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RESEARCH ARTICLE

ETHICS IN THE DEVELOPMENT OF BIOSCIENCES AND BIOTECHNOLOGY: A PROCESS SYSTEM AND ENDLESS DEBATE

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ABSTRACT

Biotechnology is applied of bioscience and one of the modern technologies in the field of biology, including in agriculture. Since the discovery of Dolly sheep cloning in 1997 and baby tube technology, ethics in biotechnology (bioethics) becomes a discourse. Ethics as values and moral principles used by a person or a group as a guide to his behavior. Ethics as a set of principles and values relating to morality (what is considered good or bad). Ethics as a science that studies human behavior from the point of norm and moral values. Bioethics is a kind of science that offers problem solving for moral conflicts that arise in the actions, practices of medicine and life sciences. As a rational ethic, bioethics stems from the analysis of scientific, biological, and medical data. The validity of human intervention is examined. Human transcendental value is highlighted in terms of the creator as the holder of absolute value. The pro-contra discourse of biotechnological products between a group of religionist, ethicist, and NGOs on the one hand with a group of biotechnologist and society on the other hand, will not end until now and. Nevertheless, the development of biotechnology is very useful for human health and treatment, improving livestock, fish populations, and increasing the agricultural production like corn hybrids and HYVS. The religionist, ethicist, and NGOs continue to criticize the biotechnology products, and biotechnologists continue to work, because everything that happens in this world is God's will.

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INTRODUCTION

The world's population is growing according to geometrical progression, food adds up by arithmetic progression, while natural resources to produce food are increasingly scarce. The solution to this problem is apply modern agricultural methods that natural resource-saving and full of technology which is nothing else that uses biscience and biotechnology to produce more foodstuffs to meet the growing needs of the world's population. It is clear that bioscience and biotechnology development is needed to meet human needs for food, health and environmental sustainability. Biotechnology is the practice of the use of plants, animals and microorganisms such as bacteria, as well as biological processes such as the maturation of fruit or bacteria that breaks down compost-for some benefits. In industry, medicine and agriculture, biotechnology is used to produce food, medicine, disease tests and produce new crops.

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Over time, biotechnology has formed the basis of learning about plants, animals, diseases, and supports the development of treatment (Anonymous, 2017). According Ruane and Sonnimo (2011), agricultural biotechnologies represent a broad range of technologies used in food and agriculture for the genetic improvement of plant varieties and animal populations, characterisation and conservation of genetic resources, diagnosis of plant or animal diseases and other purposes. Discussions about agricultural biotechnology have been dominated by the continuing controversy surrounding genetic modification and its resulting products, genetically modified organisms (GMOs). The polarized debate has led to non-GMO biotechnologies being overshadowed, often hindering their development and application. However biotechnology has the potential to have a positive and negative impact on the environment. Positive impacts can be used to support efforts to restore endangered species and control or even eradicate predators and pests that feed on plants and animals. Organisms can even be engineered to eliminate waste and pollute the environment. Biotechnology related to the environment usually means introducing new organisms into existing situations. For example, agricultural and food biotechnology investigates case studies of genetically modified organisms and the

environmental impacts these organisms cause. It is important to make a proper risk assessment and benefit before releasing genetically modified organisms to prevent environmental damage and to conserve our biodiversity. According to McLean (2000), modern biotechnology with a focus on molecular biology and human health is all related to a better human future. But at the same time, the development of modern biotechnology raises concerns, even the fear that humanity gets too much power or too little choice over human evolution and destiny. The political climate absorbed by the fierce "moral approach" to science policy, has raised public interest in biotechnology products. The biotech industry is increasingly recognizing that not only regulatory schemes, but also controversial public and political debates can allow or inhibit biotechnology research and development.

As technology advances, scientists have been able to develop more precise and powerful tools to produce plants and animals with certain characteristics aimed at benefiting to the farmers and consumers. Paula (2001) and Crop Biotech Update (2015) state that the development of biotechnology has sparked debate and confusion around the world due to the diverse messages from various circles, whether scientists, academics, critics, industry, religious representatives or consumer bodies. The worldwide debate on the pro and contra of biotechnology is associated with ethical issues. While agriculture has long been the topic of philosophical, religious and political reflection, it was not until the end of the 20th century that systematic thinking about values and norms associated with food systems such as agriculture, food processing, distribution, trade and consumption began to be discussed in the context of agricultural ethics. Additionally, by placing biotechnology within the scope of globalization, the public debate has turned to discussions of ethical and social impacts.

According to McLean (2000), the development of biotechnology in the context of ethics (bioethics), should at least answer five questions:

- What are the predictable benefits and losses for biotech innovation, both in the research and application phases, and which actions will produce the best overall consequences?
- Who are the relevant ethical stakeholders, and what rights do they have? Which actions protect those rights? Is human dignity respected?
- Which option treats everyone equally, unless there is an ethical reason to treat it differently? Biotech fairness can sustain the "need" as an innovative criterion.
- Which actions seek similarity? Of course, the recent SARS epidemic has raised concern for overall health and to create general conditions that maximize individual and communal welfare.
- Which option best develops virtue? And which virtues, such as trust and affection, may be highly relevant to the development of biotechnology and human health?

The purpose of this paper is to study ethics in the development of biotechnology and to occupy where each group positions the pros and cons of developing biotechnology and what each group should do in the future.

Etymology of ethics and bioethics

According to Dictionary of English-Indonesia by Echols and Shadily (1992: 219), Moral = *Susila* (su = good, sila = basic, susila = basics of good); Morality = *kesusilaan*; While Ethical=Ethics is *tata susila*. While ethically (ethical) is defined as proper, decent, civilized, *susila*. So the word moral and ethical use is often interchangeable and synonymous, which actually has different meanings and meanings. Moral is based on ethics, so the moral person must be based on ethics. Uno (2004) distinguishes the notion of ethics with etiquette. Etiquette is derived from the French etiquette which means a good social intercourse between fellow men. Meanwhile ethics, derived from Latin, means moral philosophy and is the correct way of life in terms of culture, ethics, and religion.

Ethics is an offshoot of philosophy related to "rightness" or morality of human behavior. The word ethics also relates to the object of human behavior in certain areas, such as medical ethics, business ethics, professional ethics (advocates, accountants, journalists) and others. In this sense ethics is defined as the rules governing the behavior of a group of people that has been agreed upon by society as "good or bad" and "right or wrong". Note the quotes on good and bad words, which means that the determination of good and bad is always changing. It is also important to realize that the 'right thing' for one person may not be true for others and it is very difficult to balance this conflicting view. However, there are certain ethical positions to be considered, such as the view that all biotechnology products are safe for humans and the environment.

In general, 'ethics' is defined as the ideals, values or standards people use to determine whether their actions are good or bad. This is what people use to assess whether an issue or something is acceptable and accountable and determines responsibility and fairness. Ethics provides guidance that helps a person decide what to do. On the one hand, ethics is a set of universal norms documented through legal codes of practice, religious texts, literature and philosophy that are legal or professional. On the other hand, ethics is a value defined by a person or group that is personal, introspective, and therefore difficult to manage public discussion (Thompson, 2001 in Crop Biotech Update, 2015). The term *Bioethics* (Greek *bios*, life; *ethos*, behavior) was coined in 1926 by Fritz Jahr in an article about a "bioethical imperative" regarding the use of animals and plants in scientific research. In 1970, the American biochemist Van Rensselaer Potter used the term to describe the relationship between the biosphere and a growing human population. Potter's work laid the foundation for global ethics, a discipline centered around the link between biology, ecology, medicine, and human values (Wikipedia, 2017). Furthermore wikipedia explains that bioethics is the study of the ethical issues emerging from advances in biology and medicine. It is also moral discernment as it relates to medical policy and practice. Bioethicists are concerned with the ethical questions that arise in the relationships among life sciences, biotechnology, medicine, politics, law, and philosophy. It includes the study of values ("the ethics of the ordinary") relating to primary care and other branches of medicine. The field of bioethics covers much of human investigation, ranging from debates on life's limits (eg abortion, euthanasia), surrogates, allocation of scarce health resources (eg organ donation, rationing of health care) to the right to refuse medical treatment for religious or cultural reasons. Biotechnology experts often disagree among themselves on the limits of their proper discipline, debating whether the field should pay attention to the ethical evaluation of all questions involving biology and medicine, or just some

of these questions. Some bioethicists narrow down the ethical evaluation only with the morality of medical care or technological innovation, and the time of human medical care. Others will broaden the scope of an ethical evaluation to include the morality of all actions that can help or harm the organisms which capable of feeling fear.

The scope of bioethics can evolve with the development of biotechnology, including cloning, gene therapy, life extension, human genetic engineering, astroethics and space life, and basic biological manipulation through DNA, XNA and altered proteins. These developments will affect future evolution, and may require new principles that address the core of life, such as biotic ethics that values life itself on their basic biological processes and structures, and seek their propaganda. One of the first areas addressed by modern bioethicists was that of human experimentation. The National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research was initially established in 1974 to identify the basic ethical principles that should underlie the conduct of biomedical and behavioral research involving human subjects. However, the fundamental principles announced in the Belmont Report (1979)—namely, respect for persons, beneficence and justice—have influenced the thinking of bioethicists across a wide range of issues. Others have added non-maleficence, human dignity and the sanctity of life to this list of cardinal values (Wikipedia, 2017). Furthermore wikipedia explains that another important principle of bioethics is its placement of value on discussion and presentation. Numerous discussion based bioethics groups exist in universities across the United States to champion exactly such goals. Examples include the Ohio State Bioethics Society and the Bioethics Society of Cornell. Professional level versions of these organizations also exist.

In regard to ethical standards, Anonymous (2017) states that the ethics that deal with biotechnology and its applications do not differ fundamentally from other situations. Ethics is practiced by everyone, every day. One common feature of ethics is that different people with different values often disagree about the 'right thing' for individuals and society. One reason for this disagreement is that one thing that benefits some people may not be beneficial to others. An example is the study of embryonic stem cells, which biotechnology researchers consider to have great potential for developing disease treatment. But the clergy and ethic groups object because it is considered to destroy human embryos that have the potential to become human. There is no right or wrong position in ethics, because individual experiences and views often lead to the way they make ethical choices. For example, someone with a strong environmental view might see genetically modified (GM) use of genetically engineered crops. But someone who has a strong scientific view of the world may see the use of GM crops as a natural extension of traditional plant breeding technology. Many new technologies are raising ethical concerns that may not be part of the worldview assessed by those who develop technology in the first place. Ethical discussions in agriculture are needed to determine what is right and wrong, what moral standards to use, and what is right to justify a single or collective action. Ethics in agricultural biotechnology therefore include value assessments that include the production, processing, and distribution of food and agricultural products.

The Food and Agriculture Organization of the United Nations asserts that ethical values determine the reasons for being a food value, welfare improvement, human health, natural resources, and nature (FAO, 2001 in Crop Biotech Update, 2015). CAST, 2005 (in Crop Biotech Update, 2015) notes that ultimately the goal of agricultural ethics is to "discover or develop clear, non-contradictory, comprehensive, and universal standards for assessing right and wrong actions and policies."

Ethics in biotechnology development

Ethics in Biotechnology Development: A Process System

If the term ethics and the development of biotechnology are assembled into an expression "Ethics in Biotechnology Development", in terms of systems science will be a process system, which consists of input, process, output, and outcome or impact. Well ethics and biotechnology development on a commercial scale (business) lies in the outcomes (impacts) of the biotechnology. If biotechnology development has a positive impact it is said that biotechnology is based on ethics. Conversely, if biotechnology development has a negative impact it is said that the biotechnology is not based on ethics (Figure 1). Thus the development of ethical or ethical biotechnology depends on the perspective of a society, generally between the saintist community on the one hand and the clergy and ethic groups on the other.

Ethics in Biotechnology Development: An Endless Debate

The Worldwhate Institute (2017) who interviewed Philip Bereano, pouted the Genetic Engeneering (GE) experts by saying none of GE's technology proved to increase food production or reduce world hunger. However, they are definitely raising funds for biotechnology scientists and profits for Monsantos of the world. Bereano further states that "Golden Rice" - with an increase in vitamin A levels - while those mentioned by GE supporters as an example of the benefits of GE, have not reduced blindness at all in the Third World and, in fact, are highly unlikely to do so because of the large amount Golden Rice to be eaten by children He may still not have a balanced diet with other nutrients needed to utilize vitamin A. There is a major ethical problem in this very simple technology-based reductionist model.GE's central dogma is the image of this genome as a series Lego, where you can bring out the green ones and put them in. In fact, however, the genome is very fluid and its parts interact.The Lego model is quite wrong, but it is used constantly in public discourse, regulation submission, and legislative testimony Biologists know how the genome actually works, but progress in or Ran professions can not be used for such discussion topics as they will challenge positions taken by industry funders. Scientists seeking to break that boundary, whether by scientific experiments or public writing, have largely been isolated and marginalized by the rich and powerful within the academic industry complex.

When Dolly's sheep cloned results were announced in 1997, ethicists and clerics in particular, as well as scientists are generally worried that cloning done on animals will be improved in humans. Although when it comes there is a cross between the pros and cons, but the cloning project continues. In 2002, cloning entered the most difficult stage when Severino Antinori and his Italian friends announced they had tried it on humans.

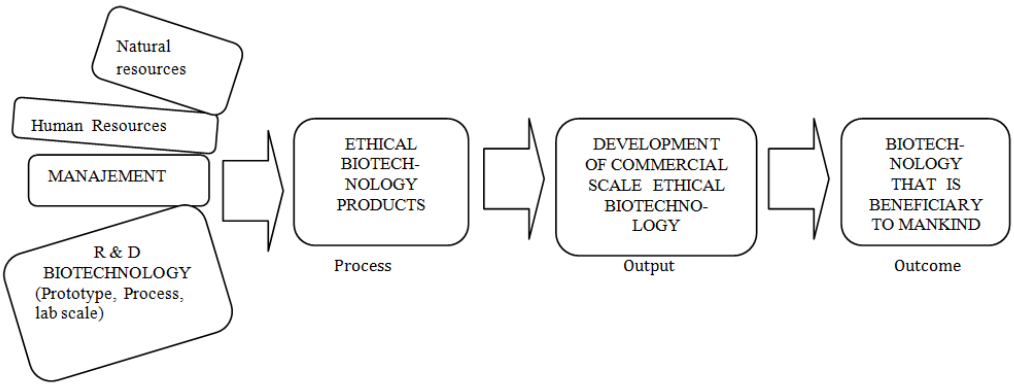

Figure 1. Ethical Biotechnology Development Process

Example:

INPUT	PROCESS	OUTPUT	OUTCOME
Field of Animal Biotechnology			
• Sheep • HR (researchers + workers • Management • Preliminary R & D • Scientific decisions	Field of Animal Biotechnology	Dolly sheep	• Beneficial breeders without the need to maintain stud (positive impact) • Lamb is susceptible to disease (negative impact)
Field of Plant Biotechnology			
• HR (researchers + labor) • Land • Management • Plant material • Business decisions	Hybridization Process	Corn and Cotton Hybrids	• Increasing corn and cotton production (positive impact) • Destroying insects beneficial to plants and polluting the environment (negative impact)
Field of Medical Biotechnology			
• HR (Expert Doctor in their field and workforce) • Laboratory • Management • Sperm and egg materials • Business decisions and married couples (couples)	Human Cloning Process	Test-tube baby	• Beneficial Couples who fertilize eggs are difficult in the womb (positive impact) • Infertile married couplers get direct offspring (positive impact) • Breaking nature as a normal marriage (religious and ethical assumptions)
Field of Nuclear			
• Human resources (atomic bomb and labor) • Land and buildings • Management • Radioactive Materials • Political decisions	The Atomic Bomb Process (Einstein)	Atom bomb	• Source of cheap electrical energy (positive impact) • Accelerate the elimination of humanity (negative impact)

The facts:

- The development of biotechnology is very rapid, while the bioethics based on the appreciation of faith values are slow, giddy and stammer in anticipation of the jumps of Biotechnology work.
- The newly rehabilitated Galileo case of the Catholic Church after the age of 500 years is a classic example of how religion is always left behind compared to Biotechnology

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The problem:

How is the Ethics Standards for Biotechnology Development (eg cloning) for Business Purposes?
"What can be done must continue to be done" versus "that can be done but not worth doing". To what is the balance ?.

↓

There are two groups of Pro and Contra:

- Pro: bringing benefits to mankind in the real world (scientists) → just talking the real world
- Contra: to play with humanity and the overwhelming human intervention in God's creative work → only talk of the hereafter and the moral messages (clerical and ethic)

Finally Ethical or Unethical in Development of Biotechnology → Crosses between perceptions:

- Saintis and Ethicist-Religionist
- Nature and Faith
- Biotechnology and Religion
- Genetich engeenering and bioethics

→ Should it be a thesis-antithesis? Each has its own principles and justifications.

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This THESIS-ANTITHESIS s require moderation: it takes a SYNTHESIS, so that together leads to the purpose of life, that is to appreciate the dignity and the integrity of humanity

What was feared before actually happened. Early April 2002 human cloning results were announced "a woman was pregnant with cloned babies with two months' gestation". The problem then: "what can be done but not worth doing" versus "what can be done must continue to be done". To what is the balance?. Cloning results were criticized because animal tests show that many fetuses fall before birth. Even if successfully born, the cloning results are generally vulnerable and bring birth defects. If the weaknesses are imposed on human cloning, would not cloning action play with human dignity? If Dolly is now rumored to be sickly and vulnerable to illness, is not human cloning that would be born vulnerable to illness and sickly anyway? How can it be accounted for ethically-religiously excessive human intervention in God's creative works?

In fact the development of Biotechnology is very rapid. While the bioethics based on the appreciation of faith values run slowly, giddily, stammer in anticipation of the jumps of Biotechnology work. The scientific community-even more optimistic feel able to resist the consideration of faith. If clerics say all Biotechnology endeavors including cloning are directed at human welfare, scientists can show the same benefits. By pride themselves that every step of the research is accounted for, scientists want to show how the work of Biotechnology can be accounted for. According to Sumantri (1985), ethics (moral philosophy) is one branch of philosophy that organizes the truth. Exemplified ethics in the scientific field, the process of discovering the truth scientifically has ethical implications for a scientist. Characteristics of the process is a moral category that melandassi ethical attitude of a scientist. Intellectual activity that puts truth as its ultimate goal will inevitably influence the moral view. Truth functions not only in the way of his mind, but also in the whole way of his life. In the community's attempt to uphold this truth, a scientist is called by his social obligations, not only as the analyzer of the material truth, but also as a good moral prototype.

In the field of ethics, a scientist's social responsibility is no longer providing information, but setting an example. He must appear in front of how to be objective, open, accepting criticism, accepting the opinions of others, staunchly in his position which he deems correct, and if necessary dare to admit mistakes. All these traits, along with other properties not mentioned here, are the ethical implications of the scientific discovery process. In the midst of a situation where all values are in turmoil, a scientist must come forward. His knowledge is a force that will give courage to face challenges. Likewise in a developing society, he must behave as an educator by giving example examples. The development of biotechnology is very progressive with surprising results. Scientists no longer appreciate faith. While placing the human figure more fully, the clerics and the ethicists only talk about the afterlife and the moral messages. That is why there is a clash between science and religion. The newly rehabilitated Galileo case of the Catholic Church after the age of 500 years is a classic example of how religion always lags behind biotechnology (Greg Soetomo, Science and Religiusity in Basis, December 1993: in Sularto, 2002). The phenomenon of rapid development of biotechnology penetrates human life, affecting the inner dimensions of man. Some people are afraid of his future, others see the development of biotechnology as part of an increasingly out of control biotechnology. The call back to nature, back to nature, or caveat Jack Ellul about the technological dangers that saw technological advances as moral decline already inadequate. Faith-in this case religion-needs to at all times reduce its moral teachings. The world of science and technology is the world of experiments with all mathematical formulas that include the need to account for every step taken. Science does not deal with faith, but becomes a problem when genetic engineering deals, for example, with a creation story. Scripture is finally no longer the only source to explain the phenomenon of creation. Another source often referred to is the theory of Pierre de Chardin with the famous expression of *creatio ex nihilo*, the creation of no thing. The rationality described by Karen Armstrong in History of God clarifies how the creation should be explained. Albert Einstein believes his theory of relativity will not affect the concept of divinity. Relativity is purely a matter of science and has nothing to do with religion (Armstrong, 1993). However, when Christians are let down by scientists such as Stephen Hawking who gives no room to God in cosmology, they may think God is anthropomorphically depicted as humans making things, but perfected through creatio ex nihilo Pierre de Chardin (Sularto, 2002).

Dolly's sheep cloning was cited as the most important breakthrough in biotechnology development during 1997, but according to Dr Kees Bertens ethicist from Atma Jaya University, Jakarta, the breakthrough of science is not necessarily the most important cause leaving controversy in ethical relation (Closing: Scientific Breakthroughs and Ethical Challenges in Ethical Perspective, Canisius , Yogyakarta 2001: in Sularto, 2002). Cloning is not performed only on embryonic cells, but also in adult cells. Cloning adult cells in mammals can be done by creating duplicates. Apparently there are no obstacles to apply the same technique to humans. The problem is, what is technically feasible to do?. Bertens compares this situation with a Scottish laboratory that produces Dolly sheep. Ian Wilmut and his team conducted 277 experiments to create a sheep embryo, but only 29 sheep embryos could live more than six days. All died before birth, except for Dolly's sheep. When the project is applied to humans, whose results are announced to the general public, the highest ethical principle that humans can not be made into toys is no longer merely a matter of religion institutionally, but humanity in general. The respect for human dignity is reduced. The World Health Organization (WHO) defines, as in religious ethics, human cloning must be rejected primarily because it is against human dignity and integrity. WHO affirms human intervention in creation is too great. The creation of man is God's right and sovereignty. Human beings are not allowed-though they can be science-mocked. The human honor of itself can not be disrupted. His integrity as a human must be respected. That is, if Dolly's sheep cloning has been shown to be facing high vulnerability, the cloning project of humans is increasingly obviously unethical. "Religious values have nothing to do with the values of science," says Dr Minda Peranginangin, a Christian theologian who firmly says, "The activities of science must be controlled and must be controlled by bioethics."

The affirmation of *Peranginangin* is analogous to the "technological imperative" according to the Bertens term: what can be done must continue. What happens to human cloning becomes clear "technological imperative". Some even say, the discovery of human cloning is analogous to the invention of the atomic bomb that destroyed millions of people in 1945. Using the term genetic engineering or genetic engineering, humanist and spiritualist (late) YB Mangunwijaya reminded

the need for control over natural processes in order not to cause environmental damage. If the findings were not controlled it would be feared to be monsters that disrupt the environment. Eric Houwink-colleague of Mangunwijaya, a biotechnologist-on the human cloning project does not see his objective and medical purposes (Modern Biotechnology: Bringing Us to Biosociety in Remembering YB Mangunwijaya Intellectual Struggle in the Anxiety Era, Kanisius, Yogyakarta 1999: cited by Sularto, 2002). Do nature and faith, biotechnology and religion, genetic engineering and bioethics, be thesis-antithesis or statements and arguments? Each has its own principles and justifications. Human cloning, for example, is said to be a lifesaver for infertile couples acquiring direct or beneficial married couples (couples) who fertilize the egg by difficult sperm in the womb. Meanwhile, ethicists and clerics hold firm to the principle that in Biotechnology, not everything that can be done is worth doing. These anthologies demand moderation: it takes a synthesis, so that together leads to the purpose of life, that is, the respect for dignity and humanity's integrity. The goal was developed both by genetic engineering and the preservation of eternal humanitarian principles. Concretely, if one of the religious rules, say the Catholic Church, affirms rejecting the tube baby, then ultimately the choice is returned to the conscience of each person. Even the question of euthanasia, the good death, which is still controversial, but in the Netherlands has only been legally permitted, but it is banned by the Catholic Church, as it may later evolve in the direction of: a return to the choice of conscience and case by case.

What about human cloning? Paus Johanes Paulus II, leader of the Roman Catholic Church, was consistent with his opinion when the issue of sheep cloning exploded in 1997. "It was a dangerous experiment", much less human. What will happen is the ongoing human cloning experiment, criticism and criticism on the basis of the principles of road ethics continue. Each with its argument: for the benefit of mankind. Religious ethics "that can be done is not necessarily worth doing" dealing with imperative technology "that can be done must be done". The challenge to such breakthroughs as cloning humans is not only a challenge to the world of Biotechnology, but also religious ethics. Franz Magnis-Suseno SJ argues, in his Basic Ethics, the clergy also need ethics in the sense, to use their minds and minds to solve the problem of how to live if they want to be good. Religious people are also expected to use the gift of the Creator. Do not let the mind be ruled out of religion. That is why precisely clerics are supposedly using ethical ratios and methods.

The ethical debate in the development of Biotechnology is an endless debate between scientists and clerical groups. As stated by Hatta (1960), there is a difference of consciousness between science (Biotechnology) produced by scientists and ethics relating to religion held by clerics, but not contradictions. Science (Biotechnology) on the subject of knowledge and technology, while religion is about trust. Knowledge and belief are two different attitudes of human consciousness. Pelita Science and technology (Biotechnology) terletah in BRAIN, the lamp of religion is located in HEART. Therefore science and religion can go hand in hand with no interfere with their respective regions. Both can be a torch for humans in the path of life. That is why, then many scholars are spelled out, also famous as pious people and believe really to God. For example Issak Newton, a famous naturalist of all time. With regard to science (biotechnology) and religion, Hatta (1960) invites us all to notice and understand what is written by Albert Einstein (Out of My Later Years) about the relationship of religion and science even though his understanding of religion is different from the most religious adherents. Einstein said: "Even though the area of religion and the area of light science is separate, there exists between both reciprocal and need-need relationships. It is the religion that determines the purpose of our life - even so it generally learns from science to know which tools are good to be used to achieve the intended purpose. On the contrary science can only be born by those whose souls are full of the purpose of attaining truth and understanding. The source of these feelings is in the religious domain. It includes the belief in the possibility that the laws that apply to the world of birth (the real world) are rational, meaning can be known by our reason. I really can not accept the existence of science that has no such firm belief. The position can be described as follows: science with no religion crippled, religion with no science of blindness."

Integrating and harmonizing the biotechnology-based view of rationality with a dogmatic-based religious view has been successfully carried out by Kiai Ahmad Dahlan through the teachings of Muhammadiyah (see: Mulkan, 2005) through a very good expression "the sacred reason is to think according to fact, carefully and Critically put the relativity of the truth of biotechnology, seeking a truth that is more beneficial to everyone's life. Sacred heart and compassion is the willingness to restrain the lust, willing to sacrifice, not lazy to fight for good and truth, make the nobility of the world as a way to achieve the nobleness of the hereafter. " The realization of these goals is done by developing modern schools, scouting, orphanages, hospitals, and empowerment of the oppressed in modern management systems and organizations. Various Islamic ritual practices functioned as the theological basis for the realization of those goals. From the life of the Nazarene and the findings of Biotechnology, Kiai learned about the development of social life. From the reformer he acquired the idea of rationalizing the teachings of Islam, while the sociological facts and human history gained inspiration of pragmatic and humanist work. At the same time Kiai continues to develop the practice of Islamic rites until it can truly solve the problem of the goodness of life of all people pragmatically and practically. This is possible only through educational action, so the mastery of Biotechnology he sees is not the guidance of God, but the acquisition of learning. Everyone must have the ethos of learning to be a student as well as a teacher. All human activities must function as learning activities to all people or as a teacher of knowledge to anyone on any occasion.

For Dahlan truth and goodness are not solely derived from the deductive interpretation of the Al Qur'an, but from induction (Biotechnology) the empirical experience of diverse religious followers. He sees the achievements of worldly nobleness is the path of attaining the greatness of life after death in the afterlife. Dahlan's view is different from the Protestant ethical model that puts earthly majesty as proof of nobleness in life after death or *ukhrowi*. Ahmad Dahlan's ideas and social actions are based on a view of the natural allegiance of the Qur'an, universal human experience, and Biotechnology findings. For Kiai, the size of the truth of the Qur'anic commentary and the findings of Biotechnology is some evidence of its usefulness for solving the universal problem of humanity. Dahlan's humanitarian ideas and practices may be called the application of humanistic pragmatism. However, it is

not easy to declare Kiai's various reforms through various social praxis based on the spirit of Protestantism. FAO, 2001 (in Crop Biotech Update, 2015) recognizes that there is no single set of ethical principles sufficient for building a more equitable and ethical food and agricultural system. However, it recommends the following actions that individuals, states, corporations and voluntary organizations in the international community can take:

- Creating the mechanisms to balance interests and resolve conflicts
- Supporting and encouraging broad stakeholder participation in policies, programs, and projects.
- Encouraging individuals, communities and nations to engage in dialogue, and ultimately, to do what is ethical.
- Developing and disseminating widely the information and analyses necessary to make wise and ethical decisions.
- Ensuring that decision-making procedures in international food and agriculture policy are well understood and transparent.
- Fostering the use of science and technology in support of a more just and equitable food and agriculture system.
- Ensuring that programs, policies, standards and decisions always take ethical considerations into account so as to lead to enhanced well-being, environmental protection and improved health.
- Developing codes of ethical conduct where they do not currently exist.
- Periodically reviewing ethical commitments and determining whether or not they are appropriate, in the light of new knowledge and changes in circumstances

CAST, 2005 (in Crop Biotech Update, 2015) suggests the need to institutionalize agricultural ethics. This involves a deliberate move to include some consideration of ethics in the actions, decisions, and policies that stakeholders in the food system create or support. Each stakeholder has to “accept the fact that that if ethical issues are going to be understood, and if ethical conflicts are going to be resolved, it is our responsibility, within the limits of our place in the system, to understand and contribute.”

The development of biotechnology has triggered many ethical and social reactions from the public opinion, the media and non-governmental organisations. However, the majority of the public is optimistic about the ability of biotechnology to improve the quality of life. There are, however, visible differences between global support when the aims are medical, moderate support when biotechnology aims at improving industry products, and low support or adverse positions against biotechnology used in agriculture (Rigaud, 2008).
Rigaud (2008) in his report "Biotechnology: Ethical and Social Debates" reveals important matters in connection with ethical and social debates, as follows:

- In the EU, the low public support for genetically modified food is an exception as compared to generally positive attitudes regarding science, technology and biotechnological progress. GM food is often seen as not useful, morally unacceptable and a risk for society. It remains unclear if technical progress could inspire more positive opinions. NGOs adverse positions, stemming from ethical concerns on health and environmental safety issues, have been influential in the 1999 EU moratorium on GM food and crops. The population from less-developed countries as India and China is interested in GM culture, perhaps less as a "humanitarian" means to "feed hungry people" than as an efficient tool chosen by farmers cooperating with industry to increase yield. Support hence depends on GM technical ability in the long term. So does belief that GMOs help respecting biodiversity.
- The public opinion is supportive of biofuels, though major national differences exist. Biofuels re linked with issues such as fighting global warming, preserving national security, and limiting dependence on foreign oil. European Green parties have an ambivalent position, while moslty vocal NGOs call for the preservation of wilderness and express adverse positions against the ecological, social and economic impacts of biofuels, such as the competition between fuel and food, detrimental environmental impacts, displacements of poor farmers and indigenous people, and global prices rises. Calls for more sustainable fuels are recurrent, and opposit ion to GM biomass is appearing.
- The Convention on Biological Diversity has produced a two-sided effect on bioprospecting. On the one hand, it has set a frame according to which the public opinion and media can consider bioprospecting, involving communities and benefit-sharing, is far from what NGOs call "biopiracy". On the second hand, however, a Mexican example shows that identifying legitimate local organizations' spokespersons has proven difficult, and that international NGOs have been influential in blurring the general scenery.
- Public support for transgenic and cloned animals is lower than that for transgenic plants. The use of such animals in medical research, though, receives strong approval. The welfare of transgenic and cloned animals used in research is not a major issue for the general public at the moment, except in the UK and Nordic countries. NGOs, however, are well-aware of specific animal welfare issues concerning transgenic and cloned animals, and have a strong influence on EU and other national policies.

When Canada embarked on a biotechnological revolution (Jones, 1998), the Canadian government has taken appropriate action to formulate a regulation between stakeholder governments, namely the general public, saintist and ethicist. Based on the unique responsibilities enjoyed in public policy and regulatory ethics, the Government of Canada has taken a leadership role, include:

- advancing public process — debate, education and participation
- fairly distributing the benefits and burdens of biotechnology
- acting as a fiduciary of public monies and public trust
- fostering ethically acceptable conduct
- resolving disputes
- protecting public health, safety and those unable to protect themselves
- promoting research and development
- promoting and protecting human dignity.

Conclusion and Suggestion

Conclusion

- Ethics is a branch of philosophy related to "rightness" or morality of human behavior. In this sense ethics is defined as rules that can not be violated from the

behaviors that society receives as "good" or ”bad". While the determination of good and bad is an ever-changing and relative nature depending on which side views it

- The development of biotechnology is very rapid, while the development of ethics in the field of biotechnology (bioethics) based on the appreciation of the values of faith and humanity runs slowly, giddily and stammer in anticipation of the jumps of Biotechnology work.
- Ethics and not ethics in the development of biotechnology, its essence lies in the crossing of perceptions between the Saintist and the Ethicist + Religionist, Nature and faith, biotechnology and religion, as well as genetic engineering and bioethics. Whether it should be a thesis-antithesis.
- Group of scientists believe in and firmly continue experimenting that biotechnology research and development will bring humanity's prosperity, just a matter of time (speaking at the real world level).
- Groups of ethicists and clerics assume the development of uncontrolled biotechnology by ethics to plot humanity and the overwhelming human intervention in God's creative works (speaking only to the world of the hereafter and the moral messages).
- Religionist and ethicists need to apply ethics in a sense, using their minds and minds to solve the problem of how to live if they want to be good. Religious people are also expected to use the gift of the Creator. Do not let the mind be ruled out of religion. That is why precisely religionist are supposedly using ethical ratios and methods.

Suggestion

The ethics debate between between a group of religionist, ethicist, and NGOs on the one hand with a group of biotechnologist and society on the other hand, never ending until later. The religionist, ethicist, and NGOs continue to criticize the biotechnology products, and biotechnologists continue to work, because everything that happens in this world is God's will.

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