of the motion around the sun (revolution).<sup>19</sup>

Here can be understood, the shadow of an object can occur because of the nature of light that propagates straight up to the object. As the result, the exact back of an object that is not exposed to the sunlight will be dark while the exposure to the sun shine will be bright to form a shadow.<sup>20</sup> Therefore, the movement of the sun according to observers on earth as an absolute frame of reference that lengthens and shortens the shadow.

Nevertheless, it cannot be denied that the occurrence of the differences of opinion on the shape of the earth, one of which is due to the differences in interpretation. Some of the often highlighted verses that say the earth is flat are; al-Baqarah (2):22, al-Kahfi (18):47, al-Hijr (15):19, Qaf (50):7, adz-Dzariyat (51):48, an-Naba' (78):6, an-Nazi'at (79):30, asy-Syams (91):6, al-Ghasyiyah (88):20 and an-Nuh

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<sup>17</sup> The Qur'an, Luqman [31]:29

<sup>18</sup> The Qur'an, al-Furqan [25]:45-46

<sup>19</sup> M. Quraish Shihab, *Tafsir al-Misbah*. Vol. 9, (Jakarta: Lentera Hati, 2009). p. 100-101

<sup>20</sup> The Greek scientist, Eratosthenes (276-195 BC), the first person to accurately determine the shape and the measure of the earth by using the shadow. See J. Ardian, et. al., *Benarkah Bumi itu Datar?* (Yogyakarta: Narasi, 2017), p. 9-10

(71): 19 "And Allah has made for you the earth an expanse (overlay)"<sup>21</sup> which mentions an overlay that is interpreted as flat.

According to Quraish Shihab as in the chapter of Nuh verse 19, the earth was made overlay as the mean of providing convenience and comfort that can be achieved from it. That the earth was made overlay does not mean it was created flat. The flatness of the earth is not contrary to its creation in the shape of the earth is globe or round or oval. Wherever man walks on this earth, he will look at the earth and find it overlay, though it is essentially globe. The word *ja'ala* is used by the Qur'an to emphasize the benefits that can derive from something that is made. In contrast to the word *khalaqa*, which emphasis is on the power of God created and the greatness of creation.<sup>22</sup>

In another interpreted as in in *Tafsir Jalalain*<sup>23</sup> in the chapter Ghasyiyah verse 20, "and at the earth – how it is spread out (overlay)"<sup>24</sup> said,

"أي بسطت، فيستدلون بها على قدرة الله تعالى ووحدانيته،  
وصدرت بالإبل لأنهم أشد ملابسة لها من غيرها، وقوله: سطحت  
ظاهر في أن الأرض سطح، وعليه علماء الشرع، لا كرة كما قاله  
أهل الهيئة وإن لم ينقض ركنا من أركان الشرع."<sup>25</sup>

The words above mean, "To think about the power and the oneness of God, like a camel because it has advantages over the others, and the word "overlay" is in accordance with the opinion of the scholars

<sup>21</sup> The Qur'an, Nuh [71]:19

<sup>22</sup> M. Quraish Shihab, *Tafsir...*, Vol. 14, p. 354

<sup>23</sup> **Tafsir Jalalain** is one of the most significant tafsirs for the study of the Qur'an. Composed by the two "Jalals", Jalal al-Din al-Mahalli (d. 864 ah / 1459 ce) and his pupil Jalal al-Din al-Suyuti (d. 911 ah / 1505 ce). It is generally regarded as one of the most easily accessible works of Qur'anic exegesis because of its simple style and one volume length.

<sup>24</sup> The Qur'an, Ghasyiyah [88]:20

<sup>25</sup> Abdul Qadir an-Naut, *Al-Qur'an al-Karim wa Bihamishihi Tafsir Imamaini Jaliiliin*, (Without District: Dar Ibn Katsir, 1407H), p. 593

that the earth is spreadout, not globe as they said and also not break any pillar of the *Shari'a* pillars”.

The above interpretation explains that the earth is flat in accordance with the mean spread out or overlay. This issue has mentioned by Rahmat Abdullah in his book “Benarkah Bumi Datar?”, he wrote,

“*Tafsir Jalalain* interpreted clearly the verse of the earth '*sutihat*' that denotes the earth '*sathiyah*'. The meaning of '*sutihat*' outwardly shows that the earth is flat and is explained by the scholars, not globe as told by the astronomers.”<sup>26</sup>

Another great scholar, Dr. Zakir Naik is an Islamic figure who is considered representative in conveying the teachings of Islam. He interpreted the Qur'an, an-Naazi'at (79):30, “And after that He spread the earth.”<sup>27</sup> He said that the actual shape of the earth is not really round or globe, but its shape is more like the shape of an egg. The word in Arabic '*dahaha*' which means "spread" means ostrich egg. So the shape of the earth actually resembles an ostrich egg (geospherical).<sup>28</sup>

While in the hadith, there are said implicitly about the shape of the earth. As example that indicates the leaving of the sun. Rasulullah (pbuh) once asked about where the loss of the sky objects that set and from where it rises? He replied, “It sets and rises to another people. It sets and rises to a people (and at the same time) one people declare it sets, while others say it is rising”.<sup>29</sup> The term used is the people, that is, humans who are certain parts of the earth. Can be interpreted, that the sun rises and sets. If the sun rises, some other parts will feel the absence of the sun that clearly shows the earth is a globe.

Another hadith which said about the sun is from Abu Dzar R.A that one day Prophet (pbuh) said,

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<sup>26</sup> Rahmat Abdullah, *Benarkah...*, p. 32

<sup>27</sup> The Qur'an, an-Naazi'at [79]:30

<sup>28</sup> Ramadhani, et. al., *al-Qur'an vs Sains Modern menurut Dr. Zakir Naik*, (Yogyakarta: Sketsa, 2017), p. iv

<sup>29</sup> From Ibnu 'Abbas, narrated in *Musnad Imam Abi Ishaq al-Hamdani*. See Ahmad Azzan and Iman Saifullah, *Studi Ilmu Falak: Cara Mudah Belajar Ilmu Falak*, (Tangerang: Pustaka Aufa Media, 2013), p. 42-43



“Do you know where is the sun going?”. They said: “Allah and His Prophet know better”. He said: “Verily the sun runs so that it reaches its circulation below ‘Arsy, then it prostrated. It was always like that so it was said to him: “Get up! Come back as before you came”. So it came back and rises from its rising place, then it walks up to its circulation beneath Arsy, then it prostrates. It was always like that so He said to him: “Get up! Come back as you came”. So it came back and rose from its rising place, then walked while the man did not think it strange at all from it to get the place of its circulation under the Arsy, then He told him: “Get up! Rise from the west”. So it came out from the west. Rasulullah (pbuh) said: “Do you know when it happened? It happens when there is no longer a person’s faith in himself that he/she has not faith before or he/she has not strived for good in their faith.”<sup>30</sup>

This hadith is not only shown about the globe earth, but also explains about the sun that surrounds the earth by the word of the sun runs. It is understood that this hadith supports the geocentric concept that the earth as the center of the solar system and the sun that surrounds the earth. Although this hadith is still debatable about the real meaning of the sun runs.

To reinforce the perspective of Islam, the famous Muslim scientist, Abu Raihan Muhammad bin Ahmad al-Biruni or known as al-Biruni, he is a prominent Muslim scientist who has researched and studied various types of science including astronomy. His study of the Qur'an is what brought him to unlimited study the more knowledge of Allah SWT. His scientific expertise cannot be denied because all based on the Qur'an and the Hadith. He also became an early Islamic scientist who interprets the Qur'an in a scientific comparison of natural events. Through this science, born various of sciences such as geology, geography, astronomy and so on about nature.

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<sup>30</sup> The hadith narrated by Bukhari 4802,3199,7424,7433, Muslim 159, Ath-Thayyalisi in his Musnad 460, Ahmad in his Musnad 5/145,152,165,177, Abu Dawud 4002, Tirmidzi 3227, Nasa'i in Sunan Kubra 11430, Al-Baghawi in Syarh Sunnah 4292, 4293, and etc. It is entirely from the path of Ibrahim bin Yazid at-Taimi from his father Abu Dzar. Rahmat Abdullah, *Benarkah Bumi...*, p. 31

In his monumental work of *al-Qanun al-Mas'udi* (The Canon of Mas'udi)<sup>31</sup> in 1030 CE, a complete encyclopedia covering the knowledge of mathematics, astronomy, and calendar. He has explained in detail in his book in *maqala* VIII chapter XIII, entitled "Time of Rising and Setting of Twilight". He described the process of night time in accordance with the fact of the earth is globe like a ball, the sunlight will only shine on some of the earth's surface, and some will be covered by shadows. This process causes the day and night. While the earth is shaped like a ball, the dark shadows that occur will be cone in shape. This phenomenon for the Muslim is an urgent thing, because the observation of the dawn and twilight is useful for determining the end time of the *maghrib* prayer, the beginning of the *isya'* prayer, and the beginning of the *subuh* prayer. These three times of prayer are closely related to observation of the phenomenon of dawn and twilight.<sup>32</sup>

In the *maqala* V chapter VII, al-Biruni deals with the dimensions of the earth's globe. He calculated the height of the peak of a mountain in the neighbourhood plain and ascertaining in the sight the declination of the horizon from the same point. He found the length of a degree to consist of a little more than 56 arabian miles. He also measured the area of the earth's surface, and its volume and weight in gold.<sup>33</sup> In his experiment, he measured the earth by using the concept of the earth's globe.

The astronomical geography in the *maqala* IV chapter VIII, al-Biruni deals with the theories of latitudes and longitudes with their applications in determining times in day and night and fixing the positions on the earth's globe. Here, he mentioned that he had an

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<sup>31</sup> Al-Biruni wrote *Al-Qanun al-Mas'udi* in 1030 AD / 421 AH, and for 900 years thereafter, has never been published. In 1954, *Al-Qanun al-Mas'udi* had been published by Dairatul Maarif al-Osmania (Osmania Oriental Publications Bureau) Hyderabad-Dn, under the auspices of The Ministry of Education by The Government of India. See Abu Rayhan Muhammad B. Ahmad al-Biruni, *al-Qanunu'l-Mas'udi (Canon Masudicus): an Encyclopaedia of Astronomical Sciences*, (India: The Dairatu'l-Ma'arif-il-Osmania, 1954).

<sup>32</sup> Nugroho Eko Atmanto, "Relevansi Konsep Fajar dan Senja dalam Kitab *al-Qanun al-Mas'udi* bagi Penetapan Waktu Salat *Isya'* dan *Subuh*", *Jurnal Analisa*. Volume 19, No. 01, January - June 2012, Balai Penelitian dan Pengembangan Agama Semarang, p. 99-100

<sup>33</sup> Abu Rayhan Muhammad B. Ahmad al-Biruni, *al-Qanunu...*, p. 31

idea of compiling a geography, combining the features of the Samanid Minister al-Jaihani's work (now lost), describing the various countries and illustrating them by maps, and other kind of books on the routes and distances of important places meant for the benefit of the state and the travelers.<sup>34</sup>

In his study of the globe earth, al-Biruni grounded his territorial mapping of the globe of the earth that was recognized as the science of Cartography<sup>35</sup>. This science aims to determine the position of *qibla* correctly. He started by drawing the latitude and longitude of the earth by making Mecca as the reference. The term *Khath al-Istiwa* (Khatulistiwa) which means "the line that divides the two globe of the earth" has been translated into Western language into 'equator'. The localized coordinate system based on the line is used to determine the angle of the center of the earth for the purposes of estimating calendar and *qibla*. The study coordinates the earth forwarded by the famous geographer, al-Idrisi. Al-Idrisi drew the world's first map on the silver globe for Roger III, King Sicily who was keenly interested in Muslim shipping in the 12<sup>th</sup> century. The globe became the European reference for 350 years. Christopher Columbus has also used this globe map for his voyage. Evidence that the earth has gravity through tidal events of seawater. The study was conducted by al-Biruni at Somnath city in India and found that tidal water has a link with the gravitational pull of the moon and the earth.<sup>36</sup>

Thus, by referring to the Qur'an and Hadith as well as the views of mufasssir and other Muslim scholars who explain that the phenomenon of day and night is a sign that the earth is round. So the Islamic perspective on the shape of the earth is not flat, but globe.

### The Shape of the Earth in the Perspective of Hinduism

Hinduism is one of the oldest religion in the world. The contribution in the development of civilization is also undeniable.

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<sup>34</sup> *Ibid.*, p. 28

<sup>35</sup> **Cartography** is the study and practice of making maps. Combining science, aesthetics, and technique, cartography builds on the premise that reality can be modeled in ways that communicate spatial information effectively.

<sup>36</sup> Zul Hilmei, *Fakta Saintifik Surah Yasin*. (Selangor: Must Read Sdn. Bhd. 2017). p. 197

Hinduism has many holy scriptures and two of them, the Vedas and the Puranas which some verses in them related to the shape of the earth.

In the Yajurveda is one of the Vedas that said implicitly about the earth which describes the shape of the earth, moreover in the globe shape. In Yajurveda III.6 mentioned "This freckled earth exists and spins in the sky like a mother. It walks around the sun like a father."<sup>37</sup> The earth spins on its axis and surrounds the sun. This is similar to the concept of heliocentric which states that the sun as the center of the solar system. The earth exists and spins on its axis and surrounds the sun, as been thought in the modern science theory. So, this verse is not contrary to the modern science.

Another verse in the same holy book, is also mentioned the spinning and the rotation of the earth. In Yajurveda XX.23, "Earth, sun and dawn (beginning) spins (rotates)".<sup>38</sup> This verse mentioned about the word 'spin' or 'rotates' that bring the meaning "turn or cause to turn or whirl round quickly" or "move or cause to move in a circle round an axis or centre". The shape of the thing that spin or rotate, its almost probably logic in round, circle or globe in shape.

The verse above is reinforced by the another verse in Veda book in Atharvaveda XII.1.37, "The earth moves rotation and translation".<sup>39</sup> According to this verse, the spinning of the earth and its surrounding of the sun is definitely globe in shape and it is impossible to form flat. As the concept of the flat earth, it is using the geocentric system that states the earth as the center of the solar system.<sup>40</sup> The movement of the earth in its axis or its circulation gives a clear impact on earth's life. It creates a right calculation of second, minute, hour, day, week, month and year.

To prove the verse above, in another verse from the same book written, in Atharvaveda XIII.3.8 mentioned, "One month consist of 30 noons and 30 nights".<sup>41</sup> This verse explains that in a month consists of 30 days consisting of 30 noons and 30 nights of the

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<sup>37</sup> Yajurveda III.6

<sup>38</sup> Yajurveda XX.23

<sup>39</sup> Atharvaveda XII.1.37

<sup>40</sup> The flat earthers believed that the earth as the center of the solar system or as known as Geocentric. See Eric Dubay, *The Flat-Earth...*, p. 127-136

<sup>41</sup> Atharvaveda XIII.3.8

average count which it is not contrary to the concept of rotation and circulation of the earth according to the modern science. The average of days in a modern science is 30.

For giving more prove in the Hinduism perspective of the shape of the earth, in the Atharveveda XIII.2.32 mentioned about the phenomena of day and night, "Day and night are due to the sun".<sup>42</sup> The phenomena of day and night are caused by the rising and setting sun. According to this verse, when the sun shine on the half earth's surface, it will become day and the another side which absence if the sun shine will be night. However, it can be debatable because the concept of the flat earth does not deny the phenomena of day and night is caused by the sun shine. It's just a different view of the sun's perspective.<sup>43</sup> As human being, this phenomena is more logically as has been taught in modern science, when the sun shines the half of the earth, the other half will be dark or night and vice versa.

While in the Purana, mentioned in chapter three verse three, that the earth rounded like a wheel of car; "Having gone round the earth, resembling the wheel of a car, abounding in cities, seas, and great rivers, those high-minded ones, not born of any female, with their minds and bodies exhausted, returned to the hermitage."<sup>44</sup> Through this verse, written of Markandeya word the round of the earth like the wheel of the car. It showed implicitly about the shape of the earth in round shape. There is no another shape that suitable to be use as the wheel of the car except round or globe for the earth.

Another verse from this book, mentioned in the chapter 54 verse 12, that described the shape of the earth; "All the six Kula mountains enter into the womb of the ocean; and the earth here is sloping towards the south and north, and at the middle it is raised to great heights."<sup>45</sup> This verse stated that the earth is flatter at its poles and swells in its equator, so it is not completely globe. It means the shape of the earth is not completely globe but it is more like an egg.

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<sup>42</sup> Atharvaveda XIII.2.32

<sup>43</sup> See, J. Ardian, et. al., *Benarkah Bumi...*, p. 70-72. See also Eric Dubay, *The Flat-Earth...*, p. 159-177

<sup>44</sup> Manmatha Nath Dutt, *A Prose English Translation of Markandeya Puranam*, (Calcutta: H. C. Dass, 1896), p. 8

<sup>45</sup> *Ibid.*, p. 103

According to this verse, it is exactly globe even it is not perfect globe in shape.

The next in the Markadeya Purana chapter 92 that clearly mentioned the shape of the earth as below;

“O King! the divine goddess was repeatedly incarnated to preserve the world, she shackles and creates the universe. She gives knowledge, pleasure, intellect. O sovereign of mortals, she pervades throughout the globe of Brahma. Maha-Kali in the form of a great goddess, the high illusion, the ancient, creates the world occasionally. And promotes wealth in the lives of the people in future period; where she is not present their misfortunes cause ruin. Whoever praises and worships her with flowers, sandal, incense, and so forth, she gives them prosperity, offspring, virtues, & etc.”<sup>46</sup>

Through this verse, the goddess created the universe including the earth throughout the globe of Brahma. It means this universe and also the earth is under the power of Brahma. The word ‘globe’ gives meaning the earth was created globe in shape and the circle of power of Brahma.

Hinduism also has some prominent scientists who are not less influential in the scientific world that emerged in the 5<sup>th</sup> century. Aryabhata is one of the acknowledged intelligent astronomers of early India and he was the first of the major mathematician-astronomers from the classical age of Indian mathematics and astronomy. There are three works of him which extant in several manuscripts, they are *Aryabhatiya*, *Arya-Siddhanta* and *al-Ntf or al-Nanf*. Abu Raihan al-Biruni used some of his excerpts and quotes. Al-Biruni said that on all other excerpts from Aryabhata’s work, “All I know of him I know through the quotations from him given by Brahmagupta”<sup>47</sup>.

Here, the writer will describe more in his thought in his *Aryabhatiya*, a Sanskrit astronomical treatise. The *Aryabhatiya* is divided into four sections which contain in all only 123 verses. In the fourth section that presented Gola “The Sphere”, many verses

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<sup>46</sup> *Ibid.*, p. 153

<sup>47</sup> S. M. Razaullah Ansari, *Aryabhata I, His Life and His Contributions*, Physics Department, Aligarh Muslim University, Aligarh. p. 10

written clearly the globe of the earth with the 'sphere' word. As in the verses five to eight;

5. "Half of the spheres of the earth, the planets, and the asterisms is darkened by their shadows, and half, being turned toward the sun, is light (being small or large) according to their size". 6. "The sphere of the earth, being quite round, situated in the center of space, in the middle of the circle of asteriums, surrounded by the orbits of the planets, consists of water, earth, fire, and air". 7. "Just as a ball formed by a Kadamba flower is surrounded on all sides by blossoms just so the earth is surrounded on all sides by all creature terrestrial and aquatic". 8. "During a day of Brahman the sphere of the earth increases a *yojana* in size all around. During a night of Brahman, which is equal in length to a day of Brahman, there is a decrease by the same amount of the earth which has been increased by earth". 9. "As a man in a boat going forward sees the stationary object moving backward just so at Lanka a man sees the stationary asterisms moving backward (westward) in a straight line".<sup>48</sup>

Aryabhata clearly identifies in the verse nine of *Aryabhatiya* that the apparent motion of fixed stars (asterisms)<sup>49</sup> with that of stationary objects for an observer in a moving boat. According to this verse, he believed in a clear geocentric view by the evident from his other verses in III-15, "Beneath the asterisms are Saturn, Jupiter, Mars, the Sun, Venus, Mercury, and the Moon, and beneath these is the earth situated in the center of space like hitching-post."<sup>50</sup> and IV-6 mentioned "The sphere of the earth, being quite round, situated in the center of space, in the middle of the circle of asterisms, surrounded by the orbits of the planets, consists of water, earth, fire, and air."<sup>51</sup> which the earth is situated in the center of space, surrounded by the orbits of the planets and his order of the celestial bodies being.<sup>52</sup>

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<sup>48</sup> *Ibid.*, p. 64

<sup>49</sup> **Asterism** is a prominent pattern or group of stars, typically having a popular name but smaller than a constellation.

<sup>50</sup> Walter Eugene Clark, *The Aryabhatiya of Aryabhata (An Ancient Work on Mathematics and Astronomy)*. Translated with Notes. (Illinois: The University of Chicago Press, 1930). p. 56

<sup>51</sup> *Ibid.*, p. 64

<sup>52</sup> S. M. Razaullah Ansari, *Aryabhata I...*, p. 12

Indian astronomy, in general, maintains that the earth is stationary and that the heavenly bodies revolve about it, but there is evidence in the *aryabhatiya* itself and in the accounts of Aryabhata given by latter writers to prove that Aryabhata maintained that the earth, which is situated in the center of space, revolves on its axis and that the asterisms are stationary.<sup>53</sup>

### Analysis on the Shape of the Earth in the Perspective of Islam and Hinduism

The similarities through the both scriptures, the phenomena of day and night is based on the human experience and it's not contradict with the modern science. As mentioned in the Qur'an, az-Zumar (39):5 and Atharvaveda XII.1.37, XII.2.32. These verses explain the occurrence of day and night phenomena caused by the sunshine. If some part of the earth is exposed to the sunshine, then that part will be the day, while the part that doesn't expose to the sunshine, then it will be the night. This phenomenon will be only able to apply when the shape of the earth is a globe.

Then, the other is the concept of the solar system. In al-Qur'an, al-Furqan (25):45-46, Yajurveda III.6, XX.23 and Atharvaveda XIII.3.8 which mentions the rotation of the earth in its axis and the circulation of the earth around the sun. These verses indicate that the sun is the center of the solar system and the circulates around the sun as grounded by Nicolaus Copernicus, the heliocentric concept. The short and length of the shadow are due to the rotation and circulation of the earth which the most suitable shape of the earth to spin and circulate is a globe.

The actual shape of the earth is not really round or globe, but its shape is in the shape of an egg. It is mentioned in Markandeya Purana 54.12 and in the Qur'an, an-Naazi'at (79):30 which is explained by Dr. Zakir Naik that mentions the shape of the earth resembles an ostrich egg (geo-spherical).

According to the two scientists, al-Biruni and Aryabhata, the earth is a globe. Al-Biruni is clearly mentioned in his book *al-Qanun al-Mas'udi* whose did experiment entirely uses the concept of the globe earth. In maqala VIII chapter XIII "Time rising and setting of

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<sup>53</sup> Walter Eugene Clark, *The Aryabhatiya of...*, p. xiv



twilight" is described with the fact of the earth is globe like a ball. He deals with the dimensions of the earth's globe in maqala V chapter VII. Next, in maqala IV chapter VIII, he deals with the theories of latitudes and longitudes with their applications in determining times in day and night and fixing the positions on the earth's globe. Furthermore, he grounded the territorial mapping of the globe earth as the science of Cartography and determining the position of *qibla* and also estimating the calendar.

While Arybahata in his book of *Aryabhatiya*, clearly mentioned the earth with the 'sphere' shape or known as globe written in the section IV *Gola* "The Sphere" verse 5-8. In section IV verse 9 he mentioned the apparent motion of fixed star (asterisms) with the stationary objects for an observer in a moving boat. He believed in geocentric theory as mentioned in Section III verse 15 & section IV verse 6, the earth situated in the center of space, surrounded by the orbits of the planets and his order of the celestial bodies being. The last, Indian astronomy in general maintains that the earth is stationary and the heavenly bodies revolve about it which situated in the center of the space, revolves on its axis and the asterisms are stationary. As for the info, some of al-Biruni works inspired and taken from Arybahata work.

The differences between the shape of the earth in the perspective of Islam and Hinduism are as mentioned clearly in Markandeya Purana 3.3, 54.12 and 92 that the earth is globe and in the Qur'an is not mentioned clearly or implicitly. Therefore, in Islam, there are the differences opinion and interpretation of the shape of the earth. This is not happening in Hinduism.

Another difference is the solar system in which both religions have differences view about it. According to the writer's analysis, the Qur'an is more inclined to the concept of heliocentric, while the hadith mentioned about the sun surrounding the earth which means geocentric and scientist as al-Biruni in his study using the heliocentric concept. In Hinduism, the scriptures clearly mention the earth surrounds the sun which means the concept of heliocentric. But the Hindu scientist Aryabhata in the section three verse fifteen and section four verse six, he used the concept geocentric. Although, not all Hindu scientists agree on the results of Aryabhata's idea which

using the geocentric concept.

## Conclusion

As the conclusion, the perspective of Islam sees from the main source of the teachings, from the Qur'an and the Hadith. The writer uses *Tafsir al-Misbah* by Quraish Shihab. In the Qur'an az-Zumar (39):5 is mentioned about the phenomenon of day and night that caused by the sun. Some part of the earth's surface when exposed to the sunshine will be the day and when the absence of the sunshine will be the night. This is impossible if the earth is flat. Then it reinforced by al-Furqan (25):45-46 about the shadows that show the process of the spinning and rotating of the earth. The occurrence of the differences of opinion on the shape of the earth is because the Qur'an only mentioned implicitly. The verses that use the word 'overlay' are interpreted as flat as in (2):22, al-Kahfi (18):47, al-Ghasiyah (88):20, al-Hijr (15):19, Qaf (50):7, adz-Dzariyat (51):48, an-Naba' (78):6, an-Nazi'at (79):30, asy-Syams (91):6 and an-Nuh (71):19. According to Quraish Shihab, the meaning of 'overlay' does not mean that the earth is flat but the earth's plain is not contrary to the creation of the globe earth. In the *Tafsir Jalalain* came with the difference perspective, the word 'overlay' is in accordance with the opinion of the scholars that the earth is spread out, not globe as the astronomers said. Another great scholar, Dr. Zakir Naik interpreted the Qur'an chapter an-Naazi'at (79):30 that the actual shape of the earth is not really globe, but its more like the shape of an ostrich egg (geo-spherical). While in the Hadith from Ibnu Abbas mentioned about the sunrise and the sunset that can be interpreted, if the sun rises, some other parts will feel the absence of the sun that shows the earth is globe. Another hadith from Abu Dzar explained about the sun that surrounds by the earth which can be understood as the geocentric. Although this hadith inclined to geocentric but it is not doubting the globe earth. According to the Muslim scientist, Abu Raihan ibn Ahmad al-Biruni in his book *al-Qanun al-Mas'udi*. Described the sunrise and the sunset to determine the time of *maghrib*, *isya'* and *subuh*. In addition, he also measured the surface of the earth with its volume and weight using the theory of the globe earth. He deals with the theories of latitudes and longitudes with their applications in determining times in day and night and fixing

the positions on the earth's globe. He also created the round earth map (Cartography) that used for voyage.

In the perspective of Hinduism, according to its sacred book, it mentioned that the earth spinning on its axis and circulating around the sun as written in Yajurveda III.6, XX.23 and Atharvaveda XII.1.37. The phenomenon of day and night caused by the sun is mentioned in Atharvaveda XIII.2.32. In addition, in Atharvaveda XIII.3.8 is mentioned about the earth's movements with the time calculation exactly. In the book of Markandeya Purana, it is mentioned clearly about the shape of the globe earth. As in Markandeya 3.3 said that the earth is round like a car wheel. According to this book, the shape of the earth is not globe exactly but it is more like an egg as mentioned in Markandeya Purana 54.12. In Markandeya Purana 92, it is mentioned that the goddess created the earth as the globe of Brahma. The Hindu scientist, Aryabhata in *Aryabhatiya*, it is mentioned clearly in his work that in section four entitled *Gola* which means "the sphere". The word 'the sphere' here same meaning with the globe. In verse five to nine, are mentioned about the globe earth. Then in the section four verse six and section three verse fifteen, he described the globe earth situated in the center of the universe. This means, he understood that the earth is the center of the solar system or called geocentric in modern science.

Thus, the writer analyzes the similarity of the perspectives between Islam and Hinduism to the shape of the earth. According to both scriptures, the phenomenon of day and night is caused by sunshine. When the sunshine is exposed to some of the earth's surface, it will be the day and some will happen that night indicates that the shape of the earth is globe. Both religions say that the earth is globe. The verses mentioned among the books of these two religions are mutually supportive of one another. The differences, in the perspective of Islam is not mentioned clearly about the shape of the earth while in the perspective of Hinduism mentioned clearly. That's why in Islam, there are differences view and interpretation of the shape of the earth. Another difference is about the heliocentric and geocentric. No one can say exactly the earth is heliocentric or geocentric. Although there are the differences in the system of the solar system, but it does not change the shape of the globe earth.

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