

MOUNTAINS AS STABILIZERS FOR EARTH FROM THE QURANIC AND MODERN SCIENCE PERSPECTIVES

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Abstract

The main thought and foundation in Islamic civilization is based from the teaching and learning of Quran. There are many secrets and mysteries in Quran and the only way to uncover it is by reading, understanding and researching its content. Among the miracles stated in the Quran, there are 49 times mentioned about mountain in different form of words and sentence structure hence its meaning. Therefore, this study will discuss and uncover the scientific evidence related to the mountain that is mentioned in the Quran. The method of this study is qualitative approach which most of the data are collected from library and literary materials that related to the word 'mountain'. In Quran, it has mentioned mountain as the pillar of earth which strengthen its ground and enable other being to inhabit it. Meanwhile, from the perspectives of scientific evidences claimed that when two continents collide, stronger plates will slip beneath the other plate and creating a platform that restrict the movement of the continent to avoid shaking. Then, the upper one folds and will form the mountain plate. This depicts that without mountains, the lithospheric plate movements will be eroded drastically. All this information has been mentioned in Quran as the word 'rawasiya' and will be discussed along in this paper accordingly

Keywords: Mountain, Quran, stabilizer.

1. INTRODUCTION

Al-Quran was revealed to Prophet Muhammad (p.b.u.h) for almost 1400 years ago yet its content is consistent with to date's modern technology or scientific knowledge. Nowadays, with the advance of knowledge and technologies, many scientific information in Quran were proved as true, thus, proving that the Quran come from the one and the only true God, Allah. Unfortunately, there are few atheist and disbeliever researchers argue the scientific information in Quran such as the role of mountain as a peg is true, thus, they deny that Quran is a message and guidance from God. This situation mostly resulted from misinterpretation of the verse and their lack of knowledge in Arabic language. Therefore, this paper is produced to help people in understand Quran better of its verses on mountains in line with scientific evidences.

Mountain is one of the most important features that can be found on earth as it stabilizes planet Earth's surface. Al-Quran as well has mentioned the importance of mountain as a platform that stabilized planet Earth's surface. The role of mountain as were mentioned in Al-Quran in various verse such as Surah Al-Hijr, Surah Luqman, Surah Al-Anbiya', Surah An-Naba' and much more. About one-quarter of the earth's land surface are covered with mountains and it has become 12 percent of total human population habitat. Mountains provide numerous benefits to human and provide indispensable supplies of natural resources as well for human. However, the formation of mountains usually related with the crash between continent. There are four types of mountains: fold mountain, fault-block mountain, dome mountain, volcanic mountain and plateau mountain and each one of these mountains have different formation process.

2. LITERATURE REVIEW

2.1 The Formation of Mountain

There are three ways mountain forms, but they form differently as depends on what category of mountain they are; namely volcanic, fold and block mountains. The volcanic mountains are formed when a tectonic plate is pushed beneath another plate causing the magma to come to the surface. When the magma piles up and cold down it will create a volcanic mountain. Next, the fold mountains are the effect from the collided of two tectonic plate at a convergent plate boundary, resulting the crust to over thicken. This phenomenon forces the weak plate to become a mountain while the stronger forced downward as a peg of the mountain has created. Lastly, the block mountains also known as horsts are formed because a problem happen in the crust where rock past each other and the rock fault raised on one side (Williams, 2015).

Nasir (n.d.) discussed about the universe in Surah Al-Hijr verse 16 until 25 and one of them that he discussed is about mountain which is in verse 19. Mostly, he discussed the miracle of Quranic terms used and its relationship with modern science. For example, in Quran the term used to describe the formation of the mountain is by the word 'ilqa' meaning throwing, casting and bring into existence. The term used in the Quran are very precise with the scientific terms as it is known that the mountain helps the existence of human being by maintaining suitable climate, good for reservoirs of water and protecting the earth crust from constant earthquake.

2.2 Mountain and Earthquake

Meantime, Harris (2017) explains that there is a relationship between the formation of mountain and earthquake. Earthquake usually happens in an area near the tectonic plates which is a giant crustal rock even as big as a continent. The tectonic plates aren't stay still and always moving and may shift against one another, thus, causing an earthquake activity to happen. This activity may lead the formation of mountains depend of the type of boundaries of the plates. There are 3 kinds of boundaries which is convergent, divergent and translation or also known as transform.

On the other hand, Tahir and Umar (2017) explain the misunderstanding of some researchers about the interpretation of Quran regarding mountain and earthquake. In Quran, the term used to describe the role of mountain as "it may not quake with you" (Surah Luqman: 11), "lest it should quake with them" (Surah Al-Anbiya': 32) and "lest it quake with you" (Surah An-Nahl: 16). All of these verses bring the meaning of the mountain decrease the intensity of the earthquake not preventing the earthquake to happen. The article also discussed the word 'rawasiya' in the Al-Quran is referring to the mountains under the sea also known as seamount and not the mountain on the land which is described as 'jibal' in the Quran. The seamount also plays a very important role in subduction the tectonic plate from creating massive 'mega thrust' earthquakes.

2.3 Mountain as Peg of Stabilizers

Furthermore, in Surah Al-Anbiya' verse 31 mentioned that mountain is to prevent shocks on earth. It is also discovered that the majority part of mountain extended underground as a root as far as 10-15 times their actual height on the surface of the Earth. The existence of mountain is the impact from collision of two massive earth tectonic plate which is the stronger plate will slide under the other and make deep extension while the weaker plate bends and creates the mountain on the surface. The mountain act as Earth's crust stabilizer and this process known as isostasy. Isostasy is the general equilibrium in the Earth's crust maintained by a yielding flow of rock material beneath the surface under gravitational stress. This role is mentioned in the Al-Quran by pointing the mountain as 'peg' (<https://questionsonislam.com/article/function-mountains>).

In the article, written by Masaf Institute (2015) explains that Quran pointed the mountain as a peg while geology knowledge explains it by clinging between the tectonic plates at conjunction point. This will avoid the plate from drifting over and its help to fix the earth's crust. Al-Quran also mentioned that mountains are not motionless as we thought. Actually, they are moving continuously together with earth crust. This is because the earth's crust float over a molted layer, meaning when the crust moves the mountain will also moves. This is shows that Al-Quran already stated before scientific facts come out with the movement of the mountain.

In addition, Al-Quran mentioned about earth formation needs a process of stabilization to make the earth suitable for living. Surah An-Nazi'at verses 32 and 33 stated that the formation of mountain is the process of stabilization and it is very important for earth fixation. In the early stage of the earth to be formed or created, the tectonic movement are more rapid and become slowly decreasing with the build-up of mountain and accretion of continent (Zaghloul, 2009). Within his writing, he also specifically mentions the formation of mountain, movement of tectonic plates and earth early activity with details. Furthermore, Zaghloul (2009)

also brings several Quranic verses that mention about geology activity such as in Surah At-Tariq, Surah At-Tur and Surah An-Naba'.

The website written by Islam Guide (2006) focus on the verses regarding the role of mountain as a peg. The actual shape of the mountain is like a peg with a very deep inside embedded of roots under the surface of the ground. They also discussed a verse from Al-Quran which is Surah An-Nahl verse 15 stated that mountain stabilize the earth crust and avoid the ground from shaking.

3. RESEARCH METHODOLOGY

This research is conducted by qualitative method which is the data are being collected from Al-Quran and scientific researches. The data of this research is mainly collected via book, thesis and internet thus it is categorized as library research. The primary data from this research are the verses from Al-Quran while the secondary data are obtained from tafsir book and scientific information. Therefore, any information related to the mountain will be collected, organized and analyzed. The information from scientific and Islamic religious book about the formation of mountain will be also highlighted in this paper.

There are three main steps structured in conducting this research. Firstly, general information about the mountain will be written. Next, the verses related to mountain as a peg will be collected from Quran. Furthermore, these verses will be translated and the information within it shall be explained. Other than that, scientific researches about the mountain that prove the truth of scientific information within the Quran also will be shown. Finally, the data analysis will be conducted by concluding all the information that already collected.

4. DISCUSSION

4.1 Definition of Mountain

Mountain can be defined as a natural elevation of the earth's surface rising more or less abruptly to a summit and attaining an altitude greater than that of a hill, usually greater than 610 meters (Dictionary online, n.d.). There are five types of mountains: fold mountain, dome mountain, volcanic mountain, plateau mountain and fault-block mountain and each of these mountains have different formation process.

The fold mountains are the biggest formation between all types of mountains. It is formed from the collision of two different tectonic plates thus creating a distortion within earth crust. This type of mountain usually has less width of mountain than the mountain's length. The mountain also has interesting shape where one slope being convex shaped while the other one concave shaped (Benjamin, 2017). The examples of this mountain are Akwapim-Togo ranges in Ghana, Ridge-and-Valley Appalachians in the Eastern United States and Jura Mountains in the Alps.

Dome mountains can be identified as the mountains formed by the cooling of magma. Unlike the volcano mountains that erupt the magma, these mountains are formed by the effect of magma that cool of beneath the mountain and creating the core of the mountain. These mountains are dome-shape by the magma from the earth crust pushed overlying rock layer upward thus creating a dome (Eldredge, 2000). There are few examples of these mountains such as Mount St. Helens in Washington State, Navajo Mountain in San Juan County and Torfajökull in Iceland.

Williams (2015) stated that volcanic mountains are usually found around the mid-ocean ridge, also known as hotspot and were formed when a tectonic plate is pushed beneath another plate causing the magma to come to the surface. The cooled magma will become a volcanic mountain and some example of them are Mount Fuji in Japan, Mauna Kea in Hawaii, Mount Ararat in Turkey and Mount Etna in Sicily, Italy.

The plateau mountains are mountains that are formed by erosion instead of internal activity like other mountains. The plateau mountain can be formed by 2 phenomena which are layer of lava or flat area that being pushed by the forces of the earth. The high of this mountain are approximately 600 meter above sea level and can be identified with large flat area in the top. These mountains are found near fold mountains such as the mountains in New Zealand (Barrow, 2013). The largest plateau in the world is the Tibaten Plateau located in central Asia (National Geographic, n.d.).

Lastly, the block mountains are created when a gigantic area or block of earth are destroyed and displaced upward. The lower blocks of mountain called graben meanwhile the uplifted part is termed as horst (PMF IAS, 2015). The examples of this mountain are the Vindhya and Satpura horsts in India, Vosges mountains in France and the Black Forest within Germany.

4.2 Verses Related to Mountain as a Peg

Al-Quran expressed mountain in 2 different words which are 'jabal/ jibil' stated in 39 places while 'rawasiya' in 10 places. 'Jabal/ jibil' bring the meaning of mountain in general definition while 'rawasiya' shows the mountain as peg of stabilizer for earth. Therefore, Quranic verses related to the function of mountain as earth peg have been listed as below:

1. It is He who has spread out the earth and set in it firm mountains and streams, and of every fruit He has made in it two kinds. He draws the night's cover over the day. There are indeed signs in that for a people who reflect. (Surah Ar-Ra'd verse 3)
2. And We spread out the earth, and cast in its firm mountains, and We grew in it every kind of balanced thing. (Surah Al-Hijr verse 19)
3. He cast in the earth firm mountains lest it should shake with you, and [made] streams and ways, so that you may be guided. (Surah An-Nahl verse 15)
4. We set firm mountains in the earth lest it should shake with them, and We made broad ways in them so that they may be guided [to their destinations]. (Surah Al-Anbiya' verse 31)
5. Is He who made the earth an abode [for you], and made rivers [flowing] through it, and set firm mountains for it, and set a barrier between the two seas? What! Is there a god besides Allah? Rather most of them do not know. (Surah An-Naml verse 61)
6. He created the heavens without any pillars that you may see and cast firm mountains in the earth lest it should shake with you, and He has scattered in it every kind of animal. And we sent down water from the sky and caused every splendid kind [of plant] to grow in it. (Surah Luqman verse 10)
7. He set in its firm mountains [rising] above it, and blessed it and ordained therein its [various] means of sustenance in four days, alike for all the seekers [of the means of sustenance]. (Surah Fussilat verse 10)
8. And We spread out the earth and cast in it firm mountains and caused every delightful kind to grow in it. (Surah Qaf verse 7)
9. And set in it lofty [and] firm mountains and given you agreeable water to drink? (Surah Al-Mursalat verse 27)

4.3 Islamic Scholar Opinions Regarding the Verses

In Quran, mountain can be identified with 2 Arabic words, first is plural word 'jibil' which is repeated 33 times, the singular word 'jabal' is repeated 6 times and the second word is 'rawasiya' repeated 10 times. The word 'rawasiya' in Arabic language has very specific meaning which function as earth peg while the word 'jabal' is more general. Accurately, the word 'rawasiya' means something that make shaking thing become silent which is in this context focused on earth (Fuad, 2016). Muhd (1997) says that the word 'rawasiya' comes from the word 'arrusu' which mean anchoring and stabilizing heavy object. In addition, according to Dr Solah (2007), Quran says that the mountains are fixed to the earth where God made rawasiya and it is call rawasiya because it is like a sailboat which maintains its balance. The mountain maintains the balance of the earth so it does not sway, disturbed and does not tilt.

Most of the word 'rawasiya' preceded with the word 'alqa' within Surah Al-Hijr verse 19, Surah An-Nahl verse 15, Surah Luqman verse 10 and Surah Qaf verse 7. The word 'alqa' indicate the meaning of throwing or placing something that are not exist before. The mountains do not appear by itself along with land formation, but it is the byproduct of tectonic process which enhancing the meaning of 'rawasiya'. The usage of the word 'al' or known as 'isim ma'rifat' at the word 'ard' within the verses are specification and specialization. On that note, in this case, the specialization is on the certain parts of the earth by the usage of that word. Thus, the mountain within these verses are specialize to certain mountain within certain place, not all types of the mountains on the earth (Fuad, 2016).

4.4 Scientific Information within the Verses

Mountain is the part of earth surface that is much higher compared to the surrounding land and it has summit and steep sides. According to the science of geology and geography, the mountains are located in lithospheric layer of the earth which consists of rock layers with a thickness of approximately 1200 km. The rock layers are not only consisting of hard rock but included form of clay, soil from volcanic lava, sand and gravel. In addition, the mountain also consists of several minerals and other chemicals such as iron, magnesium, calcium, sodium, etc (Kamarul & Noordiana, 2013).

The process of earth creation until the creation of mountain can be understood as below. First, in Surah At-Tariq verse 12, Allah mentioned that He created deeply faulted the outer layer of the earth. Next, molten lava flows from the deep faults, especially within particular part of oceans as mentioned in Surah At-Tur verse 6. This situation causing the earth to shake and jerk as well as forming trenches for mountain roots as explained in Surah An-Naba' verse 7. Lastly, this movement and jerk of tectonic plates are prevented by the formation of mountain as emphasized within Surah An-Nazi'at verse 32, Surah Al-Hijr verse 19, Surah Al-Anbiya' verse 31 and many more verses (Zaghloul, 2009).

Quranic verses illustrate the mountain as peg of the earth are within Surah An-Naba verse 6-7 and the new research already proved that the mountains have deep root embedded underground. The root can reach several times the height of mountain above the ground. The Quran also mentioned that mountain also function as stabilizer such as in Surah An-Nahl verse 15 and this theory is introduced since late 1960 in the framework of tectonic plates (IG, 2006).

Allah also revealed within Surah An-Nazi'at verse 32 that He made the mountain firm. The word 'arsaha' can be concluded as "was fixed, was made rooted and was nailed to earth". This can be understood that mountain fixes the earth's crust and preventing it from sliding all over to other layers. As conclusion, the mountain functions as a nail holding the earth together and this process is known as isostasy. This process of stabilizing the earth used the gravitational stress from the mountain to yield flow of rock material thus creating equilibrium (WSA, n.d.).

There are many definitions meaning in Arabic language within one word. The word 'ilqa' that being used before the word 'rawasiya' or mountain can be translated as bring into existence. The term that used within the Quran are very precise as mountain that inter-connected with each other functioned as shield that protect the surface from internal pressure, controlling the wind as well as the weather and the water reservoir for fresh water. Next, the word 'rawasiya' can be understood as constant that indicate that mountains serve and function as to keep the crust of the earth stay stable and constant, thus, allowing life to thrive (Nasir, n.d.).

Earthquake is the phenomena that occurs when the earth beneath the ground suddenly move causing great shaking and violence movement. The earthquake usually happens around the tectonic plates. The tectonic plates will be shaky, and the movement of the plates are usually rough and dangerous (Harris, 2017). In addition, the research conducted by Tahir and Umar (2017) stated that Quran also mentions the function of mountain does not prevent earthquake but rather reduce the intensity of the shake, that is not noticed by human. Within the Quran, mountain can be categorized into two types. First, 'rawasiya' which means sea mountains and 'jibal' means land mountains. This conclusion is made by the word 'rawasiya' that can be related to three major points which are something stable and fixed, something located on the bottom of the sea floor and something that control the harmony. The sea mountains provide the perfect structure in controlling and avoiding the tectonic plates from sliding as well as fit with each other. The multiple points of contact within sea mountains stop the plates from jolting thus preventing mega earthquake from happening. This process is known as aseismic creep preventing massive earthquake by converting and spreading the energy into a larger area. This scientific information proved the miracle of Al-Quran (Tahir & Umar, 2017).

5. CONCLUSION

After numerous researches regarding this topic, the word 'rawasiya' that being used in the Quran can be concluded as the mountain that maintain the stability of the earth. Mountain is the impact from collision of different earth's tectonic plates and has deep root several times than height of the mountain at the surface of the earth. The role of mountain as stabilizer is proved when scientific research found that mountain's root helps in reducing the speed of lithosphere thus decreasing the impact. The process of isostasy helps to maintain the stability of the earth by maintaining the mountain position.

In addition, Al-Quran mentioned this fact in many verses such as Surah Al-Hijr, Surah Luqman, Surah Al-Anbiya' and Surah Al-Mursalat. This great of guidance received almost 1400 years ago and consistently picturing the mountain as a peg that stabilizes the earth from dangerous shaking and protect the living thing. The word 'peg' symbolized that most of the mountains are hidden beneath ground and act as a nail that hold the mountain on tectonic plate. The information discussed has clearly proved on the truth of Quran and Prophet Muhammad (p.b.u.h) that are in line with the information and knowledge; that were unknown until late 1960, that now has been revealed, discovered and acknowledged based on the modern scientific evidences and research.

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