

Some Methods of Preponderance in Resolving Issues of Modern Biotechnology

¹Abdul Basir Mohamad, ¹Anwar Fakhri Omar, ¹Shofian Ahmad, ¹Amir Husin Mohd Noor,
¹Zaini Nasohah, ¹Zuliza Mohd Kusrin, ¹Ibnor Azli Ibrahim, ¹Ahmad Muhammad Husni,
¹Hayatullah Laluddin, ¹Muhammad Adib Samsudin, ¹Abdel Wadoud Moustafa Moursi,
¹Mohd Al-Adib Samuri, ¹Salmy Edawati Yaacob, ¹Mat Noor Mat Zain, ¹Zamzuri Zakaria,
¹Muhammad Nazir Alias, ¹Md Yazid Ahmad, ¹Mohd Zamro Muda,
¹Mohd Nasran Mohamad and ²Siti Fairuz Binti Sujak
¹Department of Syariah, Faculty of Islamic Studies, Universiti Kebangsaan Malaysia,
43600 Bangi, Selangor, Malaysia
²Universiti Teknologi MARA, Segamat, Johor, Malaysia

Abstract: The development of modern biotechnological 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 Muslim scholars in regarding with public interest and public corruption as to plant products that produced by modern biotechnology which is well-known now a days as Genetically Modified (GM) food is never stop. Thus, in the Islamic law there are a few methods of preponderance or predominance which could be used in order to find out the best way out of confusion in certain cases for legal rulings, especially in the cases relating to GM food. The objectives of this study are to examine the considerations of maslahah and mafsadah in purposes of Islamic law in relating to issues of modern biotechnology and to elucidate the methods of preponderance as well. It is important to understand here is everything that existed on this earth whether it occurs naturally or is present through the efforts of research and human expertise, all have benefits or advantages and risks or disadvantages. In the view of Islamic law if a biotechnological product is produced by hybrid efforts of using unlawful genes it is certainly clear can be categorized as illegal to be consumed then it becomes forbidden. But however, there are many products that are produced through biotechnological processes are unclearly able to decide easily whether they are lawful or unlawful for consumption by consumers. As such, a few methods laid down in this study are the first attempt to give a way out of difficulties for easily making legal rulings in this issue. So, it is hoped that the substance of this study will give an initial guidance for Muslim scholars to make legal judgment if they are facing the issues of GM food.

Key words: Biotechnology, purposes of Islamic law, methods of preponderance, public interest, public corruption

INTRODUCTION

The contribution of modern biotechnology in the development of agriculture and human health can not be denied. However, it is not profitable if the negative ethical issues arising and it being an obstacle in the development of modern biotechnology in Malaysia. Therefore, before implementing biotechnology in Malaysia, ethical issues that arise should be considered as a whole by the government and dealt with through the best solution as using the methods of preponderance that is to prioritize the better benefits and to take care the five pillars in purposes of Islamic law, namely religion, life, mind,

progeny and property. Any contradictions and errors must be resolved with wisdom as well as providing an alternative to coincide with Islamic law.

CONSIDERATIONS OF PUBLIC INTEREST AND OF PUBLIC CORRUPTION IN THE PURPOSES OF ISLAMIC LAW

All creatures are created by God on this earth is not made in 100% good or harm. This is because all things were created by God each has its own advantages and disadvantages. Ibn Abd al-Salam in his book said that even though advantages and disadvantages is a part of

life but Islam always leads to the public interest and rejects the public corruption either in the efforts or works of short term or long term.

The public interest is all good, beneficial and in line with legislation of Islamic law that brings happiness in the world and in the hereafter. While the public corruption is bad things and contrary to Islamic law that is not just for misery and suffering in this world but sinful in the eyes of God and the performer of it will receive torment and torture in hell.

The determination of whether a matter is categorized within public interest or public corruption requires the position of benefits and risks confidently proved without any doubt. Confidence is a situation where there is no doubt and presumption (Kasule, 2004). Explanations based on true facts and informations needed to strengthen the evidence or drop a doubt until it can change the expectation and presumption (Kasule, 2004). This is based on a Quranic verse in Yunus, verse 36 which means:

But most of them follow nothing but fancy: truly fancy can be of no avail against truth. Verily Allah is well aware of all that they do

Islamic legal maxims that support the needs of confidence in the matters relating to the public interest and also the public corruption are:

- The original remains intact as it was until there is strong evidence to change
- The contrary origin in a matter is considered as non existing
- The origin of things is permitted

Exception to the above legal maxim (No. 3) for example is the use of pigs originally been described as illegal in Islam.

Therefore, if the risks and benefits of modern biotechnology are still not clear it is necessary to note here that this situation may be expressed as vagueness or dimness. This is based on a Tradition of the Prophet which means:

Verily what is lawful is clear and indeed what is unlawful is clear and in between these things are the things that doubtful ambiguity that most people do not know. Whoever in charge of things he has indeed cleansed his religion and honored himself and those who fall in doubtful matters, he has fallen in what is prohibited

THE METHOD USED TO IDENTIFY THE PUBLIC INTEREST AND THE PUBLIC CORRUPTION

As stated earlier, public interest and public corruption should be identified and is believed to occur. In this case, there are several methods to identify differences of public interest and public corruption. According to Qaradawi (1996) some of the ways to identify and distinguish between public interest and public corruption is through reason (intellect), Islamic jurisprudence or both reason and Islamic jurisprudence.

Qaradawi (1996) explains more about the identification of public interest and public corruption by saying that the majority of the advantages and disadvantages in relation to the business world can be known through reason based on emergency matters, experience, habits/customs and assumptions that are almost certain to occur. This is because human nature is certainly created by having the ability to choose the best one for himself. Natural tendency helping people to know whether something more useful, more dangerous, better, more beautiful and so on than anything else. Hence, even children can choose the most delicious food.

The selection is made based on a strong argument and reason in order to support such a selection. The true and transparent information as to the matter involved should be comprehensively known. This will lead to a true and exact resolution after fully consideration is made. For example, one dollar and two hundred dollars, a wise man will certainly choose two hundred dollars. This is surely based on a strong argumentation because two hundred dollars having more values, more benefits, capable to purchase more things and so on (Qaradawi, 1996). This shows that human intellect can be used as a good consideration to do a good selection subjected to unavailable any specific texts of God or of the Prophet which has clearly explained the involved issue.

For the public interest that leads to the good deed in the hereafter, usually this kind of this public interest must not be known through reason but should refer to the guidance of God through the Quran, the Prophet Tradition, consensus, analogy as well as other methodological resources (Qaradawi, 1996). Ritual prayer for example, must obediently be complied with and can not be disputed because there are verses from the Quran that says it can prevent from sin and evil as well as obtaining reward and heaven. However, recent scientific studies proving prayers also having many benefits to the performer in this world like physical health that is capable of treating chronic disease and emotional therapy.

Therefore, referring to the case of biotechnology in order to decide whether a bad potential is higher than benefits, responsible parties must make a scientific assessment of information by conducting various experiments, data analysis and safety testing such as field tests and the greenhouse (Solihu and Ambali, 2011). This is very imperative in order to the product that produced by the modern biotechnological process for example as biotechnological fruits, the research and test can provide 100% guarantee that it is safe (Ahmad, 2008) before they are openly grew in the field and commercialized in the local and international markets.

In addition, all research applications in biotechnology have to look at the study case by case and should pay attention to the findings of recent cases. This is as set out by a legal maxim of Islamic jurisprudence: The original matter is observed on the case that occurs at the nearest time.

Taking into account the recent opinion or finding is very important because earlier case studies may be less complete than a comprehensive recent study and it has included various aspects, especially in terms of scientific experiments. The best example to explain this situation is that the law banning smoking. Law of smoking in the first place in Islamic law is abominable. But based on many recent studies, Muslim scholars confirm that smoking is prohibited and unlawful on a scientific study that says smoking can cause chronic and life-threatening disease to smokers and those around him as well as waste of money. However, the information has not yet to be scientifically reliable as in the issues of modern biotechnology a clash between the benefits and risks that can not be identified is a major problem which is difficult to resolve.

COPING WITH CONFLICT BETWEEN PUBLIC INTEREST AND PUBLIC CORRUPTION

Ahmad (2008) explained that to face the clash of conflict between the benefits and risks, the current Muslim jurists should have a clear standard, consistent and can be applied continuously.

However, it is important to note here that it is not an easy way to scientifically evaluate the public interest and the public corruption. As discussed earlier, the public interest and public corruption should be first ensured their authenticity. However, sometimes there are public interest and public corruption which are difficult to ascertain their authenticity. Especially if it requires experiments in the long run and likely to have any side effects that can not be expected.

Accordingly, the Muslim scholars suggested a few methods that can be called as methods of preponderance should be done in order to resolve some problems of biotechnological GM food which is based on the suggestion of purposes of Islamic law.

Methods of preponderance: Methods of preponderance are methods that require Muslim jurists to choose one of two dominant positions.

Conditionally such a dominant position is not only an assumption but has confirmed its existence and does not stray or deviate from the principle of Islamic law (Ahmad, 2008). This method can be used if the standard of conflict between the benefits and risks has not yet to be determined to solve the problem.

If once again occurring the conflict between the Muslim jurists as to any problem and they are in a difficult situation to decide a specific legal judgment because there is no particular evidence to be referred to then the Muslim jurists have to do the best selection by looking at the legal texts as well as the most similar public interest from other cases. The prioritization is based on the domination from any position based on the actual risk after a scientific study has been well done and proved its validity (Ahmad, 2008).

For Qaradawi (1996), the conflict between public interest and public corruption requires the evaluation of comparison be made in advance between public interest and another public interest and also comparison between public corruption with another public corruption before making a comparison between the current public interest and public corruption. Moreover, Qaradawi (1996) also placed this method as a basis in the discussion of priority of Islamic jurisprudence.

In addition there are studies on methods of preponderance as reviewed and summarized by Ahmad (2008) from the relevant books as follows:

- The preponderance that is based on the recognition of Islamic law
- The preponderance that is based on legal rule of liability by prioritising the obligatory public interest, rather than commendable and permissible public interest and by prioritising to reject the unlawful public corruption in the first place rather than the abominable one
- The preponderance that is based on consensus of Muslim scholars rather than in the case of public interest or public corruption which is still under debated among them

- The preponderance that is based on its position in emergency/necessity, requirement and complimentary
- The preponderance that is based on five categories of necessities in Islamic law: religion, life, intellect, dignity/lineage and property
- Prioritising to refuse public corruption compared to gaining public interest
- The preponderance in prioritising the large public interest rather than the small one and rejecting the large public corruption compared to the small one
- The preponderance that is based on public interest with the general scope of its application compared to the particular interests of specific individuals or organizations
- The preponderance in prioritising the permanent public interest compared to the temporary one

The preponderance that is based on the recognition of Islamic law: The position of public interest and public corruption can be determined based on the extent to which the rate of human needs on both sides in their lives. The recognition of Islamic law is based on the assessment of God taken from the guidance of al-Quran and the Tradition of the Prophet whether it is permitted or not.

Based on the evaluation of Islam, the concept of Genetically Modified (GM) foods must meet the concept of permissible and good. The concept of permissible and good in Islam is the guarantee insisted by Islam that allows Muslims to eat food that not only permitted by Islam but also good quality, healthy, clean and not harmful. So far, GM food has not yet reached the level of food can be recognized as permissible and good refers to the use of genes if taken from illegal sources and also still much debate about issues of concern in terms of health and safety.

It should be remembered that the prioritising the recognition of Islamic law is the first thing that needs to be preserved in the purposes of Islamic law that is to preserve religion by doing religious order and avoiding the prohibited one. To ensure an act is able to get recognition of Islamic law, the intention of a practice must be in line with the Islamic law. This is because all human actions will be assessed by their intents.

A good practice will be recognized by God and be rewarded from God and vice versa where torment and torture will be given by God in the hereafter. This can be seen in a Tradition of the Prophet which means:

Verily, every practice is depending on intentions

In modern biotechnology, the intentions of scientists who do the design, of the industry who does commercialization of the ruling government and the consumer who buy the products of biotechnology should be taken into account. The intention differs something between religious and non religious. Thus, the application of biotechnology that wants to be rewarded as a worship must begin with good intentions and accompanied by a good act done in good faith to achieve the willingness of God (Sufiyah, 1988).

The preponderance that is based on legal rule of liability by prioritising the obligatory public interest rather than commendable and permissible public interest and by prioritising to reject the unlawful public corruption in the first place rather than the abominable one: The legal rule of liability (law which defines rights and obligations) is the legal judgment of Islam about the commandment and prohibition of God which is burdened as a responsible for each competent person who is in full possession of his faculties which can be divided into two categories, namely considerations of public interest and of public corruption. A matter which has the highest and greatest interest it is ruled as a matter of mandatory items to be done. Next followed by a matter in the categories of commendable and permissible. While a matter that is categorized as unlawful/forbidden/prohibited is the most important corruption to be avoided followed by things that are ruled under abominable. Ahmad (2008) summarizes this theory as follows: as low as interest is a commendable one and as high as interest is obligatory. As low as corruption is abominable and as high as corruption is unlawful/illegal.

Ibn Abd Salam adds, a matter that in the category of obligatory like legal alms should be first fulfilled compared to the permissible matter like charity. This is because the thing which is under the term of obligatory will certainly ensure interest in this world and also in the hereafter. In addition, it is also the responsibility of the rights of God and at the same time it can grant the benefit to the whole people and as such the wrath of God will arise if people leave it. Compared with the commendable deeds like charity that will only give effects directly in the world and it is not scolded by God if it not done.

This explanation shows that the position of priority about interest and corruption is completely dependent on command and prohibition itself. So, referred to the case of biotechnology, the use of the original genes in modern biotechnology should prioritize genes that originated from legitimate sources such as plants, fish and farm animals those are allowed by the Islamic law compared to the genes that come from prohibited sources by Islam such as pigs, dogs, wild animals and humans as well. Moreover,

according to Shirazi, the illegal sources in fact could not be used at all in normal situation. Even the use of things that come from the illegal sources remain forbidden even though the using of them are in small quantity or they have been mixed by other items.

This is based on a Tradition of the Prophet which prohibited the use of liquor though it is in a small quantity which means:

Something that intoxicates when it is in a large quantity it is also forbidden though it is in a small quantity

And it can also be referred to a legal maxim: When lawful and unlawful combine together, the judgment will subject to unlawful.

The preponderance that is based on consensus of Muslim scholars rather than in the case of public interest or public corruption which is still under debated among them: Current problems related to modern biotechnology requires ideas and discussion between scientists and Muslim scholars. Before a legal verdict or a legal opinion is issued, the scientists will provide information on theory and applications. This simplifies the Muslim scholars to understand and look into the actual situation of the problems which will facilitate a legal ruling is made.

After discussion and agreement made between the scientists and Muslim scholars on a resolution it should be noted that the best *maslahah* and *mafsadah* should be agreed and prioritized compared to the debated one. A resolution which is altogether agreed as a *maslahah* should be applied and a resolution which is agreed as a *mafsadah* should be left and avoided.

Based on the legal opinions of Muslim scholars of contemporary and authoritative institutions such as Qaradawi (1996), Malaysian Authority (JAKIM, 1999) and the Islamic Fiqh Academy (2000) that so far the majority of Muslim scholars allow the development and application of biotechnology. However, it is subjected to the original source of gene is not derived from illegal sources such as pigs and the outcome of such biotechnology will never harm the people. Thus, this point of view should be prioritized.

The preponderance that is based on its position in emergency/necessity, requirement and complimentary: In the science of purposes of Islamic law, the important necessity of human needs might be divided into three, namely, first; emergency is basic and primary needs and necessities in life. The absence of those will destroy human life in this world and also in the hereafter. Second; requirement is also an important requirement but its

absence will not lead to the destruction of human life and the third is complimentary which is an additional items to complete or provide comfort to human life.

Regarding the issue of modern biotechnology, to take priority for staple food such as rice, wheat and cereals from non-GM crops is a fundamental and staple food that is emergency. The absence and lack of this basic food will cause the death of the poor people in Africa for example due to hunger. Meanwhile, GM rice known as Golden Rice was created to cope with problems such as nutritional sources of vitamin A to prevent blindness among children is a form of supplements which could only be considered as requirement and complimentary, not as emergency (Safiri, 2008).

The preponderance that is based on five categories of necessities in Islamic law: religion, life, intellect, dignity/lineage and property: The five *daruriyyahs* as described earlier is the five basic points that need to be preserved by human beings. The status of preponderance of the five *daruriyyahs* should be given priority according to its order specified. Therefore, the modern biotechnology issues that can threaten the religion should be given priority over lives and so on that is the priority of life must prevail over intellect, progeny and property. Thereby, Qaradawi (1996) says that the advance of the matters included in emergency on requirements are also on the matters included in the complementary is the same procedure done in the science of priorities.

In terms of the five emergencies, the ethical issue that arises in modern biotechnology has caused concern and anxiety of scientists themselves as well as consumers, non-governmental organizations and consumer associations in terms of health and safety aspects. The death of non-target animals such as the Monarch butterfly larvae after eating GM corn Bt is also considered might cause the same negative effects on humans. Moreover, Islam so hardly takes care and also prohibits the use of biotechnological products which endangering health risk, security and environmental sustainability of ecosystems compared to gearing profit from the sale of Bt GM corn that benefitted by a biotechnology company only. Solihu and Ambali (2011) allow this statement by saying that the risks of biotechnology which can threaten the lives must be prevented compared to obtain its additional benefits of GM.

Prioritising to refuse public corruption compared to gaining public interest: If there is a clash of opinions related to the benefits derived from modern biotechnology such as in the case of increasing nutrients compared to

the risk of harmful like in the issues of health and safety of GM foods either it will suppose to occur or not then Islamic law puts preventive approach must first be dealt with rather than to take the benefit. This approach is actually based on a legal maxim: Rejecting an evil (mafsadah) is preferable to securing a benefit.

The approach to prevent harm compared to obtaining benefit shows that Islam prefers to take precautionous steps in its approach for securing people (Solihu and Ambali, 2011) because evil or corruption can spread widely out if it is not prevented or solved. This is as the words of God which forbids people to harm themselves and the Tradition of the Prophet who told Muslims to avoid themselves from the epidemic and infectious diseases. God says in al-Baqarah, verse 195 which means:

And make not your own hands contribute to your destruction. This can be analogized as eating poisonous food or unhealthy meals

The Prophet said which means:

If you hear of an epidemic of infectious disease in an area so do not enter it (the district). And when you are in the area was hit by infectious diseases, so do not go out of it

In another Tradition which means:

No infectious belief, no bad luck, no bad luck of owl and no (believe in actions or accidents) in month of Safar and you flee from the plague of leprosy as you flee from a lion

Referring to the case of modern biotechnology, the government of Zimbabwe seems preferable to reject the GM food aid due to no health and safety testing of GM foods which is believed can cause death rather than to accept the GM food aid to overcome the lack of foods among the people.

The preponderance in prioritising the large public interest rather than the small one and rejecting the large public corruption compared to the small one: Ibn Nujaym in his book said that if there is a clash between the two evils or mafsadahs it will be a priority to reject a large mafsadah compared to a small one (Kasule, 2004).

With regard to biotechnological plants, farmers who buy GM seed was originally believed that GM crops could will increase crop yields and can generate their income to be higher than usual. However, the opposite situation occurs when the biotechnology company acted to patent their GM products on the ground to protect their intellectual property and also to take back their capital

invested research funds. The enforcement of patent which is well-known as the genetic terminator has caused the farmers have to sign the agreement that causes farmers can not keep GM seeds for planting at next season and at the same time they should continue to buy GM seeds with herbicides from the company. The breach of this agreement may result in farmers being sued in court. The situation has patently caused farmers have to pay more than the normal cost of conventional plants. Therefore, it could be said that the modern biotechnology in this case has caused difficult and burden to farmers and it could be referred to a legal maxim for a way out: serious harm is removed by a lighter harm. This means that if farmers are pressured by a company as the above case, the biotechnological processes as in this case should not be practiced.

The preponderance that is based on public interest with the general scope of its application compared to the particular interests of specific individuals or organizations: The preponderance of interest and corruption needs to be seen overall rates and the characteristics of general and specific in detail (Zirwaq, 2009). Then, the scope of its application should prioritize the public interest against the individual interest. This is because the public interest taking into account the interests of all parties and provide a comprehensive and wide impact (Zirwaq, 2009) compared to the specific interest that only giving a smaller impact and only meets the needs of some individuals. In addition, individual wishes are too many, varied and difficult to satisfy all of them. Among the legal maxims that strengthen this argument are: Public interest should prevail over particular interests and the specific harm is barred in order to protect the public harm.

We need to distinguish here between GM plants that used in food products and in pharmaceutical or medical products. The results showed that the use of GM plants in medical products are more acceptable by society than food products. This is because of medical products if there is a negative effect will only affect only users of medical products. Compared to the food products which are widely commercialized in supermarkets. Moreover, if the product is not labelled and this is very dangerous for the users who are allergic to certain products.

The preponderance in prioritising the permanent public interest compared to the temporary one: No doubt all things contained certain benefits and risks in the short and long terms. Permanent benefits should be prioritized compared to temporary risks. While something that brings a long term risk and uncertain must be avoided compared to something that brings a temporary risk.

Thus, the adverse side effects should be first considered through observation of case by case. This is because the determination of the ruling judgment might change based on a case which occurred in a time, place and circumstance. This is the best way to be done to prevent destruction and damage to the earth (Solihu and Ambali, 2011) which might affect the sustainability of life of future generations. This is based on a Quranic verse, al-Baqarah, verse 60 which means:

So eat and drink of the sustenance provided by Allah and do no evil nor mischief on the (face of the) earth

There are some scientists who expressed concern and anxiety for the GM plant which is said to adversely affect the uncertain effects and it is difficult to return to a normal condition after a period of unhealth.

Some insects are vital components for food chain of insects and other animals. If the GM plant is an adverse effect on non-target animals and this in turn will lead to a reduction of bird populations for example (FAO, 2001). There have been studies done on modern biotechnology that claim this technology will also disrupt the balance of nature (Polkinghorne, 2000), result in unwanted grass species such as superweed (Batalion, 2009; Polkinghorne, 2000; FAO, 2001) and cause more difficult on agricultural management (Wieczorek, 2003). Thereby, the scientists should be responsible for carrying out risk assessment scientifically to ensure the safety of modern biotechnology products for humans, other living organisms and the environment as well.

If the Muslim jurists are still in a state of confusion not knowing where the more dominant position then the safer position is to repel the forbidden position is preferable compared to the performance of a benefit that is not convincingly identified. This is because, in order to achieve the willingnes of God and His Prophet, Islam is hardly to welcome a cautious behaviour, care of the unlawful manner, practise the deeds of piety and avoid of uncertainty. This is consistent with the sayings of the Prophet which means:

Whoever can protect himself from uncertainty then he or she has cleansed his or her religion and honor and whoever involved with the uncertainty it means that he or she has involved in illegal matters

In addition, Ahmad (2008) also proposed to the Muslim jurists to take other alternatives to make a selection or to postpone. But the action of postpone should be temporary and does not permanent because it

is difficult for the public to practise, especially in the case relating to GM modern biotechnology. The Muslim jurists should choose any legal ruling as a guide to facilitate the public without requiring them to follow.

CONCLUSION

The approach to prevent evil compared to do good, Islam is seen to insist and stress the preservation of public interest which includes life, safety and human health from the loss of property suffered by some individuals or organizations that have a particular interest in modern biotechnology. Furthermore, the rejecting risks on health, safety and environmental pollution involve a wide scope covering the humans and the environment. This included in looking after the whole ecosystem such as flora and fauna in the long run to be favored relative to the food needs of some poor countries. Similarly by providing additional nutrition resources can actually be derived from a variety of other food sources. In addition, many other alternative methods of agriculture that can be used to enhance the quality of agricultural products rather than to use the unlawful genes for that purpose.

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REFERENCES

- Ahmad, R., 2008. Method of preponderance in Islamic law. *Shariah J.*, 16: 107-143.
- Batalion, N., 2009. 50 Harmful effects of genetically modified (GM) Foods. <http://www.raw-wisdom.com/50harmful>.
- FAO, 2001. Genetically Modified Organism, Consumers, Food Safety and Environment. FAO., Rome.
- Islamic Fiqh Academy, 2000. Resolutions and Recommendations of the Council of the Islamic Fiqh Academy 1985-2000. 1st Edn., Islamic Development Bank, Jeddah, Saudi Arabia, Pages: 269.
- JAKIM, 1999. Minutes discussion. Malaysia Islamic Development Department.
- Kasule, O.H., 2004. Medical ethics from Maqasid Al-Shari'at. *Arab, J. Psychiatry*, 15: 75-86.
- Polkinghorne, J.C., 2000. Ethical issues in biotechnology. *Trends Biotechnol.*, 18: 8-10.

- Qaradawi, Y., 1996. *The Priority of Islamic Jurisprudence*. Thinker's Library, Selangor, Malaysia.
- Safiri, 2008. *GM Food According to Islamic Law*. Academy of Islamic Studies, University of Malaya, Kuala Lumpur.
- Solihu, A.K.H. and A.R. Ambali, 2011. Dissolving the engineering moral dilemmas within the Islamic ethico-legal praxes. *Sci. Eng. Ethics*, 17: 133-147.
- Sufiyah, A., 1988. *The Elaboration of Forty Nawawiyah*. Dar al-Bashir, Cairo.
- Wieczorek, A., 2003. Use of biotechnology in agriculture-benefits and risks. *Biotechnology; BIO-3*, University of Hawaii, Honolulu HI., pp: 1-6. <http://www.ctahr.hawaii.edu/oc/freepubs/pdf/BIO-3.pdf>.
- Zirwaq, N., 2009. *The Purposes of Islamic Law*. Dar al-Salam, Cairo.