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Method of Evaluation in Respect of Negative and Positive in Issues of Modern Biotechnology: An Islamic Perspective

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Abstract: The development of modern biotechnology of plants through genetic engineering techniques is a method to improve the quality of crops in terms of quality and quantity. However, the debate among scientists and Islamic scholars in regarding with benefits and risks of injury and the limits allowed by the religion may hinder the development of modern plant biotechnology in Malaysia and also in other countries. The objective of this study is to examine methods of assessment of negative and positive in relation to issues of modern biotechnology. It is important to understand that everything that existed on this earth whether it occurs naturally or is present through the efforts of research and human expertise, all have advantages and disadvantages. In Islamic law if a result of biotechnology is clear and bright can be categorized as illegal then it becomes forbidden and vice versa. But however there are many results that are processed through biotechnology are unclearly able to decide easily whether they are lawful or unlawful for consumption by consumers. As such, it's status of legal judgment cannot be decided until requiring to look into the result of biotechnology whether it is heavier towards good or evil. So, this study is a study in general to provide input related to the method of assessment of any matter over which is better or worse because each item is not out of the two main effects, i.e., positive or negative effects.

Key words: Biotechnology, purposes of Islamic law, protection of religion, protection of life, protection of intellect, protection of lineage, protection of property

INTRODUCTION

Apart from using the method of weighting (tarjih), there is another approach that can be used in coping with problems of advantage (maslahah) and disadvantage (mafsadah) in modern biotechnology, i.e., via a rejection of the negative elements and the maintenance and improvement of positive elements. The positive and negative approach is actually one of the approaches used in the purposes of Islamic law (maqasid al-shari'ah) which was already discussed by Al-Shatibi, Masud (1977) and Nyazee (2004).

Negative aspect in the purposes of Islamic law refers to actions that prevent, reject and remove all unlawful and prohibited actions in Islam. Rejection of the negative aspects being done to prevent the destruction and damage as well as to avoid the imbalances and disharmony. While the positive aspects of the action is not just keeping the benefits and advantages which are already available in a matter but to provide the best alternative to replace the negative elements that have been rejected and removed (Masud, 1977). In summary, all the negative aspects in the ethical issues and risks inherent in modern biotechnology must be avoided or at least minimized. Meanwhile, the positive aspects of the benefits of modern biotechnology is to be maintained for human consumption as well as an approach to cope with all risks arising. As to these negative and positive approachs, it could be said that all issues related to biotechnology are not excluded from discussing of five fundamental items that must extremely be protected in the purposes of Islamic law.

PRESERVATION OF RELIGION

Religion is the most important basis of belief that must be preserved by Muslims (Laldin, 2008). Religious observance in the individual level and also in each level can be achieved by adhering to the various types of worship in the wider context (Kasule, 2004; Laldin, 2008) since, it is a whole way of life as stated in the Quran and the Sunnah (Laldin, 2008).

Of worship or devotion such as prayer, charity, fasting and pilgrimage is an important element needed to

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sustain the existence of religion (Masud, 1977). The implementations of all these worships will increase one's faith and they will become the shield from committing any sin and evil that could destroy his religion (Laldin, 2008). As words of the Prophet Muhammad, the duty of preserving the religion is also included under the category of calling to kindness and prevented from being evil.

From Abu Sa'id al-Khudri. He said: I heard the Messenger of Allah said:

> Who among you will see an evil let him change it with his hand. If he can not let him change it with his tongue. If he can not let him change it with his heart. So that is the weakest faith

This is because if religion is not preserved, it is entirely to be easily trapped into sin. While Islam completely forbids sin in all situations (Laldin, 2008). This is based on a Quranic verse which means: Verily, Allah enjoins justice and kindness and giving to kinsfolk and forbids all shameful deeds and evil and rebellion. It teaches you (with instruction and forbids), that ye may receive admonition (al-Nahl: 16: 90). In another verse, Allah says which means:

> Recite (O Muhammad) that had inspiration from the Quran and establish the prayer (with diligence); prayer forbids indecency and evil and remembrance of Allah is the greatest (and feel) and (remember) Allah knoweth what ye do (al-Ankabut, 29: 45)

Negative aspects: The development of modern biotechnology raises many concerns including environmental pollution, the transfer of unwanted genes and the possibilities of existing a new toxic or virus, the difficulty of obtaining seeds due to intellectual right of property of genetically modified plants, threats to genetic diversity, religious, ethics and culture concerns and also the annoyance of the items that have not known yet (Uzogara, 2000; Mepham, 2008). All these fears cause people have to return to learn the importance of ethical life.

The reason is strengthened by the argument of the existence of related bioethics knowledge of all ethical issues related to human actions on lives, environment and natural resources and biotechnology (Macer, 2003). At the same time, bioethics also offers a solution to moral conflict that emerged from the practical effects of the biological sciences (Aksoy and Tenik, 2002). It may be stated as one branch of philosophical sciences that is used in assessing whether an action is right or wrong and good or bad (Aksoy and Tenik, 2002).

Positive aspects: Religion can be protected through the implementation of the rule of faith and the tenets of Islam (Nyazee, 2004). This is because through the implementation of the rule of faith and the tenets of Islam, every Muslim is required to obey and comply with all determinations of the Islamic law as discussed by Muslim scholars. This also includes contemporary issues such as modern biotechnology. As long as the determination of the legal action is taken from the sources of Islamic law as the Qur'an, the Traditions of the Prophet, consensus and so on, any effort related to biotechnology will be implemented with the full ethics as well as with compliance to the Islamic legal rule as set and determined by the Islamic law.

In drafting the Islamic code of ethics in relation with modern biotechnology in Malaysia for example, the government must first consult the latest opinions and fatwas discussed by Muslim scholars. At the same time, the government should also take into account the sensitivities of other races and religions because the citizens of Malaysia consisting of people of different races and ethnic groups. As Muslims are prohibited from using any genes derived from pigs, the government must also take into account the prohibition on the use of genes derived from animal for Buddhists and vegetarians and also the use of genes from cow for Hindus (Ellahi, 1994; BIC News, 2004). As such the use of genes from animals, particularly pigs is strictly prohibited in any research of biotechnology in Malaysia.

In addition, Malaysia has also been encouraging the formation of human capital that has very good morals and values in every act done. In Seminar of Biosafety Awareness Roles and Obligations of Researchers, Research and Academic Institutions under the Biosafety Act 2007 which took place in 2008, Rofina Yasmin Othman from the Malaya University said that researchers must abide by and follow the ethics of scientific and cultural practices of good laboratory practice in the development of modern biotechnology. Besides doing evaluation of potential risks in the various stages, executing risk management and complying with all regulations.

In addition, researchers also need to manage completely the documents, protect safety information have a vast knowledge and make a report to the National Biosafety Agency about anything goes wrong.

PRESERVATION OF SELF, LIFE AND HEALTH

The second preservation needs to be preserved in Islam is self-care, life and health. A healthy life is very precious and valuable to everyone. Preservation of the life of every human being is very important and it is a shared

responsibility to be shouldered by each individual and society (Laldin, 2008). To maintain the high quality of life (Kasule, 2004), Islam requires Muslims to take care of theirselves and strictly prohibits suicide. Likewise, Islam strictly prohibits the act of harm to another person solely for one own personal interests (Laldin, 2008). This is based on a Quranic verse which means:

Do not take life which Allah has made sacred except for just cause is right and if anyone is slain wrongfully:

> We have given his heir authority responses. In the meantime, do not it is excessive in revenge murder for he is helped (by the law) (al-Isra, 17: 33)

This is also based on a Tradition of the Prophet which means:

> There should be neither harming and nor reciprocating harm (Ibn Majah, n.d.)

Negative aspects: Life must be preserved and defended from any threat and anxiety against health and safety in modern biotechnology. All concerns of emerging risks in the modern biotechnology need to be addressed and coped with effectively and efficiently to overcome and prevent identified hazards which can be or is likely to occur. In addition, various efforts are needed to develop and create alternative or new approaches more beneficial to the public without causing any harm.

Various effects on the health risks of genetically modified products such as having the potential to be toxic, possibly resulting in chronic diseases such as cancer (Harden and Erikkson, 1999; Shrader-Frechette, 2005; Hug, 2008) and any effect of the unknown that could threaten human health should be avoided altogether. This also includes the potential to be fatal allergic (Nordlee *et al*., 1996) genetic responses that are not expected (Bertoni and Marsan, 2005) and genetic transfer that is not from the main or parent plant (Van *et al*., 2004).

Positive aspects: Life kept by providing a safe environment to maintain the existence of every being, providing and maintaining a healthy lifestyle (Nyazee, 2004). Food shortages are common health issues which are being discussed importantly by many developing countries (Zhu *et al*., 2007).

The increase of human population is a main reason in increasing demand for food. Besides seeks to meet the needs of the world's population, Genetically Modified (GM) foods have been increased their value and quality to cope with seriously food shortage and sources of nutrition that hit the world population, especially in developing countries and poor countries as in Africa (Carpenter *et al*., 2002). Improvements in nutrition can help to improve health such as cooking oil (Barnum, 2005) of GM soybeans and GM canola which include low oleic and low cholesterol as well as the golden rice which contains Vitamin A of beta-carotene to overcome the problem of blindness among children.

In order to be the application of modern biotechnology in Malaysia is absolutely safe, the authority in this field in Malaysia has taken the initiative to the establishment of the Biosafety which has been developed to regulate the release, importation, exportation and use of something that contains genetically modified organisms and also the release of such GM plant-based products. The establishment of the Biosafety is important to coordinate the principle of prevention, the principle of sustainable development, ethics and cultural norms. The laws relating to biosafety are enforced to protect human health and environment as well as to maintain biological diversity.

PRESERVATION OF LINEAGE AND SUSTAINABILITY

The third preservation in Islam is the protection of descendants or in other words is to be keeping the next generation (Kasule, 2004). Descent is one of important elements in human life (Laldin, 2008). Islam insist to protect the descendants by ensuring the survival of future generations including environmental sustainability (Hasan, 2006). This is clearly stated by the Prophet which means:

> Let me tell you something. O Commander which Allah's Messenger said on the day following the conquest which my ears heard and my heart has retained and my eyes saw as he spoke it. He praised Allah and extolled Him and then said: Allah, not men has made Mecca sacred so, it is not permissible for any person believing in Allah and the Last Day to shed blood in it or lop a tree in it

Negative aspects: Sustainable agriculture is a term used to indicate voice and social responsibility towards the environment (Lyson, 2002). According to US Department of Agriculture (USDA), sustainability is an integrated system of plant production and animal products that have a specific ancillary applications that can improve the quality and nature of food resources in the long run (FACTA, 1990).

The modern biotechnology in agriculture is said that can help to improve the environmental sustainability. However, a sustainable environment is difficult to set up

because on the ground that many possible risks of effects on environment is being warmly debated since, the introduction of GM plants, especially among scientists, environmental associations and consumer associations. Among the major issues being debated in the environmental biosafety are concerns of direct toxic effects and indirect effects against the transgene for example, insect resistant *Bt* gene on non-target organisms (Hilbeck *et al*., 2000), the release of the transgene to other field crops through gene flow and the existing of wild species that are not required (Snow *et al*., 2003). This concern is feared could disrupt the ecosystems and natural balance (Polkinghorne, 2000) as well as finally to cause trouble to environmental sustainability that will be inherited by future generations.

Positive aspects: Sustainable environment is required as a human residence until the next generation to ensure a healthy and prosperous life (Nyazee, 2004). Health and well-being necessarily require the development of technology that can help reduce pollution on the environment.

The introduction of GM plants that enable to herbicide-resistant and insecticide resistance which are the fundamental success that produced by modern biotechnology has a positive impact on the environment (Batista and Oliveira, 2009). Features of these resistances are more friendly to environmental surroundings (Batista and Oliveira, 2009) because it can reduce the use of pesticides the remaining less pesticides in food and less polluting of pesticides dissolved in water, soil and air (Batista and Oliveira, 2009). It also can improve the health and safety of farmers and workers (Pray *et al*., 2002; Zilberman *et al*., 2007) and at the same time to reduce farm workers handling pesticides who are usually exposed to dangerous herbicides and herbicides products.

To view the government's concern about the concerns of consumers in the genetic modification of food and its impact on human health, the risk assessment of GM organisms in Malaysia has been conducted by the Genetic Modification Advisory Committee (GMAC) under the Ministry of Natural Resources and Environment. This team consists of members from relevant government agencies, research institutions, universities and non-governmental organizations like the Third World Network. The draft of regulations will then complete all the relevant laws as to the biosafety in the application and approval of the GM organisms.

In addition, the development and commercialization of modern biotechnology in Malaysia are also dependent on consumer acceptance. This is because the acceptance or rejection (Twardowski, 2008) in using modern biotechnology, especially in food, need to be considered and deeply examined before its development can be developed in Malaysia. This is because the impact of biotechnology can only be known and felt by the people as a subject that directly will use it. This could be referred to an Islamic legal maxim as a basis of the discussion that is the custom made as a judge.

Although, there is no community involvement in research laboratory but the involvement of users or publics is mandatory when it involves experimental farm or when the product is marketed (http://www.nre.gov.my/ 05/09/10). According BIC News (2003), the application for the release of roundup ready soybeans for human consumption and animal feed has been accepted and allowed to be imported into Malaysia after the environmental impact and safety assessment of GM soybeans has been received and approved in 1997 by GMAC Malaysia (BIC News, 2003). These security measures include nutritional similarities of Roundup Ready soybeans compared to conventional soybeans and this was confirmed through a variety of experiments on animals such as rats, cattle, swine, poultry, fish and birds.

Thus, the development of modern biotechnology requires a careful planning so that the resources of biodiversity can be fully utilized without causing any waste or destruction of the flora and fauna. This is to ensure the development of modern biotechnology will not damage the ecosystem, affect the food chain or threaten the species of flora and fauna (Batalion, 2009).

PRESERVATION OF MIND AND INTELLECT

The fourth preservation of human lives according to Islamic law is the preservation of the mind or intellect (Kasule, 2004). Intellect is the greatest gift that Allah gave to man that distinguishes humans and animals. Allah has ordered people to keep the grace of Allah with wisdom for the benefit of all beings and not used to thinking about strategy towards destruction (Laldin, 2008).

To achieve this, Islam has given freedom to his followers to throw their views and be open and tolerant to different opinions and ideas of all others. However, the views and differences of opinion must be in conformity with ethical values supplied by the Quran and the Traditions of the Prophet in order to ensure conformity with the view and requirement of Islam (Laldin, 2008). Furthermore, the Prophet has also allowed the implementation of personal conclusion made through research and based on reliable sources and methods (ijtihad) to solve the various issues that arise in the Muslim communities (Laldin, 2008). This could be seen in a saying of the Prophet which means:

> The saying of the Prophet when he sent Mua'z as a judge to Yemen: By what will you pass judgement? He said: By the Book of Allah. The Prophet said: If you do not find it there? He said: By the Sunnah of the Messenger of Allah. He said: And if you do not find it? He said: I will exercise my own reason

Negative aspects: The preservation of mind needs to a reliable protection from anything that could damage the ability of thinking. Anything that can stops the intellect to get the knowledge should be avoided (Nyazee, 2004).

In modern biotechnology, there are a few issues that seen as if to prevent the spread of information, particularly from the aspect of risk issues and scientific research. Among them are the data and information about health and safety which are issued by the scientists and the industry (Domingo, 2000). Similarly, the opposition from a particular industry against the demand and assertion of mandatory labeling of GM foods. Whereas the labeling of food products is one of the most important source of information about genetic engineering and potential effects and applications (Frewer *et al*., 1996) that can help consumers and users to identify the unwanted consequences of certain GM foods (Uzogara, 2000).

Positive aspects: The ability of intellect should be preserved by encouraging the intellectual potential growth (Nyazee, 2004). Islam always encourages people to learn and teach or seek knowledge and impart knowledge to make themselves constantly knowledgeable. Further, to stimulate the development of art, science and civilization.

Proof of information for genetic modification is a kind of information transmitted by private bodies who are having a special knowledge. This third source should not be tied to a financial interest in agricultural biotechnology industry (Huffman *et al*., 2003) among others such as FAO and WHO to deliver voice, advice and guidance which are not biased about the safety of GM food and their collaboration with other international bodies such as Codex (FAO, 2000a, b; WHO, 2005).

ISAAA is an international organization will share the benefits of plant biotechnology for various stakeholders, particularly poor farmers in developing countries through knowledge and sharing of knowledge and information and provide appropriate biotech applications (ISAAA, 2010). While Greenpeace is an independent body to conduct a campaign without violence to expose and to solve global environmental problems in order to ensure a greener future and harmony and to expose any dangerous release of genetically engineered plants into the environment (Greenpeace Canada, 2008).

However, although many organizations to distribute information in a broader topic, the consumer should make a thorough research before believing and accepting the information conveyed by such association and organization (Huffman *et al*., 2003). In the case of GM foods, the industry and the government are clearly seen constantly to encourage the use of this technology while consumer associations and environmental associations are seen as the party who are always to oppose it (Snow *et al*., 2008). In fact, international environmental NGOs, biotechnological industries of agriculture and the US government have various interpretations of the role to be played to the community in regarding to modern biotechnology (Huffman *et al*., 2003).

According to Dean and Shepherd (2007), studies have shown that scientists and officials in the industry and government are the informants of less reliability and credibility. While environmental organizations were seen as the most reliable agency. Accordingly, Dean and Shepherd (2007) suggest that the government agencies should gear and move to enhance their credibility by working with organizations that have a high confidence as consumer associations or professional groups.

In Malaysia, the 8th Malaysia Plan (8MP) from 2001-2005, the National Biotechnology Directorate was going to make efforts to implement awareness of biotechnology. Among them such as distributing leaflets and pamphlets about biotechnology and to promote understanding of biotechnology through the mass media (Daud, 2004) and electronic media.

In terms of labeling information, quality control of food or Food Quality Control (FQC), Ministry of Health Malaysia is the main government body that regulates regulatory framework for GM foods. The FQC has prepared a draft for the proposed regulation of GM food labeling mandatory for all food produced or contain >3% of GM (ISAAA, 2010; BIC News, 2002).

In addition, the generation of knowledge is also made in Malaysia by conducting its own research and development of GM plant products which are safe and harmless. This effort is the best alternative way to avoid reliance on modern biotechnology products that are coming from another country. According to the Directort of Malaysian Agricultural Research and Development Institute (MARDI), Datuk Dr. Abdul Shukor Abd Rahman, he said that till now, Malaysia is developing GM plants that contain features that have been produced in the experiment as a manipulation to papaya resistant to ring-spot virus infection and has a long duration of store. In

addition, there are also other GM plants such as disease resistant GM pineapple black heart, the slow GM ripe bananas, virus-resistant GM chili and palm oil GM which is increased of its value added such as palm oil with high content of oleate (Hautea and Escaler, 2004; Abu Bakar *et al*., 2005: Abd Rahman, 2008; Hoh, 2009). However, all GM plant products in Malaysia are still in the greenhouse and have not been commercialized (Abd Rahman, 2008).

Therefore, the complete information of both the pros and cons of modern biotechnology should be notified to the public and consumers honestly and accurately. This information is very important to bring the actual facts that occurred in the impact of modern biotechnology as well as the rights of consumers to choose the right goods to use.

PRESERVATION OF PROPERTY AND WEALTH

The fifth preservation of the purposes of Islamic law is the conservation of the property and wealth. Property is one of the most important needs of human beings. Everyone has his own property to be preserved and protected. Therefore, Islam commands that every man does not infringe and obtain possession of another person without good reason and without a legal justification (Laldin, 2008). There is a Quranic verse which should be referred to for this case that is which means:

> O ye who believe do not consume (use) your wealth among yourselves in vanity (deceit, gambling, etc.) but with the way business is done love match between you and do not fight each other with each other. Allah is ever Merciful unto you (al-Nisa', 4: 29)

Negative aspects: Violation of property occurs by the way of theft or property invasion when it is done by an individual to another without the consent of property owners. On the issue of biotechnology, violation of property occurs when it gives more profit and benefit to biotechnology industry, particularly biotechnology companies against farmers and consumers (Batalion, 2009). In addition, the enforcement of Intellectual Property Rights (IPRs) that is the patent of GM like Terminator Technology by the industry has resulted in farmers having to pay fees and sign an agreement not to store and re-seed planting in order to encourage farmers to continue in subscribing the company's GM seed for the next crop season. In addition, they also have to bear the cost of use of herbicides are more abundant compared to the normal conventional crops (UK Soil Association, 2002).

Positive aspects: Property preserved by encouraging its development (Nyazee, 2004) through the lawful investments and also any transaction by both the seller and the buyer.

Cultivation of GM plants should take into account the preservation of property by engineering a profitable income. The profit of GM agricultural revenues should include incidental costs and returns of investment of GM crops which are more cheap compared to the conventional plants (Raney, 2006). In addition, the service charges imposed must also be applied at a reasonable price and does not mistreat farmers who are most of them are poor farmers and having low income (Zilberman *et al*., 2007).

Preservation of property in the development of modern biotechnology in Malaysia do not really have a big problem compared to poor countries around the world. This is because the government has a clear vision to develop biotechnology as an engine of economic development. Therefore, biotechnology is expected to boost the quality of life and develop the scientific strength among Malaysian scientists by building the technology that can help small farmers to improve the quality of agricultural products. Further, in purposing to make narrower the income gap between urban and rural areas communities. Thus, this technology is not only technically carried out but also be developed to the stage of research, development and commercialization phases (Abd Rahman, 2008).

Commitment and important role played by the Malaysian government in the financing of the biotechnology sector can be seen via the largest source of permanent funding of biotechnology projects and companies in Malaysia. Currently, total US$1.3 billion was provided in 17 different funds which are being already invested in biotechnology companies such as Malaysian Technology Development Corporation (MTDC), Ministry of Science, Technology and Innovation (MOSTI) and the SME Bank (http://www. biotechcorp.com.my, 2009).

The SME Bank for example is as a financial development institution is preparing to allocate to small and medium companies for a biotechnology programme named Biotechnology Entrepreneur Programme. This program is to channel financial resources and business advisory services to companies (http://www.biotechcorp.com.my, 2009). In addition, the government also drafted Economic Corridor in Biotechnology Programme to encourage companies to seek new development opportunities in the biotechnology industry and its implementation in the five regional development corridors of the Northern Corridor Economic Region (NCER), East Coast Economic Region (ECER), Sarawak Corridor of Renewable Energy (SCORE) and Sabah Development Corridor (SDC) as well as Iskandar Malaysia (http://www.biotechcorp.com.my, 2009).

CONCLUSION

The implementation of the development of modern biotechnology will not be successful without the support of all parties. What is important in all researches that related to biotechnology whether made in Malaysia or in other countries are that they should properly be aligned with the teachings of Islam and in line with the universal moral values. The contradiction between the benefits and risks of harm in the process of modern biotechnology of plants and animals can not be used as a barrier that could hinder efforts in the advancement of science and biotechnology. All things that exist in this world can not be prevented from negative and positive elements. Therefore, scientists and Muslim scholars should open the minds to evaluate each item by looking at both aspects of the law so that a decision can be issued with a more equitable and beneficial to consumers without retarding the development of science and biotechnology.

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