



## Axiology of Science and Its Benefits for Humanity

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### **Abstrak**

Aritkel ini membahas peran aksiologi sebagai cabang filsafat yang menelaah nilai-nilai dalam ilmu pengetahuan serta kontribusinya bagi kehidupan manusia. Di tengah kemajuan sains dan teknologi yang pesat, dimensi etika dan moral dalam pengembangan ilmu sering kali terabaikan, sehingga menimbulkan potensi penyalahgunaan. Aksiologi hadir sebagai panduan nilai yang mengarahkan ilmu untuk tidak hanya mengejar efisiensi dan kemajuan teknis, tetapi juga memperhatikan dampak sosial, budaya, dan ekologis dari penerapannya. Penelitian ini menggunakan metode kualitatif-deskriptif dengan pendekatan studi pustaka (*library research*), yang bertumpu pada analisis literatur dan pemikiran tokoh-tokoh filsafat ilmu serta data konseptual dari berbagai sumber ilmiah. Hasil kajian menunjukkan bahwa ilmu pengetahuan yang berpijak pada nilai-nilai kemanusiaan akan lebih bermanfaat dalam membentuk masyarakat yang adil, berkelanjutan, dan beradab. Nilai etika dan moral dalam praktik keilmuan tidak hanya menjamin integritas ilmiah, tetapi juga memastikan bahwa hasil-hasil ilmu digunakan untuk kemaslahatan umat manusia secara menyeluruh. Dengan demikian, integrasi aksiologi dalam pendidikan, penelitian, dan kebijakan publik menjadi hal yang mendesak agar ilmu pengetahuan menjadi sarana emansipasi dan kesejahteraan bersama.

**Kata Kunci:** Aksiologi, Ilmu Pengetahuan, Etika Ilmiah, Nilai Kemanusiaan, Manfaat Sosial

### Abstract

This paper discusses the role of axiology as a branch of philosophy that examines values in science and its contribution to human life. Amid rapid advancements in science and technology, the ethical and moral dimensions of scientific development are often neglected, leading to potential misuse. Axiology serves as a value-based guide that directs science not only toward efficiency and technical progress but also toward considering the social, cultural, and ecological impacts of its application. This study employs a qualitative-descriptive method using a library research approach, based on the analysis of literature and the thoughts of philosophers of science, along with conceptual data from various scholarly sources. The findings show that science grounded in human values is more beneficial in shaping a just, sustainable, and civilized society. Ethical and moral values in scientific practice not only ensure the integrity of science but also guarantee that scientific outcomes are used for the greater good of humanity. Therefore, the integration of axiology into education, research, and public policy is imperative so that science becomes a means of emancipation and collective well-being.

**Keywords:** axiology, science, scientific ethics, human values, social benefit

### A. Introduction

Science has been a key pillar in the development of human civilization. Throughout history, humans have continuously sought, developed, and applied knowledge to understand the universe and improve their quality of life (Putri & Iskandar, 2020). However, behind the rapid advancement of science, there is a very important philosophical dimension to study: axiology. Axiology is a branch of philosophy that examines values, including moral and ethical values related to science. In the context of science, axiology asks: what is knowledge used for, who benefits from it, and whether its use brings good or harm (Suriasumantri, 1990).

The rapid development of technology and science often leaves humans trapped in the instrumental aspects of science, without considering human values. Nuclear technology, for example, can be used to generate environmentally friendly electricity, but it also has the potential for mass destruction if used as a weapon. This is where axiology becomes crucial as an ethical foundation to prevent science from losing its true direction and purpose (Purnasari & Sadewo, 2020).

In the history of thought, science was initially developed not solely for practical purposes, but as a form of contemplation of reality. However, in the modern era, science tends to be interpreted as a tool for controlling and exploiting nature. This view has given rise to a serious value crisis, where humans have begun to question whether everything science can do should actually be done. The axiology of science exists to restore the value dimension to the process of producing and applying knowledge. It questions the moral responsibility of scientists, the purpose of research, and the social impact of scientific findings. This is crucial considering that not all forms of knowledge bring benefits, and not all applications of technology bring good (Kaelan, 2009).

In the context of education and public policy, the axiology of science also helps establish priorities. Research that supports the general welfare, such as in health, the environment, and education, should be prioritized over research that solely pursues economic gain or political supremacy (Tharaba, 2019). More than just an ethical consideration, axiology helps humans recognize that science is not a neutral entity. It always develops within a specific social, cultural, and political context. Therefore, the results of science are never completely free from values. By recognizing this connection, humans can be more wise in utilizing the knowledge they possess.

In modern society, science has become a source of authority. Many major decisions in medicine, economics, and politics are based on scientific data and analysis. However, if these decisions are not accompanied by axiological reflection, there is a risk that science will be used to justify inhumane actions or actions that harm certain groups (Hidayatullah, 2017). The benefits of science for humanity are undeniable. Medical discoveries have extended life expectancy. Communication technology allows information to spread rapidly. However, all these benefits can turn into harm if not accompanied by moral and social awareness. For example, social media, as a product of information technology, can unite, but can also divide

society if misused. The axiology of science is also relevant in addressing global challenges such as climate change, social inequality, and humanitarian crises. Science must be directed towards solving these problems, not exacerbating them. Therefore, the integration of ethical values in research and technological innovation is an urgent need.

In academia, the importance of axiology is often overlooked. Many higher education curricula emphasize cognitive aspects and technical skills, while ethical and value dimensions receive less attention. This risks creating a generation of intellectually brilliant but morally impoverished scientists (Usboko, 2019). Science should be a tool of human emancipation, not oppression. By understanding axiology, we can ensure that science develops not only to generate power or wealth, but also for justice, wisdom, and the common good. Science must be able to serve as a bridge to a better life for all, not just a select few.

In the history of Islamic civilization, the concept of the axiology of science was actually introduced long before the development of modern Western philosophy. Figures such as Al-Ghazali and Ibn Khaldun taught that science should have a noble purpose and be directed towards bringing humanity closer to God and bringing benefit to humanity. However, in contemporary times, spiritual and ethical approaches to science are often considered unscientific. However, the integration of science and values does not necessarily diminish objectivity. In fact, by recognizing the existence of values, scientists can act more responsibly and sensitively to the social impact of their work (Suciati, 2015). The axiology of science also helps bridge the gap between the exact sciences and the humanities. Often, the exact sciences are considered superior because they are considered more "real," while the humanities are considered subjective. Yet, both have made significant contributions to shaping civilization. The exact sciences produce technology, while the humanities give that technology meaning and direction.

## **B. Methodology**

This study uses a qualitative-descriptive approach with library research methods. The main focus of this study is to explore and analyze philosophical thoughts related to the axiology of science and its relevance to human well-being. Data sources used are primary and secondary literature, including philosophy of science books, scientific journals, previous research results, and academic documents relevant to the study topic. The data collection procedure is carried out through an in-depth review of texts and scientific works that discuss the concept of axiology, ethical and moral values in science, and their application in social, cultural, and environmental life. The collected data is then analyzed interpretively to identify the role and benefits of science based on axiological values. The analysis is carried out using a philosophical-reflective approach, namely reflecting on and critiquing the conceptual meanings of science and its relationship to the values of humanity, justice, and sustainability. The goal is to build a comprehensive philosophical argument regarding the importance of integrating ethical and moral values in the development of science in the modern era.

## **C. Results and Discussion**

### **1. Direction and Objectives of the Development of Science from an Axiological Perspective**

Science, as a product of human intellect, cannot be separated from the value dimension that surrounds it. Axiology, a branch of philosophy that examines values, plays a crucial role in guiding how science is developed, used, and utilized. Without a strong foundation of values, science risks being used for destructive purposes or deviating from the well-being of humanity (Antariksa, 2012). Within an axiological framework, the development of science should not only focus on epistemology (how knowledge is acquired) and ontology (what is studied), but also on the ultimate goal of science itself. Questions such as "Why is this science being developed?" or "Who will benefit from the results of this science?" are important axiological reflections in determining the direction of research and development of science (Thorburn & Thorburn, 2019).

Axiology helps guide science so that it is not a neutral, value-free tool. Although modern science is often considered objective, the values underlying decision-making, from the selection of research topics to the implementation of the results, are unavoidable. Therefore, researchers and scientists are required to possess moral and ethical awareness in every step of their scientific journey. Without the intervention of axiological values, science can become a

destructive force. History records how science, which should have benefited humanity, was instead used to create weapons of mass destruction, over-exploit nature, and exacerbate social inequality. This demonstrates the importance of axiology's role as a guide.

In technological development, for example, axiology serves as a crucial foundation for determining ethical boundaries. Technologies ranging from genetic engineering, artificial intelligence, to personal data collection have generated numerous ethical debates. Axiology serves to provide guidance on whether a technological advancement is worth implementing or should be postponed due to its potential to harm human values (Shapin, 2020).

Human welfare, as the primary goal of scientific development, must be the starting point of an axiological perspective. Science should not be developed solely for industrial progress, economic gain, or political supremacy, but must prioritize human and environmental sustainability. Thus, the direction of science is directed toward humane and just goals. Axiology also facilitates dialogue between science and cultural and religious values. In many societies, scientific development is inextricably linked to local values and beliefs. The presence of axiology bridges potential conflicts between scientific innovation and prevailing societal norms. Science grounded in axiology is also better able to address global challenges such as the climate crisis, social inequality, and humanitarian conflict. A values-based approach to science encourages the development of solutions that are sustainable, inclusive, and based on social justice.

Furthermore, axiology inspires researchers to seek not only scientific truth but also social good. Research guided by humanitarian values will have a more positive impact on society, such as in the fields of health, education, and sustainable development. Higher education and research institutions should also incorporate an axiological perspective into their curricula and research ethics. This is crucial so that future generations of scientists will not only excel intellectually but also be morally wise and socially responsible in carrying out their profession.

In practice, axiology helps scientists make complex and challenging decisions. For example, in clinical trials of new drugs, consideration of ethical values such as patient consent, long-term impacts, and drug accessibility are crucial for science to truly benefit humanity. Axiology also emphasizes the importance of siding with vulnerable and marginalized groups. Value-oriented science will strive to correct structural injustices by providing relevant knowledge that benefits those most in need. In public policy, the role of axiology is evident in how research findings are used to establish just and inclusive policies. Value-oriented science can form the basis for policies that favor the public interest, not just a handful of elites or capital holders.

In the rapidly evolving digital and information age, the challenges of axiology are increasingly significant. Science and technology are advancing faster than ethical thinking. Therefore, the role of axiology is increasingly crucial to ensure that progress remains within the bounds of humanity (Thorburn & Thorburn, 2019). By combining knowledge and values, axiology creates harmony between practical needs and human moral aspirations. This is what distinguishes merely sophisticated knowledge from knowledge that is truly meaningful and beneficial. Axiology also teaches society to be critical and value-conscious users of knowledge. Society needs to understand that not all technological innovations automatically bring good and that they must be filtered through ethical and humanitarian considerations. The role of axiology in modern science has also sparked the concept of "transformative science," knowledge that not only explains reality but also transforms it for the better. This kind of knowledge becomes a means to fight for justice, prosperity, and environmental preservation.

Axiological awareness ultimately shapes a culture of responsible science. Scientists, educators, and policymakers become more sensitive to the social impact of the knowledge they produce, ensuring that scientific development remains grounded in the well-being of humanity. Thus, the role of axiology is crucial in shaping the direction and goals of science, ensuring that it becomes more than just a tool for intellectual exploration, but also a means to create a more just, sustainable, and dignified life for all humanity.

## 2. Benefits of Science in Human Life

Science is the result of human inquiry rooted in curiosity about the universe and ourselves. However, the existence of science cannot be separated from its underlying values, namely axiological values. Axiology, as a branch of philosophy that examines value and utility, plays a crucial role in determining the direction and goals of science, ensuring its positive benefits for humanity (Nasir, 2021). In a social context, science based on axiological values helps create a more civilized society. The knowledge developed is not solely for the sake of exploitation, but rather to strengthen human relationships. For example, advances in communications have

fostered social interaction across cultures and geographies, enabling people to understand each other, collaborate, and resolve conflicts more effectively.

Ethics in the development of communication technology is a concrete example of the application of axiology in science. Technologies such as social media or other digital platforms, when used with humanitarian values and social responsibility, can strengthen solidarity and promote human rights. However, without an axiological foundation, these technologies can become tools for spreading hatred and disinformation (Nasir, 2021).

Science also plays a central role in addressing social inequality. Various scientific approaches to public policy, such as data-driven education and health programs, have been proven to improve people's quality of life. This demonstrates that the benefits of science become more meaningful when directed toward humanitarian interests and social justice. In the economic sphere, science is the backbone of innovation and efficiency. Agricultural and industrial technology, and the digitalization of the economy have created new opportunities that improve societal well-being. However, axiological values are needed so that innovation does not only benefit a few but also brings broader economic justice (Ahmad Afan Zain, 2021).

The values of justice, honesty, and social responsibility are crucial in the application of economics. For example, in a technology-based economy (such as the digital economy), the application of ethical principles can prevent the exploitation of digital labor and monopolistic market practices that harm the wider community. Axiology helps balance efficiency and social support. The development of environmental science is also closely linked to axiological values. Ecological and sustainability science encourages humans to live in harmony with nature, rather than over-exploiting it. This knowledge becomes meaningful when used to maintain ecosystem balance for future generations.

Without a foundation in values, environmental science could be exploited for destructive corporate interests. Axiology serves as a moral safeguard that ensures that science is used for the sake of shared survival, not simply for short-term profit. Knowledge must be aligned with the preservation of nature and the well-being of humanity. In the cultural realm, science that respects local values and cultural heritage can strengthen a community's identity. Anthropology, history, and archaeology are fields that not only uncover the past but also maintain cultural continuity. With an ethical and appreciative approach, science becomes a tool for cultural preservation, not destruction (Luthfi Hadi Aminuddin, 2010).

The use of modern technology in preserving traditional culture also demonstrates the synergy between science and values. For example, the digitization of ancient manuscripts or the digital archiving of traditional music demonstrates how science is used to preserve cultural values. This enriches humanity's heritage and strengthens diversity. Science can also serve as a bridge between cultures. Cross-cultural research conducted with respect and openness to values can increase tolerance and understanding between communities. Axiological values encourage an inclusive and humanistic approach to all cultural explorations.

The benefits of science in cultural aspects are also evident in education. A science-based curriculum that respects cultural diversity and upholds humanitarian values creates a generation that is not only intellectually intelligent but also morally and socially mature. Such education strengthens integrity and social cohesion. From a spiritual perspective, science can go hand in hand with religious values, as long as it is not developed solely from a materialistic perspective. Knowledge of the universe, human biology, and the phenomena of life can increase awareness of the order and greatness of creation. This enriches the human spirit and fosters sensitivity to noble values.

In public policymaking, science grounded in axiology helps create inclusive policies that support marginalized communities. Evidence-based policy that also takes humanitarian values into account can achieve social justice and sustainable development. The main challenge in the application of science is ensuring that moral and ethical values are the foundation of every stage of its development. Without these values, science can become a destructive force. Therefore, values education is crucial in every discipline.

Collaboration between scientists, ethicists, and society is key to overseeing the development of science. Interdisciplinary discussions create space for reflection on values and moral responsibility, so that science does not wander aimlessly. Axiology also plays a role in shaping the integrity of scientists. Researchers who uphold the values of honesty, objectivity, and responsibility will produce reliable science that provides tangible benefits. This is crucial for maintaining public trust in science.

Ultimately, science guided by axiological values becomes a transformational force. It answers not only the questions of "what" and "how" but also the questions of "for whom" and "why." Thus, science becomes a tool for enlightenment and liberation of humanity from backwardness, injustice, and suffering (Tolchah, 2015). Therefore, it is crucial for society and educational institutions to continue instilling moral and ethical values in the development of science. Without axiology, science becomes directionless; but with values, science becomes a light that illuminates the path of humanity.

### 3. Ethical and Moral Values in Science

Science is the result of a rational, systematic, and methodological thought process aimed at discovering the truth and solving life's problems. However, in its implementation, science is not neutral. It constantly interacts with the moral and ethical values that develop within society. Therefore, it is important to examine how the application of ethics and morals in scientific activities influences the results and their impact on human life (Saada, 2023). In the history of scientific development, many major discoveries have had a significant impact on civilization. However, not all of these impacts are positive. When science is practiced without moral restraint, it can become a tool of domination, destruction, and even destruction. This is evident in the use of scientific technology in war, such as nuclear bombs, which kill millions of people and devastate the environment.

Ethical values in scientific practice serve as a moral filter that ensures that science is used for good and humane purposes. Scientific ethics encompass honesty in data collection, integrity in the preparation of results, and social responsibility for the impact of research findings. Without these values, science is easily misused by vested interests that conflict with the public good. Morality also plays a crucial role in shaping scientific orientation. For example, in the field of biotechnology, scientists face ethical dilemmas between promoting medical progress and respecting human dignity and rights. The application of morality in research determines whether an experiment is accepted by society or rejected for violating basic human values.

One concrete example of the application of ethics in science is medical research involving human subjects. This type of research must undergo a rigorous ethical process, including informed consent, protection of the subjects' rights, and assurance of their safety. These provisions stem from the moral awareness that humans are not merely experimental objects but rather dignified beings (Jayananda et al., 2021). The influence of ethics on the impact of science is also evident in scientific publication practices. Honesty in reporting data is a primary measure of a scientist's quality. Violations such as plagiarism, data manipulation, and fabrication of results not only damage an individual's reputation but also undermine public trust in academia.

In a social context, the application of moral values in science produces knowledge that serves the interests of the wider community. For example, research on climate change conducted with an ethical approach will pay greater attention to the fate of future generations and ecological justice for vulnerable groups most severely impacted. Ethics is also an important foundation in selecting research topics. Researchers with a moral conscience tend to choose fields relevant to humanitarian needs, such as health, education, and the environment. This demonstrates that science is not solely driven by curiosity or profit, but also by social concern.

In the field of information technology, the application of moral values significantly determines how technology is used. For example, the development of artificial intelligence (AI) must consider aspects of privacy, security, and the potential for discrimination. Without moral control, AI could become a tool of mass surveillance that threatens civil liberties (Baek et al., 2023). Science grounded in ethical values fosters sustainable innovation. This sustainability is not only seen from technical and economic perspectives, but also from the ability of science to avoid harming the environment or other living things. Thus, ethics guarantees the continuation of a more civilized and responsible civilization.

In education, the application of ethics in science teaching instills in students the importance of moral responsibility in using their knowledge. Future scientists are required not only to be intellectually intelligent but also to be wise in choosing how and for what purposes that knowledge is used. Scientific ethics also strengthens public trust in science. When the public sees that scientists are committed to moral values, trust in research results increases. This is crucial for science to be truly adopted as a guide for policy-making and daily life.

When moral values are consistently applied, science becomes a transformative force that not only enlightens but also improves the welfare of humanity. Science becomes a tool for improving the quality of life, alleviating poverty, reducing inequality, and maintaining social

harmony. Conversely, when science is practiced without an ethical foundation, it can lose its direction and contribute to widespread harm. Past cases of unethical human experimentation provide an important lesson that science that ignores morality will lead to suffering. In international relations, ethics in scientific practice can support fair and equitable global cooperation. Ethical technology transfer, sharing research results without exploitation, and humanitarian collaboration are examples of how morality strengthens the positive impact of science globally.

The application of moral values also protects science from ideological bias and narrow economic interests. Ethical science does not bow to political or industrial pressures but instead sides with truth and the public interest. This is crucial for maintaining the purity and objectivity of science. Scientific ethics also provide space for dialogue between disciplines and with the general public. Morally conscious scientists not only speak to fellow scientists but are also open to public criticism, local cultural values, and the aspirations of the common people. This strengthens the social legitimacy of science (Burstein et al., 2023).

In a modern world full of challenges such as climate crises, pandemics, and global conflicts, science is needed that is not only technologically sophisticated but also morally sound. Without an ethical foundation, scientific solutions can turn into new problems. Therefore, scientific ethics education needs to be an integral part of the curriculum of all fields of study. Students are not only taught the scientific method but also encouraged to reflect on the moral consequences of applying the knowledge they learn. This will produce scientists who are not only intelligent but also wise. Ultimately, it can be concluded that ethical and moral values are not an addition to scientific practice, but rather the foundation that determines the direction, impact, and sustainability of science in human life. Without these values, science loses its soul and can become a threat to life itself.

#### D. Conclusion

The axiology of science, as a branch of philosophy that examines the value and benefits of science, plays a crucial role in determining the direction, goals, and impact of scientific development on human life. Science is not merely viewed as the result of rationality and experimentation, but must also be guided by humanitarian, moral, and social values so that its benefits are truly felt broadly and sustainably. Without axiological considerations, science risks being used destructively or unfairly, thus deviating from its essence as a tool for improving the quality of human life. By applying ethical and moral values in every scientific process, from determining research topics and conducting experiments to utilizing scientific findings, it becomes a means of dignified development. This creates a society that is not only technologically advanced but also socially and spiritually civilized. Thus, axiology is an essential aspect in ensuring that science always sides with the welfare of humanity and does not deviate from the fundamental values that uphold justice, responsibility, and the common good.

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