

Chapter 19

Genetic Engineering, Biosafety and Indigenous Peoples

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1. Introduction

There are diverse views on the developments and decisions in science and technology because there are varying perceptions of the world and values that are deeply embedded in particular cultural and socio-political contexts. Indigenous peoples have their own worldviews and values which guide them in their relations with the natural world and with other living things and these influence the positions they take in issues being addressed by the Convention on Biological Diversity (CBD). This chapter will discuss some of these views as they relate to biodiversity, biotechnology, particularly genetic engineering, biosafety, the patenting of life, and collection of human genetic materials. Most of it will be basically be a critique of genetic engineering and the collection of human and other genetic materials from indigenous peoples and their territories. This will be seen within the nexus of biodiversity, cultural diversity, and indigenous peoples' rights and development. It will establish the relationship of our advocacy for the protection and sustainable use of biodiversity, the implementation of the Cartagena Protocol on Biosafety and our struggle for the respect and protection of our basic collective and individual rights as indigenous peoples.

On 29 June 2006, the newly established UN Human Rights Council adopted the UN Declaration on the Rights of Indigenous Peoples. For us, indigenous activists, who have been actively involved in the negotiations of this in the last 24 years, this was a major victory which we hope will make our task in asserting and claiming these rights easier. It is a historic decision, which will have direct implications for biosafety capacity building related to implementation of the Biosafety Protocol of the CBD.

One of the sticking points during the negotiations of the Biosafety Protocol was the issue of socio-economic considerations over genetically-modified organisms (GMOs). This is a key concern not only for developing countries but also for us, indigenous peoples, whether we come from developed or developing countries. Any new technology, including GMOs, should be assessed and considered not only on technical and scientific grounds, but also on the basis of actual and potential social, economic and cultural impacts.

These impacts are directly related to our rights to own and control our lands, territories and resources, our right to practice and live our cultures and to use and maintain our indigenous knowledge systems. Most of the world's remaining biological diversity is found in our territories, because our ancestors and the present generations consciously protected and used these sustainably. If GMOs invade our territories and obliterate the traditional varieties we use for food, medicines and forage, then the sustainable use and the traditional knowledge around these will be forever lost. If our traditional knowledge on the use and sustenance of these biological resources are stolen through patenting, our indigenous ways of sharing this knowledge for the common good will be destroyed. It is our right and obligation to Mother Earth and to future generations to continue to protect and nurture this biodiversity.

The first part of this chapter will trace the history and rationale of our involvement with the discussions on biodiversity, genetic engineering, biosafety and intellectual property rights. The CBD is only concerned with the biodiversity found among plants, animals, microorganisms and ecosystems. For indigenous peoples, however, it is hard to talk about biodiversity without relating these to the issue of human and cultural diversity. Thus, the second part of this chapter addresses the issue of the collection of human genetic materials of indigenous peoples under the Human Genome Diversity Project, which we thought was stopped only to discover that it has been reincarnated recently into the Genographics Project of the National Geographic Society. The last part will deal with our critique of the patenting of life and the actions and responses of indigenous peoples related to this.

2. Asserting Our Worldviews and Our Rights

In 1993, during the first meeting of the United Nations Commission on Sustainable Development (CSD), a small group of indigenous activists met with Rafe Pomerance, the then head of the US Government delegation. He patiently answered our questions about biosafety, and his country's refusal to sign the Convention on Biodiversity (CBD). However, when he said, 'everything within the Convention is negotiable except for one issue, which is intellectual property rights' I became concerned. I explained that our views diverge from his, from that of transnational corporations, and from Western thinking in general. We simply do not believe that the Western intellectual property rights (IPRs) regime should be imposed on us, nor on the rest of world for that matter. 'That is why you need to be part of the global market: to protect your intellectual property rights', he responded. However, this is one of the problems: we do not have any control over the global market economy. How can we protect our rights in an arena where we do not have any say over the rules of the game and we are not even acknowledged as key players? It is precisely the market economy which marginalized our indigenous economic systems.

A year later, I was on a panel with Andre Langanay, a former committee member of the Human Genome Diversity Project (HGDP), at a conference held in Berne, Switzerland, in October 1994. This project aimed to collect genetic materials, which the HGDP calls 'isolates of historic interest', from indigenous peoples all over the world to be stored, studied and manipulated. He discussed the objectives and promises of the HGDP and I presented my critique of this, which included our call for a moratorium on this. In response, he said he could not understand what indigenous peoples have against the extraction of their genetic materials if this means that they can contribute to the discovery of new cures for diseases. If he were asked to do this in order to help others to get well, he would have no second thoughts about it, he argued.

Langanay's statement shows how different our worlds are. He has not gone through the experience of being colonized and having his community militarized because the government or a corporation wants to appropriate his people's lands and resources. Most indigenous peoples have gone through this experience and therefore are wary in giving out easily what remains from their territories and from their bodies.¹

¹While the official documents on the HGDP did not mention that what they are doing is for profit, I am positive that eventually some scientist or corporation will apply for patents on some of the collections. The example of a US corporation called Incyte, which in April 1994 applied for a patent on 40,000 human genes and DNA fragments, provides a strong basis for my suspicion. The patent application of the T-cell line infected with HTLV-11 virus of the Guaymi woman in Panama by the US Department of Commerce and another application over the T-cell line infected with HTLV-1 virus of a Hagahai man in Papua New Guinea by the same agency, to me indicates that commercialization of these viruses will be a logical next step. While these were not directly linked to the Human Genome Diversity Project, these precedents already indicate the future of the genetic collections of the HGDP.

Our participation in the Convention on Biological Diversity is to ensure that the state parties to the Convention understand and integrate our concerns in the implementation of the programme of the Convention. We want to be effectively involved in the decision-making processes of the CBD so that we can protect the biodiversity in our territories and our traditional knowledge in the use and development of this. One way of protecting our territories from being contaminated by GMOs is to work for the proper implementation of the Biosafety Protocol in the countries where we are found. Another more strategic and effective way is to ensure that the CBD is implemented from a human-rights based approach. This means that it does not just deal with technical and scientific issues but links these up with the protection of human rights and fundamental freedoms recognized in international human rights law. There is no way that indigenous peoples address issues of biodiversity protection without linking with the need for recognition of our rights to our lands, territories and resources.

Unfortunately, it is not just the biological diversity in our territories which is being appropriated but also our human genetic materials. Hence, we consider that in fighting for our rights, especially our right to own and control our territories, resources, knowledge, and cultures, we should not forget to include our rights over our own bodies. These rights are threatened by projects such as the HGDP and extraction of the biodiversity found in our territories. Our struggle for these rights began with our ancestors fighting against foreign colonizers more than five hundred years ago and continues against nation states which continued the colonization process.

3. Gains Achieved By Indigenous Peoples

In our struggles for the recognition and protection of our collective and individual human rights, we have achieved some gains over the years. In some countries, such as the Philippines, we successfully lobbied the government to enact a law which recognizes and protects our rights. This is called the Philippines Indigenous Peoples' Rights Act of 1997. At the global level we have actively participated in the formulation and negotiations of the Draft Declaration on the Rights of Indigenous Peoples which started in the early 1980s until it was adopted after more than twenty years by the UN Human Rights Council. This happened on 29 June 2006 at the first Session of the Human Rights Council. So, it is no longer a draft; we now have a United Nations Declaration on the Rights of Indigenous Peoples.²

The specific reference to issues under discussion in this chapter is Article 31 of the UN Declaration (UN Document A/HRC/1/L.10 2006):

Article 31

Indigenous peoples have the right to maintain, control, protect and develop their cultural heritage, traditional knowledge and traditional cultural expressions, as well as the manifestations of their sciences, technologies and cultures, including human and genetic resources, seeds, medicines, knowledge of the properties of fauna and flora, oral traditions, literatures, designs, sports and traditional games and visual and performing arts. They also have the right to maintain, control, protect and develop their intellectual property over such cultural heritage, traditional knowledge, and traditional cultural expressions.

²See the UN Document A/HRC/1/L.10, 30 June 2006, Report to the General Assembly on the First Session of the Human Rights Council, Geneva, United Nations. This document contains the adopted UN Declaration on the Rights of Indigenous Peoples. It was a decision taken through a vote: 30 voted 'yes', 2 'no', and 12 abstained.

In conjunction with indigenous peoples, States shall take effective measures to recognize and protect the exercise of these rights.

We worked very hard for the establishment of policies, spaces and mechanisms in the United Nations which address indigenous peoples' rights and development. These include the UN Working Group on Indigenous Populations, the UN Permanent Forum on Indigenous Issues, and the UN Special Rapporteur on the situation of Human Rights and Fundamental Freedoms of Indigenous People. In these bodies we denounced projects such as the HGDP and we secured recommendations calling for a cancellation or a moratorium on the HGDP and the Genographic project. At the national level, we made our communities aware of the existence of this project and alerted them to be watchful over activities undertaken to collect their genetic materials.

In the Convention on Biological Diversity, indigenous peoples also engaged actively with its various working groups, such as the Working Group on Article 8j, which looks at the protection and sustainable use of traditional knowledge of indigenous peoples and local communities. We are participating in the negotiations of the international regime on access and benefit sharing of genetic resources. Further, a few of us took part, although not in a very sustained manner, in the negotiations for the Biosafety Protocol.

4. Indigenous Biotechnologies

Because of our concern over the adverse environmental, socio-cultural and economic impacts of genetic engineering and on how intellectual property rights are being used to undermine our rights, we raised our views on these at various forums. We do not have a homogenous view on these issues. However, there are basic elements which we agree upon, which will be reflected in this chapter. Most of what I will share are my own views and experiences in dealing with these issues.

Biotechnology can be defined as 'any technique that utilizes living organisms (or parts of organisms) to make or modify products, to improve plants and animals or to develop microorganisms for specific purposes' (Hobbelink 1991). By this definition, biotechnology is as old as humankind. Ancient farmers, women, and indigenous peoples, have been domesticating and cross-pollinating plants since time immemorial.

There are a host of cross-breeding efforts involving animals and plants which have been undertaken by indigenous peoples. Potatoes have been domesticated and bred by Huancapi Indians of the Peruvian Andes. The Igorots (in the Philippines) have been cultivating and breeding a wide variety of *camote* (sweet potato), which was a staple for them before rice was introduced. When rice was introduced, different varieties were developed by our people to suit the environmental conditions in our territories. In one village alone, there are more than ten varieties of rice seeds planted for different weather and soil conditions. Many varieties of other root crops, such as cassava and taro, were also developed. Such human interventions have led to the further development of biodiversity, complementing the acts of nature.

Indigenous biotechnologies include fermentation technology to brew beer, wines and other food preparations, and also the domestication of wild plants and animals. We, the Igorot people in the Cordillera region of the Philippines, have been fermenting our own *tapey* (rice wine) and *basi* (sugar cane wine) since time immemorial. *Tapey* is made with a native yeast called *bubod*, which is made by the women. *Basi* is prepared with seeds called *gamu*, which come from the forest. Indigenous peoples have also discovered a vast array of medicinal plants, and have continued to use many of these through the generations. Thus, to say that indigenous peoples have contributed significantly to the present body of knowledge possessed by scientists, such as ethnobotanists,

ethnopharmacologists, as well as by agriculturists, foresters and food technologists, is an understatement. The development of these indigenous biotechnologies is still continuing. However, the recent moves of biotechnology and agribusiness corporations towards appropriating what we have and know may have serious impacts on the continuing development of these indigenous knowledge and technologies.

5. Difference with Genetic Engineering

Of course, these innovations are fundamentally different from the biotechnology we now have, which rests on a host of applications and techniques – from manipulation of life to detection and unobtrusive marker-assisted breeding. Today, biotechnology is more often associated with the most modern technologies, particularly genetic engineering, new cellular procedures based on the old technology of tissue culture, and embryo transfer. This kind of biotechnology poses a major threat to our indigenous values and belief systems, lifestyles, biological diversity, and the last remaining indigenous sustainable resource management systems, and socio-politico-economic formations. The philosophical, social, economic, ecological, and cultural implications of these are serious, not only for us indigenous peoples but also for the whole world. In this chapter, biotechnology will refer to these new biotechnologies, particularly genetic engineering. The big difference between the new biotechnologies, specifically genetic engineering, and indigenous biotechnology is that with the traditional cross-breeding of plants and animals the reproductive process ran its natural course. Genetic engineering not only short circuits the reproductive process, but it creates new life forms and new rates of evolution never before seen on the face of the earth. Genetic materials of humans or animals are put into plants. Microorganisms, plants, animals, and human beings are the main raw materials for the biotechnology industry, just as inanimate, non-renewable matter (mineral ores, oil, petroleum, etc.) were the main raw materials for the industrial revolution. The history of colonization and exploitation of many indigenous peoples in various parts of the world is the story of how the colonizers and corporations got their hands on the rich deposits of minerals and the abundance of forests and forest products found in indigenous peoples' territories. Many of our territories are not only rich in minerals but are also biodiversity-rich. Now, with the promise of profits in the genetic resources of our bodies, and in plants, animals, and microorganisms found in our territories, we are faced with a more insidious and dangerous threat.

6. Diverse Views on Technology

As indigenous peoples are diverse, they also have varying views on how to regard this kind of biotechnology. There are those who believe that the march of science is inevitable, so if gene hunters and collectors come into our communities, the only option for us is to negotiate the best possible contracts. The aim is to ensure that we can have a share from the benefits derived from these genetic resources which come from our bodies, lands and territories. This may be the pragmatic approach, one which follows the advice given by the US delegate (Rafe Pomerance) mentioned earlier.

A related view is that there is nothing inherently wrong with genetic engineering. The problem does not lie with the science and technology, per se, but with who has control over it. If we can have control, then we will be able to use it to our own benefit and to the benefit of humankind. Thus, the strategy should be focused on how to ensure the transfer of this technology to the Third World and to indigenous peoples. We can lobby governments to exert greater control over the technology to make sure it benefits the people. Alternatively, we secure the power ourselves, and run the government so that we will be able exert our own control over this technology.

A third view is that technology, in this case genetic engineering, has its own inherent logic, dynamics and dangers, which will define not only the directions development will take but also the dominant worldview and individual consciousness. Its inherent logic will define how one will interpret and organize one's systems. With this view, there are various strategies to take. The first is to make sure that the precautionary principle is strictly applied in this case. The science, or the worldview which underpins this science, and its environmental, economic, political, and socio-cultural impacts should be analysed and critiqued. Appropriate policy frameworks, regulatory and corrective systems should be put into place to control the technology and its adverse impacts. The Biosafety Protocol is the key regulatory instrument which can be used by indigenous peoples to pursue their concerns regarding the adverse impacts of genetically-modified organisms. The second strategy is to ensure that the collection of genetic materials from indigenous peoples' bodies and territories cannot be done without their free, prior and informed consent. A third strategy involves fighting against the patenting of life forms. Most indigenous peoples support this third view. They ask that they should have the option to choose technologies which are socially, culturally, ethically, and environmentally appropriate for them. This is part of their right to self-determination and their right to lands, territories and resources.

Many indigenous peoples have held protests and conferences which have issued declarations and positions against life patents, calling for a ban on the Human Genome Diversity Project, and a moratorium on biopiracy in indigenous peoples' territories.³ Unfortunately, we know that in spite of these protests, biopiracy is still taking place, collections of human genetic materials are continuing, and various life forms are still being patented.

Those of us who have resisted colonization, and whose economies have not been thoroughly eroded by the capitalist market economy, have managed to retain aspects of our pre-colonial cultures. Our cosmologies still revolve around the need to live and relate harmoniously with nature. Our technologies are still rudimentary and not as powerful as those developed in industrialized countries which are capable of redirecting nature and channelling its forces elsewhere.

Indigenous peoples who are in this state of development still maintain an intimate union with nature. Indigenous religion, which is usually a form of animism, reflects a reverential attitude towards creation, in general. Even those who have converted to any of the dominant world religions maintain a folk religiosity which combines the dominant religion with indigenous beliefs and practices. This is not to say that our own traditions are unchanging in spite of all the developments around us and those brought into our communities. Our cultures are not static. The alienation between humanity and nature which is characteristic of highly industrialized societies is rarely experienced by indigenous peoples, who still largely rely on nature for their basic survival. Even those who have been introduced to the sophisticated mechanical technology developed since the industrial revolution have somehow consciously kept aspects of their ancestors' belief systems and cultures. This can be seen among the indigenous peoples of industrialized countries. The hunters and fisher folk among the Inuits in Alaska, Canada and Greenland, for example, do not relate to their prey in the same manner as those who own and manage commercial fish trawlers. They are aware of the need to harvest sustainably to allow for the regeneration of species. They strive to maintain their communities even amidst the strong pressures from the dominant society to assimilate and integrate with the ways of the white people.

³Examples of the declarations issued and congresses held are: Mataatua Declaration on Cultural and Intellectual Property Rights of Indigenous Peoples of June 1993 issued in Aotearoa; National Congress of American Indians (3 December 1993); Guaymi General Congress (Panama, 1994); Latin and South American Consultation on Indigenous Peoples' Knowledge (Bolivia, 1994), Beijing Declaration of Indigenous Women (Beijing, 1995).

The ways of life and spirituality of the Igorots, many of who are still small holders/tillers, are very much attuned to the agricultural cycle.⁴ Community rites and rituals are not practised only during births, weddings and deaths but also during the agricultural seasons of planting, harvesting and weeding. There are also rituals to call for the rains to come. The agricultural seasons are determined by the seed varieties we plant and by the climate. For many generations we have used indigenous seeds. The introduction of the high-yielding, hybrid seeds of the Green Revolution, however, disrupted the usual periods for community rituals. This is one reason, along with the required chemical inputs, which made many of our farmers revert to the use of indigenous varieties.

7. Implications of Genetic Engineering

7.1 The Philosophical Plane

Genetic engineering carries with it a worldview or philosophy which is reductionist and determinist. A living organism is reduced into its smallest biologically relevant component, the genome. The explanation of the way the organism behaves is sought in its genes. This worldview also regards nature as something which should be controlled, dominated, and engineered or re-engineered. With the invention of technologies which control and re-engineer nature, human beings have succeeded in setting themselves apart from nature. This is what happened after the industrial revolution and is now happening with the biotechnology revolution. Plants, animals and humans are reduced to their genetic components and their integral wholeness is not important anymore. These separate components can be manipulated and engineered at will and for commercial purposes. Hence, the way biotechnology further promotes and reinforces the mechanistic, materialistic, reductionist, and dualist worldview is a major concern for indigenous peoples.

For indigenous peoples, biodiversity and indigenous knowledge or indigenous science cannot be separated from culture and territoriality. Thus, the genetic determinism of biotechnology conflicts with the holistic worldview of indigenous peoples and general ecological knowledge. The cosmology of most indigenous peoples regards nature as divine and a coherent whole, and human beings as a part of nature. Thus, it is imperative that humans live in meaningful solidarity and harmony with nature. This is the 'web of life' concept or what is now referred to as the ecosystem approach which appreciates the relationship and bonds of all of creation with each other. Human beings have to work and live with nature and not seek to control and dominate it. Whether we recognize it or not, we humans are totally dependent on water, air, soil, and all life forms, and the destruction or pollution of these will also mean our destruction. The integrity or intrinsic worth of a human being, plant or animal is measured in relation to how it affects and relates to the others. The engineering mindset is becoming the norm. Efficiency, not only of machines and human beings but of all living things, is the goal. Because profits and economic growth are the most important parameters used to measure development and progress, the adverse environmental, economic, cultural, and social impacts of biotechnology are viewed as insignificant. Reductionist science is given preference over wholistic science to explain how the world and the human body work and how to diagnose and cure human diseases as well as to eradicate poverty. Indigenous peoples who have not totally surrendered the cosmological vision inherited from their ancestors, and have, indeed, developed it further, are in a better moral and ethical position. If indigenous peoples keep asserting their own philosophy and their right to believe and practice it, we might someday evolve a different philosophy or perspective which provides a balance between the two extremes.

⁴See Victoria Tauli-Corpuz (1996), *Reclaiming Earth-Based Spirituality, Indigenous Women in the Cordillera*, p. 101.

7.2 Ecological and Economic Implications

The ecological risks of genetic engineering have been amply elaborated by NGOs and scientists (see Chapters 10-12). Since indigenous peoples' territories are the last remaining biodiversity-rich centres, the erosion of this biodiversity could be facilitated by the invasion of more evolutionary advantaged transgenic plants, animals and microorganisms (see Chapter 11). The role that the Biosafety Protocol will play in controlling the release, transport and sale of these GMOs, especially their contamination of traditional varieties and wild relatives of their most important food, medicinal and forage crops is crucial.

The appropriation of indigenous knowledge on plants and plant uses, along with the destruction of indigenous sustainable resource management and agro-forestry practices is also facilitated by biotechnology. Patent applications by scientists, corporations, and even governments, for medicinal plants used by indigenous peoples since time immemorial are increasing each day. In India, the neem tree and the plant from which turmeric is derived are very much used by the tribals. Similarly, Ayahuasca and quinoa in Latin America, kava in the Pacific, the bitter melon in the Philippines and Thailand are all plants which are widely used by indigenous peoples. Quinoa (*Chenopodium quinoa*), for instance, is used to make a high protein cereal which has been a staple in the diet of millions of indigenous peoples in the Andean countries of Latin America. It has been cultivated and developed since pre-Incan times. Two researchers from the University of Colorado received US Patent Number 5,304,718 in 1994 which gives them exclusive monopoly control over the male sterile plants of the traditional Bolivian Apelawa quinoa variety. This crop is exported to the US and European market and the value of Bolivia's export market on this is currently USD 1 million per year. The most logical development is that the patent will be taken over by corporations. The hybrid varieties will be used for wide-scale commercial production in the US or Europe, and the Bolivian exports will be prevented from entering the US and European markets.

This will lead to the displacement of thousands of small farmers, most of which are indigenous. The other possibility is that lands will fall into the monopoly control of corporations who own the patents or their subsidiaries in Bolivia who will produce quinoa using the hybrid commercial varieties. Thereby, the genetic erosion of the diverse quinoa varieties developed by indigenous farmers over centuries will take place.⁵

This process is the most probable course of events for many indigenous peoples in different parts of the world. This is made possible because of developments in biotechnology and the legal systems that grant intellectual property rights to those who are able to innovate in high technology laboratories. The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) of the World Trade Organization has become the standard through which IPR laws are being harmonized worldwide. This is further perpetuated by regional and bilateral free trade agreements, whereby developed countries such as the US demand high standards of IPRs, even beyond what is mandatory under the TRIPS Agreement. The contributions of indigenous peoples to preserving, sustaining and developing biodiversity and resource management systems are not recognized and valued by this prevailing system.

8. The Human Genome Diversity Project and Genographic Project

The ambitious Human Genome Project, is a 20-year project funded by the National Institutes of Health (NIH) and the Department of Energy in the United States of America amounting to USD

⁵GRAIN (Genetic Resources Action International) c. Patenting, Piracy and Perverted Promises: Patenting Life, the Last Assault on the Commons, GRAIN, Barcelona, 1997, p. 5.

20 billion. Scientists working on this project realized early on that even if they were able to produce an entire DNA sequence, they still would not have information on the variation of DNA among humans. Their aim is to know the genetic basis of the biodiversity among humans. Hence, in 1991, they established a committee to develop the Human Genome Diversity Project (HGDP): ‘The objectives of the HGDP are to collect, analyze, and preserve genetic samples from a host of vanishing human populations’.⁶ This involves a massive survey of human genetic diversity. By discovering the specific DNA differences between populations, they may be able to reconstruct the origins and historical relationships among groups of peoples. They also hope to be able to establish the hereditary basis for differences in human susceptibility to disease. Researchers have already identified 722 human communities for DNA sampling, and have drafted plans to collect and analyse 10–15,000 samples at a cost of USD 23–35 million. They will collect DNA by extracting blood, scraping the inner cheek and collecting hair roots. The collections will be termed ‘isolates of historic interest’ (IHI). Preservation techniques will be used upon collection, and the researchers will then induce the white blood cells to grow permanently in culture or in vitro.

In a paper titled ‘*Call for a Worldwide Survey of Human Genetic Diversity: A Vanishing Opportunity for the Human Genome Project*’, the HGDP researchers stated:

The populations that can tell us the most about our evolutionary past are those that have been isolated for some time, are likely to be linguistically and culturally distinct, and are often surrounded by geographic barriers ... [i]solated human populations contain much more informative genetic records than more recent urban ones⁷

The scientists involved are aware that their target populations are vanishing fast, so for them, time is of the essence. Cavalli-Sforza (1991) believes that humans are an endangered species in terms of genetic diversity. He describes the HGDP as an ‘urgent last ditch effort’ to collect DNA from vanishing peoples, and is determined to finish the mapping within five to ten years. Due to the massive protests of indigenous peoples which reached the UN Working Group on Indigenous Populations and the UN Commission on Human Rights, the funding for this project has been reduced and then there was nothing much heard about it. After the demise of the HGDP it reappeared as the Genographic Project of the National Geographic Society. Cavalli-Sforza, the man behind the HGDP is also leading the Genographic Project.

8.1 Critique of the HGDP and the Genographic Project

What do indigenous peoples have against the Genographic Project? The aims of the project appear to be noble and we can grant that the scientists who are involved in it are sincere in pursuing such aims.

It is good that scientists acknowledge that most of the world’s human genetic diversity lies with indigenous peoples and that they are endangered; this underscores the urgent need to save this genetic diversity. Indigenous peoples themselves are saying the very same things. Yet, there is a lack of decisive moves on the part of governments and international bodies to address the genocide and ethnocide of indigenous peoples.

In a statement I read before the High Level Meeting of the United Nations Commission on Sustainable Development (UN-CSD) in April 1993, I said ‘After being subjected to genocide and ethnocide for 500 years, the alternative is for our DNA to be collected and stored. This is just a

⁶Report of the Second Human Genome Diversity Workshop. Penn State University, 29–31 October 1992.

⁷See Kidd, et al. 1993.

sophisticated version of how the remains of our ancestors were collected and stored in museums and scientific institutions.’⁸

There are many serious concerns to be raised surrounding the Genographic Project. These revolve around ethical and moral questions. Indigenous peoples’ cultural and religious values and rights are likely to be violated by this project. How are the genetic materials and the information going to be used? Who are going to use them and who will benefit from such use? Some of the problems foreseen with the Human Genome Project (HGP), the Human Genome Diversity Project (HGDP) and now the Genographic Project are as follows:

1. Methods of collecting DNA

Many of the methods employed by corporations to collect genetic materials from indigenous peoples are unethical. One example is the attempt of Hoffman-La Roche to collect the genes of the Aeta people in the Philippines. After the Aetas became the victims of the eruption of the Mt. Pinatubo volcano in 1991, medical missions visited them once in a while. In 1993, Hoffman-La Roche approached the Hawaii-based Aloha Medical Mission, which often visits the Aetas.⁹ They tried to link up with this group to collect the genetic materials they needed. For people facing calamity, any group that offers charity will be warmly welcomed.

How thoroughly will processes of informed consent be followed, considering the time constraints imposed by the proponents on themselves? Will the collectors be thoroughly briefed? It is easy for people from the Department of Health to visit indigenous peoples’ communities and gather blood, cheek tissues and hair roots under the guise of medical missions. The proponents are thinking of making use of such government agencies to facilitate the collection phase. Health departments do not have a good record of providing health education and services to indigenous peoples, however. In fact, indigenous women have been subjected to forced sterilization without their consent. For such a controversial project there is a strong possibility that informed consent will not be applied as it should be.

The need for sophisticated laboratory equipment to study and preserve the genetic collections means that these collections will be kept in the developed countries. While the HGDP has proposed to leave duplicate samples of the DNA with the national governments or in regional institutions, the problem of financing such laboratories still remains. While the proponents acknowledge that storage laboratories can be in indigenous communities, they still have a caveat which says ‘A condition for establishing such labs ... would have to be that they cooperate on an open basis with investigators interested in the region’.¹⁰

2. Potential uses of the genetic materials

A new eugenics?

Based on the current uses of genetic materials collected for the Human Genome Project (HGP), there is much to worry about. With the discovery of genetic ‘defects’ and ‘superior’ genes, doctors can already proceed with screening ‘effective’ or ‘superior’ embryos and fetuses. The

⁸Victoria Tauli-Corpuz, Statement presented during the 2nd Session of the UN-CSD on behalf of the Cordillera Peoples’ Alliance, New York, 1994.

⁹The information on the collection of genetic materials from the Aetas was relayed to me by my NGO friends in the Philippines. I was sent copies of the exchange of letters between Dr Philip Camara of the Makati Medical Centre in the Philippines and Elizabeth Trachtenberg of Roche Molecular Systems. The exchange of letters took place between March 1993 to July 1994. A fuller account of this exchange can be read in the book *The Life Industry: Biodiversity, People, and Profits* (1996).

¹⁰Cavalli-Sforza et al. (1991)

next foreseen step is to abort 'defective' fetuses and to clone 'superior' ones. Who will determine what genes are bad and what genes are good?

While the proponents claim that the results of the study will erase the basis for discriminating against indigenous peoples, they are not in any position to assert this. The information can be used against indigenous peoples for political purposes. When it falls into the hands of those who want to perpetuate their power over the world, political motives could overrule the original intent of the research.

Patenting and commercial production of genetic materials

With the additional information and materials which will be gathered from the HGDP, what other possible programmes will be developed? If their aim is to determine the susceptibilities and resistance to diseases, how will such discoveries be used? Will they clone the proteins conferring disease resistances and develop and sell these for profit? The fact that biotechnology corporations are already competing for the control of such materials, and investing in their commercial production and sale, says more than enough.

Patenting is the first step toward the industrial production of inventions or discoveries. Industrial production means the reproduction of millions of identical goods, such as cars, machines, clothes, etc. The patenting of life forms will naturally encourage the reproduction of isolated or modified genetic materials, plants, animals, and human beings.

Craig Venter, a former US National Institutes of Health (NIH) researcher doing gene mapping and sequencing, has applied for patents on more than two thousand human brain genes. If approved, this will give him and NIH ownership of over five per cent of the total number of human genes. Andrew Kimbrell, in his book *The Human Body Shop* (1993: 46), says:

[should] any one of the genes prove to be extremely valuable, perhaps a key gene for brain cancer research or future therapies to increase I.Q., the researcher and NIH could then form lucrative licensing agreements with biotechnology companies for exclusive commercial exploitation of the genes ... The entire human genome, the tens of thousands of genes that are our most intimate common heritage would be owned by a handful of companies.

The patent application of the US Department of Commerce for the T-cell line infected with human T-cell lymphotropic viruses (HTLV) Type 1 of a 26 year old Guaymi woman from Panama was the first attempt to patent genetic materials from indigenous peoples. This application was submitted as early as 1993. International NGOs led by the Rural Advancement Foundation International (RAFI) (1997) discovered this application. An international campaign was launched and Isidro Acosta Galindo, the President of the General Congress of the Ngobe-Bugle (Guaymi) wrote to the US Secretary of Commerce demanding that he withdraw the application. The patent claim was denounced by indigenous peoples and NGOs at meetings of the Convention on Biological Diversity and other international gatherings. Because of this international outcry, the patent application was eventually withdrawn, citing the high cost of pursuing a patent claim.¹¹

An indigenous man of the Hagahai people of the highlands of Papua New Guinea had his DNA patented by the NIH on 14 March 1995. This patent covered a cell line containing an unmodified Hagahai DNA, and was also withdrawn under international pressure.

How will genetic materials and genetic information be used?

¹¹Baumann et al. 1996: 137.

Indigenous peoples are well known for resisting ‘development’ or mal-development projects which will destroy their traditional territories. Many indigenous communities are also presently waging armed resistance against the states which are oppressing them. Will genes increasing susceptibility to diseases be used to get rid of belligerent indigenous peoples who are against ‘development’ or ‘progress’?

If genetic information shows that a certain indigenous group is descended from people from other countries, for instance that the ancestors of the Igorots come from Southern China, will this be used to deny them their rights to their ancestral lands? What if a group is found to have a genetically high risk of contracting a certain disease? The history of colonization of indigenous peoples would show that biological warfare was often used on them. Smallpox viruses were spread among the resisting Native Americans in North America. Diseases carried by colonial missionaries and soldiers decimated a significant number of Hawaiian natives. Indigenous peoples have always been discriminated against, and have been portrayed by colonizers as primitive and barbaric. In a world where Western standards and culture are being propagated by media and corporations, the intolerance for diversity is increasing. Will the collection and immortalization of the cell lines of indigenous peoples, be a justification for actions which will lead to their final disappearance?

3. Genetic determinism

It is worrisome to see how DNA or genes are being regarded by scientists. How can one explain one’s sexual orientation and behaviour, for example, by saying that there is a homosexuality gene or a violence gene? Genes are part of a whole system and an individual is part of a family and society which are major factors in configuring who that individual is. There is an overestimation of the role played by genes in determining the behaviour and personalities of peoples. What could be the possible implications of such conclusions? If the propensity to be a criminal lies in a violence gene, can the person be cured through gene therapy? The line of thinking promoted by the HGDP and the Genographic Project is fraught with dangers. The value of analysing society and better understanding the dynamics between the individual and society will be diminished significantly if we believe that social problems such as criminality can be solved by gene therapy, genetic engineering, or by aborting foetuses that are shown to have the ‘criminality genes’.

The Human Genome Project, the Human Genome Diversity Project and the Genographic Project have facilitated the invasion and colonization of the human body by the market economy. Genes are said to be the building blocks of life; thus, if life is to be considered sacred, so too should the genes. The effort to map and sequence genes will not just help us learn more about humanity’s genetic diversity, but it is leading directly toward the commercial exploitation of genes. The patenting of these genetic materials will pass the control over life from nature or God, to the patent holders.

8.2 Responses to the HGDP, Genographic Project and Patenting of Life

The World Council of Churches made a statement in 1989 calling for a ‘ban on experiments involving the genetic engineering of the human germline’. The outcry of indigenous peoples’ groups against the HGDP is another response. Obviously, there is a great need to speak out against this sacrilegious treatment of human life.

Indigenous peoples have sustained their protests against the HGDP. In June 1993 a conference was held in Aotearoa, New Zealand, and from this emerged the Mataatua Declaration on the Cultural and Intellectual Property Rights of Indigenous Peoples. This called for a moratorium on the HGDP until such time that its impact has been fully discussed. As early as 1994, I presented a

statement at the UN Commission on Sustainable Development asking for a ban on the HGDP. In February 1995, Asian indigenous peoples presented a statement at the European Parliament also calling for a halt to this project. During the Fourth World Conference on Women in Beijing, through the leadership of the Asian Indigenous Women's Network, participants agreed on the Beijing Declaration of Indigenous Women which again condemned the HGDP and called for it to be banned.

In 1995, seventeen organizations in the Americas signed the Declaration of Indigenous Peoples of the Western Hemisphere Regarding the Human Genome Diversity Project. It called on international organizations to protect all life forms from genetic manipulation and destruction. This statement criticized the efforts of Western science 'to negate the complexity of any life form by isolating and reducing it to its minute parts ... and [thereby] alter its relationship to the natural order.'¹²

The whole discussion of biotechnology and biopiracy cannot be tackled without discussing intellectual property rights and the role of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) of the World Trade Organization (WTO).

This recognition had pushed us in the Tebtebba Foundation¹³ to organize a workshop of indigenous peoples on Article 27.3.b of the TRIPS Agreement. This was held in Geneva on 24–25 July 1999, just before the 16th Session of the UN Working Group on Indigenous Populations. This workshop developed a statement titled No to Patenting of Life: Indigenous Peoples' Statement on Article 27.3.b of the TRIPS Agreement. This has been sent all over the world via the Internet and at present there are already more than 200 signatories. Almost all of the major indigenous peoples' organizations and networks from all the continents of the world have signed up.

In Seattle, during the 3rd Ministerial Meeting of the WTO there was a group of indigenous peoples who held their own caucus meeting, from which emerged the Indigenous Peoples' Seattle Declaration. Again, this included the protest against the patenting of life.

The Africa Group in the WTO has consistently maintained a position against the patenting of life forms and their parts. A group of indigenous persons met in 2003 to revisit their positions on the ongoing negotiations in the WTO and in the World Intellectual Property Organization (WIPO). This meeting supported the Africa group position, which called for a revision of Article 27.3 (b) of the TRIPS Agreement to prohibit patents on plants, animals, microorganisms, and essentially biological processes for the production of plants and animals.

In addition, a few of us have participated in the negotiations leading to the adoption of a Biosafety Protocol in the Convention on Biological Diversity. The Biosafety Protocol, which was adopted in 2000, primarily regulates the transboundary movement of genetically modified organisms (GMOs). The Tebtebba Foundation has worked closely with the Third World Network (an international NGO based in Penang, Malaysia) on this issue. Many indigenous peoples in different parts of the world are also taking part in the campaigns against GMOs and products containing GMOs. The campaign launched by indigenous peoples' organizations and NGOs

¹²UN Document E/CN.4/Sub.2/AC.4/1998/4, Standard Setting Activities: Evolution of Standards Concerning the Rights of Indigenous Peoples, Human Genome Diversity Research and Indigenous Peoples, Commission on Human Rights, Geneva, p. 4.

¹³Tebtebba Foundation (Indigenous Peoples' International Centre for Policy Research and Education) is an indigenous peoples' NGO whose objective is to help build the capacity of indigenous peoples to fight for their own issues. It carries out research work, lobbying and advocacy in the national and international arenas, holds training workshops and produces publications.

against the GMO contamination of corn in Mexico is another response which highlighted how the contamination happened and what remedial measures can be taken by the Mexican Government and the international community. We are part of an international network against genetic engineering and food security which is composed of various community-based organizations which are working for sustainable agriculture in Asia, Latin America and Africa.

At the national levels there are various efforts of indigenous peoples' organizations to monitor the state of biopiracy taking place and also to lobby for laws that will regulate bioprospecting. In the Philippines, for instance, there is Executive Order (EO) 247, which is expected to regulate research and bioprospecting in the local communities. The Executive Order requires prior informed consent before the researchers can even set foot in the communities. There are still a lot of weaknesses in terms of how this is being implemented but it has served as a deterrent against the rush of biopirates. This has since been superseded by the 1997 Indigenous Peoples' Rights Act which has specific provisions that require corporations and researchers to obtain the free, prior and informed consent of indigenous peoples in communities where research or bioprospecting is being done.

Today we do not hear about the Human Genome Diversity Project. However, as mentioned earlier, in 2005 the National Geographic Society unveiled the Genographic Project, which is a reincarnation of the HGDP. This project aims to collect 100,000 DNA samples from indigenous peoples all over the world to show how they are interconnected. Now, they are undertaking collections through different channels. The UN Permanent Forum on Indigenous Issues (of which I am the current Chairperson) in its latest session held in May 2006 made the following recommendation:

88. The Permanent Forum recommends that WHO and the Human Rights Council conduct an investigation of the objectives of the Genographic Project which proposes to collect 100,000 DNA samples from the indigenous peoples of the world in order to formulate theories on historic human migrations, that the Genographic Project should be immediately suspended and that they report to indigenous peoples on the free, prior and informed consent of indigenous peoples in all communities where activities are conducted and planned.¹⁴

Conclusions

The position of indigenous peoples vis-à-vis genetic engineering is still evolving. The common thread in the various positions is the view that life forms should not be patented. If the ownership of patents on life forms is the main incentive for scientists and corporations to invest in biotechnology, it might be a good idea not to allow this. The benevolent motives avowed by scientists who want to contribute to sustainable development should not be tainted by the commercialization or commodification of life.

There is a common concern among indigenous peoples about the dangers of releasing GMOs and commercializing them as it is already proven that these can contaminate wild and traditional varieties of food crops, medicinal plants, wild foods, and forage. Much more work needs to be done to increase the engagement of indigenous peoples in the implementation and monitoring of the Biosafety Protocol.

It is also generally agreed that the harmonization of intellectual property rights regimes to fit the mould of Western IPRs, particularly TRIPS, is morally and legally indefensible. This is being

¹⁴See UN Doc. E/2006/43/ and E/C.19/2006/11. Report on the Fifth Session of the UN Permanent Forum on Indigenous Issues (15–16 May 2006) p. 15.

done to further legitimize the desire of industrialized countries and their transnational corporations to have monopoly control over biotechnology. Those who have contributed their centuries-old knowledge to develop and protect the rich biodiversity in their communities will now be accused of biopiracy because the right to this knowledge is passing into the hands of the corporations through IPRs.

It should be recognized that indigenous peoples have a right to their intellectual and cultural heritage; this is clearly articulated in the UN Declaration on the Rights of Indigenous Peoples and other UN standards. This right is being blatantly violated by developments in biotechnology. Even the collection of genetic materials from indigenous peoples' bodies through the HGDP and the Genographic Project and other similar projects is a violation of the rights and dignity of indigenous peoples.

We indigenous peoples all agree that the protection of biodiversity and cultural diversity cannot be effectively guaranteed if our rights to our ancestral territories are not recognized and respected. Therefore, protests against biotechnology cannot be separated from the call for the recognition and respect of indigenous peoples' rights to territories, right to own their lands and resources, including genetic resources, and the right to their intellectual and cultural heritage.

The UN Declaration on the Rights of Indigenous Peoples contains the minimum standards which should guide states, corporations and society in general on how they should respect and protect indigenous peoples' rights. It was the result of more than two decades of intensive dialogues between indigenous peoples, experts and government delegations. It is the articulation of the collective values and aspirations of indigenous peoples from all parts of the world. The recent adoption of this is a historic milestone which will have strategic implications for our fight to sustain biodiversity in our lands and keep these safe from being polluted with GMOs. The march of science and technology will likely proceed in spite of protests from indigenous peoples and NGOs. In the face of the aggressive recolonization of indigenous peoples' territories, bodies and minds, which is facilitated by the new science and technologies, it is imperative to support the struggles of indigenous peoples and to ensure that the UN Declaration on the Rights of Indigenous Peoples is respected by governments, corporations and the broader society. Whatever gains indigenous peoples will make will also be gains for the whole of humanity and nature.

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