

Conference Paper

Global Warming and its Cause: Natural Science, Social, and Religious Perspective (Literature Study)

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One of the impacts of global warming is that it occurs due to an imbalance in natural systems and does not occur by itself. Humans, as the bearers of the mandate to care for the earth, are responsible for non-natural changes on earth. This literature review aims to determine the factors that influence changes in human thinking and behavior in responding to climate change as a result of human behavior, taking into account the factors of adherence to local wisdom, leader policies, and religious intervention. The method used was the library research approach. This method explores deeply through documents, journals, books, and others. The data in this study were obtained from library materials. This literature study discusses global warming and its causes from the perspectives of natural, social, and religious sciences. First, to preserve the environment and to remember the human mandate to maintain this grace of Allah that needs to be inherited as a culture of clean and healthy living. Second, human behavior is also influenced by social factors. Third, the legality factor from the government and religious fatwas with the issuance of various decrees related to environmental control is certainly a reinforcement. The conclusion is that the global climate change has a pretty serious relationship if we look at it from the perspectives of science, social, and religious ethics.

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1. Introduction

Allah SWT created nature with perfection according to its function. The earth was created complete with a protective sheath from the sun's rays, so that when the light enters the earth, it is the result of filtration in several layers of the atmosphere, it also prevents the fall of celestial bodies directly hitting the earth. Human life requires sunlight which is contained in ultraviolet light as the main function of nature is to warm the earth, also in terms of health is very good in repairing skin tissue.

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But now an imbalance occurs, along with changes in human behavior in the name of technological progress. Slowly, it is felt that the increase in the earth's temperature is due to the creation of gases resulting from industrial activities which, if the value is outside the threshold, will be dangerous, as a cause of depletion of the atmosphere. The massive forest clearing without replanting also caused climate change. As a result, the water cycle which was originally running normally, now the arrival of heavy rains has the potential to be a disaster, due to the reduced catchment area.

The importance of human concern for the slowing down of the earth's destruction which will further be an important step for the preservation of nature and the sustainability of this life which has an impact on the offspring after this period has passed. Therefore, controlling human behavior will be more aware of by understanding and implementing local wisdom, leader policies and religious intervention. This problem cannot be separated from mere natural phenomena, but also social phenomena, so that the solution to the problem must be collected in one unit. This literature review aims to determine the factors that influence changes in human thinking and behavior in responding to climate change as a result of human behavior, taking into account the factors of adherence to local wisdom, leader policies, and religious intervention. With this study, we can learn about how importance the people attention on global warming from many obstacles and not separated by each section.

2. Methods

The definition of research method is a step that is carried out systematically and owned by a researcher in order to collect valid and relevant information or data needed by a researcher in finding answers to questions from research researchers. This research is included in the type of qualitative research, research that emphasizes the aspect of deepening the data in order to get the quality of the results of a study. In this study, a qualitative approach was used to explore data or information related to global warming in many perspectives: natural science, social and religious. The approach used is the library research approach. The library approach explores deeply through documents, journals, books, and others. The data in this study were obtained from library materials. Then in the analysis process using Content Analysis. This analysis is used to obtain valid inferences and can be reexamined based on the context. In this analysis, the process of selecting, comparing, combining and sorting various meanings will be carried out

until the relevant ones are found. Then the data is reduced, presented or presented, and then conclusions are drawn [1].

3. Results

3.1. Global Warming Change in Science Perspective

The morphology of the earth's surface is a consequence of dominant forces such as tectonic uplift, erosion, sediment transport, and climate. Recently, the earth science community has also begun to consider biota as a geomorphological agent that has a role in shaping the earth's surface, although at a different scale and magnitude than the other major powers. Human activities directly or indirectly move large amounts of soil, which leave clear topographical marks on the earth's morphology [2]. The surface of the earth is a place where human life takes place, which is spread out to have heterogeneity, both geographically, culturally, local wisdom and various other things. Only 5% of the world's land area is untouched by humans, which amounts to nearly 7 million km² of the earth's landmass, and 44% (59 million km²) [3].

The atmosphere is a gas that has a thickness of thousands of kilometers that surrounds the earth. Its main function is to protect the earth's layers from the direct rays of the sun, and to prevent the fall of celestial bodies directly on the earth's surface. The atmosphere consists of many stratification layers, they are: troposphere, starting at ground level, extending upwards to about 10 km (6.2 miles or about 33,000 feet) above sea level; stratosphere, which extends from the top of the troposphere to about 50 km (31 mi) above ground level. The famous ozone layer is found in the stratosphere. The ozone molecules in this layer absorb high-energy ultraviolet (UV) light from the sun, converting UV energy into heat; mesosphere: This layer extends upward to a height of about 85 km (53 miles) above our planet. Most meteors burn in the mesosphere; thermosphere: High-energy X-rays and UV radiation from the sun are absorbed in the thermosphere, raising its temperature by hundreds or sometimes thousands of degrees; exosphere: the ozone molecules in this layer absorb high-energy ultraviolet (UV) light from the sun, converting UV energy into heat; ionosphere: The ionosphere is a series of regions in the mesosphere and thermosphere where high-energy radiation from the sun has knocked electrons off their parent atoms and molecules [4]. The figure below explains the stratification of the atmosphere:

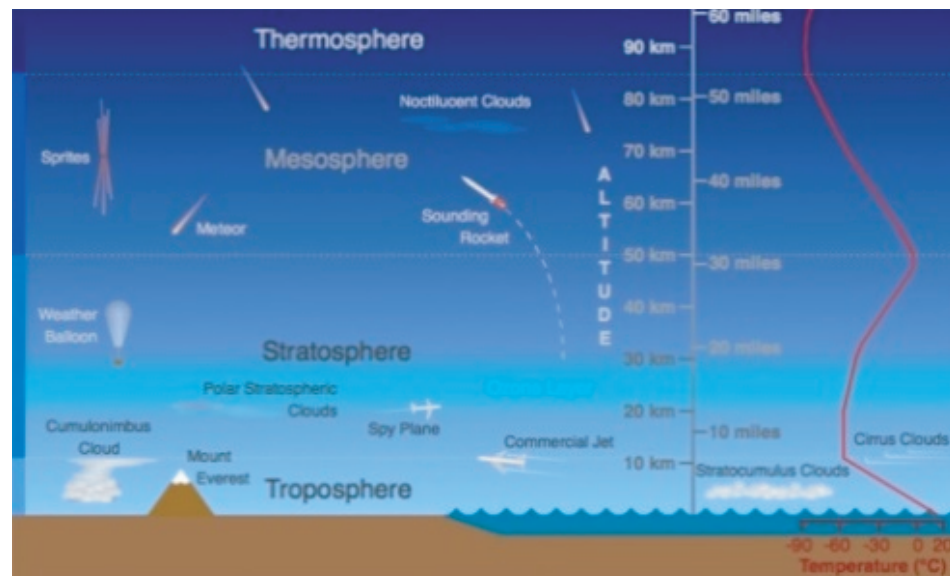


Figure 1: The Stratification of Atmosphere. Source: UCAR, 2021.

Ultraviolet (UV) is a form of sunlight that reaches the earth that has the power of electromagnetic radiation. There are advantages of UV, such as revitalizing of human skin, photosynthesis process in the leaves, reduce microorganisms and has long been used in various fields such as municipal water and sewage treatment. UV rays destroy the DNA of bacteria so they can't reproduce [5], [6].

Greenhouse effect is a phenomenon to understand how the heat can absorb into the earth. These heat-trapping gases can be thought of as a blanket wrapped around the earth, making the planet hotter than it would be without them. As general knowledge, the public needs to know the compounds other than the solid and liquid substances in the greenhouse, including carbon dioxide, methane, and nitrous oxide. Scientists have determined that the warming effect of carbon dioxide helps stabilize Earth's atmosphere. Without carbon dioxide, the surface of the third planet after the sun-earth would change by about 33 °C (59 °F) experiencing a colder feeling. Greenhouse gases occur naturally and are part of the makeup of our atmosphere. Therefore, the earth is sometimes referred to as the "Goldilocks" planet i.e. the conditions are medium, neither too hot nor too cold, but just right to allow life (including ours) to thrive. Part of what makes Earth so receptive is its natural greenhouse effect, which keeps the planet at a friendly 15 °C (59 °F). But in the last century or so, humans have disrupted the planet's energy balance, primarily through the exhaust effects of fossil fuel-derived vehicle energy intakes that add carbon dioxide to the air. Carbon dioxide levels in Earth's atmosphere have been rising consistently for decades and trap extra heat near the Earth's surface, causing

temperatures to rise. Greenhouse gases occur naturally and are part of the makeup of our atmosphere. The greenhouse effect explains the absorption of solar heat to the earth's surface which was previously trapped by the earth's atmosphere. The increase in the earth's temperature which is increasing in a matter of years is caused by the thinning of the atmosphere due to the interaction of exhaust gases in that area of the atmosphere [7].

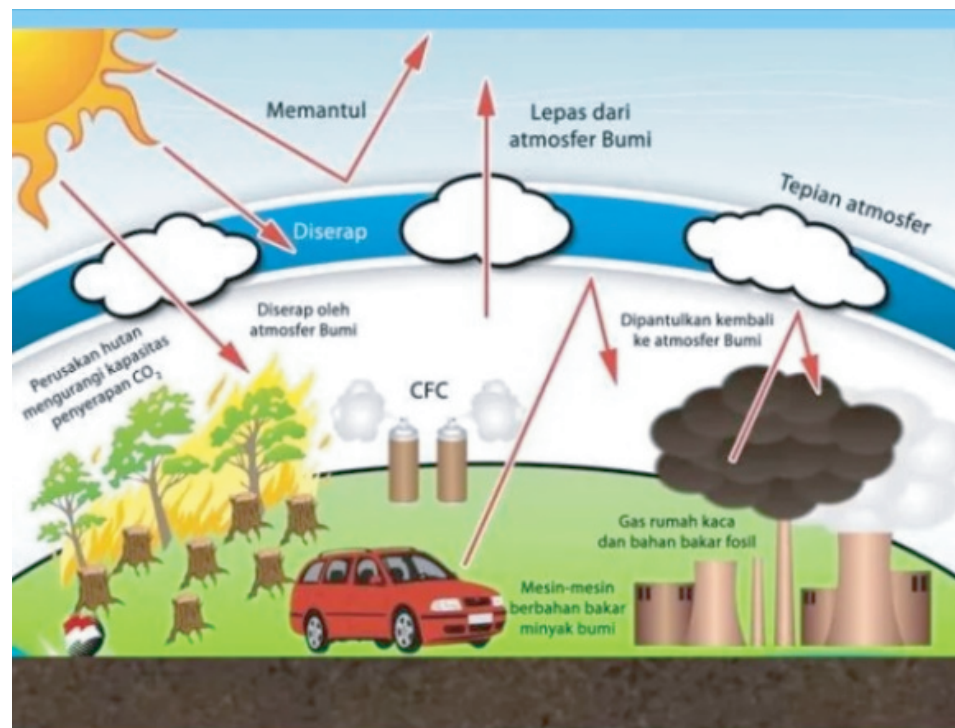


Figure 2: The Green House Effect. Source: geo-media.blogspot.com.

3.2. Global Warming Change in Social Perspective

Natural balance is the living environment or all the contents of the earth and sky that are in appropriate conditions, or the state of the human environment that is in a balanced condition or state [8]. Natural imbalance occurs when there is a consumption, use or exploitation of various natural resources that do not consider the side effects of taking the excess material without calculating the compensation. This natural balance not only maintains the preservation of nature on the earth's surface, but also pays attention to the earth's protective layer, namely the atmosphere that protects the earth from direct contact with outer space objects and filters sunlight which has electromagnetic properties. The side effects of human behavior that have accumulated negative impacts

will have the potential for natural imbalances as well, such as the depletion of the ozone layer due to chemical reactions in the atmosphere, resulting in reduced atmospheric filtration power, and resulting in an increase in Earth's temperature. Thus, this natural occurrence reminds us that there is a connection between the natural processes of the heavens and human behavior on earth.

Human behavior acts as an agent of change [9] and has many big impacts in:

1. Bridging community activities to make changes
2. Provide direction for solving problems around the social perspectives [10]
3. Assisting a person who is trusted to play a role in the change process
4. Building the relationship to help each other

Thus, socialize the environmentally friendly healthy living movement in the context of preserving nature and slowing the rise in global temperature, it is necessary to initiate the change group as a locomotive that oversees better living habits so that they become entrenched.

Human behavior, through activities that lead to increased emissions of gases that have an impact on climate change, is a current trend in global climate change, although there have been many public service advertisements with the theme of caring for the environment. This requires a holistic understanding that ultimately leads to a decision to change behavior from learning the events that have been passed that have caused damage to this earth. Many people do not realize that the activities they do hurt the earth, if they are not educated and warned of what they have done. Thus, we need a trigger agent who has the ability and motivation to direct consumers to switch to alternative behavior while still being able to meet their psychological needs by accompanying awareness in maintaining the sustainability of the earth [11]. Social processes are an important and dynamic component of the two-way relationship between human behavior and climate, potentially greatly influencing the effects of greenhouse gases. Human social processes are key to understanding mitigating behavior and limiting future climate change [12].

Local wisdom is also a set of principles or laws that exist in a local social system that regulates the interaction of the social system with nature and the elements in it to maintain a balance between social and natural systems or in other words creating and preserving sustainability between nature and social system [13]. There are many types of local wisdom in Indonesia, such as:

1. *Pikukuh* which is adhered to by the Inner Baduy Tribe, Banten by prohibiting logging, clearing land, taking fruit from certain trees, and farming must be by customary provisions

2. Indigenous *Karampuang* in Sulawesi, believe that the forest is part of their nature. Ecosystem balance rules are regulated in customary fatwas

3. *Pranoto mongso* in Java, who provides an arrangement for farming according to natural signs [14]

As an effort at the macro level, and due to the importance of global warming and environmental sustainability issues that must be managed properly, various supporting policies have been implemented, including:

1. The fatwa that decided on the first general provision regarding the definition of waste as residue resulting from human activities that are no longer used, but needs special holistic management by implementing reduction, reuse and recycling so that there is still value for benefits or does not waste objects whose functions can be optimized , in other words as an understanding to avoid tabzir as well as educating the public, especially Muslims in the sense of israf as an action that exceeds proportions as it should be. In the second general provision, it is stated on obligations and legal classifications around maintaining environmental cleanliness, avoiding harm to improving the welfare of the ummah. In the third part, it sets out recommendations from the government, legal sources, business activity activists, ulama and teachers, elementary, middle and high school levels as well as worship facilities [15]

1. The policy to set the limit values for green candidates and gold candidates for the company's performance program in environmental management 2020-2021 for this type of industry. Thus, it is hoped that industry players will be able to comply with what has been decided regarding the use and potential of the waste to be generated, so that in its implementation with full awareness it has legal potential if it is not complied with [16]

3.3. Global Warming Change in Religious Perspective, Religious Ethics in Climate Change

With the existence of hedonism, consumerism has become a part of the life of the world community, especially in metropolitan cities and almost all urban communities [17]. This

happens almost every afternoon or even every weekend. This phenomenon is referred to by Paul Knitter (2010) as "market religion" a satire to say that humans practice their faith by mastering material things through consumptive actions by going to shopping centers.

The impact of this behavior is that the level of consumption is higher, market demand is also higher, while natural resources are increasingly limited, as a result, market prices are also increasing. As a result, until 2012 the government issued subsidies sourced from people's taxes equivalent to 216.8 trillion for fuel, because fuel failed to increase. The high level of consumption is increasingly becoming an indicator of economic progress. For example, during a pandemic, when people's consumption power weakens, what happens is that the level of the economic wheel decreases. According to the author, this is different from the concept in Islam where Islam teaches more about simplicity with the level of consumption that is necessary and sufficient, the teaching not to be wasteful. Such a lifestyle has an impact and exacerbates the condition of the thickening of greenhouse gases in the earth's atmosphere.

Religion has a big enough role in driving human civilization. Belief in God and spiritual power can provide the impetus for civilization, especially peace and humanity. Based on Atlas of Religion data in 2007, the earth is inhabited by 85% of humans who believe in the existence of God. This makes the environmental crisis makes people come back again to try to reflect on the teachings of their religion.

One example of a religious meeting discussing climate change, for example the Windsor Celebration: Long Term Faith Commitment to Protect the Living Planet meeting from 2-4 November 2009 attended by nine religious leaders. Namely, Bahai, Buddhist, Christian, Taoist, Hindu, Jewish, Sinto, Muslim, and Sikh. The activity discussed the real actions that have been taken by religion in climate change and shared experiences and environmental tragedies that occurred from the symptoms of climate change from each community (*Why we do care? Inspirational Stories from the faiths about protecting the environment*).

In addition to the facts above, several important things in the perspective of Islam are religious intervention. *First*, non-Muslims. Morison et al conducted quantitative and qualitative studies on the relationship between religious affiliation and attitudes to climate change. There are findings of substantive effects on climate change beliefs based on religion. Christians (both literalists and non-literalists) are the least involved in climate change issues, while Buddhists are the most involved. For all religious

groups (Buddhist and Christian), the effect cannot be explained by sociodemography, environmental attitudes, or environmental knowledge alone.

Second, Islam. Islam itself has formed a declaration called *The Islamic Declaration on Global Climate Change* as a collaboration between Muslim specialists from various countries consisting of academics, environmental experts, organizations and individuals in draft substantive documents that have been translated into various languages. This draft contains various statements, among others, to consider the scientific consensus on climate change, namely stabilizing the concentration of Greenhouse Gases (GHG) in the atmosphere at a level that can prevent human intervention in the climate system, calling on prosperous countries and oil producers to take the lead in reducing GHG emissions as early as possible. possible, and not beyond the middle of this century, call on all nations and their leaders to reduce GHG emissions as soon as possible to stabilize them back in the atmosphere, as well as for large corporations to bear the consequences of the profit boost and take a more active role in reducing their carbon footprints and forms Other forms of impact on the environment.

As illustrated by the data above, the author describes the position of religion that can have an important role in contributing to the environmental movement, if religion is willing to involve in it.

1. *Religious communities own and use assets, including land for houses of worship, hospitals, and other properties.* This can be realized in the construction of hospitals that are more environmentally friendly. Meanwhile, for example, efforts to build the holy city of Medina into one of the Muslim green cities. Shintao is the owner of the forest where the temples are built.
2. *Education.* Be it formal, non-formal, or even informal education that involves many elements from schools, and communities. This includes the physical building model, curriculum, and policies.
3. *Wisdom.* Theological training and education. Exploring sacred texts related to nature and helping the community in their awareness of environmental care. In this case, for example, manifested in religious speeches or other training that can be held by the general public or even through formal education. An example of Hinduism in Bali, for example by giving a black and white cover cloth symbol on a tree that is considered to have power. From a scientific point of view, climate

change is a unique activity where the award for not cutting down trees carelessly is local wisdom that needs to be cultivated.

4. *Lifestyle*. Lifestyle application. For example, the implementation of Hajj can be done with the concept of minimizing carbon emissions.
5. *Mediation and advocacy*. There are many media, for example radio, television, social media, or even YouTube accounts that carry out religious missions.
6. *Establish partnerships*. This model can be done with religious actions that are also involved in partnership activities, seeking joint funding, of course from their community sources. The important role of the ulama who have many followers will facilitate this change action. Including NGOs, Ministries that can collaborate, for example with Nahdlatul Ulama (NU) and Muhammadiyah institutions. With the existence of religious organizations, even secular organizations such as Conservation International (CI) can synergize their actions with network programs through the community [18].
7. *Celebration*. The author argues that the model of religious celebrations is often held in such activities, but it is better to maintain environmental protection.

3.4. Global Climate Change Relations in Social Science and Religious Ethics Perspectives

The basis for the evidence of a relationship between religion, and climate change is quite extensive, including in terms of social science research on how the identity of religion begins to emerge in attitudes about climate change. The relationship can be seen from the constructive involvement of religious thinking and conventional with climate change, even to historical analysis of how (1) climate affects religion and (2) religion interprets climate, as well as theories in which climate change can be interpreted as a religious event [19].

In fact, Islam, with a population of 1.8 billion people who have abundant natural resources, including the oil in Arab countries, and the Middle East, as well as the natural wealth of tropical forests and biodiversity in Indonesia to other South Asian countries, will but not much of a significant impact on Muslims in other parts of the world. This is very unfortunate, if we claim that fellow Muslims are brothers but are not implemented in the realm of world life. Small actions that we take around us, such as reducing emissions,

do not have a direct impact on the global environment, but our small actions become representative of humans on earth and have a small impact on the environment in our zone.

According to Foltz, 2005, states that environmental conditions in the Muslim world are indeed very severe, where awareness of environmental care and environmental management is still relatively low. Moreover, it is emphasized by the lack of environmental care, for example by making rivers as garbage dumps, or even empty land into garbage dumps, regardless of their nature as *khalifatullah*.

However, this participation can of course also be realized through cooperation between international secular organizations and religions. For example, in the 21st Conference of Parties (COP21) in Paris in December 2015 which discussed climate change, the United Nations Organization Framework Convention on Climate Change (UNFCCC) involved 181 countries in its participation. Indirectly it is also able to involve grassroots communities if the policy target is also the state government to establish with religious communities as well [20].

The Muslim point of view can be seen in the review of the Islamic holy book, which is contained in (Surah 7, 35-56) that there is a recommendation to do good and not to. While in Q.s. 6:38 explains the recommendation to respect creatures on earth, including plants, and animals, because they are also part of living things like humans. In addition to this verse, Facruddin also quotes the verse of Q.s. 33 verse 72, that as caliph humans have been able to accept the mandate, while the heavens, the earth, and the mountains are still reluctant to accept it. However, this verse certainly cannot be used as a basis for scientific methodology. However, at least it provides a potential opportunity for the truth that humans can to manage the earth, depending on the extent of the efforts made by humans.

Some of the Islamic views on the concept of environmental protection are illustrated in several ways:

1. About the concept of *khalifatullah* and the prohibition of making damage on earth as the author mentioned earlier.
2. The concept of a prohibition against killing animals during the Hajj season.
3. The concept of respect for the holy place.
4. The concept of processing resources on earth, but using them sparingly.

This environmental damage is alleged because Muslims do not care about the environment, meaning that religious teachings about environmental care are not implemented properly. Therefore, in this case, a comprehensive exploration of Islamic teachings and ethics on the environment is needed that can be applied as a universal value. Including in terms of economy and technology that makes a negative impact, environmental damage. This should be a great opportunity because the Muslim world abundant natural resources, large biological resources (mega diversity), and has unique and universal teachings, even for humanity.

The position of religion in the context of its role in this climate change action, including Islam is very important. While the important steps for tackling climate change are through the arena of negotiations and bargaining through conferences and even through annual meetings by the UNFCCC and the *Conference of Parties* (COP) in several countries, this is different from religious tactics. Religion can play a direct role in practical steps. Through its involvement in the areas of asset use, education, wisdom, lifestyle, media and advocacy, partnerships, and celebrations.

In terms of handling climate change, we cannot let go of some of these influential elements, namely science, legislation, and religion. (1) *Science* is used as a scientific basis and justification. (2) Legislation, as a direction, and regulation, regulates activities citizenship, and (3) religion. In this case Islam. Associated with belief. Which helps a person to find the direction of his life goals, and behave in a noble manner, as taught in religious values (*Islam*). Religious ethics encourage humans to develop positive values including not killing each other (*homicide*), killing oneself (*suicide*), and killing other tribes or nations (*genocide*). However, religious challenges are growing, including the challenge of killing living things (*biocide*) and destroying the environment and ecology (*ecocide*). Therefore, the compromise of these three elements as a mutually connected and correlated relationship needs to be fostered. Here the author describes in a Venn diagram 3.

Description of the correlation of Islamic positions, legislation governing climate change, as well as scientific justification for global climate change

In Diagram 3 above, the color pink represents citizenship (citizenship) which is regulated by law. The orange image represents science, the light green image represents religion. While the dark green image represents Islam which is one of the world's religions. Meanwhile, the author describes the universe as a civilization.

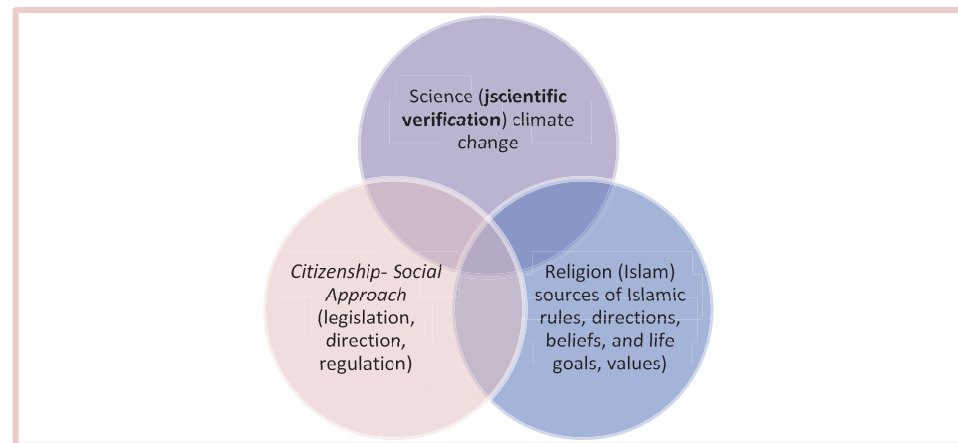


Figure 3: Venn diagram 3.

This image is at least a connecting point of the model as presented in the article [21]. First, the fundamental relationship between economic, environmental and social sustainability by HO Chin Siong and Muhammad Zaly (2018). The two conceptual frameworks form the Islamic development environment about sustainability. While in the author's perspective, the environment is an object in the universal environment that has its natural laws, the author prefers to link the Venn diagram form as the relationship between religion, science, and citizenship (represented by social policy), the three domains that we can control in perspective. policy.

Another form of how social can accommodate religion to be present is through the SDGs program. Based on data from library research, it shows that the SDGs also accommodate that Islam as a religion also shows the terms of the relationship between humans and Allah SWT, humans and humans, and humans and the environment [22].

From a religious perspective, for example, the emergence of several MUI fatwas. Meanwhile, in terms of the legal system in Indonesia, Law no. 32 of 2009, concerning the protection and management of the environment. Meanwhile, in science, there have been quite several studies on the predictions of the impact of natural weather changes on a global scale. For example the condition of forests in East Kalimantan under different global and national political situations. A fact that is quite surprising is that conditions in this region of Indonesia are not synergistic and synchronized with each other. The view of the relationship between eco-theological paradigms is not just a theoretical assumption but an application method, as in the explanation [23].

The research development agency emphasizes the importance of religion in understanding and tackling climate change. However, so far, very little has been known by the

Muslim community about climate change [24]. The author deliberately puts the position of these three things in the same position, but has an interrelated relationship with one another. Given the fact on the ground that the position of the three sometimes stands alone. For example, the implementation of legislation, sometimes it is not based on data science so it is very detrimental to the community.

For example, in the case of licensing the Central Java governor's decision no. 660.1/6/2017 concerning Environmental Permit for Mining and Mining Development and construction of a cement factory PT Semen Indonesia which is reviewed from Law no. 32 of 2009 concerning the protection and management of the environment. (Arief Hidayat and Ahmad Redi, Analysis of the Validity of Central Java Governor Decree no. 660.1/6 of 2017 concerning Environmental Permits for Mining Activities and Factory Construction of PT Semen Indonesia Based on Law Number 32 of 2009 concerning Environmental Protection and Management, Journal of Adigama Law, Untar. However, it is also possible that the rules of science also stand alone without being involved in religion or in the rule of law.

4. Discussion

Global climate change, one of which is global warming, has a quite serious relationship if we look at it from the perspective of science, social, and religious ethics. The main point is to recognize the nature and natural phenomena that occur in the atmosphere layer as a protector of the earth and the character of the earth itself, with a strong motivation to preserve the environment and remembering the human mandate to maintain this grace of God, then making changes for the better is an obligation, in addition to various arguments as reinforcement, as well as the sharpness of human nature needs to be inherited as a culture of clean and healthy living. Human behavior factors are also influenced by social factors, and need agents of change to create a new culture that is more aware of environmental issues. Customary compliance that is implemented in local wisdom is effectively applied in the order of social life, including compliance in treating nature. The legality factor from the government and religious fatwas with the issuance of various decrees related to environmental control is certainly a reinforcement so that the community has a legal basis for all actions related to changes in natural conditions, and synergizes with the teachings of the beliefs held by the community.

5. Conclusions

Global climate change, one of which is global warming, has a pretty serious relationship if we look at it from the perspective of science, social, and religious ethics. The main point is to recognize the nature and natural phenomena that occur in the atmosphere layer as a protector of the earth and the character of the earth itself, with a strong motivation to preserve the environment and remember the mandate of humans in maintaining this grace of Allah.

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6. Conflict of Interest

The authors have no conflict of interest to declare.

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