Patents on Hunger?

A selection of recent patent applications in seeds, food and agrofuels and its possible implications on world food security

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Hintergrund: Hunger durch Patente?

Warnung vor neuen Monopolen bei Lebensmitteln und Biomasse

(Deutsche Zusammenfassung)

Der Report „Patents on Hunger?“ warnt vor den möglichen Folgen der Patentierung von Lebensmitteln und Energiepflanzen. Grundlage des Berichtes ist die Analyse aktueller Patentanmeldungen bei der Weltpatentbehörde WIPO. Die Recherche zeigt, dass verschiedene Konzerne wie Monsanto Patente anmelden, die sich gleichzeitig auf die Bereiche der Lebensmittel-, Futtermittel- und Energieerzeugung erstrecken. Dabei werden alle möglichen Produktionsstufen und Verwendungen von den Ansprüchen umfasst.

Ausgehend vom Saatgut beanspruchen die Konzerne die gesamte Produktionskette bis hin zur Verarbeitung der Ernte z. B. zu Salatöl und Agrosprit. Im Gegensatz dazu kann ein Verkäufer von Saatgut, das mit dem in Europa bisher üblichen Sortenschutz ausgestattet ist, nicht bestimmen, was mit der Ernte und den daraus hergestellten Produkten geschehen soll. Mit Patenten, die die gesamte Herstellung und Verwertung von Lebensmitteln und Biomasse umfassen, ändert sich das grundlegend.

Überraschenderweise ist die Grundlage der Patente dabei in vielen Fällen die Züchtung konventioneller Pflanzen, Gentechnik spielt dagegen oft keine Rolle. In Fällen, in denen Gentechnik zum Einsatz kommen soll, bleibt die technische Beschreibung oft auffällig ungenau, es sollen sogar mehr oder weniger unerwartete Effekte patentiert werden. Auf Grundlage des Inhalts der analysierten Patente muss der künftige Beitrag transgener Pflanzen zur Produktion von Nahrungs- und Energiepflanzen als gering eingeschätzt werden.

Die Patentanmeldungen zeigen dagegen, dass Unternehmen wie Monsanto sich zunehmend so positionieren, dass sie gleichermaßen die Märkte für Lebensmittelherstellung und nachwachsende Rohstoffe kontrollieren können, unabhängig davon, ob Gentechnik zum Einsatz kommt. Damit könnten diese Konzerne gleichzeitig an miteinander konkurrierenden Märkten verdienen und würden insbesondere an einer Verknappung der Ressourcen profitieren. Konzerne, die eine ausreichend starke Marktposition haben, könnten beispielsweise ein Interesse daran haben, dass Agrarprodukte systematisch verteuert werden und würden damit gleichzeitig die Hungerkrise in den armen Ländern verschärfen.

Die Nutzung von Getreidepflanzen wie Mais, Weizen und Soja zur Energieherstellung in den industrialisierten Ländern wird bereits jetzt als einer der Gründe für die derzeitige Verteuerung der Grundnahrungsmittel in den Entwicklungsländern genannt. Gleichzeitig stiegen im Jahr 2007 die Börsenkurse des US Unternehmens Monsanto, dem weltweit größten Anbieter von Saatgut, so steil an wie die Preise für Rohöl.

Die Autoren sehen in den analysierten Patentanträgen einen drohenden Missbrauch des Patentrechtes mit dem Ziel, die Märkte für Lebensmittelherstellung und nachwachsende Rohstoffe in großem Umfang zu übernehmen. Mit besonderer Sorge weisen die Autoren darauf hin, dass das Europäische Patentamt derzeit die Freigabe von Patenten auf normale, nicht gentechnisch veränderte Pflanzen erwägt. Damit würde automatisch auch die Patentierung der nachfolgenden Schritte der Verarbeitung für Lebensmittel oder Biomasse einhergehen. Über 50 Bauernorganisationen aus vielen Teilen der Welt haben sich bereits gegen derartige Patente ausgesprochen (www.no-patents-on-seeds.org).

Contents

1 Introduction

Many debates take place about the current international food crisis and the clash of resources between the markets of energy (such as production of agrofuels) and food. Coming from public statements and comments from market analysts, the current situation offers new strategic options for companies like Monsanto, Dupont, Syngenta and BASF. For example in 2007 the world number one chemical company, BASF announced the cooperation with the world biggest company in seeds, Monsanto. By announcing the cooperation BASF especially mentioned both markets, energy and food being as relevant for this business. “We are excited about the collaboration with Monsanto, which is a strong partner with outstanding capabilities,” said Peter Oakley, Member of BASF’s Board of Executive Directors responsible for Agriculture, Health and Nutrition. “This is a great step forward in bringing to farmers higher-yielding crops that help them to meet the increasing demand in both the food as well as renewable resources segments.”[1]

The general situation seems to be promising especially for companies such as Monsanto which are big players in seed market: The shares value of Monsanto increased significantly during 2007 (the shares have more than doubled), continuing in 2008[2] , parallel to the rising prices for food and agricultural commodities. In 2007 Monsanto´s shares price were even closely related to the price of crude oil[3]. As the Wall Street Journal reports: “Monsanto and rivals such as Syngenta AG, DuPont Co. and Dow Chemical Co. have seen demand bolstered by rising global food needs and the increasing use of corn to make ethanol, a gasoline substitute.”[4] Syngenta and Dupont could increase their profits for more than 25 % in the first quarter of 2008[5].

2 Patents on salad oil and biodiesel

There seems to be some evidence that those companies which are controlling the seed market are in a permanent win-win situation if the markets of food and energy are getting in direct competition, because seeds are of crucial importance for both markets. But as this research in patents confirms, companies such as Monsanto are not only dealing with the level of seed production as traditional seed companies are doing. According to most recent patent applications there seems to be a strategic move for a general take over of large parts of the production chain, in both markets, biomass/energy and food/feed. This means a new quality in corporate control if companies systematically can build up their position throughout the whole production chain, not only controlling seeds, but all down stream products in both markets, food and energy. This kind of new economical strategy can be exemplified by analyses of recently filed patent applications.

1 BASF and Monsanto Announce R&D and Commercialization Collaboration Agreement in Plant Biotechnology, joint press release of BASF and Monsanto, 21.03.2007
2 Jack Kaskey, “Monsanto Profit Doubles on Weed Killer, Corn Seed”, Bloomberg, USA, 02.04.2008
3 Brian Hindo, “Monsanto´s rich harvest”, Business Week, USA, 04.01.2008
4 Doug Cameron, “Monsanto reaps strong second-quarter profit”, The Wall Street Journal, USA, 04.04.2008
5 Jack Kaskey, “Dupont profit Jumps 26% on crop seeds, pesticides”, Bloomberg, USA, 22.04.2008 and Antonio Ligi, “Syngenta revenue rises 28% on prices, higher demand”, Bloomberg, 22.04.2008

2.1 Alarming signals from patent examples

In patent application WO2003080802 the US company of Monsanto claims soybean seeds with a certain oil quality, no matter if derived from plants with or without GE. Claim by claim Monsanto rushes through the whole production chain in food and fuel, by even listing certain volumes such as containers and liters:

claim 9: „A container of soybean seeds (....)“
claim 13: „A crude soybean oil (...)“
claim 14: “The crude soybean oil of claim 13, wherein said oil is selected from the group consisting of a cooking oil, a salad oil, and a frying oil.”
claim 15: “The crude soybean oil of claim 13, wherein said oil is a raw material for making a substance selected from the group consisting of shortening, margarine, lubricant, biodiesel, heating oil, and diesel additive.”
claim 16: “The crude soybean oil of claim 13, wherein said oil is produced in a volume greater than one liter.”
claim 17: “The crude soybean oil of claim 16, wherein said oil is produced in a volume greater than ten liters.”
claim 20: “The crude soybean oil of claim 19, wherein said oil is selected from the group consisting of a cooking oil, a salad oil, and a frying oil.”
claim 21: “The crude soybean oil of claim 19, wherein said oil is a raw material for making a soyfood.”
claim 24: „Feedstock derived from (...)“

Similar in patent application WO 2004006659 Monsanto claims use of patented seeds and plants in industrial use and food production, this time even normal crossing and selection is part of the claims. The patent starts with a soybean plant that has a certain protein content in its seeds, no matter how this plant is produced. Then again the whole chain of production is claimed systematically:

claim 1: “An agronomically elite soybean plant of a variety having a mean whole seed total protein content (...)”
claim 2: „A plant part of the plant of claim 1.“
claim 3: „The plant part of claim 2, further defined as pollen of the plant of claim 1.”
claim 4: „The plant part of claim 2, further defined as an ovule of the plant of claim 1.”
claim 5: “The plant part of claim 2, further defined as a cell of the soybean plant of claim 1.”
claim 6: “A seed of the plant of claim 1.“
claim 16: “A method of producing soybean seed, comprising crossing the plant of claim 1 with itself or a second soybean plant.”
claim 17: “The method of claim 16, further defined as a method of preparing hybrid soybean seed, comprising crossing the plant of claim 1 to a second, distinct soybean plant.”
claim 19: „A method for developing a soybean plant in a soybean breeding program (...)”
claim 33: “A method of producing food or feed comprising: (a) obtaining the plant of claim 1; (b) cultivating said plant to maturity; and (c) preparing food or feed from said plant.“
claim 34: “The method of claim 33, wherein said food is protein concentrate.”
claim 36: “The method of claim 33, wherein said food is meal.”
claim 37: “The method of claim 33, wherein said food is oil.”
claim 38: “The method of claim 33, wherein said food is flour.”
claim 40: “A method of producing a product for industrial use comprising: (a) obtaining the plant of claim 1; (b) cultivating said plant to maturity; and (c) preparing a product for industrial use from said plant.”

Patent applications WO2005102310, WO2006039449, WO2007030429 are following similar patterns. In WO2005102310 even the uptake of food by humans seems to be part of the patent. It starts with corn having a certain oil quality. Then it goes on like this:

claim 17: „A method of increasing the nutritional value of an edible product for human or non- human animal consumption, comprising adding the corn seed oil of claim 1 to the edible product.“
claim 18: „The method of claim 17, wherein the edible product is selected from the group consisting of human food, animal feed and a food supplement.“
claim 25: „The method (...), wherein the corn seed oil is administered in an edible composition.”
claim 26: „The method (...), wherein the edible composition is food or feed.”
claim 27: „The method (...), wherein the food comprises beverages, infused foods, sauces, condiments,

salad dressings, fruit juices, syrups, desserts, icings and fillings, soft frozen products, confections or intermediate moisture food."
claim 28: „The method (...), wherein the edible composition is food or feed for a companion animal."
claim 31: „The method (...), wherein the corn seed oil is administered to a human."
claim 32: "The method (...), wherein the corn seed oil is administered to a non-human animal."
claim 33: "The method (...), wherein the corn seed oil is administered to livestock or poultry."

Very similar In WO2006039449 Monsanto claims a method for producing "beverages, infused foods, sauces, condiments, salad dressings, fruit juices, syrups, desserts, icings and fillings, soft frozen products, confections or intermediate food." (Claim 18)

Again in WO2007030429 Monsanto claims methods for production of food "wherein the food comprises beverages, infused foods, sauces, condiments, salad dressings, fruit juices, syrups, desserts, icings and fillings, soft frozen products, confections or intermediate food." (claim 41)
And again, the normal crossing of plants is part of the invention: „A method of producing soybean seed, comprising crossing the plant of claim 1 with itself or a second soybean plant." (claim 43)

In comparison Monsanto´s patent applications WO2006128881 and WO2007118212 are more specific for energy and biofuels: In WO2006128881 a alkyl-ester derived from certain rapeseed and sunflower is described. Monsanto claims explicitly its use as "biodiesel": "Use of an alkyl-ester composition of any of claims 1 to 7 or claim 20 as biodiesel." (claim 21)

In WO2007118212 very general claims are directed to the screening of plants for their starch and protein content. Further especially the use in ethanol production is mentioned in the claims:
claim 1: "A method for screening at least one plant to predict a trait of interest, the method comprising measuring the degree of starch-protein association in the at least one plant."
claim 2: "The method of claim 1, wherein the trait of interest is fermentability to yield ethanol."
claim 3: "The method of claim 1 , wherein the trait of interest is digestibility."
claim 22: "The method of any of claims 1 to 21 , wherein the at least one plant is selected from the group consisting of maize, wheat, barley, rice, rye, oat, sorghum and soybean."

Monsanto is not the only company which files patent from seed to food and fuel. For example US company Ceres which was in close cooperation with Monsanto for several years applied for patent WO2007078286. The company claims a broad range of gene sequences which might be useful in genetic engineering without knowing exactly their functions. Even gene sequences with similar structure are claimed. Thus the patent starts with a broad range of possible applications. Claim 1 mentions: "A method of improving nitrogen use efficiency, modulating vegetative growth, seedling vigor and/or plant biomass, said method comprising introducing into a plant cell an isolated nucleic acid comprising a nucleotide sequence selected from the group (...)"
Then all genetically engineered plants and their progenies are claimed as well as their use in food and energy:
claim 12: "A transgenic plant comprising the plant cell of claim 11."
claim 13: "Progeny of the plant of claim 12, wherein said progeny has modulated plant size, modulated vegetative growth, modulated plant architecture, modulated seedling vigor and/or modulated biomass (...)"
claim 15: "Seed from a transgenic plant according to claim 12."
claim 17: "A food product comprising vegetative tissue from a transgenic plant according to claim 12."
claim 18: "A feed product comprising vegetative tissue from a transgenic plant according to claim 12."
claim 19: "A product comprising vegetative tissue from a transgenic plant according to claim 12 used for the conversion into fuel or chemical feedstocks."

There is no possibility to list all similar patent applications in the field of fuel and field in this backgrounder, just some very few further examples from other companies shall be mentioned:

- Syngenta is claiming agrofuels made of genetically engineered sugar beets (WO2007122086)
- Bayer filed a patent on milled corn used in fermentation of agrofuels (WO2008025522)
- Pioneer (Dupont) is going for genetically engineered plants with a high energy content (WO2007079161)
- BASF is active in the field of chemical composition of agrofuels (WO2007000428).

Coming from this enumeration of patent applications above (which is far away from being exhaustive) and related claims al lot of questions might be raised concerning patent case law, for example if these patents might be granted at all. This question can be answered to some extend in the positive, because there are already a lot of examples for granted patents in Europe and the US which do not only concern seeds but the whole downstream chain of production[6]. So maybe some of these patents will be rejected for some technical reasons or withdrawn by the companies, but all in all there is no doubt that these kind of patents have a some potential to be granted. Anyway, by analysing recent new patent applications, these patents are giving some evidence about current intentions of the companies behind, no matter if all or just some of them get granted in the end.

In the following short analyses first it will be shortly discussed the technologies which are the underlying basis for these kind of patents and how these are related to problems as world hunger and energy supply. After that the general role of patents in the food sector as such will be explored further.

2.2 Will GMOs feed the world?

In the light of the current discussion about food and energy supply from agricultural derived resources, companies and many analysts see especially genetic engineering (GE) technology as a key tool. For example BASF, the chemical company, got heavily engaged in GMOs as never before. As CEO Jürgen Hambrecht says: “The cultivation of plants for the production of agrofuels is in competition with food production and needs al lot of energy and water also. Without genetic engineering, without genetically engineered plants, this can not be organised.”[7]

So BASF which is expecting (according to Hambrecht) “a fight for resources in a global dimension” announced a series of investments and cooperation: From 2006 to 2008 BASF announced to spend 330 Million Euro for research on biotechnology in plants[8]. In March 2007 the cooperation with US company Monsanto was started with a volume of 1,2 Billion Euro to develop crops with higher resistance against environmental stress, such as drought[9]. Further, in May 2007 BASF took over the Belgium company CropDesign, to get (as it was described in the press release) a “leading position” in biotechnology in maize, soy and rape seed[10]. In June 2007 a cooperation was started with BAYER for the production of genetically engineered food[11]. The growing demand for food and energy is named as a key motivation: “In 15 years we will have nearly 8 Billion humans living on earth, this is 1.5 Billion more than today. With 12 to 15 years for necessary technical developments we do not have to loose time,” Peter Oakley from BASF is quoted[12].

But still there are only very few products around which could meet any specific need in the context of world hunger and energy production. For example Monsanto is still basing its business mainly on GE crops with resistance against herbicides and pest insects – a technology which is available for about 20 years. For the near future some drought resistant plants are announced by Monsanto. But similar announcements are made for more than ten years. So no matter if these new generation of GE plants will be available in the next years or not – in any case it took much longer than expected to realise those products. So the question if we are really gaining or if it is much more likely to loose some time by using GE technology can not be answered as it is presented in Mr. Hambrecht statement (see above).

Looking to the patent application of Ceres **WO2007078286** (see above) which is just an example for several similar pending applications in the field of GE plants, it shows that the technology still suffers from basic technological deficiencies. These deficiencies are not only related to the real technological output in terms of available products but at the same time relevant to the questions concerning risk assessment. The patent of Ceres covers not only a long list of gene sequences (listed on about 100 pages) but also a broad range of plant qualities such as “plant growth rate, vegetative growth, organ size, architecture, seedling vigor and/or biomass in plants.”[13] As Ceres writes, the invention “may be beneficial by providing more biomass useful for processing

6 see also cases below, more example on www.no-patents-on-seeds.org
7 German paper Der Spiegel 26/2007, 25.6. 2007, page 81 ff
8 BASF, The Chemical Company, Zukunft gestalten, Unternehmensbericht 2006, Seiten 46/47
9 http://corporate.basf.com/de/presse/mitteilungen/pm.htm?pmid=2622&id=e5w34AAaHbcp.D4
10 Pressemitteilung der BASF vom 17.5.2007
11 http://www.tagesspiegel.de/wirtschaft/nachrichten/chemieindustrie-gentechnik-basf-bayer/104660.asp
12 Pressemitteilung der BASF vom 17.5.2007
13 page 1 of WO2007078286

into food, feed, fuels and/or chemicals."[14]. Further it gives an incredible long list of plants in which this invention might get applied, naming nearly all possible species and subclasses and classes of plants.[15]

But when it comes to the technology as such, to produce the transgenic plants, only last century methods such as Agrobacterium and particle gun are mentioned.[16] These methods do not allow any precise transfer of genes, the site of integration and number of copies can not be controlled. But Ceres does not see a problem in here: The company researchers transferred some of the genes by methods for occasionally insertion to a few plants such as tomatoes and rice and then simply screened the genetically engineered plants for economically useful effects. So it is not a specific function of the gene sequence which used in a targeted and precise transformation, but more or less an approach based on a statistical likelihood of shooting gene sequences into the genome of crop plant, watch the results and then claiming those as the desired "invention".

By being aware of these basic deficiencies of GE technology the company of Ceres tries to turn it even into a kind of advantage: According to the patent application gene sequences as claimed are especially useful if they get "mis-expressed (i.e. when expressed at a non-natural location or in an increased or decreased amount relative to wild-type")[17]. By reading this patent description the main technical idea in genetically engineered plants is no longer to establish a specific function of a gene sequence, but simply to make use of a pretty non specific "mis-expression". Is this the technology we are looking for to secure a sustainable world food and biomass production? Anyway, one can find very good reasons in this patent publication from 2008 (which can be seen as an typical example for several other patent applications in this field) to argue that GE technology in plants is still not precise enough and too unpredictable in its effects to be used in fields for food, feed or fuel.

2.3 Can we do better with other technologies?

The question if transgenic plants are really delivering a substantial contribution to sustainable world food supply might not be the most relevant question for companies such as Monsanto and Ceres. They simply might follow the idea that if hunger increases and basic resources get shortened, nobody will ask how food and fuel are produced. But of course this approach should not be accepted by civil society.

In any case, better alternatives in conventional breeding seem to available since several years. Most important in this context seems to marker assisted breeding (MAB) which already accounts for good results in pest and drought resistance as well as in higher yielding[18]. This technology does not introduce a complete new breeding technology but simple supports conventional breeding by relatively low technical input, using some kind of gene diagnosis.

Being aware of the many open questions associated with technology of transgenic plants and the good results as achieved by conventional breeding (assisted by methods as marker assisted breeding), it is not a surprise that also big companies such as Monsanto, Dupont and Syngenta are increasingly interested in this approach. Indeed, even according to industry, conventional breeding, assisted by gene diagnosis (MAB), seems to be more effective than GE technology.[19] Also taking account the patents as listed above it is striking that in most cases GE technology is not described as being the key tool to achieve the desired traits as claimed.

But at the same time, looking to the patents as analysed in here it is a matter of big concern that companies might be able to use just simple technical elements (such as MAB) to claim intellectual property on all steps of food and biomass production. This would allow systematic abuse of patent law to gain large monopolies in seeds, food, feed and biomass. There is already a broad coalition including also big farmer organisations which try to raise a broader public debate on this issue (www.no-patents-on-seeds.org).

[14] page 1 of WO2007078286
[15] page 32 of WO2007078286
[16] page 9 of WO2007078286
[17] page 15 of WO2007078286
[18] see for example McCouch, S., 2004, „Diversifying Selection in Plant Breeding", PloS Biology, October 2004, Vol 2, Issue 10, www.plosbiology.org
[19] see presentation of Syngenta at www.epo/aboutus/events/biotechnology.html

3 Patents as a driving factor in hunger?

IPRs (intellectual property rights) are very often seen as a driving force in innovation and a necessary precondition for investment. But in the context of food production it might be seen much more as a driving factor to monopolize some of the most basic resources needed in day to day survival. In the last ten to twenty years companies such as Monsanto, Syngenta and Dupont have built up an enormous power in the seeds business, as Monsanto becoming world number one not only in pesticides but also seeds. This development is closely related to the introduction of genetic engineering in the plant breeding sector, because this technology provided the decisive tool to introduce patents in plant breeding. The way these patents were introduced clearly showed from the beginning that it was not only about control on seeds, but on downstream production in agriculture and food. For example in the granted European patent of Monsanto on round-up ready technology (EP0546 090), includes not only claims on seeds, but on plants, their cultivation and even the harvest of the plants. Nowadays this European patent is used by Monsanto to claim even license fees from harvest of Argentinian farmers arriving in European harbours.

It is important to be aware of very basic differences differences in patent protection compared to traditional breeders plant variety protection system (PVP):

- The traditional PVP system provides the holder with a monopoly to sell its newly developed seeds. But PVP rights are restricted to a distinct single variety, while patents cover whole range of species and classes.
- PVP system allows free access to any commercial traded seed for the purpose of further breeding ("breeders exemption"). But patents can block access to genetic resources to a large extend.
- Since PVP are only directed to a single variety and allow free access to other breeders, PVP more or less end with the commercialisation of a certain variety. But patents do not end as long as the patented genetic conditions can be found in any progeny. After each crossing of plants there will be an increasing accumulation of patents in a single crop plant[20] which can slow down any progress in further breeding.
- Further PVP only deals with the sector of seeds. Patents allow claiming the whole chain of food production: Seeds, plants, cultivation, harvest and its processing are subjected to monopoly control.

By analysing this situation it becomes striking evidence that big companies such Monsanto are interested in the seeds business (and related patents) for very specific reasons: Patents on seeds (and genetic resources) in the way as they are actual granted, open the road for control of agricultural and food production as it was never before the case in human history.

By analysing the potential effects of this extremely broad control in the food sector (and parallel in feed and plant biomass energy) one should not stick too narrow to effects which can be observed in the pharmaceutical business. Patents on foods and seeds and agrofuels are considering day to day articles and not products of highly specific purpose such as pharmaceuticals. In the food sector it is unlikely that the price for the product will jump x-fold high just because a certain patent is granted.

Under the conditions of food market is not only the price of the product which is decisive for the expected revenue of the companies. The main underlying idea is not to sell specific block busters, but to gain a more general market control in the trade of mass products needed for day to day survival by people around the globe. Filing patents like the one as listed above means to aim to a new dependency on daily life products which nobody can escape, because simply everybody needs food and energy. The most relevant problem in this context seems not to be the price of a single product but a systematic economical effect that in general can price out seeds and food from the market in development countries[21].

The effect of this development might not necessarily be detrimental to food system in most industrialized countries. These are the markets the system was created for. Food and fuel derived from biomass will be available for (maybe) higher prices but the general economy is likely to organise day to day survival for society. But a system which mainly based on control and dependency of basic resources, allows global shifts of markets, investment and availability of products which will have severe impact on countries of the south. The decisions how these global markets for food and energy are organised will follow the general rules of the game:

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[20] Kryder, R., Kowalski, S. & Krattinger, A. (2000) "The Intellectual and Technical Property Components of Pro-Vitamin A Rice (Golden Rice): A Preliminary Freedom-to-Operate Review", ISAAA Briefs No.20, International Service for the Acquisition of Agro-biotech Application, New York. Source: http://isaaa.org/publications/briefs/Brief_20.htm

[21] Knight, J., 2003, „Crop improvement: A dying breed", Nature 421:568-570

Products will be produced and made available for those who pay, no matter if the demand is for food or fuel.

Under conditions of general growing demand for agricultural products this can create a disaster for those countries which economy is less powerful and people already have to spend a high percentage of their income in daily food. Giving global control to resources in agricultural derived food and fuel production in the hand of a few multinationals means to create a perfect recipe system to increase hunger on large scale.

4 Conclusions

The general idea of the patent system is a balancing act between the rights of the monopoly holder and the potential benefits derived from true technological innovation. By patenting seeds, plants, harvest and derived products such as food and fuel this balance gets shifted towards unjustified monopolies, which is much more related to a strategical control of markets than a rewarding of true inventions. This shift of the system is not acceptable for civil society if it has an potential to endanger world food supply, by blocking (or hampering) access to basic genetic resources and establish comprehensive monopoly rights on most needed products of daily life.

At least under in the current situation world hunger is not so much increased by true deficiencies in food supply, but simply by rising prices, which lead to the situation that people in development countries are no longer able to cover their costs for daily food. The UN food organisation FAO is amongst those which is concerned about rising prices for plant derived imports, especially if they can also be used in agrofuel production[22]. There is no doubt that rising prices mean nothing else but hunger in the less development countries. While FAO aimed in 1996 for a 50 % reduction in world food hunger till 2015 (starting with about 800 Million people), many experts meanwhile are predicting with a strong increase. For example, scientists from University of Minnesota are warning that number of those suffering from hunger could gain 1,2 Billion people in 2025[23].

Patents can add substantial to enhance this alarming situation, they can fuel the crisis significantly, especially in the countries of the south by transferring the control on plant genetic resources to monopolistic property right of multinational companies. Already in 2002, the UK Commission on Intellectual Property Rights gave the advise to exclude patents on seeds completely in development countries: “Because of the generally negative effects of patents in plant breeding, the UK Commission on Intellectual Property Rights explicitly advises developing countries to completely ban patents on plants and seeds.“[24]

In 2008 the IAAST (International Assessment of Agricultural Science and Technology for Development) published a report which comes to very similar conclusions: “In developing countries especially, instruments such as patents may drive up costs, restrict experimentation by the individual farmer or public researcher while also potentially undermining local practices that enhance food security and economic sustainability.“[25]

Coming from the analysis and the example above with patents applications covering systemically seeds, food, feed, and fuels and all levels of the production chain, these warnings get a new quality. An IPR system which can can lead to severe global bottlenecks in world food supply is in clear contradiction to the need of sustainable food security and should be ruled out by the international community.

22 FAO, Food Outlook, June 2007

23 C. Ford Runge und Benjamin Senauer, "How Biofuels Could Starve the Poor", Foreign Affairs, Mai/Juni 2007.

24 UK Commission on Intellectual Property Rights, 2002, Integrating Intellectual Property Rights and Development Policy, http://www.iprcommission.org

25 http://www.greenfacts.org/en/agriculture-iaastd/l-2/3-biotechnology-for-development.htm#0