



European Centre of Tort and Insurance Law

Research Unit for European Tort Law
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**Liability and Compensation Schemes
for Damage Resulting from the Presence
of Genetically Modified Organisms
in Non-GM Crops**

Reports

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Objectives of this Study*

I. Summary

- 1 The introduction of genetically modified organisms (GMOs) in EU agriculture may have economic implications that result from incomplete segregation of GM and traditional crop production. In particular, the presence of GMOs could not be ruled out in non-GM agricultural products. Due to requirements for labelling of GMOs and other purity criteria of non-GM products as well as market demand for non-GMO products, such presence may have negative economic implications for the operators concerned. The present study is aimed to analyse aspects concerning the liability of GMO presence in traditional agricultural products.

II. Background

- 2 The cultivation of genetically modified (GM) crops in the EU may lead to cases in which traditional agricultural products contain detectable traces of GMOs. On the one hand, such admixture may result from inadequate application of segregation measures by farmers. On the other hand, as agriculture is an open process that does not allow the complete isolation of individual fields, a certain degree of admixture between neighbouring crops is unavoidable in practice.
- 3 The presence of GMOs in traditional products may lead to their devaluation, which would entail an economic damage to the producer of the traditional products. For instance, due to the presence of the GMO the traditional product may require to be labelled as GM.
- 4 GMOs and products containing or produced from GMOs have to be labelled according to Community legislation, in particular Directive 2001/18/EC, Regulation (EC) No. 1829/2003, and Regulation (EC) No. 1830/2003. For the case of adventitious or technically unavoidable presence of GMOs in non-GM products, Regulation 1829/2003 provides for a threshold of 0.9% below which such presence in food or feed does not require labelling. For seeds, Directive 2001/18/EC provides for the possibility of adopting thresholds, below which

* This text was drafted by the European Commission and is part of the Tender Specifications under which the following study was performed.

the adventitious or technically unavoidable presence of GM seeds does not require the labelling of conventional seed lots. Such thresholds have not yet been adopted.

- 5 The presence of GMOs in a product above the labelling threshold also triggers the need for traceability of GM products according to Regulation 1830/2003, which may cause additional costs for the operators concerned.
- 6 In the EU, crops may only be commercially cultivated after having been authorised for the purpose of cultivation under Community legislation (i.e. Directive 2001/18 or Regulation 1829/2003). The labelling thresholds only apply for the presence of authorised GMOs. Products containing detectable traces of unauthorised events can not be legally marketed in the EU.
- 7 According to part B of Directive 2001/18, an individual Member State may grant authorisation for a non-commercial release of a GMO, for instance for the purpose of experimental field testing. As a result of such experimental cultivation, GMOs not authorised under part C of Directive 2001/18 or under Regulation 1829/2003 may be present in traditional crops. This presence could cause economic damage as food and feed could not be marketed if it contains detectable traces of such GMOs.
- 8 The admixture of GMOs may also have specific implications for organic products. Regulation (EEC) No. 2092/91 on organic production of agricultural products specifies that GMOs may not be used in organic production, with the exception of certain veterinary products. Therefore, products that require labelling as GM could not be used in organic farming. This implies that GMO presence in organic input materials (such as seed or feed) could have implications beyond the necessity of labelling alone.
- 9 Further economic implications may result for farmers producing non-GM crops, if specific requirements concerning GMO presence, which go beyond the provisions in Community legislation, are laid down in contracts with the retailers or other operators further down the food or feed production chain. Such conditions may also apply for products produced under quality schemes.
- 10 In addition to the economic implications resulting from the actual presence of a GMO in a traditional product, costs may also occur due to sampling and testing of products, either on a basis of routine controls or in cases where relevant GMO admixture may be suspected. In many cases, the presence of GMOs and their quantity could not be assessed without the use of laboratory analyses, which may cause significant costs.

- 11 Furthermore, economic implications for traditional producers that may relate to the presence of GM crop production in a region, and which could enlarge the risk of GMO admixture, could not be ruled out. For instance, food or feed producers may preferentially purchase crops from certain regions where no GM crop production may take place.
- 12 If the cultivation of GM crops will become more widespread, the issue of liability in relation to GMO admixture could gain further importance in the EU. Compared to other cases of economic damage resulting from neighbouring activity, GMO admixture may pose specific difficulties because the admixture may initially remain undetected and become known at later stages of the food or feed production chain. Furthermore, the causal link between the damage and the operator responsible for it may not always be apparent as there may be different sources of admixture (e.g., seed impurities, outcrossing with neighbouring crops, volunteers from previous GM crop cultivation).
- 13 Liability in the case of economic damage that may result from the presence of GMOs in other crops is a case of civil law. Generally, civil law is in the responsibility of the Member States. In Recommendation 2003/556/EC on guidelines for the development of national strategies and best practices to ensure the coexistence of genetically modified crops with conventional and organic farming, the Commission states that:

„The type of instruments [to achieve co-existence] adopted may have an impact on the application of national liability rules in the event of economic damage resulting from admixture. Member States are advised to examine their civil liability laws to find out whether the existing national laws offer sufficient and equal possibilities in this regard. Farmers, seed suppliers and other operators should be fully informed about the liability criteria that apply in their country in the case of damage caused by admixture.

In this context, Member States may want to explore the feasibility and usefulness of adapting existing insurance schemes, or setting up new schemes.”
- 14 Member States may develop national or regional approaches to ensure the coexistence of GM crops with conventional or organic agriculture. According to Article 26a of Directive 2001/18:

„Member States may take appropriate measures to avoid the unintended presence of GMOs in other products.”

- 15 In the context of national or regional co-existence legislation Member States may also adopt specific provisions for liability in cases of GMO admixture, and develop compensation schemes, such as insurance systems or compensation funds.
- 16 Liability has to be seen in the context of measures to segregate GM crop production from traditional non-GM production in order to achieve co-existence between these different forms of agriculture. The approach taken by the Member States to allocate the responsibility for developing and implementing these segregation measures among the operators concerned has significant implications on liability.

Executive Summary

Executive Summary

- 1 This study focuses on how to respond to losses incurred by conventional or organic farmers due to the presence of genetically modified organisms (GMOs) in their crops, primarily from a tort law perspective. It is assumed that the presence of these GMOs results either directly or indirectly from the commercial cultivation of GM crops which are approved for this purpose according to EU legislation.
- 2 Only economic losses such as a reduction of the market price or costs of testing crops are covered, whereas personal injury or damage to property as such (other than harm to the field itself or to the crops thereon) shall be disregarded. Damage to the environment in a narrower sense, for example the potentially detrimental impact on biodiversity, will equally not be addressed.
- 3 The losses under survey here need not be very significant – in a typical case, the conventional crops will not sell at a substantially higher price than their GM counterparts, otherwise the latter's cultivation would not be economically reasonable in the first place. The loss suffered by the farmer on whose field admixture occurred will therefore generally be based upon that price difference if her produce can still be sold on the GM market. Costs of testing or of entering that market (such as efforts to find a new buyer) will add thereto, however. More substantial damage is imaginable, for example, for organic farmers who may lose their organic certification, or with respect to consequential losses incurred further down the production or distribution chain.
- 4 In order to define the extent of liability, one crucial decision that all jurisdictions invariably have to make is whether claimants shall also recover those losses which are caused by admixture of food or feed production below the EU threshold for GMO labelling, which is set at 0.9%. Since the produce would not have to be labelled GM in such cases, there should typically be no difference in the price and hence no loss. However, the farmer may be under a contractual obligation to a third party, for example, to deliver crops with an even higher degree of purity. The question therefore is whether the legal system will indemnify such losses as well even if the general marketability of the crops is given. The answer to this question is not predetermined by the fundamentals of tort law – it is the result of balancing the interests involved, and as with any weighing process, the outcome is not entirely predictable.

- 5 The typical cause of any such losses, whether admixture remains below or exceeds the threshold, will be gene flow from a field where GM crops are being cultivated. Alternatively, for example, the seeds used by the conventional farmer may have been impure, but there are other imaginable sources of admixture (e.g. during harvest, storage, transportation, outcrossing with feral crop populations, etc.).
- 6 In order to find out how the legal systems of all EU Member States currently deal with such cases and what solutions they offer to indemnify non-GM farmers, experts in all jurisdictions have been consulted who have authored country reports based on a standardized questionnaire. Norway and Switzerland were also included in the survey. Summaries of all country reports offer a first overview of the more comprehensive submissions, which form Annex I to this report. In addition to these academic evaluations, feedback from all concerned governments was collected, particularly with an eye to future plans. Furthermore, a paper analyzing these problems from a law and economics perspective was produced by experts in that field. Finally, insurance practitioners also presented the position of their industry.
- 7 On the basis of these materials, a general report was drafted which will not only provide a comparative analysis of the status quo throughout Europe, but also address policy questions, in particular with an eye to whether the existing situation calls for efforts to harmonize the current laws.
- 8 The general report starts out with examining possible ways to allocate the risk. After an assessment of the kind of risks this study is concerned about, the report proceeds from the basic principle that losses may only be shifted onto someone else if law offers good reasons to do so. Initially and by definition inevitably, it will always be the immediate victim who is the first loss-bearer. Unless the legal system offers indemnification by way of tortious liability or on other grounds, or by granting awards under a compensation fund or other redress scheme, the immediate victim will also be left with her loss in the long run. That in itself does not suffice as a reason to award compensation, however – law is based upon a balancing of competing interests rather than an unconditional recognition of individual claims.
- 9 The report goes on to analyze tort law as the classic route on which all legal systems offer compensation subject to their specific requirements. Apart from the immediate neighbour who cultivates GM crops, possible defendants in a tort action include, for example, all other GM farmers in the area, seed producers or distributors, those in charge of farming equipment, as well as the authorities whose licenses or permits made the GM cultivation admissible. If the

requirements of a tort claim against more than one of them are fulfilled, the victim can typically sue either one of them to recover her full damage. It is then up to the defendant to seek contribution from the others by way of recourse.

- 10 However, these tort law requirements vary substantially throughout Europe, which may lead to different outcomes even in comparable fact settings. Some legal systems make a difference between economic loss which is a mere consequence of preceding damage to the person or to tangible property of the victim on the one hand and so-called “pure” economic loss which affects the victim’s assets directly without any intermediary harm to her person or other property. This is for example true in Austria, Cyprus, England, Finland, Ireland, Norway, Poland, Portugal, Sweden, and Switzerland. However, others do not make such a distinction. This difference is therefore crucial, e.g., for determining whether a reduction of the market price is compensable if it is the result of customer fear that the crops may be GM, even if no actual admixture had occurred. It may also be relevant if one should conclude that GM crops growing in a non-GM field are no damage to the field or to its non-GM crops, but merely to the farmer’s proceeds.
- 11 Even if the recognition of the loss should not pose a problem, the claimant may nevertheless fail due to difficulties in proving its cause. Jurisdictions are more or less generous in this respect, not only as far as procedural rules are concerned, but also when it comes to determining who should bear the consequences in case of doubt, be it with respect to a single event or to multiple possible causes. The standard of proof that claimants have to meet ranges from „more likely than not” (e.g. in Cyprus, England, Ireland, and Norway) to almost certainty (for example in Austria and Belgium).
- 12 Ultimately, jurisdictions will handle the claim either under traditional fault concepts by evaluating the defendant’s conduct, under a strict liability regime which is irrespective of blameworthy behaviour attributable to the defendant, or under any hybrid basis of liability in between. Defences may or may not reduce or exclude liability, which further diversifies the range of possible outcomes in the European overview.
- 13 In all jurisdictions, special provisions addressing damage caused to neighbouring land may come into play as well. Since these are intended to find a compromise between two conflicting interests which per se are of the same value, they seem to be at least one model to consider for developing co-existence rules in the GMO case scenario. However, those rules also differ throughout Europe, even with respect to their theoretical basis. They are by

and large in accord, however, that an interference with neighbouring land must be unusual and unreasonable in light of the area and other circumstances in order to provide for compensation.

- 14 While some countries have decided to maintain traditional tort law rules including their inherent uncertainties, other jurisdictions such as Austria, Germany, Poland or Switzerland, have introduced special strict liability regimes which apply specifically (though maybe not exclusively) to the kind of problems under survey here. Typically, those countries who opted in favour of specific legislation did so in order to make access to compensation easier, or – in other words – to shift the economic risks of GM farming onto those who pursue it. In those countries, GM farmers are much more likely to be liable towards their non-GM neighbours than in other jurisdictions even though the facts of the case may be identical. One way of doing so is to assign such cases to the existing regime for neighbourhood conflicts coupled with defining certain requirements thereof as given. This was done in Germany, for example. Other countries such as Finland or Norway chose to shift these matters at least in part into their general environmental liability regimes, which invariably exceed the scope of the Environmental Liability Directive, above all by also addressing losses of individuals.
- 15 Whether or not any special tort law rules apply, fault liability nevertheless remains the default rule throughout Europe which claimants can resort to alternatively or even cumulatively (though not beyond their actual loss, of course). This multi-layer system will inevitably resist harmonization efforts on just one level since backdoors and detours will always lead to the other(s).
- 16 Leaving aside existing differences between European jurisdictions, tort law is certainly one possible basis for proceeding to a more harmonious solution for non-GM farmers whose crops were mixed with GMOs. However, certain limits will always have to be taken into account which are not inherent in tort law proper, but inseparably connected thereto. Tort claims are traditionally administered by regular courts of law, and the procedure to obtain compensation before them can be cumbersome, time-consuming and costly. Even if the plaintiffs succeed at the end of this process, they may still not be able to collect damages from the defendants if the latter do not hold sufficient funds to pay their dues.
- 17 Furthermore, before focusing on tort law as a compensation model for the damage under survey here, one should also bear in mind that the primary function of tort law is to compensate losses and not to prevent them. Even though the latter were desirable, other areas of the law offer better tools to

achieve that. Differences in technical or administrative rules on co-existence which are designed *inter alia* to avoid harm will most likely have a greater impact on the feasibility to cultivate GM crops and the protection of non-GM farmers from GMO admixture than the existing differences in liability rules, which are all meant to step in once segregation measures have failed. Harmonization of liability would therefore only make sense after these *ex ante* aspects of coexistence are well-defined and uniform throughout Europe.

- 18 Even if all that were taken care of, a true harmonization of liability is far from guaranteed: European jurisdictions have each developed an individual claims culture and a distinct compensation culture. Some are more open towards the idea of national solidarity and collective risk-sharing, others still put considerable emphasis on a more individualistic approach. Imposing uniform rules for a comparatively narrow case scenario such as the one envisaged here may lead to a solution which may not be available under all existing tort laws, even though it will necessarily have to build upon and fit into at least the more fundamental concepts thereof. Tort law language may alone lead to complications, as the technical terms that unavoidably will have to be used are understood by the respective jurisdiction in the way it has evolved there, with all its distinct features and interactions with other aspects that the GMO scheme may not specifically address. Attempting to find a uniform standard for indemnifying losses caused by gene flow may thereby risk an admixture of tort law regimes even within one single Member State. Full harmonization cannot be achieved anyhow unless tort law is harmonized in a more general way which applies beyond singular case settings, and this does not seem to be an option for the time being.
- 19 The study also analyzes whether and to what extent the insurance market can contribute to improving coexistence between GM and non-GM farming by providing for cover against the losses under survey here.
- 20 One option could be via liability insurance, which could cushion in particular some practical problems of tort law by accelerating access to payments and, even more importantly, by absorbing the risk (to the extent of the policy limit) that the tortfeasor individually is unable to compensate the claimant. However, such third-party insurance awards will only be available if the insured is actually liable, i.e. if all substantive requirements of tort law are met, so that the complications and differences in that respect remain unresolved.
- 21 Alternatively, non-GM farmers would not have to resort to tort law at all if their losses were covered by their own farm (or other first-party) insurance. While this would require farmers to contribute to providing cover for their

own damage (which they already do for various other risks), by expanding the risk pool the extent of the said contribution could be significantly reduced as compared to cases where the non-GM farmers may be left alone with their full loss. This may well be the case if there is no other way that leads to compensation, for example due to difficulties of proving one or more tort law requirements, or because the applicable national system denies liability for other reasons, in particular if the cultivation of GM crops was done in accordance with the applicable farming standards in force at the time.

- 22 First-party insurance has the additional advantage for the victim that her peculiar risk is taken care off: She should know best what losses she may suffer, and she can therefore (at least in theory) buy cover that is tailor-made to her situation. Payments can be even faster than under a liability insurance scheme with direct claims, because the insured risk focuses on the occurrence of the harm and (at least in general) not on its cause, even though certain risks may be excluded. This is not the only reason why this type of insurance may be the most cost-efficient regime.
- 23 Whether third- or first-party insurance, both allow the pooling of risks among a larger group of people exposed thereto, and it is even bigger if taking out such cover is made mandatory. The insurer can tailor its products according to the various aspects of the risk. At least in theory, for example, those who run a higher risk will typically pay higher premiums (though not necessarily so, and it is certainly not a linear correlation): In case of liability insurance, for example, those who cultivate crops where mixing is more likely will rather pay more per area than those who plant crops less prone to mixing. Apart from more general geographic criteria, it may also be a price-determinant whether the farmer operates in a GM or non-GM environment.
- 24 Insurers may be lacking crucial information for properly assessing the risk. Premia may therefore be either too high (and thereby deter potential clients from buying such cover, or lead to an unjustified increase of production costs) or too low (which ultimately will have an impact on the insurers' balance sheets). The policies may include limitations of certain risks or other restrictions. The insured amount may not suffice to cover the full loss owing to manifold reasons and possibly leading to serious consequences. Those at risk may not be aware of it at all or have false assumptions of the extent of the risk: Conventional or organic farmers simply may not know that someone in their vicinity has started to cultivate GM crops. This may seduce them out of buying first-party insurance at all or only subject to unreasonable limitations. Such problems could be remedied by making insurance compulsory, which

only makes sense if there is an adequate range of suitable insurance products on the market to meet the (artificially increased) demand, though.

- 25 At present, neither liability nor first-party insurance products covering GMO risks seem to be available on the markets under survey. Problems for insurers in this respect can be traced back to the standard criteria which would allow them to consider whether such risks are insurable: estimable frequency and severity of harm, the fortuitous nature of the loss, and the ability to spread it. Arguably, there is currently not enough data available to predict both likelihood and extent of possible losses, particularly in light of the broad range of plant varieties and their peculiar features that have a bearing on these aspects. Unless it is clear for insurers that losses below the legal threshold of admixture need not be covered, the fortuitous aspect of the risk may lack entirely, as complete segregation is impossible in a coexistence environment. The most important obstacle to offering liability insurance cover is a tort law regime which allows for compensation of any type of loss irrespective of any wrongdoing by the insured and coupled with a presumption of causation, or – probably even more problematic for insurers – a liability regime which does not allow for predictions of how an admixture case would be solved.
- 26 In order to avoid the shortcomings of the current insurance market, several countries have already taken steps to introduce a compensation fund which should lead to a better protection of the victims as compared to what tort law can offer so far. The models used vary, but the majority only come into play when the admixture is purely accidental and not due to some misconduct, the latter cases being left to tort law. Contributions to the funds come primarily from GM farmers, but others are also included in some countries. In Denmark, for example, the State serves as short-term financier of losses exceeding the fund limit until contributions in the following year have been adjusted to enable the fund to reimburse the State for such interim payments. This redress scheme shall be operative for five years, based upon the hope that the insurance industry will be able to take over in the meantime.
- 27 Compensation funds are typically tailor-made to a particular risk scenario. The procedure to assess a claim and to make payments is often faster. Since the risk group is identified in advance, also the administration of the fund can be designed according to their specific needs. The range of those who pay into the fund may be broader than under other indemnification regimes – not only those immediately concerned will be involved, but also others with a more general interest, including – as could be seen from the example of Denmark – the State who may otherwise not contribute to indemnifying losses (though participation in an insurance pool may be imaginable). State aid rules will de-

fine the limits thereto, however. Other such redress schemes do not foresee or even exclude State participation, e.g. in the Walloon region of Belgium or in Portugal. Compensation funds need not necessarily follow the restraints of actuarial mathematics and therefore can be introduced to fill a gap in the insurance market: Even if commercial insurers feel unable to offer cover, compensation funds may nevertheless (or even just for that reason) be installed in order to at least serve as a temporary solution until the market can take over.

- 28 Monies accumulated in compensation funds are typically limited, and depending upon the pooling arrangement, the funds may be dried out even before all claims have been settled unless someone backs up the regime by way of a guarantee as in the Danish case. Lack of current information is not the only reason why compensation funds may have to struggle with inadequate risk assessment – depending on the political pressure that tends to precede the formation of such a risk pool, its conditions may not even entirely reflect what is already known. Risk differentiation may also be inadequate in comparison to alternative indemnification models: Those who contribute to the fund are not necessarily those who are in control of the risk that shall be covered, or at least their contribution may not reflect the actual weight of their influence.
- 29 One major argument against compensation funds is the principle of equality: Why are certain risks (and therefore certain claimants) favoured whereas others are left to the more traditional ways to obtain compensation? Indeed, one may wonder why a comparatively exotic risk such as the economic losses caused by gene flow should deserve to be addressed by a special fund as long as traffic accidents and other, much more frequent loss scenarios are not equally addressed. This question can of course also be posed with respect to any other special solution, for example in the field of tort law.
- 30 Yet other risk spreading models have been developed in some Member States. In Germany, for example, a feed producer (with the support of seed producers) voluntarily offers to buy the crops of conventional farmers within a certain distance to a GM farmer at the regular price. In the Netherlands, all stakeholders have jointly come up with a contractual compensation scheme which also foresees a fund. These peculiar solutions have been developed on the basis of very specific market conditions, though, which do not necessarily translate well into other settings in different countries.
- 31 Any such measure to promote coexistence is likely to assist the insurance market to step in at some point. By enabling GM farmers to get started without concerns of unpredictable liability issues in the future, but at the same time without leaving their non-GM neighbours empty-handed in case a loss

should indeed occur, data can be gathered over time which is essential for insurers to properly calculate the risk.

- 32 While it depends upon their statutes how compensation funds and similar redress schemes handle cross-border applications (which allow for tailor-made solutions such as bilateral arrangements), the transboundary loss case in tort law is governed by already uniform rules with respect to the jurisdiction of the court and will soon be falling under a harmonized conflict of laws regime. In essence, therefore, the victim will be able to sue both in her own jurisdiction as well as in the GM farmer's country, and the laws of the victim's jurisdiction will (most likely) apply. Hence, there is no imminent need for further action at Community level to harmonize just the cross-border matters. Apart from other flaws, a substantive solution such as a compensation fund applying to transboundary losses only would violate the principle of equality if these cases are handled differently from national ones.
- 33 As could be seen already in this overview, the current situation in Europe shows a wide range of solutions to address the issue of GMO admixture. Is such national diversity really desirable, or do we have to strive for harmonization in this field? Harmonization as such can never justify itself, though: The existence of differences between the Member States per se is no sufficient reason to interfere with their national legal systems.
- 34 This leads to the question whether such diversity has any negative influence on the internal market. The report is at least doubtful whether that is the case. Local market conditions (including in particular the regulatory framework of GM farming) will play a much more considerable role than redress schemes stepping in ex post. Even if one should come to the conclusion on the basis of further economic and sociological data (which cannot be provided by this report) that the internal market may be affected by the existing compensation rules and the diversity thereof, one would still need to pose the question whether a harmonized regime designed to replace existing national solutions would really improve the current situation in this respect.
- 35 If this question were answered in the affirmative, the necessary starting point would be the regulatory framework of GM farming which needs to be expanded towards a more precise definition of good farming practice. Clarifications with respect to the labelling thresholds and their impact on the liability issue are also desirable. Otherwise, the Member States will not be in a position to draw the borderlines foreseen by a compensation scheme, for example which losses are compensable, or whether or not the GM farmer is liable for fault.

- 36 Any choice to interfere with the existing national solutions in a strive to achieve at least some degree of harmonization will necessarily have to be based on a political opinion-forming. The legal perspective itself does not offer sufficient guidance to single out an optimal solution. After all, the tort laws and other compensation systems applicable to the cases under survey here only mirror the attitude of the respective jurisdiction towards GM farming, which is primarily marked by other rules and regulations.
- 37 The fundamental question whether and to what extent GM farming shall be advanced in Europe may have a bearing on the choice of the ideal liability or other redress scheme. It is important to note, however, that the promotion or limitation of GM farming can also be achieved by other, more direct means, and if the problem is rooted in the general public's fear of or mistrust in genetic engineering, tort law cannot offer any way to overcome that fear or to establish confidence.
- 38 There are various ways to respond to the risks on which this study is focusing, and so are the possible degrees of harmonizing the current national solutions. The choice behind any option will necessarily be dominated by the replies to the more elementary questions of how to promote coexistence, and how far to go in reaching that goal.
- 39 Apart from no action at all, the other extreme would be complete harmonization of all aspects of compensating losses arising from adventitious presence of GMOs in non-GM crops. It is hard to imagine how such an exclusive regime can be conceived, even if it were deemed desirable (which is highly doubtful). A lesser degree of harmonization could be achieved by identifying a compensation model for all Member States which leaves certain aspects open for them to regulate individually. This would inevitably lead to different treatment of similar cases in the Member States, though. A very mild form of harmonization (if at all) would be to offer a merely optional model without any need for the Member States to implement it. This will most likely not abolish the differences between the various regimes existing altogether, however, even though some Member States may indeed adjust their systems accordingly. From a cost-benefit-analysis, one may wonder whether establishing such a regime is really needed in light of the fact that the various options currently chosen by the Member States already constitute a full catalogue of possible schemes, and the pros and cons of each of them are clearly visible for those jurisdictions which are considering a re-evaluation of their own system.
- 40 This has to be differentiated from setting a minimum standard that shall apply throughout Europe. The policy choice could be, for example, that non-GM

farmers deserve compensation for at least the immediate harmful effects of GMO admixture, and that it should be more or less readily available to them. It should be noted, however, that all national jurisdictions already provide at least for a minimum level of protection via tort law. Further conditions or aspects going beyond this status quo could be included in defining that minimum standard. An alternative target that could be set would be to require Member States to achieve insurability of such risks by reducing the uncertainties created by imprecise legislation, but leave the tools to reach that goal up to them to choose.

- 41 The key concern of any steps taken towards harmonization – if that should be the political preference – must be on the interaction of any future uniform guidelines or rules with the existing legal systems in general and the tort law regimes in particular.

General Report

General Report

Bernhard A. Koch

A. Introduction

- 1 The following study was produced at the initiative of the European Commission. The objectives of the study as defined by the Commission are reprinted above.¹ The conclusions, recommendations and positions presented in this report reflect the opinion of the consultant only, however, and do not necessarily reflect the opinion of the Commission.
- 2 In order to ascertain the status quo, country reports were produced by specialists in all jurisdictions covered by the end of August 2006 and are current as of that time. The reporters followed a uniform questionnaire² which had been put together in close cooperation with the Commission. Their responses form the first Annex to this study.
- 3 It was agreed upfront that not only the 25 Member States of the European Union should be covered this way, but also Norway and Switzerland, due to their (not only geographic) proximity and their necessary involvement in loss scenarios at their borders to Member States.
- 4 Another questionnaire was sent out to the competent ministries in each Member State, but also to their counterparts in other EEA countries as well as in Acceding³ and Candidate States. The focus of this second survey was more on legislative aspects (both present and future). While the responses to these questionnaires cannot be published as such, they have nevertheless been considered in the following report.
- 5 Apart from this assessment of the status quo (including upcoming changes to the extent already known), two more general reports were produced: One study offers an economic analysis of the various legal options to deal with the kind of losses covered by this study. Another report was produced by insurance experts and focuses on the insurability of such risks.

¹ Supra p. 15 ff.

² Annex I, p. 9 et seq.

³ Bulgaria and Romania were not yet Members at the time this survey was conducted.

- 6 In order to avoid an overly complicated style, it will be necessary to use language that seems to oversimplify the matter or even reflect a certain bias with respect to the subject matter of this study. Unfortunately, this is not entirely avoidable. Please note, however, that the use of words like „contamination” or „victim” is entirely technical and has no pejorative undertone whatsoever.
- 7 The „GM farmer” in this report will obviously be the one who cultivates GMOs on her fields. Since she does not necessarily need to own the land used for such purposes, the landowner may be a different person. If so, there may be two (or more) addressees of a claim against the person in charge of the origin of GM seeds or pollen. This will only be addressed explicitly where needed; at other occasions, please bear this possible separation of persons in mind.
- 8 The „non-GM farmer” is meant to be the one who suffers a loss by GMO admixture, no matter whether she is a conventional or an organic farmer. This difference may be important, however, when it comes to determining the scope of the loss, as the damage resulting from gene flow may be more substantial for organic farmers.

B. Possible ways to allocate the risk

I. What risks are at stake?

1. Potentially harmful causes

- 9 For the purpose of this study, the only harmful events that will be considered are the economic consequences of the involuntary admixture of GM crops with non-GM crops. This may occur in a variety of ways, from the very first stages of seed production to the delivery of the ultimate produce to the consumer. The seeds sold may already be impure, they may have commingled during production, processing, transportation or storage. So-called volunteer seeds may have survived on a field previously used for GM cultivation and sprout in the next season. GM and non-GM crops may have been mixed during planting, harvesting, drying, or on the way to storage or vendors, or while at one of those places along the chain of distribution. Pollen may have dispersed from a GM to a non-GM field, be it by wind, by insects or other animals. Contamination may have occurred at one point only or at several stages

of the production.⁴ Its likelihood „depends on several variables: the specific crop, its location, the presence of outcrossing wild relatives/sexually compatible crops, the competitive nature (advantages and disadvantages) of the introduced trait, and the environmental consequences of neutral traits.”⁵

- 10 Human intervention may play a role, but not necessarily so. It is more likely, for example, during seed or crop handling, whereas transfer by natural forces or animals is typically not triggered by human conduct (if one disregards the farmer’s choice to proceed with GM cultivation in the first place, of course). Nevertheless, omissions may at least have contributed also to the latter phenomena, for example if the GM farmer has disobeyed certain segregation measures. Even if human conduct was involved, however, it may or may not be considered improper according to recognized farming standards of the time.
- 11 As far as the cause is concerned, any intentional violation of segregation rules, in particular by way of sabotage, will be disregarded in the report. In such cases, all legal systems will provide for mechanisms in tort law to cover the ensuing losses, and these will typically be more victim-friendly than in cases of damage caused unintentionally.
- 12 Unproblematic from a tort law policy perspective are furthermore cases where someone along the GMO production chain has acted in violation of mandatory rules, e.g. by disobeying segregation requirements or by growing genetically modified species which have not (yet) been authorised for cultivation.⁶ While such cases will still be considered in the report, it is clear from the outset that – again – traditional tort law rules will typically provide tools for victims who seek compensation: Most legal systems offer special protection to victims of a violation of some legal norm whose purpose (inter alia) it was to protect someone from harm, for example by reversing the burden of proving

⁴ Commission Recommendation of 23 July 2003 on guidelines for the development of national strategies and best practices to ensure the co-existence of genetically modified crops with conventional and organic farming (http://ec.europa.eu/agriculture/publi/reports/coexistence2/guide_en.pdf) no. 2.2.2. See also *A. Nelson*, Legal Liability in the Wake of Starlink™: Who Pays in the End? 7 [2002] *Drake Journal of Agricultural Law* 241, 251 ff., on the various possibilities of crop contamination.

⁵ *H. Daniell*, Molecular strategies for gene containment in transgenic crops, 20 [2002] *Nature Biotechnology* 581 (available at <http://www.nature.com/nbt/journal/v20/n6/pdf/nbt0602-581.pdf>).

⁶ Cf. Ireland (Annex I/12) no. 2: “[A]lthough the existence of the regulatory framework for GMOs does not provide a framework for liability, it is also clear that where these regulations have not been complied with, both the government agency and the originator of the GMO may be liable for breach of statutory duty.”

fault.⁷ Nevertheless, one might wonder whether the position of the claimant in such cases could and should be improved by, say, lowering the standard of proof, or by reversing the burden of proving certain requirements of the claim.

2. What losses are imaginable?

- 13 This study disregards personal injury resulting from GMOs as well as direct property damage such as harm to the crops as such. The latter may, however, be a precondition for the ensuing economic losses that are under survey here, in particular for their market value, which some jurisdictions consider to be damage to the crops themselves in an objective assessment of the overall loss. The focus of this study is therefore on the indirect consequences of involuntary admixture only, which affect the financial value (such as the marketability) of agricultural products. Further excluded is environmental harm as such, i.e. damage to biodiversity or any other losses that do not affect individuals, but society at large.
- 14 It is important to note, therefore, that potential losses in the core cases envisaged here are not as difficult to predict since there is less insecurity about the type or the extent of the possible harm. While harmful effects of genetically modified food, for example, should be ruled out for products that have undergone the risk assessment as part of the EU authorisation procedure, the market values of GM and conventional agricultural products are both quantifiable data for any given point in time, and so the potential loss sufferable is the difference between the two, even though the former may be influenced by public opinion about GM products, which in turn is based upon an immeasurable assessment of the risks they may bring about to consumers. This may lead to a market value of zero (and therefore to a loss equalling the sales value of the conventional product)⁸ in a case where a certain variety is not marketable if genetically modified, but that figure zero is a certainty for the particular product under the market conditions of the time. Furthermore, if one farmer starts to grow GM crops, the size of the neighbouring fields and their potential yield as well as their distance to the GM farmer are equally given facts. The only uncertainty with respect to the immediate economic losses of the neighbouring farmers remaining is the likelihood of admixture, but even there some data is already available with respect to certain crop varieties.

⁷ See *infra* no. 63.

⁸ See, e.g., United Kingdom (Annex I/27) no. 18. Cf. Art. 5 Sect. 1 2nd paragraph of the Belgian Draft Decree (Annex II/2): “If the harvest cannot be placed on the market because of admixture with genetically modified plants, the financial losses shall be taken as the market value of a similar harvest not labelled as containing GMOs, from which shall be deducted, where applicable, any type of benefit gained from this harvest, including use within the farm.”

- 15 In such a narrow case scenario, the loss of the non-GM farmer may not be excessively high. After all, if her harvest needs to be labelled as genetically modified (which is the immediate consequence of admixture), she may still be able to sell it on the market for GM products. The assumption that there is such a market is not far-fetched:⁹ After all, the farmer to whose fields the admixture can be traced back will not have started to grow GM crops unless it is (1) permitted to commercially cultivate them and (2) economically profitable for her, which not only presupposes that there is a market where she can sell these products, but also that the price is high enough to cover her (at least initially) higher production costs. Examples from Spain show that the price for GM and non-GM products may even be the same, so that part of the victim's damage may be close to or equalling nil. This does not mean that she has not suffered any loss since at least her costs of identifying the admixture as well as her efforts to re-label or re-market her now genetically modified products have to be taken into account in addition to the actual price difference (if any).¹⁰
- 16 However, the damage may be significant in other scenarios, not only for organic farmers whose losses are obviously not limited to the price difference in one given year.¹¹ Imagine that a feed producer is sued by all her customers for her failure to provide GM-free products, which in turn has had a detrimental effect on the marketability of their own products. Or: A food producer may not discover the GM qualities of the raw materials until the final production stage, when the produce of all her suppliers has already been processed. The food producer suffers a substantial loss with respect to that particular lot of her total production, and she seeks recourse from the non-GM farmer whose crops were contaminated.¹² The latter in turn claims compensation from her

⁹ DEFRA Consultation Paper (Annex II/27) no. 139. But see *ibid.* no. 141: "[T]here may be circumstances in which there is no market for the GM equivalent (e.g. the non-GM farmer may be growing sweetcorn maize while GM maize is only being grown as a forage crop and there is no market in which it is traded). The loss in this case would be the whole of the non-GM or organic price that has to be foregone, as there is no GM market to sell into to mitigate the loss."

¹⁰ DEFRA Consultation Paper (Annex II/27) no. 146.

¹¹ Cf. *Ex parte Watson*, 10.7.1998, [1999] Env. L.R. 310, 315 (CA): "If cross-pollination occurs, it will have a devastating effect upon the applicant's business, reputation and livelihood."

¹² Cf. the "Terra Prima" case, a producer of organic tortilla chips that had to destroy 87,000 packages thereof when it turned out that the maize field of its supplier had been contaminated by cross-pollination from a nearby Bt maize field. As stated by a Terra Prima executive, this had been "a financial disaster" for the company (see the minutes of a U.S. Food and Drug Administration's hearing at <http://www.fda.gov/ohrms/dockets/dockets/99n4282/99n-4282-tr00003.rtf>). The chips producer chose not to sue the farmer, however.

neighbouring GM farmer, which will most likely be a lot more than in the standard case mentioned earlier.

- 17 Without prejudicing the outcome of the following scenario, a GM farmer (or whoever will be sued for the harmful consequences of unintended admixture) may face an even more substantial claim if an entire region suffers economic losses due to an impairment of its previous reputation as a GM-free zone. A single case of admixture on a single field within that region may lead to customer mistrust in the other farmers' claim of cultivating conventionally, even if their own fields have not been contaminated at all in reality.
- 18 An important issue will therefore be where to draw the line between compensable and non-compensable losses. Unlimited indemnification of each and every imaginable loss of even the remotest third party is unthinkable.
- 19 This also relates to an important separate category of losses: the costs of identifying a loss in the first place. While this may be unproblematic in cases where admixture has actually occurred, shall a conventional farmer whose customers suspect that her production was contaminated by pollen from her neighbouring GM farmer be left with the entire (and often quite substantial) costs of testing her crops if the customer fear (which may deter them from buying before their suspicion is refuted) turns out to be unsubstantiated?

II. Who shall bear the loss?

1. Starting point

- 20 Once admixture has occurred, the farmer whose fields are concerned is the first to suffer a loss under the conditions just mentioned. The key question is, of course, whether she shall be left with that loss, or whether she will be able to recover at least part of it from someone else. This is not just a rhetorical question: After all, the basic norm underlying all compensation schemes (though unfortunately mostly forgotten today) is that the loss at least initially lies where it falls. It is only shifted to someone else if there is a good reason to do so. The occurrence of the loss as such is never sufficient justification in itself.

2. The immediate victim as the ultimate loss-bearer

- 21 A very simple response to the cases under survey here may therefore be a complete denial of compensation to the victim. This sounds harsh and contrary to that farmer's free choice to grow conventional or organic crops.

- 22 One should also consider that GMO admixture is certainly not the only real-life scenario imaginable where a farmer may suffer the same or even more damage without being able to pass it on to someone else, for example in the course of natural catastrophes¹³ or, seemingly less dramatic, but certainly just as detrimental, changes in customer preferences.
- 23 The immediate victim may not be able to shift her losses despite the fact even that some special compensation regime may apply: Its prerequisites simply may not be fulfilled or may be impossible for the victim to prove. This is of course more likely if traditional tort law applies, but there is by definition no indemnification scheme imaginable which pays out monies without any further concern of the applicant's position.
- 24 One therefore needs to bear in mind that under any option presented in the report, at least some victims may not collect compensation at the end of the day.

3. Minimum standards for any loss allocation scheme

- 25 Any loss allocation scheme will have to fulfil certain minimum standards. Only the most important ones shall be listed in the following bullet points:
 - 26
 - The ultimate goal of any regime is a fair distribution of risk – advantages and disadvantages of producer behaviour have to be taken into account as well as other aspects of a more general nature. If co-existence is the political goal, it can only be put into action if both GM and conventional farmers have an even chance to choose between their alternative ways of cultivation. This cannot mean, however, that one may produce at the expense of the other. Where the balance lies has to be defined by policy-makers. Law can only implement such choices by offering the proper tools.
 - 27
 - No matter what kind of regime one chooses, it has to be easy to handle. The more complicated the requirements for finding a solution, the less likely the regime will survive in practice. As a minimum, all elements of a potential claim have to be clearly defined.
 - 28
 - Access to the scheme is of paramount importance. Claims should not be denied (or discouraged) merely because it is too complicated to apply. The procedure to obtain compensation must be apt to handle the volume of potential claims in the best possible way, but at the same time allow for a

¹³ See also infra no. 159-160.

thorough analysis of the matter: The decision-making process should be time-efficient, but not a quick shot.

- 29 ▪ A connected matter is costs of the scheme: This is not about the amounts actually paid out in compensation, but rather administrative costs of the regime – attorneys, judges, civil servants in the administration handling claims and the like. The more complicated and/or time-consuming the set-up of the system is, the more costly it will be to administer. The higher the costs, the more likely potential applicants will be deterred from filing their claims.
- 30 ▪ Even if a scheme theoretically allows a claim for compensation, the victim ultimately may not collect money on that basis, for example because the defendant in a tort suit is bankrupt, or if a compensation fund is empty. This needs to be kept in mind at least when setting up a suitable regime. One way to address the problem would be to require advance cover for future losses, or – in the case of funds – consider backup guarantees of whatever kind.

III. The classic route: Tort Law

1. General considerations

- 31 The classic way to award compensation for detriments of the kind envisaged here is tort law. It is undoubtedly a concept generally accepted in society, not only in light of its strong roots in history, but also since it corresponds to very basic notions of corrective justice, at least in its core.¹⁴ It is essential, however, to keep in mind the functions of this body of the law, which determines its potential to solve the kinds of cases under survey here.
- 32 Tort law offers a response to unwanted consequences of certain events, its primary function is therefore not to prevent them.¹⁵ This is predominantly left to other areas of the law, for example to administrative law, which regulates and pre-defines, for example, the conduct expected from all members of society. While it is clear that the threat of having to compensate losses one may cause might influence the behaviour of an individual and therefore contribute

¹⁴ On these theoretical foundations, see e.g. *G. Schwartz*, *Mixed Theories of Tort Law: Affirming Both Deterrence and Corrective Justice*, 75 (1997) *Texas Law Review* 1801.

¹⁵ *P. Widmer*, *How Tort Law Deals With Apprenticeship in Sorcery*, in *MunichRe* (ed.), *5th International Liability Forum Munich* (2001) 90, 92, who rightly emphasizes that “in respect of the damaging event, tort law always comes too late”.

to the prevention of unwanted conduct, this is more of an effect of tort law than a dominant factor in shaping its rules.¹⁶

- 33 Nevertheless, a particularly harsh regime of liability linked to certain activities may deter individuals altogether, particularly if these activities are based upon an advance economic assessment of their pros and cons, as is typically (or at least should be) the case in any business activity. A very rigid and unlimited duty to compensate all and any losses resulting from GM farming, for example, may lead those potentially interested in this technology not to further consider pursuing it. Needless to say, this may have often been in the back of the heads of the legislators and illustrates their attitude towards regulating GM agriculture altogether. In the absence of further legitimate and recognized reasons, however, it is rather an abuse of tort law's concepts to turn mere effects into functions, as it evidences flaws in regulating behaviour in its proper legislative place.
- 34 Before looking at some of the key aspects of the various options tort law may offer claimants, it is important to note from the outset that this study can only offer just that – it is by no means a comprehensive overview of tort law in Europe, but focuses on those aspects which either seem to be dealt with differently in the jurisdictions under survey, or which should be of particular concern for an imaginary legislator who wants to redesign liability for GMOs. The focus will be primarily on claims against a neighbouring GM farmer at first; other possible defendants will be addressed in a separate sub-section (infra 9).

2. Requirements for tort law claims in general

- 35 Tort law at least in its historic core is assumed to be a predictable route to compensation. This is only true, however, if and to the extent the requirements for a particular claim are well-defined. The broader the terms used, the more open the inherent concepts are, the less likely will one be able to really predict the outcome of an individual case, at least as long as court practice is missing.¹⁷ Defining the requirements for compensation is therefore a crucial task for tort law legislators. Despite (or maybe because of) that, tort law tends to define the conditions for awarding compensation narrower than other regimes.

¹⁶ See also Art. 10:101 PETL. But see the approach taken by the economic analysis of law, whose starting point is the preventive effect of liability rules: *M. Faure/A. Wibisana*, Economic Analysis (infra p. 166, 170 ff.) no. 4, 12 ff.

¹⁷ Cf., e.g., the rather disillusioned statement in the DEFRA Consultation Paper (Annex II/27) no. 137: “The application of the common law of negligence or private nuisance to GM cross-pollination is untested and uncertain.”

- 36 Before addressing the most basic elements of a tort claim with an eye to how they may be applied in the cases envisaged by this study, it is important to keep in mind that procedural law and practice place further obstacles in tort claimants' path to indemnification. Civil procedure can be cumbersome and time-consuming, which in turn tends to trigger fairly substantial costs for litigants along the way to collect on one's claim. Even if these should be awarded to successful claimants in the end, they may not receive any payments at all if the defendant holds insufficient funds to pay her dues, so the insolvency risk mentioned above¹⁸ is not addressed at all by tort law.

3. Damage

- 37 Already, the first problem is the loss itself as seen through the eyes of tort law: Is the detriment that the non-GM farmer has suffered really compensable, or, in other words, is the loss which undisputedly has occurred recognized as a violation of an interest that tort law shall protect?
- 38 The question in itself already indicates that tort law does not indemnify all interferences with a claimant's sphere:¹⁹ This might otherwise lead to excessive claims, not only of the immediate victim, but also of merely remotely affected third parties. „Obviously, liability has to stop at some point.”²⁰ If we take a standard case of our study, unlimited recognition of all detriments arising from GMO admixture may not only provide compensation to the farmer for her economic loss, but also, say, for the sentimental value of her crops, for her emotional distress experienced throughout the duration of the case, for the time she may have spent in explaining the problem to her family, and the like. Neighbours may be allowed to sue for the loss of enjoyment of looking at a GM-free field. Customers of the farmer may bring actions not only for the latter's failure to deliver products as contracted for, but also for the anger about the (temporary) loss of a previously reliable farmer, and so on. Needless to say, while these may be actual problems, tort law cannot take note of such concerns: „The law of delict would ruin itself, the people governed by it, and consequently the legal system assigned to it.”²¹
- 39 Where to draw the line is of course a crucial question, and there is certainly no self-evident reply thereto. As a rule of thumb, one may say that the higher the value of an affected interest as defined by the legal system as a whole, the

¹⁸ *Supra* no. 30.

¹⁹ E.g. Cyprus (Annex I/3) no. 73-74.

²⁰ Finland (Annex I/7) no. 33.

²¹ *Ch. von Bar*, The Common European Law of Torts II (2000) no. 1.

more likely also that tort law will offer tools to victims who seek compensation, but the reverse is equally true.²²

- 40 It is undisputed in any jurisdiction that human physical integrity is of the highest value, so that bodily injury will typically qualify as a compensable loss under the further conditions of a tort claim (though not without exception, as certain minimal interferences such as stepping on somebody's toes will most often not lead to a tort claim). At the other end of the range of legally protected interests are, for example, pure economic interests, and many jurisdictions are reluctant to award compensation in tort law²³ for the mere reduction of an economic value as such.
- 41 „There is no consensus on the exact content of the phenomenon of ‘pure economic loss’”.²⁴ However, it is common understanding in many,²⁵ but certainly not all jurisdictions²⁶ that this is an additional category to be separated from the immediate consequences of bodily injury or damage to tangible things, even though this demarcation is imperfect inasmuch as indirect financial consequences triggered by such direct losses may also fall under the notion of „pure” economic loss, at least if they are experienced by third parties separate from the immediate victim (such as the loss of revenues of an opera house whose star singer is injured in a car accident).
- 42 The difference between pure economic loss and consequential loss linked to other (directly caused) harm such as personal injury or property damage is sometimes hard to tell.²⁷ It is often in itself rather a grey area than a clear-cut dividing line. With respect to the kinds of losses under survey here, one may argue that the economic loss of the conventional farmer was but an addition to

²² H. Koziol in *European Group on Tort Law*, Principles of European Tort Law (2005) Art. 2:102 no. 1 ff.

²³ Other parts of the law may offer claims, however, in particular contract law.

²⁴ W. van Boom, Pure Economic Loss – A Comparative Perspective, in: W. van Boom/H. Koziol/Ch. Witting (eds.), *Pure Economic Loss* (2004) 1 (no. 5).

²⁵ Austria (Annex I/1) no. 43; Cyprus (Annex I/3) no. 92 ff., 98; Finland (Annex I/7) no. 23; Ireland (Annex I/12) no. 53; Norway (Annex I/19) no. 36-38; Poland (Annex I/20) no. 33; Portugal (Annex I/21) no. 54; Sweden (Annex I/25) no. 29 ff.; Switzerland (Annex I/26) no. 44, 49; United Kingdom (Annex I/27) no. 54.

²⁶ Pure economic loss is not seen as a separate category, for example, in Belgium (Annex I/2) no. 38; Denmark (Annex I/5) no. 45; France (Annex I/8) no. 35; Hungary (Annex I/11) no. 30; Lithuania (Annex I/15) no. 20; Luxembourg (Annex I/16) no. 43; the Netherlands (Annex I/18) no. 6, 36; Slovenia (Annex I/23) no. 40; and Spain (Annex I/24) no. 23.

²⁷ *Ch. von Bar* (fn. 21) no. 25 ff. See in particular the discussion of the Canadian case *Hoffmann v. Monsanto*, which held the loss in question to be purely economic, in United Kingdom (Annex I/27) no. 36.

the harm caused to her crops or land and therefore to be included in the calculation of the overall loss to that property. On the other hand, that in itself may be disputed as the admixture as such may not be considered to qualify as a „damage” to the field or to its fruits,²⁸ particularly if the economic performance of the genetically modified variety is better than its conventional counterpart. Some jurisdictions, however, use the test of whether an object has been physically changed (for better or worse) before the economic loss ensued, in which case the latter is considered to be a mere consequence of the former rather than a „pure” economic loss.²⁹

- 43 A legal system may decide to award damages only if GM crops were actually mixed with conventional ones, but not for the mere fear thereof. The farmer whose suspicious customers no longer believe her GM-free label despite the fact that it is indeed true indisputably suffers an economic loss because her sales will drop. Is mere fear of admixture also recognized as a basis for a tort claim? Such loss would typically be deemed purely economic (and already for that reason be considered with the corresponding degree of reluctance by some jurisdictions), as it was not triggered by any actual harm to some property. One could argue, though, that any reduction of the market price (even if caused by unreasonable consumer fears) already constitutes damage to the crops themselves if their value is to be assessed objectively. Some countries at least would not exclude compensating such a loss, for example,³⁰ whereas a claim based on mere fear by customers would most likely fail in others.³¹

²⁸ Cf. *M. Brühlhart*, *Gentechnik und Haftpflicht* (2003) 162 fn. 612; Portugal (Annex I/21) no. 2.

²⁹ Cf. *Ch. von Bar* (fn. 21) no. 32. See also the German case cited there (at fn. 175): A fish farmer could not sell his trouts for a certain period of time because the feed that he had used was enriched with broad-range antibiotics, of which he was unaware. The German Federal Supreme Court acknowledged the claimant’s losses as damage to property despite the fact that the fish were not actually harmed from a veterinarian point of view – he simply could not sell them and derive profits therefrom (BGH 25.10.1998 BGHZ 105, 346).

³⁰ Denmark (Annex I/5) no. 46; Estonia (Annex I/6) no. 32; Hungary (Annex I/11) no. 37-38 (but probably too remote); Lithuania (Annex I/15) no. 21; the Netherlands (Annex I/18) no. 37; Poland (Annex I/20) no. 37 ff.; Slovakia (Annex I/22) no. 33; Sweden (Annex I/25) no. 35.

³¹ Austria (Annex I/1) no. 15; Cyprus (Annex I/3) no. 97; the Czech Republic (Annex I/4) no. 61-63; England (Annex I/27) no. 37, 57; Finland (Annex I/7) no. 26 ff.; France (Annex I/8) no. 36; Germany (Annex I/9) no. 19; Italy (Annex I/13) no. 23; Latvia (Annex I/14) no. 12; Luxembourg (Annex I/16) no. 44; Norway (Annex I/19) no. 40; Portugal (Annex I/21) no. 57, 60; Switzerland (Annex I/26) no. 48-50. See also Belgium (Annex I/2) no. 41 ff.; Spain (Annex I/24) no. 64: recovery at least doubtful. Cf. DEFRA Consultation Paper (Annex II/27) no. 148.

- 44 Some jurisdictions refuse to acknowledge a certain smaller loss as compensable by pointing at the traditional principle that „de minimis non curat praetor”.³² This may come into play if, say, only a handful of GM seeds find their way to the borderlines of the adjoining property of which even less self-sow there without mixing with the crops that are used for commercial cultivation.

4. Causation

(a) The need for a factual link between the loss and the defendant

- 45 If a damage is deemed compensable under tort law, a defendant will only have to indemnify it if something happened within her sphere that caused the loss or at least contributed thereto in a legally recognized way.
- 46 Causation therefore links the loss of the claimant to the actual defendant, which is a necessary requirement before proceeding to consider further requirements of the tort claim. A GM farmer consequently goes free if the admixture was the result of impurities of the seeds that the claimant herself had bought, or if it was caused by shared harvesting machinery that had not been cleaned properly.³³ If that was the duty of the GM farmer herself who happened to have used that equipment just before her neighbour, she may be held liable for not cleaning the machinery as required, but not for growing GM crops as such, which in the normal course of events would not have spread to her neighbour’s fields (because they were too far away, for example).

(b) Conditio sine qua non and exceptions thereto

- 47 The most basic test is asking whether the damage would still have occurred if the activity or event to which the defendant can be linked had not taken place (the so-called „conditio sine qua non” or „but-for” test).³⁴

³² Cf. *Ch. von Bar* (fn. 21) no. 12. See, e.g., Cyprus (Annex I/3) no. 74; Finland (Annex I/7) no. 22; Sweden (Annex I/25) no. 33 (generally uncommon, but part of the liability regime under the Environmental Code with respect to pure economic loss).

³³ Cf. http://www.pioneer.com/biotech/images/genetic_purity.pdf.

³⁴ E.g. Belgium (Annex I/2) no. 11; Cyprus (Annex I/3) no. 20; Czech Republic (Annex I/4) no. 19 ff.; Denmark (Annex I/5) no. 37; Estonia (Annex I/6) no. 9; France (Annex I/8) no. 19; Hungary (Annex I/11) no. 10; Ireland (Annex I/12) no. 3; the Netherlands (Annex I/18) no. 7, 22; Norway (Annex I/19) no. 23; Poland (Annex I/20) no. 13; Slovakia (Annex I/22) no. 9; Slovenia (Annex I/23) no. 29; Spain (Annex I/24) no. 43; United Kingdom (Annex I/27) no. 46. But see Sweden (Annex I/25) no. 8 on the absence of a general concept corresponding to *conditio sine qua non*: “The approach of the

- 48 All jurisdictions allow for deviations from that rule in certain special fact settings, for example in cases of multiple possible causes. If the conventional farmer whose crops were contaminated was surrounded by GM farmers who all grew the variant in question, the latter are not off the hook just by claiming that it may have been seeds or pollen from any other GM farmer rather than her own which were transferred to the conventional farmer's field. This may be a case of alternative causation, if it is clear that the GMOs came from only one field, but it cannot be specified which one of several neighbours owned the actual source. More likely in the GMO scenario are cases of concurrent causation, where pollen or seed from all surrounding GM fields were spread onto the conventional farmer's land, but the admixture would have occurred if there had been only one – and no matter which – neighbour who cultivated GM crops.
- 49 The majority of European legal systems, but not all,³⁵ provide for joint and several liability of all those GM farmers from whom the admixture may have originated in a way which would trigger liability.³⁶ In such cases, they are, however, only liable for „hypothetical causation” as their actual share – if any – in bringing about the loss remains uncertain.³⁷
- 50 These cases get more complicated if the GM farmers are only held liable if they have to account for faulty behaviour within their sphere. In contrast to strict liability cases, where it makes no difference why the GM pollen spread from the defendant's onto the conventional farmer's field (though maybe sub-

Swedish courts could probably best be described as pragmatic and the courts seem not to have felt any need for a general theory of causation.”

³⁵ United Kingdom (Annex I/27) no. 49: If liability at all, it will only be proportionate to the extent of each defendant's contribution to the risk. See also Czech Republic (Annex I/4) no. 34; Estonia (Annex I/6) no. 14 (proportional to the probability of causation); Norway (Annex I/19) no. 26 ff.; Portugal (Annex I/21) no. 37; Switzerland (Annex I/26) no. 24 (traditionally no liability, modern doctrine in favour of either proportionate or joint and several liability).

³⁶ E.g. Austria (Annex I/1) no. 8-9, 35; Belgium (Annex I/2) no. 16; Cyprus (Annex I/1) no. 32; Denmark (Annex I/5) no. 39; Finland (Annex I/7) no. 13; France (Annex I/8) no. 24 (though subject to reservations); Germany (Annex I/8) no. 10; Greece (Annex I/10) no. 56 ff.; Hungary (Annex I/11) no. 18-19; Ireland (Annex I/12) no. 17; Latvia (Annex I/14) no. 7; Lithuania (Annex I/15) no. 10; the Netherlands (Annex I/18) no. 16; Norway (Annex I/19) no. 9; Slovenia (Annex I/23) no. 29; Spain (Annex I/24) no. 49; Switzerland (Annex I/26) no. 24-25 (for cases of cumulative causation, see also fn. 35). See generally *H. Koziol*, Comparative Report, in: *B. Winiger/H. Koziol/R. Zimmermann/B.A. Koch* (eds.), *Digest of European Tort Law I: Essential Cases on Natural Causation* (2007, in the following: *Digest I*) 6a/29 no. 1 ff.; *B.A. Koch*, Comparative Report, *Digest I*, 7/29 no. 4-5.

³⁷ See also *J. Spier*, Comparative Conclusions on Causation, in: *J. Spier* (ed.), *Unification of Tort Law: Causation* (2000) 127.

ject to defences),³⁸ the cause in a fault case that needs to be looked at is the conduct that violates the required standard of care, not the admixture as such, which is only a starting point for establishing causation.

- 51 If there are additional factors that at least may have contributed to the admixture, but which no-one is to blame for (such as the forces of nature, unusual weather conditions or seed translocation by wild animals), this conflict of possible causes may lead to a different outcome: In most jurisdictions, hazards and other events that cannot be causally linked to someone else who might be liable have to be clearly ruled out as an alternative cause.³⁹ This all-or-nothing approach negates liability of a potential tortfeasor if the likelihood that the cause originated within her sphere is below the required degree of probability.⁴⁰ Some jurisdictions are open towards a more balanced approach, however, at least under certain conditions.⁴¹
- 52 Even more disagreement can be found in cases of successive events where each would have sufficed to cause the whole loss at stake. If, for example, farmer A starts with GM cultivation before farmer B and admixture occurs while only pollen from field A are spread, jurisdictions are divided whether to proceed only with the case against farmer A, or whether the pollen which originated from field B, though at a later point in time, should also be taken into account, which may lead to joint and several liability of A and B.⁴²

(c) Proof of causation

- 53 The more complicated cases get, the more crucial it is to determine who has to prove causation. Again, it is generally the claimant who needs to convince the court that all requirements of her claim are met.⁴³ Nevertheless, there may be exceptions to that standard rule, as can often be seen in the area of environmental liability, for example, and in allowing or denying such exceptions, or by lowering or raising the level of certainty that the claimant's proof has to reach, jurisdictions may significantly influence the outcome of the case, in particular in scenarios such as the ones under survey here.

³⁸ See *infra* no. 65 ff.

³⁹ *H. Koziol*, Comparative Report, in: Digest I (supra fn. 36) 6b/29 no. 3.

⁴⁰ See *infra* no. 53 ff.

⁴¹ *H. Koziol*, Comparative Report, in: Digest I (fn. 36) 6b/29 no. 4 ff.

⁴² *B.A. Koch*, Comparative Report, in: Digest I (fn. 36) 8a/29 no. 2 ff.

⁴³ E.g. Czech Republic (Annex I/4) no. 27; Denmark (Annex I/5) no. 38).

- 54 Some jurisdictions require that the evidence brought forward by the claimant needs to establish with almost certainty that her assertions are true.⁴⁴ Others are content with a „more likely than not” approach,⁴⁵ so if the judge is convinced there is a 51% probability that the facts speak for the claimant, the latter will succeed on the causation issue. These two extremes are not always spelled out in the fact-finder’s wording, as evaluating the evidence is in her hands, which leaves a certain degree of flexibility in allotting percentages to the likelihood of claimant’s factual allegations. Some jurisdictions also generally lower the standard of proof in certain cases, for example if the defendant has acted with a qualified degree of fault such as gross negligence or even intent.⁴⁶
- 55 There are some tools that judges may use in order to effectively help the claimant on the way to prove her case. In cases where the evidence is entirely in the defendant’s hands, for example, some jurisdictions conclude that the latter should bring it forward.⁴⁷
- 56 A typical tool to alleviate the burden of proving causation is to acknowledge *prima facie* evidence, which may be the case if some given facts are typically the result of a certain course of events: Even if the latter cannot be proven in all detail, the mere presence of the characteristic result indicates that these events probably have taken place.⁴⁸ The defendant can hold against that if she sufficiently raises doubts against that assumption by bringing forward evidence which suggest that another set of facts may also have triggered the same result (though she need not prove that this was in fact the case). *Prima facie* evidence is often acknowledged if a statutory rule has been violated which was designed to prevent a certain loss: If such a loss has indeed occurred and the defendant’s conduct was in violation of that provision, the causal link between the one and the other is presumed.

⁴⁴ Cf. Austria (Annex I/1) no. 6; Belgium (Annex I/2) no. 15 (“very high degree of likelihood”); France (Annex I/8) no. 20-23 (flexible approach – from certainty to high probability).

⁴⁵ Cyprus (Annex I/3) no. 19; Ireland (Annex I/12) no. 10; Norway (Annex I/19) no. 11; United Kingdom (Annex I/27) no. 49. Cf. Finland (Annex I/7) no. 11 (“clearly over 50 percent”); Switzerland (Annex I/26) no. 19. Cf. Sweden (Annex I/25) no. 11 (“higher than the ‘more likely than not’ standard, but lower than the ‘beyond a reasonable doubt’ standard”).

⁴⁶ E.g. Denmark (Annex I/5) no. 38. See also Sweden (Annex I/25) no. 12 (two or more possible causes).

⁴⁷ See, e.g., the Netherlands (Annex I/18) no. 13; Spain (Annex I/24) no. 46.

⁴⁸ Austria (Annex I/1) no. 35; Cyprus (Annex I/3) no. 24; Germany (Annex I/8) no. 9, 44; Portugal (Annex I/21) no. 33. Cf. Greece (Annex I/10) no. 54; Hungary (Annex I/11) no. 14; Ireland (Annex I/12) no. 11.

- 57 If causation is presumed, however, the claimant only needs to prove the requirements for that presumption, which can be rebutted by the defendant if she indeed proves the contrary, whereas raising doubts does not suffice.⁴⁹
- 58 If the burden of proving causation is shifted entirely onto the defendant, the claimant need not submit any evidence in support of her allegations other than the starting point, i.e. the occurrence of her loss. It is then up to the defendant to prove the absence of a causal link leading into her sphere.⁵⁰

(d) *Adequate causation*

- 59 Even if the claimant has proven that the neighbouring farmer has set a *conditio sine qua non* for the admixture, the latter may still not be liable in tort if the causal connection from a normative perspective is so weak that it could only be established under highly extraordinary circumstances and was not to be reasonably expected. There are various ways to formulate this concept which cushions the most extreme results of the but-for test (remoteness, unforeseeability, indirectness, adequacy, ...),⁵¹ but at the end of the day, almost all European jurisdictions (with the exception of Belgium⁵²) allow for some limits to avoid unduly harsh results brought about by the affirmative answer to the *conditio sine qua non* test (so-called „legal” or „adequate” causation).⁵³
- 60 If cross-pollination, for example, was completely unusual in a particular case and not to be expected in the eyes of science looking at the actual circumstances, e.g. because of an extraordinary distance between the fields concerned, the owner of the GM field from where the pollen undoubtedly came may be able to avoid liability in tort for lack of „legal” causation, even though she has set a cause in fact. Mere lack of certainty, however, does not suffice per se to successfully escape liability under this heading.

⁴⁹ Austria (Annex I/1) no. 7, 29; Latvia (Annex I/14) no 7; the Netherlands (Annex I/18) no. 14; Poland (Annex I/20) no. 19; Spain (Annex I/24) no. 14, 46.

⁵⁰ E.g. Norway (Annex I/19) no. 26 (discretion of the judge). Maltese law “does not envisage any circumstances where there might be a reversal of the burden of proof”, however: Malta (Annex I/17) no. 9.

⁵¹ Cf. *Ch. von Bar* (fn. 21) no. 448 ff.

⁵² Belgium (Annex I/2) no. 11, but see no. 12-13, 32, 45 ff.

⁵³ *J. Spier* (fn. 37) 130 ff. See, e.g., Cyprus (Annex I/3) no. 20; Czech Republic (Annex I/4) no. 22; Estonia (Annex I/6) no. 9; Finland (Annex I/7) no. 10; Hungary (Annex I/11) no. 10 ff.; Ireland (Annex I/12) no. 5-9; Luxembourg (Annex I/16) no. 13; the Netherlands (Annex I/18) no. 8 ff.; Norway (Annex I/19) no. 24; Poland (Annex I/20) no. 12 ff.; Portugal (Annex I/21) no. 28; Spain (Annex I/24) no. 44. Cf. Sweden (Annex I/25) no. 8-9 (“necessary and sufficient conditions”).

5. Bases of liability

- 61 If it is clearly established that a farmer has suffered a compensable loss caused by GM crops that spread from the adjoining land, do we really see enough reason to hold that neighbour liable simply for the fact that she is in charge of the cause? Or do we require some sort of wrongdoing on her side, for example failure to observe mandatory segregation measures? The core of this problem concerns the classic choice between fault and no-fault liability.⁵⁴

(a) Fault

- 62 Traditional tort law is built upon the notion of remedying a harm that was caused by legally unacceptable behaviour committed by someone who could have adhered to the required standard of conduct, but failed to do so. However, this classic notion of fault is moving away from the ancient perception of individual blameworthiness towards a more objective view which focuses on the average rather than the actual person under the circumstances of the case, though one often has the impression that even an ordinary person could not have come up to the standard that is imposed upon her *ex post* by the judge. This development is at least supported by the fact that technology has long expanded the individual capabilities of each person to act beyond one's own personal faculties.⁵⁵
- 63 This is just one indication of a general shift throughout Europe from fault liability towards a more objective duty to compensate the unwanted consequences of one's conduct.⁵⁶ The next step along that trail would be a reversal of the burden of proving fault, and many European jurisdictions have already followed that route, some only in cases of professional misconduct, others irrespective of such a limitation.⁵⁷ Depending on how far a jurisdiction has al-

⁵⁴ In the following, the element of wrongfulness will be disregarded even though many European jurisdictions regard this as one additional (and separate) requirement of a tort claim. See generally the overview by *H. Koziol* in *European Group on Tort Law*, Principles of European Tort Law (2005) Introduction to Chapter 2, no. 2 ff.; and *id.*, Conclusions, in *H. Koziol* (ed.) *Unification of Tort Law: Wrongfulness* (1998) 129.

⁵⁵ Cf. *M. Brühlhart*, *Gentechnik und Haftpflicht* (2003) 120.

⁵⁶ *P. Widmer* in *European Group on Tort Law*, Principles of European Tort Law (2005) Introduction to Chapter 4, no. 3. See, e.g., the Dutch report, explaining that "tortious liability is incurred not only in a case of subjective fault, but also in a case of objective 'answerability'" (Annex I/18 no. 4). See also Spain (Annex I/24) no. 53; Portugal (Annex I/21) no. 98.

⁵⁷ Bulgaria, Czech Republic (Annex I/4) no. 12; Estonia (Annex I/6) no. 11, 17; Finland (Annex I/7) no. 54; Hungary (Annex I/11) no. 20; Latvia (Annex I/14) no. 8; Lithuania (Annex I/15) no. 11; Slovenia (Annex I/23) no. 28, 31, 34; Spain (Annex I/24) no. 53.

ready moved on that path, it is more or less likely that the claimant will succeed in establishing this essential element of her claim.

- 64 Almost all countries are in accord, however, that if they have prescribed a certain conduct specifically by law in order to avoid the infliction of harm, any violation thereof will generally per se be considered to be faulty unless the defendant can prove that no reasonable person could have adhered to that standard under the circumstances.⁵⁸ Any prescription of certain farming practice with respect to GMOs will be considered to fall under this category of „protective norms” inasmuch as they serve to prevent the adventitious presence of GMOs in conventional crops. So if a GM farmer does not abide by the distance limits or fails to observe other measures foreseen by law, it is up to her to prove that she was not thereby at fault.

(b) *Strict liability*

(i) *Strict liability in general*

- 65 In contrast to its fault-centred counterpart that is historically rooted in the idea of personal blameworthiness (though it has long departed from there in the meantime), strict liability overcomes the need to search for an individual behaviour as the trigger for liability. Instead, it is based upon the idea „that responsibility has to be assumed as a counterpart of the privilege to create (and maintain) a situation of increased risk.”⁵⁹ Strict liability attaches to risks which are triggered by certain objects or activities whose use or pursuance is permitted by law even though its potential for harm is at least presumed. Should the risk materialize, the person who takes advantage of the dangerous object or activity must in exchange for it being admissible compensate any losses that it causes (*cuius commodum, eius et incommoda*).
- 66 Apart from unavoidable diversity with respect to details, differences within Europe as regards fault liability primarily concern its readiness for deviations from its historic core, without negating the latter as such. When it comes to strict liability, however, even its fundamental acceptance varies throughout Europe. While England, for example, tries to avoid it to the extent possible,

⁵⁸ E.g., Austria (Annex I/1) no. 39; Belgium (Annex I/2) no. 6, 21; Denmark (Annex I/5) no. 40; Luxembourg (Annex I/16) no. 28; Malta (Annex I/17) no. 14; Norway (Annex I/19) no. 31; Portugal (Annex I/21) no. 22, 101. But see Sweden (Annex I/25) no. 22-23: The violation of a rule of conduct per se may not be regarded as negligent, but there would be a “very strong case for negligence” if “clearly established statutory rules defining the required conduct for GMO agriculture” had been infringed.

⁵⁹ P. Widmer (fn. 56) Art. 4:101 no. 2. See M. Faure/A. Wibisana, Economic Analysis (infra p. 172 ff.) no. 17 ff., on economic arguments applying to strict liability.

foreseeing only rare instances thereof in rather narrow case settings,⁶⁰ continental European jurisdictions are much more willing to introduce instances of liability without fault. However, they thereby rely on a piece-meal technique of legislating, stumbling from one singular statutory act to the next, rarely ever with any obvious road-map that might support their trail.⁶¹ Very few countries are bold enough to fill the gaps thereby opened:⁶² Austrian courts at least cautiously apply existing strict liability statutes by analogy, for example, which is denied by the German or the Swiss courts, despite their affiliation to the same legal family.

- 67 While some countries already have a more or less general clause of strict liability in their statutes, such as the Italian Art. 2050 Codice civile,⁶³ France seems to be the only jurisdiction that allows liability irrespective of the defendant's behaviour in a general and generous way via Art. 1384 Code civil, which would also extend to the cases that are of concern in this study.⁶⁴ Depending on the wording and interpretation of the respective „default” rule of strict liability in those jurisdictions which have enacted one, it remains to be seen whether courts are willing to consider GM farming as a dangerous activity within the meaning of these provisions so that it would trigger strict liability.⁶⁵ This is yet another indication that even in civil law countries judges in fact have quite considerable power to shape the practice of tort law, which is

⁶⁰ The same is true for Cyprus: “In the twentieth century the emphasis has been on fault based liability and strict liability has been generally frowned on by the judiciary.” Cyprus (Annex I/3) no. 42.

⁶¹ A comparative overview of existing strict liabilities is given by *B.A. Koch/H. Koziol*, Comparative Conclusions, in *B.A. Koch/H. Koziol* (ed.): *Unification of Tort Law: Strict Liability* (2002) 395.

⁶² See, e.g., Sweden (Annex I/25) no. 4: “[I]n Swedish tort law there has been a considerable reluctance to establish strict liability regimes in the absence of legislation.”

⁶³ See also Hungary (Annex I/11) no. 26 ff. and the debate in the Czech Republic (Annex I/4) no. 15.

⁶⁴ France (Annex I/8) no. 28, but see Belgium (Annex I/2) no. 27-29 (where the same wording of the Code leads to the opposite outcome since Belgian courts did not follow their French peers in their broad interpretation of Art. 1384).

⁶⁵ See, e.g., Estonia (Annex I/6) no. 20; Hungary (Annex I/11) no. 26-28; Italy (Annex I/13) no. 20; Luxembourg (Annex I/16) no. 31; Slovenia (Annex I/23) no. 10. Cf. Portugal (Annex I/21) no. 11, 15.

This only applies to countries which either have a broader concept of strict liability embodied in their legislation (such as a general clause) or are at least more open towards expansion by analogy. Others will be more reluctant (to say the least) to allow an inclusion of GMO risks if these are not addressed specifically by express legislation. Consequently, for example, “it seems unlikely that a Swedish court would establish a strict liability regime for GMOs without any clear guidelines from the legislator” (Annex I/25 no. 4).

often underrated in the discussion about GMO liability that so far seems to focus on legislative acts primarily.

- 68 Not only do the kinds of risks covered by strict liabilities in Europe vary from country to country, the regimes as such are also framed quite differently: Some allow defences rather generously, others are quite restrictive. Some traditionally limit the amount of damages available under strict liability, other jurisdictions avoid such caps.⁶⁶
- 69 While fault liability is the default rule in all tort laws, strict liabilities are always the exception thereto.⁶⁷ When comparing the legal systems, the question can therefore be reduced to whether or not a jurisdiction has introduced such a special compensation regime covering the risks under survey.⁶⁸

(ii) Strict product liability in particular

- 70 A special branch of tort law which may be considered in this context is product liability. However, the various solutions to implement Directive 85/374/EEC⁶⁹ into the Member States' laws as such do not cover the kinds of cases that are of concern to this study.⁷⁰
- 71 To begin with, seeds or pollen flying around are not „defects” of the GM crops – this is simply a natural feature thereof which has nothing to do with the special genetically modified quality.⁷¹ Therefore, the only imaginable varieties of „defects” within the meaning of the Directive may be inadequate instructions or warnings by the seed producer, e.g. about the GM qualities or the necessary precautions when using the seeds.

⁶⁶ See *B.A. Koch/H. Koziol* (fn. 61) no. 109 ff. and *infra* no. 95.

⁶⁷ This does not mean, however, that the two bases of liability are of different weight: Cf. *P. Widmer* in *European Group on Tort Law*, Principles of European Tort Law (2005) Art. 4:101 no. 6.

⁶⁸ See *infra* C.II. Turkey is also considering to introduce a strict liability regime in its Law on Biosafety.

⁶⁹ Council Directive 85/374/EEC of 25 July 1985 on the approximation of the laws, regulations and administrative provisions of the Member States concerning liability for defective products, [1985] OJ L 210/29, as amended by Directive 1999/34/EC, [1999] OJ L 141/20.

⁷⁰ Cf. Belgium (Annex I/2) no. 26. See also *Ch. von Bar* (fn. 21) no. 276. On the scope of product liability in other GMO scenarios, see *I. Wildhaber*, *Produkthaftung im Gentechnikrecht* (2000), in particular 167 ff. on the German statute implementing the Directive.

⁷¹ Once gene-containment techniques have progressed so far that gene flow is under full control in a new generation of GM crops (e.g. the so-called “terminator genes”), the occurrence of cross-pollination despite such intended features would of course indicate a defect in the particular seed within the meaning of the Directive's regime. On the various techniques see *H. Daniell* (fn. 5) 581.

- 72 However, even if all the other requirements of the Directive were met, the narrow definition of what kind of losses are compensable under its regime clearly preclude liability thereunder: Apart from the fact that pure economic loss is not recoverable at all, even consequential losses following property damage are not covered unless they are sustained by a consumer.⁷² Art. 9 of the Directive defines damage other than personal injury as:

„(b) damage to, or destruction of, any item of property other than the defective product itself, with a lower threshold of 500 ECU, provided that the item of property:

- (i) is of a type ordinarily intended for private use or consumption, and
- (ii) was used by the injured person mainly for his own private use or consumption. ...”

- 73 This narrows the scope of the laws implementing the Directive to fields cultivated by individuals for non-commercial use and to the loss of those private landowners, which is beyond the scope of this study.
- 74 One may of course argue that national legislators could have expanded the scope of product liability beyond the boundaries of the Directive to include also losses caused to producers such as farmers. However, in light of recent ECJ case law⁷³ one is inclined to think that such extensions are not permissible, since the Court emphasised not only the desire of the Directive to protect consumers, but the intended side effect to equally clarify the scope of product liability for producers, who should fall under a uniform standard of product liability throughout the market, and that goal would be clearly shattered if they were liable for business losses in one Member State but not the other.⁷⁴ If the prime concerns of the ECJ are consumer claims only, however, which would correspond to the genesis of the Directive, more stringent rules with respect to losses might not be ruled out by said case law. If so, the existing product liability practice throughout Europe that presently has no problems to award compensation also in a B2B setting could survive the scrutiny of the ECJ.⁷⁵

⁷² Belgium (Annex I/2) no. 39.

⁷³ *González Sánchez v. Medicina Asturiana SA*, ECJ 25 April 2002, C-183/00, [2002] ECR I-3901.

⁷⁴ *H. Fitz/A. Grau/P. Reindl*, *Produkthaftungsgesetz* (2nd ed. 2004) § 2 no. 2.

⁷⁵ This may be supported by the Court's ruling in *EC Commission v. French Republic*, ECJ 25.4.2002 C-52/00, [2002] ECR I-3827: France had implemented Art. 9(b) in Art. 1386-2 *Code civil* by providing that product liability shall only extend to “damage resulting from injury to persons or property other than the defective product itself”, thereby disregarding both the private use or consumption requirement and the threshold of € 500. Only the latter was disapproved of by the ECJ, whereas the former was not addressed at

(c) Nuisance, trespass and its civil law counterparts

- 75 Almost all legal systems⁷⁶ seem particularly concerned about possible disputes between neighbours, inasmuch as all offer at least some form of special remedy irrespective of fault in cases where some harmful influence originated on the adjoining land. Instead of reproach for some wrongdoing, the underlying motive is rather to find a compromise between two conflicting interests which per se are of the same value: Both landowners have the identical right of enjoying their property, but exercising that right particularly at the borderlines may infringe upon the corresponding right of the neighbour (who typically need not be on a contiguous piece of land, but at least within reach of the interference⁷⁷). At least with respect to this theoretical basis, the solutions found to solve neighbourhood conflicts seem to be an ideal starting point to develop coexistence rules in other, more specific areas, such as the problems we are concerned with here. However, the common grounds shall not obscure the fact that the rules developed by the Member States to govern neighbourhood conflicts show quite some differences, not only in detail.⁷⁸
- 76 Already the theories under which such problems are tackled vary: For the majority of European jurisdictions, this belongs to (or at least originated within the realm of) property law, as the focus is on the bilateral conflict of exercising real property rights, while common law offers special torts for cases of such kind, thereby focusing on the violation of the victim's rights.⁷⁹
- 77 One key aspect common to all jurisdictions in such cases, however, is that they tend not to focus so much on the question whether the behaviour of which the neighbour complains is faulty,⁸⁰ but whether it is unusual in the

all. This impression is supported by the Court's emphasis on consumer protection (rather than a more general reference to victims of product defects) in para. 17.

⁷⁶ But see Latvia (Annex I/14) no. 10; Lithuania (Annex I/15) no. 15.

⁷⁷ See, e.g., Austria (Annex I/1) no. 27; Belgium (Annex I/2) no. 32; Greece (Annex I/10) no. 67; Poland (Annex I/20) no. 88; Switzerland (Annex I/26) no. 15.

⁷⁸ See, e.g., *Ch. von Bar*, *The Common European Law of Torts I* (1998) no. 535 ff., 545 ff.

⁷⁹ *Ch. von Bar* (fn. 78) no. 533, 536. As to private nuisance, see Cyprus (Annex I/3) no. 57 ff.; United Kingdom (Annex I/27) no. 41-42. In Finland, the idea of liability for nuisances has obviously been shifted into the more general concept of environmental liability; see Finland (Annex I/7) no. 56 and *infra* C.II.2.

⁸⁰ E.g. Austria (Annex I/1) no. 28; Belgium (Annex I/2) no. 30 ("does not require the existence of fault"); France (Annex I/8) no. 29; Luxembourg (Annex I/16) no. 34; Portugal (Annex I/21) no. 17, 106. Cf. W.V.H. Rogers, England, in: *B.A. Koch/H. Koziol* (ed.): *Unification of Tort Law: Strict Liability* (2002) 101 (no. 29): "Nuisance is the law of give and take ... and the issue is 'reasonableness' rather than 'reasonable care'." But see the Netherlands (Annex I/18) no. 32, where liability depends upon a wrongful act by the neighbour.

area (even though it may be common in other places), which is a highly objective standard, of course. Producing substantial noise, for example, may be abnormal in a quiet residential neighbourhood, but not so in a zone with heavy industry.⁸¹ This test overlaps with the question whether the defendant's behaviour was unreasonable as between neighbours under the circumstances, which also includes a duty to tolerate minor disturbances.⁸² It will therefore be of considerable influence on the outcome of GMO cases whether this technology is still entirely new and rarely practiced (which is currently true for almost all European countries)⁸³ or whether it has turned into a widespread agricultural practice, with conventional and GM farming occupying comparable fractions of the land.⁸⁴ If GM crops should ever exceed their conventional predecessors in any given area, tables may even turn and the GM farmer might then have a claim against the conventional farmer if the former's yield is reduced due to admixture with traditional crops that lack the special resistance or other qualities of the GM variant.⁸⁵

- 78 Another decisive factor may be whether the neighbour aimed something onto the neighbouring ground,⁸⁶ or whether it either spread there accidentally (though maybe unavoidably) or did not pass the borderline at all, but still had a negative influence on the enjoyment of the adjoining land.⁸⁷ In the GMO scenario, the former would be true if the GM farmer poured a packet of seeds onto neighbouring grounds, whereas the latter is the case if admixture occurs by natural seed or pollen drift.
- 79 Not only can neighbours claim compensation under these concepts,⁸⁸ they may also ask for an injunction of the contested conduct or other disturbance on adjoining land subject to further (more restrictive) conditions, including in

⁸¹ See, e.g., Belgium (Annex I/2) no. 33; Ireland (Annex I/12) no. 26 ff.

⁸² *Ch. von Bar* (fn. 78) no. 534. Cf. Estonia (Annex I/6) no. 53; Finland (Annex I/7) no. 17; Germany (Annex I/8) no. 4, 36 ff.; Ireland (Annex I/12) no. 30; Luxembourg (Annex I/16) no. 34; Norway (Annex I/19) no. 34; Slovenia (Annex I/23) no. 37-38; Spain (Annex I/24) no. 38-39, 56 ff. (on the various systems in the Spanish autonomous regions); Switzerland (Annex I/26) no. 15.

⁸³ Cf. Ireland (Annex I/12) no. 28.

⁸⁴ Cf. e.g. Austria (Annex I/1) no. 4; Denmark (Annex I/5) no. 44.

⁸⁵ Cf. Spain (Annex I/24) no. 60: Conventional farmers already may have a hard time pursuing all claims based upon nuisance in light of the wide-spread GMO cultivation.

⁸⁶ Cf. § 906 para. 3 BGB (Annex II/8); Estonia (Annex I/6) no. 53.

⁸⁷ Under common law, the former would qualify as trespass to land, if the defendant did so intentionally, whereas the latter varieties could only be actionable as a nuisance. United Kingdom (Annex I/27) no. 56.

⁸⁸ One exception is Hungary (Annex I/11 no. 29) where the concept is not coupled with compensation rules, so that damage can only be claimed on the basis of general tort law.

particular a significant likelihood that the inconvenience will be prolonged or repeated.⁸⁹

- 80 A special variety of these problems arises if the defendant's activity on or other use of her land was in some way specifically authorized. Even though the right for an injunction may be excluded, compensation may still be due, in particular if the concerns of the affected neighbours were not considered adequately when the permit was issued.⁹⁰ While statutory authority „is of major significance in connexion with nuisance and related areas,”⁹¹ its impact is from a slightly different angle: Whereas authorised activities on land will typically exclude liability of the landowner, the latter will still have to compensate her neighbours either if the statute explicitly leaves the question of nuisance open or if a permit or other authorization does not amount to statutory authority.⁹²

6. Defences

- 81 Even if the requirements of a claim in tort law are fulfilled, the claimant may still be left empty-handed or face a reduction of the amount of damages that she would otherwise be awarded if and to the extent that one or more of the legally acknowledged defences come into play in her case.

(a) *Human intervention*

- 82 The classic defences are linked to the range of identified causes and consider whether and to what extent another event than the one traced to the defendant played a role in bringing about the loss. The behaviour of third parties is equally relevant like the conduct of the claimant herself, as is some outside influence such as the forces of nature.⁹³

(i) Third-party conduct

- 83 Unless superseding the cause within the defendant's sphere, the behaviour of third parties has no influence on a fault-based action from the claimant's per-

⁸⁹ See, e.g., Austria (Annex I/1) no. 23; Estonia (Annex I/6) no. 53; Ireland (Annex I/12) no. 57-59; Italy (Annex I/13) no. 29; Portugal (Annex I/21) no. 104; United Kingdom (Annex I/27) no. 41.

⁹⁰ Austria (Annex I/1) no. 28; Denmark (Annex I/5) no. 44; France (Annex I/29) no. 29; Germany (Annex I/8) no. 37 and § 906 para. 1 and 2 BGB (Annex II/8).

⁹¹ W.V.H. Rogers (fn. 80) no. 50.

⁹² W.V.H. Rogers (fn. 80) no. 50-51. Cf. Ireland (Annex I/12) no. 34.

⁹³ United Kingdom (Annex I/27) no. 51. On the notion of an “unavoidable event” in the Czech Republic see Annex I/4 no. 45.

spective as long as all (then) multiple tortfeasors are jointly and severally liable: The defendant as one of them will still have to indemnify the claimant to the extent she is liable, even though she may be able to seek recourse from these third parties. If the claim against the defendant is not based upon fault, but rather on strict liability, however, faulty behaviour of third parties may reduce or exclude the defendant's liability: The lower the risk or the less characteristic the harm caused is for the dangerous object or activity, the more likely third-party influence will be considered in favour of the defendant as at least a buffer against her strict liability.

(ii) Contributory causes within the claimant's sphere

- 84 This is equally true for contributory causes within the claimant's own sphere, in particular for her personal behaviour that played a significant role in bringing about her own loss.⁹⁴ A non-GM farmer will typically not be able to shift her loss onto neighbouring GM farmers if it was herself who caused the admixture, e.g. by the improper handling of seeds, but also if these are impure (which may lead to a successful claim against the seed distributor or producer, though). However, not all jurisdictions are equally ready to exculpate a defendant if the blame falling upon the claimant herself does not reach a certain minimum gravity.⁹⁵
- 85 Along the same lines, all jurisdictions require the claimant to mitigate her loss to the extent reasonable, so she may, for example, not proceed with destroying her crops upon discovering admixture if she could have sold them on the GM market.⁹⁶ Also, the contaminated crop may still be used as feed on her own farm without an ensuing need to label the animal products as GM, which may reduce her actual loss.⁹⁷
- 86 Another universally accepted⁹⁸ argument that can reduce or even eliminate the defendant's liability is the claimant's assumption of the risk. If the latter knew or should have known of the harm potential originating from the defendant's sphere, but nevertheless actively exposed herself to it, she can subsequently

⁹⁴ E.g. Austria (Annex I/1) no. 48; Belgium (Annex I/2) no. 38.

⁹⁵ *Ch. von Bar* (fn. 21) no. 521 ff., also pointing to other European exceptions from the general rule that contributory conduct is to be considered. See, e.g., Poland (Annex I/20) no. 3 (only exclusive fault of the victim accepted as valid defence); Portugal (Annex I/21) no. 40.

⁹⁶ See, e.g., Cyprus (Annex I/3) no. 100; Denmark (Annex I/5) no. 50; Finland (Annex I/7) no. 18; Ireland (Annex I/12) no. 51, 56; Switzerland (Annex I/26) no. 52; United Kingdom (Annex I/27) no. 61.

⁹⁷ DEFRA Consultation Paper (Annex II/27) no. 144.

⁹⁸ *Ch. von Bar* (fn. 21) no. 512.

not build her claim upon the fact that this risk materialized. However, this defence will probably not affect the claim of a farmer who starts to grow non-GM crops which are subsequently contaminated, even if she knew from the start that all her neighbours have opted for GM cultivation: The latter will either only be liable for failure to abide by the applicable coexistence rules, which – even if adhered to – can certainly not eliminate the free choice by neighbours, or they will be strictly liable, in which case their neighbour’s decision to start with conventional farming will even less likely be considered as a voluntary exposure to the risk of cross-pollination or the like. This outcome may alter, however, if the GM cultivation was preceded by some contractual arrangement between the owners of adjoining land, if the segregation rules vary depending upon the type of land use in the vicinity, or if the claimant had previously grown GM crops herself.⁹⁹

(b) *Force majeure*

- 87 Force majeure or „acts of God”¹⁰⁰ are commonly cited as standard defences in cases of strict liability and come into play even in high-risk scenarios (though not undisputedly, at least with respect to core risks for which the liability regime was designed)¹⁰¹. It is at least doubtful, however, whether the forces of nature such as the wind should invariably trigger this defence in GMO cases: If a jurisdiction should decide to award compensation to a neighbouring farmer to whose fields GM seeds were blown, it seems less convincing to reduce her claim simply because it was the wind that transported the seeds, which lies in their very nature. If the wind was so strong, however, that it transferred the seed beyond a distance to be expected under normal weather conditions, the concerns just mentioned may be less compelling, so that the defence may come into play again.

⁹⁹ Depending upon the crop, she may have a hard time, however, to prove that the contamination on her field was not caused by volunteer seeds remaining in her soil; cf. supra no. 9.

¹⁰⁰ Note the differences in terminology: *B.A. Koch/H. Koziol* (fn. 61) no. 109. See also *Ch. von Bar* (fn. 21) no. 318 ff. Cf. Finland (Annex I/7) no.16 and Sweden (Annex I/25) no. 27 (these defences probably not applicable in the context of strict liability under the Environmental Code). See further *M. Faure/A. Wibisana*, Economic Analysis (infra p. 176) no. 26 ff., on an economic assessment of this defence.

¹⁰¹ Cf. *B.A. Koch* in *European Group on Tort Law*, Principles of European Tort Law (2005) Art. 7:102 no. 1, 5-6. They are of course equally considered in fault cases, though rather as part of the evaluation of the defendant’s conduct. But see e.g. Belgium (Annex I/2) no. 17-18 (force majeure is only a defence if it was the exclusive cause).

(c) Lawful authority

- 88 The defendant's behaviour may be justified if she can prove that she has acted within the scope of some lawful authority or statutory permission.¹⁰² While jurisdictions are not in full accord as to the scope of that defence,¹⁰³ it may operate either as such or will at least be considered when defining the appropriate standard of care that the defendant should have adhered to.¹⁰⁴ Unless a country has not coupled its provisions on ascertaining coexistence with duties to compensate losses even irrespective of fault, a farmer therefore has a strong argument against liability if she fully adhered to all the formalities and requirements prescribed by such rules.¹⁰⁵

(d) Development risk

- 89 Another defence primarily cited in the context of strict liability (in particular strict product liability¹⁰⁶), but in essence originating within the realm of fault

¹⁰² B.A. Koch in *European Group on Tort Law*, Principles of European Tort Law (2005) Art. 7:101 no. 17 with further references. See, e.g., Malta (Annex I/17) no. 16; Portugal (Annex I/21) no. 41 ff.; Sweden (Annex I/25) no. 27 (though not defence but rather limitation of liability); United Kingdom (Annex I/27) no.31. This defence is not acknowledged in Hungary (Annex I/11 no. 24) and Poland (Annex I/20 no. 3, 20). See also the doubts raised by the economic analysis of *M. Faure/A. Wibisana*, Economic Analysis (infra p. 187 ff.) no. 53-54.

¹⁰³ See section 3.2.4 on grounds of justification in *W. van Gerven et al.* (ed.) *Tort Law* (2000), this section available online at <http://www.law.kuleuven.ac.be/casebook/tort/heading3.2.4.A.pdf> (352/3 ff.).

¹⁰⁴ Cf. United Kingdom (Annex I/27) no. 38. See also DEFRA Consultation Paper (Annex II/27) no. 159, where the approval of GMOs is seen as a possible hindrance already with respect to recognizing admixture as compensable harm: "A GM crop will only be grown commercially if it passes the legal risk assessment process, so it may be a contradiction to treat as a form of damage the presence of a legally-approved GMO."

¹⁰⁵ This is in line with the Opinion of the European Economic and Social Committee (EESC) on the 'Co-existence between genetically modified crops, and conventional and organic crops', [2005] OJ C 157/29, 3.6.3: "The fact that a GMO is authorised for release within the Community will, generally speaking, rule out the conditions for negligence or intent, unless specific conditions for release were breached." Cf. Art. 8 para. 4 lit. a of the Environmental Liability Directive. But see Spain (Annex I/24) no. 53 and Belgium (Annex I/2) no. 23: "[A] licence to cultivate GMO would not exempt its holder of its duty of care nor of its duty to comply with the legal and administrative rules, as well as of its duty not to inflict to others a disorder that exceeds the extent of the normal disadvantages of vicinity ...".

¹⁰⁶ See Art. 7 lit. e of the Product Liability Directive (85/374/EEC): Belgium (Annex I/2) no. 26; Estonia (Annex I/6) no. 21; Greece (Annex I/10) no. 13; Malta (Annex I/17) no. 20; Portugal (Annex I/21) no. 21.

liability,¹⁰⁷ is the development risk (or state-of-the-art) defence.¹⁰⁸ It is built upon the state of scientific and technical knowledge at the time of the activity which is subsequently evaluated as possibly giving rise to liability.

- 90 The core of the defence merely argues that science and technology did not offer appropriate means to discover, let alone avoid a certain risk at the time of the conduct under scrutiny which later turned out to be harmful. The defence is often expanded (whether permissibly or not) to the broader claim that the risk was unknown or unheard of (even though this is not synonymous to the objective possibility of discovering it, since this may well be feasible, but due to lack of imagination or concern at the time, no-one takes care to investigate it).
- 91 The precautionary principle¹⁰⁹ goes the other way and effectively speaks against admitting this defence.¹¹⁰ If precaution shall be taken as soon as there are reasonable grounds for concern of future harm connected to a certain activity, even though this fear can neither be verified nor falsified with the scientific evidence available at the time, conducting that activity nevertheless will always be considered in violation of that principle despite contemporary scientific or technological inability to detect the risk or to prevent ensuing harm, though obviously only if its prevention corresponds to the chosen level of protection.¹¹¹
- 92 Interestingly,¹¹² the Environmental Liability Directive allows the Member States to deny liability of the operator if the latter successfully raises the de-

¹⁰⁷ Cf., e.g., the *Cambridge Water* case cited by the English report (United Kingdom, Annex I/27, no. 31).

¹⁰⁸ See the economic perspective on this defence by *M. Faure/A. Wibisana*, *Economic Analysis* (infra p. 177 ff.) no. 29 ff.

¹⁰⁹ For anecdotal reference, please note the definition of the precautionary principle used by the U.S. government (<http://www.usembassy.at/en/us/glossary.htm>): “A term used in Europe (by the EU member states, the Commission, and governments aspiring to join the EU) which has been rejected by virtually [*sic*] all other governments. While many governments apply precautionary approaches in a variety of contexts (e.g. food safety, animal and plant health, the environment, etc.), the EU’s precautionary principle provides that politicians can over-rule science-based decisions of regulators. ...” For a more serious approach, see the Communication from the Commission on the Precautionary Principle, COM (2000) 1 (http://ec.europa.eu/environment/docum/20001_en.htm).

¹¹⁰ Greece (Annex I/10) no. 18.

¹¹¹ There is an obvious link to the previous defence (no. 88): If the statutory authority backing up the activity at the time was based upon a risk assessment which in itself applied the precautionary principle, the defence may be valid.

¹¹² On the critical responses to this legislative choice, see only Spain (Annex I/24) no. 10.

velopment risk defence (Art. 8 para. 4 lit. b). In current legislation dealing with the risks of GMOs, however, the defence is often expressly excluded.¹¹³

(e) Time limitation

- 93 An important bar to recovery is the expiration of a certain time period between the occurrence of the loss and the filing of an action. While it may be the „morally weakest defence,”¹¹⁴ it is generally accepted throughout Europe without exceptions. Jurisdictions are, however, divided with respect to the length of that period,¹¹⁵ as well as to its starting point (focusing either on the occurrence of the damaging event or on its harmful effects, whether or not coupled with actual or imputed knowledge thereof by the victim).¹¹⁶ Further differences include the additional qualification whether there is any overall limit irrespective of such subjective elements as knowledge of the damage or of the tortfeasor.

7. Remedies

(a) Damages

- 94 Generally speaking, all jurisdictions subscribe to the overall aim of full compensation.¹¹⁷ However, this has to be seen in the light of the initial question of what these systems consider to be compensable in the first place: To the extent they recognize a certain interest as worthy of indemnification, its full (ascertainable) value will be added to the tortfeasor’s ultimate bill. However, losses that are excluded from the start will never make it to the remedies stage.¹¹⁸
- 95 The type and extent of compensation for a recognized loss, however, is therefore probably less controversial once the case has reached that final question, but there may be limits to the amounts available: A few jurisdictions couple the introduction of strict liabilities with caps on damages recoverable under these regimes, which at least initially were aimed at striking a balance be-

¹¹³ Germany (Annex I/9) no. 7; Switzerland (Annex I/26) no. 33.

¹¹⁴ *Ch. von Bar* (fn. 21) no. 545.

¹¹⁵ See the overview by *Ch. von Bar* (fn. 21) no. 547.

¹¹⁶ *Ch. von Bar* (fn. 21) no. 549 ff.

¹¹⁷ E.g. Cyprus (Annex I/3) no. 80; Czech Republic (Annex I/4) no. 68; Denmark (Annex I/5) no. 45; France (Annex I/8) no. 34; Hungary (Annex I/11) no. 12, 30; Lithuania (Annex I/15) no. 23; Malta (Annex I/17) no. 21; the Netherlands (Annex I/18) no. 40; Poland (Annex I/20) no. 32; Spain (Annex I/24) no. 62, 66.

¹¹⁸ Cf. *U. Magnus in European Group on Tort Law*, Principles of European Tort Law (2005) Art. 10:101 no. 7.

tween the interests involved. Some (like Austria) have given up such limitations in more recent pieces of legislation, while probably the majority of countries only considered introducing a maximum limit if foreseen by an international treaty.¹¹⁹

(b) Ad hoc mitigation of damages

- 96 Some jurisdictions foresee a rule of „last resort” for the defendant which allows a reduction of the award against her at the discretion of the judge in case of extraordinary and overly burdensome and oppressive circumstances that speak in the defendant’s favour. While several civil codes include such an ad hoc mitigation rule, not all jurisdictions actually apply it in court practice.¹²⁰

(c) Other remedies

- 97 Apart from monetary awards, it is important to know whether the system allows for injunctive relief, i.e. a tool to ban GM production in advance simply for the fear of admixture that may cause loss in the future, particularly if it has happened before.¹²¹

8. Interdependencies between the various liability regimes

- 98 If a jurisdiction has decided to introduce some stricter form of liability that applies to the cases of our concern, the question remains whether this is meant to offer the victim exclusive remedies, or if she can still resort to traditional tort law (i.e. fault liability) alternatively or even cumulatively – while no legal system would allow her to recover twice, she may at least be allowed to seek indemnification for part of her loss under a fault theory to the extent it is not recoverable under the strict liability regime.
- 99 Typically, fault or any other general provisions of tort law are not superseded by strict liability rules altogether. While the latter do apply as *leges speciales*, they hardly ever rule out the alternative path via traditional tort law, apart from the fact that they by default tend to leave certain aspects of their claims to be governed by the general rules.

¹¹⁹ *B.A. Koch/H. Koziol* (fn. 61) no. 139.

¹²⁰ Czech Republic (Annex I/4) no. 78 ff.; Estonia (Annex I/6) no. 31, 38; Finland (Annex I/7) no. 38; Hungary (Annex I/11) no. 40 (“not actually applied”); Lithuania (Annex I/15) no. 26; the Netherlands (Annex I/18) no. 41-42 (“hardly ever used”); Norway (Annex I/19) no. 43; Poland (Annex I/20) no. 91; Portugal (Annex I/21) no. 120 (only applicable in cases of fault liability); Sweden (Annex I/25) no. 42; Switzerland (Annex I/26) no. 54.

¹²¹ See no. 79.

- 100 All jurisdictions which have provided for special rules that apply to GMO admixture leave the door open to alternative routes that their general tort law regime may provide, including special rules of a more general scope which may apply, but of course also classic fault liability, the latter though subject to its typically much narrower conditions.¹²²

9. Possible other defendants than the GM farmers

(a) Overview

- 101 In a typical tort law scenario, the farmer whose crops were adversely affected might sue her neighbour(s) from where the GM crops came from (at least as suspected), and this is what we have primarily looked at till now. We have thereby not differentiated between the „neighbour” in the sense of the owner of the adjoining land on the one hand and the farmer who cultivates that land on the other, even though these may be different persons, e.g. if the latter is a tenant of the former.¹²³ This difference may have an impact on identifying the proper defendant in some jurisdictions.¹²⁴ In a classic fault-based cause of action, the latter may not be liable for wrongdoing by the tenant farmer since the respective theories of vicarious liability may not provide for a sufficient link between the two.
- 102 But even if we disregard this potential split of identities on the land from where the GMOs originated, the theories mentioned above also apply to further potential tortfeasors correspondingly.
- 103 „Anyone involved in the production or handling of GMOs is a potentially liable party when losses occur.”¹²⁵ One possible alternative defendant, amongst others, could be the seed producer.¹²⁶ Also the authority that regulates (and authorizes) the release of GMOs may be targeted, particularly if it later turns out that there were flaws in the legislative or licensing procedure. Depending on the circumstances, further players may be involved, such as the

¹²² See, e.g., Austria (Annex I/1) no. 12; Denmark (Annex I/5) no. 35; Norway (Annex I/19) no. 17; Portugal (Annex I/21) no. 49 ff.

¹²³ Cf. *I. Glas*, Die Haftungs der Landwirtschaft im Kontext des Pachtrechts und Gesellschaftsrechts im Rahmen des Gentechnikrechts, in: *Ch. Gallies/I. Härtel/B. Veit* (ed.), Neue Haftungsrisiken in der Landwirtschaft: Gentechnik, Lebensmittel- und Futtermittelrecht, Umweltschadensrecht (2007) 141 et seq.

¹²⁴ United Kingdom (Annex I/27) no. 42.

¹²⁵ *M. Davenport*, Genetically Modified Plants and Foods – Brave New World or Brand New Headache for Insurers? 35 [2006] *The Brief* 56, 61.

¹²⁶ Cf., e.g., the statement by a GM seed producer that full seed purity cannot be achieved: <http://www.pioneer.com/biotech/images/management.pdf>.

farmers' cooperative from where the claimant borrowed machinery which was not cleaned properly.

- 104 This does not necessarily mean, however, that those listed will always be subject to liability, quite the contrary: As a rule of thumb, one might say that the farther away from the actual incident on the chain of causation, the less likely someone is to be held liable in (classic) tort law. In any case, the reasons established by tort law to shift the loss of the claimant at least in part to any given defendant need to be fulfilled.
- 105 From a policy perspective, several standard points are commonly cited when arguing why an individual along the chain of causation is selected as a potential defendant in tort. These include aspects like:
- knowledge of the risk
 - profit or some other benefit from the risk
 - control of the risk
 - ability to prevent the risk from materializing, in particular to bear the costs necessary for such measures
 - capability to cover against potential losses in the future.
- 106 Depending on the circumstances, the interplay of these factors may vary, and they may be complemented by further arguments. Even though it may appear at first sight that the list only includes pointers into the defendant GM farmer's zone, this is not the case: It may well be, for example, that the defendant was completely unaware of the special risk that her activities posed vis-à-vis her neighbour. In a fault case, it therefore may be of relevance whether the GM farmer knew that her neighbour has switched back to non-GM agriculture after years of using GM seeds as well, which will affect the width of the buffer zones and other precautionary measures. When looking at the latter, at least some of the necessary investments and efforts may be too costly for the GM farmer in relation to the risk or in comparison to the corresponding duties of her neighbours to protect themselves, which are never zero.
- 107 From the viewpoint of economic analysis, the costs of expanding the buffer zone beyond reasonable or statutory limits (which are marked, for example, by the reduced economic performance of conventional crops that the GM farmer may typically grow in that zone) may exceed the risk of admixture on the adjoining land (which not only takes into account the potential economic loss to the neighbour, but also its likelihood).

108 The overall idea is of course to search for the best way to spread the loss of the individual victim, but this presupposes that there are convincing arguments to shift that loss to others in the first place.

(b) The seed producers in particular

109 Only one group of possible defendants will be singled out in this survey since applying the above-mentioned list of factors strongly points in their direction, which may even support a channelling of liability upon them:¹²⁷ the seed producers¹²⁸.

110 Unless the cause of action is based upon the fault of the party who triggered the immediate cause of the loss, causal uncertainties if several farmers in the neighbourhood grow GM crops could be circumvented by redirecting the victim's claims against the seed producer – after all, as long as the GMOs can be identified, they may also be traced to a particular producer. This advantage on the causation level also extends to cases where the admixture may have occurred by commingling with remnants in farming equipment – the GMOs, again, arrived there through the distribution chain originating from the seed producer: Even though the latter of course did not place her seeds there, the one who did was one of her customers, and the risk of not being able to identify which one of them it actually was could be absorbed by the distributor from whom the consignment causing the loss originated. This presupposes that the seed producer can in turn spread this risk upon all her customers via the price mechanism.

111 If the theory on which liability is based does not depend upon faulty behaviour within the GM farmer's sphere, incentives to ensure good farming practice are inevitably reduced, which in turn reduces concerns to keep the GM farmer high in the list of priority defendants.

112 A cost-benefit-argument harps on the tunes of „cuius commodum, eius et incommoda”: The seed producers have not started biotechnology for Samaritan purposes, but for profit, which they derive from customers who in turn expose their neighbours to the risk of admixture. If the loss is channelled onto the seed producers, the GM farmers are not entirely off the hook since they will ultimately contribute to these extra expenditures at the seed producers'

¹²⁷ On channelling liability, see *infra* no. 121.

¹²⁸ For the sake of simplicity, this term is used to denominate all operators who develop and/or market GM seeds, whether immediate producers, secondary breeders, or similar members of the seed industry.

level since the latter will inevitably pass these costs onto their customers via the price mechanism.

- 113 Seed producers in North America already try to ensure that they collect the full benefit from their investment by suing conventional or organic farmers on whose fields GM traces have been found for fees, even if it is assumed that these farmers have not contributed in any way to this admixture.¹²⁹ If the seed producers thereby volunteer to extend their profit range to third parties, it seems logical and fair to use exactly the same line of causation in the reverse direction as well.
- 114 Further support can be drawn from a larger perspective: If all the effects, both profits and losses, are centred in the hands of the seed producers, they have ample incentives to expand the margin between the two e.g. by monitoring the production line, by ensuring that their customers are properly instructed on how to use their seeds,¹³⁰ and ultimately by continuing research on their products, also with respect to potential detrimental effects that have not been discovered before.¹³¹
- 115 The seed producers might not necessarily oppose the channelling as such – Monsanto, for example, participates in an innovative compensation scheme practiced in Germany which has the same effect – ensuring compensation to conventional and organic farmers, while at the same time GM farmers are relieved of the threat of potential individual or collective liability.¹³² Furthermore, the industry is already on alert since the StarLink fiasco, when GM maize by Aventis CropScience (now owned by Bayer) found its way into the food production chain despite lack of approval for human consumption. Aventis ultimately had to pay a US\$ 110 million settlement,¹³³ which made insurers, among others, nervous.
- 116 If seed producers assumed the risk of unwanted crop spreading, they could thereby convince more and more farmers to switch to GM agriculture, who would consequently leave the group of possible claimants for the losses under survey here.

¹²⁹ See, e.g., <http://www.percyschmeiser.com> on the famous Canadian case of *Monsanto v. Schmeiser*.

¹³⁰ DEFRA Consultation Paper (Annex II/27) no. 156: “Making GM seed companies responsible would give them a clear incentive to ensure an effective coexistence regime.”

¹³¹ Cf. DEFRA Consultation Paper (Annex II/27) no. 156.

¹³² See *infra* no. 117 ff.

¹³³ A court decision in this case before settlement was *In re StarLink Corn Prods. Liab. Litig.*, 212 F. Supp. 2d 828 (N.D. Ill. 2002). The details of the settlement are described at <http://www.starlinkcorn.com/Claims/Documents/34800Starlink1232qxd.doc>.

10. Problems of aggregation

(a) *Multiple tortfeasors*¹³⁴

- 117 If more than one tortfeasor may be liable for the same loss¹³⁵, any legal system will have to decide how to apportion the risk among these parties. The ultimate solution is not hard to imagine: Ideally, all those responsible for a loss should contribute to indemnifying it according to their respective share in causing the harm. Very often, however, this portion will be hard to determine, and even if a certain weighing may be possible, an exact percentage figure will be difficult to calculate. Jurisdictions typically cut that Gordian knot by holding all those liable for equal shares whose exact degree of participation cannot be determined, the latter of course being dependent upon the respective laws of evidence and other procedural factors.
- 118 A necessary follow-up question then is whether to allow the victim to pick just one of the many possible defendants who will have to indemnify the claimant in full, though with an obvious right to go after the other tortfeasors for contribution. Alternatively, the victim will have to sue each of the tortfeasors individually, so she will only collect a respective portion from each of them (and bear the additional risk that she may not be able to bring one of them before a court of law or succeed there for reasons particularly associated with that individual defendant).
- 119 The key question underlying that choice is who shall bear the risk of insolvency of one or more of the defendants. In a victim-friendly climate, obviously the first solution is the best, as the risk of not being able to collect damages from one of the tortfeasors is passed on to their „colleagues” who will fail to receive reimbursement of the part of the loss which they paid to the victim on behalf of the (now insolvent) other tortfeasor. Alternatively, one could argue that fairness demands alternative two, particularly in a fact setting where the multiple tortfeasors are joined because of uncertainties as to which of them really did participate in causing the loss, in which case at least one of them may be held liable even though she in fact did not (or not to that degree) cause the loss.

¹³⁴ See generally (and with much more detail) *W.V.H. Rogers*, Comparative Report on Multiple Tortfeasors, in: *W.V.H. Rogers* (ed.), *Unification of Tort Law: Multiple Tortfeasors* (2004) 271.

¹³⁵ Obviously, if each tortfeasor only has to account for one particular part of the overall loss which can be clearly distinguished from the rest, the issues in the following do not arise. See *W.V.H. Rogers* (fn. 134) no. 12-14.

- 120 Jurisdictions are in accord that generally multiple tortfeasors should be jointly and severally liable¹³⁶, so they decide in favour of the victim and let her pick and choose a defendant who will then have to compensate her in full, coupled with a right of recourse against the others.¹³⁷ The alternative solution of proportionate liability is only an option if the respective shares in causing the loss can be identified.
- 121 A different approach could be taken if a legal system should decide *ex ante* that one of the actors should be at the primary focus of compensation claims, so that liability should be channelled to this tortfeasor either primarily or at the exclusion of more remotely connected parties.¹³⁸ This is not necessarily to the advantage of the victim: Claims against others may be precluded altogether.¹³⁹ Still, singling out one of many possible defendants may be supported, for example, by the assumption that her influence on the chain of causation in a standard case will often be stronger than that of others, that she was in a better position to prevent the loss, or that she can more easily spread the risk internally between all those involved. In particular, not only will she probably be in a better position to obtain insurance cover, but she can also typically pass those costs on to other parties involved (including the ultimate victims).¹⁴⁰

(b) Multiple victims

- 122 A different (and additional) range of problems may arise if it is not just one victim of the same event, but if, for example, the fields of several conventional farmers have been contaminated, assuming for the sake of the argument that the GMOs originated in just one field.¹⁴¹ From a substantive law perspec-

¹³⁶ On the terminology, see *W.V.H. Rogers* (fn. 134) no. 3.

¹³⁷ *W.V.H. Rogers* (fn. 134) no. 4 (“remarkable uniformity”); see also Austria (Annex I/1) no. 36-37; Cyprus (Annex I/3) no. 32; Czech Republic (Annex I/4) no. 36; Estonia (Annex I/6) no. 13; Finland (Annex I/7) no. 13; France (Annex I/8) no. 24; Germany (Annex I/9) no. 10; Greece (Annex I/10) no. 56 ff.; Hungary (Annex I/11) no. 18-19; Ireland (Annex I/12) no. 18; Latvia (Annex I/14) no. 7; Malta (Annex I/17) no. 13; the Netherlands (Annex I/18) no. 15; Poland (Annex I/20) no. 24, 73-75; Portugal (Annex I/21) no. 36, 96; Slovakia (Annex I/22) no. 13, 19; Slovenia (Annex I/23) no. 32; Spain (Annex I/24) no. 15, 47; Sweden (Annex I/25) no. 17; Switzerland (Annex I/26) no. 26.

¹³⁸ On an economic assessment of channelling liability, see *M. Faure/A. Wibisana*, Economic Analysis (infra p. 195) no. 73-74.

¹³⁹ See, e.g., Switzerland (Annex I/26) no. 6-7.

¹⁴⁰ Cf. *M. Faure/A. Wibisana*, Economic Analysis (infra p. 168) no. 9.

¹⁴¹ If there are more possible sources of harm, the above-mentioned problems of multiple tortfeasors also multiply the complications of the case. In particular, causation will be a major problem zone as the GM farmers may argue that their crops did not cause the

tive, these multiple victims may encounter barriers to full recovery which arise just because there is more than one claimant: Caps on liability may be narrowed by overall limits per event, so that if more victims suffer a loss equalling or exceeding the individual caps, their compensation will be reduced proportionally even though they would recover the full maximum amount if they had suffered harm alone. Procedural law may include further hurdles (or advantages¹⁴²) for a group of victims, which is beyond the scope of this study, however.

IV. Insurance options

1. General aspects

- 123 Another way to obtain compensation is via insurance. The major difference here is that the victim at least in theory can draw from much larger funds than if she went after the individual farmer or any other tortfeasor. While the first variety that comes to one's mind in this context may be the latter's liability insurance (*infra* 2), which is obviously closely linked to the tort law options just mentioned, one should not forget the alternative model of self-insurance of the potential victim, which will be dealt with separately (*infra* 3).¹⁴³
- 124 Either way, insurance allows the pooling of risks among a larger group of people exposed thereto, and this group can be expanded by law if it requires those at risk to provide for such cover. Claims will be handled by professionals who do just that, and – depending upon the insurance conditions – the procedure to pay out awards will be less complicated than before a court of law. Making insurance compulsory can contribute to ensure that the product meets a certain demand on the market, though it may at the same time distort market forces and hinder proper risk differentiation, particularly if sufficient information to assess the risk is lacking.¹⁴⁴ After all, the insurer should tailor the policies according to the various aspects of the risk, ideally with respect to each insured. At least in theory, for example, those who run a higher risk should therefore also pay higher premiums. This is not necessarily always the case, but under a mandatory insurance scheme, it is even less likely that this balance is achieved.

same degree of harm to each of the victims (which may be well founded in light of the geographic distribution of fields).

¹⁴² Cf. Sweden (Annex I/25) no. 19: Cases of the kind envisaged here may be dealt with by a class action, which was introduced in 2002.

¹⁴³ See also *M. Faure/A. Wibisana*, Economic Analysis (*infra* p. 205 ff.) no. 93 ff.

¹⁴⁴ *M. Faure/A. Wibisana*, Economic Analysis (*infra* p. 206 ff.) no. 98 ff. (in particular no. 103).

- 125 The standard checklist used to determine if a risk is insurable includes questions such as whether the frequency and severity of potential claims can be estimated, and whether the occurrence of a loss is truly fortuitous within the terms of the policy.¹⁴⁵

„At this point, GMOs present more unknown than known variables for insurers. Sufficient loss history is not available to underwrite GMO exposures. The technology used to create GMOs and the varieties of available GMOs are perpetually advancing. Thus, evaluating the risks inherent to particular GMO techniques or GMOs is of little value from a risk-bearing standpoint, especially since the long-term impacts of GMOs are totally unknown. Obviously, unknown variables are difficult, if not impossible, for an actuary to evaluate.”¹⁴⁶

- 126 This has led the insurance industry to include far-reaching exclusions of GMO risks into their policies,¹⁴⁷ even though some apparently offer „buybacks” to cover at least third-party liability exposure with clear-cut limitations.¹⁴⁸
- 127 One key problem that affects all types of insurances is the wide range of risk scenarios in light of the various plants’ distinctive potential for gene flow.¹⁴⁹ Insurers therefore argue that achieving a „uniform insurance solution for all plant types seems virtually impossible.”¹⁵⁰ The administrative costs of establishing, marketing and administering a risk-specific range of insurance products would at least be very significant.
- 128 Another important issue concerns the extent of possible harm that shall be covered by the insurance. While this can always be defined by the policy itself (from risk exclusions to restrictions concerning the insured amounts), such a limited product may not meet market demands, particularly if farmers are required by law to buy insurance cover for risks beyond such boundaries. Insurers therefore argue that the potential compensable damage needs further legal specification, in particular with respect to the question whether losses arising from admixture below the 0.9% threshold should also be covered. Insurers

¹⁴⁵ *M. Davenport* (fn. 125) 61.

¹⁴⁶ *M. Davenport* (fn. 125) 61.

¹⁴⁷ *I. Ebert/Ch. Lahnstein*, GMO Liability: Options for the Insurers (infra p. 215) no. 1, 4 ff. See the sample wording cited by *M. Davenport* (fn. 125) 59 (Exhibit 1): “This insurance does not apply to any injury, damage, expense, cost, loss, liability, or legal obligation arising out of or in any way related to modified seeds, plants, grains, crops, organisms, animals, or other material, however caused ...”

¹⁴⁸ See Exhibit 2 given by *M. Davenport* (fn. 125) 62-63.

¹⁴⁹ See supra at fn. 5.

¹⁵⁰ *I. Ebert/Ch. Lahnstein* (infra p. 219) no. 13.

want this to be answered in the negative since „it appears to be virtually impossible to avoid any trace of cross-pollination,”¹⁵¹ which would eliminate the fortuity of the risk for practical purposes.

2. Third-party insurance

- 129 Third-party liability insurance seems to be most relevant in the context of the cases under survey here. However, it is interdependent with the tort law addressed earlier and therefore only shifts the problem to another arena without truly solving it. Insurance thereby serves as a cushion to the shortcomings of tort law proper, inasmuch as it helps to simplify and to assure access to payments, but it certainly cannot level out the different requirements for liability in the various Member States mentioned above. All the uncertainties surrounding the question of tortious liability as indicated in part B.III add to the further uncertainties with respect to the extent of a potential loss as well as its frequency.
- 130 Arguably the most important obstacle to offering liability insurance cover is a tort law regime which allows for compensation of any type of loss irrespective of any wrongdoing by the insured and coupled with a presumption of causation. Obviously, such a scheme¹⁵² substantially increases chances for a non-GM farmer to obtain compensation. This in turn converts the risk of the insured to be held liable into almost certainty, which runs afoul of the most fundamental principles of insurance.¹⁵³ As a minimum, insurers demand that the scope of compensable harm shall be clearly defined by excluding losses resulting from admixture with GMOs below the 0.9% threshold that currently triggers labelling requirements (and which thereby is crucial for determining the ensuing loss).¹⁵⁴ Needless to say, the current lack of such a threshold with respect to seeds would also have to be reconsidered.
- 131 If we disregard the severe restrictions on or the complete unavailability of liability insurance which covers GM risks, those most likely interested in buying such policies are the farmers who have opted to cultivate GM crops. By taking out insurance, they can spread the risk among each other, which effectively reduces the likelihood of having to compensate the entire harm caused individually. This is obviously also in the interest of potential victims who are thereby at least to some extent relieved of the risk that „their” tortfeasor be-

¹⁵¹ *I. Ebert/Ch. Lahnstein* (infra p. 216) no. 4.

¹⁵² Cf. the Austrian liability regime infra no. 166.

¹⁵³ Cf. *I. Ebert/Ch. Lahnstein* (infra p. 215 f.) no. 1, 4.

¹⁵⁴ *I. Ebert/Ch. Lahnstein* (infra p. 216) no. 4. See also the DEFRA Consultation Paper (Annex II/27) no. 138: “It would be a disproportionate burden on the GM sector to make it liable for redress on the basis of a threshold stricter than the relevant legal standard.”

comes insolvent, and their position would be further improved if they could file direct claims with the insurer. What is sometimes overlooked, however, is the fact that it is actually the ultimate consumer who pays the insurance premiums: The GM farmer will inevitably try to pass on these costs to her customers, or at least include it in her calculation.

- 132 Another group of potential insurance clients are the seed suppliers, who are one step behind in the production chain. Depending on the liability regime, they will also have a more or less stronger interest in taking out cover against the risk of being sued (albeit by way of recourse).
- 133 The practical importance of such a risk pool is bolstered, of course, by statutory rules requiring insurance against liability risks.¹⁵⁵ These only make sense, however, if the insurance market is ready to offer adequate products for those who are obliged to take out such cover.
- 134 Depending on the policy, insurance cover – if available at all – will typically be limited to a certain maximum amount. Further caps may apply cumulatively, such as an „aggregate limit”, defining how much the insurer will pay out in any one given time period per insured, or a „per occurrence” limit, which caps payments for all claims filed with the same insurer that arise out of a single event.

3. First-party insurance

- 135 An alternative type of insurance would be first-party insurance: Potential victims thereby have to take out insurance themselves for their own risk of loss.¹⁵⁶ Probably all farmers already have first-party policies such as farm property insurance, though covering different risks, for example natural disasters such as hail or the like. However, these hazards are typically named in a closed list which excludes other risks such as GMO admixture.
- 136 Suggesting that first-party insurance could be one way to ensure that the losses of non-GM farmers are made good sounds problematic since this option seems to be too close to the starting point where the immediate victim had to bear her own loss entirely (supra B.II.2), even though self-insurance would spread that risk at least among all other potential victims who join that pool.

¹⁵⁵ See, e.g., Luxembourg (Annex I/16) no. 53. Cf. supra no. 124.

¹⁵⁶ Cf. *M. Faure/D. Grimeaud*, Financial Assurance Issues of Environmental Liability, in: *M. Faure* (ed.), *Deterrence, Insurability, and Compensation in Environmental Liability* (2003) 7, 208-209, 217 ff., on first-party insurance against environmental harm.

- 137 Still, „[e]conomists are relatively enthusiastic concerning this first party insurance”¹⁵⁷: Potential victims should know best what losses they may suffer, and they can shop for the best cover against risks that they think should be taken care of. They tend to receive payments faster than under other redress mechanisms since the awards are paid out upon the occurrence of the insured loss and (at least in general) irrespective of its cause, even though some may be excluded in the policy.
- 138 However, for the very same reason, there is hardly any incentive for the victim to protect herself against damage beyond the requirements imposed upon her by the insurer, and the tortfeasor is not even addressed at all by the regime. The – at best – limited deterrent effect of tort law will be even further reduced if the potential tortfeasor knows that the harmful consequences of her conduct will be cushioned by resources to which she need not contribute unless the insurer sues her in a recourse action, which is not very likely at least in minor tort cases.
- 139 The potential victims may not see themselves as such – they may simply not be aware of the fact that someone in the vicinity may or already has started to cultivate GM crops. The risk of gene flow may be underestimated as well, which further reduces the conventional farmer’s incentives to buy first-party insurance.
- 140 Furthermore, she simply may not see any need to do so in light of an obvious fairness argument: It may be difficult to convince conventional or organic farmers that they themselves should invest money into loss prevention if the risk is brought about by their neighbour whose profits from GM cultivation will not equally be reduced by any insurance premiums.
- 141 Nevertheless, first-party insurance could be of particular importance at least in all those cases where there is no other way that leads to compensation, for example due to difficulties of proving causation, or because the applicable national system denies liability if the cultivation of GM crops was done in accordance with the applicable farming standards in force at the time. Even if that was not the case, the tortfeasor may be insolvent and uninsured. There may be no compensation fund set up yet, or it may be dried out already. If

¹⁵⁷ *M. Faure/A. Wibisana*, *Economic Analysis* (infra p. 206) no. 97. Interestingly, the British National Farmers Union, whose insurer (NFU Mutual) offers agricultural insurance, also seems to be in favour of such a regime: “Of the possible financial instruments to compensate non-GM growers against economic loss due to admixture we would favour an insurance-based approach. In principle, first-party insurance against economic loss due to admixture is the most attractive insurance option.” Cited after http://www.non-gm-farmers.com/news_details.asp?ID=747.

non-GM farmers are aware of these possibilities (which is not necessarily the case, though), they may have ample motivation to seek cover against potential losses themselves.

- 142 For practical purposes, however, first-party insurance will only be an alternative route to redress the kinds of losses under survey here if it is priced in a way that makes it attractive to potential clients. Not only must there be sufficient information about the risk available to insurers,¹⁵⁸ but also the number of participants in the pool must be big and diverse enough in order to allow a better risk differentiation. More demand typically also increases competition among insurers, which tends to put pressure on the pricing.
- 143 One possible way to make such a product more attractive to farmers would be to bundle it with other farm insurances or to include the risk in existing policies, if only by eliminating or at least reducing the current GMO exclusions.¹⁵⁹ As with other risks involving a high degree of uncertainty, cover could be subject to time limitations, e.g. per cultivation season. The awards could be capped at a certain amount correlating to the potential loss of the individual farmer, which can be determined in light of the crop cultivated, the size of the field and its environment. Expanding existing farm insurance cover would also have the advantage of existing distribution networks.

V. Compensation funds

- 144 Another option contemplated by at least some jurisdictions is compensation funds.¹⁶⁰ While the risk pool is usually smaller compared to an insurance solution, such funds have the big advantage that they can be tailor-made to the particular problems they shall address. Furthermore, such funds tend to have procedural advantages in comparison to other regimes: Since the risk group is identified in advance, also the administration of the fund can be adjusted to their specific needs. Formalities are typically easier to fulfil for the claimants, and payments can be faster than under other schemes. They are not necessarily linked to liability rules, in which case problems resulting from establishing the latter's requirements may be disregarded.¹⁶¹

¹⁵⁸ *M. Faure/A. Wibisana*, Economic Analysis (infra p. 208) no. 103.

¹⁵⁹ Cf. supra at fn. **Error! Bookmark not defined.**

¹⁶⁰ See infra C.III for examples.

¹⁶¹ Cf. the options for a "statutory redress mechanism" listed by the DEFRA Consultation Paper (Annex II/27) no. 165 ff.

- 145 Also, the range of payors who contribute to the fund is typically broader than in the classic insurance scheme. Not only those immediately concerned can be involved, but also others with a more general interest, including the State, who may otherwise not contribute to indemnifying losses (though participation in an insurance pool may be imaginable, for example by way of a State guarantee).¹⁶² However, the amount of each stakeholder's contribution is not always easy to determine: While in the insurance setting, it is the decision (and responsibility) of the insurer to determine how high the premiums must be in order to maintain a functioning system, payments into compensation funds are not always calculated according to risk assessment as defined by actuarial mathematics. Particularly the State contributions tend to follow political and/or budgetary constraints.
- 146 On the other hand, for the very same reasons compensation funds can be introduced to fill a gap in the insurance market: Even if commercial insurers fear that lack of information prevents them from properly assessing risks and therefore feel unable to offer cover, funds may nevertheless (or even just for that cause) be installed in order to at least serve as a temporary solution until the market can take over.
- 147 Compensation funds may have to operate with less financial means, though, and depending upon the pooling arrangement, the funds may be dried out even before all claims have been settled. This may happen particularly if they serve as a gap filler in the way just mentioned: If the risks are not yet entirely known or hard to predict (as otherwise insurers would step in), actual claims may by far exceed expectations. The reverse may equally be true, however: If the aggregate contributions to the fund are not spent, this means in retrospect that they were priced too high, which in turn made GM crop cultivation more expensive and consequently less competitive than necessary.
- 148 Lack of current information is not the only reason why compensation funds may have to struggle with inadequate risk assessment – depending on the political pressure that tends to precede the formation of such a risk pool, its conditions may not even entirely reflect what is already known.
- 149 Risk differentiation may also be inadequate in comparison to alternative indemnification models. Those who contribute to the fund are not necessarily those who are in control of the risk that shall be covered, or at least their contribution may not reflect the actual weight of their influence.

¹⁶² State aid restrictions impose obvious limitations to the possibilities of state involvement, of course.

- 150 Payments out of the fund may not be as predictable as insurance awards, particularly if the means of the fund are limited, or if payments are at least in part only discretionary awards. A much more serious problem arises, however, if the fund is installed ad hoc after a first loss has actually occurred.
- 151 One more fundamental argument against compensation funds is the principle of equality: Why are certain risks (and therefore certain claimants) favoured whereas others are left to the more traditional ways to obtain compensation? Indeed, one may wonder why a comparatively exotic risk such as the economic losses caused by gene flow should deserve to be addressed by a special fund as long as traffic accidents and other, much more frequent loss scenarios are not equally addressed. The reasons for establishing a fund can certainly not provide us with all the answers thereto.

VI. Ad hoc compensation

- 152 One may of course also take a more fatalistic approach and argue that there will always be a solution in case of need. One thereby typically points at the State which often steps in on a case-by-case basis, though depending upon the degree of public awareness, which may not always be very high in the cases under survey here. Other ad hoc solutions include monies and further benefits donated by individuals after a damaging event, but this is also not something very likely to happen in the scenarios envisaged here. Only large-scale or in some other way spectacular losses may qualify for such contributions by the general public, which is typically dependant upon the degree of media attention given to the case.¹⁶³
- 153 In any event, ad hoc compensation is per definition unpredictable, both with respect to likelihood and quantum, and can therefore not be considered for the ex ante planning of co-existence measures. Furthermore, the amounts paid out differ quite substantially, which leads to inequalities that must be avoided.
- 154 One special variant of an ad hoc regime is given if the GM farmer has contracted with all her conventional neighbours before getting started.¹⁶⁴ Such an agreement could include an ex ante distribution of the risk, in particular in the form of a contractual promise by the GM farmer to indemnify her neighbours

¹⁶³ But see websites like, e.g., <http://www.percyschmeiser.com> where a victim of adventitious admixture asks for donations to support his quest against a seed producer.

¹⁶⁴ The likelihood of such an agreement is not as remote as it may appear – after all, some jurisdictions require GM farmers to collect declarations of consent by their neighbours, which is a prerequisite for their permit to cultivate GM crops.

for losses they may encounter due to admixture, possibly including the costs of testing. The neighbours' claims will then become contractual, which typically improves their standing in a subsequent dispute.

VII. Links to other loss scenarios

155 While the Product Liability Directive¹⁶⁵ is focused on harm to the individual, the Environmental Liability Directive¹⁶⁶ does not apply to „traditional damage” such as personal injury, damage to private property or to any economic loss. Instead, it is concerned with harm to the environment as such, i.e. to biodiversity, water and land. Nevertheless, some Member States have already introduced environmental liability regimes that at least address losses of individuals as well. While some of them are of no relevance to this study, however,¹⁶⁷ others at least arguably also offer compensation for losses caused by GMO admixture, which not only requires that they cover the peculiar harmful events that are of concern here, but also that their definition of „environmental damage” extends to losses of such kind.¹⁶⁸

156 There is a considerable degree of overlap between the modern concept of environmental liability and the traditional concept of liability between neighbours. The responses of the various legal systems to immissions from neighbouring land described above¹⁶⁹ offer at least some guidance for developing a suitable model when deciding on how to compensate losses of the kind envisaged by this study. It is particularly helpful to look at the solutions found for the interplay between the interests of those who pursue activities that have been licensed by the authorities on the one hand and the concerns of

¹⁶⁵ Supra B.III.5(b)(ii).

¹⁶⁶ Directive 2004/35/EC of the European Parliament and of the Council on Environmental Liability with Regard to the Prevention and Remedying of Environmental Damage, [2004] OJ L 143/56.

¹⁶⁷ This is true, e.g., for Denmark (Annex I/5) no. 34; England (Annex I/27) no. 4; Poland (Annex I/20) no. 63-64; Slovakia (Annex I/22) no. 6-8; Sweden (Annex I/25) no. 3 (probably not applicable, though suitable).

¹⁶⁸ As to Finland, see C.II.2. See also Norway (Annex I/19) no. 3 express reference to Pollution Act included in Genetic Technology Act); Portugal (Annex I/21) no. 7 ff. Romania also seems to consider providing for compensation of losses arising from GMO admixture in the course of the legislation implementing the Environmental Liability Directive. Cf. also Art. 24 of the Liechtenstein Act on Genetically Modified or Pathogenic Organisms (“Gesetz vom 17. Dezember 1998 über den Umgang mit gentechnisch veränderten oder pathogenen Organismen”), which introduces strict liability for harm “to humans or to the environment” caused by the special traits of GMOs.

¹⁶⁹ Supra B.III.5(c).

their neighbours not to be interfered with in their enjoyment of their own land on the other.

- 157 Take the example of a discotheque: Running such an establishment is not something prohibited per se, quite the contrary: There is a certain interest of society to make it possible that such places can be set up and maintained. There are, however, several regulatory restrictions thereto which are designed to preserve potentially conflicting interests that may be affected by such a business. If we focus on neighbours only, there is an obvious concern that there will be disturbances from the noise generated by such an establishment, for example. This should be dealt with by building regulations and other rules of administrative law: A permit to the discotheque owner will only be issued if – among other requirements – the legally defined noise thresholds are not exceeded, which means the applicant will have to take the necessary precautions, e.g. apply proper insulation measures, so that she can meet these conditions. The neighbours may still hear sound coming from the discotheque, but it should not be louder than what the law deems reasonably acceptable under the particular circumstances, otherwise the rules are either wrong or have not been implemented properly, in which case the neighbours can seek redress.
- 158 A new highway running through a rural neighbourhood will (or at least should) not be built unless all legally defined caveats are taken care of. Apart from more general environmental concerns, there may be a certain unavoidable emission of fuel components and heavy metals from the traffic onto adjoining land, which may ultimately affect the marketability of the agricultural products produced nearby. Law has to take account not only of the overall environmental impact of such a new road, but also of the adverse effects upon the neighbours who are all known individually in advance. Licensing procedures and other administrative measures (e.g. acquisition or expropriation of adjoining land up to a certain distance from the road in exchange for compensation) should make sure that a balance can be struck (inter alia) between the interests of society at large in the planned addition to the traffic network on the one hand and those of the landowners nearby on the other. As long as the safeguards of the regulatory framework have been observed, owners of land near a new highway will not have a legally valid claim for compensation of the remaining and at least generally foreseen detrimental effects of the emissions stemming from the newly opened traffic.
- 159 An entirely different set of problems is connected to catastrophes and the losses to individuals resulting therefrom. At first sight, they seem to have very little, if anything, in common. Not only is the extent of harm in those cases dramatically different at least from the standard cases envisaged here, but also

the events causing the loss are apparently completely unrelated. After all, catastrophes are typically associated with the forces of the uncontrollable elements, whereas GMO admixture would not occur without human intervention, if only by the GM farmer. There are at least some arguments bridging this gap: The notion of „catastrophes” may well include man-made, including technological, disasters, and even natural catastrophes sometimes would not have the same impact if there had not been some very human failure multiplying the damage. When it comes to the cases we are focusing on, it may well have been the uncontrollable forces of nature without which the pollen or seed would never have spread to the neighbouring land.

- 160 The reason why catastrophes are mentioned in this context lies elsewhere, however: It is commonplace that farmers can (more or less) easily obtain insurance cover against losses caused by natural disasters. It is equally well known that there are permanent State funds ready to step in when such risks materialize, and even in countries which lack such ex ante planning, these have a considerable experience with ad hoc compensation schemes developed ex post.¹⁷⁰ Similar solutions may apply to animal or crop diseases. One may wonder, therefore, why it is possible to tie a more or less satisfactory safety net in response to fairly unforeseeable risks, but not in case someone in the vicinity wants to start growing GM crops. A quick reply may point at the fact that admixture may ultimately be unavoidable, and that the risk in the latter case is strongly influenced by geographic, climatic and other individual criteria. Also, it is simply too predictable, i.e. the risk is much more likely, if not certain, to materialize. On the other hand, the (current) impossibility to fully control gene flow does not mean that every neighbouring field will inevitably be contaminated above the 0.9% threshold (thereby presupposing that the GM farmer abides by the applicable farming standards such as ample buffer zones etc.). Considering how often certain regions are hit by destructive hailstorms, the chances of losing one’s entire crop may not be so much different. Therefore, at the bottom line lies the unpleasant question: How can we explain to non-GM farmers why they are compensated if their crops are destroyed by pattering hailstones, but not if GM pollen are spread onto their fields?

¹⁷⁰ On the various responses to catastrophes and the ways to compensate ensuing losses, see *M. Faure/T. Hartlief* (ed.), *Financial Compensation for Victims of Catastrophes* (2006).

C. Current solutions

I. Introduction

- 161 A survey of the status quo in all jurisdictions covered conveys a rather diverse and inhomogeneous picture. The lowest detectable common denominator seems to be the fact that most systems are currently on the move, either by implementing changes recently legislated, or by at least considering future amendments to their liability regimes.
- 162 Those countries which have already introduced specific legislation dealing with losses caused by GMOs have thereby taken a clear stand, either in favour of or against GM cultivation: Jurisdictions which have adopted a very strict liability regime clearly signal caution or more concern with regard to such farming technology, others which have designed compensation rather than liability schemes apparently want to ensure and facilitate actual coexistence between conventional and GM farming. Mere silence of other legislators is neutral in this respect, in particular if the legislative process is still going on.
- 163 In the following part, only those aspects of the legal systems under survey will be mentioned which have been designed specifically to address the problems of involuntary GMO admixture. General tort law issues will not be addressed since these have already been mentioned in the overview given above (B.III).

II. Special liability regimes

- 164 The first group of specific solutions include both liability regimes which have been tailor-made for our problem setting as well as provisions which merely refer such cases to another special tort law regime which would not be applicable otherwise. Some countries such as Germany, for example, explicitly assign the cases under survey here to neighbourhood or any other special indemnification rules of broader application, which in substance nevertheless renders this solution unique although it has not been designed specifically for the GMO scenario.

1. Austria

- 165 The Austrian special statutory liability regime for GMOs is modelled after the general rules on compensation for neighbourhood interferences, including a

right to obtain an injunction against GMO cultivation on adjoining land if such is not customary in the area concerned.¹⁷¹

- 166 If the claimant substantiates that some activity within the defendant's sphere was generally apt under the circumstances to cause the kind of harm she actually suffered, it is presumed that it was indeed the defendant who caused the claimant's losses,¹⁷² and if the latter cannot rebut this presumption, she will be liable without fault. If there is more than one neighbour who cultivates GM crops, they are all liable jointly and severally unless their individual contributions can be identified.
- 167 Claims arising under this special regime first need to be brought before a conciliation body, and only if a settlement cannot be reached may the claimant proceed to bring the case before a court of law.¹⁷³
- 168 Several Austrian Federal Provinces (*Bundesländer*) have introduced their own Genetic Engineering Precautionary Measures Act (*Gentechnik-Vorsorgegesetz, GtVG*), of which some include special liability rules.¹⁷⁴ However, these separate rules have to be disregarded since their enactment constitutes a clear violation of the Austrian Federal Constitution.¹⁷⁵

2. Finland

- 169 Sec. 36 para. 1 of the Finnish Gene Technology Act (GTA) holds that „damage to the environment” caused inter alia by the deliberate release of GMOs (sec. 2 GTA) shall be compensated according to the 1994 Environmental Damage Compensation Act (EDCA), which effectively replaced the tradi-

¹⁷¹ Austria (Annex I/1) no. 4.

¹⁷² Austria (Annex I/1) no. 7.

¹⁷³ Austria (Annex I/1) no. 21.

¹⁷⁴ See § 11 Burgenland GtVG, 19.5.2005, LGBl 2005/65; § 12 Carinthian GtVG, 21.10.2004, LGBl 2005/5 (available on the TRIS database at <http://ec.europa.eu/enterprise/tris/pisa/cfcontent.cfm?vFile=220030200DE.PDF>) and § 8 Salzburg GtVG, 7.7.2004, LGBl 2004/75 (available on the TRIS database at <http://ec.europa.eu/enterprise/tris/pisa/cfcontent.cfm?vFile=220030475DE.PDF>).

¹⁷⁵ Art. 10 para. 1 no. 6 of the Austrian Federal Constitution gives the exclusive power to legislate in civil law affairs to the Federation. While Art. 15 para. 9 allows the Federal Provinces to adopt civil law provisions that are necessary for the regulation of subjects within their own field of legislation, this exceptional power can only be exercised to the extent it is necessary and not in conflict with federal law. In the instant case, the Federal Gene Technology Act already provides for liability rules, conflicting provisions on the level of the Provinces are therefore not admissible (apart from the fact that the rather bizarre contents of the said provisions would violate the principle of equality if valid).

tional civil law rules on nuisance as between neighbouring land.¹⁷⁶ As the Finnish report suggests,¹⁷⁷ cases of involuntary admixture of GM with conventional or organic crops would fall under this notion of environmental harm and consequently be governed by the EDCA, which provides for strict liability of the operator of a harmful activity, but excludes minor losses. If not, the harmful consequences of admixture would be „other loss” as referred to by sec. 36 para. 3 GTA, which is to be compensated according to the general rules of tort law, though at the express exclusion of the requirement of fault.

3. Germany

- 170 The German statutory liability regime also uses the Austrian technique to shift these cases into the more general ambit of neighbourhood liability, but while Austria simply duplicated its rules into the special statute, Germany went the other way and included a pointer to the more general rule in its Genetic Engineering Act (GenTG), but coupled with substantive restrictions, which in essence brings about a strict liability regime for the cases under survey here.¹⁷⁸
- 171 § 36a para. 1 GenTG rules that any dispersal of GMOs constitutes a „significant impairment” within the meaning of § 906 BGB, which triggers the disperser’s duty to compensate the ensuing losses irrespective of fault if the impairment of the neighbouring land „cannot be prevented by measures that are economically reasonable”. According to § 36a para. 2 GenTG, „compliance with good professional practice” is by law deemed to be „economically reasonable”. Furthermore, § 36a para. 3 GenTG prevents the assessment of first-time GM farming as „usual” by excluding the possibility to thereby consider whether the fields in question are cultivated with or without GMOs.¹⁷⁹
- 172 If the actual neighbour from whose fields the GMOs spread cannot be identified, all those from whom they may have originated will be jointly and severally liable for the full loss of the victim according to § 36a para. 4 GenTG unless their individual shares can be determined.

¹⁷⁶ Sec. 18 of the 1920 Act on Neighbour Relations, Finland (Annex I/7) no. 56 (with only indoor conflicts remaining within that provision’s scope).

¹⁷⁷ Finland (Annex I/7) no. 1.

¹⁷⁸ Germany (Annex I/8) no. 39 ff.

¹⁷⁹ See also the amendments to the GenTG foreseen by the German government under [http://www.bmelv.de/nn_750598/DE/04-Landwirtschaft/Gentechnik/ Kabinettschluss-Gentechnik.html](http://www.bmelv.de/nn_750598/DE/04-Landwirtschaft/Gentechnik/Kabinettschluss-Gentechnik.html).

4. Hungary

- 173 The Hungarian Gene Technology Act determines that (inter alia) harm resulting from the incomplete segregation of GM and conventional crops shall be governed by the general strict liability rule for dangerous activities (§§ 345-346 of the Hungarian Civil Code) unless the victim had previously consented to the GM farming of her neighbour in writing (in which case traditional fault liability would apply).¹⁸⁰

5. Italy

- 174 Even though special legislative measures addressing the loss scenarios under survey here have already been enacted in Italy, they have not yet been implemented for various reasons.¹⁸¹ It remains to be seen whether the regime envisaged by the acts passed so far will ever make it to the practice stage.

- 175 Even if it does, it only addresses violations of the conduct foreseen by the applicable coexistence rules and therefore does not extend to cases of accidental admixture. Still, it would improve the position of the claimant at least insofar as she would not have to prove the misconduct of the defendant, but it is up to the latter to exculpate herself.¹⁸²

6. Norway¹⁸³

- 176 § 23 of the Norwegian Act on Gene Technology¹⁸⁴ provides for strict liability for activities that fall under its scope and includes by way of reference the liability provisions of the Norwegian Pollution Act. These rules read together allow claims based upon the mere likelihood of causation (which is not generally the case in Norwegian tort law¹⁸⁵). In addition, the link between the conduct as such and its harmful effect is presumed, so it is up to the defendant to prove that there is no causal connection between her GM farming and the economic loss of her neighbour.

7. Poland

- 177 The Polish Act on Genetically Modified Organisms of 2001 includes in its Art. 57 a special rule introducing strict liability for damage to persons, prop-

¹⁸⁰ Hungary (Annex I/11) no. 1 ff.

¹⁸¹ Italy (Annex I/13) no. 1 ff.

¹⁸² Italy (Annex I/13) no. 4, 13 ff.

¹⁸³ Norway (Annex I/19) no. 1 ff.

¹⁸⁴ See its translation at Norway (Annex I/19) no. 1.

¹⁸⁵ Norway (Annex I/19) no. 11.

erty, or to the environment caused by the contained use of GMOs or their deliberate release into the environment. As the Polish report suggests, this rule already applies to the kind of cases envisaged here since the range of risks falling under this rule is not limited. A current draft statute which is intended to replace the said Act will include an explicit reference to GM crop cultivation.

- 178 Under the present regime, only force majeure is accepted as a valid defence, as is a causal influence of either the victim herself or of a third party, though the latter two must have been the exclusive cause of the loss in order to avoid liability under the GMO Act.¹⁸⁶ Abiding by the statutory rules of good farming practice will not aid the defendant either.¹⁸⁷

8. Slovakia

- 179 In Slovakia, a 2006 Act on genetically modified agricultural production provides inter alia that the deliberate release of GMOs constitutes a dangerous behaviour within the meaning of § 420a Civil Code, thereby submitting cases arising out of an involuntary admixture to a strict liability regime of a more general kind.¹⁸⁸

9. Switzerland

- 180 The Swiss solution is unique inasmuch as it provides for a channelling of strict liability towards the person or entity which has obtained the authorisation to release the GMO into the environment. GM farmers or other players involved are therefore exempt from liability in the standard cases envisaged here. There is no presumption of causation, but the standard of proof is set at mere preponderant probability. The liability regime is considered to be a *lex specialis* to the general rules of tort law, which therefore do not apply, not even alternatively.¹⁸⁹

¹⁸⁶ Poland (Annex I/20) no. 7.

¹⁸⁷ Poland (Annex I/20) no. 20.

¹⁸⁸ Slovakia (Annex I/22) no. 2, 22, 25, 51 ff.

¹⁸⁹ Switzerland (Annex I/26) no. 7.

III. Compensation funds

1. Compensation funds in legislation or already in force

(a) *Belgium (Walloon region)*¹⁹⁰

- 181 In the Walloon region of Belgium,¹⁹¹ the scope of an already existing fund shall be expanded to also cover losses resulting from the adventitious presence of GM plants in conventional or organic crops. Payments into this fund („subscriptions“) will be collected from all producers of GM crops upon granting authorisation to do so. The extent of each applicant’s contribution shall be determined in light of existing insurance cover, if any, and according to individual risk factors¹⁹² rather than some flat fee as foreseen in other countries.¹⁹³ Also other enterprises engaged in GM agriculture, including those dealing in the transportation and storage of GM plants, will have to contribute to the fund accordingly.¹⁹⁴
- 182 The claimants will receive compensation for their economic losses (including „any other losses or costs directly linked to adventitious presence“ of GMOs) as defined by Art. 5 of the draft decree.¹⁹⁵ The government has retained the power to introduce a lower threshold in order to exclude smaller claims.
- 183 The draft very thoroughly tries to address the problems arising from the involuntary spread of GMOs as comprehensively as possible, though at the expense maybe of predictability in practical application, but certainly of administrative costs, as the contributions to the fund shall be determined on an individual risk basis, and many aspects are left open for further legislative or administrative choice.

¹⁹⁰ See Annex II/2.

¹⁹¹ There are also plans for a similar regime in the Flemish region: Belgium (Annex I/2) no. 7.

¹⁹² These risk factors include “whether or not GMPs are grown, whether or not work is carried out requiring contact with GMPs, the species grown, the surface area to be cultivated, the distance separating the genetically modified crop from land farmed by the nearest neighbouring producers, the coexistence on a farm of a GMP crop and non-genetically modified crops ..., and taking account of cultivation agreements which may have been concluded between neighbouring producers. Where a producer or operator poses no risk, the subscription shall be set at zero.” (Art. 8 Sect. 2 of the draft).

¹⁹³ Cf. Denmark at C.III.1(a) and Portugal at C.III.1(d).

¹⁹⁴ See Art. 11 of the draft.

¹⁹⁵ See Annex II/2.

*(b) Denmark*¹⁹⁶

- 184 Denmark was the first country to introduce legislation on a compensation fund for losses arising from GMO admixture. The Danish model foresees – initially for a period of five years – that GM crop growers shall pay 100 DKK per hectare of GM cultivation into a fund which shall be administered by the Danish Plant Directorate, a division of the Ministry of Agriculture. Even though there seems to be no State participation other than in the administration of the fund at first sight, there may be at least an interim financing by the State: If in one given year claims should exceed the resources of the fund, they will nevertheless be satisfied. The excess monies will come from the State, but shall be recovered in the following year when the farmers’ contributions will be adjusted accordingly.¹⁹⁷
- 185 Non-GM farmers who suffer economic losses due to involuntary admixture but without contributory conduct in their own sphere¹⁹⁸ can claim compensation from the fund for the market price difference as well as for costs incurred for testing and sampling. Organic farmers can ask for further damages due to their special situation.¹⁹⁹ A lower threshold which the losses must exceed in order to be eligible for payments under the regime is foreseen, but yet to be set. Causation need not be proven strictly, a certain closeness in space and time between a GM field and the contaminated land suffices.
- 186 While the provisions governing the compensation fund currently do not yet address cross-border losses, the Danish government is currently negotiating with authorities of the German state of Schleswig-Holstein to achieve a bilateral solution for transboundary admixture.²⁰⁰
- 187 The Danish model was submitted for state aid scrutiny and was subsequently cleared by Decision No. 568/04.²⁰¹ The main arguments raised by the Commission in support of upholding the regime were the limited duration of the present scheme, the fact that it is financed by those who are in charge of the cause (the GM farmers, though irrespective of any wrongdoing on their side), but also the present unavailability of insurance cover on the European market.

¹⁹⁶ See Annex I/5, no. 1 ff. and Annex II/5.

¹⁹⁷ See the State Aid Decision No. 568/04 on this scheme, p. 4.

¹⁹⁸ Annex I/5, no. 5.

¹⁹⁹ See Art. 9 para. 3 of the draft: Recoverable are also losses which are “a consequence of requirements for conversion of organic areas or animals due to the occurrence of genetically modified material”.

²⁰⁰ As stated by Danish representatives at the SIGMEA Workshop on Legal Approaches to Coexistence in Sheffield on April 16, 2007.

²⁰¹ http://ec.europa.eu/agriculture/stateaid/decisions/n56804_en.pdf.

*(c) France*²⁰²

- 188 The French proposal is unique inasmuch as it allows the GM farmers to choose between an individual solution (by taking out private insurance) or a collective one (by participating in a compensation fund). Ultimately, the bill envisages that all will pursue the insurance track, but as long as it is not yet open due to unavailability of suitable products on the insurance market, this temporary regime of a compensation fund (designed for five years) shall be introduced.
- 189 Apart from the GM farmers, also the seed producers and others involved in GM agriculture shall contribute to the fund. Only actual admixture beyond the 0.9% threshold will be indemnified.

*(d) Portugal*²⁰³

- 190 The Portuguese compensation fund is designed for an initial period of five years (but may be extended thereafter). It is limited to cases of adventitious presence of GMOs in conventional or organic crops above the labelling threshold of 0.9% only, while losses caused by the GM farmer's neglect of good farming practice has to be pursued on the basis of tort law.²⁰⁴ Monies are collected via a green tax on seeds (€ 4 per 80,000 seeds, Art. 6), though the fund may generate further income from investing amounts not used, but also from a 100 € fee per application, which is withheld if unsuccessful (Art. 11).
- 191 Applicants must prove causation at their own expenses (Art. 9 para. 5) and are only eligible if they have used certified seeds themselves.²⁰⁵ Claims must be delivered to the Directorate-General for Crop Production within the production (and contamination) year. As payments depend upon the means of the fund, compensation may be reduced proportionally if its resources should not suffice to pay out all approved amounts.

2. Planned variations of compensation funds*(a) Finland*²⁰⁶

- 192 In Finland a compensation fund is being discussed which would address the issues under survey here. As the concept stands, contributions shall be col-

²⁰² France (Annex I/8) no. 4 ff.

²⁰³ See Portugal (Annex I/21) no. 71 ff. and Annex II/21.

²⁰⁴ See Portugal (Annex I/21) no. 82 on details.

²⁰⁵ See Art. 8 of the draft for further eligibility criteria.

²⁰⁶ Finland (Annex I/7) no. 5-6.

lected from both the State and the GM farmers (for the latter, calculated on the basis of the size of their GM fields). Payments will only be made for adventitious presence of GMOs in non-GM crops above the 0.9% threshold, not in cases where the admixture was the consequence of some faulty conduct. Proof of causation will be alleviated inasmuch as mere probability shall suffice. However, minor losses will not be compensated under the proposed fund.

*(b) Germany*²⁰⁷

- 193 A 2004 proposal of the German *Bundesrat* envisaged a compensation fund with the participation of the State and economic stakeholders (including GM farmers, seed producers, seed importers or developers, and the biotech industry). It would have applied to cases of adventitious admixture only, and only as long as the insurance industry would be ready to offer adequate cover. Most details were left open, however. The discussion is still pending, though seed producers have already declined to participate in such a fund.²⁰⁸

(c) United Kingdom (England)

- 194 A statutory redress scheme is currently being considered by DEFRA²⁰⁹. In contrast to other jurisdictions, England is also considering to include seed producers as payors of compensation, with contributions collected either to an ex ante fund or to an ex post ad hoc regime.
- 195 Applicants would only need to prove admixture of their own crops with GMOs above the legal threshold of 0.9% without even alleging what the source thereof could be (apart from an exclusion of causes within their own sphere).²¹⁰ Compensation will most likely be limited to losses calculated on the basis of the said threshold.²¹¹

²⁰⁷ Germany (Annex I/8) no. 26 ff.

²⁰⁸ [Http://www.bmelv.de/nm_750598/DE/04-Landwirtschaft/Gentechnik/Gentechnikgesetz.html](http://www.bmelv.de/nm_750598/DE/04-Landwirtschaft/Gentechnik/Gentechnikgesetz.html). See also infra C.IV.2(b) on the alternative German model introduced by the seed producers.

²⁰⁹ Department for Environment, Food & Rural Affairs. See its consultation paper (Annex II/27) for details.

²¹⁰ United Kingdom (Annex I/27) no. 5, 11.

²¹¹ DEFRA Consultation Paper (Annex II/27) no. 140 ff.

IV. Other special solutions

1. Pure State compensation²¹²

196 According to Directive 98/34/EC, Slovenia notified a draft act on coexistence to the Commission which provides that the State shall fully compensate victims of adventitious presence of GMOs in conventional and organic crops. In the introduction to its filing, the government argues that:

„if the Act and the planned implementing regulations ... determine such measures for ensuring the coexistence of genetically modified and other crops that the adventitious presence of GMPs in other agricultural plants and products cannot arise (unless there is a failure to implement these measures correctly and consistently), the individual that cultivated the GMP in accordance with the Act cannot be held liable for adventitious presence”.²¹³

197 In such cases, therefore, the State assumes „objective liability” (Art. 29 of the Draft) and pledges to pay compensation on the basis of the market price difference, though subject to an assessment by a special committee. The remaining cases of admixture are referred to general tort law (Art. 28).

198 It is doubtful whether this draft will stand the test of state aid restrictions. In light of State Aid Decision no. 568/04,²¹⁴ one key aspect missing in the Slovenian proposal is a time limitation of the intended regime: In contrast to the Danish model, which was set up for a temporary period of five years only, the Slovenian draft statute does not foresee any such restriction. Furthermore, the compensation payments are taken out of the State’s general budget without any specific contribution from the GMO farmers or seed producers. Therefore, the mere argument that insurance is currently unavailable (which is not even raised by the Slovenian government) does not seem to suffice in order to uphold the proposed regime.

²¹² The German government is considering to offer state compensation to all damage resulting from admixture originating in GM fields where the cultivation is state-supported (field trials). See http://www.bmelv.de/nn_750598/DE/04-Landwirtschaft/Gentechnik/KabinettschlussGentechnik.html.

²¹³ Available at <http://ec.europa.eu/enterprise/tris/pisa/app/search/index.cfm?fuseaction=getdraft&inum=1305441>. See also Annex II/23.

²¹⁴ See infra C.VII.

2. Voluntary compensation schemes²¹⁵

- 199 In some Member States, stakeholders have teamed up to settle potential losses resulting from GMO admixture *ex ante*, either on a national level or at least on a local level. The Danish compensation fund model²¹⁶ also falls under this category, for example, inasmuch as it is based upon a decision-making process involving all concerned parties. In the following, some further models developed bottom-up rather than top-down will be presented.
- 200 What will not be dealt with in detail, however, is the obvious possibility for neighbouring farmers to jointly find a contractual solution for admixture problems *ex ante*. A GM farmer could enter into an agreement with her neighbours, for example, which arranges for regular testing at the expense of the GM farmer and/or includes a contractual duty for her to indemnify all potential losses (including, e.g., a definition of what kind of losses will be covered and how to assess them). Such individual solutions can hardly be anticipated by the legislator, however, unless farmers are required to submit evidence of such an arrangement with their neighbours as a prerequisite to obtain a permit to proceed with GM cultivation.

(a) *The Netherlands*

- 201 A unique solution from a European perspective can be found in the Netherlands.²¹⁷ „According to good Dutch tradition,”²¹⁸ all stakeholders²¹⁹ have agreed upon a „Covenant Coëxistentie”²²⁰ and thereby regulated problems of adventitious presence of GMOs in non-GM crops internally, even though parts of this contract are complemented by legislative and regulatory acts.²²¹ This industry agreement regulates GM farming and foresees compensation to all who suffer losses despite adherence of their peers to these principles.²²² Their direct economic damage (including loss of turnover as well as costs of

²¹⁵ See also the options considered in the DEFRA Consultation Paper (Annex II/27) no. 162-164.

²¹⁶ *Supra* C.III.1(b).

²¹⁷ The Netherlands (Annex I/18) no. 48-50; Annex II/18.

²¹⁸ The Netherlands (Annex I/18) no. 48.

²¹⁹ Biologica (Dutch Organic Farming Association), LTO Nederland (Dutch Organisation for Agriculture and Horticulture), Plantum NL (Dutch Plant-Breeding Association) and Platform Aarde, Boer en Consument (Dutch Land, Farmers and Consumers).

²²⁰ Agreement on Coexistence in the Primary Sector, November 2004.

²²¹ See, e.g., the Regulation on the Coexistence of Crops issued by the Dutch Commodity Board for Arable Farming (available on the TRIS database at <http://ec.europa.eu/enterprise/tris/pisa/app/search/index.cfm?fuseaction=getdraft&inum=1255325>).

²²² Violations of these rules and the consequences thereof fall outside the scope of this model and are left to tort law.

testing) shall be compensated by a compensation fund which is yet to be established. Payments into this fund shall come from the biotech industry, the seed producers, all farmers (including organic growers), furthermore from those who process the products of GM agriculture. Initially also the State will contribute. This model ensures that GM farmers who abide by these practice rules are immune from liability in tort, whereas violations of said provisions have to be dealt with by the law of delict and thereby fall out of the contractual regime.

(b) Germany

- 202 Another innovative project to achieve coexistence was launched in Germany in 2005.²²³ With the support of Monsanto and Pioneer, a feed producer (Märka Kraftfutter GmbH) guarantees to buy the entire maize production of farmers who grow maize conventionally within a distance of 100 meters of GM maize fields, irrespective of potential admixture. They also assume the responsibility of testing this maize for GM presence, which clarifies whether the maize has to be labelled. The GM farmers participating in this model have to contractually commit themselves to adhere to the farming standards established by the seed producers.²²⁴

V. Costs of testing

- 203 In virtually all jurisdictions, the claimant has to finance the testing of her crops in advance, but may claim these costs ultimately from the defendant if the latter's liability is confirmed before a court of law.²²⁵ It is a mere technical matter whether these costs are considered to be additional losses (which have to be added to the tort claim) or procedural costs (in which case they are adjudicated separately).²²⁶ However, it is equally clear that the fees paid for testing where results turn out negative can generally not be recovered.

²²³ Germany (Annex I/9) no. 28. On the results of the first phase of this model 2005, see http://www.transgen.de/pdf/erprobungsanbau/ergebnisse_maerka-modell.pdf.

²²⁴ Cf. the SCIMAC voluntary redress "charter" presented by the DEFRA Consultation Paper (Annex II/27) no. 162-164, which builds upon the same concept.

²²⁵ Austria (Annex I/1) no. 51; Finland (Annex I/7) no. 9; France (Annex I/8) no. 35; Germany (Annex I/8) no. 63; Greece (Annex I/10) 82; Ireland (Annex I/12) no. 60; Lithuania (Annex I/15) no. 35; Luxembourg (Annex I/16) no. 65; Malta (Annex I/17) no. 10 (but wide discretion of courts in apportioning costs); Switzerland (Annex I/26) no. 64; United Kingdom (Annex I/27) no. 66.

²²⁶ Cf. Estonia (Annex I/6) no. 10; Finland (Annex I/7) no. 9; the Netherlands (Annex I/18) no. 47, 51; Portugal (Annex I/21) no. 127-128.

VI. Cross-border issues

- 204 GMO admixture does not stop at national borders, which raises questions as to whose court will be competent to adjudicate over the case, and which law it shall apply to solve it. After all, in a cross-border case, there are at least two jurisdictions which compete to offer the applicable law, and choosing one of them may be decisive for the outcome of the case.
- 205 These issues are irrelevant when it comes to compensation funds inasmuch as their statute will typically decide about procedure and geographical scope autonomously. It is well imaginable, however, that the protective scope of such funds remains limited to their own respective jurisdictions, thereby excluding foreign claimants from access to payments. Current data available does not yet allow predictions on how these issues will be handled by the redress schemes that have already been conceived.

1. Jurisdiction

- 206 The most important body of law governing questions of jurisdiction for the Member States of the European Union are the following instruments:
- the Brussels Convention²²⁷ of 1968;
 - the Lugano Convention,²²⁸ which was signed twenty years later and was intended to offer the EFTA countries as well as other non-members of the EU the possibility to join a regime almost identical to the earlier Brussels Convention;²²⁹
 - and finally (and nowadays most importantly) the Brussels I Regulation of 2001,²³⁰ which was designed to replace the afore-mentioned conventions.²³¹

²²⁷ Convention of 27 September 1968 on jurisdiction and the enforcement of judgments in civil and commercial matters, [1972] OJ L 299/32.

²²⁸ Convention of 16 September 1988 on jurisdiction and the enforcement of judgments in civil and commercial matters, [1988] OJ L 319/9.

²²⁹ Switzerland and Poland (at the time not yet an EU member) have joined this convention, whereas Liechtenstein is the only EFTA state which did not accede to this regime. The Lugano Convention therefore now applies if the defendant is domiciled in Iceland, Norway, or in Switzerland.

²³⁰ Council Regulation (EC) No 44/2001 of 22 December 2000 on jurisdiction and the recognition and enforcement of judgments in civil and commercial matters, [2001] OJ L 12/1.

²³¹ Denmark was not bound by the Regulation for lack of participation in Title IV of the EC Treaty, but has agreed to effectively apply the regime of the Regulation as it stands sub-

207 The following provisions of the Brussels I Regulation (and only that regime shall be dealt with in the following section)²³² may govern the kind of claims we are concerned with in this study:

Art. 5: „A person domiciled in a Member State may, in another Member State, be sued ...

3. in matters relating to tort, delict or quasi-delict, in the courts for the place where the harmful event occurred or may occur; ...”

Art. 22: „The following courts shall have exclusive jurisdiction, regardless of domicile,

1. in proceedings which have as their object rights in rem in immovable property or tenancies of immovable property, the courts of the Member State in which the property is situated. ...”

208 For the kind of cases under focus here, only Art. 5 para. 3 is relevant, even though Art. 22 could well be applied to the above-mentioned cases of private nuisance, to the extent a jurisdiction considers these as property actions, arising not from a delict but from the right in rem of the landowner whose crops have been contaminated. However, in a recent ruling the ECJ has clearly cut off that path by stating that such claims are not governed by Art. 22, which leaves them within the domain of Art. 5 para. 3.²³³

209 The „harmful event” in Art. 5 para. 3 is interpreted extensively by the ECJ, including not only the place where the damage occurred, but also the location where the harmful cause was set, thereby effectively allowing the claimant to choose between the two (ubiquity principle). Therefore, if GM seed from a field in country A is blown onto land in country B causing damage, the victim can file a tort claim in either country at her own choice.²³⁴

ject to certain exceptions and reservations. See the Agreement between the European Community and the Kingdom of Denmark on jurisdiction, recognition and enforcement of judgments in civil and commercial matters, [2005] OJ L 299/62.

²³² The corresponding provisions of the Brussels Convention (Art. 5 para 3, Art. 16 para. 1) and the Lugano Convention (Art. 5 para 3, Art. 16 para. 1 lit. a) contain almost the identical language, the only significant difference being a lack of explicit reference in Art. 5 para. 3 to events which have not yet occurred, but “may occur” in the future.

²³³ *Land Oberösterreich v. ČEZ*, ECJ 18.5.2006 C-343/04. Due to the timing of the facts underlying that case, the Brussels Convention and its Art. 16 were at stake (cf. fn. 232), but in light of the identical wording and underlying substantive motivations, it is clear that this ruling correspondingly applies to the new Regulation as well.

²³⁴ *Bier v. Mines de Potasse*, ECJ 30.11.1976 C-21/76, [1976] ECR 1735: A French company polluted the Rhine water, causing harm to a flower producer in the Netherlands. The Court held that the victim could sue both in the Netherlands (where the damage oc-

- 210 As an exception, however, this flexibility is restricted if compensation is sought for pure economic loss only: In such cases, the claimant cannot sue at the place of her domicile simply because her assets which have been reduced are centred there if the effect of the harmful conduct has already had direct consequences in another country.²³⁵
- 211 Furthermore, consequential losses in a country other than where the direct harm occurred do not justify the jurisdiction of courts at that additional location.²³⁶ Therefore, the fact that the market of the conventional farmer whose fields in country A were contaminated lies in country B (so that her losses effectively „occur“ there) does not shift jurisdiction onto the latter.

2. Choice of law

(a) *Admixture cases under current conflict of laws regimes*

- 212 At present, jurisdictions are divided when it comes to determining which law applies to a cross-border tort case. Even though all adhere to the so-called *lex loci delicti commissi*, it is exactly under dispute where the delict was committed, which comes down to the same issue as just discussed at the occasion of the court's jurisdiction: Is it the place where the harmful event was completed (i.e. the cause was set),²³⁷ or is it the location where the damage occurred instead?²³⁸ Some opt for either the former or the latter, others allow the court²³⁹ and/or the claimant to choose,²⁴⁰ yet others seem to be internally undecided.²⁴¹

curred) as well as in France (where the cause was set, i.e. the water discharged into the river).

²³⁵ *Kronhofer v. Maier et al.*, ECJ 10.6.2004 C-168/02, [2004] ECR I-6009. The scope of this ruling is often overstated by claiming that the occurrence of pure economic loss in general does not suffice. This was not the issue before the court, where the plaintiff had lost monies that he had entrusted to the defendants in a different country for speculation (which obviously failed). In *Kronhofer*, the pure economic loss had already occurred elsewhere, and the Court only rejected jurisdiction at the plaintiff's domicile where the loss ultimately (but indirectly) lay.

²³⁶ *Dumez France v. Hessische Landesbank*, ECJ 11.1.1990 C-220/88, [1990] ECR I-49.

²³⁷ Austria (Annex I/1), no. 54; Latvia (Annex I/14) no. 23; Poland (Annex I/20) no. 101; Portugal (Annex I/21) no. 141 ff. (subject to exceptions); Spain (Annex I/24) no. 78; Sweden (Annex I/25) no. 51 (but exception if Nordic Convention applies); Switzerland (Annex I/26) no. 69 (though place of damage if foreseeable); United Kingdom (Annex I/27) no. 69.

²³⁸ Austria (Annex I/1), no. 52; Luxembourg (Annex I/16) no. 68; Malta (Annex I/17) no. 37.

²³⁹ Czech Republic (Annex I/4) no. 98 ff.; France (Annex I/8) no. 40.

²⁴⁰ Estonia (Annex I/6) no. 59; Finland (Annex I/7) no. 62; Germany (Annex I/8) no. 65; Hungary (Annex I/11) no. 48; Italy (Annex I/13) no. 51; Lithuania (Annex I/15) no. 37;

In Austria, for example, the connecting factor for the general rule applicable to tort law conflicts is the harmful conduct, whereas the special rule for GMO liability focuses on the place where the damage occurred.²⁴²

- 213 A separate analysis may apply if the claim is based upon the law of property, which is an alternative path to compensation in some jurisdictions.²⁴³ If the applicable rules of conflict of laws follow a structural analysis rather than a functional approach, the *lex rei sitae* will govern, which means that the connecting factor is the location of the land that is protected.²⁴⁴ In most cases, this will coincide with the place where the damage occurred, so the applicable law will be the same in those jurisdictions whose tort law conflicts rule at least allows focusing on that factor.²⁴⁵

(b) Admixture cases under the draft Rome II Regulation

- 214 The differences with respect to the choice of the applicable tort law will hopefully be reduced once the Rome II Regulation has entered into force, which shall fill the present gap in European law with respect to the conflict of laws in extracontractual relations. A draft was published in 2003,²⁴⁶ and at present Parliament is discussing a Council Common Position²⁴⁷ in its second reading.
- 215 The draft as it stands²⁴⁸ proposes as its general rule the *lex loci damni*, which is a variant of the *lex loci delicti commissi* focussing on the occurrence of the damage rather than its cause. The formula used to solve the mentioned differences between the Member States in this respect reads:

„Art 4. (1) Unless otherwise provided for in this Regulation, the law applicable to a non-contractual obligation arising out of a tort/delict shall be the law of the country in which the damage occurs irrespective of the country in which the event giving rise to the damage occurred and irre-

Norway (Annex I/19) no. 52 (for inner-Scandinavian cases). See also Slovenia (Annex I/23) no. 52.

²⁴¹ E.g. Denmark (Annex I/5) no. 59; Greece (Annex I/10) no. 90-92; Norway (Annex I/19) no. 55. See also Belgium (Annex I/2) no. 66.

²⁴² Austria (Annex I/1) no. 52.

²⁴³ Supra B.III.5(c) (in particular no. 76).

²⁴⁴ See, e.g., Austria (Annex I/1) no. 53; Germany (Annex I/9) no. 70; Portugal (Annex I/21) no. 146; cf. UK (Annex I/27) no. 69.

²⁴⁵ Supra at fn. 238 and 239-**Error! Bookmark not defined.**

²⁴⁶ Proposal for a Regulation of the European Parliament and the Council on the Law Applicable to Non-Contractual Obligations (“Rome II”), COM(2003) 427 final, 22.7.2003 (hereinafter “Rome II Draft”).

²⁴⁷ Common Position (EC) No 22/2006, 25.9.2006, 2003/0168 (COD).

²⁴⁸ The wording is taken from the Common Position (fn. 247).

spective of the country or countries in which the indirect consequences of that event occur. ...”

- 216 In light of the ECJ’s position taken with respect to jurisdiction,²⁴⁹ it is most likely that this rule will also be interpreted to govern compensation claims based upon property law rules, since the same policy reasons apply.
- 217 In contrast to the European Parliament,²⁵⁰ the Council insists on a special rule for individual environmental damage, which reads:

„Art. 7. The law applicable to a non-contractual obligation arising out of environmental damage or damage sustained by persons or property as a result of such damage shall be the law determined pursuant to Art. 4(1), unless the person seeking compensation for damage chooses to base his or her claim on the law of the country in which the event giving rise to the damage occurred.”

- 218 Depending upon the definition of „environmental damage,”²⁵¹ at least some of the cases under survey here might fall under this special rule rather than the general clause, which means that the conventional or organic farmer could choose whether to apply the law at the location of their land on deciding their claims or instead the law governing at the site of the GMO field. If Art. 7 were to become the law, but would not apply to these cases due to a different definition of environmental harm, the general rule of Art 4 para. 1 reduces the focus to the place where the loss occurred, i.e. the situs of the non-GM land where the admixture with conventional crops took place.

VII. State aid issues

- 219 While it is beyond the scope of this study to analyze and evaluate whether and to what extent the financial participation by a Member State in a national compensation scheme might constitute a state aid within the meaning of Art. 87(1) of the EC Treaty, the issue as such shall be raised in this context nevertheless, if only as a pointer to a further set of problems.

²⁴⁹ Supra at fn. 233.

²⁵⁰ It is entirely inexplicable why Parliament sees no need for a special rule on environmental harm, even less so as the Council’s proposal would be in favour of the same victims that Parliament claims to protect.

²⁵¹ In this respect, the criticism raised by Parliament is justified: That term indeed calls for an express definition which is currently lacking.

220 The Danish compensation fund system described above²⁵² has already been scrutinized by the Commission.²⁵³ The Commission started its assessment of the scheme by finding that the measure was attributable to the State since the fund was financed with an obligatory fee whose use is determined by the State. It was also clear that compensation paid by the fund would benefit both non-GM farmers (by enabling them to collect compensation they would otherwise not have received) and GM farmers (who can spread the risk of individual liability among others who do the same). Since the measure would benefit certain undertakings, it was also considered selective. The measure was therefore held to constitute aid within the meaning of Art. 87(1) EC Treaty. The provisions concerning aids to compensate losses in agricultural production²⁵⁴ were not applicable because the damage in question could not be regarded as an exceptional occurrence within the meaning of the Guidelines. However, in light of the clear EU objective to promote coexistence, the fact that GM farmers finance the scheme and in the absence of suitable insurance products on the market which could substitute the measure envisaged by Denmark, the Commission was convinced that it was necessary as a temporary measure until the insurance industry was in a position to take over the risk management function. It was therefore concluded that the measure contributed to the structural development of agricultural production and was therefore considered to be compatible with the common market according to Art. 87(3)(c) EC Treaty.

221 As a rule of thumb, therefore, one could conclude that the Member States under certain conditions may promote coexistence by setting up and financing compensation schemes whose purpose it is to alleviate the concerns of farmers who want to continue conventional or organic agriculture but fear that they may suffer losses if one of their colleagues should decide to switch to cultivating GM crops.

222 The aspects of the Danish regime the Commission deemed particularly crucial in order to qualify for an exception under Art. 87(3)(c) EC Treaty were that compensation was possible even in cases where none could be claimed under civil law, as well as the temporary character of the scheme, limiting its validity in time to the moment when suitable products are available on the insurance market. This possibility is not as illusory as it may seem: After all, one of the major obstacles for insurers in their bid to offer adequate products is the lack of experience with certain risks. An alternative compensation model that

²⁵² *Supra* C.III.1(a).

²⁵³ State Aid Decision no. N 568/04.

²⁵⁴ See the Community Guidelines for State Aid in the Agriculture and Forestry Sector 2007 to 2013, [2006] OJ C 319/1, p. 17 ff.

gets GM farming started on a broader scale will allow the market to gain such experience, which may be decisive for the insurance industry.

- 223 Another aspect of the Danish model stressed by the Commission was the fact that the scheme shall ultimately be financed by the GM farmers themselves. This raises doubts as to whether some other possible involvement of the State may be looked at equally favourably, for example a state guarantee backing up an insurance scheme. This question would have to be assessed by weighing the benefits of the scheme to sectoral developments against possible distortion of competition.

D. Options for the future

I. Range of desirable solutions

- 224 The current state of the law in all Member States already shows such a wide range of options that hardly any further variety is imaginable. Anything from traditional fault liability to no-fault compensation schemes can already be found. These are all per se at least at first sight desirable, if only for the very jurisdiction that introduced it.
- 225 In light of this undeniable diversity, one is inclined to ask whether it should be levelled out by harmonizing the laws at least with respect to certain aspects of such cases. An answer thereto will be sought in the following section.
- 226 Before this, let us have a quick glance at some of the key issues that need to be resolved if a uniform compensation model were to be developed,²⁵⁵ without prejudicing for the time being whether this is feasible and/or desirable at all.²⁵⁶ The list will not (and cannot be) comprehensive, as the problems are too manifold.²⁵⁷ The items chosen shall merely give some idea of the complexity of the decision-making process that is inevitably needed for such a task.
- 227 Some aspects would have to be addressed irrespective of the type of regime chosen. One key question would be of course whether all economic losses of

²⁵⁵ See also the checklist *supra* B.II.3.

²⁵⁶ See in particular *infra* D.II.

²⁵⁷ First-party insurance, ad hoc and other compensation regimes will be disregarded during that brief overview, but obviously need to be considered as further options with peculiar problems.

non-GM farmers shall be compensated or just parts thereof. This could be split into subtopics such as the importance of the 0.9% (or any other applicable) threshold (compensation only in case of a higher degree of admixture?)²⁵⁸ or the desirability of caps and/or thresholds (which, if answered in the affirmative, necessarily leads to the follow-up question of where exactly to set these limits)²⁵⁹.

- 228 The biggest challenge for all compensation regimes is to define the trigger for payments, and this invariably includes an analysis of causation. How can this link be established, and who has got to prove it? The latter question is easier to answer – it is hard to imagine that any system would relieve the claimant entirely of that task. However, from that decision onward, the situation gets less clear: What percentage of probability must the claimant prove (the range going from 51% to 100%), and are there any ways to soften this duty, in particular by way of factual presumptions or even a reversal of the burden of proof after a primary fact has been established?²⁶⁰
- 229 If the political preference should be in favour of resolving disputes between neighbouring GM and non-GM farmers in tort law proper, one would need to choose between a fault or strict liability model or any of the various hybrids between those two extremes, as well as a broad range of details. These choices would need to be made with an eye to the insurability of such liability risks.
- 230 If, on the other hand, a compensation fund were to be recommended as a standard solution for all Member States, the various options to finance the fund need to be thoroughly analysed (including the manifold ways to adjust the fund to changing needs over time), as well as its administration (both with respect to the institution in charge as well as the procedure). One crucial choice will concern access to the fund for those whose loss was caused by the fault of another (and who therefore could claim compensation under tort law). At present, the scope of most funds is limited to cases of accidental admixture only. However, it is not entirely clear why those who seem to deserve easy access to compensation better than others are for that reason excluded.²⁶¹ After all, this would alleviate them of the risk of the tortfeasor's insolvency and shift it to the fund (which in turn could pursue the claim upon subrogation). On the other hand, awarding damages for negligently or even intentionally disregard-

²⁵⁸ See also *infra* no. 266.

²⁵⁹ See the critical analysis of financial limits by *M. Faure/A. Wibisana*, *Economic Analysis* (*infra* p. 202 ff.) no. 89-91.

²⁶⁰ See *supra* B.III.4(c).

²⁶¹ See also Finland (Annex I/7) no. 8.

ing good farming practice under the regular tort system may provide incentives to abide by such rules, even though these could be mirrored in a compensation fund scheme by way of a recourse action against GM farmers who were at fault when causing the loss covered by the fund. Another feature of the fund which would need to be decided upon concerns its borderlines to the insurance market, which can be pinned down to the question whether the fund shall be set up only temporarily or on a permanent basis.²⁶²

II. To harmonize or not to harmonize?

- 231 Typically, those countries who opted in favour of specific legislation did so in order to make access to compensation easier and to shift the risks of GM farming onto those who decide to go ahead with it. Other countries have (whether purposefully or not) decided to maintain their traditional tort law rules with all the complications indicated earlier.
- 232 Is such national diversity really desirable, or do we have to strive for harmonization in this field?²⁶³ Harmonization as such can never justify itself, though – the existence of differences between the Member States per se is not sufficient reason to interfere with their national legal systems. After all, the differences between them may at least in part be triggered by diverse factual backgrounds, be it agro-economic, climatic, market, or any other factors which do not change simply because the legal response thereto is altered.

²⁶² As the economic analysis shows, a merely temporary fund is preferable as long as the private insurance market does not offer adequate cover: *M. Faure/A. Wibisana*, Economic Analysis (infra p. 209 ff.).

²⁶³ The EESC (fn. 105, 4.7) has already made up its mind:
 “4.7 Civil liability provisions must fully cover compensation for financial damages
 4.7.1 The reproductive capability of GMOs and the fact that their unwelcome presence can cause financial damage to those affected makes it necessary to adapt the civil liability provisions in Member States to ensure that such damages are covered.
 4.7.2 The civil liability provisions should ensure that those involved are liable only to the extent that they are able to prevent possible damages. Liability for keeping to good professional practice and any further expenses of the supplier of a GMO should rest with the users of that GMO. Conversely, the liability for damage occurring despite good professional practice being observed should rest with the supplier. If appropriate, the Community rules on legal liability should be adapted accordingly.
 4.7.3 Suppliers or users of GMOs should be able to prove their ability to cover, whether through insurance or by similar means, any liability for damages that arise from their activities.”

- 233 The problem cannot be addressed, however, before resolving the fundamental question whether harmonization is feasible at all. If it were impossible, there is no point in deciding whether we want it or not.

1. Degree of harmonization

- 234 One key question to be asked is how far a possible harmonization program should go. Obviously, this question is inseparably intertwined with the following ones that focus on the feasibility and desirability of the various options. A smaller degree of harmonization may be easier to achieve (both technically and politically) than the replacement of all existing redress schemes with a uniform model imposed from above. Nevertheless, the degree of interference with the national legal systems as they stand is per se rather policy-neutral, which is why these possible solutions will be addressed at this point.
- 235 To begin with, it is clear that there is no one-stop solution in response to the diversity of the laws of the Member States. Apart from no action at all, which is certainly one option that should not be disregarded just because it happens to be the solution with least activity at Community level, the other extreme at the opposite end of the range would be complete harmonization of all aspects of compensating losses arising from adventitious presence of GMOs in non-GM crops. The latter would require an exclusive regime to be set up which does not allow any deviations or alternative paths on the side. So if, say, the introduction of a European compensation fund were the model of choice, any alternative action in classic tort law would need to be ruled out entirely to the extent they overlap with the claims covered by the unified regime. This would presuppose that the latter is conceived in a way that allows no way out, which in turn means that it must address all aspects of the claim as precisely as possible, from merely administrative points such as the procedure of filing and handling claims to the more fundamental question of financing, from a description of the requirements for compensation to the extent of compensation, how multiple claims are dealt with, how the regime handles cross-border issues (and also in this respect, forum shopping must be ruled out), and so on. However, one should note from the outset that previous efforts at European level to achieve complete harmonization in the field of tort law have invariably proven to be impossible to realize.²⁶⁴
- 236 A lesser degree of harmonization could be achieved by identifying a compensation model for all Member States which leaves certain aspects open for them to regulate individually. Depending on which points fall under the latter category, such a partial solution can be more or less far-reaching. As a rule of

²⁶⁴ Cf. *infra* at no. 247.

thumb, however, the more that is left for individual solutions, the less desirable such a model is from an EU perspective if uniformity is the ultimate goal.²⁶⁵ While it will inevitably lead to different treatment of similar cases in the Member States, this may not necessarily be in conflict with the intention to proceed with harmonization in the first place. After all, some aspects of the claims will be handled in a uniform way, and a political assessment of the problem may lead to the conclusion that only those aspects are deemed crucial and worthy of harmonization. Identifying these elements will be critical, however. One (but certainly not the only) key aspect will be how to deal with the requirement of causation, for example, which is an essential component of any imaginable compensation mechanism.

237 A very mild form of harmonization (if at all) would be to offer a merely optional model for the Member States to consider without any need for them to implement it. It is questionable, however, whether such a solution deserves that name, since it will most likely not abolish the differences between the various regimes existing altogether, though maybe some Member States may indeed adjust their systems accordingly. From a cost-benefit-analysis, one may wonder, however, whether establishing such a regime is really needed in light of the fact that the various options currently chosen by the Member States already constitute a full catalogue of possible schemes, and the pros and cons of each of them are clearly visible for those jurisdictions which are considering a re-evaluation of their own system.

238 This has to be differentiated from setting a minimum standard that shall apply throughout Europe.²⁶⁶ The policy choice could be, for example, that non-GM farmers deserve compensation for at least the immediate harmful effects of contamination, and that it should be more or less readily available to them. Further conditions or aspects could be included in defining that minimum standard. This would immediately change the status quo in light of the fact that some legal systems do not yet reach that benchmark. However, also a common minimum standard is not justified per se – again, one needs to ask whether such an interference, even if less substantial than others listed here, is necessary and desirable from a political point of view.

²⁶⁵ Cf. *J. Smits*, *European Private Law: A Plea for a Spontaneous Legal Order*, in: *D. Curtin et al.* (ed.), *European Integration and Law* (2006) 55, 62: “Another reason for the ineffectiveness of the *acquis* is that almost all private law legislation aims at minimum harmonization. This implies that the Member States can establish more stringent provisions to protect consumers, going beyond the directive itself. The effect of this is that companies are still confronted with divergent legislation among the Member States and may still be deterred from doing business elsewhere.”

²⁶⁶ But see fn. 265.

- 239 An alternative target that could be set would be that the Member States should regulate liability in such a way as to facilitate insurability of such risks, but leave the tools to reach that goal up to them to choose. Denmark has, for example, conceived its compensation fund regime in order to temporarily fill a gap until insurance is available, which at the same time may indeed be the trigger which makes the risk calculable and thereby insurable.²⁶⁷
- 240 Yet another option could be to conceive a system which only deals with cross-border contamination. However, the key argument against a similar plan with respect to environmental liability was that a „transboundary only system would ... lead to subjects being treated completely differently within one Member State, since some, who happen to be involved in a case of transboundary damage, could be liable under the EC transboundary only regime, whereas others, who are conducting the same activity in the same country and causing similar damage, could walk free if the national regime happened not to cover such a case”.²⁶⁸ For lack of equal treatment, therefore, this option certainly deserves the label „least desirable” within the range of alternatives just mentioned, though the choice of either one of them will invariably discriminate against other problems of a similar kind that have not yet been addressed by Community action.²⁶⁹
- 241 A cross-border redress scheme as just considered has to be differentiated from the question of how Member States respond to cross-border issues in the context of their national regimes. While the former solution would offer a substantive answer to the claimants, another way to strive for harmonization would be to merely tackle the jurisdiction and conflict of laws issues. However, both of the latter concerns either have already been answered²⁷⁰ or are about to be solved²⁷¹ on a more general level, so coming up with a separate scheme would require very fundamental justification.

2. Feasibility of harmonization

- 242 Technically speaking, anything goes. As long as the Community’s authority to legislate in this field is not considered to be limited with respect to the action envisaged, possible measures can include the full range of options just listed.

²⁶⁷ See supra no. 187 and 222.

²⁶⁸ White Paper on Environmental Liability, COM(2000) 66 final, 9.2.2000, 25-26 (available at http://ec.europa.eu/environment/liability/white_paper.htm).

²⁶⁹ Cf. infra no. 268.

²⁷⁰ Supra C.VI.1.

²⁷¹ Supra C.VI.2.

- 243 However, from a legal policy perspective, the answer to the question whether one of those solutions really helps to reach the desired goal is not as straightforward, particularly not in light of the fact that one always needs to assess what side effects any measures may have on the legal systems of the Member States, and whether these are so critical that the intended action needs to be reconsidered.
- 244 The starting point for this inquiry is whether the Member States are prepared for the kind of Community action that is envisaged.
- 245 In light of the broad range of plant varieties, each with a peculiar risk of gene flow, the insurance report doubts „that one comprehensive insurance solution can be found for GMO crop.”²⁷² However, it may well be that this biological diversity is still easier to overcome than the differences between the legal systems.
- 246 Throughout history, European jurisdictions have developed a different claims culture and a different compensation culture. Some are more open towards the idea of national solidarity and collective risk-sharing, others still put considerable emphasis on a more individualistic approach. Seen from a distance, all tort laws at least seem to pursue the same goal, and all apparently use comparable tools. The closer the look one takes, however, the further apart they are, and it is the details that may well make the difference.²⁷³ All jurisdictions require some causal link between the harmful conduct and the loss, but the way to convince the judge thereof is longer and more difficult in some countries than in others. All offer compensation if someone is hurt through the fault of another, of course, but some let the claimant prove it, others presume it and let the defendant refute it. Some jurisdictions are more open towards strict liabilities, others are very restrictive.
- 247 These differences need to be considered and taken seriously if Community action is to be taken in this field. Otherwise, the so-called harmonized regime will lead a life of its own, either hardly applied in practice at all due to better options in the internal laws of the Member States,²⁷⁴ or, if effective, causing

²⁷² I. Ebert/Ch. Lahnstein, *GMO Liability: Options for the Insurers* (infra p. 219) no. 13.

²⁷³ See supra B.III.

²⁷⁴ Cf. the fate of the Product Liability Directive, where the second report on its application more than fifteen years after its adoption had to admit “that only little information about the application exist and statistics, if available, are not complete“. COM(2000) 893 final, p. 8. The third report is much more optimistic, though not quite understandably why: See COM(2006) 496 final, p. 6.

difficulties due to frictions with existing national concepts.²⁷⁵ After all, the use of at least some basic general concepts such as damage and causation seems to be inevitable for any imaginable harmonized redress mechanism, and in light of existing dissimilarities between the Member States even at this fundamental level, either differences in applying the desired uniform standard or inconsistencies on the national level with local standards seem unavoidable. Attempting to find a uniform standard for indemnifying losses caused by gene flow may thereby risk an admixture of tort law regimes even within one single Member State. The outcome of academic efforts to define a standard for harmonizing tort law as a whole such as the „Principles of European Tort Law“²⁷⁶ needs to be consulted in this respect in order to avoid problems of the kind experienced with previous attempts to interfere with national tort laws, carried through with an eye solely to the narrow focus of the matter.²⁷⁷

248 If we look at the present-day solutions to be found in the Member States, at least some of them seem to be the unique results of a unique legal, social, and economic environment, which as such is not transferable to other Member States.

249 Just think of the Dutch „Convenant Coëxistentie“,²⁷⁸ which per se is certainly a very reasonable model,²⁷⁹ but it is hard to imagine how this could be taken over by any other country. As the country report rightly states, achieving solutions in a bargaining process of the stakeholders is a „good Dutch tradition“,²⁸⁰ but it is hard to predict whether such a tradition can be initiated elsewhere as well. Too many factors come into play here, including (but not limited to) the market situation, the structure of the insurance industry, the interplay of the government with interest groups and the like.

250 The optimistic statement at the beginning therefore has to be revised if the feasibility of harmonization is assessed in a more differentiated way. Full harmonization is not feasible at all, unless a uniform redress scheme is intro-

²⁷⁵ Cf. *J. Smits* (fn. 265) 67: “Harmonization means that European and national elements within one legal system form a consistent whole and, if there is no smooth cooperation between the two, it is hard to categorise harmonization as successful.”

²⁷⁶ *European Group on Tort Law*, Principles of European Tort Law (2005). See also <http://www.egtl.org/Principles>.

²⁷⁷ The problems of the Product Liability Directive, for example, are evidenced by the three reports thereupon issued so far (cf. fn. 274) and the ECJ rulings in recent years, e.g. C-52/00, *Commission v. France* [2002] ECR I-2553, and C-154/00, *Commission v. Greece* [2002] ECR I-3879.

²⁷⁸ *Supra* C.IV.2(a).

²⁷⁹ See *M. Faure/A. Wibisana*, Economic Analysis (infra p. 169) no. 10, on economic arguments in favour of contractual solutions.

²⁸⁰ The Netherlands (Annex I/18) no. 48.

duced which excludes all detours, backdoors and alternative ways to compensation in the Member States. Even if that should be the solution envisaged, one needs to bear in mind that any such singular regime would disrupt the harmony of the Member States' legal systems internally, which at least indirectly will also have a bearing at the European level. Any less ambitious degree of action at Community level will not lead to harmonization in the narrower sense of that word, as the implementation and subsequent application of such an effort will not necessarily lead to uniform solutions. However, that per se shall not be seen as a deterrent to interfering with the existing situation, it just needs to be borne in mind in order to correctly assess the impact of any such plan when deciding upon it.

3. Desirability of harmonization

(a) Is the internal market really affected by such diversity in any negative way?

- 251 The impact of local compensation schemes on the internal market is often overstated, as is the preventive effect of a tort law rule in general, which plays the key role in this respect, even though the two need to be looked at separately: Even if a liability regime should have a preventive effect, this does not necessarily mean that it deters foreigners from submitting themselves to it by doing business in that legal system – they may simply choose to pursue their activities with due consideration of the potential consequences thereof if something goes wrong.
- 252 While there are quite important differences between the laws of delict in all Member States, on average they do not reach far enough to play such a decisive role in the choice of market participants as does, say, the „quantum leap” to the U.S. tort system, the latter being marked not only by the theoretical availability of punitive damages,²⁸¹ but in particular by substantial procedural advantages for victims to pursue their claims (starting from contingency fee arrangements with attorneys to the manifold ways to aggregate claims, from extensive possibilities to obtain evidence during discovery to the role juries play in court practice).
- 253 Local market conditions in the narrower sense (such as the costs of human labour, land, or of raw materials, the availability of subsidies, the regulatory

²⁸¹ This red rag of European enterprises has a much more faded colour, though, in light of statistics underlining the very limited practical importance of this head of damages.

framework for the branch of industry concerned etc.)²⁸² seem to be much more influential than the likelihood of losing a tort case, which in turn also quite significantly depends upon the duties of care established by administrative law. Besides, the better the rules prescribing good farming practice (coupled with effective surveillance of compliance), the lower the risk that damage will be caused, which is one of the reasons why such rules were introduced in the first place.

- 254 The less predictable losses and/or duties to compensate them are, the more likely market participants will have a distorted perception of the risk, and this is even more so true when emotions tend to at least influence (if not prevent) rational decisions.²⁸³ If that is the case, the risk will either be over- or underestimated, thereby preventing at least to some extent the proper interplay of rules regulating the market *ex ante* with those responding *ex post* to failures and defects on the market.
- 255 The decisive factor in GMO agriculture is the openness or hostility of a legal system towards such technology in general, which is reflected by more or less lenient buffer zone definitions and other regulatory choices. Tort law typically only mirrors the attitude of the respective market towards GM farming. Liability rules are therefore generally more a symptom and not the cause of market conditions attracting or deterring new entrants.
- 256 Only extreme variations may have a more noticeable effect on mobility in the internal market, such as the complete unavailability of tort law protection in certain fields, or – at the other end of the spectrum – a very harsh liability regime which effectively makes it impossible (or too expensive) to obtain insurance cover.

²⁸² Cf. *M. Brühlhart*, *Gentechnik und Haftpflicht* (2003) 128; *J. Smits* (fn. 265) 66 (“[T]he importance of law should not be overestimated either.”). See also *M. Faure/A. Wibisana*, *Economic Analysis* (infra p. 185) no. 50: “[A] much more important role will in practice be played by safety regulation than probably by liability rules, at least as far as prevention is concerned.”

²⁸³ See also *W. van den Daele*, *Special features of the public debate on the risks of transgenic crops – The dynamics and arenas of a modernization conflict*, in *MunichRe* (ed.), *5th International Liability Forum Munich* (2001) 25 at 56: “Risk regulations – even under the precautionary principle – select among fears; they take only fears into account that can be based upon some ‘reasonable’ assumption of possible damage. Risk is a formula for justified fears. However, fears are emotional facts, and they do not need to be justified in order to be real. To be told that your fears are not justified will not necessarily reduce these fears; in fact, it may instead propel mistrust in the authorities who tell you this.”

- 257 Above all, one may wonder whether mobility in the internal market is really of major concern to farmers. Those who have their fields on or near national borders may be exposed to foreign legal rules anyhow, even without leaving the country (though the seeds or pollen from their fields may).²⁸⁴ Undoubtedly, though, seed producers, for example, who operate internationally will at least be indirectly affected by tort law restrictions in one state which effectively amount to a market barrier there. However, this does not lead to „legal uncertainty”²⁸⁵ at all as long as the rules governing choice of law are clear, and they will (or at least should) be, at latest once the Rome II Regulation is in force.²⁸⁶
- 258 Even if one reached the conclusion that diversity does affect the internal market in a negative way, one should still ask the necessary (but often forgotten) follow-up question whether a harmonized regime adds any improvement to that situation. It is well imaginable that harmonization makes the situation even worse, if only by causing frictions with existing national rules that continue to apply, or by replacing non-uniform rules with harmonized ones whose application in the Member States turns out to lead to even more differing solutions. If this is not ruled out, the search for factors affecting the internal market in support of legislative action at European level will inevitably be incomplete and unbalanced.
- 259 Furthermore, harmonization would have to go beyond setting a mere minimum standard, otherwise the problem of diversity will persist (although changing this need not necessarily be the political intention after all).²⁸⁷
- 260 Ultimately, the question of how much the internal market is indeed affected by the existing diversity of compensation models cannot be answered by a legal study. It would require further research from an economic and sociological perspective, including a survey among market participants.²⁸⁸

²⁸⁴ See C.VI.

²⁸⁵ This is presumed (but not explained) by the European Economic and Social Committee (fn. 105) 3.7.3.

²⁸⁶ See C.VI.2(b). This cannot avoid potential uncertainties with respect to losses incurred at both sides of the borderlines to non-EU countries, but this problem cannot be solved by an EU-internal liability regime anyhow.

²⁸⁷ Cf. the citation by *J. Smits* supra fn. 265.

²⁸⁸ But see the outcome of an economic study submitted in preparation for the Environmental Liability Directive, which – in line with the above reasoning – concluded that “[i]t seems unlikely ... that existing liability systems in EU Member States are currently creating any significant distortion of trade”: *ERM Economics*, Economic Aspects of Liability and Joint Compensation Systems for Remedying Environmental Damage (Sum-

(b) Should the Community interfere with present-day solutions?

- 261 The current situation in the Member States reflects their outlook on GMOs. The various solutions offered for losses caused by gene flow are just one indication of the overall attitude. They are all based upon a weighing of interests, and the choice of tools speaks for itself. Far-reaching tort claims against GM farmers without any effective possibility for them to take out insurance can be contrasted with state-backed compensation funds that are designed to spread these farmers' individual risks evenly. Selecting one model over the other is a policy choice, and it is not determined by any inherent feature of the respective legal system in general or its tort law in particular.
- 262 The key question is therefore whether the EU wants to give a boost to GM farming in Europe, and whether this has to happen in all Member States alike. This is clearly not a legal question, and it is certainly not our task here to find the answer thereto.
- 263 One may well ask, however, whether this answer needs to be found in the tort law arena at all. Promoting GM production can be achieved by other, more direct means, and if the problem is rooted in the general public's fear of or mistrust in genetic engineering, tort law cannot offer any way to overcome that fear or to establish confidence.
- 264 However, even though different ways to compensate the losses envisaged here are just the symptoms and not the cause, finding a cure for the latter may also require a look at the former.
- 265 If the political choice should be in favour of at least reducing differences between the Member States' ways of handling losses caused by admixture, a clear starting point lies beyond the domain of compensation rules. It is an essential prerequisite for all legal systems to identify the proper yardstick for evaluating the conduct of the GM farmer, which is not only essential for a fault-based claim: It is also crucial for the compensation fund models presented above²⁸⁹ to know whether the claimant could also recover in tort law – most of them are only designed for cases of accidental admixture, and even if not, it is still decisive whether the funds will have a recourse action against a tortfeasor by way of subrogation. Consequently, defining good farming practice is a fundamental task which needs to be fulfilled before any further thought is given to the follow-up issue of how to respond to a situation where

mary Report), Annex 2 to the Commission's White Paper on Environmental Liability (fn. 268) 37, 39.

²⁸⁹ Supra C.III.

someone does not adhere to that standard or causes loss despite full compliance.²⁹⁰ If we look at the substantial differences in the definition of buffer zones alone, it is obvious that there is yet a long way to go before uniformity can be achieved in this respect.

266 A further crucial point is more focused on the definition of the damage which triggers the compensation mechanism.²⁹¹ Above all, it is essential to decide whether claimants shall also recover losses caused by admixture even though it remains below the 0.9% threshold. The losses as such may not be talked away, but the question is whether the legal system shall indemnify them. Such choices need to be made throughout tort law,²⁹² and they certainly need to be made here. Again, the answer is not predetermined by the fundamentals of tort law – it is the result of balancing the interests involved, and as any weighing process, the outcome is not entirely predictable. Setting a standard here could resolve some uncertainties which may account at least for some differences between the Member States.²⁹³ This applies correspondingly to seeds, where a clear threshold is currently lacking altogether.

267 How far harmonization shall go²⁹⁴ is yet another political choice, as is the selection of the preferable model.²⁹⁵

268 One discomfoting question still needs to be posed upfront, however: Why should there be Community action for cases with such a comparatively narrow risk scenario and not in other areas which are much more relevant in everyday practice? Liability for traffic accidents, for example, has not yet been harmonized in Europe.²⁹⁶ The same question has to be answered at Member States' level, of course: Setting up a compensation fund for problems of coexistence may not be an obvious first choice on the agenda of legislators,²⁹⁷ and the same is true for the ranking of problems that may adversely affect the in-

²⁹⁰ See also *I. Ebert/Ch. Lahnstein*, GMO Liability: Options for the Insurers (infra p. 219) no. 14.

²⁹¹ See also DEFRA Consultation Paper (Annex II/27) no. 140: "In establishing any redress mechanism the specific economic losses which redress is available need to be clearly identified."

²⁹² Cf. supra B.III.3.

²⁹³ *I. Ebert/Ch. Lahnstein*, GMO Liability: Options for the Insurers (infra p. 216) no. 4.

²⁹⁴ Supra D.II.1.

²⁹⁵ Supra D.I.

²⁹⁶ However, motor vehicle liability insurance is significantly regulated, which effectively cushions the most pressing needs in cases of cross-border accidents. Nevertheless, the major reason why Parliament has proposed significant changes to the Rome II draft (supra C.VI.2(b)) is exactly the lack of uniform liability (and remedies) rules.

²⁹⁷ See also supra no. 151 and 160.

ternal market.²⁹⁸ On the other hand, no task list will ever be completed if its items are not tackled one by one. As long as the particular item and the way it is being handled fits into a broader regime, there is no reason why it should be left aside just because there are other tasks left to be addressed.

E. Conclusions and Recommendations

- 269 A survey of all EU Member States shows considerable differences between the various ways that non-GM farmers may be compensated for their economic losses resulting from the admixture of their crops with GMOs stemming from an adjoining field.
- 270 All foresee at least some sort of minimum protection, if only by offering a general tort law claim under its regular conditions. The latter is currently true for the majority of the Member States, which is not surprising in light of the rather exceptional character of GM farming in most European countries at present. This also seems to be why many have so far not yet seen a need to change existing rules for the risks under survey here, even though other legislation addressing coexistence may have an indirect effect on the application of the respective tort law regime, e.g. by defining the standard of due care. However, existing dissimilarities between the tort laws of the Member States already make up for quite substantial variations in the way potential claims would be handled and resolved.
- 271 This diversity is immediately evident when one considers the kinds of harm the various legal systems recognize as compensable: Purely economic loss is treated separately in some countries (and will therefore only be indemnified subject to additional conditions), whereas it falls under a more general notion of damage in others. Even if a loss is recognized from a tort law perspective, it needs to be linked to a cause within the defendant's sphere. Differences relating to this particular requirement of tortious liability stem not only from substantive, but also from the respective procedural laws of the Member States. Furthermore, there is a wide range of policy reasons for holding a defendant liable, if all other requirements are met, starting (at least historically) from the defendant's subjective fault to strict liability, which does not depend

²⁹⁸ Cf. *J. Smits* (fn. 265) 62: “[I]t is quite arbitrary why some topics are part of the *acquis* and others are not. ... If the purpose of the EU is to address issues that may hamper the functioning of the internal market, there is much more to regulate than is currently being done.”

upon a value judgement of the defendant's behaviour. In between are, for example, more objective forms of fault as well as presumptions thereof.

- 272 All jurisdictions have shaped their tort laws with selections from that range, but that choice was not done uniformly throughout Europe: In an overall assessment of the current situation in the Member States, some focus more on the fault side of that range, whereas others have moved towards its no-fault end to a higher or lesser degree. Some jurisdictions have chosen to introduce a special liability regime designed specifically for the risks under survey, or to refer them expressly to some already existing special rules of tort law which address other risks as well. Invariably, claims in those countries will fall under some strict (or at least stricter) liability regime.
- 273 The Member States have of course all implemented the Product Liability Directive, whose regime will most likely not apply to cases of the kind envisaged here, though.
- 274 Almost all legal systems seem particularly concerned about possible disputes between neighbours, inasmuch as all offer at least some form of special remedy irrespective of fault in cases where some harmful influence originated on the adjoining land. The underlying motive is to find a compromise between two conflicting interests which per se are of the same value since both landowners have the identical right of enjoying their property. The solutions found to solve such neighbourhood conflicts therefore seem to be at least one model to consider for developing coexistence rules in the GMO case scenario. However, the ways Member States tackle these issues differ considerably as well. One key aspect common to all jurisdictions in such cases is, however, that they tend not to focus so much on the question whether the behaviour of which the neighbour complains is faulty, but whether it is unusual in the area (even though it may be common in other places), which is a highly objective standard.
- 275 Fault liability nevertheless remains the default rule in all tort laws. Typically, fault or any other general provisions of tort law are not superseded by strict liability rules altogether, which almost invariably tend to leave certain aspects of the claim to be governed by more general rules. Even if a legal system foresees a strict liability claim in response to a certain loss, this will hardly ever be the exclusive path to compensation for the victim, as she may still be able to resort to traditional tort law (i.e. fault liability) alternatively or even cumulatively (though not beyond her actual loss).
- 276 Depending on the scope of the applicable liability regime, the immediate neighbour who cultivates GM crops is not the only imaginable defendant, but

all other farmers in the area, and (apart from cases of established wrongdoing by one of them) it will depend upon the rules of causation to select who will be considered to have set a (possible) cause, and whether and to what extent mere likelihood thereof will suffice to proceed with the case against each of them. The majority of European legal systems, but not all, provide for joint and several liability of all those from whom the admixture may have originated in a way which would trigger liability.

- 277 Other possible defendants include the seed producers or distributors, those in charge of the farming equipment used (not only) in GM fields, as well as the authorities whose licenses made the GM cultivation admissible. This does not necessarily mean, however, that all of them will be subject to liability – after all, its requirements need to be fulfilled in order to trigger an award.
- 278 One fundamental advantage of attributing the losses under survey here via tort law is the fact that it is a risk spreading scheme which is generally accepted in society, not only in light of its strong roots in history, but also since it corresponds to very basic notions of corrective justice, at least in its core. It is essential, however, to keep in mind that its primary function is to compensate losses and not to prevent them. Even though the latter were desirable, other areas of the law offer better tools to achieve that. Liability rules may have a preventive effect, though, even more so if they significantly improve the victim's position: The lower the requirements to hold someone liable for a certain behaviour or activity, the more likely it will be reconsidered by the actor, particularly if deciding to go ahead with it is based upon an advance economic assessment of the expected benefits and detriments.
- 279 Any Community action trying to harmonize tort law as a response to GMO admixture should be based upon careful considerations of the dangers such an interference with existing national laws might bring about. Throughout history, European jurisdictions have each developed an individual claims culture and a distinct compensation culture. Some are more open towards the idea of national solidarity and collective risk-sharing, others still put considerable emphasis on a more individualistic approach. Imposing uniform rules for a comparatively narrow case scenario such as the one envisaged here may lead to a solution which may not be available under all existing tort laws, even though it will necessarily have to build upon at least the more fundamental concepts thereof. Tort law language may alone lead to complications, as the technical terms that unavoidably will have to be used are understood by the respective jurisdiction in the way it has evolved there, with all its distinct features and interactions with other aspects that the GMO scheme may not include. Attempting to find a uniform standard for indemnifying losses caused

by gene flow may thereby risk an admixture of tort law regimes even within one single Member State. Full harmonization cannot be achieved anyhow unless tort law is harmonized in a more general way which applies beyond singular case settings, and this does not seem to be an option for the time being.

- 280 It is also important to note in this context that differences in technical or administrative rules on co-existence will most likely have a greater impact on the feasibility to cultivate GM crops and the protection of non-GM farmers from GMO admixture than the existing differences in liability rules: Generally, co-existence approaches are aimed at avoiding damage in the first place. Under normal conditions, and if good farming practice is well designed, damage should be the exception. Consequently, rules intended to avoid harm should have a greater impact than rules applying to cases where segregation measures have failed. Harmonization of liability would therefore only make sense after these ex ante aspects of coexistence are harmonized.
- 281 A further crucial point is more focused on the definition of the damage which triggers the compensation mechanism. Above all, it is essential to decide whether claimants shall also recover losses caused by admixture even though it remains below the 0.9% threshold. The losses as such may not be rationalized away, but the question is whether the legal system should indemnify them. Such choices need to be made throughout tort law, and they certainly need to be made here. The answer is not predetermined by the fundamentals of tort law – it is the result of balancing the interests involved, and as any weighing process, the outcome is not entirely predictable. Setting a standard here could resolve some uncertainties which may account at least for some differences between the Member States. This applies correspondingly to seeds, where a clear threshold is currently lacking altogether.
- 282 Notwithstanding these caveats, tort law may certainly be designed in such a way as to redistribute at least some losses resulting from GMO admixture. However, certain limits will always have to be taken into account which are not inherent in tort law proper, but inseparably connected thereto. Tort claims are traditionally administered by regular courts of law, and the procedure to obtain compensation can be cumbersome, time-consuming and costly. Even if the plaintiffs succeed at the end of this process, they may still not be able to collect damages from the defendants if they do not hold sufficient funds to pay their dues.
- 283 At least the latter could be avoided if the defendants held liability insurance that covers such losses, though the other (and more fundamental) problems

would remain unsolved which concern the tort law claim itself, to which liability insurance is obviously closely connected. If the losses fell under some first-party insurance scheme, however, the victims would not have to resort to tort law in the first place. Probably all farmers already have first-party policies such as farm property insurance, though covering different risks, for example natural disasters such as hail or the like. However, these hazards are typically named in a closed list which typically excludes risks such as GMO admixture at present.

- 284 Whether third- or first-party insurance, both allow the pooling of risks among a larger group of people exposed thereto, and it is even bigger if taking out such cover is made mandatory. The insurer can tailor its products according to the various aspects of the risk. At least in theory, for example, those who run a higher risk will typically also pay higher premiums (though not necessarily so, and it is certainly not a linear correlation). The procedure to pay out awards will be less complicated than before a court of law.
- 285 First-party insurance has the additional advantage for the victim that her peculiar risk is taken care off: She should know best what losses she may suffer, and she can therefore (at least in theory) buy cover against such risks tailor-made to her situation. Payments can be even faster than under a liability insurance scheme with direct claims, because the insured risk focuses on the occurrence of the harm and (at least in general) not its cause, even though certain risks may be excluded. This is not the only reason why this type of insurance may be the most cost-efficient regime. First-party insurance could be of special importance at least in all those cases where there is no other way that leads to compensation, for example due to difficulties of proving causation, or because the applicable national system denies liability for other reasons, in particular if the cultivation of GM crops was done in accordance with the applicable farming standards in force at the time.
- 286 Further problems with insurance, whether first- or third-party, may arise, however, when insurers assess the risk: They may be lacking crucial information (even with all due efforts), or may not be in a position to duly take account of them when calculating premiums. The policies may include limitations of certain risks or other restrictions. The insured amount may not suffice to cover the full loss owing to manifold reasons, which could have grave consequences. Those at risk may not be aware of it at all or have false assumptions of the extent of the risk: Conventional or organic farmers simply may not know that someone in their vicinity has started to cultivate GM crops. This may seduce them out of buying insurance at all or only subject to unrea-

sonable limitations. Such problems could be remedied by making insurance compulsory, but that may distort the functioning of the market forces.

- 287 At present, neither liability nor first-party insurance products covering GMO risks seem to be available on the markets under survey. Problems for insurers in this respect can be traced back to the standard criteria which would allow them to consider whether such risks are insurable: estimable frequency and severity, the fortuitous nature of the loss, and the ability to spread it. Arguably, there is currently not enough data available to predict both likelihood and extent of possible losses, particularly in light of the broad range of plant varieties and their peculiar features that have a bearing on these aspects. Unless it is clear for insurers that losses below the legal threshold of admixture need not be covered, the fortuitous aspect of the risk may lack entirely, as complete segregation is impossible in a coexistence environment. Arguably the most important obstacle to offering liability insurance cover is a liability regime which allows for compensation of any type of loss irrespective of any wrongdoing by the insured and coupled with a presumption of causation, or – probably even worse – a liability regime which does not allow for predictions of how an admixture case would be solved.
- 288 Problems relating to the insurability of the risk of admixture could be avoided if a compensation fund were available to absorb it. Some Member States have indeed already decided to establish such a fund or are at least considering to do so in future.
- 289 Compensation funds are typically tailor-made to a particular risk scenario. The procedure to assess a claim and to make payments is often faster. Since the risk group is identified in advance, also the administration of the fund can be designed according to their specific needs. The range of payors may be broader than under other indemnification regimes – not only those immediately concerned will be involved, but also others with a more general interest, including the State which may otherwise not contribute to indemnifying losses (though participation in an insurance pool may be imaginable). Compensation funds need not necessarily follow the restraints of actuarial mathematics and therefore can be introduced to fill a gap in the insurance market: Even if commercial insurers feel unable to offer cover, compensation funds may nevertheless (or even just for that reason) be installed in order to at least serve as a temporary solution until the market can take over.
- 290 Compensation funds may operate with less financial means, however, and depending upon the pooling arrangement, the funds may be dried out even before all claims have been settled. Lack of current information is not the only

reason why compensation funds may have to struggle with inadequate risk assessment – depending on the political pressure that tends to precede the formation of such a risk pool, its conditions may not even entirely reflect what is already known. Risk differentiation may also be inadequate in comparison to alternative indemnification models. Those who contribute to the fund are not necessarily those who are in control of the risk that shall be covered, or at least their contribution may not reflect the actual weight of their influence. Payments out of the fund may not be as predictable as insurance awards, particularly if the means of the fund are limited, or if payments are at least in part only discretionary awards. A much more serious problem arises, however, if the fund is installed ad hoc after a first loss has actually occurred. One major argument against compensation funds is the principle of equality: Why are certain risks (and therefore certain claimants) favoured whereas others are left to the more traditional ways to obtain compensation? Indeed, one may wonder why a comparatively exotic risk such as the economic losses caused by gene flow should deserve to be addressed by a special fund as long as traffic accidents and other, much more frequent loss scenarios are not equally addressed. This question can of course also be posed with respect to any other special solution, for example in the field of tort law.

- 291 At first sight, one is inclined to think that the existing diversity of solutions could negatively affect the functioning of the internal market. However, from a legal point of view, there is no obvious reason for grave concerns in this respect for two reasons: First, similar degrees of diversity for compensation mechanisms also apply in other areas, and second, the internal market is more likely to be affected by the diversity in technical co-existence measures. An economic or sociological study may have different findings, though.
- 292 Any choice to interfere with the present national compensation models in a strive to achieve at least some degree of harmonization will necessarily have to be based on a political opinion-forming. The legal perspective itself does not offer sufficient guidance to single out an optimal solution.
- 293 After all, the tort law and other compensation systems applicable to the cases under survey here only mirror the attitude of the respective jurisdiction towards GM farming, which is primarily marked by other rules such as definitions of good farming practice which come into play ex ante, whereas indemnification by definition is only an ex post matter. Consequently, defining good farming practice is a fundamental task which needs to be fulfilled before any further thought is given to the follow-up issue of how to respond to a situation where someone does not adhere to that standard or causes loss despite full compliance.

- 294 The various solutions presently offered for losses caused by gene flow are all based upon a weighing of interests, and the choice of tools speaks for itself. Far-reaching tort claims against GM farmers without any effective possibility for them to take out insurance can be contrasted with state-backed compensation funds that are designed to spread these farmers' individual risks evenly. Selecting the one model over the other is a policy choice, and it is not determined by any inherent feature of the respective legal system in general or its tort law in particular.
- 295 As could be seen above, there are various ways to respond to the risks on which this study is focusing, and so are the possible degrees of harmonizing the current national solutions. All have their peculiar advantages and disadvantages. The choice for either option will necessarily be dominated by the replies to the more fundamental questions of how to promote coexistence, and how far to go in achieving that goal.
- 296 It is clear that there is no one-stop solution in response to the diversity of the laws of the Member States. Apart from no action at all, the other extreme would be complete harmonization of all aspects of compensating losses arising from adventitious presence of GMOs in non-GM crops. The latter would require that an exclusive regime will be set up which does not allow any deviations or alternative paths on the side.
- 297 A lesser degree of harmonization could be achieved by identifying a compensation model for all Member States which leaves certain aspects open for them to regulate individually. As a rule of thumb, however, the more that is left for individual solutions, the less desirable such a model seems to be from an EU perspective. It will inevitably lead to different treatments of similar cases in the Member States, but this is not necessarily in conflict with the intention to proceed with harmonization in the first place. After all, some aspects of the claims will be handled in a uniform way, and a political assessment of the problem may lead to the conclusion that only those aspects are deemed crucial and worthy of harmonization. Identifying these elements will be critical, however. One (but certainly not the only) key aspect will be how to deal with the requirement of causation, for example, which is an essential component of any imaginable compensation scheme.
- 298 A very mild form of harmonization (if at all) would be to offer a merely optional model for the Member States to consider without any need for them to implement it. This will most likely not abolish the differences between the various regimes existing altogether, however, even though some Member States may indeed adjust their systems accordingly. From a cost-benefit-

analysis, one may wonder whether establishing such a regime is really needed in light of the fact that the various options currently chosen by the Member States already constitute a full catalogue of possible schemes, and the pros and cons of each of them are clearly visible for those jurisdictions which are considering a re-evaluation of their own system.

- 299 This has to be differentiated from setting a minimum standard that shall apply throughout Europe. The policy choice could be, for example, that non-GM farmers deserve compensation for at least the immediate harmful effects of contamination, and that it should be more or less readily available to them. Further conditions or aspects could be included in defining that minimum standard. An alternative target that could be set would be to require Member States to achieve insurability of such risks, but leave the tools to reach that goal up to them to choose.
- 300 Another option could be to conceive a system which only deals with cross-border contamination. This would lead to inequalities, however, since victims of a transboundary incident would be treated differently from purely national cases.
- 301 Defining cross-border matters on a purely technical level does not seem to be necessary: Questions of jurisdiction are already determined by European law, allowing a tort law claimant to sue not only in the country where the loss occurred, but also where the harmful cause was set. Conflicts of tort laws will soon be addressed by European legislation that is presently in the making. As it stands, the law of the country in which the damage occurs shall govern, irrespective of the country in which the event giving rise to the damage occurred, so that the law of the non-GM farmer would apply to tort claims. The only potential gap could concern the question whether national compensation funds allow foreign victims to file transboundary claims, but such gaps may be filled by bilateral arrangements, for example.
- 302 The key concern of any steps taken towards harmonization – if that should be the political preference – must be on the interaction of any uniform guidelines or rules with the existing legal systems in general and the tort law regimes in particular.
- 303 This makes it hard to imagine how a uniform liability regime as such could be introduced without more far-reaching efforts to link it to some common basis of European tort law in general which has yet to be defined. As long as insurers do not offer adequate products on the market covering first-party or third-party risks of the kind under survey here, considerations to leave the matter to the insurance market forces are rather academic: The reasons brought forward

by insurers as obstacles to covering such risks therefore have to be addressed first. Compensation funds as a temporary solution filling these gaps in the insurance market seem to be a workable solutions in some Member States, but whether it is desirable and feasible to establish such a regime for the others, either on a national or on the European level, depends upon economic and political factors beyond the scope of this study.

Special Reports

A. Summaries of the Country Reports*

Vanessa Wilcox

1. Austria

(a) Special Liability or Compensation Regime

- 1 The amended Gene Technology Act (GTG) regulates GMO liability for farmers (§ 79k to § 79m). Fault need not be proved and causation is presumed if the claimant can show that the defendant's actions/inactions were prone to cause interference. This presumption is rebutted if the farmer can show that it is probable that the interference was not caused by his action/inaction. In this case the burden of proof lies with the claimant. The *Loser Pays Principle* applies in respect of costs incurred in establishing causation. The Act does not explicitly provide for any defences but those of the general tort law apply. In the case of multiple tortfeasors joint and several liability is imposed. There are no specific rules for recourse between such tortfeasors and therefore the rule of the general tort law (§ 896 General Civil Code) has to be applied. The Act does not differentiate between crop and seed production. The application of the Civil Code and other relevant provisions remains unaffected. Simultaneous or subsequent claims may be instigated.

- 2 Lost profits, damage to persons/property and costs incurred to remedy environmental damages are compensable. Injunctive relief and damages are available where GMO interference is above tolerance levels and where substantial impairment is caused. A farmer who suffers loss owing to consumer fear of contamination will face difficulty in establishing actual GMO interference. The value of the entire product is covered where unmarketable and where marketable albeit discounted in price, such depreciation is covered. Damages are subjectively reviewed and thus encompass increased overhead/indirect costs. No financial limits to liability apply. As in the general tort law, the defendant is obliged to take out advance cover, but in the case of a significant impairment to the environment the plaintiff is obliged to refund the amount exceeding the market value of the impaired good, if he does not restore the damaged good to its original condition within a reasonable amount of time. In

* The country reports, which form Annex I to this report, were submitted in August 2006 and are current as of that time.

respect of redress procedures, conciliation/mediation must precede litigation. No current/prospective compensation funds exist.

(b) General Liability or other Compensation Schemes

- 3 Under the Civil Code, the claimant must prove unlawfulness, causation and fault. In the case of GMOs, unlawfulness particularly arises, where the GTG provisions are breached. Where a protective law is breached (e.g. the GTG), prima facie evidence may suffice to establish causation and a reversed burden of proof in respect of fault arises. Joint and several liability applies in the case of multiple, alternative or cumulative causation. The courts, however, will first try to ascertain individual contributions. A right of recourse against contributing tortfeasors exists. Generally, with intervening causation the initial tortfeasor is wholly liable.
- 4 Where the defendant was negligent, actual damages may be claimed. To claim loss of profits gross negligence must be established. The quantum of damage is the difference between the market value of a GM-free and GM-affected crop. In recompensing the claimant, his subjective circumstances will be considered. Pure economic loss is recoverable, *inter alia*, in the case of a violation of a protective law if the law is designed to protect such losses. Losses pertaining to customer fear of GMO contamination are unlikely compensable. Injunctive relief is granted for nuisances if specified conditions exist. If the impairment was caused by a licensed activity, compensation according to § 364a ABGB (neighbourhood liability) may be sought. No financial limits to liability apply though contributory negligence would reduce/extinguish the quantum of recoverable damages. The defendant is obliged to take out advance cover. Operators are under no obligation to obtain liability insurance.

(c) Sampling and Testing

- 5 Costs associated with GMO sampling/testing are borne by the farmer where GM presence tests positive or in the case of an admission procedure.

(d) Cross-border Issues

- 6 For tortious damages under the GTG, the law of the state where the damage occurred applies. Austrian Law applies in the case of injunctive relief if the damaged farmland lies in Austria. For damages based on general tort law, the law of the state where the tortious conduct was performed applies.

2. Belgium

(a) Special Liability or Compensation Regime

- 7 There is currently no special regime in force for GMO related liabilities though legislative provisions exist which could affect the determination of liability. E.g. the Royal Decree of 21 February 2005 specifies conditions for GMO usage which, if contravened, result in the operator being deemed to be 'at fault'. No specific compensation scheme exists as GMO admixture is unlikely to qualify under a fund established to compensate damages caused by 'waste'.
- 8 There are plans to install a compensation fund in the Flemish region. A decree establishing a compensation fund and regulating the coexistence of GM and non-GM crops in the Walloon region is awaiting parliamentary assent. Economic loss and secondary fees (generally, in respect of primary products) will be compensable under the fund, provided all coexistence measures are adhered to. Agricultural enterprises and seed sellers are among some of the candidates under obligation to contribute to the fund. Farmers/operators are expected to be majority contributors making payments in ratio to the peril generated from GMO usage. Compensation payments will be modified to each crop's potential for dispersal and levies will be adapted annually based on compensation paid two years previously. Designated bodies will manage the fund, draft general rules for compensation and officials will carry out requisite sampling for GMO presence.

(b) General Liability or other Compensation Schemes

- 9 Under the Civil Code, the burden of proof lies with the claimant to show that his damage is recoverable and to prove causation through a person's fault or the defect of a thing. I.e. 'but for' the defendant farmer's actions/inactions his losses would not have arisen. Disregard of GMO legal/administrative prescriptions is insufficient to establish casualty. Joint and several liability applies in the case of multiple tortfeasors. Recourse against contributing tortfeasors is permitted. *Force majeure* has to be the exclusive cause before the defendant can be exonerated. Contributory negligence would reduce/extinguish liability unless the defendant acted with intent. A defendant is deemed to be at fault where certain statutory obligations are infringed (freely/consciously) or at the court's discretion, where a general duty of care is breached. Evocable defences include necessity, cause for justification and invincible error. Where the damage was caused by 'a thing', a presumption of liability exists against its keeper if the presence of the thing, e.g. a GMO crop, is abnormal in its environs. This strict liability regime would apply in the case of unauthorised or

adventitious GMO presence. *Force majeure* or wrongful acts of third parties are possible defences.

- 10 A claim may exist against a 'producer' under the Belgian Product Liability Law but the provisions apply to defective products put into circulation and are thus unlikely evocable against a GMO farmer. Fault need not be demonstrated. Defences include third party/contributory negligence. A special strict liability regime imposes the theory of Disorder of Vicinities to limit compensation to that part of the damages which exceeds the limits of normal nuisances *in that* vicinity.
- 11 The quantum of damage is the price difference between a GMO affected crop and one without. Though more difficult to prove, economic losses are compensable provided like other losses, the damage is certain and not previously indemnified, foreseeable (in some cases), personal and causation exists. Losses attributable to consumer fear of contamination or losses caused where contamination is confirmed though confined to one regional farmer are compensable though difficult to establish. Damages are fully compensable and cannot be punitive. The claimant must mitigate his losses though is under no obligation to obtain advance cover/liability insurance. No general compensation schemes would apply here.

(c) Sampling and Testing

- 12 The Royal Decree of 21 February 2005 mandates monitoring, sampling and testing for GMO presence. Costs incurred in the course of legal proceedings are allocated to the 'succumbing' party.

(d) Cross-border Issues

- 13 No specific provisions aimed at resolving cross-border cases exist. Under the Brussels I Regulation, the courts of the place where the harmful event occurred have jurisdiction. For cases falling outside the Regulation, if the damage occurred in Belgium, Belgian courts have jurisdiction. The law of the country where both parties are resident, where the entire liability components of the wrongful act arose or the law with the closest relation applies.

3. Cyprus

(a) Special Liability or Compensation Regime

- 14 There is no special liability or other compensation regime in force. The use of GM crops is currently prohibited.

(b) General Liability or other Compensation Schemes

- 15 Actions exist under the Civil Wrongs Law, negligence and nuisance. Under the Civil Wrongs Law, a claim for GMO damage would be an action 'on the case'. An act/omission, fault (intention/negligence) and damage must be proved. Causation, based on the 'but for' test must be established by the claimant, taking remoteness into account. Where specific conditions are met, *res ipsa loquitur* may apply such that the claimant need not prove causation or fault. There are no specific provisions regulating costs incurred in establishing the former. For multiple tortfeasors, joint and several liability applies. In respect of concurrent causes, the tortfeasors are liable to the extent of their contributions.
- 16 For negligent actions, either the reasonable person standard or the standard of a professional in the defendant's field is imposed to determine whether a breach of duty has arisen. Damage and causation must also be established. Public nuisance may give rise to a civil action where the claimant suffers *special damage*. Unreasonable interference with the reasonable use or enjoyment of the claimant's land is actionable under private nuisance. Damage is a prerequisite to compensation. Where strict liability applies, defences include inevitable accident and regulatory permit. The aim of damages is to place the claimant in the position he would have been in but for the tortious act. Physical damage to property and consequential losses are recoverable. Pure economic loss is not compensable thus losses caused by consumer fear of contamination are not compensable. There is no financial limit to liability. The claimant must mitigate his losses. No general compensation schemes are applicable here.

(c) Sampling and Testing

- 17 No specific rules cover costs associated with sampling and testing for GMO presence.

(d) Cross-border Issues

- 18 There are no special jurisdictional or conflict or law rules in force. Cypriot courts have jurisdiction *inter alia* where a writ is served on the defendant in the jurisdiction or where leave is granted to serve a writ outside the jurisdiction e.g. where land is situated in Cyprus.

4. Czech Republic

(a) Special Liability or Compensation Regime

- 19 No legislative measures currently provide a special liability regime for GMO related damages. The laws concerning the GMO only provides for basic provisions for dealing with and producing of the GMO, which may indirectly influence such liability.

(b) General Liability or other Compensation Schemes

- 20 Under the Civil Code, breach of duty/statutory provisions, causation, damage and often, fault must be established before liability exists. In civil cases, the theory of adequacy requires the claimant to prove that the wrongful act is a common result of the damage as objectively foreseeable and that no intervening act has broken the chain of causation. This theory also applies to multiple causes and multiple tortfeasors are jointly and severally liable. Alternative, potential or uncertain causation are dealt with circumstantially.
- 21 Liability of GMO farmers would qualify as a case of strict liability, namely damage caused by operational activities under s.420a Civil Code so that no fault is required. Defences under s.420a include contributory negligence or causation by an independent unavoidable event. Other general defences e.g. the fulfilment of a legal obligation or acquiescence by the claimant may also be evoked. The Civil Code regulates ownership rights so that adventitious GMO presence may constitute an unreasonable annoyance or restrict the user of neighbouring land – both of which are actionable.
- 22 Damage is defined as any loss of property which can objectively be calculated in monetary value. It is subdivided into actual damage and loss of profits. The former covers distraction/reduction in property value together with consequential losses and the latter covers loss of an anticipated rise in property value. While independent, both are recoverable. Although uncertain, pure economic loss may fall under either damage category provided certain conditions are fulfilled. It is doubtful whether losses owing to consumer fear of GMO contamination would be compensable in the absence of actual admixture. Foreseeability determines compensability of damages. In general, there are no financial limits to compensation though certain circumstances may warrant a reduction at the court's discretion provided the defendant did not act with intent. Compensation for non-pecuniary injuries is subject to certain limits set in the statutory instruments. However, the judge may use his discretionary power to increase the amount of compensation payable. Though elective,

a GMO farmer may subscribe to an insurance scheme offered by commercial firms. No applicable compensation regime exists.

(c) Sampling and Testing

- 23 Specific provisions require monitoring and by inference, the GMO farmer bares associated costs. The farmer must also compensate the state for any corrective measures taken.

(d) Cross-border Issues

- 24 No special jurisdictional or conflict of law rules exist. Thus in the absence of a bilateral treaty, private international law and procedure law apply. For GMO related damage, at the court's discretion, either the laws of the place of the damage or the place where a fact establishing the claim for damages arose would apply – whichever is closest.

5. Denmark

(a) Special Liability or Compensation Regime

- 25 The Coexistence Act establishes a special compensatory regime applicable to GMOs. For causation, proof of GMO presence and its proximity to a non-GM crop suffices. In the case of ecologically cultivated crops only GMO presence is required. Inferably, the burden of proof lies on the claimant and once established, causation is irrebuttable. It is not a liability regime as compensation is paid regardless of fault. However, compensation can be reduced if the claimant was negligent, wilful or acted in such a way as to inhibit recourse by the state from the GMO cultivator. In general the same criteria apply to crop and seed production. The regime is not exclusive though double recovery is impermissible.
- 26 Liability is limited to consequential reductions in sale prices, sampling expenses and remedial costs (ecological). Actual admixture is required under the Act thus general tort law rules regulate losses due to consumer fear of GMO contamination or losses caused where contamination is confirmed though confined to a single regional farmer. There are no financial limits to liability. GMO presence must be notified to the Plant Directorate within a specified timeframe. The later manages the fund, hears claims and conducts sampling. Injunctions may be granted before/after admixture occurs. The regime is partly funded by the state and will be evaluated in 2007 (including matters of income and expenditure). The state has recourse to the GMO farmer insofar as the farmer would have been liable to the injured party under general rules of

tort law. Insurance cover is not obligatory though mandatory annual contributions are made by GMO cultivators to the compensation fund. This regimen is comparable to four other compensation schemes.

(b) General Liability or other Compensation Schemes

- 27 Alternative actions may be pursued under the Environmental Liability Act, judicially developed strict liability rules, negligence or rules on neighbourhood conflicts. The two latter options are more likely applicable in the case of GMO liability. The burden of proof is on the claimant to establish causation under the *conditio sine qua non* rule. Multiple tortfeasors are jointly and severally liable. In the case of fault based liability, the claimant must prove breach of duty/negligence. The burden is reversed where statutory obligations are contravened.
- 28 Damage caused by nuisance over an acceptable threshold level (in *that* specific local) is compensable. Strict liability is not unlikely to apply here. The aim of damages is to put the injured party in the position he would have been in but for the wrongful act thus full compensation is awarded. Damage encompasses devaluation of the crops and loss of profits. Pure economic losses are not handled differently. By analogy with neighbourhood conflicts, losses caused by consumer fear of GMO presence or losses caused where contamination is confirmed though suffered by a single regional farmer are not unlikely to be recoverable. There is no financial limit to liability. The claimant must mitigate his losses.

(c) Sampling and Testing

- 29 Claimants under the compensation scheme must cover sampling and testing costs which will be reimbursed if GMO traces are found. No general monitoring is required.

(d) Cross-border Issues

- 30 No special jurisdictional or conflict of law rules are in force and there are no specific provisions aimed at resolving cross-border cases. The defendant may be sued where he is resident or domiciled. The Brussels Convention applies for cross border issues so that at the choice of the claimant, the defendant may be sued where he is domiciled or where the harmful act occurred. Generally, the *lex loci delicti* applies.

6. Estonia

(a) *Special Liability or Compensation Regime*

- 31 Numerous provisions regulate the use of GMOs including an Act on the Deliberate Release Into the Environment of Genetically Modified Organisms which directs compensatory claims to be dealt with under general civil liability rules. No special regimes are currently in force.

(b) *General Liability or other Compensation Schemes*

- 32 Unless expressly stated, liability for tortious conduct (including delictual liability) is fault-based. The claimant must establish all elements of claim including causation. The ambit of the *conditio sine qua non* rule is narrowed through the use of elimination and substitution methods. The *Loser Pays Principle* applies in respect of costs incurred to establish causation. Statutory construction dictates however that liability for GMO admixture is likely strict and more so if GMOs can be regarded as inherently/potentially dangerous. Broadly, if the defendant establishes *force majeure*, contributory negligence or that the item liable for the damage was used consistently with prescribed guidelines/statutes he will be exonerated. Product liability provisions may also be evoked. Alternative remedies may be sought. Solidary liability applies in the case of multiple tortfeasors. Recourse between contributing tortfeasors is permissible. Environmental clean up provisions exist where the polluter falls short. These are unlikely to compensate GMO victims. In respect of applicable criteria, seed and crop production are undifferentiated.
- 33 Damages are widely defined as their aim is to restore the injured party to the position he would have been in but for the tortious act/omission. The value of the entire product is covered where unmarketable and where marketable albeit discounted in price, such depreciation is covered. The award is reduced if the loss arose out of an obligation not specified by a statutory provision, if full compensation would be grossly unfair, the claimant failed to mitigate his loss or to the extent of contributory negligence. Losses relating to customer fear of GMO contamination and losses arises from contamination that is confirmed though confined to one regional farmer's crops are technically recoverable though causation in the former case must be proved.
- 34 Advance cover/liability insurance is not obligatory. Injunctions may be granted against a defendant's intolerable actions. No compensation funds exist. The abatement of neighbourhood nuisance is only actionable if the nuisance is material or contrary to environmental provisions.

(c) Sampling and Testing

- 35 There are no special regulations concerning the costs of testing and sampling of GMOs. If government bodies sample products, the costs will be passed to the operator where GMO traces are found.

(d) Cross-border Issues

- 36 There are no special jurisdiction or conflict of law rules concerning civil liability for GMOs, nor are there any other specific provisions aimed at resolving cross-border cases. At the claimant's preference, applicable law is either the law of the state where the tortious act was performed or where its consequences arose. Alternatively, the laws of a state as agreed between the parties or the closest relation laws apply. The courts of the state where the defendant resides have jurisdiction.

7. Finland

(a) Special Liability or Compensation Regime

- 37 Statutory provisions implementing a special regime for GMO related damages are in force. Under the EDCA, the claimant must prove damage and adequate causation though probable causation may suffice. Unforeseeable consequences are not compensable. Joint and several liability applies in the case of multiple causes. Recourse to contributory tortfeasors is permitted. The costs of establishing causation are likely compensable. The regime imposes strict liability though *force majeure* and wrongful acts of third parties are possible defences. Intolerable disturbances taking *inter alia*, regulatory consents and the local into account may be compensable. Damages may be reduced due to contributory negligence or failure to mitigate losses.
- 38 The same criteria apply to crop and seed production. The regime is supplemented by general tortious liability rules. Pure economic losses are compensable though recovery of loss caused by the fear of GMO contamination is doubtful except where actual admixture or damage to the environment occurred. The requirement to establish adequate causation may restrict recovery of losses suffered by other farmers where contamination is confirmed though restricted to a single regional farmer. Consequential economic losses and indirect costs are compensable. There is no financial ceiling to liability though damages may be reduced where the financial impact would be too onerous on the defendant. It appears liability insurance is optional. Redress is sought in accordance to civil law procedural rules. In certain circumstances, injunctive relief may be granted. There are no current/intended compensation funds.

(b) General Liability or other Compensation Schemes

- 39 General tort law provisions impose a fault based liability regime. The burden of proving all elements of fault rests with the claimant though a reversal may arise in some cases. Multiple tortfeasors are jointly and severally liable. Recourse to contributing tortfeasors is permissible. Strict liability applies where certain nuisances are committed. Liability may also exist under the Product Liability Act.

(c) Sampling and Testing

- 40 Mandatory sampling and testing costs are likely borne by the GMO farmer.

(d) Cross-border Issues

- 41 At the claimant's choice, either the state where the wrongful act took place or where damage arose have jurisdiction. There are no generally applicable statutory provisions on the choice of law in cross-border cases. At the claimant's preference, either the law of the state where the wrongful act took place or where the damage arose applies.

8. France*(a) Special Liability or Compensation Regime*

- 42 A special compensation regime for economic loss as a result of GMO contamination is pending discussion by state authorities. Claims are to be reported to a designated body which has recourse to a defaulting farmer/his insurance cover. A farmer seeking compensation must establish that compulsory labelling under EU/national rules *now* applies to his crops owing to the proximate farming (as defined) of GM crops in the same cultivating season. Matters of causation/multiple causes are irrelevant for compensation claims under the regime. While the insurance market in this field develops, trade organisations and farmers must contribute towards a guarantee fund which operates like liability insurance. Thus GMO farmers are strictly though indirectly liable. Only the difference in value between GM and non GM crops are compensable. The regime does not prevent alternative courses of action being brought thus claims for other losses can be brought under general liability provisions. Contributory negligence has a reductive effect on awardable compensation. The regime is silent on the possibility of obtaining injunctive relief. Comparable special liability regimen/compensation funds exist though each is particular to its own liability sphere.

(b) General Liability or other Compensation Schemes

- 43 Depending on whether the defendant is a private or a public entity, liability for GMO damage is respectively governed by general civil or administrative liability principles. The claimant is burdened with establishing causation and loss. The courts deal with causation flexibly which in some instances is presumed and in others no strict proof is necessary. It is always possible that the latter approach could be used where a GMO farmer breaches his administrative/statutory obligations. Joint and several liability applies in the case of multiple causes. Recourse against contributing tortfeasors is foreseen.
- 44 For fault based liability, fault is presumed against unauthorised farmers or where non-compliance with licence/statutory provisions is apparent. Theoretically, a claim against a GM farmer may also exist under Article 1384-1 Civil Code for liability for harm caused by inanimate objects provided control of the object, causation and damage are established. Claims may be brought against recurring and unreasonable levels of nuisance. No fault need be established. Though doubtful, product liability rules may be relevant where the GM plant/its genes were defective.
- 45 Damages aim to place the victim in the position he would have been in if the act giving rise to the damage had not taken place. The quantum of damage is the price differentiation between a GMO affected crop and one without. Direct/indirect losses (if sufficiently certain) and consequential, increases in overhead costs are recoverable. It would be difficult for a farmer claiming compensation for losses caused by consumer fear of GMO contamination to prove requisite elements of his case. Liability insurance is discretionary.

(c) Sampling and Testing

- 46 No specific rules deal with sampling and testing costs. Where liability and causation exist, a non-GM farmer may claim sampling and testing costs from the GM crop producer.

(d) Cross-border Issues

- 47 There are no special jurisdictional or conflict of law rules in force or planned. In respect of applicable law, *lex loci delicti* applies. Where the tortious act and damage occur in different places the closest relation applies. At the claimant's choice, either the jurisdiction of the defendant's place of residence or the jurisdiction where the harm took place applies.

9. Germany

(a) Special Liability or Compensation Regime

- 48 A special regime for GMOs establishes a strict form of delictual liability but only has a limited and largely interpretive application to GMO liability which remains regulated under the Civil Code. It does not regulate losses resulting from actual/feared GMO admixture unless contamination arose through research and development schemes or instances where there is limited/no circulatory permission. The claimant must establish damage and causation in line with the *conditio sine qua non* rule. Though rebuttable, it will then be presumed that damage was caused by the crop's modified characteristics. There is no reversal of the burden of proof and the regime leaves the regulation of alternative, potential or uncertain causation to the Civil Code. Joint and several liability applies in the case of multiple tortfeasors. Recourse to contributing tortfeasors is permissible. Contributory negligence and failure to mitigate will reduce damages. Wrongful acts/omissions of third parties are explicitly excluded as defences. Crop and seed production are undistinguished. Generally, other claims may be pursued simultaneously thus the regime is not exclusive. It defers compensatory matters to the Civil Code.
- 49 Damages include the price difference between contaminated and non contaminated crops, indirect costs, remedial costs and loss of future profits (if foreseeable). Proof of actual admixture is necessary thus losses owing to consumer fear of contamination are unrecoverable. Liability is limited to € 85 million. Injunctive relief is available under property law. The possibility of a mandatory compensation fund, to be state and operator funded, is under review. No recourse will be had to farmers who adhered to requisite safety standards. Marginally comparable regimes exist.

(b) General Liability or other Compensation Schemes

- 50 Farmers growing GM seeds authorised for general circulation are subject to the rules of the Civil Code. For compensation to arise, infringement of property rights, fault, damage and causation must be established. Joint and several liability applies in the case of multiple causation unless respective contributions can be identified in which case liability is apportioned. Nuisances must be substantial (taking customary use into account) and abatement measures must be economically reasonable before an injunction/damages will be awarded. The scope and recoverability of damages are parallel to the special regime discussed above. There are no financial limits to liability. Liability insurance/advance cover are not mandatory. No applicable compensation scheme exists. A claim may exist under product liability provisions.

(c) Sampling and Testing

- 51 There are no specific rules which cover costs associated with sampling and testing. Food producers bare monitoring costs. Sampling/testing costs are recoverable as part of the compensation claim if actual GMO presence exists.

(d) Cross-border Issues

- 52 There are no special jurisdiction or conflict of law rules in force or planned. Applicable jurisdiction for cross border contaminations is either Germany or the country where the damage arose, at the claimant's choice. *Lex rei sitae* i.e. the law where the property is situated applies.

10. Greece

(a) Special Liability or Compensation Regime

- 53 No special liability regime completely regulates GMO liability. For the time being the relevant matters are dealt under Law 1650/1986 on the protection of the environment, which imposes a type of risk liability on damage caused to a legally protected good or interest of the plaintiff through the impairment of the environment and gives the defendant the defences of act of God or of malicious act of a stranger as the only defences in order to be discharged of liability. There are no financial limits to liability. No compensatory funds exist though an environmental fund is currently being considered by some scholars.

(b) General Liability or other Compensation Schemes

- 54 Claims may be brought under tort law, neighbourhood law or under consumer protection provisions. Ordinarily, for tortious liability to arise, an unlawful and culpable act/omission (civil delict), damage and adequate causation must be established by the claimant. For environmental cases an effort is being made to reverse the burden of proof so that culpability and causation are presumed. The claimant need only prove minimum causality. Generally, joint and several liability applies in respect of multiple tortfeasors. Normally the discharge of statutory or administrative obligations acts as a defence but this should not be available to GMO operators. Damage encompasses depreciation in property value, future and indirect losses and lost profits if foreseeable. A farmer who suffers loss owing to consumer fear of contamination or losses suffered by other farmers where contamination is confirmed though confined to a single regional farmer are likely unrecoverable. There are no financial limits to liability though contributory negligence will likely reduce compensation. Insurance/advance cover is optional. Nuisances, though in principle ac-

tionable if substantial interference by an unconventional use of the land results, they are also actionable if they arise from emissions, which, albeit common and ordinary for the area, contravene the constitutional principle of preserving a viable vital area and infringe on the neighbour's right to use his property.

(c) Sampling and Testing

- 55 Specific rules which cover costs associated with sampling and testing are found in the Common Ministerial Decision No 332657 and require from seed enterprises to bear the cost of re-examination of some kinds of seeds (sugar beet, rape, maize, soybean, cotton, and certain varieties of tomato) in case they challenge the results of the first examination. For the farmer who has sustained damage from the release of GMOs, general tort rules would apply and costs associated with sampling and testing of GMO presence borne by him are recoverable as part of a claim if the tests prove actual GMO presence.

(d) Cross-border Issues

- 56 There are no special jurisdiction or conflict of law rules in force or planned. Generally, the courts where an immovable property lies have jurisdiction. The Brussels Convention applies with respect to contracting states so that at the claimant's choice, either the courts of the state where the tortious conduct took place or the courts of the state where the harm arose have jurisdiction. The law of the state where the tortious act was committed applies.

11. Hungary

(a) Special Liability or Compensation Regime

- 57 The Genetic Technology Act refers cases of admixture to the general strict liability rules for dangerous activities (§§ 345-345 Hungarian Civil Code). Liability is fault-based, however, if the claimant had consented to the neighbour's GM farming in advance.

(b) General Liability or other Compensation Schemes

- 58 Under the Civil Code, the claimant must establish damage and causation while unlawfulness of damage and accountability of the tortfeasor (fault) are presumed. The burden of proof concept is not rigid and a reversal is possible at the courts discretion so e.g. damage may be presumed in certain circumstances. The defendant will be exonerated where he exercised the expected standard of conduct or acted in accordance with statutory prescriptions. Cau-

sation is a complex though flexible element of claim. The 'but for' test and other limiting considerations apply. There are no specific rules allocating the cost of causation.

- 59 The Civil Code provides a strict liability regime for dangerous activities which may apply if GMOs can be categorised as such. Causation must be proven by the claimant. If the damage fell outside the scope of the dangerous activity and was unavoidable e.g. acts of God, a defence exists. Contributory negligence will reduce the defendant's liability. A claim may exist under the Product Liability Act.
- 60 There are no special rules on alternative, potential or uncertain causation. Joint and several liability applies in respect of multiple tortfeasors. Recourse to contributing tortfeasors is permitted. Established statutory rules defining the required conduct for GMO agriculture would only be instructive were the provision expressly states that adherence to it excludes liability. General tortious remedies are available where an act causes unnecessary disadvantage to neighbours. Depreciation in the value of property, pecuniary/non-pecuniary losses and remediation costs are recoverable. A claim by a farmer who suffers loss as a result of consumer fear of GMO admixture or losses caused where contamination is confirmed though limited to a single regional farmer would be difficult to establish as causation is indirect. Recovery of pure economic losses is limited through causative concepts. There are no financial limits to liability. The court may theoretically mitigate the tortfeasors liability, but this is rarely ever used in practice. Insurance/advance cover is required where activities likely to cause environmental damage, are undertaken. No general compensation schemes exist.

(c) Sampling and Testing

- 61 There are no special rules on costs relating to monitoring or sampling/testing for GMO presence. Generally, such costs are borne by the party carrying out the sampling/testing. The possibility of cost recovery if GMO presence is found is uncertain.

(d) Cross-border Issues

- 62 There are no special jurisdiction or conflict of law rules in force. At the victim's discretion, either the law where the tortious conduct was committed or where the harm occurred applies. If both parties are resident in the same state, the law of that state applies.

12. Ireland

(a) *Special Liability or Compensation Regime*

- 63 There is currently no special liability or other compensation regime with respect to GMOs in force, and neither is one planned.

(b) *General Liability or other Compensation Schemes*

- 64 GMO actions may be pursued under the heads of nuisance, negligence or the rule in *Rylands v Fletcher*. It rests with the claimant (in respect of all three heads) to establish both factual causation i.e. the 'but for' test and legal causation. Legal causation is dependent on proximity of harm and cause. Generally, the defendant would be liable for all reasonably foreseeable damage arising from his actions. Where specific conditions are met, *res ipsa loquitur* may (at the court's discretion) apply in negligence actions such that the claimant need not prove negligence and possibly causation. The defence of deliberate act of third parties may be invoked. In the case of potential causes, if the cause materially increased the peril of harm, legal causation exists albeit factual causation remains unproven. Joint and several liability applies in the case of multiple tortfeasors.
- 65 *Public nuisance* is actionable where damage in excess of that suffered by the public exists. Broadly, under *private nuisance*, the claimant must establish an interest in the land and unreasonable interference with his use/ enjoyment of it. It is no defence that the defendant took all reasonable steps to reduce his effects or that the nuisance arose out of matters beyond his control. Thus nuisance is comparable to strict liability. The nature of the locality and utility of the defendant's conduct are instructive in determining reasonability. Abnormally sensitive activities are disregarded. *Force majeure*, consent and statutory authority are possible defences.
- 66 The rule in *Rylands v Fletcher* imposes strict liability where a person uses his land in a non-natural way to collect/keep anything likely to do mischief if it escapes. The likelihood of its application to GMO damage is questionable as the rule is often evoked in respect of one-off damages, the GMO crop must constitute a non-natural thing and this depends on the local of its cultivation, the harm must have been unforeseeable and the rule in itself is infrequently applied. Defences include unforeseeable third party negligence, *force majeure*, statutory authority/licence to keep the object on the defendant's land (provided the defendant operates within the prescribed provisions and was not negligent). For negligence, duty of care, breach of duty and damage must be established. In determining whether a duty exists, foreseeability of harm,

proximity of relationship and policy issues are taken into consideration. Nuisance actions are *sui generis* thus whether a GMO farmer owes a duty of care requires inferences to be drawn from accepted cases. To establish breach, the conduct of the GMO farmer must have fallen below the standard of like farmers. The observance of administrative/statutory rules though inconclusive is indicative of compliance with duty of care.

- 67 Except under nuisance actions where an inference arises, actual harm must be proved. The aim of damages is to restore the claimant to the position he would have been in but for the defendant's conduct thus depreciation in property value and consequential costs, *inter alia*, are recoverable. The claimant must mitigate his losses. For nuisance actions, loss of enjoyment/use of land is compensable. Where there is no physical harm, pure economic loss not compensable. No financial limits to liability exist. Insurance/advance cover is not mandatory. An injunction may be sought for nuisance actions, is seldom granted in negligence actions and is an unsuitable remedy for a *Rylands* action.

(c) Sampling and Testing

- 68 Sampling costs are recoverable under a successful legal action.

(d) Cross-border Issues

- 69 Irish courts have jurisdiction over tortious acts committed in the jurisdiction or where summons are served on the defendant who is temporarily resident in Ireland except where the Brussels Convention applies. The law where the tort occurred applies.

13. Italy

(a) Special Liability or Compensation Regime

- 70 A special liability and compensation regime regulates economic damage resulting from adventitious GMO admixture, however, certain necessary implementation and specification measures at regional and local level have not yet been taken. These were necessary to enable the cultivation of GMOs. Certain provisions of the special regime have been declared unconstitutional. For liability to arise, fault, causation, damage and capacity of the tortfeasor must exist. Though rebuttable, fault is presumed where obligations prescribed in regional coexistence/mandatory business management plans are breached. It is unclear whether general provisions apply so as to require the claimant to prove causation or if damage is presumed where a defendant contravenes co-

existence measures. The regime does not regulate causation or multiple causes.

- 71 Other sources of compensation exist and the regime recommends the establishment of regional/provincial funds. The existing National Solidary Fund is exclusively state funded. Like criterion apply to crop and seed production. It is unclear whether the regime is exclusive or whether it overlaps with the general liability regime. The latter is likely the case. Pending determination, the scope of compensable damages is regulated under the Civil Code. The regime does not regulate loss owing to consumer fear of contamination or losses suffered by other farmers where contamination is confirmed though confined to one regional farmer. It is silent on injunctive relief. No financial limits to liability apply. The regime is comparable to provisions for liability for dangerous activities under the Civil Code.

(b) General Liability or other Compensation Schemes

- 72 Damage encompasses actual loss and the loss of profits (economic detriment). Injunctions may be sought against the excessive emission of substances (including GMOs) from neighbouring property. Joint and several liability is applicable in the case of concurrent causes. The cultivation of GM crops may be categorised as a „dangerous activity” so that a quasi-strict liability regime applies. It appears that only losses deriving from actual admixture would be recoverable. Thus loss owing to consumer fear of contamination or losses suffered by other farmers where contamination is confirmed though confined to one regional farmer are unlikely compensable. Compliance to statutory rules defining required conduct does not guarantee exoneration.

(c) Sampling and Testing

- 73 There are no specific rules which cover costs associated with sampling and testing of GMO presence as the cultivation of GM crops is prohibited.

(d) Cross-border Issues

- 74 There are no special jurisdiction, conflict of law rules or other specific provisions aimed at resolving cross-border cases of admixture. At the claimant’s preference, either the law of the state where the wrongful act took place or where the damage occurred applies. Under the Brussels Convention persons domiciled in a Contracting State shall be sued in the courts of that State or in the courts of the State where the harmful event occurred.

14. Latvia

(a) *Special Liability or Compensation Regime*

- 75 At present, there are no special liability or other compensation regimes which specifically address liability for GMOs. Liability arising from GMO admixture and damages will continue to be regulated under general tort law. There are no existing specific compensation funds set up to contend with the consequences of GM crop admixture.

(b) *General Liability or other Compensation Schemes*

- 76 The claimant ordinarily bares the burden of proving damage but this is reversed in certain circumstances e.g. where the defendant failed to apply proper segregation/legal measures. Joint and several liability applies where ascertainment of the extent of each tortfeasor's actions is unfeasible. Where strict liability is imposed *force majeure*, wrongful acts/omissions of third parties or contributory negligence are possible defences. No special rules apply to cases of nuisance.
- 77 Damages are defined as 'any deprivation which can be assessed financially' – the aim being *restitutio in integrum*. Only actual damages, including lost profits are compensable. The value of the entire product is covered where unmarketable and where marketable albeit discounted in price, such depreciation is covered. Losses resulting from consumer fear of GMO contamination, *force majeure* related damages and avertable losses (except where the defendant acted maliciously) are not compensable. If a direct/indispensable causal link between contamination of a farmer's crops and losses suffered by other farmers in the same region exists, the latter's losses could be recoverable.
- 78 Liability insurance/advance cover is not obligatory. No financial limits to liability exist. There are no general applicable compensation schemes in force.

(c) *Sampling and Testing*

- 79 No specific rules cover costs associated with the sampling and testing for GMO presence. Ultimately, the *Loser Pays Principle* applies in respect of such and other costs. If the court appoints an expert, related costs are recoverable if tests prove GMO presence.

(d) Cross-border Issues

- 80 No current or prospective special jurisdictional or conflict of law rules exist, nor are there any other specific provisions aimed at resolving cross-border cases. The law of the place where the wrongful act was committed applies. Actions against a defendant shall be heard by the courts of his place of residence/location.

15. Lithuania*(a) Special Liability or Compensation Regime*

- 81 At present, there are no special liability or other compensation regimes which specifically address liability for GMOs. In accordance with Commission Recommendation 2003/556/EC, the Rules on the Coexistence of Genetically Modified, Conventional and Organic Crops are currently undergoing legislative drafting. Notwithstanding the prospective approval of these Rules, liability arising from GMO admixture and damages will continue to be regulated under general provisions of the Lithuanian Civil Code. There are no existing specific compensation funds set up to contend with the consequences of GM crop admixture.

(b) General Liability or other Compensation Schemes

- 82 In the case of an alleged GMO contamination, general liability provisions under the Civil Code apply, which require the claimant to establish causation and damage. Wrongful act and fault are presumed. The causative burden is irreversible. Joint collective liability applies in the case of multiple causes though the defendant may rebut this liability by proving lack of causation. Strict liability may also apply as GM farming may qualify as a „hazardous activity” within the meaning of Art. 6.270 Civil Code. Force majeure, wrongful acts of the claimant or gross contributory negligence of the claimant would be available defences. Lithuanian jurisprudence does not provide for special GMO rules applicable to cases of nuisance or similar neighbourhood problems.
- 83 All losses are compensable as the aim of damages is to put the claimant in the position he would have been in had the tort not occurred. Damages are extensively defined and encompass direct losses (meaning harm to property and/or expenses suffered), loss of future profits, reasonable sums expended in mitigation and costs incurred in assessing the extent of the damage including expert fees. The value of the entire product is covered where unmarketable and where marketable albeit discounted in price, such depreciation is covered.

Pure economic loss is handled on a general basis. Compensation may be awarded where fear of GMO presence in non-GM crops exists or where losses arise when contamination is confirmed though confined to one regional farmer on the proviso that the aforementioned elements i.e. a wrongful act, causation, damage and fault are established.

- 84 Damages may be mitigated at the defendant's request and at the court's discretion however, the court would take into account the nature of the liability, the parties' relationship and their respective financial positions. Financial limitations cannot exceed the amount by which the debtor has or ought to have obtained under compulsory insurance. Unless specified by law, liability insurance/advance cover is voluntarily.

(c) Sampling and Testing

- 85 There are no specific rules which cover the costs associated with general monitoring, sampling or testing for GMO presence. These are initiated by state bodies and are financed by the state. A petitioner's claim for damages would encompass reasonable costs incurred in the sampling and testing for GMO presence.

(d) Cross-border Issues

- 86 There are no existing or proposed special jurisdictional or conflict of law rules or any other specific provisions aimed at resolving cross-border cases. At the choice of the claimant, either the law of the state where the wrongful act took place or where the damage arose will apply. Alternatively the closest relation counts. If both parties are domiciled in the same state, the law of that state is applicable.

16. Luxembourg

(a) Special Liability or Compensation Regime

- 87 A Coexistence Law will regulate conditions for GM crops and cultivation, but will not include special rules on liability, which will continue to be governed by general civil law. However, farmers will possibly be required to take out liability insurance.

(b) General Liability or other Compensation Schemes

- 88 The Civil Code provides that the burden of proof rests on the plaintiff who must establish fault (i.e. the defendant failed to exercise due care and skill as

is expected of a reasonable practitioner in his field), damage and causation. Multiple causes are assessed under the principle of „*causalité adéquate*” under which the court will identify the most likely cause. The defendant can escape liability by evoking a number of defences including necessity and more appropriately, in respect of GMO admixture, legitimate authority, contributory negligence, acquiesce by the plaintiff or third party liability.

- 89 The Civil Code recognises the concept of strict liability, applicable where property in a person’s custody occasions damage. This regime would be appropriate in the case of GMO admixture though defences may be relied upon by the defendant. If nuisance exceeding normal neighborhood inconveniences can be established, liability can be imposed on the basis of neighborhood disruption. Presumably, this could be relied upon by a petitioner suffering GMO related consequences. An added merit to the claimant in this case is that, third party liability or ‘*force majeure*’ will not suffice to relieve the defendant of liability.
- 90 To be compensated, damage must be personal, certain and direct. Luxembourg courts also recognise the concept of ‘loss of chance’ provided the damage is proven. Potential damage e.g. the fear of GMO presence by a farmer’s customers cannot be compensated owing to lack of sufficient ‘degree of present certainty’. Pure economic losses are not differentiated from other types of losses.
- 91 In respect of quantum, damages are reparatory rather than punitive or exemplary. No financial limits to liability or obligations on the plaintiff to mitigate losses exist. A candidate seeking authorisation for the intentional dissemination of GMOs will be accountable financially for authorisation costs, insurance liability premiums and reimbursements for clean up costs expended by public authorities to reverse any damage caused by GMO presence.

(c) Sampling and Testing

- 92 No specific rules cover costs associated with the sampling and testing of GMO presence in non-GM products however, the Draft Coexistence Law delegates to regulations, the task of setting out fees payable by seed and plant producers that subject their crops to inspection. The financial outlay on insurance and authorisation as well as sampling and testing costs are capped at prescribed levels. In the case of justified suspicion, costs are recoverable.

(d) Cross-border Issues

- 93 There are no existing or proposed special jurisdictional or conflict of law rules. Luxembourg courts take jurisdiction on any tort committed within the state or outside Luxembourg if dictated by rules on private international law. The law of the state where the damage occurred or the state most closely linked to the damage will apply.

17. Malta*(a) Special Liability or Compensation Regime*

- 94 No legislative measures currently prescribe special liability or other compensation regimes for GMO related liability. This lacuna will be reviewed in due course.

(b) General Liability or other Compensation Schemes

- 95 In cases of GMO contamination, fault-based liability under the Civil Code or provisions under the Environment Protection Act could apply.
- 96 For causation, the claimant must prove that the tortious act was an immediate and direct cause of the damage though if the tortious act was the only indirect proximate cause, this may suffice. The *Loser Pays Principle* usually applies in respect of costs incurred in establishing causation. Negligence (not causation) may be presumed where the defendant breaches his legal obligations. Generally, joint and several liability is imposed on multiple tortfeasors. Recourse to a contributing tortfeasor is permissible.
- 97 The claimant must prove that the defendant fell below the ‘reasonable person’ standard. Failure to meet e.g. GMO statutorily regulated skills/conduct would automatically render the defendant liable though damage and causation would still have to be established. *Force majeure* is an available defence. Contributory negligence would reduce awardable damages. Although strict liability applies under the Consumer Affairs Act, its product liability provisions only relate to defective products.
- 98 Damages encompass actual loss pertaining to the act, consequential expenses and loss of actual/future expenses – the objective being *restitutio in integrum*. Prospective damages are compensable provided they are certain. There are no financial ceilings on liability. Liability insurance/advance cover is not mandatory. There are no general compensation schemes available under Maltese

law. A non-GMO farmer may require a neighbouring GMO-user to take steps to prevent any impending damage or provide security for the same.

(c) Sampling and Testing

- 99 No specific rules govern the costs associated with sampling and testing for GMO presence. Inferably the GMO farmer is likely to bare such costs in the case of justified suspicion.

(d) Cross-border Issues

- 100 There are no special jurisdictional or conflict of law rules or any specific provisions aimed at resolving cross-border cases. Provisions under Regulation 44/2001 apply where the defendant is domiciled in an EC Member State. Otherwise, Maltese courts have jurisdiction (*inter alia*) where the defendant is domiciled, resident or present in Malta. *Lex loci delicti commissi* applies.

18. Netherlands

(a) Special Liability or Compensation Regime

- 101 There are no specific rules on liability or compensation for GMO related damages. However, a special covenant between the stakeholders provides for compensation in cases of involuntary admixture.

(b) General Liability or other Compensation Schemes

- 102 For fault based liability four conditions must be met: a wrongful act, which is imputable to the actor, causation and damage. The burden of proof rests with the claimant to prove the existence of a wrongful act (i.e. an infringement of a subjective right, breach of statutory duty or conduct below that seemly in society) except where reasonability, equity or statutory provisions dictate otherwise. *Force majeure*, self-defence or statutory prescriptions are possible defences. Imputability is often presumed when an unlawful act is established. The claimant must prove causation under which the 'but for' test precedes the 'reasonable imputability' test. The former does not apply in the case of alternative or concurrent causes. Causation may be presumed when an act known to be risky causes damage. Joint and several liability applies in the cases of multiple uncertain and concurrent causes. Strict liability applies, *inter alia*, to defective moveable objects and to proven hazardous objects used/kept in a trade. It is unlikely that a GMO would be considered a hazardous substance. Defences include intentional wrongful conduct of third parties and *force majeure*.

- 103 Damage includes patrimonial (actual loss suffered and lost profits) and non-patrimonial damage (if specified conditions are met). Loss as a result of consumer fear of GMO contamination is unlikely compensable though an omission to inform neighbouring farmers of GMO activities may result in the recoverability of such and other losses. Causation would be difficult to establish for losses suffered by farmers where contamination is confirmed though restricted to a single regional farmer. Pure economic losses are not handled differently and are recoverable. GMO admixture may amount to actionable nuisance depending, *inter alia*, on reasonability of precautionary costs. Compensation is payable in full though specified factors e.g. contributory negligence may result in a reduced award. Except where required by a local authority, liability insurance/bank guarantees are not mandatory.

(c) Sampling and Testing

- 104 There are no specific rules concerning sampling and testing costs. These are recoverable as part of damages. In certain instances, costs are recoverable even in cases of unjustified suspicion provided the GMO farmer is found liable e.g. for breach of statutory provisions.

(d) Cross-border Issues

- 105 There are no special jurisdictional or conflict of law rules in force or planned. Under the Brussels I Regulation the courts of the country where the respondent is domiciled have jurisdiction. *Lex loci delicti* applies in respect of applicable law.

19. Norway

(a) Special Liability or Compensation Regime

- 106 There is no special liability or compensation regime that applies to GMO liability though the Norwegian Act on Genetic Technology contains a general liability clause imposing strict liability for resulting damage. Multiple and potential tortfeasors are regulated under the Pollution Act under which joint and several liability applies. Liability is established if the defendant *may* have caused damage unless he proves lack of causation. No defences are evocable. The same criteria apply to crop and seed production. A simultaneous claim under general tort law provisions may be pursued though double recovery is barred. Pure economic loss is not handled differently. No compensation funds exist. This regime is comparable to Product and Environmental Liability provisions.

(b) General Liability or other Compensation Schemes

- 107 The *conditio sine qua non* precedes a comparative analysis of the tortfeasors conduct to other causal factors before adequate causation is considered. The burden rests with the claimant to prove damage though this may be reversed at the court's discretion. Joint and several liability applies in the case of multiple cooperating tortfeasors. In respect of alternative causation, it must be proved that it is more probable than not that the defendant is the cause of the damage otherwise each causer escapes liability. The concept of uncertain causation is not recognised. Statutory/administrative provisions establishing required conduct are useful in establishing fault. Although unlikely applicable to GMO damage, a strict liability regime is applicable where damage results from a „continuous, typical and extraordinary risks”.
- 108 The Neighbour Act will likely apply in respect of GMO nuisances. The quantum of damage includes the price difference between traditional/organic and a GMO contaminated crop. Pure economic losses, unlike damage to property/persons must pass a normative threshold before they are regarded as compensable. Losses owing to consumer fear of GMO contamination and those suffered by other farmers where contamination is confirmed though limited to a single regional farmer are purely economic and lack adequate causal connection. There are no financial limits to liability though the defendant's financial standing may result in a reduction in damages. There is no general obligation to obtain liability insurance. No general compensation schemes are in operation.

(c) Sampling and Testing

- 109 There are currently no specific rules which cover costs associated with sampling, testing or the general monitoring of GM crops. Sampling and testing costs are recoverable as part of damages where the defendant is liable.

(d) Cross-border Issues

- 110 Under the Pollution Act, the question of compensation shall be decided in the courts of the country where the polluting activity took place. The courts where the direct effect of the damaging activity occurred have jurisdiction. *Lex loci delicti* applies.

20. Poland

(a) Special Liability or Compensation Regime

111 A legislative provision due to be amended regulates liability for GMO damage. Liability is strict though defences exist: *force majeure* and where exclusive, contributory negligence and wrongful acts of third parties. Compliance with established legislative rules is no defence. Causation is regulated under the Civil Code though under the current regime the defendant may, at his expense, be required to adduce evidence to ascertain the extent of his liability. The same criteria apply to crop and seed production. The regime is not exclusive. It overlaps with provisions under the environmental protection law. The scope of recoverable damage is delegated to the Civil Code. Where legislated, security for potential damage in the form of a deposit, bank guarantee or insurance policy would be mandatory. The regime is comparable to other regimes.

(b) General Liability or other Compensation Schemes

112 For liability to arise, fault, causation and damage must exist. To establish fault, the GMO farmer must have fallen below the standard expected of a person in his profession. Alternatively, liability is established through the failure to comply with statutory rules defining conduct. The burden rests with the claimant to prove the *conditio sine qua non* rule in respect of causation and that the damage was a normal consequence of the cause. Joint and several liability applies in the case of multiple tortfeasors. Alternative, potential or uncertain causation are addressed by the requirement to establish adequate causation. Damage to persons, property, pecuniary and non-pecuniary losses are compensable. Full compensation is awarded though damages may be mitigated. The depreciated value of the non-GMO product and indirect costs are covered. Pure economic loss is not compensable unless, *inter alia*, it comes within the ambit of lost profits. Proof of actual damage is required hence loss of profits owing to fear of GMO admixture or losses suffered by other farmers where contamination is confirmed though restricted to a single regional farmer are compensable if adequate causation is proved. There are no financial limits to compensation. Injunctive relief is available. Excessive interference is actionable under property law. There is no obligation to obtain insurance/advance cover. No general applicable compensation schemes exist.

(c) Sampling and Testing

113 Testing, sampling and monitoring costs are to be borne by the GMO operator. Such costs if incurred to mitigate damages are recoverable. They are also re-

coverable where no admixture exists e.g. if the traditional/organic farmer suffers economic loss as a result of price drops pertaining to confirmed regional GMO presence.

(d) Cross-border Issues

- 114 There are no special jurisdictional or conflict of law rules in force/planned. The law of the state where the tort occurred applies.

21. Portugal

(a) Special Liability or Compensation Regime

- 115 There is currently no special liability regime yet in force however several possible provisions may be invoked including those under the Frame Law on Environmental protection which impose strict liability on damage caused to a thing through the impairment of the environment. Causation and damage must be established. Act of God and contributory negligence (if gross/intentional and exclusive) serve as defences. Compliance with administrative/statutory requirements will not exonerate a defendant though licences may serve to justify his behaviour. The same criterion applies in respect of crop and seed production. Unless expressly regulated, pure economic loss is not recoverable. Actual admixture is required thus fear is only compensable if there is an imminent threat to the environment. The requirement to establish causation may hinder recovery of losses suffered by other farmers where contamination is confirmed though restricted to a single regional farmer. Injunctive relief is available.
- 116 Provisions requiring a compensation fund to be set up for economic damage arising from GMO contamination are pending approval. The fund covers adventitious contamination above a 0.9% threshold. No governmental funding is expected. Recourse from those responsible for the damage is possible. The regime is not exclusive thus claims may also be brought under general tort provisions.

(b) General Liability or other Compensation Schemes

- 117 For liability to exist, an unlawful act, causation and damage must be established. Breach of statutory duty or failure to meet an objectively conceived standard is sufficient to establish fault. The latter is presumed where breach arises out of failure to adhere to statutory provisions which expressly define required conduct. The burden lies on the claimant to prove adequate causation. If legislative provisions are aimed at protecting specified interests, causa-

tion is easier to establish. The Code is silent on costs incurred in establishing causation. Multiple tortfeasors are jointly liable. Alternative, potential or uncertain causation are not statutorily regulated though a potential tortfeasor is likely to be exonerated.

- 118 Damage includes actual positive damage, loss of profit and future loss (if foreseeable). Fear of GMO contamination is not actual damage thus resulting losses are unlikely compensable. Insurance cover is mandatory for certain specified (high risk) activities. There are no financial limits to compensation though contributory negligence and the defendant's financial status (at the courts discretion) may warrant mitigation of damages. A GMO farmer may seek an abatement order and compensation for nuisance for *inter alia* a substantial impairment to the use of land. Fault need not be established.

(c) Sampling and Testing

- 119 There are no specific rules on sampling and testing which under draft rules are to be borne by the claimant. These are likely recoverable if actual GMO is proved. The GMO farmer must bare monitoring costs.

(d) Cross-border Issues

- 120 There are no special conflict of law rules. Portuguese courts have jurisdiction, *inter alia*, over immovables in Portugal, if the claimant resides or if the tortious act was committed in the jurisdiction. The law of the state where the main conduct that caused the damage or where the effects of the damage occurred applies. Where the claimant and defendant are resident in the same country, the law of that country is applicable.

22. Slovakia

(a) Special Liability or Compensation Regime

- 121 A 2006 Act on genetically modified agricultural production refers liability issues to tort provisions of the Civil Code and the Commercial Code. No special compensation regime for GMO liability is in force. In the case of GMOs, where damage resulting from the defendant's business operations (as defined) and causation are established, strict liability is imposed. Fault is presumed. The wrongful act of third parties is a possible defence. The same criterion is applicable to crop and seed production. The regime is not exclusive. Other statutory provisions also exist which regulate the obligations of GMO operators.

(b) General Liability or other Compensation Schemes

- 122 Breach of duty, damage and causation must be established. Fault is presumed. *Conditio sine qua non* is one of the tests used to establish causation. Joint and several liability applies in the case of multiple tortfeasors. Damages encompass lost profits, remedial costs and the difference in value between a GMO admixed crop and a traditional/organic crop. A farmer's losses due to fear of GMO contamination are likely compensable. Losses suffered by other farmers where contamination is confirmed though limited to a single regional farmer are recoverable if causation can be proved. To be relieved, the defendant must establish that the damage was caused by an unavoidable event not generated by the operation of his business or by contributory negligence. Excessive nuisances are actionable. There are no financial limits to liability. Insurance/advance cover is not mandatory. No applicable compensation funds exist.

(c) Sampling and Testing

- 123 There are no specific rules which cover costs incurred in the sampling and testing of GMO presence in other products. Such costs including costs associated with mandatory monitoring are presumed to be borne by the GMO operator.

(d) Cross-border Issues

- 124 No specific provisions aimed at resolving cross-border cases exist. Tort claims are governed by the law of the place where the damage occurred or the place where any circumstances establishing the right for compensation arose.

23. Slovenia*(a) Special Liability or Compensation Regime*

- 125 A fault based liability regime regulates the use of GMOs though liability issues are delegated to the Civil Code. Causation may be established due to failure to comply with administrative obligations. There are no financial limits to liability. Insurance is not mandatory. No compensation funds exist. Injunctive relief is available. The criterion for crop and seed production is undifferentiated. The state is responsible for assuring measures to minimize/prevent damage caused by GMO activities. If it fails to meet its obligations, then it could be held subsidiarily liable. Recourse would then be taken against the responsible tortfeasors.

(b) General Liability or other Compensation Schemes

- 126 The claimant must prove an illegal act, damage and causation. Fault is presumed if damage was caused intentionally or negligently. The defendant must then demonstrate that he satisfied the requisite standard of care including those prescribing conduct expected of a GM farmer. The main test for causation is *conditio sine qua non*. Joint liability applies in the case of multiple tortfeasors.
- 127 The Civil Code also provides a strict liability regime for hazardous activities where causation is presumed though damage must be proved. *Force majeure*, wrongful acts of third parties and contributory negligence are possible defences. Excessive nuisances including GMO admixture (taking account the local) are actionable. The value of the entire product is covered where unmarketable and where marketable albeit discounted in price, such depreciation is covered. Pure economic losses are not handled differently. Actual damage must exist thus losses caused by consumer fear of GMO contamination and losses suffered by other farmers where contamination is confirmed though restricted to one regional farmer are not actionable though the farmer may seek compensation for his ‘tarnished reputation’. There are no financial ceilings to liability. Insurance is not mandated by law. A claim may also exist under product liability provisions. Injunctive relief is available.

(c) Sampling and Testing

- 128 There are no special rules on costs associated with sampling and testing for GMO presence. Such costs would be borne by the requisitioning party though are likely recoverable in the case of justified suspicion.

(d) Cross-border Issues

- 129 Either the law of the state where the act was committed or the law of the state where the damage occurred is applicable – whichever is most favourable to the defendant.

24. Spain

(a) Special Liability or Compensation Regime

- 130 There is no special liability or compensation regime in force which address liability for GMOs.

(b) General Liability or other Compensation Schemes

- 131 The claimant must prove fault (the consequences of which must have been foreseeable) and causation – both factual (under the equivalence theory) and legal (usually according to the theory of adequate causation). In proving fault, the existence of provisions establishing statutory conduct is inconclusive. In theory, the burden may be shifted in circumstances where it is easier for the defendant to disprove causation. Joint and several liability apply in respect of multiple tortfeasors and concurrent causes. In case of damage caused by an undefined member of a group, all potential tortfeasors may be held liable provided that it is proved that one of them caused damage. Strict liability provisions e.g. under the Product Liability Act may be evoked however, these are unlikely to apply in respect of GMO admixture.
- 132 Specific legal rules apply in certain regions. According to Catalan law, repeated nuisances are actionable if arising out of abnormal uses of land, are substantial and out of line with local customs and regulations. Abatement measures, if financially onerous may prevent the grant of injunctive relief or compensation. Under the general Spanish tort law regime, damages aim to restore the claimant to the position they would have been in but for the tortious conduct. It includes mitigation costs and loss of earnings. The concept of pure economic loss is not recognised as a separate head of damages. Losses caused by GMO fear of contamination are unlikely compensable. There are no financial limits to liability. Farmers are under no obligation to obtain liability insurance/advance cover. There are no existing general compensation schemes.

(c) Sampling and Testing

- 133 There are no specific rules on the costs of sampling and testing. Such costs are unrecoverable notwithstanding actual GMO presence is detected though they may be compensable if categorised as mitigation expenses.

(d) Cross-border Issues

- 134 There are no specific provisions concerning cross-border issues. The law of the place where the tortious act took place applies.

25. Sweden*(a) Special Liability or Compensation Regime*

- 135 There is no special liability or compensation regime in force. The possibility of such regulation is currently being considered.

(b) General Liability or other Compensation Schemes

136 GMO damages could be actionable under the Environmental Code (strict liability) or under a strict liability regime formulated by the courts. Under the former, *force majeure* is unlikely to avail the defendant. General liability rules can also be evoked under which the claimant must prove negligence and causation. Though inconclusive, violation of statutory or other duties point towards negligence. Causation is not statutorily regulated thus the courts take a pragmatic approach to it. The *conditio sine qua non* rule applies in certain instances. The burden of proof is rarely shifted though the threshold for causative proof could be lowered e.g. in the case of multiple causes. Alternative, potential or uncertain causation are unregulated. Joint and several liability applies in the case of multiple tortfeasors. Pure economic loss is treated differently from other losses. Losses of a farmer whose customers fear GMO contamination or losses caused where contamination is confirmed though restricted to a single regional farmer are compensable if the other conditions for liability exist. The price difference between contaminated and non-contaminated crops, future losses and testing costs are compensable. There are no financial caps on liability though damages may be mitigated if overly burdensome on the defendant.

(c) Sampling and Testing

137 No specific rules cover costs associated with sampling and testing of GMO presence in other products. Ultimately, such costs are borne by GMO users.

(d) Cross-border Issues

138 No special conflict of law rules are in force or planned. The court where the harm was caused or where it occurred has jurisdiction. *Lex loci delicti* applies in respect of applicable law.

26. Switzerland

(a) Special Liability or Compensation Regime

139 Statutory provisions impose strict liability on authorised persons for damage caused through the modification of genetic material. Damage is presumed without taking fault/negligence into consideration. Authorised persons have recourse against the GMO operator.

140 The claimant must prove causation. Multiple causes and the recovery of costs incurred in establishing causation are not expressly regulated under the re-

gime. Act of God, gross misconduct of third parties or the injured party serve as defences. There is no reversed burden of proof. The same criterion applies in respect of crop and seed production. Damages include actual loss of property and personal and environmental injury. Though at the court's discretion, the value of the entire product is covered where unmarketable and where marketable albeit discounted in price, such depreciation is covered. Loss caused by consumer fear of GMO presence or losses caused where contamination is confirmed though restricted to a single regional farmer are pure economic losses and thus unrecoverable. There are no financial limits to liability though contributory negligence and the defendant's financial state may result in a reduced award. A guarantee/security to cover GMO damage is compulsory. No compensation funds exist. The claimant must mitigate his losses. Injunctive relief is available. Defective products are also actionable under the regime. *Lex specialis* provisions are exclusive so that they prevail over general provisions. The regime is comparable to other schemes.

(b) General Liability or other Compensation Schemes

- 141 The general liability provision for illicit acts assumes an illicit act/omission, damage and fault/negligence. Causation must be established. Alternative causality is handled under proportionate or joint and several liability. The latter applies in respect of cumulative causality or multiple independent causes. The possibility of recourse against contributing tortfeasors lies at the judge's discretion. Damages and injunctions may be sought against unreasonable conduct by residents of neighbouring property. Liability for defective products may exist under the Product Liability Act and the Environmental Protection Law.

(c) Sampling and Testing

- 142 There are no specific rules that cover costs associated with sampling and testing for GMO presence. The claimant bares the costs which are recoverable if tests prove positive.

(d) Cross-border Issues

- 143 There are no special jurisdictional or conflict of law rules in force. The provisions of the Lugano Treaty on Jurisdiction and the Enforcement of Judgments in Civil and Commercial Matters apply. For non-contracting states, Private International Law provisions grant Swiss courts jurisdiction if the defendant is domiciled or habitually resident in Switzerland. The law of the country whose courts have jurisdiction applies where the parties agree. If the parties are resident in the same country, the laws of that country apply otherwise, the

law of the country where the wrongful act was committed or where the damage arose applies.

27. United Kingdom: England & Wales

(a) *Special Liability or Compensation Regime*

- 144 A public consultation proposing a statutory redress scheme in respect of economic damage resulting from adventitious GMO presence is underway. Other GMO liability claims may be brought under existing legal principles. No specific civil liability or other compensation regimes are in force. For a claim to succeed, the claimant must demonstrate GMO presence in excess of 0.9% through no fault of his own. Economic losses relating to regulatory as opposed to market requirements are compensable. It is not a fault based or strict liability scheme. Establishment of the GMO source is unnecessary thus multiple causes are of no consequence. The scheme applies exclusively to crop production. As actual GMO presence is required, losses resulting from consumer fear of contamination or losses suffered by other farmers where contamination is confirmed though restricted to a single regional farmer are not compensable. In essence, the difference in value between the GM and traditional/organic crop represents the compensation ceiling. Funding from the government or non-GM farmers is unlikely. It is expected that redress is to be sought through an adjudication/arbitration procedure. Injunctive relief is not available. Unless contractually stipulated, recourse to defaulting farmers is unlikely. It bears no exact correlation to other existing schemes.

(b) *General Liability or other Compensation Schemes*

- 145 Claims under general tort law include negligence, private and public nuisance and the rule in *Rylands v Fletcher*. For negligence, duty of care, breach of duty and causation must be established. The first two conditions will likely pose difficulty for GMO claims. General defences apply e.g. contributory negligence. Though doubtful in the case of GMO presence, public nuisance may give rise to a civil action where the claimant suffers *special damage*. Unreasonable interference with the claimant's use or enjoyment of land is actionable under private nuisance. The defendant will not be exonerated even if he takes all reasonable steps to ease the effects of such interference. Damage need not be established. An injunction may also be sought. The rule in *Rylands v Fletcher* imposes strict liability where a person uses his land in an extraordinary/unusual way to collect/keep anything likely to do mischief if it escapes. Success under this head is doubtful in the case of GMO admixture. Damage caused must be suffered outside as opposed to on the land. Defences

include contributory negligence, *vis major* and act of God. An action may exist under the Consumer Protection Act 1987.

- 146 To establish causation, the claimant must show that *but for* the tortious act, damage would not have occurred. Damage must have been reasonably foreseeable. For multiple causes the defendant is liable to the extent of his contribution if assessable. To establish fault, the reasonable person standard applies. Statutory requirements/authorisations may disaffirm fault.
- 147 Unlike public/private nuisance actions, physical injury to persons/property must be established under negligence. Losses as a consequence of consumer fear of GMO presence or losses suffered by other farmers where contamination is confirmed though restricted to a single regional farmer are likely unrecoverable under negligence or the rule in *Rylands v Fletcher*. The position under public/private nuisance is tentative. Damage is calculated as the difference between the market value of an unaffected and contaminated crop. The award of pure economic loss is restricted in the case of negligence though more easily recoverable under public/private nuisance. There are no financial limits to liability, no duty to obtain liability insurance/advance cover and no general compensation schemes are applicable here. The claimant must mitigate his losses.

(c) Sampling and Testing

- 148 There are no special rules regulating testing/sampling costs. Although uncertain, these may however be recoverable under the proposed redress scheme. Under general tort law, only if GMO traces exist will such costs be recoverable.

(d) Cross-border Issues

- 149 No special jurisdictional or conflict of law rules are in force/planned. The Brussels Convention applies in respect of jurisdiction. If the defendant is not domiciled in a participating state, applicable jurisdiction is based on the proper service of a claim form on the defendant in the jurisdiction or abroad (where damage was sustained in the jurisdiction or results from an act committed within the jurisdiction). Generally, the law of the country in which the tort occurred applies.

B. Liability in Cases of Damage Resulting from GMOs: an Economic Perspective

Michael Faure/Andri Wibisana

I. Introduction

- 1 The problems sketched in the introduction to this research project, being what the role of liability rules could be in case there is a presence of genetically modified organisms (GMOs) in non-genetically modified crops is certainly a question that merits to be analysed from an economic perspective as well. Economic analysis of law or, as it sometimes shortly referred to „law and economics” has paid a lot of attention generally to the question how legal rules can be designed in such a way to increase social welfare.¹ In this respect, some attention has been paid to the use of GMOs generally. That literature more particularly focuses on the uncertainties inherent in the use of GMOs. Increasingly, economic analysis also deals with the question of how the law should react to risk and uncertainty. Hence, economists also provide an economic perspective of the precautionary principle. In that respect, economists have also paid attention to the question whether risky activities that have benefits to society but may also have uncertain negative consequences should still be allowed to take place or not. Traditional cost-benefit analysis has been supplemented with insights from behavioural law and economics to tackle these complicated issues. In that respect, law and economics has paid some attention to the acceptability of GMOs, but that is obviously not the focus of this study.
- 2 In this study, a more narrow question is addressed, being whether there could or should be any liability if genetically modified crops are used in the EU whereby these GMOs may affect other products that have not been genetically modified². Even though this liability for (in short) damage caused by GMOs

¹ The standard handbook in this respect is still from R. Posner, *Economic Analysis of Law* (6th edn. 2003). But see equally R. Cooter/T. Ulen, *Law and Economics* (4th edn. 2004) and S. Shavell, *Foundations of Economic Analysis of Law* (2004).

² Of course, it should be noted that the issue of co-mingling between non-GM and GM crops is not the only concern that might result from a deliberate release of GMOs to the

has to our understanding not been the subject yet of much economics literature there is obviously a vast law and economics literature with respect to the role and shape of liability rules. That general economic literature provides some insights that can also in quite a useful way be applied to the liability for damage caused by GMOs. Indeed, a parallel can be made with other, although slightly related liability situations on which economic analysis exist. For instance, a wide economic literature exists on environmental liability³ as well as for the related area of product liability.⁴ Even though liability for damage caused by GMOs may of course still pose slightly different problems, some of this literature can be applied to the issues raised in the questionnaire.

- 3 However, since this report is not, like the other reports for this study, a traditional country report in which existing legal rules from statutes or case law are discussed, the questionnaire cannot be followed in a literal sense. For instance, it does not seem useful to make, from an economic perspective, a distinction between special liability or compensation regimes on the one hand and general liability regimes on the other hand. However, it is very well pos-

environment. For example, genes of GM crops designed to be tolerant for the application of certain herbicides (herbicide-tolerant crops) have a potential to flow to their weedy relatives or other plants resulting in the development of herbicide resistant hybrids. The development of herbicide-tolerant weeds could increase the costs of weeds control and pressure to the environment as farmers are forced to resort to chemicals that are possibly more toxic. Concerns have also been pointed to another type of GM crops, namely insect-resistant crops that are designed to express a certain types of pesticides. Some crops have been genetically modified with genes from *Bacillus thuringiensis*, referred to as Bt crops, in such a way that insects eating these crops will be killed. Such self-producing pesticides plants might create several environmental problems. It has been argued that Bt crops could make the development of pest resistance faster. The development of Bt-resistant pests will not only reduce the economic value of Bt crops, but also create a significant loss for organic farmers as Bt is one of most effective pesticides allowed for organic farming. Finally, the release of GMOs into the environment might also create impacts on non-target and beneficial species, such as monarch butterfly. See: D.E. Ervin, *et al.*, Towards an Ecological Systems Approach in Public Research for Environmental Regulation of Transgenic Crops, [2003] *Agriculture, Ecosystems and Environment* 99, 1-14; S.S. Batie, The Environmental Impacts of Genetically Modified Plants: Challenges to Decision Making, [2003] *American Journal of Agricultural Economics* 85, 1107-111. Readers interested in more scientific evidence about various environmental impacts of GMOs could see, for example: L.L. Wolfenbarger and P.R. Phifer, The Ecological Risks and Benefits of Genetically Engineered Plants, [December 2000] *Science* 290, 2088-2092; and D.A. Andow and C. Zwahlen, Assessing Environmental Risks of Transgenic Plants, [2006] *Ecology Letters* 9, 196-214.

³ See for a summary of this literature M. Faure (ed.), *Deterrence, Insurability, and Compensation in Environmental Liability. Future Developments in the European Union* (Vienna, Springer, 2003).

⁴ See M. Faure, Product Liability and Product Safety in Europe: Harmonization or Differentiation? [2000] *Kyklos*, 467-508.

sible to address the various issues mentioned in the questionnaire in this report as well, thereby focusing on the general question how, from an economic perspective, legal rules should be constructed to address a liability in case of mixture of GM crops with non-GM crops.

- 4 Generally, in the economic analysis of law, a distinction is made between prevention and compensation. As will be shown below, from an economic perspective, liability rules primarily should have a preventive effect and thus provide incentives to those dealing with GMOs to prevent the particular damage coming from this mixture. This is in the economic analysis distinguished from *ex post* compensation for which a variety of remedies can be developed as well. Both issues will be addressed in this report, the remainder of which will be structured as follows: after this introduction (1) the importance of distinguishing liability in tort and liability in contract from an economic perspective will be briefly introduced (2). Then, more attention will be paid to the detailed shape of a potential liability regime, given its goal of preventing damage resulting from mixture (3). The questionnaire already makes clear that important questions can arise concerning causation more particularly when there is e.g. uncertainty between the damage and the operator responsible for it, more particularly since there may be different sources of mixture. Hence, the causation issue has to be addressed from an economic perspective (4). Next, the question arises as to the available remedies and more particularly the damages that can be awarded (5). This also raises a more general question of compensation for the loss, also through other mechanisms than liability (6). Finally, attention will briefly be paid to a few cross-border issues from an economic perspective (7).

II. Liability versus Contract

- 5 First of all, it should be mentioned that many of the examples of potential damage situations have, both from a legal and from an economic perspective, a different legal structure. Some cases can clearly be constructed as tort cases whereby damage is caused to third parties. However, in some cases, the mixture can only be known at later stages of the food or feed protection chain and hence there may be contractual liability as well. Indeed, specific requirements concerning GMO presence could also be laid down in contracts with retailers or other operators further down the food or feed production chain. From an economic perspective, there is a clear distinction between those two situations. The dividing line is clearly whether there is a third party involved or not. If e.g. a producer of GMOs wrongfully causes mixture of his products with non-genetically modified crops, this would generally be constructed as a

tort case as long as the victim does not stand in a contractual relationship with the injurer. However, the situation may be different when the injurer and the potential victim stand in a contractual relationship to each other and are thus bound to each other via the price mechanism. In practice, however, co-mingling between GM and non-GM crops usually occurs as a result of cross-pollination between the two crops, in which we can hardly find that potential victims, namely the farmers whose crops pollinated by pollen from GM crops, have a contractual relationship with the farmers planting GM crops or the producer of the GM crops.

- 6 From an economic perspective, the question arises whether and if so how legal rules should intervene to prevent the damage from occurring. As was already mentioned in the introduction, economists would basically stress that legal rules, thus also liability rules, have an incentive function. Thus, the main function of legal rules in this particular context would be to provide incentives to producers or manipulators of GMOs to prevent damage more particularly resulting from mixture with non-genetically modified crops. It should be clear from the outset that for the purpose of this study, we simply assume that it is efficient to prevent this mixture from occurring and that hence this mixture can from a social welfare perspective be considered as a loss.⁵ Thus the law and economics problem we face in this study is what particular rules should or can be designed to provide incentives to operators for preventing damage resulting from this mixture and on the other hand how appropriate compensation could be guaranteed if *ex post* damage nevertheless occurred.

1. Coase

(a) Basic Theory

- 7 As long as a victim and injurer stand in a contractual relationship to each other, most law and economics scholars would probably immediately refer to

⁵ Indeed, some may doubt whether the mixture between GMOs and non-GM crops thus constitute damage at all. It has been argued, for example, that one of damage for organic farmers is their lost of organic certification due to the presence of GMOs in their products. However, Kershen challenges this possibility of losing organic certification because the merely presence of transgenic crops does not necessarily violate the standards of organic certification. The author argues that according to official standards for organic crops in the USA, organic crops may contain transgenic crops without losing organic certification. In this regard, the co-mingling between GM and non-GM crops does not necessarily create economic damage for organic farmers. See: D.L. Kershen, Legal Liability Issues in Agricultural Biotechnology, [2004] *Crop Science* 44, 457. For the purpose of this study, however, we assume that the admixture will create damage for the victim, i.e. the farmers that plant non-GM crops. More detailed information about possible damage of these farmers will be discussed in section V.

the well-known *Theorem* presented by Nobel Prize winner Ronald Coase in his well-known paper „The Problem of Social Cost”.⁶ Coase showed that if transaction costs are zero, an optimal allocation of resources will follow no matter what the legal rule holds. This is the short summary of what later became known as the Coase Theorem. It basically means that if parties are in a situation where they can contract (hence the reference to the low transaction costs) the optimal solution for society (in case of a potential damage, the optimal loss reduction) will always be followed by parties, even if the legal rule would say something else.

- 8 Of course, some have doubted the importance of the Coase Theorem for real life situations since transaction costs are inevitably a reality. On the other hand, other scholars showed that in fact the conditions of the Coase Theorem are also met in every situation where the injurer and the victim are bound to each other via the price mechanism. Thus some have applied the Coasean solution also to the area of product’s liability. Therefore, Oi argued that a well informed consumer will only buy the product that has the lowest full price.⁷ The full price in this perspective includes both the production price and the expected damage (due to the potential defect of the product). If there would hence be a liability situation (*Caveat Vendit*) the market price would already reflect the expected damage since the expected damage would be incorporated by the seller in the market price. However, Oi showed that also in case of no liability of the manufacturer (*Caveat Emptor*) the buyer would only buy the product at the lowest full price. This means that he would take the expected damage into account and add this to the market price. Of course, Oi has been criticized for the obvious reason that he assumes full information on the side of the consumer, which may not always be the case.⁸
- 9 Nevertheless, this Coasean solution remains important for GMO liability since there is a second aspect to it: another implication of the Coase Theorem is that if the law would e.g. decide to impose liability on an operator or manufacturer, the cost of such a liability could easily be passed on via the price mechanism. Through this passing on of additional liability costs Oi showed that in this particular Coasean setting, the price mechanism means that an intervention of the legal system cannot even have distributional effects (e.g. shifting costs to producers instead of to consumers). As long as the manufac-

⁶ R.H. Coase, The Problem of Social Cost, [1960] *Journal of Law and Economics (JLE)*, 1-44.

⁷ W. Oi, The Economics of Product Safety, [1973] *BELL Journal of Economics (BELL J ECON)* 4, 3-28.

⁸ See V.P. Goldberg, The Economics of Product Safety and Imperfect Information, [1974] *BELL Journal of Economics (BELL J ECON)* 5, 683-688.

turer is indeed able to pass on increased liability costs via the price mechanism, it will by the end be the consumer who will pay for his own increased protection.

(b) Coase and GMO Liability

- 10 These basic economic insights, resulting from the Coase Theorem, of course have their importance for GMO liability as well. For instance, as far as a potential liability is concerned in a contractual relationship (for instance in contract with retailers or operators further down the food or feed production chain) economists would (stated simply) argue that there is not much reason to worry since the parties can in principle freely negotiate about the division of risks. The division of risks would thus also be reflected in the price. If for instance a producer would exclude liability towards buyers further down the food or feed production chain this should not necessarily be a problem since it will be reflected in a lower market price. Hence, economists would argue that as long as these Coasean bargaining conditions are fulfilled, there should not necessarily be an intervention of the legal system to change the (probably efficient) outcome of the bargaining between the contracting parties. The goal of law should then simply be, as the economics of contract law teaches,⁹ to back up the contractual solutions agreed to by the parties.¹⁰
- 11 Since the study basically supposes that the liability question would arise between professionals engaged in the agricultural business, the traditional assumption of the Coase Theorem, being that well informed parties negotiate contracts that will increase their utility will in most cases probably be met. This confirms that there may not be a necessity for a specific intervention in this particular case. The need for such an intervention may only be there if it appeared that one of the particular parties was not informed on the particular risks. In that case, one may not assume that the price will also reflect the agreement between the parties concerning the risk. The latter may more particularly be the case when the victim is not a professional but a consumer. In as far as the consumer would suffer damage from the mixture of GMOs with

⁹ For an overview of the economics of contract law see S. Shavell, *Foundations of Economic Analysis of Law*, 291-385 and A.T. Kronman, Mistake, Disclosure, Information, and the Law of Contracts [1978], *Journal of Legal Studies* (J LEGAL STUD) 7, 1-34.

¹⁰ Of course, in the economics of contract law, there is a wide literature dealing with interesting problems such as e.g. whether there should still be a right on specific performance even if that may meanwhile have become inefficient or whether parties can still claim the execution of the contract even if the factual conditions have changed. It would lead us too far to discuss these issues in any detail here. See S. Shavell, Contracts, in: P. Newman (ed.), *The New Palgrave Dictionary of Economics and the Law* (1998) 436-445.

non-GMO crops and if we assume that the consumers were not informed of this risk and would file a law suit, not against his seller but against the operator who was responsible for this mixture, this particular case would then again be dealt with like the traditional tort case, which we will discuss now.

2. Tort Liability

(a) Goal of Tort Liability: General

- 12 If we now take the second case, the one in which there is no such contractual relationship between the injurer and the victim and where the victim is thus a third party who suffers damage as a result of the mixture of GMO with non-GMO crops, we find ourselves in the traditional tort case. The goal of tort liability has been well described in the economic literature. The economic analysis of law in general and of accident law more specifically starts from the belief that a legal rule and more particular a finding of liability will give incentives to potential parties in an accident setting for careful behaviour.¹¹ Thus, economists tend to stress the deterrent function of tort law. Lawyers on the other hand mention this deterrent function sometimes as well, but tend to attach more value to the compensation goal of accident law. This „victim protection” argument is discussed in the law and economics literature as well.¹² In that respect it is, however, often stressed that the best form of victim protection is to avoid victimisation in the first place. Of course, no one will argue that prevention of accidents is not a way of victim protection as well. This difference in accent between both approaches is also characterised as an *ex ante* versus an *ex post* vision. Whereas lawyers tend to be more interested in the accident problem *ex post*, where there is a victim that needs to be compensated, economists look at the accident problem in an *ex ante* perspective by asking the question how an *ex post* finding of liability will influence *ex ante* the incentives of potential parties in an accident setting for care-taking.

¹¹ For excellent overviews of the role of liability and insurability as ‘engineering instruments’ see A. Endres/B. Staiger, Ökonomische Aspekte des Umwelthaftungsrecht, in: M. Ahrens/J. Simon (eds.), *Umwelthaftung, Risikosteuerung und Versicherung* (1996), 79-93; G. Wagner, Haftung und Versicherung als Instrumente der Techniksteuerung, [1999] *Versicherungsrecht* (VR), 1441-1480; A. Monti, Environmental Risk: A Comparative Law and Economics Approach to Liability and Insurance, [2001] *European Review of Private Law* (ERPL), 51-79 and M. Gimpel-Hinteregger, *Grundfragen des Umwelthaftung* (1994), 19-58.

¹² Schwartz showed that rules of tort law may serve both the aims of deterrence and corrective justice (G. Schwartz, Mixed Theories of Tort Law: Affirming both Deterrence and Corrective Justice, [1997] *Texas Law Review* (TLR) 75, 1801-1834).

- 13 Of course, the differences in approaches between lawyers and economists are not really that black and white. There are lawyers who stress the deterrent function of tort law as well and some economists pay attention to compensation issues by stressing that accident law should also aim at an equitable loss spreading.¹³ Moreover, also lawyers argue that tort law should lead to duties of care, which aim at prevention. One advantage of the economic approach is that the deterrent function and compensation goal are carefully distinguished so that the influence of various legal mechanisms that one would choose can be evaluated both with respect to the prevention and with respect to the compensation issue. The first scholar to analyze these problems from a law and economics perspective was probably Guido Calabresi from Yale Law School.¹⁴ In his well-known book *The Costs of Accidents* Calabresi makes a careful distinction between primary, secondary and tertiary accident costs.¹⁵ Primary accident costs are the costs of accident avoidance and the damage that finally occurs; secondary costs refer to the equitable loss spreading and tertiary costs are the costs of administering the legal system. Tort law should give incentives for a reduction of total social costs of accidents. Thus the central goal of tort law was given: it should provide incentive for a minimisation of accident costs. This notion of Calabresi has been taken up later by economists that have formalized this issue.¹⁶
- 14 Let us address the first goal of tort law, i.e. the minimization of primary accident costs: the costs of accident avoidance and the expected damage. Indeed, from a social point of view accidents do not only cause costs from the moment an accident occurs and harm is suffered; potential parties in an accident setting, both injurers and victims make investments in care to avoid the occurrence of an accident. Sometimes costs of care-taking are very clear and visible. We can refer for instance to the investments made by firms to reduce environmental pollution by investing in water-cleaning equipment or the investment to install safety controls to avoid product defects. But also the mere fact that in a traffic accident case both injurers and victims are limited in their freedom of movement for instance because they have to drive or work care-

¹³ See C.G. Veljanovski, *The Economic Theory of Tort Liability – Toward a Corrective Justice Approach*, in: P. Burrows/C.G. Veljanovski (eds.), *The Economic Approach to Law* (1981), 125-150.

¹⁴ See his seminal article *Some Thoughts on Risk Distribution and the Law of Torts*, [1961] *Yale Law Journal* (YLJ), 499-553.

¹⁵ G. Calabresi, *The Costs of Accidents. A Legal and Economic Analysis* (1970).

¹⁶ Here we refer more particularly to: J.P. Brown, *Toward an Economic Theory of Liability*, [1973] *Journal of Legal Studies* (JLS), 323-349; P. Diamond, *Single Activity Accidents*, [1974] JLS, 107-164; W. Landes/R. Posner, *The Positive Economic Theory of Tort Law*, [1981] *Georgia Law Review* (GLR), 851-924; S. Shavell, *Strict Liability versus Negligence*, [1980] JLS, 1-25.

fully is considered as a cost by economists. A difference is further made between so-called unilateral accidents in which only the care taken by one of the parties (the injurer) can influence the accident risk on the one hand and bilateral accidents in which the behaviour of both parties can influence the accident risk on the other hand.¹⁷ In a bilateral accident situation the goal of accident law should therefore be to give incentives to minimise the total costs of care taking by the potential injurer and the potential victim and the expected damage that will occur in case of an accident.

(b) Goal of GMO Liability

- 15 Having now sketched the basic features and functions of the liability system in the context of GMO damage, let us now address a few more detailed questions in the questionnaire concerning the way in which a liability regime for GMO damage could be constructed from an economic perspective. At least after this exposé, it is clear what the goal of such a liability regime should be: it should primarily aim at the prevention of damage by providing incentives to the operator of GMOs to take optimal care in order to prevent mixture with non genetically modified crops. Compensation is, as we mentioned, from an economic perspective not primarily the goal of liability rules but can be dealt with through other instruments which we will discuss below.

III. Liability Regime

- 16 Assuming that the damage is suffered by a victim who does not stand in a contractual relationship with the operator who handles the GMOs we are thus in a third party liability situation. The question then arises through which liability rule (mainly strict liability or fault) from an economic perspective incentives should be provided for optimal prevention (1). The question also arises whether particular defences should from the same economic perspective be allowed to the operator (2) and what the influence may be of the other main instrument aiming at prevention of damage, being regulation (3).

1. Strict Liability versus Negligence

(a) Economic Criteria for Strict Liability

- 17 Economists use classic cost/benefit analysis to determine what the level of care is that will lead to such minimisation of the social costs of accidents. Not surprisingly, this can be found where the marginal costs of care-taking equal

¹⁷ This distinction has been made by S. Shavell, [1980] JLS, 7.

the marginal benefits in accident reduction. Indeed, since care-taking has its price as well a legal rule should not give incentives to avoid every possible accident that could occur, but only accidents that could be avoided by investments in care, of which the marginal costs are lower than or equal to the marginal benefits in accident reduction. It might well be that extremely high care could well additionally contribute to a reduction of the accident risk but the marginal costs of care-taking in that case might well be much higher than the additional benefit in accident reduction. Investments in care would in that case be inefficient and scarce resources would be spoiled.¹⁸ These levels of care where marginal costs of care-taking equal marginal benefits in accident reduction are referred to in the literature as optimal or efficient care levels.¹⁹ We will now first address optimal liability rules in a unilateral case.

- 18 Looking at a unilateral accident situation, one can state that two legal rules would give the injurer incentives for taking optimal care. If there were no liability at all, clearly the injurer would have no incentive for care-taking; therefore in a no-liability situation the externality will not be internalised and an inefficient outcome will follow. If a negligence rule is adopted, the injurer will take optimal care, provided the due care required in the legal system is equal to the optimal care as resulting from a marginal cost/marginal benefits weighing.²⁰ This can be easily understood. If the judicial system sets the due care standard correctly, the injurer can avoid liability by taking due care. Thus he will have to take care to avoid the accident, but if he does so he can avoid paying the expected damage. Of course, the injurer could take more care than the legal system requires him to do under a negligence rule, but he will have no incentive to do so since he can already escape liability by following the due care standard. The injurer could also spend less on care than the legal system requires him to. In that case he will have lower costs of care-taking, but he will have to pay damages in case an accident occurs. Since the optimal care standard was defined as exactly that level of care where the marginal costs of care equal the marginal benefits in accident reduction, taking less than the due care standard will not be interesting for the individual injurer since it will increase his total expected costs. Thus a negligence rule will lead to an efficient outcome as long as the legal system defines the due care as equal to the optimal care of the model.

¹⁸ This finding only holds in a risk neutral setting. In case of risk aversion higher investments in care might well be efficient since a reduction of accident risk will in that case also remove the disutility of risk from a risk averse person.

¹⁹ See W. Landes/R. Posner, [1981] GLR, 870 and A.M. Polinsky, *Introduction to Law and Economics* (1983).

²⁰ S. Shavell, [1980] JLS, 8 and G. Calabresi, Optimal Deterrence and Accidents, [1975] YLJ 84, 658.

- 19 Also a strict liability rule will lead to the optimum in a case where only one party can influence the accident risk. The reason is quite easy. A strict liability rule basically states that the injurer has to compensate in any case no matter what care he took. It is sometimes argued that this will lead the injurer to take excessive precautions or to take no care at all since he is liable anyway. Neither of these statements seems true. By making the injurer strictly liable, the social decision is in fact shifted to the injurer. In a unilateral accident case it simply means that he has to bear all the social costs of accidents, i.e. his own costs of care-taking and the expected damage.²¹ Therefore, he will take exactly the same decision, i.e. to minimise his total expected accident costs. This can be reached at the optimal care level. Therefore, the injurer will take optimal care since this is the way to minimise his total expected costs. Spending more on care would increase his costs of care-taking inefficiently and spending less on care would increase the expected damage inefficiently.

(b) Strict Liability for GMO Damage?

- 20 How do, in sum, apply the economic arguments in favour of strict liability to the case of damage caused by GMOs?
- 21 The first question to be answered would be whether handling of GMOs should be considered a unilateral accident, being an accident where only the injurer can influence the accident risk. If that were the case, we just mentioned that the economic model predicts that the advantage of the strict liability rule is that it will give the injurer optimal incentives for care.²² If in this particular case the victim cannot influence the accident risk, strict liability would be the first best solution to give the operator of the GMO optimal incentives to reduce the risk of GMO mixture with non genetically modified crops.
- 22 The question, however, arises whether GMO mixture is always a truly unilateral case. Depending upon the factual circumstances (which can of course significantly vary) some may argue that one could imagine circumstances where also potential victims (in the sense of persons handling crops which are non genetically modified) could take measures to prevent their crops from being affected by GMOs. If that would be the case, one could argue that a GMO damage becomes a bilateral risk in which also the potential victim could take efficient measures to prevent the risk. However, one could still argue that the influence of the operator of the GMO is probably still far more important than

²¹ A.M. Polinsky, *Introduction to Law and Economics* (1983) 39; S. Shavell, *Economic Analysis of Accident Law* (1987), 11.

²² Also, it would provide optimal incentives to take an efficient activity level. See on the importance of the activity level also S. Shavell, [1980] JLS, 1-25.

the influence of the victim. If that is the case, the outcome does not change and the strict liability rule remains warranted to give the operator of the GMO optimal incentives to take preventive measures. This clearly assumes that the operator who handles the GMO is in the best position to prevent the risk. However, as will be mentioned below, in this bilateral case, it remains important that the defence should be added to the strict liability rule to give victims incentives for prevention as well. However, if it would appear from the factual situation that it is as important to provide victims with incentives to prevent the risk than it would be to give similar incentives to the operator who handles the GMO a negligence rule would be optimal.

- 23 Hence, GMO damage does not seem to be comparable with a classic environmental case. In the latter case, it is often argued that these are typical unilateral cases, where most of the influence of the accident risk comes from the potential polluter. Hence, most argue in favour of a clear strict liability rule since the victim can usually do less than the potential polluter to avoid the risk. However, since potential victims in the GMO case may be professionals as well, the same line of reasoning does not apply. If in fact it appears that the influence of both the potential victim and the operator who handles the GMOs is equally important, a negligence rule might in fact be optimal.²³
- 24 From explanation above, it appears that whether GMOs cases are of unilateral or bilateral cases depends upon the factual situation. One could certainly argue that cross-pollination from GM crops to non-GM crops constitutes a unilateral case. This is because if organic or conventional farmers should also prevent the cross-pollination, they should change their usual practices and, hence, incur high costs²⁴. Under this situation, if transaction costs between organic farmers and farmers planting GM crops are low, they may bargain as to determine who is in a better position (i.e. more cheaply) prevent the pollination. However, if transaction costs are high, a liability rule more suitable for unilateral case should apply. In this regard, strict liability may be better than a negligence rule²⁵.

²³ The economic reason is that only negligence also provides incentives to the victim to adopt an optimal activity level.

²⁴ One commentator notes that if organic or conventional farmers are forced to prevent genes contamination, they may have to abandon their seed-saving practices and, given resistant of the hybrids, to use more toxic herbicides. See: H. Preston, Drift of Patented Genetically Engineered Crops: Rethinking Liability Theories, [2003] *Texas Law Review* 81, 1159.

²⁵ Another reason for applying strict liability is the nonreciprocal nature of damage possibly suffered by the organic or conventional farmers. In this case, a farmer who plant GM crops gain benefits from his crops, while at the same time exposing his neighbour to

2. Defences

- 25 Of course, economic analysis of liability law has paid a lot of attention to some of the classic defences available in tort law and has also provided an economic justification. Although many defences could theoretically be thought of within the context of this report, we will only mention the most important ones for the issue of GMO damage.²⁶

(a) Force Majeure

- 26 A traditional defence accepted in almost every liability regime is force majeure (although it may have different interpretations). From an economic point of view one can easily argue that in case of force majeure there should be no liability. Force majeure is generally a condition, not only for fault or strict liability, but for every liability in tort. It is related to the blameworthiness requirement, which requires that the injurer should have capacity for tortious liability. A tort will indeed, accordingly to most legal systems, only make an injurer liable if the wrongful act is imputable to him.
- 27 This condition of blameworthiness relates to the free will and the capacity of discretion of the tortfeasor.²⁷ This blameworthiness requirement also has a clear economic rationale. When the injurer did not act out of free will, liability cannot influence his incentives to take care and has, therefore, no economic meaning. A finding of liability which does not influence the incentives of the tortfeasor will only create administrative costs (caused by the transfer of the loss) without any compensating benefits in providing additional incentives to take care.

a risk that he is not subjected, e.g. the risk of losing organic certification. See: A.B. Endres, „GMO“: Genetically Modified Organism or Gigantic Monetary Obligation? The Liability Schemes for GMO Damage in the United States and the European Union, [2000] *Loyola L.A. International and Comparative Law Review* 22, 491. A rationale behind this argument is probably related to the issue of the distribution of risk and benefit, in which those who gain benefits, while at the same time subjecting others to risks, should pay the damages if those risks materialize.

²⁶ The interested reader can see for further information on possible defenses for instance in the related area of environmental liability M. Faure/D. Grimeaud, Financial Assurance Issues of Environmental Liability, in: M. Faure (ed.), *Deterrence, Insurability and Compensation in Environmental Liability. Future Developments in the European Union* (2003) 52-67.

²⁷ H. Vandenberghe/M. Van Quickenborne/P. Hamelink, Overzicht van rechtspraak. Aansprakelijkheid uit onrechtmatige daad (1964-1978), [1980] *Tijdschrift voor Privaatrecht* (TPR), 1170-1171.

- 28 We refer here to the blameworthiness requirement simply as meaning that the injurer contributed in some way to the loss. The requirement of ‘blame’ traditionally fits into a fault or negligence concept. In fact, in the context of strict liability mere causation suffices. But if the injurer did not ‘cause’ the accident, he should not be held (strictly) liable. Force majeure therefore should remain a defence, even under strict liability, since a finding of liability makes no sense if the injurer could not have influenced the risk.

(b) Development Risk?

- 29 An important question, also with respect to GMO damage, is of course whether the operator handling GMOs should be allowed to call on the development risk defence. This would mean that the operator would not be liable if the damage could according to the state of the technology at the time when the act took place not be foreseen.²⁸ One would thus assume that an operator is handling GMOs and that certain negative consequences of GMOs for third parties could at that particular moment not be foreseen by the operator. How should, from an economic perspective, the law deal with the fact that there may be situations where either the risks change, or technology changes and as a result of that also the standard of care increases?
- 30 One could argue that holding a person liable for an unforeseen damage will not give incentive for an injurer to take more optimal care, because unforeseeability means that the injurer’s subjective probability of the occurrence of the damage is zero. In this case, although the injurer has to pay infinite damages, his expected damage remains zero because the subjective probability of the damage is zero; and hence his optimal care is also zero. In this regard, holding an injurer liable for the unforeseen damage could actually reduce social welfare.
- 31 However, one may argue that exposing injurer to liability, regardless of the unforeseeability of the damage, is efficient as it will induce the injurer to acquire information as much as possible in order to prevent the damage. In addition, with regard to the GMOs case, one could also argue that although the exact vectors of cross-pollination and the magnitude of damage might be uncertain, the cross-pollination itself is a real threat. In this regard, Repp argues that the fact that GM crops planting is usually undertaken with the contractual ob-

²⁸ This is also the formulation chosen in the European directive on product liability of 25 July 1985: liability is excluded if the producer can prove that, having regard to the circumstances, it is probable that the defect did not exist at the time when the product was put into circulation.

ligation to establish a buffer zone, has implicitly shown recognition about the possibility of cross-pollination.²⁹

- 32 Consequently, it would be too easy simply to state that the tortfeasor will only be held to comply with the „old” standard of care and will never be liable for risks which he could not foresee. Indeed, it has equally been stated in the literature that the foresight that there may be liability *ex post* will obviously give incentives to obtain information about risk to industrial operators.³⁰
- 33 The fact that there may be *ex post* liability even if technology changes is one of the powerful arguments made in law and economics in favour of liability for the so-called development risk. This should give an operator appropriate incentives for investments in research to acquire information about risk and about optimal technologies to prevent the risk.
- 34 The question, however, arises whether this reasoning can also be used to justify a retrospective change of a liability rule or changes in the standard of care itself. The argument is hence a totally different one if not only the nature of the risk changes but the liability rule itself. The economics of tort law assume that future incentives for prevention will be affected, given the legal regime in force. Hence, it is hard to defend that an *ex post* change in the liability rule will positively affect the incentives for proper behaviour which was not considered wrongful at all at the time when the act was committed by the industrial operator. One can expect an operator to assume that new risks may emerge, but hardly that the contents of the law will change. Requiring this would lead to an inefficiently high demand for preventive measures and thus to over-deterrence. Hence, retrospective liability indeed seems problematic, taking into account the deterrent function of tort law.

²⁹ R.A. Repp, Biotech Pollution: Assessing Liability for Genetically Modified Crop Production and Genetic Drift, [2000] *Idaho Law Review* 36, 615. Similar opinion has been given by Endress, who argues that the possibility of cross-pollination is supported by some studies showing that transgenic pollen may be carried by vectors to a great distance even beyond the buffer zone. See: A.B. Endres, (supra fn. 25), 487. Lewis also shares similar opinion by arguing that when released into the environment, GM crops may cross-pollinate with other plants due to wind or animal pollinators; therefore, so the author argues, the risk of cross-pollination „is almost guaranteed”. S.K. Lewis, Attack of the Killer Tomatoes? Corporate Liability for the International Propagation of Genetically Altered Agricultural Products, [1997] *Transnational Lawyer* 10, 186.

³⁰ This point is discussed in S. Shavell, Liability and the Incentive to obtain Information about Risk, [1992] *JLS*, 259-270; see also L.T. Visscher/H.O. Kerkmeester, Kenbaa-heidsvereiste en gewoonte als verweren tegen een aansprakelijkheidsactie: een rechtseconomische benadering, [1996] *Tijdschrift voor Milieuschade en Aansprakelijkheidsrecht* (TMA), 48-57.

- 35 From this it follows that there apparently is a dilemma: on the one hand it is obviously useful that the standard setting process in civil law is seen as a process of learning whereby the standard of care is not static, but dynamically changes in time.³¹ It would obviously be wrong to state that due care standards should never change. There may be many reasons, for instance new technological insights, leading judges to the efficient decision that a more stringent standard of care can be applied. This new case law can, moreover, have an important signalling function for other parties in the market who can again, adapt their future behaviour. But the question obviously arises what should be done with the individual defendant in the particular case in which a new standard of care is set. Should we sacrifice him for the benefit of a more efficient standard in the future and make him retroactively liable although his behaviour was not considered wrongful at the time when it was committed? There is a possible way out of this dilemma presented by – inter alia – the German Supreme Court.³² The Supreme Court held in that particular case that an operator violated a general duty of care given the fact that technology had changed. However, at the same time, the Court also held that the operator was not to blame for the violation of the duty of care, since this was not foreseeable. This approach is known in the American literature as the „prospective overruling”, meaning that a court follows an old duty of care in this particular case (with the result that there is no finding of liability), but announces that it will follow a different decision in the future.³³ This seems to be both an efficient and a just solution: on the one hand, a preventive effect is achieved for the future since future potential tortfeasors know that a new and more stringent due care standard will apply. On the other hand, it seems fair not to apply this new standard with respect to the particular defendant in that particular case, who could indeed not have known that new rules would apply.
- 36 In sum, the discussion above makes clear that in fact a distinction has to be made (although the issues seem to be confounded sometimes) between on the one hand a retrospective application of a new liability regime and on the other hand the liability for development risks. A liability regime for risks which are not known yet today is not necessarily inefficient, precisely since, if this is known in advance, it will give incentives to require information on these new

³¹ This argument has been powerfully stressed by C. Ott/H.B. Schäfer, Negligence as Untaken Precaution, Limited Information and Efficient Standard Formation in the Civil Liability System, [1997] *International Review of Law and Economics* (IRLE), 15-29.

³² See Bundesgerichtshof, 23 October 1984, [1985] *Neue Juristische Wochenschrift* (NJW), 16-20 and Bundesgerichtshof, 14 March 1995, [1985] NJW, 26-31.

³³ This has been defended in the Dutch legal literature by J. Drion, *Stare Decisis. Het gezag van precedenten* (1950) and by O. Haazen, De temporele werking van een rechterlijke uitspraak, in: H.G. Schermers/Th. L. Bellekom/P.T.C. Van Kampen (eds.), *De rol van de rechter in de moderne Westerse samenleving* (1993), 171-207.

risks and on the optimal techniques to prevent the risk. Thus a strict liability, also for development risks, might provide appropriate incentives for a dynamic investment in optimal preventive techniques. This however does not justify a retrospective application of new standards or new legislation, which could never have positively affected future incentives for prevention. In other words: a liability for development risks is not inefficient as long as it may positively influence incentives for prevention and as long as the development risk liability is not a disguised retroactive liability.³⁴

- 37 The – justified – fear for retroactivity probably explains why legal systems are often reluctant to introduce liability for development risks. For instance, in the context of the product liability directive we can point to Article 7 (b) which explicitly excludes liability if the producer can prove that, having regard to the circumstances, it is probable that the defect did not exist at the time when the product was put into circulation. Moreover, the real ‘state-of-the-art defence’ is included in Article 7 (e) which states that the producer shall not be liable if he can prove that the state of scientific and technical knowledge at the time when he put the product into circulation, was not such as to enable the existence of the defect to be discovered.³⁵ However, Article 15.1.b provided for an option for Member States to nevertheless introduce liability for development risks. This option was only used by Luxembourg and Finland.³⁶

(c) Contributory Negligence

- 38 We indicated above that both a strict liability rule and a negligence rule will lead to the optimum in cases where the victim’s care does not influence the probability of an accident and where only care (and not the activity level) can influence the risk. Most accident situations are, however, ‘joint care’ cases.³⁷ In this situation the risk is also influenced by the behaviour of the victim. A simple strict liability rule would not lead to the efficient result, since the victim has no incentive to spend on care. To remedy this problem, the victim

³⁴ A similar – balanced – conclusion concerning the efficiency of a development risk defence is reached by G. Wagner, [1999] VR, 1450.

³⁵ The state of the art defense has also been addressed in the American context by J. Boyd/D. Ingberman, Should ‘Relative Safety’ be Test of Product Liability, [1997] JLS, 433-473. They show that the ‘customary practice test’ tends to induce inadequate safety, whereas the ‘technological advancement test’ tends to induce excessive safety.

³⁶ And by Spain for food on medical products as well as by France for products derived from the human body. See the overview of the transposition in domestic law, provided in the *Green paper on the liability for defective products* (COM (1999) 396 final of 28.7.1999), 35-36. The issue of foreseeability defence will be discussed further in section 3.

³⁷ Although we already argued above that environmental pollution is probably a good example of a truly unilateral case.

might be considered „contributory negligent” if he does not take due care. A contributory negligence rule, as known under Common Law, excludes a right to compensation for the victim who did not take due care.

- 39 Assuming that the legally required level of care for the victim is equal to the efficient care, the victim will have the incentive to take optimal care. If he did not take due care he would be found negligent and would receive no compensation. An efficient result will also follow both under negligence rule and under a negligence rule with a contributory negligence defence. In both cases the injurer will take efficient care and the victim will (being fully exposed to the risk), in order to avoid to bear the loss himself, take efficient care as well. Discussing the economic model of tort law, we therefore indicated that both a strict liability rule in combination with a defence of contributory negligence and a negligence rule (with or without contributory negligence) will give appropriate incentives to the victim to take efficient care.³⁸
- 40 A comparative negligence rule has the effect of proportionally dividing the loss between the injurer and the victim, if both committed a fault. Under this rule the right to compensation will be proportionally reduced if the victim was negligent. The injurer will still take efficient care to avoid liability, while the victim still takes care to minimise his own loss.³⁹ The efficiency of this rule is debated in the literature. Haddock and Curran point to difficulties in analysing the comparative benefits of comparative negligence versus a contributory negligence defence.⁴⁰ It is well known that Posner is an opponent of this rule.⁴¹ According to him, the rule causes considerable administrative costs, without any compensating benefits for the incentives to take care. Not only is an intervention of the legal system necessary to shift a part of the loss from the victim to the injurer, but judges will also have to examine the faults of both parties and the proportion in which they contributed to the loss. Posner argues that comparative negligence makes economic sense only when society wants to use the tort system to provide insurance to accident victims.
- 41 In sum, if a strict liability rule is proposed for GMO damage, some defence should be added to take account of the behaviour of the victim, but this can either be a contributory or a comparative negligence rule. To be clear: a strict contributory negligence rule, meaning that the victim loses the claim on com-

³⁸ J.P. Brown, [1973] JLS, 340-342; G. Calabresi, [1975] YLJ, 663; W. Landes/R. Posner, [1981] GLR, 880-882.

³⁹ D. Haddock/C. Curran, *An Economic Theory of Comparative Negligence*, [1985] JLS 14, 59-63.

⁴⁰ D. Haddock/C. Curran, [1985] JLS, 59-63.

⁴¹ R. Posner, *Economic Analysis of Law* (1998) 187-189.

pensation entirely in case of his negligence, is practically no longer applied. Most legal systems have turned to a proportionate reduction of the compensation due to the victim. If on the other hand a negligence rule is applied to GMO damage, it is not strictly necessary to add a contributory negligence defence⁴².

(d) *First Use Defence*

- 42 The first use doctrine (also referred to as the coming-to-nuisance defence) relates to discussions that arise when, for example, a factory was located in a relatively empty area and is afterwards confronted with neighbours who „came to the nuisance” and then claim compensation or even the relocation of the factory. This problem is widely discussed in law and economics literature⁴³ and more specifically by Wittman.⁴⁴ This problem could equally play a role in case of damage caused by mixture with GMOs. Suppose that the operator of a GMO field was the first mover and that e.g. another farmer would knowingly locate himself next to the operator who handles GMOs, being well aware of that particular risk. Could one then argue that the newcomer has knowingly „come to the nuisance” caused by the GMO and that therefore liability for damage *inter alia* caused by mixture should be excluded?

⁴² A contributory negligence defence may arise, for example, in the form of the infringement of patent right of a GM crops producer. We could refer to the *Monsanto v. Schmeiser* case, in which the defendant has been found guilty of the infringement of Monsanto’s patent rights for herbicide-resistant canola. See: J.L. Fox, Canadian Farmer Found Guilty of Monsanto Canola Patent Infringement, [May 2001] *Nature Biotechnology* 19, 396-397. The ruling of the court of this case has, however, been severely criticized as the court ignores the fact that the defendant did not use glyphosate, a herbicide to which the patented GM canola is supposed to resist. Some author argues that if the possession of hybrids containing the patented gene is already a sufficient ground for defendant liability for the infringement of a patent right, then the question of the defendant’s intention should be seriously considered by the court. Otherwise, a farmer whose land has been contaminated by GM crops and, hence, unwillingly grows the hybrids, will be found guilty for the patent infringement. See: M. Lee and R. Burrell, Liability for the Escape of GM Seeds: Pursuing the ‘Victim’? [2002] *Modern Law Review* 65, 523-525; also: H. Preston, (supra fn. 24), 1167-1169.

⁴³ See e.g. R. Cooter/T. Ulen, *Law and Economics* (2004), 170-185.

⁴⁴ D. Wittman, First come, First Served: an Economic Analysis of ‘Coming to Nuisance’, [1980] *JLS*, 557-568. See also R. Epstein, Nuisance Law: Corrective Justice and its Utilitarian Constraints, [1979] *JLS*, 72-73; D. Dewees, Tort Law and the Deterrence of Environmental Pollution, in: T.H. Tietenberg (ed.), *Innovation in Environmental Policy, Economic and Legal Aspects of Recent Developments in Environmental Enforcement of Liability* (1992), 139 and T. Merrill, Trespass, Nuisance and the Costs of Determining Property Rights, [1985] *JLS*, 13-48.

- 43 The starting point for this literature is that it will usually first be investigated whether the harm to the „newcomers” can be prevented or reduced by preventive measures to be taken by the existing factory. If this is the case and transaction costs are zero, Coase teaches us that the efficient preventive device will be installed irrespective of the legal rule. If transaction costs are prohibitive, a liability rule can force the existing firm to implement the preventive measures. If the conditions for liability are met, the existing firm will usually not be successful in claiming the coming-to-nuisance defence. This has to do with the fact that in case law these issues are usually dealt with in an *ex post* perspective, when people have already moved to the vicinity of the factory and the question is simply asked in an *ex post* perspective whether additional investments in preventive measures could have reduced the harm beneficially. Liability law then gives an incentive to invest in efficient safety equipment, even though the victims „came to the nuisance”. The problem with this solution, however, is that, looking at it in an *ex ante* perspective, it removes incentives with potential victims not to locate to the vicinity of the GMO field.⁴⁵ However, it will generally, especially in highly occupied areas, be difficult for farmers to choose their location in such a way that they could never locate in the vicinity of a GMO field. The GMO field on the other hand may have the possibility to invest in preventive mechanisms to reduce harm for third parties.
- 44 Obviously a lot of these conflicting uses of property rights, of which there are many examples in case law, can be prevented if it could be established *ex ante* which area is, given its specific properties, best suited for a certain activity. Wittman argues that the goal of zoning is precisely to determine that, for example, in a beautiful hilly landscape with trees a residential area can better be situated than heavy industry, taking into account such factors as limited transport possibilities, the potential of heavy environmental degradation in this ecologically sensitive area, etc. Ideally zoning could lead to an *ex ante* fixing of a destination for certain areas. The same could thus apply to zoning for GMO fields and non GM crops as well.
- 45 Problems specifically arise usually *ex post*, when there are no *ex ante* decisions available concerning the destination of a certain area and in addition a further reduction of harm to the citizens is not possible through cost effective measures. This is particularly the when planting GM crops is considered as a normal practice or merely an extension of such a practice. In this case, we could expect that there will be no special area designated for GM crops planting. Consequently, a victim of contamination from GM crops may find it dif-

⁴⁵ Compare D. Wittman, [1980] JLS, 567-568.

difficult to show the magnitude the damage he suffers relative to the social benefits of GM crops and to show that planting GM crops in his area is not a normal practice⁴⁶. However, by refereeing to a court ruling in Canada, one commentator argues that the so-called „normal farm practice” should be weighed relative to the effects of neighbouring property owners, including the non-GM crops farmers⁴⁷. In this regard, the victim could rely on the non-reciprocal risk of GM crops.

- 46 The question then arises how this conflicting use of the property rights has to be resolved in this *ex post* perspective. In some cases one should examine whether the costs of nuisance have already been taken into account in the price of a certain property, in which case there would already have been a compensation for the externality. Assume that a new railway station is built and that surrounding land is sold for a relatively low price. In that case the relatively low price a prospective owner pays for the land he purchases can be considered as a compensation for future nuisance to be caused by the railway station. This will then exclude a subsequent claim by the property owner against the railway station. This is not only true for the owner who purchased at a low price, but also if, for example, a subsequent purchaser were to become owner of the piece of land. Again he should have been informed on the presence close to a railway station (which is obviously easily visible) and realise that future nuisance to be caused by the railway station is compensated for in the relatively low price he pays. This could thus equally play when a farmer purchases land at a relatively low price next to a land where GM crops are handled.
- 47 Wittman therefore rightly claims that the foreseeability of the nuisance is an important criterion in most of these cases. A neighbouring farmer thus will have far more possibilities to claim compensation if, for example, the harmful activity (which was first relatively innocent) expands in a totally unforeseeable way (e.g. because the destination of the area is changed). Once more: if the „surprised owner” is compensated for the additional harm caused by the unexpected and unforeseeable expansion by the firm, this compensation is final. This means that he is compensated also for the fact that the price for his land will have decreased as a consequence of the expansion of the particular activity. A potential new purchaser can then again purchase the land at a relatively low price but cannot claim compensation again from the injurer who already paid once compensation to the previous owner.

⁴⁶ D.L. Kershen, (supra fn. 5), 459.

⁴⁷ J.M. Glenn, Footloose: Civil Responsibility for GMO Gene Wandering in Canada, [2004] *Washburn Law Journal* 43, 556-557.

- 48 More difficult are the situations where the conflicting use of property rights cannot be dealt with by paying compensation for the unreasonable nuisance caused. In some cases the conflict may be so important that it can only be solved by the relocation of one of the two parties involved. This solution will typically be reached if the magnitude of the damage caused is much larger than the lowest relocation costs. If relocation is therefore the efficient solution, Wittman claims that it will have to be established whose relocation costs are the highest in relation to the importance of the externality caused. If it can be established that the relocation costs of the existing farm would be much lower than the relocation costs of many neighbours even if they came to the nuisance, the relocation of the existing farm would still be the efficient solution since his relocation costs are the lowest.
- 49 Obviously, the question who came first will not play a role in answering the question who will have to relocate, but possibly when answering the question who will have to pay for the relocation costs. If the new neighbours came to the nuisance in a case of foreseeable harm, one could claim that even though the existing farmer will have to relocate (because of the lower relocation costs) the citizens who wrongfully came to the nuisance may be liable to pay (part of) the relocation costs of the first mover. The latter is obviously important to give new farmers (and citizens!) in an *ex ante* perspective correct incentives to choose wisely concerning their location decision. If they foreseeably locate next to a harmful activity (like a farmer applying genetic modification) they can afterwards hardly claim that the farmer should relocate and should moreover do so at its own costs.

3. Influence of Regulation

- 50 So far we presented liability rules from an economic perspective as instruments to provide incentives to prevent damage caused by GMOs. In reality of course, as the introduction with the description of the objective of the study also makes clear, GMOs are subject to a great deal of safety regulation. The goal of this safety regulation is precisely the prevention of damage. Thus a much more important role will in practice be played by safety regulation than probably by liability rules, at least as far as prevention is concerned. This, by the way, also corresponds with the economic criteria for safety regulation as they have *inter alia* been developed by Shavell.⁴⁸ Indeed, information on the optimal ways to prevent damage caused by the use of GMOs is probably more readily available with a regulator than with the potentially liable operator.

⁴⁸ See S. Shavell, Liability for Harm versus Regulation of Safety, [1984] JLS, 357-374; S. Shavell, A Model of the Optimal use of Liability and Safety Regulation, [1984] *Rand Journal of Economics* (Rand J Econ), 271-280.

Thus the informational advantage is a *first* important criterion in favour of safety regulation. *Second*, there may be a serious insolvency risk. That plays from the moment that the damage that could be caused as a result of the GMO mixture is higher than the wealth of the particular operator. The damage should in principle not be catastrophically high (although one could of course imagine damage along the food chain with far reaching consequences to many consumers or at least leading to large economic losses). There is always the likelihood that operators are organized as legal entities. Legal entities enjoy the limitation of liability and thus there is always the danger that they will externalize harm to third parties.⁴⁹ *Third*, there may be a risk that there is a long time lapse between the moment that the mixture (or any other source of GMO damage) takes place and the moment that the damage occurs. In addition, there may be difficulties for the victim to prove a causal relationship between his damage and the acts of a particular operator. These latency and causation problems may lead to situations whereby tort law is not used even though the conditions for liability are fulfilled. When thus the threat of a liability suit will not provide sufficient deterrent effect, this provides another argument in favour of regulation.

- 51 Although Shavell's criteria thus provide a strong argument to control GMO risks *ex ante* through regulation, in individual cases there can still be damage. Then again, liability under tort comes into the picture and the question of course arises how regulation influences the liability system and *vice versa*.
- 52 The first question that arises is whether violation of a regulatory standard concerning GMOs should automatically be considered a fault under tort law and thus lead to liability. Most legal systems consider a breach of a regulatory duty evidence of negligence *per se*.⁵⁰ One of the reasons for introducing safety regulation to control GMO risks is, as was mentioned above, that the regulator will usually possess better information to evaluate the efficient standard of care than the parties involved. Hence, regulation passes on information to the parties on the efficient standard of care, but equally to the judge. The judge may lack the necessary information to find out what the particular care is that could be required from the person handling the GMO. Therefore, the statutory standard can guide the judge in a liability case.

⁴⁹ See H. Hansman/R.H. Kraakman, Toward Unlimited Shareholder Liability for Corporate Torts, [1999] YLJ 100, 1879-1939. Because of this danger of using the corporate structure for externalizing harm to involuntary creditors Hansman and Kraakman pleaded in favour of unlimited shareholder liability for corporate torts.

⁵⁰ See for instance K.S. Abraham, The Relation between Civil Liability and Environmental Regulation: An Analytical Overview, [2002] *Washburn Law Journal* (Washburn LJ) 41, 379-398.

- 53 A more difficult question may arise as to whether compliance with a regulatory standard could release an injurer from liability. Several authors argue that since a GM crop has undergone a pre-market test, in which a risk assessment has been carried out prior to the commercialisation of the crop, as long as the injurer has followed requirements for planting the GM crop, such as establishing a buffer zone, he should not be liable for the damage of cross-pollination. In this case, the injurer may argue that the damage is in fact unforeseeable⁵¹. However, as Smyth and others have put it, although regulatory standards have been followed, many species could still possibly wander to their wild relatives, which potentially would create environmental problems⁵². This means that a regulatory standard does not necessarily remove the risks of cross-pollination, since some species may wander beyond the buffer zone and pollinate with other plants. Again, one could argue that the risk of cross-pollination is inevitable. The question will be whether the impacts of such a pollination are significant. In this case, the injurer may still be found liable although he has complied with the regulatory standards⁵³.

⁵¹ C.P. Rodgers, *Liability for the Release of GMOs into the Environment: Exploring the Boundaries of Nuisance*, [2002] *Cambridge Law Journal* 62(2), 390 and 400. However, the author argues that the authorization itself does not constitute a defence. A firmer rejection to idea of holding injurer liable for unforeseeable damage is given by Bergkamp. The author argues that deliberate release of GMOs undertaken in compliance with regulations and conditions prior to authorization is quite unlikely to create foreseeable and significant risks. Accordingly, only „non-compliant GMOs or activities involving GMOs conducted in an irresponsible way” that could pose the risks and hence should be subjected to liability. L. Bergkamp, *Allocating Unknown Risk: Liability for Environmental Damages Caused by Deliberately Released Genetically Modified Organisms*, [2000], available at SSRN: <http://ssrn.com/abstract=223068>, 25. The author goes on by refusing the proposal of singling out biotechnology in a specific liability system. He argues that concerns about environmental impacts of GMOs have been triggered by the fear of the unknown, unforeseeable, and even non-existent risks of GMOs, which cannot be adequately dealt with by a specific liability system. *Ibid.*, 28-29.

⁵² S. Smyth, G.C. Khachatourians, and P.W.B. Phillips, *Liabilities and Economics of Transgenic Crops*, [June 2002] *Nature Biotechnology* 20, 537-538. As quoted by Endres, a study conducted in the UK found pollen from GM crops have been carried by bees 4.5 kilometres away from the test field. A.B. Endres, (*supra* fn. 25), 456.

⁵³ Khoury and Smyth argue that although a risk assessment prior to an authorization of GM crops revealed the remoteness of risks, these risks could still be considered as foreseeable based on public concerns. This is because, the authors argue, the absence of knowledge does not mean the absence of public concerns about possible risks. As a result, injurer will still be held liable if these risks materialize in the future. To support this argument, the author resort to the precautionary principle, by which the injurer is liable when the uncertain risks of serious magnitude materialize in the future. L. Khoury and S. Smyth, *Reasonable Foreseeability and Liability in Relation to Genetically Modified Organisms*, [2005] *The 9th ICABR International Conference on Agricultural Biotechnology: Ten Years Later*, Ravello, Italy, 20-21.

- 54 Consequently, although the non-compliance with a regulatory standard is a sufficient reason for injurer's liability, the reverse is not true: following regulation should, from an economic perspective not necessarily free the GMO operator from liability. The reason to reject this so-called regulatory compliance defence from an economic perspective is that the regulatory standard is in some cases merely a minimum⁵⁴. The efficient standard can be higher and thus liability should supplement regulation in this case to provide the GMO operator incentives to take efficient care to prevent the damage.⁵⁵ Exposure to liability does provide the GMO operator with incentives to take all efficient precautions, even if this requires more than merely following the regulation. This role is moreover an important remedy for the unavoidable capturing of administrative agencies which may lead to inefficiently low regulatory standards. Exposing the GMO operator to liability even though the operator followed regulation or the conditions of a license is thus, from an economic perspective, an important tool to guarantee that the operator will take efficient care.

IV. Causation

1. General

- 55 Problems can of course arise as far as the requirement is concerned that a causal link should be established between the alleged damage and the presence of the particular GMO concerned. The economic analysis of law has paid a lot of attention to the requirements that should in general be attached to causation. It would lead us too far to discuss these in any detail at this moment.⁵⁶

⁵⁴ Some countries may have even not only minimum, but also sub-optimal regulatory standards for GMOs. See for example critics of Bratspies againsts US regulation on the commercialization of Bt crops. In this paper, the author concludes that the agencies responsible for the release of Bt crops have abandoned the precautionary principle, and instead used the most optimistic estimates as the basis of their decision. In addition, there is no clear mechanisms to ensure the growers' compliance with requirement set by seed companies, as it could be assumed that it is not in the companies' interest to enforce their requirement. See: R. Bratspies, *The Illusion of Care: Regulation, Uncertainty, and Genetically Modified Food Crops*, [2002] *New York University Environmental Law Journal* 10, 346. Assuming that this allegation is true, releasing an injurer just because he has followed such a non-optimal regulatory standards, may create too many harms for society, in which the price of GM products does not represent the true social costs.

⁵⁵ Compare P. Burrows, *Combining Regulation and Liability for the Control of External Costs*, [1999] *International Review of Law and Economics* (IRLE) 19, 227-242.

⁵⁶ See G. Calabresi, *Concerning Cause and the Law of Torts*, [1975] *University of Chicago Law Review* (U Chicago Law Rev), 69-108; S. Shavell, *An Analysis of Causation and*

Shavell explains in simple words that there is a good economic reason to limit the liability of an injurer to cases he has really caused. If the requirement of a causal link would not have this limiting effect on liability, the result would be that many potentially beneficial activities in society would no longer take place since in effect an operator would then also be held liable for damage which would not result from his acts. A liability for damage which is not the result of the own activity of the operator would thus be considered as crushing, so Shavell holds.⁵⁷ Thus it makes well sense to limit the liability of the operator who handled GMOs to the damage actually caused by the GM crop.

2. Burden of Proof

- 56 A first question that arises in that respect is on whom the burden of proof should lay in case there is uncertainty over causation. Uncertainty can arise for instance when there may be many different sources and it is not clear what precisely caused the damage to a non-GM crop. Also, there may be multiple causes. To all of these issues of causal uncertainty, there is both a procedural aspect (who should bear the burden of proof?) and an aspect of contents (how should the law deal with uncertainty over causation?).
- 57 Traditionally, the plaintiff, i.e. the victim, should bear the burden of proof regarding some elements of liability rule that he uses to claim damages⁵⁸. He should, for example, prove the foreseeability of cross-pollination to his land, the presence of hybrids from his non-GM crops with injurer's GM crops, and the damage suffered as a result of this cross-pollination. Almost inevitably, the victim needs to rely on experts' opinion to support his claim⁵⁹.
- 58 However, one may argue that the court may place the burden of proof on those who can acquire information more cheaply. Based on such an efficiency argument, more important question will be no longer about the burden of

the Scope of Liability in the Law of Torts, [1980] JLS, 463-516 and W. Landes/R. Posner, Causation in Tort Law: An Economic Approach, [1983] JLS, 109-134.

⁵⁷ See S. Shavell, Uncertainty over Causation and the Determination of Civil Liability, [1985] JLE, 587-609 and S. Shavell, *Economic Analysis of Accident Law*, 108.

⁵⁸ In the absence of a specific liability system for GMOs, the victim should resort to one of several liability rules, namely trespass, private nuisance, negligence, strict liability, or product liability. Each of these rules has its own elements that should be proven by the victim. For a brief summary about the elements of nuisance, negligence, and strict liability, readers may consult: T.N. Vollendorf, Genetically Modified Organisms: Someone is in the Kitchen with DNA, Who is Responsible when Someone Gets Burned? [2001] *Mississippi College Law Review* 21, 48-53.

⁵⁹ The burden of proof borne by the victim might be reduced if GM products are required to be labelled with their genetic markers, as it has been proposed in Europe. See: A.B. Endres, (supra fn. 25), 487.

proof, but about the standard of proof. The issue of standard of proof is particularly important if we are faced with uncertainty concerning causality.

3. Causal Uncertainty

- 59 There is a real likelihood that, as we just mentioned above, many issues of causal uncertainty could arise in case non GM crops are damaged as a result of mixture with GM crops. There can be different sources of presence of GMOs, whereby the question arises how the law should deal with uncertainty when it cannot be established with certainty who the precise cause of the problem was. Potentially, the law could provide a variety of solutions to this problem.
- One could, on the one hand, judge that as soon as there is any statistical chance that a certain activity (or product) may cause a certain damage, all victims receive 100% compensation of their damage.
 - The second possibility is to refuse the claim of the victim unless there is 100% certainty that the tort caused the damage.
 - The third possibility is to award compensation only when the probability that the damage was caused by the tort passes a certain threshold of, say, 50%. This threshold rule is a kind of ‘all or nothing’ approach: if the probability is lower than the threshold, the victim receives no compensation at all; if the probability is higher than the threshold the victim receives full compensation. This threshold rule is known in the American literature as the ‘more probable than not’ solution, referring to the fact that the plaintiff must convince the judge that it is ‘more probably than not’ that its damage was caused by the tort.
 - The final solution is to take into account the probability that the tort caused a certain damage and to award compensation, taking into account this probability. This would mean that if the scientific expertise indicates that the likelihood of damage is, say, 40% that the victim can then receive compensation for 40% of his damage.
- 60 The way the law should deal with causal uncertainty has been addressed extensively in the economic literature, for instance by Rosenberg,⁶⁰ Kaye⁶¹ and Shavell.⁶²

⁶⁰ D. Rosenberg, The Causal Connection in Mass Exposure Cases: ‘Public Law’ Vision of the Tort System, [1984], *Harvard Law Review* (HLR), 851-929.

- 61 Let us address more closely the various options addressed above. The *first* option would be to award a victim total compensation of damage, even if the probability that his loss was actually caused by the injurer's activity was relatively low, say 30%. In such a case, this means that we also know that there is a 70% probability that the damage (*e.g.* a certain illness) was caused through another event. If an injurer is held liable for the full amount even if there was only a 30% probability that his activity caused a loss, this will lead to too few incentives to invest in socially desirable activity, such as *e.g.* the development of genetically modified organisms.
- 62 This shows that the first solution, simply arguing that in case of causal uncertainty the victims can claim full compensation, is inefficient and unjust. The same is obviously true for the *second* solution in which it would be required that the victim proves with 100% certainty that his damage has been caused by the tort. That requirement would mean that in many cases injurers would escape the clutches of the law whereas their activities have effectively created an additional risk. That solution would therefore amount to under-deterrence.
- 63 This therefore leads us to the two other solutions, often seen in tort law, being either the requirement that a certain threshold should be passed or the proportionate liability.
- 64 The threshold liability leads to a situation whereby the victim's claim is totally accepted if the probability passes the threshold of, say, 50%. If the probability passes the threshold, compensation is in full, but if the probability is lower than the threshold, the victim receives no compensation at all. The disadvantages of this hard and fast solution are obvious. One problem, both from the victim compensation as well as from the deterrence perspective, is that the probability of causation could systematically be lower than the threshold. Assume that the probability were systematically 40% that a certain cancer would have been caused as a result of a certain activity. If the threshold were 50% this would mean that the enterprise exposing persons to this 40% risk would systematically escape the clutches of the law. Victims would not be compensated and the incentives towards accident reduction would be too low.⁶³ This seems inefficient and probably also unjust, since the enterprise has

⁶¹ D. Kaye, The Limits of the Preponderance of the Evidence Standard: Justifiably Naked Statistical Evidence and Multiple Causation, [1982] *American Bar Foundation Research Journal* (Am. Bar Found. Res. J.) 487-516, and see. S. Gold, Causation in Toxic Torts: Burdens of Proof, Standards of Persuasion, and Statistical Evidence, [1986] *Yale Law Journal* (YLJ), 376-402.

⁶² S. Shavell, Uncertainty over Causation and the Determination of Civil Liability, [1985] *Journal of Law and Economics* (JLE), 587-609.

⁶³ S. Shavell.

after all, in a number of cases, at least statistically, created certain losses. Assume that 100 cancer victims all file a lawsuit, in this particular example one would assume that 40 out of these 100 cancer cases would have been caused by the emissions emanating from the particular enterprise. However, for every individual the probability of causation would always be below the 50% threshold, so that the enterprise would not be held to compensate the victims in any of these cases. That is a clear disadvantage of this 'all or nothing' approach which is inherent in the threshold liability.

- 65 A more fine-tuned alternative can be found by translating the probability of causation by awarding the victim a proportionate amount of his damage. In practice, this would mean that if the probability that the victim's damage was caused by the injurer's activity was 40%, the victim would be compensated for 40% of his damage. From an economic perspective, the advantage of this proportionate liability is that it exposes the injurer precisely to the excess risk (in this case the additional number of cancer cases) that was caused by the (assumed wrongful) activity of the injurer. The enterprise will then, returning to the previous example, have to compensate 40% of all the damage of every particular victim, which amounts at the aggregate level to the same as compensating 40 out of 100 victims whose illness would have been caused by the enterprise.⁶⁴
- 66 The result of this proportionate liability is that the injurer will receive optimal incentives for prevention, since he is precisely exposed to liability for the risk which was caused by his activity.⁶⁵ A proportionate liability rule therefore provides optimal incentives for accident reduction, so it is generally held in the economic literature.⁶⁶
- 67 This proportionate liability rule has been defended by several American scholars and is also defended in the economic analysis of law. The negative consequences of causal uncertainty could then be limited. A proportionate liability rule is less rigorous than the all or nothing approach of the reversal of

⁶⁴ So S. Shavell, *Economic Analysis of Accident Law* (1987) 116.

⁶⁵ So L. Bergkamp, *Liability and Environment* (2001) 290-291.

⁶⁶ See on this proportionate liability J. Makdisi, Proportional Liability: A Comprehensive Rule to Apportion Tort Damages Based on Probability, [1989] *North Carolina Law Review*, 1063; W. Landes/R. Posner, Tort Law as a Regulatory Regime for Catastrophic Personal Injuries, [1984] *JLS*, 417-34 and G. Robinson, Probabilistic Causation and Compensation for Tortious Risk, [1985] *JLS*, 797-798. For a discussion of the possible legal foundation of a proportionate liability rule see A.J. Akkermans, Grondslagen voor proportionele aansprakelijkheid bij onzeker causaal verband, in: W.H. van Boom/C.E.C. Jansen/J.G.A. Linssen (eds.), *Tussen 'Alles' en 'Niets'. Van toedeling naar verdeling van nadeel* (1997) 105-115.

the burden of proof.⁶⁷ The proportionate liability rule would indeed mean that all victims can claim a proportion of their damage equal to the amount by which the power plant contributed to the loss. Thus the exposure to liability of the enterprise corresponds precisely with the amount to which the power plant contributed to the risk.⁶⁸ This proportionate liability rule could, more particularly in cases of product's liability, take the form of the market share liability.⁶⁹

4. Multiple Actors

- 68 A related problem, also having to do with causal uncertainty, is how one should handle the situation where multiple actors are involved. This can again have different sources. It could either be the case that there are potentially many GM crops that could have affected the non GM crop. The other possibility is that there are various liable actors in the vertical production chain. Again, as with the general issue of causal uncertainty, the law has basically a variety of options to solve this issue, the most realistic ones (and thus applied in the legal system) are on the one hand a joint and several liability and on the other hand a proportional liability. A so-called market share liability whereby the liability is apportioned according to the market share of the operator is an example of such a proportionate solution to multi-actor causation.
- 69 At first sight, a joint and several liability rule appears as a regime whereby the legal system deviates from the principle that a tortfeasor should only be held liable for the damage which was caused by its own behaviour. Under joint and several liability, the tortfeasor is held liable in full also for damage which was not caused by its own behaviour.
- 70 One could therefore at first blush argue that a joint and several liability seems inefficient since it leads to overdeterrence: the injurer's liability is not limited to the risk created by its own activity. However, such a simple conclusion is (as usual) indeed too simple. One may argue that a distinction should be made between the situation of full solvency of all the contributing tortfeasors on the one hand and the situation in which either one or more of them are insolvent. In case of full solvency of all the actors, one can argue that there is no effi-

⁶⁷ See G. Brüggemeier, Liability for Water Pollution under German Law: Fault or Strict Liability, in: J. van Dunné (ed.), *Transboundary Pollution and Liability: The Case of the River Rhine* (1991) 88-91.

⁶⁸ G. Robinson, Probabilistic Causation and Compensation for Tortuous Risk, [1985] JLS, 798.

⁶⁹ See also P. Widmer, Causation under Swiss Law, in: J. Spier, *Unification of Tort Law: Causation* (2000) 112-113.

ciency loss caused by joint and several liability.⁷⁰ In that case, the injurer who has to compensate the victim can in turn exercise a redress against the other parties who contributed to the loss in proportion to their contribution. Assuming that the other tortfeasors are fully solvent, the one who first paid only pre-finances the compensation of the victim and will be able to recover a part of the damage paid. Thus, in the end, also under joint and several liability, the extent to which every contributor has to pay should be proportionate to their contribution to the risk. In that sense, a joint and several liability rule, combined with a right of recourse and solvent actors amounts to a proportionate solution. The exposure to liability of every tortfeasor in this model is limited to its own contribution to the loss and thus optimal incentives would follow.

- 71 Of course one could wonder what the additional benefit is of a joint and several liability rule compared to the situation whereby the victim would have to sue every individual tortfeasor separately. One could make a victim protection argument, simply on the basis of the fact that for the victim it is often more difficult to prove a causal link with the action of one particular actor. Thus it certainly makes the life of the victim easier if the victim can claim full compensation from one injurer who then has to exercise the right of redress against the other parties who contributed to the loss. However, in addition to this distributional argument, there are undoubtedly efficiency arguments in this particular case as well. They are probably not linked to a benefit in administrative costs. Indeed, whether either the victim has to sue e.g. five different tortfeasors or the victim just sues one tortfeasor and the latter exercises a right of redress probably does not create much differences as far as the administrative costs are concerned. However, one could make the argument that the joint and several liability may give *ex ante* excellent incentives for mutual monitoring between potential joint tortfeasors.⁷¹ Indeed, victims may well encounter difficulties in proving a causal link between the action of every particular tortfeasor and the loss he suffered. That may result in too little claims and hence in underdeterrence. Shifting the risk to the injurers would mean that they *ex ante* have an excellent incentive to mutually monitor their activities. Joint and several liability in fact shifts the risks of uncertainty concerning the proof of the causal link to the injurers. The victim can suffice with suing just one of the many potentially liable injurers and claim full compensation. If the

⁷⁰ For a detailed analysis of joint and several liability when all defendants are fully solvent see L. Kornhauser/R. Revesz, Sharing Damages Among Multiple Tort Feasors, [1989] YLJ, 831-884 and for the analysis in case of limited solvency see L. Kornhauser/R. Revesz, Apportioning Damages Among Potentially Insolvent Actors, [1990], JLS, 617-651.

⁷¹ An argument in that direction is made by T. Tietenberg (supra fn. 44).

one injurer who is sued does not succeed in proving that others contributed to the loss, the damage will ultimately fall on him.

- 72 However, these arguments may not be valid any more under insolvency.⁷² Indeed, the picture changes if the tortfeasors are no longer solvent. In that case, the risk of insolvency is shifted to the injurer who will be sued by the victim. If in that particular case one would assume that e.g. only the solvent injurer is sued by the victim and he has no right of recourse (given the insolvency of the others). The effect would be that one (solvent) injurer would be held to compensate also for losses which he has not caused.⁷³ In case of insolvency, joint and several liability may thus violate the principle that the injurer should only be held liable to compensate in the proportion to which he contributed to the loss.⁷⁴

5. Channelling of Liability

- 73 One possible solution when various actors are potentially involved is to impose liability exclusively on one of those parties and to exclude the liability of all others. This is a solution which has been followed for instance in the nuclear liability conventions whereby the liability is channelled to the licensee of a nuclear power plant. In the conventions concerning damage caused by marine oil pollution a channelling of liability to the tanker owner can be found. Usually this channelling of liability means that one party is exclusively liable which hence means that victims cannot bring a suit against other parties who might have contributed to the damage as well. In some cases recourse actions are still possible; in other cases these are excluded as well. Channelling of liability is sometimes defended as a device that would make the life of the victim easier. The victim would then know *ex ante* exactly against whom a law suit would have to be brought and difficult procedural issues in case of multi actor causation could be avoided. Also it is sometimes argued that channelling would increase the insurability of particular risks since only one party would have to take insurance cover. Nevertheless the overall apprecia-

⁷² For an excellent analysis of the effects of various systems of extended liability see the recent paper by Boyd and Ingberman who argue that under certain conditions extended liability may promote cost internalization, but that there are serious drawbacks as well. Hence, they argue that other solutions should be examined to cure the problem of undercapitalisation (J. Boyd/D. Ingberman, The Vertical Extension of Environmental Liability through Claims of Ownership, Contact and Supply, in: A. Heyes (ed.), *The Law and Economics of the Environment* (2001) 44-70.

⁷³ Then joint and several liability would lead to overdeterrence, so Bergkamp rightly argues (L. Bergkamp, (supra fn. 65) 301).

⁷⁴ See equally Bergkamp, L., (supra fn. 65), 153-154 who argues that joint and several liability may be unfair and may lead to overdeterrence.

tion of channelling of liability from an economic perspective is rather negative. Indeed, it has been argued that this channelling is inefficient because it has perverse effects on the incentives for care where the liability applies exclusively to one operator.⁷⁵ This is the case if channelling means that victims no longer have the right to sue another party who could influence the accident risk as well. Excluding that third party from liability is inefficient since his incentives for prevention would be diluted. That effect is obviously reduced if the licensee or operator who would be held liable still has a right of recourse against the third party or if a liability could be passed on the basis of contract, for example. In that case one could argue that the liability is simply transferred and that such a reallocation complies with the principles of the Coase theorem.⁷⁶ However, this private reallocation of liability may not always be possible and some of the conventions, moreover, even restrict the possibilities of a right of recourse. Channelling can hence hardly be considered as an efficient mechanism for the prevention of accidents.

- 74 In addition to this principle economic argument one could also argue that at the practical level channelling of liability might be difficult to introduce in the area of GMO damage. In case of oil pollution or nuclear accidents it is relatively easy to identify one liable party to whom liability can be ‘channelled’ such as an operator or tanker owner. However, in case of damage caused to non-GM crops by GMO crops it is *ex ante* for the legislator far more difficult to identify to whom a potential liability should be channelled. Hence, in addition to the principle arguments against channelling one can equally wonder whether it would be practically possible to implement it.

V. Damage and Remedies

1. Possible Damage of Co-Mingling between GM and non-GM Crops

- 75 Once a cross pollination between GM and GM crops occurs, the economic loss for the non-GM crops farmers will become a reality. One possibility is that the organic farmers may lose their organic certification, since many standards only allows for a low level of GM crops or even zero tolerance of GM crops for a product to be marketed in an organic market. Repp observes that

⁷⁵ For a critical economic analysis of the channelling of nuclear liability see T. Vanden Borre, Transplantatie van ‘kanalisatie van aansprakelijkheid’ van het kernenergierecht naar het milieu (aansprakelijkheids)recht: een goede of een gebrekkige zaak?, in: M. Faure/K. Deketelaere (eds.), *Ius Commune en Milieurecht, Actuaia in het Milieurecht in België en Nederland* (1997) 329-382.

⁷⁶ See M. Trebilcock/R. Winter, The Economics of Nuclear Accident Law, [1997] IRLE, 232-235.

the loss of such certification may impose significant costs for the organic farmers, since they not only lose their future sales, but also the loss of opportunity to recapture costs that have been invested for years to acquire an organic certificate⁷⁷. Another possibility of damage that may result from co-mingling occurs because the presence of segregations between GM and non-GM food or between GM feed and non-GM food⁷⁸. The famous case for this type of damage is the StarLink case, triggered by the finding of the Cry9C gene from Aventis's StarLink, a GM corn specifically designated for animal feed, in corn for human consumption. This finding induces US corn farmers and producers to sue Aventis for the impacts of admixture between StarLink with corn for human food. No court decision has, however, been made on this case, since the parties have settled the case outside the court, by which Aventis has to pay up to US\$110 million⁷⁹.

- 76 The above two possibilities of damage can be considered as having non-reciprocal nature, in which only non-GM crops farmers can be adversely affected by admixture of GM and non-GM crops. There are, however, other possibilities of damage that may result from cross-pollination of GM crops with non-GM crops or their wild relatives, including the increase use of herbicide or pesticide. One, of course, may argue that such an increase results from the developments of herbicide-resistant weeds and pesticide-resistant insect, which occur both because GM and non-GM crops. However, it could also be argued that wider adoption of transgenic crops just increase the likelihood and speed of the development of such resistance.

2. Damages in Tort

- 77 Law and economics scholars usually hold that the amount of damages the injurer should pay should be at least equal to the victim's loss in order to provide optimal compensation to the injurer.⁸⁰ These so-called compensatory damages must be paid to the victim in order to give the victim an incentive to sue, which is essential to let the tort system provide an effective and credible

⁷⁷ R.A. Repp, (supra fn. 29), 594-595.

⁷⁸ As long as such segregations exist, hence there also exist markets for non-GM products, the risks of damage from co-mingling will not be entirely removed. The risk of losing the entire organic market due to co-mingling has motivated Canadian groups of organic farmers to sue two giant GMO producers, Monsanto and Aventis. The farmers argue that the entire organic market for wheat, worth as much as \$17.5 million, is threatened due to the commercialization of GM wheat in Canada. See: A. Bouchie, [March 2002] *Nature Biotechnology* 20, 210.

⁷⁹ L. Khoury and S. Smyth, (supra fn. 53), 12. See also: S. Smyth, G.C. Khachatourians, and P.W.B. Phillips, (supra fn. 52), 539.

⁸⁰ R.A. Posner, *Economic Analysis of Law* (6th edn. 2003) 192.

deterrent. The duty to pay compensatory damages to the victim will moreover avoid that victims would take inefficiently high precautions.⁸¹ If the damages to be paid by the injurer would fall short of the harm so that the expected payments would be below expected harm the incentives to reduce the risk would be inadequate.⁸²

- 78 Therefore the starting principle should be that the liable party should pay for the actual level of losses of the victim.⁸³ There is in addition an extensive economic literature for instance on the question on how life should be valued in a tort case and more particularly on the valuation of non-pecuniary losses. In addition economist hold that in some cases damages should outweigh a low probability of detection and should therefore be ‘punitive’. The punitive damages are thus meant to provide appropriate incentives to injurers in case where for instance through his malicious acts the probability of the tort being detected would be lower than one.
- 79 However, non of these specific cases seem to play a particular role in the case of GMO mixture, so that still the general rule applies that damages should be calculated in such a way to compensate for the actual harm suffered by the victim.

3. Damages in Contract

- 80 Economic literature has paid a lot of attention to the various types of damages that could be compensated in case of a contract is breached. A variety of possibilities is indicated in the literature:
- Damages could be equal to the promisee’s reliance loss (the costs he incurred in a recently relying on the promisor’s performance of the contract)
 - Damages could be equal to the expectation loss (the loss of the anticipated profit of the contract)
 - Damages could be consequential (in that sense they would also include the effects on the promisee’s business on the breach)⁸⁴.
- 81 In addition parties could *ex ante* have agreed in the contract on the amount of damages in case of a breach, the so-called liquidated damages. Moreover,

⁸¹ R.A. Posner (supra fn. 80), 192.

⁸² So S. Shavell, *Foundations of Economic Analysis of Law* (2004) 236.

⁸³ S. Shavell (supra fn. 82), 237.

⁸⁴ See further R.A. Posner (supra fn. 80), 118.

other remedies than damages could be possible like either restitution or specific performance.

- 82 Shavell indicates that the damage measures should in principle provide parties incentives to perform.⁸⁵ The expectation damages should in principle make the potential victim indifferent between performance and breach. A damage measure which is thus based on the value of the expected performance is referred to as expectation damages.⁸⁶ Reliance damages refers to the fact that the promisee may have invested in reliance on the promise. The breach of contract can thus diminish or destroy the value of the investment in reliance. In that hypothesis the promisee is thus made worse off than if he had not made a contract. In that hypothesis courts may award damages that place the victims of the breach in the position they would have been in if they had never contracted with the other party. The damages computed on this basis are referred to as 'reliance damages'. If these are computed correctly they should equally leave the potential victim indifferent between breach and no breach.⁸⁷
- 83 Much more debated than expectation and reliance damages are the so-called consequential damages. Law and economics scholars are rather hostile towards awarding a buyer also consequential damages for the simple reason that this may reduce his incentives for loss reduction as well. This problem more particularly arises according to Posner when the losses that would result from the breach of contract would be unforeseeable for the seller.⁸⁸ These type of damages are also sometimes referred to in the literature as 'opportunity – caused' damages since the contract often entails the loss of an opportunity to make a profit based for instance on an alternative contract.⁸⁹ The opportunity – caused damages are thus seen as a form of negative damages (*damnum emergens*). To some extent the opportunity – caused damage can fit into the reliance damages in the sense that the promisee may invest in reliance on the contract and thus forgo an opportunity in which he had relied.
- 84 All of these damage measures may of course play a role in cases of compensation for damage caused by GMOs. This problem of compensation for lost profits e.g. because the victim would suffer as a result of his crops being affected by the GMOs is of course well-known in the literature as the problem of 'pure economic loss'. Also in economic analysis the problem of whether

⁸⁵ S. Shavell (*supra* fn. 82), 304 et seq.

⁸⁶ R. Cooter/Th. Ulen, *Law and Economics* (4th edn.), 239.

⁸⁷ See R. Cooter/Th. Ulen (*supra* fn. 86), 241.

⁸⁸ R.A. Posner (*supra* fn. 80), 127-128.

⁸⁹ R. Cooter/Th. Ulen (*supra* fn. 86), 242.

pure economic loss should be compensated has been extensively studied.⁹⁰ It is held, as mentioned above, that the treatment of pure economic loss in contracts is less problematic than in torts since in contract law compensation is usually awarded both for the concrete damage actually incurred and for the lost profit. Dari Mattiacci, however, makes clear that whereas lawyers usually consider the compensation for pure economic loss a problem, economists traditionally consider economic loss the same as any other type of damage. The dichotomy between on the one hand pure financial losses and on the other hand physical damage to property or personal injury is not known in economic analysis of law. The economists consider any loss a decrease in the victim's welfare, irrespective of whether this decrease derives from a physical or a monetary loss.⁹¹ Economists have also criticized the approach of lawyers who hold that physical loss would be of greater importance for the law than financial loss. From an economic perspective also a financial loss is an externality which should be internalized.⁹² The scope of this study does not allow us to examine this problem in further detail, but in general it can be held that also economic analysis holds that the compensation for pure economic loss should be constructed in such a way that liability rules provide incentives both to injurers and to victims to mitigate damage in an efficient manner.⁹³

4. Remedies – Injunction

- 85 There is still a third type of question that could be asked in relation to the remedies. What if the potential victim sees the harm coming or has a case where harm continues? Can in that case injunctive relief be asked so that the judge can order the injurer to refrain from the damaging behaviour? In this particular case it would for instance mean that specific measures are ordered by the judge to the injurer to void further GMO mixture.
- 86 The economic literature makes a distinction as far as injunctive relief is concerned between the way property rights are protected and the way in which other rights are protected. Economists point at the fact that the typical remedy in case of a violation of a property right is an injunction. Damages are the

⁹⁰ An excellent overview of the literature in this respect is provided by G. Dari Mattiacci, *The Economics of Pure Economic Loss and the Internalization of Multiple Externalities*, in: W.H. van Boom, H. Koziol and Chr.A. Witting (eds.), *Pure Economic Loss* (2004) 167-190.

⁹¹ So G. Dari Mattiacci, 169.

⁹² See M. Bussani, V. Palmer and F. Parisi, *Liability for Pure Financial Loss in Europe: An Economic Restatement*, [2003] *American Journal of Comparative Law* (Am. J. Comp. Law), 51, 113-162.

⁹³ For a comprehensive analysis of the problem of pure economic loss in tort see G. Dari Mattiacci, 167-190.

usual remedy for torts whereas injunction is the usual remedy in case of a nuisance, hence a violation of a property right.⁹⁴ For the case of GMO mixture this would hence mean that when a neighbour's property right (enjoying a non-GM crop) would be endangered by the presence of a neighbour using GMO an economist would thus predict that the remedy would be injunctive relief. However, the fact that a property right is granted and that the victim could theoretically use injunctive relief does of course not mean that this will necessarily be the result. The Coase theorem discussed above predicts that parties may engage in bargaining and when transaction costs are low this is precisely what will happen. Hence, the injurer may 'buy' his right to pollute by paying damages to the victim. This would of course depend on what the efficient outcome is. But the Coase theorem holds that if transaction costs are equal to zero successful bargaining can cure inefficient laws. Hence economists consider damages and injunctions as equally efficient remedies when transaction costs equal zero. Differences in efficiency thus depend on transaction costs.⁹⁵ If transaction costs are high bargaining may be impossible. In that case the more efficient remedy is damages and no longer the injunction. The injunction could have as a result that an inefficient solution survives, whereas damages could be adjusted to harm done. Precisely because in a nuisance context where a property right protection is enforced transaction costs are relatively low the typical remedy will be the injunction. The injunction is more particularly more efficient than damages when the parties can bargain with each other. The reverse is thus true in a high transaction costs setting, which is typically the tort case. Then an economist would predict that the efficient remedy should be damages and not injunctive relief. This is a finding in a well-known paper by Calabresi and Melamed, which is often quoted in the law and economics literature.⁹⁶ They argue as follows:

- When there are obstacles to cooperation (high transaction costs), the more efficient remedy is the award of compensatory money damages;
- When there are few obstacles to cooperation (low transaction costs), the more efficient remedy is the award of an injunction against the defendant's interference with the plaintiff's property.⁹⁷

87 They therefore hold that when the nuisance is private and thus few parties are affected by it the costs of bargaining will be low and the injunction may be

⁹⁴ See R. Cooter/Th. Ulen (supra fn. 86), 100.

⁹⁵ R. Cooter/Th. Ulen (supra fn. 86), 104.

⁹⁶ G. Calabresi/Melamed, Property Rules, Liability Rules and Inalienability: One View of the Cathedral, [1972] *Harvard Law Review* (Harv. L. Rev.) 85, 1089.

⁹⁷ See for a summary of Calabresi/Melamed, R. Cooter/Th. Ulen (supra fn. 86), 104-107.

the preferred remedy. This then prevents that the court should have to undertake the difficult job of computing damages. The injunction in this law and economics perspective is, however, not viewed as a remedy which would forever prohibit the offensive activity, but rather as an instruction to the parties to resolve their dispute through bargaining. If the harmful externality is of the public – bad type bargaining is impossible because of high transaction costs and damages will be the more efficient remedy. Cooter and Ulen therefore hold that in choosing between injunctions and damages the court will have to examine the number of people affected by the externality. Only when the number of affected parties is low (this can often be the case with GMO damage) injunctive relief may be warranted.⁹⁸ This choice of optimal remedy is of course also closely linked to the coming to nuisance defence discussed above.⁹⁹

- 88 If the court, however, tends to apply permanent injunction and damages the results might be different. In this case, the court should consider the social value of GM crops compared to the harms suffered by non-GM crops farmers. In this case, the court might look at the benefits of GM crops in general, ranging from increasing productivity to serving as a solution to provide cheap and nutrition-rich food for the world. These benefits should, of course, be compared with the perils of GM crops and with the needs to provide non-GM product as an alternative for society. In particular, the benefits of individual GM crops farmers might be compared with the damage suffered by individual non-GM crops farmers. If the value of GM crops exceeds the harms suffered by non-GM crops farmers, then permanent damages is a preferable remedy. This is because, as the potential Pareto suggests, efficiency means that the winner still gains after compensating the loser, and because GM crops, which are highly beneficial to society, are too important to be permanently stopped.

5. Financial Limit

- 89 A further question that could be asked as far as damages and the remedies is concerned is whether there is any argument to put a financial cap or limit on the amount of damages due to the victim. To answer this question again a distinction has to be made between the contracts case (where *ex ante* bargaining was possible) and the tort case (where the victim is a third party and hence bargaining was impossible). In case of a contract parties could of course *ex ante* agree to limit damages due to a specific amount which can be less than the actual loss suffered by the victim. If that were the case it is an explicit agreement concerning allocation of risk which will undoubtedly also have an

⁹⁸ R. Cooter/Th. Ulen (supra fn. 86), 168-169.

⁹⁹ See supra section 3.2.4.

effect on the price agreed between the parties. In that particular case there is no objection against a limit. In fact it amounts to the liquidated damages, an amount of damages *ex ante* agreed by the parties in case of breach of contract.¹⁰⁰

- 90 A limitation of liability is far more complicated in the tort case. In the literature it has been indicated that there may be good reasons to favour a strict liability rule for major industrial accidents,¹⁰¹ the main reason being that only a strict liability rule would lead to a full internalization of those highly risky activities.¹⁰² This strict liability rule is especially put forward in so-called unilateral accident situation, this is where only one party influences the accident risk. Only with strict liability the potential injurer would also have an incentive to adopt an optimal activity level. This full internalization is obviously only possible if the injurer is effectively exposed to the full costs of the activity he engages in and is therefore in principle held to provide full compensation to a victim. An obvious disadvantage of a system of financial caps is that this will seriously impair the victim's rights to full compensation. But if the cap is indeed set at a much lower amount than the expected damage, this would not only violate the victim's right on compensation, but the above-mentioned full internalisation of the externality would not take place either. From an economic point of view a limitation of compensation therefore poses a serious problem since there will be no internalization of the risky activity. Indeed, if one believes that the exposure to liability has a deterrent effect, a limitation of the amount of compensation due to victims poses another problem. There is a direct linear relationship between the magnitude of the accident risk and the amount spent on care by the potential polluter. If the liability therefore is limited to a certain amount, the potential injurer will consider the accident as one with a magnitude of the limited amount. Hence, he will spend on taking care to avoid that an accident will be caused with a magnitude equal to the limited amount and he will not spend on the care necessary to reduce the total accident costs. Obviously, the amount of care spent by the potential injurer will be lower and a problem of underdeterrence arises. The amount of optimal care, reflected in the optimal standard, being the care necessary to reduce the total accident costs efficiently, will be higher than the amount the po-

¹⁰⁰ See supra section 5.2.

¹⁰¹ Above we argued that it will depend upon the specific circumstances of the case whether there is an argument in favour of strict liability for GMO damage. A crucial factor in that respect is what the respective contribution of both injurer and victim on the risk of GMO mixture is. We therefore assume here that the influence of the injurer is more important and that therefore the legal system has adopted a strict liability rule.

¹⁰² S. Shavell, *Strict Liability versus Negligence*, [1980] JLS, 11 and S. Shavell, *Economic Analysis of Accident Law* (1987), 8.

tential injurer will spend to avoid an accident equal to the limited amount.¹⁰³ Thus, as a result of the cap too little care is taken.¹⁰⁴

- 91 The conclusion is, however, different in case of bilateral accidents, where also the victim's behaviour may affect the accident risk. The standard argument against providing full compensation to victims (also of non-pecuniary losses) in case of bilateral accidents is that victims can take precautionary measures which are not always observable for judges and which can therefore not be fully accounted for in contributory or comparative negligence defences.¹⁰⁵ A limit on the compensation in case of bilateral accidents may therefore be useful in cases where victims should be given additional incentives to reduce the accident risk. Whether caps are efficient in specific bilateral accident cases will depend on the circumstances. The question arises – inter alia – whether exposing the victim to risk is indeed necessary to provide these additional incentives or whether the victim's incentives can be optimally controlled via the contributory negligence defence. Also the amount of the cap remains important. If the cap were set too low, this would give incentives to the victim but it could equally lead to serious underdeterrence of the injurer.

VI. Compensation

- 92 Again, the issue how efficient compensation for damage suffered by GMOs could be provided is an issue which could be discussed at length from a law and economics perspective. For instance already the question whether the GMO risk can be considered sufficiently foreseeable to consider this an insurable risk would already merit a separate study. Within the limited scope of this study we can only point at a few of the questions and issues that could be raised (also taking into account the questionnaire) in relation to the compensation of GMO damage.

¹⁰³ See M. Faure, Economic Models of Compensation for Damage Caused by Nuclear Accidents: Some Lessons for the Revision of the Paris and Vienna Conventions, [1995] *European Journal of Law and Economics* (EJLE), 21-43.

¹⁰⁴ The reason for the underdeterrence is obviously the same as for the underdeterrence which results from the insolvency of the injurer. Underdeterrence arises because the injurer is not exposed to full liability, either as a result of his insolvency or as a result of a cap.

¹⁰⁵ This point has been made by S. Rea, Non-pecuniary Loss and Breach of Contract, [1982] JLS, 50-52, but also by M. Adams, Warum kein Ersatz von Nichtvermögensschäden, in: C. Ott/H.B. Schäfer (eds.), *Allokationseffizienz in der Rechtsordnung*, 214 and by C. Ott/H.B. Schäfer, Schmerzensgeld bei Körperverletzungen. Eine ökonomische Analyse, [1990] JZ, 564-565. See also M. Faure, Compensation of Non-pecuniary Loss: An Economic Perspective, in: U. Magnus and J. Spier (eds.), *European Tort Law, Liber Amicorum for Helmut Koziol* (2000) 143-159.

1. Available insurance schemes

- 93 A first principle distinction which has to be made from an economic perspective is indeed the availability of a variety of different insurance schemes. Indeed, economists would hold that if a particular party has an aversion against certain risk, one way to increase his utility is by seeking *ex ante* protection through insurance. The mechanism is well-known: through the payment of a premium (which should at least be equal to the probability of the loss multiplied with the damage, the insured can *ex ante* seek security that in case an accident happens, a third party (the insurance company) will take over the loss. Provided that many similar persons seek this protection with an insurance company, an insurer can in principle bring together these non correlated risks in segregated risk pools and spread the risks over the participants in the pool. Crucial in this respect is of course that the insurer has information on the GMO risk and that he can use this information to apply a correct risk differentiation (e.g. through appropriate policy and premium conditions).
- 94 Within the context of GMO damage in fact two different parties could seek insurance coverage. One possibility is that the potential injurer (the party handling GMOs) would seek insurance to cover the risk that he would be held liable for the consequences of his use of the GMO. This would then be a traditional liability insurance. It is also referred to as a third party insurance since in fact the insurer covers the risk that this insured (the injurer) will have to compensate a third party (the victim). The alternative is obviously that the potential victim himself would seek protection against the damage he may suffer as a consequence of having his non GM crop exposed to GMOs. If it is the potential victim who seeks this coverage, it is a so-called first party insurance.
- 95 In a contract case, both insurance types are of course possible, depending upon the allocation of the risk. If parties agreed *ex ante* to make the seller liable, he may purchase a liability insurance. If on the other hand the buyer purchases at his own risk, he may seek first party insurance to cover the risk of harm. The type of insurance chosen in a contract context could thus also provide an indication of the implicit agreement between the parties concerning the allocation of the risk.
- 96 In the tort case, the difference between the two insurance types is related to the difference between the two liability rules discussed above, strict liability and negligence. Since in a strict liability case the injurer will in principle always have to compensate the victim, it will be the injurer who seeks third party liability insurance. Since the victim is in principle always compensated, he does not need to seek insurance protection. The reverse is true in case of negligence. Since negligence provides incentives to the injurer always to take

the due care required in the legal system, the injurer will do so and will hence not be held liable. The injurer therefore – in theory – does not need liability insurance¹⁰⁶ but the victim will under negligence in principle not be compensated and thus be confronted with the damage. The risk averse victim may therefore under negligence seek first party insurance.

- 97 Economists are relatively enthusiastic concerning this first party insurance and one can notice a tendency towards an increasing use of first party insurances for instance also to cover environmental damage.¹⁰⁷ The underlying principle in a first-party insurance is that the insurance undertaking – in principle – pays as soon as damage occurs, provided that it can be proven that the particular damage has been caused by the insured risk. Payment by the insurance undertaking occurs irrespective of the fact whether there is liability. The arguments advanced in the literature in favour of first-party insurance are that the transaction costs would be lower and that risk differentiation might be a lot easier.¹⁰⁸ The reason is simply that with first-party insurance the insurer directly covers the risk of damage with a particular victim or a particular site. The idea is that it is therefore much easier for the insured to signal particular circumstances which may influence the risk to the insurer. The problem with liability insurance is that the insurer is always insuring the risk that his insured (the potential injurer) will harm a victim (a third party) of which the properties are unknown *ex ante* to the insurer. Moreover, under liability insurance there are lots of uncertainties, e.g. how the judge will interpret this specific liability of the insured. In the ideal world of first-party insurance the insurer directly covers the victim, i.e. the risk. He can therefore directly monitor the risk and in principle provide a much better risk differentiation. First party insurance by the victim may thus be one potential instrument to provide compensation for losses.

2. Compulsory Insurance

- 98 Another question is of course whether there is an economic argument to force a potentially liable GMO producer to seek insurance cover. This again is an issue that has received a lot of attention in the law and economics literature. We will of course not summarize all of this literature within the scope of this

¹⁰⁶ Except of course for the cases where either the injurer or the judge would commit errors as a result of which there still would be a liability case.

¹⁰⁷ See M. Faure, Environmental Damage Insurance in the Netherlands, *Environmental Liability* (2002), 31-41 and M. Faure, Environmental Damage Insurance in Theory and Practice, in: T. Swanson (ed.), *An Introduction to the Law and Economics of Environmental Policy: Issues in Institutional Design* (2002) 283-328.

¹⁰⁸ This argument is especially advanced by G. Priest, The Current Insurance Crisis and Modern Tort Law, [1987] YLJ, 1521-1590.

study, but merely state the most important argument in favour of compulsory insurance from an economic perspective.¹⁰⁹ The most important argument to introduce compulsory liability insurance relates to the insolvency problem. The argument goes that the magnitude of the harm will often exceed the individual wealth of an injurer, whereby a problem of under compensation of victims will arise. Lawyers would, hence, push forward compulsory insurance as an argument to guarantee an effective compensation to the victim.

- 99 It is, however, also possible to make an economic argument that insolvency will lead to underdeterrence problems which might be remedied through liability insurance. Indeed, this so-called „judgement-proof” problem has been extensively dealt with in the economic literature.¹¹⁰ Insolvency may pose a problem of underdeterrence. If the expected damage largely exceeds the injurer’s assets the injurer will only have incentives to purchase liability insurance up to the amount of his own assets. He is indeed only exposed to the risk of losing his own assets in a liability suit. The judgement-proof problem may therefore lead to underinsurance and thus to underdeterrence. Jost has rightly pointed to the fact that in these circumstances of insolvency, compulsory insurance might provide better outcome.¹¹¹ By introducing a duty to purchase insurance coverage for the amount of the expected loss, better results will be obtained than with insolvency whereby the magnitude of the loss exceeds the injurer’s assets.¹¹² In the latter case the injurer will indeed only consider the risk as one where he could at most lose his own assets and will set his standard of care accordingly. When he is, under a duty to insure, exposed to full liability the insurer will obviously have incentives to control the behaviour of the insured. Via the traditional instruments for the control of moral hazard the insurer can make sure that the injurer will take the necessary care to avoid an accident with the real magnitude of the loss. Thus Jost and Skogh argue that compulsory insurance can, provided that the moral hazard problem can be cured adequately, provide better results than under the judgement-proof problem.

¹⁰⁹ For a more detailed discussion see M. Faure, *Economic Criteria for Compulsory Insurance*, [2006] *Geneva Papers on Risk and Insurance* (Geneva Pap Risk Ins) 31, 149-168.

¹¹⁰ More particularly by S. Shavell, *The Judgement Proof Problem*, [1986] *IRLE*, 43-58.

¹¹¹ P.J. Jost, *Limited Liability and the Requirement to Purchase Insurance*, [1996] *IRLE*, 259-276. A similar argument has recently been formulated by M. Polborn, *Mandatory Insurance and the Judgement-Proof Problem*, [1998] *IRLE*, 141-146 and by G. Skogh, *Mandatory Insurance: Transaction Costs Analysis of Insurance*, in: B. Bouckaert/G. De Geest (eds.), *Encyclopedia of Law and Economics* (2000) 521-537. Skogh has also pointed out that compulsory insurance may save on transaction cost.

¹¹² See also H. Kunreuther/P. Freeman, *Insurability, Environmental Risks and the Law*, in: A. Heyes (ed.), *The Law and Economics of the Environment* (2001) 316.

- 100 Indeed, this economic argument shows that insolvency may cause potentially responsible parties to externalise harm: they may be engaged in activities which may cause harm which can largely exceed their assets. Without financial provisions these costs would be thrown on society and would hence be externalised instead of internalised. Such an internalisation can be reached if the insurer is able to control the behaviour of the insured. This shows that if the moral hazard problem can be cured adequately insurance even leads to a higher deterrence than a situation without liability insurance and insolvency.
- 101 Notwithstanding this advantage of liability insurance, the literature has equally pointed at many dangers of compulsory insurance and has thus formulated several warnings. They can be summarized as follows:
- 102 Compulsory insurance should only be introduced when there is a sufficient amount of supply of differentiated insurance policies on the market. This supposes that sufficient competition on insurance markets exists and that operators have the possibility to actually seek coverage.
- 103 Therefore, compulsory insurance should only be introduced when sufficient information is available with insurers on the particular risk that will be covered. If too little information is available on the risk, the risk might be uninsurable or the risk premium (to account for insurers ambiguity) may be that high that insured do not have a willingness to pay that high premium.
- 104 Information on the risk with insurers is also crucial since insurers need to be able to control the moral hazard problem through an appropriate risk differentiation.
- 105 Compulsory insurance should never be accompanied with a duty to accept on insurers. The possibility for an insurer to refuse cover to high risk individuals can be a socially desirable control of moral hazard.
- 106 If at all, a legislator should merely impose a duty to seek financial coverage, but should at the same time provide a lot of freedom to the market to choose the type of financial coverage which is desired. Hence, this can but should not necessarily be limited to insurance. Other alternatives could meet the financial security requirement as well.

3. Compensation Funds

(a) Risk Differentiation

- 107 A question that often comes up in relation to new risks, like GMO damage, is whether damage should be compensated through a compensation fund. The reason that a fund solution is sometimes advanced is that there may be problems with the coverage of this risk on traditional insurance markets. For instance, problems with the insurance of environmental damage were a reason for some to propose compensation funds for environmental damage. Nevertheless, in general there are not many reasons to believe that a compensation fund would be better able than insurance (if this were also available) to compensate for GMO damage. Moreover, it can be feared that precisely the reasons that may make GMO damage a „hard to insure” risk may also render it impossible to organize a fund in an efficient manner. Indeed, one crucial issue is that no matter whether one organizes compensation through a fund or through traditional insurance, some principles of risk differentiation always need to be respected. This means that a duty to contribute (to an insurer or to a fund) should in principle only rest upon the one who actually contributed to the risk. A second principle is that this duty to contribute should also be related to the amount in which the specific activity contributed to the risk. This principle is important since it will give incentives for the prevention to operators. Risk differentiation means that bad risks will be punished (with a higher contribution) and good risks will be rewarded.
- 108 These principles are not only important from an efficiency point of view (providing optimal incentives for prevention), but also include a fairness element. Indeed, if these principles were not followed, it would mean that good risks would have to pay for the bad risks as well and would therefore in fact subsidise bad risks. This negative redistribution should be avoided and therefore the compensation mechanism, fund or insurance, should be financed principally by the ones who really contributed to the damage.
- 109 Thus, the compensation mechanism should aim at a differentiation of the contributions due. This differentiation is only possible if the insurance company or agency administering the fund also possesses information on the amount in which the specific activity contributed to the risk. One key element to determine the choice between insurance or funds is therefore who possesses the best information to control the risk.

(b) Funds versus Insurance

110 Applying the principles discussed above, there are not many reasons why, if both are – in theory – available a compensation fund would provide better protection against insolvency than the private insurance markets. One could assume that an insurer is better able to differentiate risks since an insurer is specialised in risk differentiation and risk spreading. Insurers therefore possess techniques to determine in what way their insured contribute to the risk. Obviously this assumes that the insurance markets are competitive. In the absence of competition on insurance markets, either the supply of insurance coverage could be too limited or premiums could be excessively high, which could justify a preference for a compensation fund.¹¹³ But if insurance markets are competitive, insurers can be assumed to be better able to deal with classic insurance problems such as moral hazard and adverse selection than the administrators of a compensation fund. One cannot see as a matter of principle why a government agency that would run a compensation fund would have better information on risks than an insurer. This might, however, be different if highly technical risks are involved where operators (e.g. producers of GMOs) are in a much better position than the insurance company to monitor each other. Some examples have been given above. This point has been made for instance concerning the compensation for nuclear damage. One could argue that a risk-sharing agreement between nuclear plant operators could lead to optimal monitoring between the operators since they possess much better information on prevention, good and bad risks than an insurance company would.¹¹⁴ Also in maritime insurance the Protection and Indemnity Clubs, are based on a mutual risk sharing between tanker owners play a crucial role.¹¹⁵ With respect to these highly specialised matters one could therefore argue that the operators themselves might in some cases be better suited than an insurance company to control moral hazard since they are better able to process information on the particular risk.¹¹⁶ However, the examples given show that with these risk sharing agreements no use is made of a government-run compensation fund.

¹¹³ M. Faure/R. Van den Bergh, Restrictions of Competition on Insurance Markets and the Applicability of EC Anti-Trust Law, [1995] *Kyklos*, 65-85.

¹¹⁴ See M. Faure/G. Skogh, Compensation for Damages Caused by Nuclear Accidents: A Convention as Insurance, [1992] *Geneva Pap Risk Ins*, 499-513 and M. Faure, [1995] *EJLE*, 21-43.

¹¹⁵ See T.G. Coghlin, Protection and Indemnity Clubs, [1984] *Lloyd's Maritime and Commercial Law Quarterly* (LMCLQ), 403-416.

¹¹⁶ These 'joint compensation systems' are also discussed in the *Green Paper on Remedying Environmental Damage*.

- 111 To summarise, if both insurance and compensation funds are available there are no clear reasons why a fund would be the preferred solution. There may, however, be reasons why insurance may not provide coverage for certain risks. In that case, funds cannot be compared with insurance since insurance is no alternative. However, there are no reasons to assume *ex ante* that GMO damage would be uninsurable, provided sufficient information on the risk can be obtained.

(c) *Costs*

- 112 Comparing insurance with compensation funds one should also address the comparative costs of both instruments. Insurance will generally be cheaper because liability insurance policies are not concluded for one activity, but for a whole set of risks. There is hence one insurance policy with transaction costs that are incurred once and an administrative structure within an insurance company that will be forced to an adequate cost reduction by competitive pressures. The costs of risk spreading might also be lower with an insurance company than with a compensation fund. Insurers are indeed specialised in methods for acquiring information on differentiation of risks. In addition, it has been argued in the literature that insurance provides for a reduction of transaction costs between contracting parties, because parties can *ex ante* agree on a distribution of risks and losses in case of an incident.¹¹⁷ The comparison will obviously also depend upon the type of compensation fund under discussion. In most cases one immediately thinks of a compensation fund run by a regulatory authority. If that is the case, one can of course refer to the literature on the negative effects of bureaucracies to argue that such a publicly operated compensation fund should not necessarily provide compensation at lower costs than the private insurance market. This can be reduced if the fund is administered privately, but in that case a competition with other funds has to be organized to provide incentives for cost reduction.
- 113 Summarizing, it seems more appropriate to use traditional liability and insurance as far as possible to cover damage and to use funds only in cases where insurance markets fail and there is reason to believe that funds would be able to provide adequate compensation.

¹¹⁷ This argument has been made by G. Skogh, The Transactions Cost Theory of Insurance: Contracting Impediments and Costs, [1989] *Journal of Risk and Insurance* (JR&I), 726-732.

VII. Cross Border Issues

114 The questionnaire rightly also addresses the question what changes if the GMO damage would be in a transboundary context. Of course one could easily think about examples for instance where there would be cultivation of a GM crop whereas the mixture would take place with non GM crops in another country.

1. Conflict of Law Rules

115 First one can briefly address how from an economic perspective conflict of law rules should address this type of transboundary damage. Although traditional handbooks in law and economics do not address conflict of law rules in any detail, the potential solution does not seem to be that complicated. Again, a distinction should be made between on the one hand the contract case and on the other hand the tort case. In a contract case parties can again negotiate *ex ante* on the applicable law and hence a choice of law regime will usually be agreed between the parties and next, enforced by the judge. As far as the tort case is concerned from an economic perspective there should not necessarily be a preference for the application of the law of the state of the injurer rather than applying the law of the state of the victim. The most important issue is, however, that also in a transboundary context externalities may arise. Hence, the function of tort law in the transboundary context should again be the internalization of externalities. The bottom-line should therefore be that the GMO producer in the injurer's state should be forced to take into account the damage suffered by the victim even if that takes place in another state. That result can be achieved as long as the victim has the possibility to bring a lawsuit against the injurer for the damage suffered, so that this internalization can take place. Depending upon the legal system in some cases victims will be forced to bring the suit in the state of the injurer. Injurers are thus also liable for harm caused in a transboundary context. In other situations victims may have the possibility to file the suit in their own state whereby the judgment that is obtained can afterwards be executed in the other country.

116 Thus, if the victims can sue the injurers according to the place that is most suitable to provide full compensation, the difference in liability system among countries would not create serious problems for the victims. The same conclusion may also be drawn if we look at the incentive to internalise the damage. Consider for example two neighbouring countries, one has a sub-optimal standard and country B has an optimal one. Supposed that the victim is a citizen of B, and the injurer is a citizen of A. If the victim can file the case either

in A or B, the injurer will take an optimal level of care according to country B, otherwise he would be held liable¹¹⁸.

2. Harmonization?

117 Another question that always comes up when harm is caused in a transboundary context is whether there is any specific reason to harmonize legislation simply because the rules governing GMO liability might be different in various countries. A lot of literature exists on the question whether there should be harmonization of tort law from a law and economics perspective. That literature can of course not be even summarized within the context of this project, but the main results can of course apply to the GMO case as well.¹¹⁹ The arguments for centralization of GMO liability are not particularly strong. One can compare the necessity to harmonize GMO liability with the question whether there should be harmonization of environmental liability in Europe.¹²⁰

118 A *first* economic argument would be the transboundary character of an externality. However, as we just discussed, the mere fact that GMOs travel over borders is not necessarily an argument in favour of harmonization. The crucial question is whether the law can be used to remedy the transboundary externality. As we indicated above also an extraterritorial application of national law may solve this problem. Moreover, if the transboundary externality posed by transboundary GMOs would constitute an argument in favour of harmonization it would only be necessary to harmonize transboundary transport of GMOs, but there would not be a reason for a European-wide GMO liability regime.

119 Also the *second* economic reason, the race for the bottom, does not seem to be an issue in the case of GMO liability. It can hardly be expected that states would engage in a destructive competition to attract industry to its country. It is very unlikely that such a race for the bottom would take place since states

¹¹⁸ This is not the case if the victim can only sue the injurer in the injurer's country. In this case, the injurer will only take a level of care that is enough for him to avoid liability, namely the less-than-optimal standard of his country (A). As a result, there will be too many activities in country A that may create externality in country B.

¹¹⁹ For a summary of this economic literature see *inter alia* M. Faure, How Law and Economics may Contribute to the Harmonization of Tort Law in Europe, in: R. Zimmermann (ed.), *Grundstrukturen des europäischen Deliktsrechts* (2003) 31-82.

¹²⁰ See in that respect M. Faure and K. Desmedt, Harmonization of Environmental Liability Legislation in the European Union, in: A. Marciano and J.-M. Josola (eds.), *From Economic to Legal Competition. New Perspectives on Law and Institutions in Europe* (2003) 45-86.

would damage their own interests by lowering standards of GMO liability. Since they would wish to protect their own voters it is more likely that states would engage in a race to the top. Only if there were empirical proof that states would engage in such a race for the bottom (showing that there would be actual relocation of industry as a result of differing liability regimes) would this constitute a reason for harmonization.

- 120 Also the *third* reason, harmonization of marketing conditions, has often been rejected by economists. Economists rightly pointed at the fact that marketing conditions will always differ and that this is as such not a problem for the internal market. As long as products, services, capital, and persons can freely flow without obstacles the fact that legal rules differ does as such not constitute any obstacle to trade. Moreover, rules of civil liability like GMO liability do not constitute a serious impediment to transboundary trade.
- 121 The *fourth* argument would be that a harmonization might reduce transactions costs. But as equally has been indicated in the literature, this argument often neglects the fact that differences often reflect differing preferences of the citizens and are thus not necessarily a bad thing. Moreover, the argument that uniform laws would lead to lower transactions costs neglects the fact that there are high costs as well in harmonization. Only if it were possible (e.g. through a bottom-up approach by a European group on tort law) to identify the common roots in European legal systems one could argue that it may make sense to try to find this common denominator, provided that it is established that in fact it is only the legal form and technique that differs, but not the preferences of citizens.
- 122 In sum, this very brief overview of the economic arguments shows that the fact that there may be cross-border issues involved in transboundary GMOs is as such not an argument at all in favour of harmonization of GMO liability.

C. GMO Liability: Options for the Insurers

Ina Ebert/Christian Lahnstein

I. Introduction

- 1 If a traditional farmer suffers a loss of income due to unwanted cross-pollination, insurance coverage of such a loss might theoretically involve different insurances of the affected parties, depending on the liability structure of such losses: the commercial third-party liability insurance of the GMO farmer, the product liability or recall insurance of his supplier, an agricultural insurance against material damage of the traditional farmer or, if the cross-pollination was only discovered after the genetically modified (GM) products had been passed on to customers, the product liability or recall insurance of the traditional farmer. However, determining the existence of coverage for each of these types of insurance is problematic for a variety of reasons. In addition to this, GMO cross-pollination losses are usually explicitly excluded from insurance coverage due to the incalculability of associated risks, particularly in countries with stringent liability laws governing GMO farmers that are independent of proof of causality. Two alternatives for settling such cross-pollination losses sustained by traditional farmers have been developed in practice parallel to insurance solutions: variously organised and financed compensation funds and also contractual constructions under which the seed producer obligates himself to buy any plants of farmers in the neighbourhood of the seed producer's customers affected by unwanted cross-pollination at the price of not genetically modified crops. In such cases, any need for insurance or options for insurers arise only insofar as some area not covered by these alternatives remains to be dealt with by liability law. This will mostly be the case where funds are activated or any purchase obligation arises only if the GMO farmer has adhered to all safety requirements or if the unwanted cross-pollination cannot be traced back to a specific GMO farmer.
- 2 If cross-pollination losses are to be covered by insurance, the question arises of the scope and terms and conditions at which such insurance protection can be granted. Apart from restricting insurance protection to certain types of plants and GMs as well as agreement of monetary limits, consideration must

primarily be given to setting safety standards for preventing unwanted cross-pollination.

II. Coverage of cross-pollination losses in individual classes of business

1. Commercial third-party liability insurances of GMO farmers

- 3 Since GMO farmers are in any case exposed to liability for unwanted cross-pollination, it would in principle be logical to have cross-pollination losses (at least also) be included under their commercial third-party liability insurance. Originally, the largest obstacle to this was the fact that the maximum sums insured for pure financial loss were frequently low, if it was included in the cover at all. Moreover, unwanted cross-pollination might also be regarded as environmental damage, in which case the wide variety of exclusions of non-sudden pollution contained in various forms in all commercial third-party liability insurance, would probably stand in the way of coverage. In the case of cross-pollination losses related to plant types where the cultivation of GM crops almost inevitably leads to cross-pollination, coverage would conceivably also be refused because of a lack of fortuitousness of a loss event, although this would depend on the structure of the insurance contract.
- 4 Particularly in countries that have stringent liability laws under which the GMO farmer's liability is independent of proof of causality, coverage of cross-pollination losses has however met with widespread doubt in the insurance industry, particularly in the wake of the first large recall campaigns resulting from unwanted cross-pollination. As a consequence of this, the cross-pollination risk is in some countries – for instance in Germany – considered to be uninsurable in the present legal environment and GMO-related losses are usually excluded from coverage. The most important point of criticism of the insurance industry here is the uncertainty of whether GMO farmers are only liable in the event that the legal limit of 0.9 % is surpassed or also if the insured neighbouring traditional farmer has guaranteed his customers observance of lower threshold values by contract. This distinction is important, because, even if all conceivable safety standards are adhered to, it appears to be virtually impossible to avoid any trace of cross-pollination, at least in the case of commercial cultivation of GM crops. Another pre-condition for the insurability of the GMO farmer's liability would be the establishment of legal regulations for good professional practice (requiring the erection of barriers, separation of GM and traditional products in storage and transport, etc.).

2. Property insurances of traditional farmers

- 5 Even if the traditional farmer has agricultural insurance without any specific GMO exclusion, the loss of income due to unwanted cross-pollination will usually not be covered, since the coverage is limited to (named) natural hazards. Besides, at least as long as traditional farming is the rule and GMO farmers are the exception, it would also seem unfair to let the possible victim of unwanted cross-pollination pay for having the risk set by the GMO farmer covered by insurance.

3. Product liability and recall insurances of traditional farmers

- 6 If unwanted cross-pollination is not noticed before the traditional farmer has delivered his crops to customers, the product liability insurance of the traditional farmer could in principle be involved, if the farmer is liable for exposure due to cross-pollination under guarantees afforded to his customer. This of course presupposes that the insurance protection of the traditional farmer does include pure economic loss (if the national legal system considers the consequences of cross-pollination not as damage to property but as pure economic loss). With the product liability insurances, this will frequently not be the case, since these insurances usually only cover losses to property and personal injury.
- 7 However, all the differences in the national legal systems concerning the classification of cross-pollination do not really matter in the end since more recent product liability policies for farmers usually have an explicit GMO exclusion.

4. Product liability and recall insurances of GMO seed producers

- 8 Coverage of cross-pollination losses under the product liability or recall insurance of the GMO seed producers is not likely to play a significant role, since the producer will as a rule not be held liable since his products are not defective and a voluntary recall appears to be improbable. A link to liability that might be covered under product liability or recall insurance of the seed producer might therefore only materialise from some violation of the seed producer's obligation to caution the GMO farmer about the risks related to the cultivation of GMO seeds and inform him about safety precautions. This however presupposes that the seed producer has insufficiently cautioned the GMO farmer and that such an obligation to caution exists under the respective legal system.

III. Alternatives and supplements to the insurance of cross-pollination losses

1. Fund solutions

- 9 Regardless of how they are organised and financed, funds can bear the liability in cases of unwanted cross-pollination, provided that they compensate for all financial disadvantages of the traditional farmers. They thus make both special liability regulations governing the consequences of cross-pollination that go beyond general liability law and insurance protection for such financial losses redundant. There is however no evidence of such a comprehensive fund having been established anywhere in Europe. Instead the concept of GMO funds is rather limited to supplementing the traditional liability system, particularly in Denmark and the Netherlands: They ultimately more or less indemnify only those traditional farmers who sustain losses, although no GMO farmer has violated existing protective regulations or because the unwanted cross-pollination cannot be traced back to a specific GMO farmer. In contrast to this, if causality or even a wrongful act on the part of the GMO farmer can be proven, cross-pollination loss is still settled under liability law. This means that the options are the same for the commercial third-party liability insurer as in countries without funds.

2. The seed producer's purchase of products affected by cross-pollination

- 10 At least with certain plant types (e.g. maize), products which must be labelled as GM can be sold as cattle fodder without significant shortfalls in selling price. If, despite the adherence to established safety regulations, unwanted cross-pollination occurs, mass producers of GMO seeds therefore occasionally offer to buy the affected crop of the traditional farmer in the neighbourhood of the seed producer's customer for the price of non-GM crops (e.g. in Germany the Märka model of Monsanto). This concept is already being tested (in Germany since 2005), but has not yet progressed far beyond that stage (there are however plans to expand it in 2007).
- 11 Of course, such a solution is only viable for the seed producer if involuntary cross-pollination is rare, or, as in the case of maize, if there is only a small price discrepancy between GM and non-GM products.
- 12 Even under the most favourable legal and actual parameters, the buying up solution can therefore only help to solve the problems of indemnifying a small cross-section of traditional farmers for unwanted cross-pollination. Replacing liability law and liability insurance in this area on a large scale, however, does

not seem possible, even for cases where the GMO farmer has not committed any wrongful act. Much less is a contractual obligation of the seed producer to buy up the crop of the traditional farmer in the event of unwanted cross-pollination suited to replace liability if the cross-pollination is due to a violation of legal safety requirements by the GMO farmer.

IV. Options of the insurers in structuring the insurance of cross-pollination losses

- 13 In case insurers should decide to offer some form of insurance coverage for the consequences of unwanted cross-pollination, they have several options for structuring the offered protection: Apart from the possibility of agreeing upon certain maximum sums insured (event and annual aggregate limits, as well as deductibles), there is the question of which plant types and GMs are to be included. In the past, the discussion of these options has essentially focused on maize and maybe potatoes. At present however more than 40 additional plant varieties are already being tested or at least planned for GM plant cultivation. Since the probability of unwanted cross-pollination differs greatly with each of these varieties, and, in some cases, cross-pollination even appears to be almost inevitable (e.g. with oilseed rape), it does not seem likely that one comprehensive insurance solution can be found for GMO crop. Finding a uniform insurance solution for all plant types seems virtually impossible.
- 14 On the other hand, similar to seed producers and the purchase model, insurers will have to impose well-defined rules of good professional practice in cultivating GM plants as a prerequisite for covering cross-pollination losses, at least where adequate state regulations are missing. This could for instance include provisions for erecting barriers between traditional and GM crops, cleaning agricultural machines used on fields of both varieties, as well as criteria for separating both types of products in storage and transport.

