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Editorial

The current issue of elni Review (2/2011) covers a variety of topics on international environmental law, including standardisation of environmental NGOs, conservation law and two country specific contributions from Brazil regarding access to environmental information and biotechnological inventions.

Special focus in this issue is placed on two different topics: Firstly on intellectual property rights on genetic resources. The second subject is devoted to access to environmental information and access to justice within the framework of the Aarhus Convention.

First of all, *Christoph Then and Ruth Tippe* examine the impact of biopatents on animal and plant breeding in their article "Patents on melon, broccoli and ham?". After shedding light on current German and European patent legislation they discuss the consequences of patents on conventional breeding regarding genetic resources and food production.

The second article "Biopatents in Brazil" by *Edson Paula de Souza* provides insights into current legislation on biotechnological inventions in Brazil. He explores the impact of limitation on patent protection for R&D.

Susette Biber-Klemm and Michelangelo Temmerman then provide us with an overview of Rights to Animal Genetic Resources by comparing the different legal frameworks for plant and animal breeding/genetic resources on national and international levels.

The two subsequent articles address different aspects of the Aarhus Convention:

Sandra Aline Nascimento da Nóbrega gives an overview of access to environmental information in Brazil (access to environmental information is one of the three pillars of the Aarhus Convention). She compares the Aarhus Convention with Brazilian legislation and discusses which regulations have been implemented in Brazilian law.

In her contribution *Eva Julia Lohse* asks whether there is unrestricted access to justice for environmental NGOs. She examines the judgement of the European Court of Justice (Case C-115/09) on the non-conformity of the German Environment Appeals Act with Directive 2003/35 and the Aarhus Convention.

Ralf Lottes's article analyses what civic society can expect from the Commission's proposal for a legislative review of the European standardisation policy. He concentrates on the standardisation of NGOs through the review of the EU framework for standardisation regarding environmental NGO participation on a national level.

Hendrik Schoukens's contribution on temporary nature and conservation law examines the adaptability of European nature conservation law for temporary nature, focusing on the situation in Belgium.

Finally, we cover recent developments in environmental law with three different contributions concentrating on intellectual property rights in terms of genetic resources.

The article by *Lisa Minkmar* provides insights from a biopatent case: the "Teff-Patent" (EP 1646287).

Subsequently; *Claudia Fricke* reviews the current debate on the revision of Directive 98/44/EC on the legal protection of biotechnological inventions.

Lastly, *Graham Dufield* comments on the United Nations Special Rapporteur on the Right to Food and the interplay between traditional knowledge, intellectual property rights and the right to food.

Contributions for the next issue of the elni Review are very welcome. Please send contributions to the editors by mid-February 2012.

Claudia Fricke/Martin Führ
November 2011

Rule of Law for Nature

9-11th May 2012
in Oslo, Norway

The year 2012 marks a number of watershed points in international environmental affairs: The 40th anniversary of the adoption of the Stockholm Declaration, the 30th anniversary of the UN World Charter for Nature and the UN Convention on the Law of the Sea, the 25th anniversary of the Brundtland Report, and the 20th anniversary of both the Rio Declaration, Agenda 21, and the UNCED Conventions: the Framework Convention on Climate Change and the Convention on Biological Diversity.

This is an appropriate point in time for reflection on the legal status of nature, how environmental goods and services are valued and taken into account in decision-making, and the implications of the rule of law in this respect.

While the rule of law generally is used with regard to citizens' rights, this conference aims to explore the application of the rule of law to environmental protection, and its implications. How can the legal protection of the natural environment be strengthened? This also opens for reflections on the temporal and geographical extension of the rule of law.

The conference aims at analysing these basic issues of international and national environmental law and looking at new trends in this area of law.

For more information about participation, including registration forms, please visit:

<http://www.jus.uio.no/forskning/omrader/naturressurs/arrangementer/2012/05-09-rule-of-law>

Patents on melon, ham and broccoli? Change of paradigm in patent law: From protection of inventions to control of genetic resources

Christoph Then and Ruth Tippe

1 Introduction

In recent years, there have been an increasing number of patent applications on conventionally bred plants and animals. These patents no longer simply focus on a particular segment of farm and food production, such as the cultivation of genetically engineered seeds, but more on the resources of daily living in general. According to our research¹, there has been an ongoing steady increase in the number of such patent applications in this area. Patents are being filed on seeds and breeding material, plants and animals, processes for breeding and food derived thereof, such as oil, flour, tomatoes, melons, milk and eggs. While the technical innovation in most cases is only minor, the scope of the patents is extremely broad, covering the whole chain of food production, from farm to fork. Several such patents have already been granted.

Modern patent law is in danger of being abused and losing control of resources and products needed for global food production. If this trend is not stopped, companies such as Monsanto, which not only apply for patents, but also have the economic power to access and dominate markets, will be able to decide which seeds are used in agriculture, which products are available for the food market and which prices will be paid by farmers, food producers and consumers. Especially Monsanto, which is already number one in the international seed market, will be able to realise its interests in global markets. It has already acquired the biggest vegetable breeders such as Seminis and DeRuitter and dominates the maize and soy markets². There are several other companies in the agrochemical sector which have become major players in the seed business. Market concentration in this sector has steadily intensified within the last decade and patents are a main driving factor in this context.

From a more general perspective of on the history of patent law and the impact of patents in this area, there has been a major change in the paradigm; the main purpose of these patents is not to protect inventions, but to monopolise resources. Strategies for controlling genetic resources have become a main driver in biotechnology patents.

The authors of this report believe that patents on plants and animals as well as breeding materials should be excluded by law, and open source systems in plant and animal breeding should be promoted to support innovation in plant breeding, enhance biological diversity in agriculture and secure world food production.

2 History of 'life patents'

Patent law has developed over centuries. While in the 17th century the British Crown issued patents as privileges that guaranteed monopolies in trading salt, glass, steel and beer, modern law is driven by the guiding principle that patents can only be granted on inventions. Patents can only be granted on technical developments with an inventive character, but not on discoveries or natural resources. Recent developments show that this fundamental distinction between invention and discovery is about to be abandoned, especially in regard to patents on genetic resources and conventional breeding.

In 1980, a patent was granted on a microorganism in the US. This case, which is known as the *Chakrabarty* case, represents a milestone in the history of 'life patents'. In 1987, the US PTO stated for the first time that it would grant patents on multi-cellular organisms (in this case it was an oyster). In 1988, also in the US, the first patent on a mammal was granted, the so-called *OncoMouse*, a genetically engineered mouse created specifically to be susceptible to cancer, it was invented by Harvard University and Philip Leder and licensed by Dupont.

In 1992, the patent on the *OncoMouse* was also granted in Europe (EP 0169672). This patent was the starting point for a controversial debate in Europe about the future of patent law, which continues to this day.

The patent on the *OncoMouse* was accompanied by early patent applications on human genes and genetically engineered plants. For example, in 1980 the German company Hoechst filed an application for a patent on a gene sequence on human interferon (EP 0034306) that was granted in 1987. In 1991, a patent on genetically engineered plants for the Dutch company Plant Genetic Systems was granted (EP 242236), and in 1996, a European Patent was granted on Monsanto's *Roundup Ready* soy.

¹ C. Then & R. Tippe, Seed monopolists increasingly gaining market control, 2011, C. Then & R. Tippe, The future of seeds and food under the growing threat of patents and market concentration, 2009, www.No-patents-on-seeds.org.

² P.H. Howard, Visualizing Consolidation in the Global Seed Industry: 1996–2008, *Sustainability* (2009), 1, 1266–1287; doi:10.3390/su1041266.

2.1 The European Patent Directive

Before 1998, patents, in particular those on plants and animals, were granted without sufficient legal basis because the European Patent Convention (EPC) excludes patents on plant and animal varieties (Art. 53B EPC). Thus, in 1995, patents on plants and animals were stopped by the Board of Appeal at the European Patent Office after opposition from Greenpeace (T356/93). However, in 1998 the European Union adopted The *Directive on Legal Protection of Biotechnological Inventions* (98/44 EC) which changed the legal landscape in Europe. Its adoption was debated for more than ten years. During this time, controversial debates in the European Parliament were accompanied by a well-orchestrated campaign by industry, which threatened Parliament with slogans like “no patents, no cure”.³

With the adoption of this directive, the patentability of human gene sequences was permissible, and the existing prohibitions in EPC concerning plants and animals (Art. 53b EPC) were substantially narrowed by the new interpretation. From now on this exclusion was only relevant for those cases in which a specific plant variety is claimed by a patent. All other plant or animal materials are regarded as being patentable, even if varieties are within the scope of the claims. If, for example, a particular tomato variety with big red fruit was to be claimed as an invention, this application would probably be rejected. However, if someone applies for a patent on tomato plants in general with bigger red fruit, this might become an invention, even if dozens of varieties are included. Following this interpretation in 1999, the EPO overturned its previous decision (T356/93) taken by the Enlarged Board of Appeal (G1/98). As a result opposition to patents such as Monsanto’s patent on *Roundup Ready* soybeans (EP 0546090) covering plant material, gene sequences and plant varieties were rejected. Even legal experts at the EPO perceived this situation as comparable with a law prohibiting bigamy but allowing polygamy (T1054/96).

Meanwhile, more than thousand patents on genetically engineered plants and several hundred on animals have been granted in addition to several thousand patents on human gene sequences. While consequences for the plant-breeding sector are set out in the next chapter, it should also be mentioned that patents on human gene sequences are now viewed with increasing scepticism. For example, in August 2011 a UK National Health Service (NHS) expert is quoted in the Financial Times as saying:

“The view from the NHS is that, for diagnostics, gene patents are unacceptable, unenforceable and detrimental to the delivery of patient services.”⁴

2.2 Patents on seeds – The consequences so far

In the last ten years, the seed market has experienced an ongoing process of concentration and restructuring. According to the expert group ETC, just ten companies control two thirds of global seed sales.⁵ The process of concentration has led to the takeover of big seed companies, such as Pioneer, DeKalb and Seminis, and led to the disappearance of many smaller companies.⁶ The big players in the international seed market such as Monsanto, Dupont, Syngenta and Bayer originated in the agrochemicals sector and have shown a special interest in the global seed market ever since the 1980s when genetic engineering in plants became technically feasible. From the beginning, the introduction of genetically engineered seeds was strongly connected with the idea of a new quality of corporate control. For example, a 1992 OECD publication⁷ stated that, within the seeds sector, the main company focus should be on the reorganisation of the seed market, leading to a greater integration and dependency with the agrochemicals sector. Genetic engineering and patents served as a major tool in this context. Any gene sequence introduced into plant material also confers its patent protection to seeds, plant and progenies, all along the chain of farm and food production up to markets such as food and biofuels.

Thus, patents became an important driving factor in the concentration process. They made it possible to hamper or even block access of other breeders to the biological material. In comparison, plant variety protection (PVP) system allows free access to commercially traded seed for the purpose of further breeding (“breeders’ exemption”). Thus PVP works as an open source system for other breeders.

Patents not only block access to genetic material of a certain variety. The monopoly rights of patents do not end as long as the patented genetic conditions can be found in any progeny. Thus after crossing of plants there can be an accumulation of patents in the subsequent generations.

So contrary to the principle of *breeders’ exemption* in the plant variety protection system, no other breeder can use patented seeds for further development of new varieties if the patent holder does not issue a licence.

³ See C. Then, *Dolly ist tot*, Rotpunktverlag (2008).

⁴ NHS ignores gene patents, experts say, Financial Times, August 5, 2011, <http://www.ft.com/intl/cms/s/2/87f6d486-bf5c-11e0-898c-00144feabdc0.html#axzz1USb2gwfP>.

⁵ ETC, *Who Owns Nature*, (2008), http://www.etcgroup.org/en/materials/publications.html?pub_id=706.

⁶ See footnote 2 supra.

⁷ OECD, *Biotechnology, Agriculture and Food*, Published by OECD Publishing, (1992), OECD Code: 931992031P1, ISBN 92-64-13725-4.

And even then the marketing of new plant varieties will not be independent of the rights of the patent holder as set out in the plant variety protection system. From the perspective of patent law, this constituted a major change in the paradigm. The main objective of these patents is the monopolisation of resources rather than the protection of inventions.

Besides the negative impact on breeders and innovation in plant breeding, there are other issues under discussion, which could affect markets and world food supply.

Patents require costly legal procedures that very often smaller breeders cannot afford, while plant breeders' rights can also be used by small companies. Patent applications require specialised patent attorneys, it may take years before rights are granted and it might be contested afterwards. The legal costs of such a procedure may cause a financially weaker party to give up if threatened with a court case.⁸

Patents make it possible to fix higher prices for seeds. In recent years, the prices for patented seeds in the US have increased dramatically.⁹ However, yields from these crops have not increased proportionally.¹⁰ Thus, there is an increasing difference between the noticeably slow growth of yields and the rapid increase of prices, especially in those plant species such as soy, maize and cotton where patented genetically engineered varieties have been introduced.

Farmers are not only facing soaring seed prices, but very often have fewer products to choose from. For example, the National Family Farmers Coalition (NFFC) reported several cases, in which seed companies were first bought up by Monsanto and then the traditional varieties were taken off the market, reducing the farmer's choice substantially.¹¹

Moreover, these developments are putting the interests of developing countries at risk. For example, there has been increasing discussion within the UN. As Miguel d'Escoto Brockmann, President of the General Assembly, remarked on 25 September 2008 at an important event on the millennium development goals:¹²

*"The essential purpose of food, which is to nourish people, has been subordinated to the economic aims of a handful of multinational corporations that monopolize all aspects of food production, from seeds to major distribution chains (...)."*¹³

Concerns about the implications of patented seeds on developing countries have been expressed by many experts in the field of patent law. For instance, the UK Commission on Intellectual Property Rights¹⁴, the Rockefeller Foundation¹⁵ and the European Group on Ethics in Science and New Technologies to the European Commission (EGE)¹⁶ voiced its concerns about increasing concentration and even monopolisation within the seeds sector.

European seed-market experts are also raising major concerns, since the process of market concentration has also reached the breeders within the EU. Especially plant breeding in the Netherlands has eminent importance in the European seed market. A report from the University of Wageningen warns of the consequences of patenting for Dutch breeders:¹⁷

"Patent positions in combination with technological developments have in recent decades led to a large consolidation move among breeding companies. For most crops only a few companies are controlling a large part of the world market. This makes a growing part of the global food supply dependent on a few companies. The access barrier for new companies to the plant breeding sector is high, where IPR plays a role next to the large amount of knowledge and expertise required to set up a breeding company and the long development period for new varieties. Farmers and growers fear that their freedom of choice is threatened and that no varieties will be developed for certain crops that specifically meet their requirements when the decision power in breeding moves away from The Netherlands."

⁸ N. Louwaars et al., Breeding Business, the future of plant breeding in the light of developments in patent rights and plant breeder's rights, University of Wageningen, CGN Report (2009) <http://documents.plant.wur.nl/cgn/literature/reports/BreedingBusiness.pdf>.

⁹ See database of United States Department of Agriculture (USDA) - Economic Research Service, <http://www.ers.usda.gov/Data/CostsAndReturns/testpick.htm>.

¹⁰ See footnote (9) supra.

¹¹ K. Hubbard, Out of Hand, farmers face the consequences of a consolidated seed industry, National Family Farm Coalition (2009), <http://farmerstofarmercampaign.com/>.

¹² <http://appablog.wordpress.com/2008/09/26/opening-remarks-by-h-e-miguel-d%E2%80%99escoto-brockmann-president-of-the-general-assembly-at-the-high-level-event-on-the-millennium-development-goals-25-september-2008-united-nations-new-york/>.

¹³ Quoted from C. Then & R. Tippe, The future of seeds and food under the growing threat of patents and market concentration (2009) M. d'Escoto Brockmann, UN-General Assembly (2008), <http://appablog.wordpress.com/2008/09/26/opening-remarks-by-h-e-miguel-d%E2%80%99escoto-brockmann-president-of-the-general-assembly-at-the-high-level-event-on-the-millennium-development-goals-25-september-2008-united-nations-new-york/>.

¹⁴ UK Commission on Intellectual Property Rights, Integrating Intellectual Property Rights and Development Policy (2002), <http://www.iprcommission.org>.

¹⁵ Knight, Crop improvement: A dying breed, (2003) Nature 421: 568-570.

¹⁶ The European Group on Ethics in Science and New Technologies to the European Commission (EGE), Ethics of modern developments in agriculture technologies, Opinion Nr. 24 (2008).

¹⁷ N. Louwaars et al., Breeding Business, the future of plant breeding in the light of developments in patent rights and plant breeder's rights, University of Wageningen, CGN Report (2009), <http://documents.plant.wur.nl/cgn/literature/reports/BreedingBusiness.pdf>.

3 Patents on conventional breeding – a new development

As mentioned earlier, Europe is seeing a growing trend in the number of applications for patents on plants derived from conventional breeding. At the same time, there is a steadily increasing number of such patent applications and patents being granted by the Patent Office. According to our research, there are about 800 applications pending, with around 100 patents covering conventional breeding that have already been granted by the EPO.¹⁸ The proportion of patents covering conventional breeding being filed by corporations such as Monsanto, Syngenta and Dupont is also increasing; these now make up 20 to 30 percent of their patent applications in the context of plant breeding. Compared to patents in the field of genetic engineering, patents on conventional breeding takes us a step 'ahead' in the dismantling of the traditional distinction between discoveries and inventions. Very often the overall technical contribution to the process of breeding is only minor. For example, plants can be turned into 'inventions' by measuring the content of compounds in plants (such as oil or protein), by describing phenotypical features (such as number of leaves or size of plants, yield, growth, biomass), by detecting resistance against biotic or abiotic stress or by genomic screening for naturally occurring genetic conditions. In many cases, mutagenesis which has been used for several decades is also claimed in patent applications.

In 2010, the EPO's Enlarged Board of Appeal decided, based on precedent cases, that methods used for conventionally breeding plants are not patentable (G2/07 and G1/08). The patent cases under discussion in this decision were a patent on broccoli (EP 1069819) and on tomatoes (EP 1211926), both derived from conventional breeding. These patents claimed the process for breeding as well as the seeds, plants and edible parts of the plants. In G1/08, the EPO decided that the process for breeding had to be regarded as "essentially biological" and therefore could not be patented because of Art. 53b of the EPC which excludes patents on "*essentially biological processes for the production of plants or animals*".

However, this decision does not solve the legal questions or the underlying problems regarding conventional breeding in any way. For example in May 2011, the EPO granted a patent on melons derived from conventional breeding (EP 1962578). The examiners only removed the process for breeding from the claims – the products such as plants and fruits were regarded as an invention. In May 2010, a similar decision was taken by the EPO's Board of Appeal. In the reasoning of this decision it was

explained that conventionally bred plants, their seeds and harvested products could be patented, even if the process for breeding could not (T1854/07). Thus the EPO explicitly argues that the prohibition of Art. 53b of the EPC would only exclude the process of breeding, but not the products derived. But experts are warning that such a narrow interpretation of the wording of Art. 53b of the EPC would rule out any meaningful content. Instead Art 53b of the EPC should be interpreted in a way that the products derived from conventional breeding can also not be patented.¹⁹

Nevertheless, in October 2011 the EPO announced that the patent on broccoli which was a precedent case at the Enlarged Board of Appeal (G2/07) will not be revoked and only the claims concerning the process of breeding will be deleted.²⁰

Furthermore, the Enlarged Board of Appeal decided in (G1/08) that the process for breeding can be patentable as soon as an additional step is applied

"(...) which step by itself introduces a trait into the genome or modifies a trait in the genome of the plant produced, so that the introduction or modification of that trait is not the result of the mixing of the genes of the plants chosen for sexual crossing (...)".

This wording might not only apply to genetic engineering, but also to mutational breeding. Thus, as a result, a procedure that is widely used in conventional breeding could be turned into a patentable invention.

Patent EP 1616013, granted in July 2011 is an example that shows that the EPO has indeed some major difficulties in applying Art. 53b in a meaningful way. This patent as granted, covers a claim on a process for conventional breeding based only on selection of natural genetic conditions (claim 14), and also a claim on mutational breeding in plants (claim 13).

This development is under fire from various sides. For example, a statement was published in Germany in January 2011 listing the relevant representatives from all parties in the German parliament and requesting that patents on plant and animal breeding should be stopped.²¹ The German government made similar demands.²² Farmers and plant breeders in Europe are at least partially of the same opinion in their criticism

¹⁸ C. Then & R. Tippe, Seed monopolists increasingly gaining market control, 2011, www.No-patents-on-seeds.org.

¹⁹ Wissenschaftlicher Beirat für Biodiversität und Genetische Ressourcen beim Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz, 2011, Product-by-Process-Ansprüche auf Biopatente in der Tier- und Pflanzenzucht – Voraussetzungen, Problemlagen und Handlungsempfehlungen, <http://beirat-gr.genres.de>.

²⁰ Media release of the EPO from 18 October 2011 <http://www.epo.org/news-issues/news/2011/20111018.html>.

²¹ http://www.keinpatent.de/uploads/media/11_Erklaerung_zu_Keine_Patent_auf_konventionell_gezuechtete_Pflanzen_und_Tiere-1.pdf.

²² <http://www.bmelv.de/SharedDocs/Standardartikel/Landwirtschaft/Tier/Tierhaltung/BiopatenteHintergrund.html>.

of plant patents. For example, the German Plant Breeders Association made the following statement in 2010:²³

“Recently more and more patents are applied on naturally occurring genetic resources on the basis of new technologies that allow precise description of natural genetic conditions up the sequencing of whole genomes. This practise in patenting opens up new conflicts and inherits the risk to erode the principles of plant variety protection, especially concerning the access plants and therefore to genetic variability. The development is a threat of slowing down innovation in plant breeding, to narrow genetic diversity and increase dependency from license holders.”

In recent years there have also been an increasing number of patents relating to the conventional breeding of farm animals. Discussions on a patent on pig breeding (EP 1651777) that was granted in 2008 by the EPO were especially controversial. This patent was revoked after opposition from several organisations, which had collected thousands of signatures. In other cases, though, opposition was rebuffed, e.g. a patent on the selection of dairy cows with higher milk production (EP 1330552), a procedure that now is pending at the Board of Appeal. More recently it was made publicly known that Monsanto has been applying for patents on feeding of poultry, aquatic organisms, pigs and cattle. Even products like eggs, meat and fish fingers are listed in the patent applications (WO 2010/107422, WO 2010/027788, WO 2009/097403, WO 2009/102558).

For example in a Monsanto patent application WO 2009097403 which reads:

“a pork product for human consumption ...” (claim 1), “(...) consisting of bacon, ham, pork loin, pork ribs, pork steaks (...)” (claim 18), “A method of producing pigs comprising: a) providing a nutritious composition (...), b) feeding said nutritious composition to at least one pig; and c) producing progeny from said at least one pig ...” (claim 34).

It looks as though this patent will not be granted as filed. The wording of the claims typifies the current strategy of particular companies and the general underlying problem. Mostly trivial technical contributions, such the analysis of plant components or description of naturally occurring genetic conditions or the feeding of animals with certain crops, are used to issue broad claims on the whole chain of food production from seed to salad oil, from

animal feed to the bacon. Many of these cases are documented in recent publications.²⁴

This development in modern patent law not only harks back to its very early beginnings in the 17th century, it also puts into question its future and general justification. The recent change of the patent law paradigm leads from the protection of innovations to a misappropriation of basic resources needed for everyday life. This is a major challenge for civil society.

4 Conclusions

In conclusion, the necessary legal certainty and clarity is not given by the current legal framework, nor by its interpretation by the EPO. Conventional breeding can be patented in Europe and the consequences as already observed with patents on genetically engineered seeds are likely to impact the everyday farm and food production. There is huge potential for abuse of patents in conventional breeding. The inventive step in most cases is negligible (if any), but the scope of the claims is extremely large and can be expanded over the whole chain of food production. In the opinion of the authors, patents on plants and animals should be excluded by law, and further development should no longer be left to the patent office.

If conventional breeding is seen as patentable, the consequences will not only hit farmers and breeders. In patents such those on broccoli, tomato and melons, the food products are within the claims as granted. The US company Monsanto has already announced that it will take up a licence on the patent of broccoli (EP 1069819) if the patent is upheld. Further, this company has already acquired some of the biggest vegetable seed companies, Seminis and DeRuiter. If patenting is expanded to conventional breeding, Monsanto and some other corporations such as Syngenta and Dupont are likely to gain a dominant market position because of their strategy of combining market concentration with patent monopolies. This development will not only affect the farm and seed sector, but also consumers and food producers.

In the light of this development, the No Patents on Seeds initiative (www.no-patents-on-seeds.org) is urging for clarification in European Patent law so that patents on plants and animals and genetic material used in breeding are excluded.

²³ Bundesverband Deutscher Pflanzenzüchter (BDP), BDP-Position zur Ausgestaltung des Patentschutzes in der Pflanzenzüchtung BDP fordert Änderung der europäischen Biopatentrichtlinie 98/44/EG www.seedquest.com/News/pdf/2010/BDP2.pdf.

²⁴ P. Feindt, Biopatente – eine Gefährdung für Nutzung und Erhaltung der Agrobiodiversität? Beirat für Biodiversität und Genetische Ressourcen beim Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz, 2010, http://www.bmelv.de/SharedDocs/Downloads/Landwirtschaft/Tier/TierzuchtTierhaltung/Gutachten-Biopatente.pdf?__blob=publicationFile; further: C. Then & R. Tippe (2009) and (2011) supra note 1 and 1.

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The Öko-Institut (Institut für angewandte Ökologie - Institute for Applied Ecology, a registered non-profit-association) was founded in 1977. Its founding was closely connected to the conflict over the building of the nuclear power plant in Wyhl (on the Rhine near the city of Freiburg, the seat of the Institute). The objective of the Institute was and is environmental research independent of government and industry, for the benefit of society. The results of our research are made available of the public.

The institute's mission is to analyse and evaluate current and future environmental problems, to point out risks, and to develop and implement problem-solving strategies and measures. In doing so, the Öko-Institut follows the guiding principle of sustainable development.

The institute's activities are organized in Divisions - Chemistry, Energy & Climate Protection, Genetic Engineering, Sustainable Products & Material Flows, Nuclear Engineering & Plant Safety, and Environmental Law.

The Environmental Law Division of the Öko-Institut:

The Environmental Law Division covers a broad spectrum of environmental law elaborating scientific studies for public and private clients, consulting governments and public authorities, participating in law drafting processes and mediating stakeholder dialogues. Lawyers of the Division work on international, EU and national environmental law, concentrating on waste management, emission control, energy and climate protection, nuclear, aviation and planning law.

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The University of Applied Sciences in Bingen was founded in 1897. It is a practiceorientated academic institution and runs courses in electrical engineering, computer science for engineering, mechanical engineering, business management for engineering, process engineering, biotechnology, agriculture, international agricultural trade and in environmental engineering.

The *Institute for Environmental Studies and Applied Research* (I.E.S.A.R.) was founded in 2003 as an integrated institution of the University of Applied Sciences of Bingen. I.E.S.A.R. carries out applied research projects and advisory services mainly in the areas of environmental law and economy, environmental management and international cooperation for development at the University of Applied Sciences and presents itself as an interdisciplinary institution.

The Institute fulfils its assignments particularly by:

- Undertaking projects in developing countries
- Realization of seminars in the areas of environment and development
- Research for European Institutions
- Advisory service for companies and know-how-transfer

Main areas of research

- **European environmental policy**
 - Research on implementation of European law
 - Effectiveness of legal and economic instruments
 - European governance
- **Environmental advice in developing countries**
 - Advice for legislation and institution development
 - Know-how-transfer
- **Companies and environment**
 - Environmental management
 - Risk management

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The Society for Institutional Analysis was established in 1998. It is located at the University of Applied Sciences in Darmstadt and the University of Göttingen, both Germany.

The sofia research group aims to support regulatory choice at every level of public legislative bodies (EC, national or regional). It also analyses and improves the strategy of public and private organizations.

The sofia team is multidisciplinary: Lawyers and economists are collaborating with engineers as well as social and natural scientists. The theoretical basis is the interdisciplinary behaviour model of homo oeconomicus institutionalis, considering the formal (e.g. laws and contracts) and informal (e.g. rules of fairness) institutional context of individual behaviour.

The areas of research cover

- Product policy/REACH
- Land use strategies
- Role of standardization bodies
- Biodiversity and nature conservation
- Water and energy management
- Electronic public participation
- Economic opportunities deriving from environmental legislation
- Self responsibility

sofia is working on behalf of the

- VolkswagenStiftung
- German Federal Ministry of Education and Research
- Hessian Ministry of Economics
- German Institute for Standardization (DIN)
- German Federal Environmental Agency (UBA)
- German Federal Agency for Nature Conservation (BfN)
- Federal Ministry of Consumer Protection, Food and Agriculture

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NATUUR & MILIEU



elni

In many countries lawyers are working on aspects of environmental law, often as part of environmental initiatives and organisations or as legislators. However, they generally have limited contact with other lawyers abroad, in spite of the fact that such contact and communication is vital for the successful and effective implementation of environmental law.

Therefore, a group of lawyers from various countries decided to initiate the Environmental Law Network International (elni) in 1990 to promote international communication and cooperation worldwide. elni is a registered non-profit association under German Law.

elni coordinates a number of different activities in order to facilitate the communication and connections of those interested in environmental law around the world.

Coordinating Bureau

Three organisations currently share the organisational work of the network: Öko-Institut, IESAR at the University of Applied Sciences in Bingen and sofia, the Society for Institutional Analysis, located at the University of Darmstadt. The person of contact is Prof. Dr. Roller at IESAR, Bingen.

elni Review

The elni Review is a bi-annual, English language law review. It publishes articles on environmental law, focusing on European and international environmental law as well as recent developments in the EU Member States. elni encourages its members to submit articles to the elni Review in order to support and further the exchange and sharing of experiences with other members.

The first issue of the elni Review was published in 2001. It replaced the elni Newsletter, which was released in 1995 for the first time.

The elni Review is published by Öko-Institut (the Institute for Applied Ecology), IESAR (the Institute for Environmental Studies and Applied Research, hosted by the University of Applied Sciences in Bingen) and sofia (the Society for Institutional Analysis, located at the University of Darmstadt).

elni Conferences and Fora

elni conferences and fora are a core element of the network. They provide scientific input and the possibility for discussion on a relevant subject of environmental law and policy for international experts. The aim is to gather together scientists, policy makers and young researchers, providing them with the opportunity to exchange views and information as well as to develop new perspectives.

The aim of the elni fora initiative is to bring together, on a convivial basis and in a seminar-sized group, environmental lawyers living or working in the Brussels area, who are interested in sharing and discussing views on specific topics related to environmental law and policies.

Publications series

elni publishes a series of books entitled "Publications of the Environmental Law Network International". Each volume contains papers by various authors on a particular theme in environmental law and in some cases is based on the proceedings of the annual conference.

elni Website: elni.org

The elni website www.elni.org contains news about the network. The members have the opportunity to submit information on interesting events and recent studies on environmental law issues. An index of articles provides an overview of the elni Review publications. Past issues are downloadable online free of charge.

elni Board of Directors

- Martin Führ - Society for Institutional Analysis (sofia), Darmstadt, Germany;
- Jerzy Jendroska - Centrum Prawa Ekologicznego (CPE), Wrocław, Poland;
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- Marga Robesin - Stichting Natuur en Milieu, Utrecht, The Netherlands;
- Gerhard Roller - Institute for Environmental Studies and Applied Research (I.E.S.A.R.), Bingen, Germany.

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