

Patents on Seeds

– The turning point?

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Conference proceedings

Organized by the *No patents on seeds* Coalition



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Forward by the organizers

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During the last decade, an increasing number of patents on plants, animals and gene sequences has been granted, especially in industrialized countries. Their negative impacts on farmers and breeders have become more and more evident, resulting in higher costs for farming and breeding, market concentration and less innovation. Especially worrying is the relatively new trend to patent even seeds and animals that have been bred conventionally, without any genetic engineering involved. Our recent research shows international patent applications in this sector are skyrocketing, having doubled in the two years from 2007 to 2009.

There is a growing rejection of these patents by NGOs, farmers' organizations, breeders and even governments. The coalition 'No Patents on Seeds' – supported by over 300 civil society organizations around the world – calls for radical change in patent legislation. We are convinced that visible civil society mobilization is needed to make use of this window of opportunity and urge governments and international institutions to revise patent laws in order to exclude patents on seeds, animals and parts thereof.

There are some positive initiatives in order to change the current patent system:

- Even EPO is looking at this in its "raising the bar" project to imply higher technical standards for granting of patents
- German government announced that they are willing to take an initiative to exclude patents on plants and animals in the European Patent Law.
- Dutch report and debate in Dutch parliament 1.July 2010. (see contribution of Niels Louwaars)
- Increased pressure from civil society

From July 20th – 21st 2010, the European Patent Office (EPO) was having a public hearing on the contested patents on broccoli and tomato, both patents on conventionally bred plants. In front of the EPO's Enlarge Board of Appeal, the lawyers of the competing companies were arguing on the legal interpretation on "essential biological processes". In order to raise the public awareness on the crucial issue of patents and their impact on food security, the coalition *No patents on seeds* organized the conference "**Patents on Seeds – The turning point?**" a day before the hearing took place. The conference informed about and discussed recent development regarding patents on seeds and animals, highlighting the negative impacts of the current system, the changes that would be needed, and possibilities for effecting those changes. The summary of the various presentations as well as the panel discussion are covered in this conference proceedings.

On July 20th, while the hearing at the Enlarged Body of Appeal was going on, a demonstration was organized by the coalition *No patents on seeds* together with German farmers and other civil society organizations. 300 concerned citizens and activists protested in front of the European Patent Office and asked for the withdrawal of all patents on life forms.

Summary of the presentations and discussions

Welcome and Short Introduction

François Meienberg, Berne Declaration

Ladies and Gentlemen, dear colleagues

On behalf of the No Patents on Seeds Coalition I would like to welcome you to our conference: Patents on Seeds - the Turning Point? We appreciate the high level of interest and the large number of people in attendance here today.

In recent months, the controversy over patents on plants and animals has once again come to the attention of a wider public. So is this a truly turning point? Our conference should provide some answers to this question. In Europe, clearly, we are going through an exciting period with important decisions on the future direction of patent law about to be handed down. Maximum protection for patents on living organisms may very well have reached its high point and the pendulum might start to swing the other way.

Our first speaker is Carlos Correa of the University of Buenos Aires. He will present us with an overview of recent developments in international patent law and show how patents on plants and animals have raised countless legal questions that have not been resolved.

After this introduction the positions of the most important actors—farmers, seed breeders, and civil society—will be presented. Guy Kastler, the seed expert at Via Campesina, the world's largest associations of small farmers, will talk about the dangers of intellectual property rights—patents and variety protection rights—to farmers and food sovereignty. Niels Louwaars of the University of Wageningen will address the negative effects of the current system on innovation and breeders and reports on the growing criticism in the Netherlands. Christoph Then (Greenpeace) and Ruth Tippe (No Patents on Life) will speak about worrisome trends in patents and patent applications and comment on the broccoli-controversy that is causing a stir in the European Parliament. A hearing at the European Patent Office is scheduled for tomorrow. In the afternoon we will widen our focus. Wilhelmina Pelegrina (Searice, Philippines) will demonstrate how innovation is possible without patents, especially if farmers are involved in the process.

In the panel discussion at the end of the day we will focus on the necessary political changes. How can we prevent patent laws from further exacerbating seed market concentration, curtailing farmers' rights, and diminishing food sovereignty?

Let me give one answer to these questions right away. We must not leave the development of patent law in the hands of a few experts and industry representatives. Since patents on animals and plants ultimately affect all of us we have to butt in and make our voices heard in the legal and political discourse. There is no other way to turn matters around. We hope that our conference will encourage a broader public discussion of these matters. With this in mind I am particularly pleased to see how many people have joined us here today. I wish all you an inspiring conference and hope you will be motivated to participate even more actively in future discussions.

World Wide Trends on Patents on Seeds

Carlos Correa, University of Buenos Aires, Argentina

The landscape of intellectual property on genetic resources for food and agriculture has become more complex and raises a set of new and delicate issues. In particular, patents on genetic resources may impede their use by third parties for further research and breeding during the term of protection, and thereby delay the development of new products and the capacity to address evolving demands (including those associated to climate change).

Some of the problems found in this field include:

- The distinction between 'invention' and 'discovery' has been blurred with the acceptance, for instance, of patents over isolated natural genes;
- In some cases, patent claims cover many field crops, apply throughout a whole species or have been allowed in functional terms;
- The owner of a patent over a gene may obtain control over any possible use of a gene, including those not discovered by him;
- Lax application of the inventive step (non obviousness) requirement has led to the proliferation of patents with a low or inexistent inventive step.

A multiplicity of patents around the same subject matter are obtained, for instance, covering the DNA sequence, whether comprising a complete or partial gene, promoters, enhancers, individual exons, expressed sequence tags (ESTs) or cDNAs, whole transcribed genes as cDNAs, cloning vectors, expression vectors, isolated host cells transformed with expression vectors, amino acid sequences (proteins), and nucleic acid probes. Another problem is the misappropriation through patents of genetic resources and traditional knowledge obtained without prior informed consent and benefit sharing as mandated by the Convention on Biological Diversity.

The application of a range of tools to enhance the efficiency of conventional breeding methods may reduce the interest in obtaining new GMOs, except when the desired characteristic is weakly expressed. A noticeable increase in patent applications relating to 'native' traits and conventional breeding methods (e.g. EP 1069819 on broccoli and EP 1211926 on tomatoes derived from conventional breeding and EP 0483514 on the use of fingerprinting in tree breeding) can be observed.

Unless specifically provided for, patents over plants or their components can be used to prevent further research and breeding by a third party for the development of new plant varieties. Even if research and breeding is allowed, patents may prevent the commercialization of the new variety. Furthermore, patents normally prevent farmers from saving and re-using seeds, unless specifically exempted.

Another challenge for future plant breeding is the accumulation on the same material of PVP and patent rights belonging to different parties. This double protection and unclear ownership situation can become an important barrier for the development and commercialization of new varieties.

Despite the flexibility left by article 27.3(b) of the TRIPS Agreement of the World Trade Organisation, regarding the modalities of protection of plant varieties and, in particular, the possibility of establishing *sui generis* regimes, a large number of developing countries have opted to join UPOV 1991. In fact, only a small number of countries have adopted *sui generis* regimes suited to their local conditions. Examples are provided by the laws of India, Thailand and Malaysia,

which apply new or relaxed requirements for plant variety protection and combine it with benefit sharing provisions in line with the Convention on Biological Diversity.

Overall, governments have used to a very limited extent the flexibilities available under the TRIPS Agreement to develop a balanced system of intellectual property protection that rewards innovations and, at the same time, promotes a sustainable agriculture and the attainment of food security. The lack of attention to these issues is in sharp contrast with the situation in the area of public health, where several measures have been debated and adopted nationally and internationally to ensure access to drugs.

This balanced system of intellectual property protection should include the following points:

- Exclusion of plants (whether genetically modified or not) and biological processes
- Clear distinction between discovery and invention
- Rigorous examination of novelty and inventive step
- Use-bound protection (only the function of the gene specified in the claim)
- Research exemption and commercialization of new variety (?)
- Interface patent-plant variety protection: compulsory license

The impact of patents and plant variety protection on farmers

Guy Kastler, Via Campesina, France

Plants belong to the communities that have bred them and maintain them. These plants must be protected by collective user rights that are defined by these communities, not by property rights that are held by individuals. The work of maintaining and breeding all the varieties that are modified today was done by farmers. One cannot claim that their improvement depends on a single person. It results from the work of all farmers and communities, in particular thanks to the exchange of seeds.

The industry has adapted varieties, formerly bred by farmers, to suit oil-dependent, chemical farming. The industry's aim is to prevent farmers from re-sowing part of their harvest and exchanging their seeds, so as to have a monopoly on seeds. The creation of F1 hybrid varieties and the legal system (catalogue + UPOV + patent) have made it possible, both technically and legally, to limit the ability to re-sow and exchange seeds.

The systems of catalogues and Plant Breeders' Rights are the main tools used to restrict the access of "farmers' seeds" to the market, because the latter do not fulfill the criteria for listing in official catalogues or obtaining Plant Breeder's Rights. They are never uniform and stable, but reproducible and evolutionary. Moreover, the listing costs are beyond the financial capacities of farmers.

Plant Variety Protection under UPOV is not "better" than a patent, because it makes it possible for industrialists to appropriate farmers' varieties. We are thus witnessing the legalization of biopiracy. Indeed, when you file an application for Plant Breeders' Rights, you don't have to describe the invention, as you would have to do for a patent, nor do you have to mention the origin of the variety.

Plant Breeders' Rights nevertheless have two drawbacks for industry. The morphological characteristics of a plant change when farmers grow a protected variety outside the comfort conditions of the multiplication station, and if other breeders use the protected variety to create a new one, it is difficult to prove which variety they have used. The UPOV regime enables individual countries to ban the farmer's privilege, but this does not apply to morphological characteristics and there is therefore no way of proving which variety is growing in a field.

Some countries have indeed forbidden the sowing of protected varieties. In the US, the patent on a variety has the same drawbacks as Plant Breeders' Rights, i.e. there is no means of proving which variety you are faced with.

GMOs and other molecular markers, however, create a new situation, because the owner can easily prove that his gene is in the field or in a competing breeder's new variety. So patenting a gene means the plants in question are being branded with a mark of the industrialist's ownership.

Only a few GM plants are currently grown in Europe, but many other types of plants have been patented! Increasing numbers of mutated plants are being protected by patents – they are effectively clandestine GMOs. For example, all new varieties of cabbage nowadays are the result of cellular fusion, carried out using technologies that can be patented!

Where does the fight against patents by farmers stand outside the US and Canada? In France, the organic harvest of an organic farmer was contaminated by GMOs. His complaint, which was lodged in 1997, has still not been investigated. But farmers are not only fighting in courts. Theirs is essentially a political battle. Farmers are also battling against Plant Breeders' Rights which, since 1991, have levied royalties on farm-saved seeds. When farmers initiate legal battles, they need time to defend themselves. In Germany, for example, they successfully fought the compulsory

completion of questionnaires sent to farms. These questionnaires aimed to ask which varieties the farmers had sown, in order to recover royalties. The farmers, however, organized themselves for 12 years and won the battle. Today, farmers are not obliged to fill in the questionnaires in order to identify the varieties they have sown, unless there is a suspected infringement, for example, if they signed a contract the previous year undertaking not to reuse the seeds of protected varieties. The lobbies, however, carry a lot of weight and on July 7th 2010, industrial breeders asked the European Commission to ensure farmers indicate the varieties they sow in the compulsory declaration they have to fill in for the Common Agricultural Policy (CAP) and environmental cross-compliance payments. The industrialists have also started to use molecular markers to distinguish their varieties and are preparing to use them to force farmers to pay royalties on farm-saved seeds. So you cannot fight patents on seeds by saying, as industry does, that UPOV is a good alternative solution. You have to fight 1991 Plant Breeders' Rights at the same time. If applied to a variety in conjunction with a gene patent, these Plant Breeders' Rights are even worse than a patent alone. A patent only protects the variety for as long as the gene performs its function, i.e. an infringement does often not cover the harvested or transformed products. It was recently found, for example, that the (soy) gene that is resistant to Monsanto's Roundup no longer performs its function in soy flour imported into Europe, i.e. the patent was not infringed by soy flour that contained the gene. With 1991 Plant Breeders' Rights the situation is different, as they also protect the harvested and transformed products.

There is only one real alternative to patents and IPR on life in general. This is collective user rights for farmers, such as the right to take part in decisions, the right to re-sow, the right to exchange, to sell and to protect their seeds. We need social battles to make these rights part of our legislation.

Informal systems also exist in Europe. Farmers who save their seeds depend on this informal system, because all they can find in catalogues is F1 hybrid corn, for example. The process of "improving European regulation" (on seeds) aims to integrate the informal system into catalogues, with exceptions for conservation varieties and short-circuit sales. However, it is not very practical for farmers to list their varieties in catalogues. We don't want to join the market system. Some seed companies want to weaken the legislation on patents, proposing in exchange that breeders' rights should be extended by strengthening the protection of Plant Breeders' Rights on farm-saved seeds. This is a trap, because farmers currently benefit from breeders' rights (to use a protected variety to breed another one by adapting it to local conditions) and they would lose out. We have to ban patents, but we have to ban 1991 Plant Breeders' Rights as well and gain recognition for farmers' rights.

The Future of Plant Breeding in the Light of Developments in Patent Rights and Plant Breeder's Rights

Niels Louwaars, Wageningen University, The Netherlands

The Dutch Ministers for agriculture and for economic affairs have recently informed the Parliament that they will propose a change in Dutch national patent law and will table the issue of patents on plants on the agenda of the European Commission and in forums beyond the level of the EU. For the future of a healthy, competitive and innovative breeding industry, it is important that strategic patenting by the industry behaviour is halted, the quality of patents is radically improved and that patents on biotechnological methods do not impinge on practical variety development. In their letter they refer to a report conducted by Wageningen University and partners on the future of plant breeding in the light of patent rights and plant breeder's rights. The study reports on trends that are relevant to the plant breeding sector and included interviews with stakeholders.

Plant breeding serves an important public interest. It provides a basis for food security, responses to ecological and technological changes in agriculture, for healthy food and for developments in the bio-based economy. An innovative plant breeding sector is thus essential for global society. The plant breeding sector is of high economic significance in the Netherlands with a steadily growing export value, notably in horticulture and potato. The Netherlands play a leading role in plant genetics and plant breeding research. It is thus relevant that the Netherlands assumes an important role in the debate on the future of the sector.

Innovation in plant breeding is dependent on knowledge, the development and application of new technologies, access to genetic resources, and capital to utilise those factors. Access to technology as well as genetic material is essential for the development of new plant varieties. Competition and profitability of the plant breeding sector play a major role in the sustainability of the total food chain. Farmers and growers have an interest in competition in the seed market.

Two intellectual property (IP) systems are relevant for the protection of innovations in this sector: plant breeder's rights and patent rights. Important exemptions to the right of the breeder have been introduced 50 years that were deemed necessary to advance crop improvement, such as the 'breeder's exemption', which are unknown in current patent rights. The breeder's exemption ensures that other breeders may in a sort of 'open innovation' system use any protected variety in their own breeding programmes. Patent rights together with the technological developments in biology and general globalisation trends contribute to the current concentration in the plant breeding industry. This concentration with a few companies dominating the seed sector is threatening future innovation. Patent rights hold possibilities for strategic use, which may lead to lack of clarity in the market and to monopolistic behaviour. It may also lead to high costs of legal council. The issue of patents in plant breeding is not only restricted to transgenics, but also to conventional breeding.

If it is agreed that a competitive, innovative, and profitable plant breeding sector should continue to make a sustainable contribution to global food supply and to sustainable agriculture and horticulture; and if it is further agreed that intellectual property right is a tool to stimulate innovation and that access to genetic resources is vital for the sustainability of the plant breeding sector, then the patent system needs to be amended. This can be reached by: amendments of legislation and regulations, by increasing patent quality by improving the work of patent offices, and by improvement of the way that innovators use their patent rights.

Amendment of regulations is necessary to increase the room for innovation in plant breeding. This can be reached by restricting the scope of patents on plants and components of heredity, more specifically by introducing a full breeder's exemption in patent rights. This should preferably be implemented at European or WTO level, in close cooperation with other countries with a strong plant breeding sector, such as the USA, Japan, and China. Also – and most urgently, the evaluation criteria for granting patents needs to be tightened and the strategic use of IP rights that stimulate monopolistic tendencies in plant breeding banned. Within the same scope, attention should be given to competition law (economic policy), access to genetic resources (biodiversity policy), IP aspects of development cooperation policies and science and technology policy.

The Broccoli and Tomato Case – and Why the Upcoming Decision of the Enlarged Board of Appeal is Important

Christoph Then, Greenpeace and Ruth Tippe, Kein Patent auf Leben, Germany

The coalition *No patents on seeds* was initiated by Berne Declaration, Development Fund, Greenpeace, Kein Patent auf Leben, Misereor and SWISSAID in 2007 to monitor the patent practice of the European Patent Office (EPO) and to advocate for the abolishment of the patents on seeds and animals. The EPO, established 70 years ago, is now one of the main patent offices of the world. EPO started to grant patents to plants and animals for about 20 years ago. By the end of 2009, the office had granted about 900 patents on animals and around 1300 patents on plants. In addition, approximately 10.000 patent applications on gene sequences, 4000 on animals and 5000 on plants are currently pending.

Patents have negative impacts on plant breeding by among others contributing to the strong concentration in the seed market. In 2008 the top ten companies control about two thirds of the global seed market, the top three companies alone – Monsanto, Dupont/Pioneer Hi-Bred and Syngenta – controlled around 45 per cent of the seed market.

Despite comparatively small changes in yield from 1990 till 2008 in the USA in maize, soy and cotton, the crops where patents are the most broadly used, there is high increase in the cost of seeds (from 1990 to 2008: around 200% in maize, 270% in soy and over 700% in cotton, in 2009 and 2010 prices jumped again).

Looking at the number of patent applications to EPO, there is a decrease in applications related to genetic engineering. However, there is a drastic increase in applications related to conventional breeding. The number of applications related to conventionally breeding even doubled between 2008 and 2009. This is a threatening paradigm shift and a rather new development within the European Patent law. And this trend continues in 2010 and is linked to the technical limitations of genetic engineering, as for example expressed by Syngenta in its patent application WO2008087208 “Most phenotypic traits of interest are controlled by more than one genetic locus, each of which typically influences the given trait to a greater or lesser degree”.

The larger companies abuse the patent law by claiming that plants are “inventions”. They do this by among others,

- Measuring the content of compounds in plants (such as oil or protein)
- describing phenotypical features (such as number of leaves or size of plants, yield, growth, biomass)
- detecting resistance against biotic or abiotic stress
- genomic screening for naturally occurring genetic conditions
- mutagenesis

Monsanto’s patent application WO2009097403 on pig is an example how a company is misappropriating basic resources for global food production. Among their patent claims are any pork product for human consumption that has a certain level of omega 3; and they are even claiming that feeding a pig with soy with enhanced omega 3 content is a method of producing a pig that they should have the monopoly to do.

In 2002, the EPO issued a patent on broccoli to the British company Plant Bioscience Ltd. The patent claims include a method for the production of Brassica oleracea with elevated levels of

glucosinolates, which comprises crossing wild Brassica oleracea species with Brassica oleracea breeding lines; and selecting hybrids with levels of glucosinolates elevated above that initially found in Brassica oleracea breeding lines. Edible parts and seeds of Brassica plant produced according to this method are also covered by the patent. Limagrain (France) and Syngenta (Switzerland) filed oppositions to this patent in 2003 and EPO's Enlarged Board of Appeal is currently examining whether the patent is in line with the European Patent Directive or not. The Directive is explicitly stressing that "essentially biological processes" for the production of plants or animals are not patentable.

The coalition of *No patents on seeds* is demanding no patents on plants and animals; on process for breeding plants and animals; or on gene sequences and breeding material from plants and animals. In favour of our claims, the German government recently stated that it is against the patenting of plants and animals. Furthermore, the broad opposition of civil society against such patents, will lead us to victory!

Participatory Plant Breeding: Alternatives for Innovations. Experiences from Southeast Asia

Wilhelmina R. Pelegrina, SEARICE, the Philippines

The experiences of SEARICE¹ on participatory plant breeding (PPB) come from five countries (Bhutan, Lao PDR, Vietnam, Thailand and the Philippines) and span more than 10 years of work, involving more than 18,000 farmers in direct partnership. Aside from farmers, different stakeholders are involved such as local and national government units, research institutions, extension agencies, academic institutions and civil society organizations. A typical institutional set-up for PPB work involves national level agencies for policy and program support and local agencies for actual field implementation and support to farmer groups.

Lao PDR: Community Innovations Adopted by Research Institution

In Lao PDR, more than 600 farmers developed 114 rice varieties in nine years. These 'varieties' did not go through the formal varietal release process but are directly used by other farmers at production level. This is made possible with the release of more than 100 segregating lines (early generation populations) by the National Agriculture Research Center (NARC) for farmers to select from. At the same time, plant breeders from NARC provided technical support to extension agents and farmers in developing new varieties and in conserving seeds on-farm. NARC did not apply for any PVP protection for varieties developed by farmers from the lines they initially developed.

To give an idea as to the potential contribution of farmer innovations (development of new varieties/seeds), the Lao-IRRI (International Rice Research Institute) project of 15 years, released for national use, 15 modern varieties. The 114 new varieties developed by farmers, in 9 years offer a significant contribution to national plant breeding system. The potential of farmer developed varieties can be gleaned from seed centers and regional research stations including farmer varieties in their seed production and distribution work. This despite the fact that farmer varieties being distributed through the system did not go through national varietal release process and are not registered nor certified seeds.

Farmers claim that they were able to secure 90-98% of community seed requirements in their communities which used to be 100% seed insecure (had to rely on outside sources for their seeds). Developing new varieties and strengthening local seed systems enabled farmers to share seeds to other farmers in time of disaster. For example, around 40 tons of seeds were shared by farmers, involved in PPB work to seven communities which were inundated by floods.

Farmers developed flood tolerant varieties as well as drought tolerant varieties and claim 10-20% increased in production with use of farmer varieties. Some communities of indigenous people in Luang Prabang claim that the varieties they developed, closed their 3 month hunger gap. Farmer varieties developed at the community level are more adapted to local conditions and local management practices of farmers.

¹ The Southeast Asia Regional Initiatives for Community Empowerment (SEARICE) is a regional non-government development organization that promotes and implements community-based conservation, development and sustainable use of plant genetic resources in partnership with civil society organizations, government agencies, academic research institutions and local government units in Bhutan, Lao PDR, the Philippines, Thailand and Vietnam.

Bhutan: Farmer Innovations Recognized in National Programs and Policies

Bhutanese farmers involved in PPB developed 46 new varieties of rice from selections from segregating populations distributed by the research stations. This is significant development, in a country which used to rely on IRRI for the development of new varieties for the country. Usually, Bhutan receives stable materials from IRRI for adaptability testing, which are then released for distribution to farmers. Within Bhutan, there is no actual crossing and extensive selection that takes place – no national rice breeding to speak of. The development of 46 new rice varieties by farmers was therefore a major break through.

Apart from rice, farmers, with support from research and extension agencies and local government units innovated on their seed selection practise for corn – selecting from the standing crop in contrast to the usual practise of selecting from seeds. This simple change, resulted to a 10-20% increase in yield. Women farmers involved in PPB and seed selection, thought of developing surplus corn into other products by frying and adding flavour to traditional 'tengma' or cornflakes. This enabled the women farmers to earn additional income for the household and set-up a group fund from the proceeds of sales. One women group has US\$2000 group fund. This is a substantial amount for this group, who are mostly into subsistence farming.

The growing results on the ground was seen by policy makers, to the extent that farmer developed varieties are now recognized by the Bhutanese Varietal Release Committee. Likewise, the work of farmers on on-farm conservation and PPB is part of Bhutan's 10th Five Year Plan in Agriculture. The Five Year Plans of Bhutan set the national priorities of the country within the designated five years, as drawn from series of consultations from the local level up to the national level.

There are also initiatives to review Bhutan Seed Act and Bhutan Biodiversity Act (which contains the Plant Variety Protection provisions) due to the growing recognition within the Ministry of Agriculture and Forestry, on the potential contribution of farmers' seed systems and farmers' innovations to national food security. Also, the Ministry recognizes their limitation in regulating farmers' seed system which is very dynamic in nature. It appears that farmer innovation systems in Bhutan are different from the varietal development and seed production system in developed countries, which was the template for the seed policies used in Bhutan.

Vietnam: Scaling Up Farmer Innovations

In 2008-2009 season, around 85,500 tons of seeds were exchanged by more than 4,400 farmers involved in PPB work from 320 seed clubs in the Mekong Delta. This is equivalent to almost 16% of the total seed requirement in the whole of the Delta. In contrast, the formal seed system supplies only 3-4% of the total seed requirement. The Mekong Delta covers 13 provinces and provides around 50% of the exported rice of the country. Vietnam, is the second rice exporter in the world.

In communities where there are seed clubs, formed by farmers involved in on-farm conservation and PPB work, around 87% of the community's seed requirement is supplied by the farmer group/seed club. In 2006, the Mekong Delta Research and Development Institute, together with An Giang Department of Agriculture estimated that the contribution of farmers involved in PPB work, in terms of developing new varieties and producing seeds, amounts to US\$1.2M. This is a significant contribution.

Farmers developed different rice varieties adapted to acid sulphate soils, acidic soils and saline

soils. In 2008, more than 100 farmer varieties were planted in more than 100,000 hectares of rice land. The diffusion of farmer varieties was made possible through farmer to farmer seed exchanges and through seed centers which adapted and distributed farmers varieties despite the fact that farmer varieties did not go through formal varietal release process and seed certification process.

Apart from the 13 provinces in the Mekong Delta, an additional 13 provinces in North and Central Vietnam have likewise supported PPB with farmers. The growing recognition on the importance of farmer innovations and the compelling results on the ground is forcing the evolution of varietal regulation and seed rules. For instance, the fast spread of farmer varieties in the Mekong Delta contributed to the recognition for farmer varieties planted in more than 10,000 hectares to be 'varieties' (no need to go through national varietal testing process). District and provincial officials have issued local and provincial seed certification to farmer varieties to allow seed trading by farmers within the province. Local officials and farmers have started calling the attention of national authorities to review that national varietal release and seed certification process, pushing for a decentralized and democratized process. As a response, the national authorities facilitated the entry of farmer varieties in the formal varietal release and seed certification process.

During the series of dialogues between farmers and policy makers on the Plant Variety Protection Act of Vietnam, some farmers called for the repulsion of the PVP law. As a response, the PVP Office of Vietnam facilitated test cases of having farmer varieties to go through the PVP process. Meanwhile, the same variety is being sold and propagated by other farmers.

The spread of farmer varieties and growing support at the local level, contributed to the development of the Ministry Of Agriculture and Rural Development Decision 35/2008 regulating on-farm variety development but at the same time calling all agencies under the Ministry to provide technical support for farmers to develop their varieties. Farmer innovations on on-farm conservation and PPB is being now integrated in school curricula or specific subjects in three universities in the Mekong Delta.

THAILAND: Mainstreaming Farmers' Innovation Processes As Part of School Curriculum

PPB is part of primary and secondary school curricula or subject in local schools. This was made possible because Thai education system, allows for incorporation of local knowledge in 30% of its curriculum. Even schools for monks, adopted PPB in its learning modules, inviting farmers to teach the students. This innovative approach to education received national recognition for the pioneering teacher and school. Currently, there is an informal network of schools and universities in the region exchanging experiences and ideas to include farmers innovative systems for seed management in school curriculum

PHILIPPINES: Towards National Participatory Plant Breeding Program

Bagumbayan, Sultan Kudarat is one of the major corn producing community with 18,000 hectares of devoted to corn cultivation. In the late 1990's it was, ranked 3rd, consumer of Monsanto's herbicide, in the world, under the zero-tillage farming system. There were reported cases of landslides, health problems and increasing cost of production. In 2008, the Municipal Agriculture Office embarked on a program on PPB for corn to enhance farmers' innovative capacity and

strengthen the local seed supply system. More than 200 farmers were involved in the program. To date, there are emerging farmer varieties and corn population developed by farmers, whose performance is comparable to hybrid corn.

According to literature, in 10 years the Philippine Rice Research Institute released 55 inbred lines. In the provinces of Bohol and North Cotabato, farmers developed more than 200 farmer varieties in a span of 8 years. In Bohol, most of these varieties are red rice, which are not developed by the formal sector. When this figure was presented to PhilRICE, plant breeders commented that the 55 inbred lines include materials developed by IRRI and other institutions. Currently, there is a standing policy within PhilRICE to apply for PVP certificates for PhilRICE developed varieties. Likewise, there are pronouncements that PhilRICE will be restricting the distribution of segregating populations to farmers to protect and motivate plant breeders to develop more varieties. PVP certificates are seen as incentives for plant breeders. But researchers and plant breeders agree that their primary role is to create diversity from which farmers can select from and that there can be other incentive mechanisms to promote innovations.

Some farming communities set-up community registries of varieties developed and used in the community as a mechanism to protect against application of PVP/IPR on seeds, by placing these materials in the public domain. This is part of asserting community rights over seeds.

Conclusion

From experience of working with farmers for more than 10 years on on-farm conservation and PPB, these are some of our main lessons learnt:

1. Farmers conserve traditional seeds but also develop new seeds (new varieties). They are innovators and technology developers too.
2. Seeds are usually developed and produced by a community (of farmers, with other stakeholders), such that it is difficult to pinpoint an individual who will have an exclusive rights over seeds.
3. This is not to say, that there are no individual farmer plant breeders. There are individuals who develop new varieties, but it is notable that these individuals almost always have an intention to share.
4. Seed sharing is natural among farmers because seeds at farmers fields are in perpetual state of development. Seeds are tested by farmers in their fields for adaptability, production capacity, subjected to stress and different management practices, selected from or combined with other seeds, marketed, shared and distributed. Thus, the initial seed shared or given to a farmer, after one season, may no longer be the same seeds as the original because the seeds were subjected to different environment and management system.
5. IPR protection was NOT the incentive for the profuse innovation of farmers (new seeds, new varieties). In fact, government agencies had to fit community innovations within the prescribed seed rules, but fails in the process because development/innovation is proceeding fast that agencies cannot cope and halt the innovation process.
6. Some incentive measures which could have encouraged farmers and other stakeholders to innovate include:
 - a. Recognition of farmers through awards at local and national level, through continued support to their learning processes (by building farmer network, through exposures and study tours, research and extension support) as well as improved standing within the community

- b. Additional income from seed exchanges and seed sales (in large volume) of their developed varieties for a few seasons. In most instances, farmers who developed new varieties continue to provide seed lots in small amounts to other farmers, for free. It is only when large volumes of seeds are required by other farmers (more than 2 kgs) that farmers start to ask for some compensation either in cash or in kind. Seed sharing is an inherent part of farmers' culture towards mutual help and support. Seed sharing is also part of risk management, whereby farmers can pre-test the performance of new seeds (in small amounts) in small plots prior to actual production.
7. Seed development, production, exchange and sale are part of the dynamic farmers' seed system, which is a crucial cornerstone to food security. The dynamic farmer innovation system and farmers' seed systems are the ones that need 'protection'. Current seed policies imported from developed countries do not fit this dynamic system. There is a need to develop new pathways to spur innovation and protect farmers' seeds from misappropriation. PPB offers one pathway, but it needs to be accompanied by appropriate policy and practice.

Needs and strategies to change the current patent system

Panel discussion

What needs to be changed to avoid the problem we see today?

There is a need to use more of the actually existing space at the national level in order to promote local innovation and protect food security. The current pressure on UPOV 1978 countries to move into UPOV 1991 restricts the flexibilities that TRIPS allow for. UPOV 91 is designed to strengthen and improve protection of IPR, other aspects and interests are not considered.

The asymmetry in power in regard to the intellectual property rights (IPR) system with more and more patents, less competition and marked concentration, makes litigation impossible as farmers are too weak compared to multinational companies to take a legal dispute. The more patents are granted, the less competition and innovation will take place and the seed market concentration will continue. There is therefore an urgent need to stop the proliferation of patents. Patent offices have gone too far in granting patents that underpin inventive step. Competition laws could be used to stop this process. In the US respective hearings have started.

How could the informal system be strengthened in the future? Does it have to become formal in order to survive?

Policy makers need to acknowledge that the informal innovative system of farmers is different than formal breeding programs and need other policies than IPR to be promoted. The informal system is crucial for securing food in the future. The practical experiences and results we have are very helpful to convince policy makers. Nevertheless, links between the formal and informal systems, like in Participating Plant Breeding (PPB), can lead to fruitful cooperation. And there are no reasons why the formal and informal systems should not equally be recognized and coexist. For example in Ethiopia, different farming sectors and their respective production models (export, subsistence etc.) are acknowledged. They need different seed systems with different regulations, seed laws and IPR systems. Europe should learn from this. The Netherlands for example is supporting the development of an IPR system only for the formal system.

What about Europe and the informal system?

The formal system in Europe does not allow innovation from farmers. In maize for example the formal system does only provide hybrid maize. For seed breeding farmers or small seed breeders the formal system is rather a threat than anything else.

The adaptation of the EU patent directive is an example of a lost battle, but the war is not lost. The situation to change IPR laws is complex with EPO not being EU and the TRIPs agreement at the global level.

In Germany, all parties agree that something needs to be done about the EU patent directive, and the German government will take action in Brussels and contact other governments. But the pressure from the street and civil society is needed, otherwise the process that has now started rather promisingly, will lose its dynamic.

What prevents us from excluding plants and animals from patentability?

We need to offer alternatives. The restructuring of our research system would be one of the most important thing. From publication to patenting, we might need to go back to public funding.

An independent court is needed. The EPO is financed by the patent fees from the patent owners. It is not and can't be an independent institution.

What kind ordinary concerned citizen do?

Patent product to be labeled – do not buy patented products?

Talk to journalists - more media coverage means that more people will realize and understand the issue

Ask your politicians / members of parliament to negotiate the EU patent directive

France won the fight against MON810 – this changed the situation in France. There are more demonstrations, more signatures and campaigns going on.

Ecuador and African countries handed in a proposal to TRIPS and demand: no patents on life.

Alliance between NGO in rich and poor countries: send message to parliament. Poor countries need to know that the EU patent directive and the current IPR system are also challenged in

Europe. European politicians and NGO ask for a review of the directive. Up till know developing countries only get the message from Europe and the US: 'These are the rules, you have to fulfill

The highest protection standards'. In many developing countries there are important initiatives and experiences with alternatives we should learn from.

One of the most important messages from our conference is, that all GMOs carry patents, but not patents are on GMOs. In other words: more and more non-GM plants and animals are patented. The patent issue is therefore much wider and bigger than the GM issue.