Response of Hungary

ANNEX 1

QUESTIONNAIRE about the socio-economic implications of the placing on the market of GMOs for cultivation

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B - Contact Details

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HUNGARY

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ANNEX

Lead questions per area and stakeholder

For each question, answers should be broken down:

- by the purpose of the genetic modification if this affects the content of the responses,
- between ex ante and ex post considerations.

Introduction

First of all, Hungary highly appreciates the efforts by the Commission to gather and exchange information regarding experiences of Member States concerning on the socio-economic impacts of the GMO cultivation.

Hungary supports to include an assessment of socio-economic implications of the deliberate release and placing on the market of GMOs during the authorisation process, after the risk assessment on environmental and health effects of the particular GMO has been carried out.

There has not been any GMO cultivation in Hungary for the time being. Therefore, the coutry has no practical experience regarding this issue. Therefore, in case of Hungary, social and economical implications of the cultivation of GM crops can only be estimated.

Hungary would like to stress however that these implications are highly depending on regional/national characteristics where the GM crop cultivation takes place. Hovewer, there is a need on the elaboration of a new evaluation system with detailed assessment of the different socio-economic factors and effects arising from GMO cultivation. A good basis for this could be the system of Norway, where – in deciding whether or not to grant an application to the deliberate release of genetically modified organisms – considerable weight shall also be given to whether the deliberate release will be of benefit to society and is likely to promote sustainable development. Applications for the approval of deliberate release shall include an impact assessment setting out the risk of adverse effects on health and the environment but also other consequences of the release. This means that the notifier should provide evidence in the dossier that the placing on the market of its GMO product can be supported also from socio-economical point opf view. As a first step, the competent authority assesses whether the potential authorisation provides the Norwegian population with social or economical advantages. On the other hand, the CA also assesses whether the authorisation of the particular GMO has any advantage for other countries including developing ones. During the assessment, following questions should be answered: Is it a) in compliance with the principle of sustainable development? b) of benefit to the community? c) ethically and socially justifiable?
The Norwegian Biotechnology Advisory Board released a guideline on how to implement the concepts of "sustainable development" and "benefit to the community" set out in the Norwegian Gene Technology Act with the following title: Sustainability, Benefit to the Community and Ethics in the Assessment of Genetically Modified Organisms: Implementation of the Concepts set out in Sections 1 and 10 of the Norwegian Gene Technology Act.

Hungary believes that the Norwegian Guidance Document is extremely useful also for the EU when considering how and which legitimate factors could be taken into account as socio-economical issues during the GMO authorisation system. We attached the document as an annex to this questionnaire.

Furthermore, a study has recently been launched on the economical impacts of the introduction of GMOs into the Hungarian Agriculture (Gy. Pataki and R. Matolay, 2008.). We hereby attach this study to the questionnaire for your kind information.

1. - Economic and social implications

Upstream

1.1. Farmers

For each question, answers can be broken down by the range of relevant agricultural stakeholders farmers

- farmers cultivating GM crops;
- and/or conventional crops;
- and/or organic crops;

Since Hungary is not involved in the commercial growing of GM plants, there is no experience regarding Hungarian farmers. However, a survey has been conducted among domestic farmers, which shows that they tend to be rather negative towards GMOs. Hungarian farmers do not agree with the statement that a competitive drawback would arise from failing to produce GM crops. According to their opinion, the possibility of having to apply a smaller amount of plant protection products is not a strong enough reason for their introduction. However, they do agree that their use should be avoided due to the lack of knowledge concerning the effects of their production. Ex ante economic assessments performed in Hungary do not provide particularly attractive or beneficial results in regard to the growing of GM crops, although the exogenous variables are optimistic concerning the development of conditions.

Furthermore, as many international experiences show, it is not feasible in the agricultural praxis to realize the complete separation between the different types of products for the long run. Consequently, the farming enterprises and the farmers themselves would face with the problem of coexistence. Furthermore, as international experiences show, they would face more and more frequently with the problem of the presence of GMOs in conventional and organic products or sowing seeds.

It is also to be expected that the confidence of the farmers and of the neighbours would decrease particularly. As mentioned before, the major problem would be the risk of out crossing and the GMO contamination of other crops, which results the loss of the marketability of the harvested product. The free choice of the farmers would also go against. The farmers would not give any confidence to the efficiency of the institutes and/or organisations/competent authorities/governments. The fact that conventional and organic farmers have extra costs arising from the laboratory tests for GMO contamination will also contribute to tension between GM and non-GM cultivating farmers.

Agricultural policies will always have to face therefore serious economic and societal issues in case GM crops are put into production, since either decision will result in organic or traditional farming practices either to be upheld or to disappear. For example, experience in Aragon and Catalonia indicates that the organic farming of those plants that are also grown in a GM variant in the same region can be drastically reduced. This is a severe market loss to both the growers and to the consumers of organic products. Considering the tendencies of demand on the present food market, it can be established that the present products offered by agricultural biotechnology, as opposed to organic products resulting from the various forms of ecological production, do not provide added values to consumers regarding either comfort or a healthy diet. Thus, in this respect the maintenance, and in fact the support, of organic farming, seems to be economically more rational in terms of agricultural policies than the support of biotechnology.

Furthermore, on the basis of the experiences gained thus far, there is no evidence to indicate that the production of first generation GM crops improves the productivity or decreases the costs of farmers to result in increased competitiveness.
Even the USDA reports in 2006 that the gene technology has not increased the yield potential of commercially crown GM crops. The same resolution was shown with MON810 maize carried out by several Hungarian studies.

According to some studies in the scientific literature, on the level of farmers, the application of agricultural biotechnology results in mixed experiences worldwide. Advantageous effects can indisputably also be found in given areas and times on the level of certain farming communities (exlusively at large-scale farms) that have switched from conventional agriculture to agricultural practices based on GM plants. These advantages can be found mostly in certain dimensions of agronomical practice, such as the use of simpler plant protection products and the more flexible application of labour.
As we said before, however, an increase in profitability on the level of the farmer cannot be unequivocally established or proved. This stems partly from the fact that according to experiences gained in North America indicate that the decrease in the use of plant protection materials begins to abate after the first three years and commences to rise to a level higher than previously, thus decreasing the profits of farming. The improvements in environmental conditions that are promised by the supporters of agricultural biotechnology are also nullified. The decrease in competitiveness of farmers can be attributed to partly the effects of the international market, since American farmers have experienced a substantial drop in market share due to the opposition met with in certain main export markets.

This conclusion is also substantiated by analyses conducted on the level of our national economy: if export markets do not accept GM products, this can lead to decreases in well being in food or crop exporting countries like Hungary. This leads to a decrease in market share and to a rise in production costs both for conventional and organic farmers, due to the costs of segregation and identity preservation.

In Hungary, corn borer is not a significant pest, which only appears once in every ten years in the southern part of the country. Even in this case, maize can be protected against the pest by using traditional agricultural techniques. This practically means that our agriculture does not need this type of Bt crops as a solution for fighting against the corn borer. GM farmers would pay definitely more for GM sowing seeds but the pest does not appear in most of the years. This is the reason why the GM technology will not contribute to higher yields, less application of pesticides or higher incomes for GM farmers.

On the contrary, for Hungary, as the second biggest maize producer and exporter in the EU, to refrain from GMO cultivation is a great advantage on the GMO refusing exportmarkets. Most of the exporting actors – even biotech companies – if they indends to export corn – ask the Competent Authority to issue an official document stating that there is no GMO cultivation in Hungary. This is also the case when GMO cultivating countries intends to purchaise corn from Hungary from the intervention.

Conventional maize is cultivated in Hungary on approximately 1,2 million hectares. At least 2/3 of the yield will be exported (approximately 8-10 million tons/year, the national use is approcimately 4 million tons/year).
Hungary is also one of the biggest sowing seed producers in the EU. At least 364 different types of sowing seeds of maize varieties is produced here – a large majority goes for export.
Both of the examples shows that the "GMO free status" is a remarkable market advantage for Hungary for the time being, which contributes significantly to the national economy and to the profitability and the competitiveness of Hungarian conventional and organic farmers.

In our opinion, the increasing of the GMO cultivation results in using of intensive, high energy consuming, high-input and not sustainable agricultural practices, in concentration of agricultural land in less hands. This intensive technology means that there is a need on less labour, locals will therefore move from villages to the cities where unemployement will increase.

We believe that the EU should support low-input, environmental friendly, less intensive and sustainable farming methods, which results in high quality products and prevents locals to move from the countryside. There is a need on a unambiguous agricultural policy within the EU, which supports the above mentioned farming methods taking into account that – even with the wide application of GM crops – the EU will not be able to produce at such a low cost like farmers do in Brasil, China or the US. Therefore, the needs of domestic consumers on traditional, high quality products should be met.

- beekeepers;

Hungarian beekeepers also feel that beekeepers interests have not been considered accordingly when discussing GMO authorisation issues so far. There is a need on an exhaustive assessment on the impacts of a large-scale GMO production within the EU on European beekeepers.

Furthermore, according to beekeeper organisations in Hungary, with the commercial GMO cultivation in Hungary, the beekeepers would be "defenceless", the honey contaminated by GMO pollen will not be marketable in Hungary without a GMO label.
Bees fly even 6 kilometers far. In the case of an extensive GMO cultivation they can hardly avoid that bees collect honey also on GM culture, which leads to the appearance of GM pollen in the honey which undermines their marketing possibilities and causes ecomonic losses.

Békési (2006) showed that the pollen of the DK-440 BTY maize line, which containes the MON810 gene combination, decreases the chance of the larvae's survival and negatively influences the adult bees' resistence to the Nosema apis microsporidian parasite. (Békési, L. 2006: A géntechnológiai úton módosított növények és a méhek. (Genetically modified plants and bees). In: Darvas 2006, pp. 28-29.) This also leads to extra costs for beekeepers.

- seed producers producing GM seeds;
- seed producers producing conventional seeds;
- seed producers producing organic seeds;

Regarding seed producers, complete and satisfactory separation would be necessary among GM, conventional and organic seed producing farms. There is a need on a quite large buffer zone in order to be able to avoid the GMO contamination of the conventional or organic sowing seed. At an extensive level of GMO cultivation in a country also means that conventional or organic seed producers will have to face difficulties by keeping isolation from GMO producers. There will also be a need for costly laboratory cheks for adventious GMO content, which will not be financed by GM cultivating farmers or the biotech industrie. There will also be a need on separate seed production industrie.

In Hungary, maize seed production is one of the most important sectors in the agriculture. We produce a large amount of seeds of different GM maize varieties, not only for domestic use but also for export. The fact that currently there is no GMO cultivation in Hungary means a great advantage on the sowing seed market for the country.

Has GMO cultivation any impact regarding the following topics? If so, which one?

- farmers' revenues (output prices and agricultural yields);

As regards GMO cultivating farmers, the price of the GM sowing seeds are considerably higher than non-GM sowing seeds. Furthermore, according to several studies (USDA, Benbrook), the yield of GMOs has not been proven to be higher.

Conventional or organic products contaminated by GMO above the 0,9% threshold level would not be marketable as GMO free; consequently, the price of these products would be lower. On the above grounds, it should be assessed, what is the effect on the prices of conventional and organic products (and the revenues of conventional and organic farmers) of the more and more frequently appearing GMO contamination in non-GM products. The introduction of the new technology cuts down the profitability of farmers using traditional agricultural methods – but also other sectors including the processing industry – (for example by spending on regular laboratory checks regarding an unintended GMO content of their products). By building paralell storage/transit/processing systems as well as by the need on carrying out regular laboratory tests regarding a possible GMO contents results in a higher market price in non-GM food and feed products, which should be covered by the GMO refusing consumers.

There is a need on exhaustive studies regarding farmer's revenues, solely based on European data or estimations.

Regarding the revenues of the Hungarian farmers, – as already mentioned before – the "GMO free status" of the country is a guarantee for profitability and compatitiveness on domestic and exportmarkets.

- farmers' production costs;

As already mentioned before, on the basis of the experiences gained thus far, there is no evidence to indicate that the production of first generation GM crops improves the productivity or decreases the costs of farmers to result in increased competitiveness.
Even the USDA reports in 2006 that the gene technology has not increased the yield potential of commercially crown GM crops. The same resolution was shown with MON810 maize carried out by several Hungarian studies.
In paralell, non-GM farming costs will increase.

Many studies reports also that by large-scale cultivating of herbicide tolerant (HT) GM crops results in the emergence of resistant weeds. This goes hand in hand with the increase of use of other herbicides, of mechanical soil tillage, which leads to increased production costs for GM but also for non-GM farmers. To the end, the price of the herbicides as well as the soil erosion may increase.

- labour flexibility;

The increasing of the GMO cultivation results in using of intensive, high energy consuming, high-input and not sustainable agricultural practices, in concentration of agricultural land in less hands. This intensive technology means that there is a need on less labour, locals will therefore move from villages to the cities where unemployement will increase.

- quality of the harvest (e.g.mycotoxines);
- cost of alternative pest and/or weed control programmes;
- price discrimination between GM and non-GM harvest;
- availability of seeds and seed prices;
- dependence on the seed industry;

Biotechnology holds no advantages for the small family based farming that is characteristic of Europe and Hungary and in fact leads to their suffering disadvantages in competitiveness. The delicate situation of farmers increases as they are set against the giant companies that reach monopolistic status on the input side; losing their freedom, they become sorts of "day labourers" of the companies.

By increasing of the GMO cultivation, the domestic supply on varieties will decrease, local and regional, traditional varieties may disappear, which is the case in some GMO producing third countries. This leads to decrease of agricultural biodiversity, to a high dependence on the GM seed industry, to higher sowing seed prices and less farmer incomes as well as to less safe national food/feed supply.

- farmers' privilege (as established by Article 14 of Regulation (EC) No 2100/94 on Community plant variety rights) to use farm-saved seeds;

By using the GM technology, farmers are obliged to purchase sowing seeds every year and not allowed to use farm-saved seeds. This leads to increasing production costs and less incomes for the farmers.

- the use of agriculture inputs: plant protection products, fertilisers, water and energy resources;

See above.

- health of labour (possible changes in the use of plant protection products);
- farming practices, such as coexistence measures and clustering of GMO and/or non-GMO products;
- cost of coexistence measures;

The growing of both GM and non-GM plants (coexistence) and the possibility of implementing the various types of agricultural practices is a very important question.
In the case of growing non-GM maize and GM maize together, significant changes would have to be made to the agricultural practices presently used; the most important factor is to use isolation distances/buffer zones.
However, adhering to the obligatory isolation distances does not have the same effects on farmers. The characteristics of the ownership of land in a given region substantially influence the economic viability of coexistence. Land divided into small plots and the prominence of numerous small family farms as opposed to large land owners (as the situation on Hungary is) all increase the price to be paid for coexistence and decrease its economic viability within a given region.

- conflicts between neighbouring farmers or between and other neighbours;

It is to be expected that the confidence of the farmers and of the neighbours would decrease particularly. The production of GM crops thus cannot be considered as merely a decision to be made freely by the growers themselves in as much as it has negative external effects. It infringes upon the freedom of neighbouring growers within the buffer zone to make their choice and upon their economic interests.

- labour allocation-insurance obligations;
- opportunities to sell the harvest due to labelling

See above.

- communication or organisation between the farmers;

As already mentioned, the communication between the farmers is expected to be decrease according to the lack of confidence.

- farmer training;
- beekeeping industry.

Bees are flying to 5-6 kilometres from the beehive; consequently, contamination of the honey with GMO pollen can hardly be avoided in a case of a large-scale GMO cultivation. The marketing opportunities of a labelled, GM-contaminated honey would result in remarkable difficulties for the beekeeping industry.

Any other impact you would like to mention:

1.2. Seed industry

For each question, answers can be broken down by the range of relevant stakeholders, including:

- plant breeders,

It is to be expected that by large-scale GMO cultivation, the demand on convventional varieties will decrease. Producing of conventional or organic soeing seeds will be difficult and more expensive. Local and traditional varieties may disappear which also means that domestic plant breeding institutes will have difficulties to survive.

A second important question is the protection of the plant breeding resources from GMO content.

- multiplying companies;
- seed producing farmers;

It is to be expected that by large-scale GMO cultivation, the multiplying of sowing seeds will be more costly. If the GMO cultivation will be dominant in a region, multiplíing companies will not be able to multiply GMO free seeds in that particular region any more.
The same is true for seed producing farmers.

According to studies, this has happened in the United States where farmers can choose only from GM soybean varieties, traditional varieties have practically disappeared, commercial sowing seeds are hardly available on the market. The price of the GM seeds is constantly increasing. The whole soybean industry concentrates in the hands of only some multinational seed companies (therefore this issue could also be handled as an internal safety issue within the EU). This process means that the free choice of farmers/consumers is not ensured.

Furthermore, the costs of co-existence will increase their production costs of multiplying or seed producing companies/farmers. In case of multiplying/producing conventional or organic seeds, there is a more definite need on regular laboratory checks for adventitious GMO content of conventional/organic seeds.

- seed distributors;

And/or:

- GM seeds;
- conventional seeds;
- organic seeds;

It is to be expected that in case of large-scale GMO cultivation, the adventitious GMO content of conventional and organic seeds will increase which will result in less income for traditional seed producers. It would be also more difficult to find land for the production of conventional or organic seeds.

In some of the third countries, where in particular sectors, the GM cultivation is typical, the state is not any more able to guarantee that conventional seeds are free from GM content.

And/or:

- industrial/arable crops;
- vegetable crops…

Regarding seed producers, complete and satisfactory separation would be necessary among GM, conventional and organic seed producing farms. There is a need on a quite large buffer zone in order to be able to avoid the GMO contamination of the conventional or organic sowing seed. At an extensive level of GMO cultivation in a country also means that conventional or organic seed producers will have to face difficulties by keeping isolation from GMO producers. There will also be a need for costly laboratory cheks for adventious GMO content, which will not be financed by GM cultivating farmers or the biotech industrie. There will also be a need on separate seed production industrie.

In Hungary, maize seed production is one of the most important sectors in the agriculture. We produce a large amount of seeds of different GM maize varieties, not only for domestic use but also for export. The fact that currently there is no GMO cultivation in Hungary means a remarkable advantage on the sowing seed market for the country.

Has GMO cultivation any impact regarding the following topics? If so, which one?
- employment, turn over, profits;
- the production of seeds (easiness/difficulty to find seed producers, easiness/difficulty to find areas to produce these seeds…);
- marketing of seeds;
- the protection of plant breeders rights;
- the protection of plant genetic resources.

See above.

Does the marketing of GM seeds have an impact on the seed industry and its structure in the EU (size of companies, business concentration, competition policy)? Please specify per sector:
- for plant breeders;
- for seed multiplication;
- for seed producers;
- for the availability of conventional and organic seeds;
- creation/suppression of barriers for new suppliers;
- market segmentation.

See above.

Any other impact you would like to mention:

Downstream

1.3. Consumers

Has GMO cultivation any impact regarding the following topics? If so, which one?
- consumer choice (regarding quality and diversity of products);

The majority of consumers in both Europe and in Hungary is opposed to GM foods, does not wish to consume GM products, and expects GM products to be unequivocally labelled in order to guarantee customers the right to freely make their choice. The characteristics of the market demand do not make it economically feasible to avert to the production of GM crops.

The tendencies exhibited by the food market indicate that comfortable, safe, and healthy foods are going to continue increasing market share. In the eyes of consumers, the GM products presently available do not meet these criteria and consumers do not feel that these benefits would be attained. In fact, they generally increase an uncomfortable feeling in consumers, decrease the trust that consumers have in foods and in the related institutional system, which can easily have a backward effect on the competitiveness of the agricultural sector in the form of food scandals.

Furthermore, as we explained before, according to studies, in some of the third countries, farmers can choose only from GM soybean varieties, traditional varieties have practically disappered, commercial sowing seeds are hardly available on the market. This practically means that the free choice of consumers is not ensured.

- the price of the goods;

With the increasing of GMO cultivation, unintended presence of GMOs is expected to increase. There will be a need on regular checks for adventitious GMO content. Furthermore, according to some studies, adventitious presence of GMOs in conventional or organic food/feed products can only be achieved by sustaining separate production, storage, processing chains.

The expenses of the laboratory tests, of the separate producing/storage/processing routes result in a higher price of the non-GM end products, which should be payed by the consumers.

- consumer information and protection;

In our view, consumers are not in need of more information concerning GM foods, but their trust should be increased regarding the safety of the food supply chain, the regulating authorities, and the creditability and legitimacy of the other players on the market.

Any other impact you would like to mention:

1.4. Cooperatives and grain handling companies

Has GMO cultivation any impact regarding the following topics? If so, which one?
- work organisation;
- handling and storage;
- transport;
- administrative requirements on business or administrative complexity;

GMOs cultivation would cause additional costs and further investments, regarding handling, monitoring, transport, and processing of different types of products. For all of the above-mentioned corporations, it would be more difficult to produce GM free products.

Any other impact you would like to mention:

1.5. Food and feed industry

Has GMO cultivation any impact regarding the following topics? If so, which one?

- range of products on offer;
- employment, turn over, profits;
- work organisation;
- crop handling (drying, storage, transport, processing, etc…);
- administrative requirements on business or administrative complexity;

Agricultural biotechnology products continue to potentially transform the food supply chain, since they unequivocally increased and increase concentration within the sector, primarily on the agricultural input market. This strengthen the monopolistic type market structure, the existence of which is not necessary in this sector, due to its nature. On the basis of results obtained thus far, concentration in the sector did not only result in an economic and political strength on behalf of the input side of supply, but also led to the decrease in the ambitiousness of R+D (meaning it also negatively affects innovation, as well). All the market failures support the argument as economic reasons that stringent regulations are definitely needed in the case of agricultural biotechnology (see Jackson–Villinski, 2002).

The tendencies exhibited by the food market indicate that comfortable, safe, and healthy foods are going to continue increasing market share. In the eyes of consumers, the GM products presently available do not meet these criteria and consumers do not feel that these benefits would be attained. In fact, they generally increase an uncomfortable feeling in consumers, decrease the trust that consumers have in foods and in the related institutional system, which can easily have a backward effect on the competitiveness of the agricultural sector in the form of food scandals.

As we already explained before, with the increasing of the GMO cultivation, the adventitious presence of conventional and organic products will grow. It decreases the freedom of choice, increases the costs of GMO free food and feed production, increases the costs of carrying out regular national checks from the government side, etc.

The maintenance of separate producing/storage/processing chains for GM and non-GM products will also increase the production costs and decrease profits in the non-GM sector.

As mentioned before, the range of products can also be decreased with the large-scale GMO cultivation (as an example, non-GM soybean is almost unavailable in the world market). This infringes the concept of freedom of choice.

Any other impact you would like to mention:

1.6. Transport companies

Has GMO cultivation any impact regarding carriers (insurance, cleaning, separate lines…)? If so, which one?

Because of the difficulties in the separation of the different seeds, the costs would increase; the working method would be slower and less efficient, the administrative burden will increase.

1.7. Insurance companies

Does the GMo cultivation have any impact regarding insurance companies (e.g. in terms of developing new products)? If so, which one?

When developing our national coexistence rules, the Hungarian Government asked the insurance companies association whether they intend to develop new insurance products in relation to GMOs. In their response they indicated that they consider the introduction of such products too risky (because of the pontential GMO contamination) for the time being.
In Hungary, there is currently no insurance available on the market regarding the GMO cultivation.

1.8. Laboratories

Has GMO cultivation any impact regarding the following topics? If so, which one?
- employment, turn over, profits;
- feasibility of analyses;
- time necessary to provide the results;
- prices of the analyses.

Any other impact you would like to mention:

In Hungary, because of the lack of GMO cultivation, we do not have experiences with laboratory analyses. However, we believe that with the increase of the GMO cultivation, profits of the laboratories will increase.

On the other hand, laboratories will face with difficulties in analysing of stacked events. As an example: in case of a n "AB" double stack, they are currently not able to say whether the samle contains a double stack or 50% of the single stack "A" and 50% of the single stack "B" which could lead to definite legal consequences for certain market actors.

1.9. Innovation and research

Do GMO cultivation and the technology spill over have an impact on the following topics? If so, which one?
- investment in plant research, number of patents held by European organisations (public or private bodies);
- investment in research in minor crops;
- employment in the R&D centres in the EU;
- use of non-GM modern breeding techniques (e.g. identification of molecular markers);
- access to genetic resources;
- access to new knowledge (molecular markers, use of new varieties in breeding programmes, etc.).

It is extremely problematic that more and more cases are being documented showing that independent risk research is being hampered. In many cases, it is not possible to access necessary testing materials. Even the publication of findings is often being obstructed (in case of negative findings). All in all the influence of industrial interest in research and the presentation of findings have reached alarming proportions.

By the extensive use of patents in the biotechnology, access to research resources, to new knowledge will be more and more restricted.

1.10. Public administration

Has GMO cultivation any impact regarding the actions of the national public administrations and the necessary budget (national and local level) for example policing and enforcement costs?

With regulation of the GMO cultivation (coexistence measures), the administrative costs will definitely increase. The implementation requires specific expert knowledge and more staff in the controlling authorities.

Furthermore, not only the implementation of the coexistence measures but also the post market monitoring activity will cause high extra costs for national budgets.

In case of GMO contamination of non-GM products, national administrations should also face extra costs: either by the establishment of a national compensation found or by increased cases taken to court.

Furthermore, if the GMO cultivation will be the dominant production type, this intensive agricultural mean will requre less workers and will increase unemployment in the region. Also this contributes to higher administration costs.

Any other impact you would like to mention:

Economic context

1.11. Internal market

Does the placing on the market of GMO seeds have impacts on the functioning of the EU internal market on seeds? If so, which one?

Many international examples indicate that with the spread of the GMO cultivation, GMO gene flow can not be avoided, which means that the free movement of conventional or organic seeds, food and feed products would be negatively affected. This process wil go hand in hand with the infringement of the free choice of farmers and consumers.

Furthermore, when assessing the impacts of the placing on the market of GMO seeds on the internal EU market, its implications on national economies of particular Member States – especially which are the significant producers in the affected sector – including Hungary should also be taken into account. We already provided information regarding this issue in the above.

Does it have an impact on the internal markets for services (if so which impact and which services), for agriculture products and on workers' mobility? If so, which one?

Does GMO cultivation have an impact on monopolies? If so, which ones (emergence/disappearance)?

Many international examples indicate that with the spread of the GMO cultivation, the concentration process has already happened. In our view, monopoly of a multinational company, which do not seat in Europe, has a negative impact on the European economy.

Does it provoke cross-border investment flows (including relocation of economic activity)?

Any other impact you would like to mention:

1.12. Specific regions and sectors

Answers can be broken down on the purpose of the level (national, regional, local) and according to region.

Has GMO cultivation any regional and local impact in those regions regarding the following topics. If so, which one?

- agriculture incomes;

When assessing the effects of the GMO cultivation on regional and local enviromnent, it should also be assessed that in cases (and this is the case in Hungary regarding the maize producing sector), where export markets do not accept GM products, this can lead to decreases in the incomes of the farmers of the region as well as well being in food or crop exporting countries or regions. This leads to a decrease in market share and to a rise in higher production costs, due to the costs of segregation and identity preservation.

As an exapmle, in Hungary, corn borer is not a significant pest, which only appears once in every ten years in the southern part of the country. Even in this case, maize can be protected against the pest by using traditional agricultural techniques. This practically means that our agriculture does not need this type of Bt crops (including MON810) as a solution for fighting againinst the corn borer. GM farmers would pay definitely more for GM sowing seeds but the pest does not appear in most of the years. This is the reason why the GM technology will not contribute to higher yields, less application of pesticides or higher incomes for GM farmers.
On the contrary, for Hungary, as the second biggest maize producer and exporter in the EU, to refrain from GMO cultivation is a great advantage on the GMO refusing exportmarkets. Most of the exporting actors – even biotech companies – if they indend to export corn – ask the Competent Authority to issue an official document stating that there is no GMO cultivation in Hungary. This is also the case when GMO cultivating countries intends to purchaise corn from Hungary from the intervention.

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Hungary is also one of the biggest sowing seed producers in the EU. At least 364 different types of sowing seeds of maize varieties is produced here – a large majority goes for export.
Both of the examples shows that the "GMO free status" is a remarkable market advantage for Hungary for the time being,, which contributes significantly to the national economy.

- farms' size;

Several experiences indicate that the organic or conventional farming of those plants that are also grown in a GM variant in the same region can be drastically reduced. This is a severe market loss to both the growers and to the consumers of conventional and organic products.

Considering the tendencies of demand on the present food market, it can be established that the present products offered by agricultural biotechnology, as opposed to conventional or organic products resulting from the various forms of ecological production, do not provide added values to consumers regarding either comfort or a healthy diet. Thus, in this respect the maintenance, and in fact the support, of low imput agricultural methods including organic farming, seems to be economically more rational in terms of agricultural policies than the support of biotechnology.

As regards farms" size, the rise in GMO cultivating areas brings more intensification with it. Furthermore, the increase of the number of larger farms deepens the dependence on high energy and resource use, rising climate emissinons. Agricultural land will be concentrated in fewer hands. This intensive technology also means that there is a need on less labour, many locals will move from villages to the cities where unemployement will increase.

- the farm production practices (e.g. increase or decrease of monoculture)
- the reputation regarding other commercial activities of the region/localities.

Any other impact you would like to mention:

The application of biotechnology in agriculture can have an effect on agriculture that totally transforms its social characteristics and traditions. Its effects on ownership structures, market relationships, the use of certain regions and micro regions, and biodiversity will all have effects on society by benefits and costs being distributed in different degrees between the various concerned groups. Agricultural policies therefore have to face issues of societal justice. This demands that all those involved in domestic agriculture participate in a democratic forum that includes a wide stratum of society and that concerns the future of sustainable, GM free agricultural practices.

The application of biotechnology in agriculture transforms the agricultural ecosystem and can also manifest effects on numerous levels of biodiversity; these affects will not limit themselves to areas under agricultural cultivation, but will irreversibly influence even natural protection areas or protected species (like the butterfly Inachis io that is protected in Hungary) in a manner that cannot be anticipated beforehand.
Agricultural ecosystems are important parts of European and Hungarian nature protection and serve as institutes for the protection of biological diversity. It is well known that the EU gained a significant environmental contribution with the accession of Hungary. A price can basically not be put on the economic value of this asset, although it also appears in several sectors besides agriculture (for example, tourism). The effects of agricultural biotechnology thus include these sectors and their values and result in consequences that cannot be scientifically foreseen – precaution is therefore very much substantiated.

Furthermore, the number of the GMO free regions is constantly rising in the EU and in Hungary. The legal and procedural steps in order to acknowedge a region as GMO free are not clarified in the EU. We strongly believe that there is a need on the legal and EU-wide acknowledgement of such regions by providing them with more rights and legal certainty.

2. – Agronomic sustainability

2.1. Agricultural inputs

Does the cultivation of EU approved GMOs for cultivation have an impact regarding the use of pesticides against target insect pests (i.e. corn borer)?

Does the placing on the market of GMOs have impacts, and if so which ones, regarding the use of pesticides or/and on the patterns of use of chemical herbicides?

As there is no GMO cultivation in Hungary, we do not have domestic data regarding this question. However, the international experiences and scientific studies (including Benbrook, 2009.) have demonstrated that the currently cultivated GM crops had contributed substantially to increase pesticide use and an epidemic of herbicide-resistant weeds.
Furthermore, agricultural biotechnology continues to develop pesticide-promoting, herbicide GM crops. Four out of every five hectares of biotech crops worldwide were engineered for applications of chemical herbicides.

2.2. Biodiversity, flora, fauna and landscapes (other impacts than the ones considered in the environmental risk assessment carried out under Directive 2001/18 and Regulation (EC) No 1829/2003)

The application of biotechnology in agriculture transforms the agricultural ecosystem and can manifest effects on numerous levels of biodiversity; these affects will not limit themselves to areas under agricultural cultivation, but will irreversibly influence even natural protection areas in a manner that cannot be anticipated beforehand. Agricultural ecosystems are important parts of European and Hungarian nature protection and serve as institutes for the protection of biological diversity. It is well known that the EU gained a significant environmental contribution with the accession of Hungary. A price can not be put on the economic value of this asset, although it also appears in several sectors besides agriculture (for example, tourism). The effects of agricultural biotechnology thus include these sectors and their values and result in consequences that cannot be scientifically foreseen – precaution is therefore very much substantiated.

Does the cultivation of EU approved GMOs have an impact regarding the number of non agriculture species/varieties?

As in Hungary there are no GMOs cultivations, we have no practical information about the impacts on biodiversity. Although several research publications showed that the MON 810 GM maize could cause remarkable damages in the population of the Peacock Butterfly (Inachis io) which is a protected butterfly species in Hungary.
In the edges of the Hungarian cornfields the third most abundant plant or/and plant-connection is the Great nettle (Urtica dioica). On this plant, the worms of two protected butterfly species (Inachis io – Peacock butterfly and Vanessa atalanta – Red admiral); and those of one rare species (Polygonia c-album - Comma) could develop when the Hungarian maize varieties disperse their pollens. In the edges of the corn-fields in the case of the worm of the Peacock Butterfly, we could detect singifically increased mortality, which means that the habitats of this species will change dramatically because of the pollen of MON 810.

Does GMO cultivation have an impact on agricultural diversity (number of plant varieties available, agriculture species, etc.?

The extensive cultivation of uniform, high yielding crop varieties can cause the replacement and loss of traditional crop varieties from the agro-ecosystem. Now, at least 1350 varieties face to extinction.

Does GMO cultivation have an impact, and if so which one, regarding:
- protected species;
- their habitats;
- ecologically sensitive areas.

See our response to the first question in 2.2 regarding Inachis io.

Does GMO cultivation have an impact, and if so which one, regarding:
- migration routes;
- ecological corridors;
- buffer zones.

Does GMO cultivation have an impact, and if so which one, regarding:
- biodiversity;
- flora;
- fauna;
- landscapes.

The problem is that we do not have detailed baseline data regarding the the regional characteristics, the flora of the soil, the endemic species and their habitats. It is to be expected that the species/varieties characteristic for the localities/regions would be less abundant in the future.

By increasing field sizes and huge monocultures, agricultural biodiversity will significantly decrease. Exstensive GMO cultivation may negatively affect many habitats and non-target organisms living on the margins of or close to the GM fields.

2.3. Renewable or non-renewable resources

Does the placing on the market of GMOs have an impact, if so which one, regarding the use of renewable resources (water, soil…)?

Does the placing on the market of GMOs have an impact, if so which one, regarding the use of non-renewable resources?

Because of the intensification caused by the increase of the GMO cultivation deepens the dependence on high energy and resource use, rising climate emissions. Using GM technology can not be considered as a sustainable farming method.

Any other impacts you would like to mention:

The more extensive use of crop protection products – which, according to the latest scientific literature, is the case regarding GMO cultivation – significantly affects the quality of the soil, water and groundwater. Intensive agricultural technologies can lead to depletion and erosion. The clearing of the areas with large above ground and underground carbon reservoirs can lead to the emission of the greenhouse gases. Gas emissions to the air can come from using crop protection products and/or artificial fertilizers.

In order to solve the problems of the resistant weeds emerged because of the large-scale cultivation of biotech crops, more herbicides are used in some of the GMO exporting countries. Biotechnology-chemical companies that increasingly dominate world agriculture develop new crops that tolerate multiple herbicide and higher doses of glyphosate; and promote the use of older, more toxic herbicides in combination with glyphosate.

The use of mechanical tillage to control resistant weeds is also increasing, contributing to greater soil erosion and greenhouse gas emissions.

2.4. Climate

Does GMO cultivation have an impact regarding our ability to mitigate (other than by possibly reducing CO2 emissions from fuel combustion – see next section) and adapt to climate change? If so, which ones?

See the already mentioned arguments in point 2.3.

2.5. Transport / use of energy

Does the cultivation of EU approved GMOs have an impact regarding energy and fuel needs/consumption? If so, which one?

See the already mentioned arguments in point 2.3.

Does the cultivation of EU approved GMOs have an impact regarding the demand for transport in general terms? If so, which one?

Any other impacts you would like to mention:

3. <u>– Other Implications</u>