

WHO BENEFITS FROM AFRICAN RESEARCH?¹

The case spans over more than 20 years. It begins in the 1980s and is currently being debated. Between 1984 and 1986 a Ph. D. Botany student wanted to establish what kind of enzymes could be found in lakes of the Great Rift Valley of East Africa, namely: Lakes Bogoria, Magadi, Nakuru, Elementaita and Solai within Kenya, and Lake Natron in Tanzania. These lakes are famous for their salt and soda and their extremely hot geysers. Due to the fact that Kenyan universities do not generally possess the kind of powerful laboratory equipment needed to carry out such a research, this candidate arranged to send samples to major laboratories in the world. In order to do so she applied for and obtained the necessary permits according to the laws regulating this kind of research in Kenya. The results submitted to her by those outstanding scientific centers indicated that no enzymes could be traced in any of the samples she had sent from the different lakes. Since no enzymes could be found in the samples taken from any of the lakes, the research student changed the focus of her research. Her new project would consist in establishing what kinds of organisms could be found in just one of the lakes: Lake Bogoria in Kenya.

Aiding African research

Through her institution, this candidate applied for a research grant to any organization, which would be interested in sponsoring such a project. She wrote and submitted a proposal. The response came from the British Council which, in turn, circulated the proposal in English universities to find out which university could host and supervise her work while in England. The University of Leicester was the one which showed such an interest. It offered to provide the candidate with whatever she needed for her research work including tuition and accommodation. Two professors were designated as research supervisors. During her research period the candidate was required to work between the two countries, Kenya and England. She would spend some time each year in Kenya collecting and classifying samples, and some period in the University of Leicester doing the rest of the laboratory work.

This type of research work usually goes through certain procedures. First she needed to get the endorsement of the National Council for Science and Technology (NCST). This was done and all the necessary permits granted within the proviso that she would submit a report of her findings to the NCST at the completion of her Ph. D. research. It was also agreed that the British Council, through Leicester University, would meet fees and accommodation costs while the NCST would sponsor the Kenya part of the research.

¹ This story has been compiled from different sources. First, media reports in *The East African* and *Daily Nation* which carried exclusive reports on the issues discussed below; then a direct interview with the chief protagonist: a former Ph. D. student from a Kenyan university; an interview with the journalist who compiled the media reports; and an interview with an official of the Kenya Wild Life Services. Details regarding the nature and work of the two companies have been obtained from the web.

The research samples

The kind of research the candidate was undertaking required the collection or scooping of materials from the lakes for analysis. These samples consisted mostly of water and different kinds of solids. Once collected these samples would be put in tiny plastic bags or small phials and then sealed. This made the transportation and storage of such materials less bulky. In order to take the samples out of the country, however, more permits were needed. She would obtain these as well as per regulation. During the course of her field research at Lake Bogoria her supervisors and other visiting professors visited her at the site as was to be expected. At the laboratory both in Kenya and in England she would store the research samples in a refrigerator destined for that purpose. The candidate completed her Ph. D. work in 1991 and in 1992 she was awarded the Ph. D. in Botany of the University of Leicester. She returned to Kenya thereafter and submitted her report. Her thesis had simply identified, classified and named the organisms present in a particular spot of Lake Bogoria. She submitted her report to NCST in Kenya and continued her teaching job at her university where she is now a professor of botany.

A surprise revelation

In 2004, the *East African* of August 23, 2004 carried a story which, among other things, said that following extensive investigation and interviews with scientists working for the World Wildlife Fund for Nature (WWF), the International Centre for Physiology and Ecology (ICIPE),² the Kenya Wildlife Services (KWS) and members of the Kalenjin³ community living around Lake Bogoria in Kenya, it had established that samples of living organisms were collected from a number of alkaline lakes located on the bed of the Great Rift Valley. However, only samples that yielded positive results were taken from the hot geysers of Lake Bogoria and along the shores of Lake Nakuru.

The point of contention has been that, according to Kenya Wildlife Services, the research permit which was granted to the candidate by the Ministry of Education and Technology in Kenya with the recommendation of NCST did not include any commercial involvement of the research findings whatsoever. If any such additional prospecting was intended neither the candidate nor the University of Leicester ever expressed such intention. If they had done so, that would have required a new and different kind of permit. The candidate's story is that she only obtained a permit to carry out the research she had declared in her proposal and at the end to submit a report. She complied with these requirements.

However, according to *the East African*,⁴ its findings reveal that some scientists who visited Lake Bogoria collected samples from the lake and sold them to Genencor International. This company, in turn, extracted an enzyme and sold it to a third party:

² ICIPE's Headquarters are in Nairobi.

³ The Kalenjin are a Kenyan ethnic community whose ancestral land occupies most of the southern Rift Valley.

⁴ J. Mbaria, "KWS Seeks Millions from Procter & Gamble," *The East African*, Nairobi, 23 August 2004 (a).

Procter & Gamble for use as a critical ingredient in the manufacture of Tide Alternative Bleach detergent.

Since then, sales of that and other detergents have earned the two companies significant amounts of dollars. So happy are they that in Genencor's Annual Report of 2000 Procter & Gamble is quoted as saying specifically that it looked for enzymes that flourish in alkaline environments, in the soda lakes of Kenya where they found "enzymes that give your jeans a softer feel and a stonewashed look."⁵ The two companies, Genencor Inc. and P & G are known to have had a long-standing commercial relationship however. Their relationship is known to have become even stronger after signing a \$600 million five-year supply contract.⁶ The fact that they are really happy with their finding is evident from a statement made by the vice president in charge of research and development at Procter & Gamble, Dr. Nahil Sakkah, at the launch of Genencor's 2000 Annual Report. He explained how the very cordial relationship between the two companies resulted in "Genencor delivering innovative biotechnology-based solutions to Procter & Gamble for over 18 years."⁷ That specific date coincides with the period when the Kenyan student was engaged in her Ph. D. research with the University of Leicester.

Asked what she knew about this science expedition in the alkaline lakes of Kenya, the ex-student, now professor of Botany, says that the only way her professors could have had access to the samples was if they took them from her refrigerator. If this did indeed happen, she says, it would be unfortunate because it was not normal procedure neither at the university she worked in England nor at her own university, for anyone to take someone else's samples from the refrigerator for their own research interest without permission. In that respect, however, she has no recollection whatsoever of anyone asking her for such permission. She is therefore very surprised with what she has read in the media and angry that her colleagues might have taken advantage of her refrigerator to carry out private research of which she was not a part.

During her stay in Britain the researcher noted however, that British universities were putting a lot of pressure on University faculty and departments to justify their university positions through research and consultancy. This, according to her, might partly have contributed to the interest and choice of her project by the department in which she worked. Nevertheless since that discussion never arose throughout the years she worked at the University of Leicester, she was not aware that her project was being pirated. Since it is becoming increasingly important for academic departments to fight for their survival, one wonders to what extent such pressure can lead academicians to either waive some ethical standards or to completely forget that there are certain protocols and responsibilities towards countries and communities that should be observed also. In the present case the research student says she never knew that her supervisors' interest in her

⁵ J. Mbaria, 2004 (a).

⁶ Genencor International: Press Release of November 7, 2001 (www.genencor.com/wt/print/pr_1005091211).

⁷ J. Mbaria, 2004 (a).

work was commercial. She further expressed disappointment that her colleagues could have made such an important breakthrough and keep her in the dark about it.

Extremophiles

Extremophiles⁸ are micro-organisms which have the ability to survive in temperatures as high as 113 degrees centigrade or in highly-concentrated acidic broths that would literally consume human tissue. Some love salt and prefer to live in extremely saline lakes. Others thrive in extreme cold temperatures inhabiting polar seas and soils and Alpine glaciers. Extremophiles thrive even better in areas that combine a number of extreme factors such as extremely high temperatures and acidic conditions. This is the case with some of the lakes in the Great Rift Valley in East Africa, specifically Lake Namanga, Lake Nakuru and Lake Baringo.

According to the research candidate mentioned before and scientists at ICIPE, extremophiles are named after the conditions in which they exist. Those that prefer to live in acidic solutions are called acidophilus, while those found in alkaline areas are called alkaliphiles. Other groups include halophiles, psychrophiles and thermophiles for saline, cold and hot places, respectively.⁹

Genencor International

Genencor International Inc. is a diversified biotechnology company with over \$380 million in 2003 revenues.¹⁰ It has offices in California and New York in the US and in the town of Leiden in the Netherlands. In a number of its annual reports, Genencor has stated that its scientists discovered the extremophile from which they developed an easy-to-use enzyme that can treat denim (jeans) to create the popular "stonewash" look, in Kenya.¹¹

In its own story¹² Genencor's explains how it discovered extremophiles in Kenya during an expedition in 1992 and how in 1998 it commercialized an extremophile enzyme, *Puradax cellulase*, derived from a new *Bacillus* species found in the Rift Valley soda lakes of East Africa. It further explains that it also introduced *IndiAge Neutra*, an enzyme derived from a bacterium that was isolated from the soda mud flats on the shores of the

⁸ See J. Mbaria, "Extremophiles: They Like It Hot, Cold, Salty and Acid," *The East African*, Nairobi, August 23, 2004 (b).

⁹ In the US, a famous example of a heat-loving organism with a high commercial value is a bacterium called *Thermus aquaticus* discovered in the late 1960s at hot springs in the Yellowstone National Park in Wyoming. According to one scientist at ICIPE, Nairobi, a bacterium *Thermus aquaticus* once it was found that this bacterium was capable of producing the enzyme *TaqDNA Polymerase*, US scientists went ahead to develop the universally-famous DNA finger-printing technique that is now widely used to fight crime.

¹⁰ www.genencor.com/wt/home.

¹¹ www.genencor.com/wt/print/biodiversity.

¹² www.genencor.com/wt/gcor/biodiversity.

highly alkaline lakes in Kenya. "The discovery of this cellulose was, according to Professor Jones, ... 'pure serendipity' – a happy accident."¹³ They do not specifically mention Lake Bogoria, but Bogoria is an alkaline lake in Kenya. Furthermore both KWS and the NCST deny having granted permits to Genencor to collect samples from any of the lakes.

In its Profile Genencor International, Inc. explains its line of work as follows:

If you've got the money, honey, Genencor International's got the 'zyme. Genencor manufactures genetically modified enzymes for the industrial, agricultural, and health care markets. Using gene discovery, molecular evolution and design, and functional genomics, the company finds genes and alters their proteins for use in cleaning products, textiles, health care products, and enhanced grain and animal feed. Genencor is developing enzymes for use in skin care products through a partnership with Procter & Gamble (which accounts for more than one-third of sales). More than half of Genencor's product sales are outside the US. Eastman Chemical and Danisco each own 42% of Genencor.¹⁴

Procter & Gamble

Procter & Gamble was established as a soap and candle company by the Americans William Procter and James Gamble in 1837. It started as a family business. Over its 167 years of existence Procter and Gamble expanded to become a \$38 billion corporation as per March 2004. It turns out more than 300 products and has a consumer base of about five billion people worldwide with sales in more than 140 countries which include Kenya.¹⁵

Its original Tide detergent was launched in 1946. Over the years since then it has come up with a host of brands bearing the name Tide. It boasts of how Tide has remained its flagship, retaining its popularity because of its "superior" washing quality and "innovations" that have helped it to remain the company's single largest brand.¹⁶

An investigation into the principles that guide P & G activities shows their declared core values which include Integrity and Trust. Of integrity P & G has this to say:

"We always try to do the right thing. We are honest and straightforward with each other. We operate within the letter and spirit of the law. We uphold the values and principles of P & G in every action and decision. We are data-based and intellectually honest in advocating proposals, including recognizing risks."¹⁷

¹³ *Textile Month. The International Textile Magazine*. Issue I: 2004, p. 2.

¹⁴ www.genencor.com.

¹⁵ www.pg.com/company.

¹⁶ www.pg.com/product_card/brand_overview.

¹⁷ Ethics Statement of Procter and Gamble cited in Patrick E. Murphy: *Eighty Exemplary Ethics Statements*, University of Notre Dame Press, Notre Dame, Indiana, 1998, p. 162.

Disclosure of a scientific expedition

Following the disclosure that an enzyme had been created from organisms that had been collected from the Kenyan lakes for research purposes, and on learning that from those enzymes a lucrative business has flourished for over 18 years, the Kenya Wildlife Service (KWS) with assistance from scientists at ICIPE (International Centre for Physiology and Ecology) took action. They launched a claim for a share of the proceeds accruing to the US multinational giant Procter & Gamble and to Genencor International BV of the Netherlands with respect to the sales of Tide Alternative Bleach Detergent and "stonewashing", because the active ingredients they are using were acquired in Kenya in contravention of the Convention of Biological Diversity (CBD)¹⁸ and the agreement of the Intellectual Property Rights (IPRs).¹⁹

Both ICIPE and KWS declare that it was wrong of foreign scientists to have acquired samples from Kenya without permission and to later commercialize them. They further maintain that those actions directly violate the international agreement on biodiversity. Precisely one of the provisions of the CBD affirms the sovereign right of signatories to the CBD Act over all biological resources found within their territories and commits the parties to "fair and equitable sharing of the benefits accruing from the utilization of genetic resources."²⁰ In that sense the scientists, Genencor Inc., and Procter & Gamble have violated the CBD protocol in dealing with Kenya.

To date Genencor Inc. has denied any wrongdoing. It denies that it ever sold any such enzymes to its principal business partner, the US multi-billion-dollar giant Procter & Gamble. It also disputes claims that it contravened the CBD provisions, arguing that by the time the CBD was put into effect (1992) its company had already scooped the samples. It also claims that the scientific expedition during which the samples were scooped and taken out of Kenya had had the blessings of the National Council for Sciences and Technology (NCST). If that is so, then this expedition seems to have been the same one of the Kenyan researcher doing her Ph. D.

On their part NCST expresses doubts that the Genencor Inc. team could ever have made full disclosure of the nature of their expedition and research interests in Lake Bogoria and Lake Nakuru because the NCST's job is usually the vetting of research applications after which they pass the applications to the Ministry of Education which gives the permits for

¹⁸ By biological diversity is meant: "The variability among living organism from all sources including *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; his includes diversity within species, between species and of ecosystems." www.biodiv.org.

¹⁹ Third World Network, Briefing Paper No. 7. www.twinside.org.sg.

²⁰ V. H. Heywood and R.T. Watson (eds.). *Global Biodiversity Assessment*, published for UNEP, Cambridge University Press, p.7.

action. The Ministry of Education and Technology does not deal with commercial research.

The Convention on Biological Diversity (CBD)

In 1987, the United Nations Environmental Program started making preparations for a Convention on Biodiversity through the establishment of a Working Group of experts on Biological Diversity (CDB).²¹ In 1991 that Working Group proposed an Intergovernmental Negotiating Committee for a Convention on Biological Diversity and in May 1992, in Nairobi, a draft of the Convention CBD was agreed upon and adopted by 101 governments and signed by 159 governments, plus the European Union, at a United Nations Conference (UNCED) held in Rio de Janeiro in June of the same year. In its article 1, it states that:

“The objectives to be pursued in accordance with its relevant provisions, are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.”²²

Since then the Convention has been ratified by more than 180 countries. Unfortunate though is the fact that the United States did neither ratify nor approve the Convention while Great Britain ratified it and the European Union even approved it. The Convention goes on to state in article 3 that

“States have, in accordance with the Charter of the United Nations and the principle of international law, the sovereignty right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.”²³

Questions:

(1) How do you assess the story of the organisms found in the Lake Bogoria, from which enzymes were created to be used in Tide Alternative Bleach detergents?

²¹ See Heywood and Watson (footnote 20).

²² www.biodiv.org.

²³ www.biodiv.org.

(2) What actions do you recommend to be taken in order to recompense the community living around the Lake Bogoria and the people in Kenya for using their organisms?

(3) What is the role of business ethics in the intercultural context?

(4) Who benefits from African research?

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