



# STUDY GUIDE

## International Bioethics Committee of UNESCO

### AGENDA ITEM

International Standard for the Sustainable Regulation of Genetically Modified Organisms and for the Use of Genetic Engineering to Advance Environmental Development Technology

### CHAIRING PANEL

Cecilia Ocheng & Zachary Wakefield

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## Welcome

- Forum:** International Bioethics Committee of UNESCO
- Topic:** Establishing an International Standard for the Sustainable Regulation of Genetically Modified Organisms and for the Use of Genetic Engineering to Advance Environmental Development Technology.
- Member States Represented:** Australia, Brazil, China, Egypt, Ethiopia, France, Germany, India, Japan, Malaysia, Mexico, Pakistan, Philippines, Russia, South Africa, Turkey, United Kingdom, United States.
- Chair:** Zachary Wakefield
- Co-Chair:** Cecilia Ocheng

*On behalf of all MUN Day Organizers, we would like to thank you for joining the International Bioethics Committee of UNESCO. We are very excited to chair this committee and oversee discussion of an issue of such deep and interesting nature. In this brief study guide, we will provide some background information that can serve as a basis for further research and allow delegates to formulate solutions respecting bioethics, along with the balance of utilitarian and deontological means it uses to direct resources, establish regulations, and manipulate discourse on genetics and biotechnology to maximize the well-being of humans and animal species.*

We welcome you to our committee!



*Cecilia Ocheng (Juba, South Sudan) & Zachary Wakefield (Los Angeles, California)*



## Definition of Key Terms

**De-Extinction:** the process of creating an organism, which is either a member of, or resembles an extinct species, or breeding populations of such organisms. Cloning is the most widely proposed method, although selective breeding has also been proposed. Similar techniques have been applied to endangered species.

**Genetically Modified Organism (GMO):** Any organism whose genetic material has been altered using genetic engineering techniques. GMOs are used to produce many medications and genetically modified foods and are widely used in scientific research and the production of other goods.

**Genetic Engineering:** The direct manipulation of an organism's genome using biotechnology. Genetic Engineering is a set of technologies used to change the genetic makeup of cells, including the transfer of genes within and across species boundaries to produce improved or novel organisms. New DNA may be inserted in the host genome by first isolating and copying the genetic material of interest using molecular cloning methods to generate a DNA sequence, or by synthesizing the DNA, and then inserting this construct into the host organism.

**Regulation:** The process of forming governmental or ministerial orders having the force of law. These orders often seek to curtail what are harmful behaviors in a sector and aim to promote the greater societal and/or environmental good.

**Substantial Equivalence:** In food safety, the concept of substantial equivalence holds that the safety of a new food, particularly one that has been genetically modified (GM), may be assessed by comparing it with a similar traditional food that has proven safe in normal use over time.



## General Overview

In this committee, we will discuss various issues arising from the regulation of genetically modified organisms and from the use of genetic engineering in advancing environmental development technology. The IBC is tasked with ensuring that member states set rules and regulations promoting the development of GM products that are safe for human consumption and produced while causing minimal environmental harm and/or ethical dilemma.

Genetic Engineering has significantly improved the quality and production yield of agricultural products. Plants like cabbage, corn, and tomatoes are genetically modified to become pest-resistant. Some animals like fish, rodents, and reptiles are genetically modified to achieve desired traits for domestic purposes. Other organisms are modified to promote genetic biodiversity and to preserve traits lost when related species become extinct. The history of genetic modification can be traced back to approximately 12,000 BC, when humans began domesticating organisms. However, the first organism was not genomically modified until 1974.

Although genetic engineering has improved agricultural efficiency in developing nations, drastically reducing hunger and poverty, many issues have been raised concerning health risks of consuming these products and environmental risks of introducing recombinant organisms which possess entirely different behaviors from naturally-found species. Public criticism of GMOs is often surprising because no scientific evidence has ever indicated these crops pose any severe health risks. The issue is also controversial due to ethical concerns about genetic engineering such as the treatment of animals used in cloning procedures. Although scientists take great care to treat these subjects with appropriate care in the laboratory environment, operations such as that which led to the cloning of the extinct Pyrenean Ibex involved implanting the embryo of a foreign species into a goat's womb and forcing the goat to stay in a monitored environment for the duration of her pregnancy - experiments like this one are impossible to orchestrate without stressing the subject organism.

Ironically, although societies in developing nations are more likely to consider GMO products unhealthy, inhabitants of developing nations seem to consume slightly *more* GM products than inhabitants of highly-developed and OECD nations. This causes some understandable resentment in developing nations and reduces economic profit to companies that promote GM products.

Figure 2.1—Average cotton yields in India, 1950–2010



Source: Indian Cotton Advisory Board, obtained from International Cotton Advisory Committee.



## Major Parties Involved

The International Bioethics Committee (IBC) of UNESCO is directly involved in the issue of genetic engineering and genetic modification of organisms. It comprises of 36 experts from different regions whose aim is to ensure norms of bioethics as soft law in shaping sustainable advancement of biotechnology. In 1993, the IBC was given a task to prepare an international genome instrument on human genome by the UN. The purpose of the instrument was to protect the human genome from manipulation that might alter and endanger the identity of future generations.

The European Union (EU) has also set some regulations for labeling genetically modified organisms to prevent citizens' right to choose what to consume. In contrast, the Food and Drug Administration (FDA) in the United States has declared that there is no difference between foods that are genetically modified and food products produced using "traditional" technologies; the FDA believes therefore that all foods should be treated with equal safety standards for consumption.

The World Trade Organization (WTO) clearly acknowledges that member states should impose strict regulations on GM foods to protect public health and preserve the moral integrity of the agricultural sector. However, the goal of the WTO is to achieve efficient use of all existing resources; this involves reducing trade barriers between countries. International trade makes the issue of regulating genetically-modified organisms more complex because country-specific restrictions could negatively impact import and export quantities on the global market.



## Timeline of Key Events

- 1975:** beginning of regulatory framework concerning genetic engineering which involves setting guidelines regarding use of recombinant technology
- 1976:** US National Institute of Health (NIH) forms a recombinant advisory committee to monitor and advise the scientific community about the possible potential risks of genetic modification of organisms. This follows the formation of other regulatory offices such as the United States Department of Agriculture (USDA), Environmental Protection Agency (EPA) and Food and Drug Administration (FDA).
- Early 1990s:** Food and Agriculture Organization (FAO) and World Health Organization (WHO) begin assessing safety of genetically modified foods.
- 1996:** Pleistocene Park, a project to recreate the “Mammoth Steppe” ecosystem with DeExtincted animals, is founded in Northern Siberia.
- 1997:** EU introduces laws that requires labelling of genetically modified organisms/food products
- 2000-2003:** EU member countries were expected to have fully implemented the law requiring labeling of GMOs
- 2003:** “Celia” of the recently-extinct Pyrenean Ibex species, is the first extinct animal to be successfully cloned in a laboratory
- 2013:** Connecticut becomes the first state in the United States to accept the law of labelling of GMO products



## Previous Attempts to solve the Issue

The International Bioethics Committee (IBC) of UNESCO is a body composed of 36 independent experts from all regions and from different disciplines (mainly medicine, genetics, law, and philosophy) that follows progress in the life sciences and its applications to ensure respect for human dignity and human rights. It was created in 1993 by Dr Federico Mayor Zaragoza, General Director of UNESCO at that time. It has been prominent in developing Declarations about norms of bioethics that are influential in shaping the deliberations, for example, of research ethics committees (or Institutional review board) and health policy.

Regulations regarding the release of genetically modified organisms (GMOs) outside the laboratory varies widely by country. Countries such as the United States, Canada, Lebanon and Egypt use *substantial equivalence* as the starting point when assessing safety, while many countries such as those in the European Union, Brazil and China authorize GMO cultivation on a case-by-case basis. Many countries allow the import of GM food with authorization, but either do not allow its cultivation (Russia, Norway, Israel) or have provisions for cultivation, although no Genetically-Modified products are yet produced (Japan, South Korea). Most countries that do not allow for GMO cultivation do permit research. There is no evidence to support the idea that the consumption of approved GM food has a detrimental effect on human health. Some scientists and advocacy groups, such as Greenpeace and World Wildlife Fund, have however called for additional and more rigorous testing for GM food.

In general, attempts by international organizations such as the International Bioethics Committee to regulate genetic engineering have been mired by opposing values systems of various countries. When certain groups believe all genetic engineering should be illegalized and other groups do not believe it should be restricted whatsoever, effective compromise in an international setting is quite challenging.



