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# Islamization of Science: Ziauddin Sardar's Critique of the Universality of Science

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**Abstract:**

This qualitative research explores Ziauddin Sardar's critique of Western-influenced universal science. It employs a literature study to analyze Sardar's thoughts using various methods. The findings reveal that Islamic science, rooted in ethical principles, offers an alternative to Western science, which often overlooks diverse paradigms and local knowledge systems. While Islamic science excels in addressing region-specific issues, it may struggle with complex problems. In contrast, Western science, considered global, has historically caused environmental challenges by disregarding non-conventional paradigms. Therefore, Islamic science, with its inclusive approach to knowledge, presents a potential solution to the crises stemming from the dominance of Western scientific paradigms.

**Keywords:** Ziauddin sardar, Islamic science, universalism

## A. Introduction

One characteristic of science is that it should be universally applicable, without geographical limitations, so that all its users can understand it. As long as the knowledge remains relevant and there is no better alternative theory, it can be utilized by anyone worldwide[1]. This characteristic has undergone significant development among Western scientists, particularly in the natural sciences.

[1] Conny Semiawan, Theodorus Immanuel Setiawan, and Yufiarti, *Panorama Filsafat Ilmu* (Jakarta: Teraju, 2005).

However, science is often influenced by politics, especially during World War II. This simultaneously emphasizes that science is not value-free. Despite not being value-free, this does not deter scientists from upholding the universality of science. To this day, this characteristic is still believed by scientists, with the enduring influence of Western scientific products in other parts of the world, including within the Islamic civilization.

The emergence of the Islamicization of knowledge movement followed the spread of Western knowledge in Islamic civilization. One of the figures in this movement was Al-Faruqi, whom Ziauddin Sardar later criticized. Sardar argued that the perspective of Islamicizing knowledge would lead to the Westernization of Islam. This is because, according to Sardar, Western disciplines are shaped by Western perceptions, concepts, ideologies, language, and paradigms. Sardar also critiqued Al-Faruqi's belief that mastering Western science was a prerequisite for mastering Islamic science, considering it a form of Western influence on Islamic knowledge. Sardar then presented the concept of Islamic Science as an alternative to the Islamicization of knowledge[2].

Sardar also criticized young Muslim scholars. He believed that much of the knowledge they studied was irrelevant. According to him, the study of subjects like economics, sociology, architecture, engineering, and biology did not equip these scholars to advance the values they hold. This is because, in his view, these academic disciplines are only relevant to the capitalist and socialist structures, values, and norms of the West. This leads to his argument that knowledge or information is not value-free. There is always a value system at play in the collection and utilization of knowledge. Sardar contended that knowledge from the West only serves the interests of the West[3].

Ziauddin Sardar attempted to compartmentalize knowledge based on their respective regions and cultures. His desire simultaneously critiqued Western Science, which sought to establish a universally applicable body of knowledge. On one hand, this inclination led to the segmentation of expertise based on regions, such as Western physics and Islamic physics. On the other hand, Sardar's desire had a strong foundation for realization. Several speculative theories in natural sciences conflict with Islamic values. For instance, many theoretical

[2] Muhammad Taufik and Muhammad Yasir, "Mengkritisi Konsep Islamisasi Ilmu Ismail Raji Al-Faruqi: Telaah Pemikiran Ziauddin Sardar," *Jurnal Ushuluddin* 25, no. 2 (2017), https://doi.org/10.24014/jush.v25i2.3830.
[3] Zauddin Sardar, *Tantangan Dunia Islam Abad 21: Menjangkau Informasi*, Seri Peradaban Islam (Jakarta: Penerbit Mizan, 1989).

physics theories are heavily influenced by materialism. Islamic scientists must inevitably align with this trend if they wish to engage in the field of physics.

Sardar's concept of Islamic Science not only reminds Muslim scholars not to blindly follow the Western scientific development heavily influenced by Western materialist philosophy, but also serves as a critique of one of the characteristics that all scientists have long believed. Islamic Science, which initially emerged due to the awareness of the need for Islamic values to influence the development of knowledge, in Sardar's perspective, becomes a critique of the universality of science. This underscores the need for further research regarding Sardar's concept of Islamic Science as a critique of the universality of knowledge.

## B. Research Methods

This research is a qualitative study in the field of philosophy. Specifically, this type of research is a factual and historical study of a figure. The object of this research is the thoughts of Ziauddin Sardar regarding Islamic Science as found in his written works. The theory utilized in this research is Thomas Kuhn's paradigm of science. This research employs a literature review method for data collection. The data, consisting of Ziauddin Sardar's written works, will be systematically collected and then inventoried before undergoing further analysis. The data analysis techniques used in this research include interpretation, internal coherence, historical continuity, and heuristics.

## C. Findings

### 1. Islamic Science and Western Science

Western civilization generally holds the view that knowledge and religion are two contrasting and conflicting elements. Contrast, in this context, implies that these two aspects have no connection and each follows its path. In this regard, knowledge is related to worldly life. As for religion, it pertains to both earthly and spiritual matters. In the Western perspective, knowledge is solely associated with the worldly, while the hereafter is considered an illusion. Conflict, on the other hand, signifies that the presence of religion is seen as hindering the progress of knowledge. The two are in opposition and cannot be reconciled[4].

Such a perspective is undoubtedly contrary to the actual values of Islam. From an Islamic perspective, even a term like "dichotomy of knowledge" is used merely as a means of distinction or classification of different fields of

[4] Darwis A. Soelaiman and Rahmad Syah Putra, *Filsafat Ilmu Pengetahuan Perspektif Barat Dan Islam* (Bandar Publishing, 2019), https://repository.bbg.ac.id/handle/778.

knowledge based on their respective characteristics, following ontological, epistemological, and axiological aspects. Islam does not recognize an excessive and discriminatory dichotomy of knowledge, let alone prohibit one over the other. On the contrary, Islam positions them in parallel, as long as they provide positive value and benefit to humanity in order to bring goodness to both the worldly and the hereafter life[5].

The concept of knowledge in Islam is rooted in faith and driven by the Quranic encouragement to learn, explore, and investigate natural phenomena. Therefore, since classical times, Islamic states have promoted scholarly activities through phases of translation, assimilation, and investigation, leading to remarkable advancements in the natural sciences and technology. These contributions have had a profoundly positive impact on the security and well-being of both the nation and the world on a global scale[6].

If we refer to H.F. Zarkasyi, there are five differences in the elements of the Islamic worldview and the Western worldview, namely[7]:

| No | Element | Islamic Worldview | Western Worldview |
|---|---|---|---|
| 1 | Principle | Tauhid | Dichotomy |
| 2 | Source | Revelation, mind, experience, and intuition | The reason, speculation, and philosophy |
| 3 | Sifat | Authenticity and finality | Rationality, openness, and always changing |
| 4 | Reality meaning | Based on metaphysical studies | Social, cultural, and empirical views |
| 5 | Object of study | Visible and invisible | Community Values |

Four arguments by Ziauddin Sardar are often quoted when discussing the concept of Islamic Science. Firstly, different civilizations will produce different sciences. Secondly, Islamic science has its unique qualities and distinctions when viewed from a historical perspective. This can be seen

[5] Zaenuddin Idris, *Dikotomi Ilmu Dalam Perspektif Dan Sejarah Islam* (Bandung: KARIMA (Karya Ilmu Media Aulia), 2019).
[6] Idri, *Epistemologi Ilmu Pengetahuan, Ilmu Hadis, Dan Ilmu Hukum Islam* (Jakarta: Prenada Media, 2015).
[7] Fuad Nashori et al., *Ilmu Sosial Humaniora Dalam Perspektif Islam*, ed. Hariz Enggar Wijaya and Subhan Afifi (Yogyakarta: Sevenbooks, 2020).

from the nature and character of Islamic science itself. Thirdly, Western science has destructive qualities and is a threat to humanity itself. Lastly, Western science is considered unable to meet the spiritual, cultural, and physical requirements and needs of Islamic society[8].

There are fundamental differences in the aspects of ontology, epistemology, and axiology of knowledge between the Islamic and Western scholarly traditions. These differences are the result of contextualization processes within each civilization, influenced by the social and cultural aspects surrounding them. This is why it is necessary to understand the historical roots when examining these differences. The differences between the Islamic and Western approaches to science, according to Ziauddin Sardar, can be seen in the following table[9]:

| **Western Science** | **Islamic Science** |
|---|---|
| Believe in rationality | Believe in revelation |
| Science for science | Science is a tool to obtain the pleasure of Allah; it is a form of devotion that involves both physical and spiritual elements. |
| The only method to attain the truth. | There are many methods that can be based on reasoning, as well as revelation. |
| Ignoring the aspect of emotions to achieve rationality. | Human emotions are needed in the development of science. |
| Science is impartial or unbiased. Scientists should focus on the development of knowledge. | Science favors the truth. Scientists should consider the impact of the knowledge they develop. |
| Science should not be biased in the sense that truth depends on proving operations rather than the personal side of researchers. | There is a subjective aspect to science. The validity of a statement is also influenced by the background and intentions of the researcher. |
| The truth of science is based only on convincing evidence. | The truth of science is always obtained from unconvincing evidence. Scientists must practice |

[8] Z Sardar and E Masood, *How Do You Know?: Reading Ziauddin Sardar on Islam, Science and Cultural Relations* (London: Pluto Press, 2006).

[9] Alias Azhar, "Sains Islam Vs Sains Barat: Analisis Amalan Dan Perbandingan," *Ulum Islamiyyah* 21 (2017), https://doi.org/10.33102/uij.vol21no0.21.

| Western Science | Islamic Science |
|---|---|
| | making decisions based on unconvincing evidence. |
| Analysis is the dominant method to achieve scientific progress. | Synthesis is the dominant method, including synthesizing knowledge and values. |
| Science is something complex, so it must be broken down into sub-disciplines. | Prefer a holistic approach. Science should be approached holistically and interdisciplinary. |
| Regarding universality, although science is universal, its results will only benefit those who can afford it. Confidentiality in science is allowed. | The results of scientific research are for the benefit of all humanity. Knowledge is not a commodity for buying and selling. Keeping research results secret is contrary to morality. |
| Science is not good, but it is also not something bad. | Science, like human activities, can be evaluated, either positively or negatively. |
| Scientists should ignore any social, political, and ideological influence. | The activities of scientists have a responsibility to society. |
| The results of research in the form of new knowledge are the most important and deserve primary attention. | Science is only a way to understand the greatness of God, so God, who should be the most important, can receive primary attention. |
| Have complete freedom. All suspicions about science should be avoided. | Science is something valuable, so it must be continuously monitored and subject to ethics. |
| Freedom in using methods, including research materials, such as animals, humans, etc. | There are ethical limitations in conducting research. |

In Western countries, large-scale basic research is funded with the assumption that it will provide support for specific technologies or because it follows trends. However, in Islamic countries, research cannot be financed solely on the basis of expectations or trends. It must be target-oriented. It must adhere to research systems that consider the needs, demands, and interests of the indigenous population and encourage the implementation of

local industrial research. It must be related to pressing national issues. Nevertheless, this should not be interpreted as political interference, but rather as the use of science as a vital tool for national development[10].

## 2. Islamization of Science and Ziauddin Sardar's Critique

The Quran never fundamentally distinguishes between good and bad knowledge, unlike how it distinguishes between believers and disbelievers among humans and jinn. Knowledge remains accurate and neutral, and there is no such thing as "infidel knowledge" or "Islamic knowledge." Based on this, classical Islamic philosophers generally did not recognize the term "Islamization of knowledge," despite studying and mastering knowledge originating from Greece, Persia, and India. Philosophical figures such as Al-Kindi, Al-Farabi, and Ibn Rushd focused more on providing evidence that the expertise and philosophy acquired from foreign nations were not in conflict with Islamic law. Islamic law encourages and even obligates Muslims to study these sciences[11].

Al-Faruqi believes that the process of Islamization of knowledge is not the process of Islamizing expertise, as the literal meaning of Islamization of knowledge suggests, but rather refers to the purification of factual expertise from destructive elements such as ill intentions, ignorance, bias, envy, and others. Islamization also simultaneously involves injecting Islamic principles into the principles, methodologies, strategies, data, objectives, information, and inspiration of a discipline, such as in the field of science and technology[12].

The initial meaning of the Islamization of knowledge is to add Islamic values, particularly those derived from the Quran, as the foundation of existing social science theories. One example is the Islamization of sociology, which incorporates Quranic verses related to family life, social issues, law, and culture into existing sociology textbooks. However, upon critical examination, the goal of this movement is not to incorporate Islamic references into the existing knowledge database, but rather to evolve the social sciences with an Islamic epistemological paradigm.[13].

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[10] Zauddin Sardar, *Explorations in Islamic Science*, British Library R & D Report (London: Mansell, 1989).
[11] Mohd Nasir Omar, *Gagasan Islamisasi Ilmu* (Kuala Lumpur: Utusan Publication, 2005).
[12] Mohd Nasir Omar.
[13] Anis Ahmad, "Islamization of Knowledge: A Futurist Perspective," in *Islam and Knowledge*, 2020, https://doi.org/10.5040/9780755607501.ch-011.

The emergence of the Islamization of knowledge in the field of philosophy is based on the effects of Western capitalism and imperialism on Islamic countries, which resulted in the use of European languages as administrative languages. There are three responses to this condition. First, some reject the Western education and thinking system. Second, the education system is adopted to facilitate and become part of the structure of imperialist power, to gain economic benefits by establishing friendships with Western nations. The third response is to adapt the features of this new system that are considered economically, politically, and educationally beneficial for the Muslim community while incorporating elements of religiosity into it. Unfortunately, none of these responses has the potential to give birth to independent, creative, and holistic thinking. The Islamization of knowledge then emerged to challenge the assumptions of Western social sciences and produce holistic knowledge based on the Islamic epistemological paradigm[14].

In essence, Sardar is one of the proponents of the Islamization of knowledge in philosophy. Still, according to Sardar, Islamization is not simply the synthesis of modern sciences with Islamic sciences. Islamization should begin with constructing a worldview based on Islamic epistemology. According to Sardar, the values of the Middle Ages had a direct or indirect influence on the development of knowledge during and after that era. This is also a factor that leads to a mismatch when applying such knowledge in countries with Islamic values and culture.

Modern rationalist science, according to Sardar, is based on Christian philosophy. Therefore, if there are changes to the underlying assumptions that alter that philosophy, it will also transform science into a new form. Sardar desires a science based on the assumptions found in Islamic teachings, which will then transform modern science into something distinct from what is currently evolving[15].

According to Sardar, there are two reasons for not using conventional Western technology: its subversive cultural nature and its highly destructive nature. When a technology, like the Concorde aircraft, lands in Bahrain, it also brings the ideology of its creators. It is not uncommon for technology to

[14] Ahmad.
[15] Ahmad.

be chosen not based on existing economic conditions, production, and organization, but rather determined by ideology and other factors[16].

## 3. Local Knowledge and Global Knowledge

The dichotomy between Sardar's concept of Islamic Science and the idea of the universality of knowledge is closely related to the dichotomy between local knowledge, often contrasted with global or universal knowledge. In this context, "local" implies aspects of plurality and relativity. Local knowledge can exist at the level of a village, region, country, or even in a more global sector. In this case, global knowledge refers to the contextualization based on social space and time. The dichotomy between the two is not a new phenomenon and has been a topic of discourse in the field of anthropology since World War II[17].

Global knowledge, in this context, cannot be equated with Western knowledge or even scientific knowledge. However, if global knowledge is understood as knowledge that is widely disseminated and easily accessible to people around the world, then in the context of natural resource management, that knowledge is often associated with scientific knowledge or Western knowledge, or Western science[18].

On the other hand, the Islamic science presented by Ziauddin Sardar at present is nothing more than a local science that can be precisely applied within the conditions of Islamic civilization. Local knowledge has its advantages compared to global knowledge, especially in terms of environmental aspects. Local knowledge generally focuses specifically on the local conditions surrounding it. For example, local knowledge may hold the best insights into how a plant grows and develops over time or how bird migration occurs. Local knowledge can also indirectly identify the impact of a phenomenon, such as the socio-cultural impact resulting from the use of biological resources[19].

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[16] Ahmad.

[17] Wenda K.. Bauchspies, Jennifer. Croissant, and Sal Restivo, *Science, Technology, and Society : A Sociological Approach* (Malden: Blackwell Pub., 2006).

[18] Ezra M. Choesin, "Connectionism: Alternatif Dalam Memahami Dinamika Pengetahuan Lokal Dalam Globalisasi," *Antropologi Indonesia* 0, no. 69 (2014), https://doi.org/10.7454/ai.v0i69.3440.

[19] L. Failing, R. Gregory, and M. Harstone, "Integrating Science and Local Knowledge in Environmental Risk Management: A Decision-Focused Approach," *Ecological Economics* 64, no. 1 (2007), https://doi.org/10.1016/j.ecolecon.2007.03.010.

This is what later becomes one of the factors why Sardar wants to highlight environmental issues. Sardar himself is one of the figures who emphasize the ecological damage resulting from the development of Western science. In addition, Sardar's thinking is also greatly influenced by environmental figures such as Jerome Ravetz and Rachel Carson. This background forms the basis of Sardar's thinking in advocating for a local knowledge system within the Muslim community.

Local knowledge indeed has great potential, particularly in terms of its compatibility with the surrounding environment. However, this type of knowledge also needs to be understood as having many limitations, especially in comprehending complex environmental issues and navigating significant uncertainty[20]. Based on these reasons, there is a need for the development of a robust social system among local knowledge experts before this knowledge system can be relied upon to solve existing societal problems, especially those that are complex.

There are still a few Muslim scientists working within the framework of the Islamic science paradigm, which means that their knowledge is not yet mature. Islamic science is still unable to stand on its own. Western science is still needed to identify the problems that exist in Islamic civilization. The dichotomy between local science, in this case Islamic science, and global science, often proposed by Sardar, will likely cause Islamic civilization to fall further behind, as it must re-explore what was already known to humans through Western science and adapt it to Islamic epistemology.

The distinction between local and global knowledge is gradually fading over time as the political categorization of the 19th century, between domestic and foreign, diminishes. Local knowledge must be interdependent with international knowledge, where globalization will always incorporate localization values, so local knowledge should not be seen as isolated and purified. The term "universal" itself should be understood as being able to move from one place to another while adapting to the specific context in which that knowledge is applied.[21].

[20] Lucky Zamzami, "Sekerei Mentawai: Keseharian Dan Tradisi Pengetahuan Lokal Yang Digerus Oleh Zaman," *Antropologi Indonesia* 34, no. 1 (2014), https://doi.org/10.7454/ai.v34i1.3195.

[21] Bauchspies, Croissant, and Restivo, *Science, Technology, and Society : A Sociological Approach*.

The connectionist model is one option for breaking down the boundaries between local knowledge and global knowledge. This model, developed in cognitive anthropology, aims to understand how old and new knowledge are integrated to generate interpretive schemes and actions relevant to existing social situations. Thus, the encounter between local expertise and global knowledge does not always result in choosing one over the other. If we follow this model, the differences between local expertise and international knowledge will no longer be significant[22].

In reality, it must be acknowledged that the Western world currently dominates the exploration of the universe. Therefore, Islamic science should not be forced to completely detach itself from Western scientific knowledge. In this context, the idea of Islamicizing Al-Faruqi's knowledge is more reasonable than simply forming a new scientific knowledge system built on an immature epistemological basis. The connectionist model can provide a middle ground where Islamic science can maintain its values and scientists can still work on complex topics that may not be solvable solely through Islamic science.

## 4. The Position of Islamic Science in the Universality of Western Science

The future of Islamic science is still uncertain, given the strong dominance of Western science, which can even influence religious studies. There is doubt about how Islamic science can sustain itself in the face of the Western desire to make their values universal, with the emergence of universal characteristics in the development of the philosophy of science. These universal characteristics simultaneously perpetuate their modern scientific paradigm above other local knowledge paradigms.

Sardar certainly recognizes that there needs to be a strong argument to defend the sustainability of Islamic science while criticizing the universal concepts brought by the West in the development of their knowledge. One of the reasons Islamic science is still upheld is that the universality of Western science is not something autotelic or a priori, but rather a historical coincidence[23]. f we consider the history of argumentation development, it is reasonable to regard the progress of knowledge and civilization in the Eastern world, including India, China, and Islamic civilization, as equally significant as that in the West in the past. It is a historical coincidence that

[22] Choesin, "Connectionism: Alternatif Dalam Memahami Dinamika Pengetahuan Lokal Dalam Globalisasi."
[23] Sardar, *Explorations in Islamic Science*.

Western knowledge and values are more widely known to the public than those originating from the East.

Sardar further explains that there are two types of paradigms in formulating contemporary Islamic epistemology. These paradigms are the scientific paradigm and the behavioral paradigm. The scientific paradigm emphasizes the principles, concepts, and vital Islamic values that are relevant to specific studies. On the other hand, the behavioral paradigm focuses on determining ethical boundaries, which allows scholars and scientists to work freely[24].

From the perspective of the philosophy of science, Sardar's statement indicates that Islamic Science can have two roles. These roles are related to the epistemic value and non-epistemic value of knowledge. Islamic Science can either stand as an epistemic paradigm, alongside the rapid globalization of Western science, or it can serve as an ethical paradigm for scientists. Ziauddin Sardar wants Islamic Science to play a role in both aspects. However, if we want to be realistic, the most feasible condition at present is to use it as an ethical guide for scientists rather than forcing it to be the epistemic foundation for the development of knowledge. This is also supported by Sardar's thinking, which focuses on the environmental impacts of Western science.

Western Science, which has become universal, has proven to have many shortcomings that environmental figures like Rachel Carson have revealed. Rachel Carson's actions subsequently led to the emergence of Eastern values as alternative paradigms in science and development. Islamic Science, as conveyed by Ziauddin Sardar, has a responsibility towards society and considers the impact of the knowledge it develops, unlike Western science, which tends to disregard social, political, and ideological influences, focusing solely on the development of expertise. This is also related to the characteristic of Islamic Science, which takes into account human feelings[25].

The concept of universality in science advocated by the West has had a significant influence on the impact of scientific development during the Green Revolution. Many studies conducted by environmental experts on the dangers of pesticides were ignored by scientists at that time. These studies were never utilized by scientists until Rachel Carson's work titled "Silent Spring" shook the world. This case illustrates how knowledge that has not

[24] Taufik and Yasir, "Mengkritisi Konsep Islamisasi Ilmu Ismail Raji Al-Faruqi: Telaah Pemikiran Ziauddin Sardar."
[25] Azhar, "Sains Islam Vs Sains Barat: Analisis Amalan Dan Perbandingan."

been universally accepted is disregarded in Western science. The paradigm of using synthetic pesticides, which has become the norm in science, is considered more universal than the paradigm that criticizes its use.

It took a considerable amount of time, from the post-World War II era until the publication of Rachel Carson's work, to change the paradigm of integrated pest management. This lengthy period resulted in an enormous impact on the environment. This prolonged paradigm shift is one of the consequences of the concept of universality in science offered by the West. In this regard, according to Feyerabend, science, or Western science in this case, is considered to have been comfortable sitting on its "throne," refusing to accept truths from other forms of knowledge[26]. This is certainly different when compared to Islamic science. The Islamic values in Islamic science do not simply disregard other systems of knowledge and do not easily dismiss paradigms outside of the normal science.

Referring to the relationship between local and global science, an alternative that can be proposed is to keep modern science as a Western legacy in its place, but not make it the norm of science, let alone the only knowledge that is worthy and applicable to all cultures. Islamic science, along with other forms of knowledge, stands on their epistemological foundation and becomes an alternative with the same position as Western science or global science.

## 5. Islamic Science as a New Paradigm

Islam as a paradigm means that Islam is not only seen as a religion with a set of rituals or as a law with rules and prohibitions, but as a comprehensive and systematic paradigm. This paradigm encompasses principles and a framework of concepts found in the Quran and Sunnah. These principles form the general rules of behavior and development and establish the general boundaries within which the Muslim civilization must grow and flourish[27].

Furthermore, according to the thoughts of Thomas Kuhn, something is said to be a paradigm if it is collectively owned or believed by a scientific community, where the members of that scientific community believe in that

[26] Ibnu Farhan, "Anarkisme Epistemologis Paul Karl Feyerabend Dan Relevansinya Dalam Membentuk Pandangan Moderasi Beragama," *Analisis: Jurnal Studi Keislaman* 20, no. 2 (December 30, 2020): 109–30, https://doi.org/10.24042/ajsk.v20i2.7605.

[27] Kurnia Sari Wiwaha, "EPISTIMOLOGI PARADIGMA ISLAM: (Studi Pemikiran Ziauddin Sardar)," *Religious: Jurnal Studi Agama-Agama Dan Lintas Budaya* 3, no. 1 (2018): 70–79, https://doi.org/10.15575/RJSALB.V3I1.3673.

paradigm[28]. Based on the statement, if Islamic science is to be considered a paradigm, there must be a scientific community that first believes in it as a paradigm and adopts it as the principles and standards of scientific practice. Islamic science must first gain popularity among Muslim scientists, creating a community that embraces it as a paradigm.

When looking at the history of Islamic scientific knowledge, it can be seen from two perspectives. Firstly, Islamic science as a field that has its own paradigms and history within it. As a discipline, Islamic science encompasses many theories, some of which form a paradigm that at one point dominated normal science. At certain periods, scientific revolutions occur, leading to paradigm shifts. On the other hand, Islamic science can also be viewed as a paradigm within a larger scientific community.

According to Thomas Kuhn's paradigm theory, before expecting a scientific revolution that brings the Islamic science paradigm to the forefront and even dominates normal science, it is necessary to ensure that there is a crisis within the old paradigm, in this case, the Western science paradigm. This paradigm crisis is related to the impact of rapid scientific development during the industrial and green revolutions on the environment.

Paradigmatic errors in the development of scientific knowledge have long occurred, especially in the relationship between economics and ecology, which are often seen as contradictory or opposing. Modern society has been trapped by the capitalist economic system, replacing the natural and integrated traditional informal economic systems with a formal modern economic system that relies on modern technology and scientific instruments to dominate and conquer the surrounding environment in pursuit of human prosperity[29].

The origins of the Western scientific crisis, when traced back far enough, can be found in the initial use of chemicals in agriculture. Most of the synthetic chemical industry for pest control itself emerged during World War II. Like technology born during wartime, initially, these chemicals were intended for war purposes. This technology was later found to be useful for killing insect

[28] Paul Hoyningen-Huene and Peter Lipton, "Reconstructing Scientific Revolutions: Thomas S. Kuhn's Philosophy of Science," *American Journal of Physics* 61, no. 11 (1993), https://doi.org/10.1119/1.17343.
[29] Alexander Sonny Keraf, *Etika Lingkungan Hidup* (Jakarta: Penerbit Buku Kompas, 2010).

pests, which were initially used as test specimens before eventually being used to harm humans[30].

The emergence of synthetic pesticide uses in the field of agriculture itself later became a paradigm due to the undeniable need for pesticides after World War II. Data shows that in the 1951-1960 decade in the United States, 34% of agricultural production was lost/damaged due to pest attacks. The total losses caused by plant-damaging organism attacks in 1970 were estimated to be around 11.1 billion US dollars, with a breakdown of 5.5 billion US dollars from pest attacks, 400 million US dollars from nematode attacks, 2.7 billion US dollars from plant disease attacks, and 2.5 billion US dollars from weed infestations[31].

From the facts found in the field, it can be known that the economic factor plays a crucial role in driving the need for synthetic pesticides in the field of agriculture, particularly in the control of pests and plant diseases. This need then led to the theory that synthetic chemicals could be effectively used for pest and plant disease control, which eventually became a paradigm that dominated normal science in the field of agriculture.

This paradigm was embraced by scientists and practitioners in the field of agriculture worldwide at that time. As Ziauddin Sardar stated about Western science, this paradigm then displaced theories that did not align with the existing paradigm of pest and plant disease control at that time. As Rachel Carson revealed, many studies on the dangers of pesticides during that time were disregarded by the scientific community[32]. If we refer to Thomas Kuhn's theory, these negative impacts can be considered anomalies in the field of agriculture.

Neglecting these anomalies does not automatically dismiss the theory. These anomalies then drive more and more research aiming to prove the environmental impacts. The peak of these anomalies was when Rachel Carson wrote the book Silent Spring, which significantly brought these anomalies to the surface, causing a crisis in the field of agriculture and other fields that also use synthetic chemicals to control certain organisms, such as

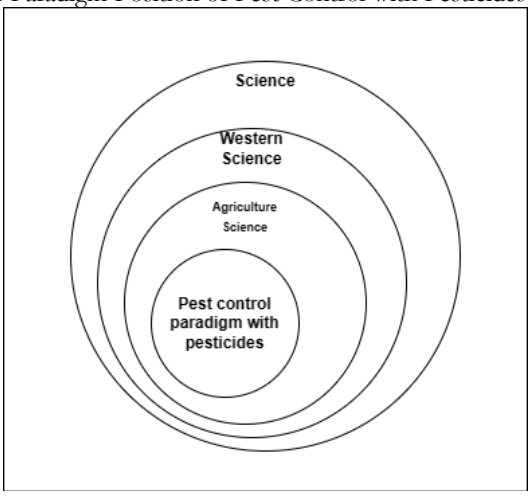
[30] Rachel Carson, *Silent Spring*, ASMSU/Spartans.4.Spartans Textbook (Boston: Houghton Mifflin, 2002).
[31] Anthony William Aldridge Brown, *Ecology of Pesticides*, Wiley-Interscience Publication (New York: Wiley, 1978).
[32] Carson, *Silent Spring*.

in the field of health, where they are used to eradicate mosquitoes and other disease-causing insects.

This crisis then led to a scientific revolution in the field of agriculture, giving birth to a new paradigm known as integrated pest management. This had a significant impact on food policies worldwide. In Indonesia, this policy change only occurred at the end of the New Order era, specifically during the Pelita III era. The government established integrated pest management as the basic policy for every plant protection activity. The legal basis for the implementation of integrated pest management in Indonesia is based on Presidential Instruction No. 3 of 1986 and Law No. 12 of 1992 concerning plant cultivation systems[33].

Scientific revolution has indeed occurred in the field of agricultural science, but it doesn't stop there. This crisis and scientific revolution have created an anomaly in Western science in general, which has dominated the development of knowledge in the modern era, including in the field of agricultural science. The paradigm of pest control with synthetic pesticides is one of the paradigms that resulted from the scientific process of scientists who adhere to the Western scientific paradigm. This condition can be depicted through the Venn diagram below:

Figure 1. The Paradigm Position of Pest Control with Pesticides in Science




In the diagram, the paradigm of pest control with synthetic pesticides is considered part of the set of agricultural sciences. Agricultural science itself

[33] Kasumbogo Untung, *Pengantar Pengelolaan Hama Terpadu*, 2nd ed. (Yogyakarta: Gajah Mada University Press, 2006).

then becomes part of Western science. Western science itself is one of the paradigms and parts of the set of sciences in general. This is the condition that occurs in the modern era, where all fields of knowledge are part of Western science. The branches of science themselves are the result of the Western scientific paradigm.

The anomalies and paradigm crises in one of the branches of science are the effects of paradigm errors previously proposed by Sonny Keraf. These paradigm errors are anomalies that have long been ignored by scientists working for the Western scientific paradigm. Just like the anomalies in agricultural science, anomalies in Western science then surface due to the presence of crises and scientific revolutions in one of the branches of science formed by the Western scientific paradigm. These anomalies then develop in such a way that they can become a crisis for Western science, where Eastern scientists over time begin to seek alternative paradigms to the Western scientific paradigm.

From what happened in the above case, it can be known that there is a connection between the anomalies and crises that occur in one branch of science in Western science with the Western scientific paradigm. In order for Islamic science to be accepted as a replacement paradigm for the Western scientific paradigm, it needs to first resolve the crisis that occurs in one branch of Western science by bringing the core values of the Islamic scientific paradigm.

Ziauddin Sardar, with his concept of Islamic science, becomes part of the anomaly by criticizing some gaps that occur in Western science. If environmental figures highlight the environmental impacts as one of the anomalies and some philosophy of science figures tend to criticize the concept of value-free Western science, Ziauddin Sardar in this case combines both by adding other aspects related to the universality of knowledge and development.

Islamic science as a paradigm offers a different approach compared to Western science. If Western science focuses on breaking down complex problems into smaller parts that are then solved with specific knowledge, the Islamic science offered by Sardar requires the integration of knowledge to solve complex problems.

The approach will distinguish how both scientific paradigms deal with different scientific opinions. Western science tends to reject views that are not based on the same scientific method. This is different compared to

Islamic science, which not only considers opinions from other branches of knowledge but also views from systems of knowledge outside of scientific knowledge. The different approaches will then distinguish how these two scientific paradigms handle different opinions from different branches of knowledge. Western science tends to reject views that are not based on the same scientific method. This is different compared to Islamic science, which not only takes into account opinions from other branches of knowledge but also views from knowledge systems outside of scientific knowledge.

## D. Discussion

Ziauddin Sardar proposes the concept of Islamic science as a critique of the Islamization of knowledge, which is essentially a response to the influence of the universality of knowledge put forward by the West. Islamic science itself can be seen as a paradigm, where scientists work within an ethical framework, which in this case is the Quran. The characteristic that distinguishes this paradigm from the Western scientific paradigm lies in its attachment to values, the integration of different fields of knowledge, and how it deals with theories and knowledge from outside the dominant scientific paradigm. In other words, Islamic science accommodates local knowledge rooted in the local culture, enabling it to adapt to the local environment.

Islamic science is a comprehensive paradigm, similar to Western science, that can serve as a framework for scientists from various fields of knowledge. The Islamic paradigm attempts to critique the concept of universality, which has been one of the values embraced by the Western scientific paradigm. This concept has been one of the reasons why scientific revolutions have occurred slowly. This has led scientists to be less sensitive to the environmental impacts of scientific developments. The value of universality tends to perpetuate branch paradigms that work for the Western scientific paradigm, which in the modern era has overly separated economic interests from ecological aspects. This crisis is then addressed by Ziauddin Sardar's Islamic science, which tends to be more open by shedding the value of universality and adjusting knowledge according to local cultural roots.

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