A Law & Economics approach to Trans-border Environmental Damages

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ABSTRACT

This paper proposes to analyze the actual situation of the legal treatment of the so called, environmental trans-border damages in the international (private and public), so the efficient and inefficient measures to this kind of accident can be quoted and if necessary, to appoint some considerations about the current system under the Law & Economics perspective.

Key words: trans-border environmental damages; law & economics; deterrence.

Introduction

The International scenario is a stage to many controversies since the borders between Countries are only political barriers and it is virtually unavoidable the intersection between the Legal and Natural persons to occur in those different National States.

This is the very situation is that justifies the efforts to regulate those relations through the International Law’s institutes such as soft law regulations and hard law statements that composes the International Law’s legal system.

The Environmental Law is a historically new Legal Institute that is has grown in importance in the last decades.

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It concerns mostly about damages that are being ages in making, trying to solve or at least reduce the impact of past issues and hopefully help to reduce new damages occurrences as well.

The Contamination in water flows and reserves, poor air quality, climate changes and other occurrences of Environmental damages could even threat human kind’s survival as a species.

Thus is imperative to study the solutions hypothesis to those important matters in our own generation to guarantee the others to survive and to live in a perfectly habitable world.

The Environment for its very trans-border nature is responsibility of all mankind; it cannot be contained in one National State, an Economic Trade Block, or Continent.

Therefore, the damages caused by one State can cause externalities to all the interconnected Environment, that does not chose between individuals, States or Organizations to affect, which makes those damages a Global interest.

Cançado Trindade wrote about that subject, and standing for the Environmental Law as a Human Right, which deserves the treatment of "jus cogens" (hard law). The Hard Law principles establish these rights with universal character to guarantee a minimum standard in quality of life to mankind despite the nature of a specific National State’s culture or will.

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2 Pfennigstorf says that: the progress itself brought several changes. First trough modern technologies and products that can cause damages on a scale never considered before, frequently irreversible and threaten not only the non-human environment, but the health and even the survival of mankind. The modern researches brought to light the complex effects that can bring nature out of balance. Thirdly, the science and technologies developments could offer ways to restore that balance and to prevent new damages. (Pfennigstorf, Wener, Environment, Damages and Compensation; Law & Social Inquiry, Volume 4 Issue 2, American Bar Foundation Pg. 347-448. Disponível em: http://www3.interscience.wiley.com/journal/119606542/abstract p 350).

3 On the same path, Pfennigstorf defends the environment as follows: what became clearly on average understanding is that environmental decisions couldn’t be left to individuals anymore. Where the welfare of whole nations or even mankind could be at stake, the decisions cannot be
Analogical to the Entrenchment Clauses system in a Country’s Constitution (regulations that cannot be changed by constitutional amendment). As such, it can be said that Human Rights are “Entrenchment Clauses” in a Global scale.⁴

Even though that there are those who defend that the Environmental Policies can be let up to the Market system, for example the Green Consumers theory⁵ which says that the consumers pressure would be enough to deter damages to the Environment; Wu and Wirkkala’s Environmental Over compliance’s studies can prof that those theories lack of empirical strength.⁶

Therefore, is crucial to have an institutional treatment to Environmental Law in every National State as in the International scenario. Especially in the trans-border damages subject, that can be defined as follows:

The average “damage” is defined as those caused to people, goods or environment, and the trans borderer damage those caused in one territory or in places under

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⁵ ... According to the green consumer theory, firms over-comply to appeal to environmentally conscious consumers, who are willing to pay more for green products or redirect their demand toward clean firms. (Wu, Junjie and Wirkkala, Teresa M. (2009) "Firms’ Motivations for Environmental Overcompliance," Review of Law & Economics: Vol. 5 : Iss. 1, Article 17. DOI:10.2202/1555-5879.1293 Disponível em: http://www.bepress.com/rle/vol5/iss1/art17 p 399-400).

⁶ Our empirical results provide some evidence that supports the strategic behavior theory of environmental overcompliance. Our measure of regulatory pressure indicates the “priority” that a facility puts on preempting or being better prepared for future environmental regulations, as well as meeting the current environmental regulations. The coefficient of regulatory pressure is positive in all specifications of the model that focuses on the overall level of compliance. It is also statistically significant in some of the specifications. These results provide limited evidence that firms are more likely to overcomply with an environmental standard if they behave strategically when making environmental management decisions. However, we found little evidence that supports the green consumer theory. (Wu, Junjie and Wirkkala, Teresa M. (2009) "Firms’ Motivations for Environmental Overcompliance," Review of Law & Economics: Vol. 5 : Iss. 1, Article 17. DOI:10.2202/1555-5879.1293 Disponível em: http://www.bepress.com/rle/vol5/iss1/art17 p 417)
jurisdiction of one State other than the State in who’s the damage’s cause was originated.\(^7\)

These kinds of damages, despite the fact that the cause was originated on a different country, makes effects outside its borders affecting other country or even other countries originating International Private Law’s disputes. In which one has to decide which Law is applicable to the concrete case, and other matters that will be discussed on this paper.

To understand better the issue to be discussed, we’ll bring a short background to this subject: the international liability from externalities by licit acts has emerged in 1975 in United Nation’s International Law’s Commission (ILC), which brought to discussion the trans-border damages matter. In 1993, this subject has return in the Civil Liability from Dangerous Activities for the Environment; In 2000, in the specialists reunion preparatory to the VI Inter-American Specialized Conference about International Private Law in Washington DC approved a work group about the trans boarder theme\(^8\), in addition the Federal University of Rio Grande do Sul (UFRGS) studies a new proposal of Inter American Convention (IAC) to discuss the matter.

The main problems to be discussed on that subject are:

- The National State liability (is the polluter the only one to blame or should the State be burden with the liability or should both be liable for the damage caused?)\(^9\).
- The damages compensation.
- The amount of the compensation/punitive damage
- Internal law harmonization/ whose is the best legal system to apply?
- Who should judge the Environmental International Dispute?.\(^{10}\)

\(^7\) *Ortiz Ahlf, Loretta;* Avances en materia de responsabilidad generada por daños transfronterizos, jurídica. Anuario del Departamento de Derecho de la Universidad Iberoamericana Número 31, 2001 pg 100

\(^8\) *Ibidem* pg 97 a 100

\(^9\) The omissive liability is defended by Cançado Trindade em: MEDEIROS, Antônio Paulo Cachapuz, Desafios do Direito Internacional Contemporâneo, p 211.

\(^{10}\) Op. Cit.
The polluter National State’s responsibility can be related to the “polluter’s must pay principle” (worldwide known since Rio Declaration at RIO 92 conference) and the industry development risk theory, since that the enterprise creates the pollution’s risk through its activity’s nature and the State creates the pollution’s risk by allowing this specific activity to this company without the necessary cares to avoid the damage (which is contemplated with wealth extracted from taxes and for the labor performed by the employees of this activity).

The State’s liability is necessary to fulfill the international juridical good recognized as the Environment? Should the State be responsible or the enterprise that created the pollution’s risk or should them both pay for the damages caused by this specific activity? These questions will be better analyzed further on this paper.

The reparatory damage’s quantum is another subject that must be at discussion, since, it’s hard to precise the reparability of each trans-border accident hypothesis. And still the compensation function of the damage must attend to a deterrence criteria (the goal of the damage is to de-incentive some activity by a response to a legal procedure as an economic incentive) based on the Environmental Law’s necessity to deter the pollution instead to compensate the accident due its own non-compensable nature.

This kind of lecture is shared by the Law & Economics institutes that will be brought to this work to give a pragmatic overview of the Environmental International Law’s disputes procedure problems.

The damage’s quantum is a delicate subject in the Environmental Law’s traditional doctrine, which can be helped by a carefully study of the Law & Economics tools based on an Economic Analysis of Civil Liability applied to the International field, as we’ll see during this article.

In addition, about the International Law’s harmonization issue, we’ll concern the difficulties brought by different juridical heritages in our juridical establishments and try to build a justify to the conciliation of different systems
through the dialogue between the Environmental Law and the Economic Science commonly treated as antagonists parts of a larger scenario.

And finally, about the jurisdiction matter, or who should judge the trans borderer damages, we’ll analyses the hypothesis presented by the International Private Law such as the German and Italian School’s solutions (nationality of the polluter in the origin and execution criteria) and International Public Law such as International Courts through the law harmonization perspective taking to balance the efficiency criteria as well.

Trying to solve, or at least to bring a new approach upon those issues this work will then utilize the Law and Economics tools to evaluate public and private international law criteria’s to get to an efficient solution to the trans borderer environmental damages.

It’s not the prior concern of this paper than to get a perfect solution, but to appoint an efficient solution to be take on account to further discussions about this subject and to make a stand to help the wealth maximization\textsuperscript{11} and the trans-border polluters deterrence effect.

1. Law and Economics and Game Theory applied to the Liability Systems Election.

To analyze the subjects: National State liability hypothesis (subsidiary, exclusive or non-liable), Compensatory Damages (should or should not the trans borderer damage be compensated), Damage’s Quantum (how much should be charged for the damage caused, and what criteria should be used to

\textsuperscript{11} Schäfer, Hans-Berns; Ott, Claus, \textit{Manual de Análisis Económico del Derecho Civil} Pg. 21
calculate such amount), we'll utilize the Law and Economics data based on Economic Analysis of Civil Liability early papers and the Game Theory instrumental applied to those themes.

In order to accomplish such analysis, we'll do it under the follow assumptions:

The agents are rational and self-interested\(^\text{12}\): in this particular context, that would mean that the States involved have a rational administration, are sovereign and tend to attend the best interests of their own people.

The incentives of each State involved then are respectively from the Polluter State to search for the non-liability for its actions and the left the costs burden to the affected State and in a second stance to the Industrial Activity responsible under your own territory in its totality or as a last resort to share the liability burden; as for the affected State to search for the full liability of the polluters, preferentially to the polluter State to cut transactional costs related on charging the damages, in a second resort to take the polluter company as a full responsible or in the last resort to take the both State and Industry as liable (which implies higher administration costs and a lower compensatory damages amount that would be enough to satisfies the affected State's compensation proposal).

\(^{12}\text{A popular discussion on Law and Economics studies concerns the rationality paradigm which implies that the wellbeing of the agent defines its actions and is one of the bases of the efficiency as a principle. This is often summoned as a Law and Economics studies goals. The efficiency predicts that at least one party must win something in a transaction situation which should overcome the other party losses bringing a global wealth to the society by the maximization of the bargain objects value. (As bigger the pie grows, the societies share will follow). Which in this particular case would be the same on cutting costs on liability through a regime that implies the prevention on environmental accidents., for more Law and Economics basic theories, please check: Ibidem, pg 61.}\)
We’ll make a scientific delimitation concerning only the unilateral damages cases\textsuperscript{13}. Which in the trans-border accidents, for this analysis purpose, are those that the affected State’s actions are irrelevant to avoid the damage at stake, due the difficulties existent to predict a damage outside its borders.

In addition, we’ll take on account the prevention costs\textsuperscript{14} as necessarily lower than the damage costs (damage itself, risk spread and administration costs sum): in environmental damages, the social costs involving the legal procedural (knowledge, judgment, execution, etc.), and the damage itself (restoration of the “status quo ante”, or even mitigate the damages) are mostly superior to the prevention costs, for the potential risks involved and the very nature of the damage (a chemical licking in a specific water flow can affect a entire hydrographical system). We’ll not consider in this work eventual hypothesis that preview cases that the prevention costs are larger than the damage costs (Hand’s negligence criteria\textsuperscript{15}).

\textsuperscript{13} Shavell, in his Foundations of Economic Analysis of Law book, in his Civil Liability essay, brigs two possibilities of accidents, the unilateral damages, where the victim actions does not interfere on the damage’s prevention and the bilateral damages, which are those accidents where the victim actions interferes on the damage’s occurrence. Shavell, Steven, Foundations of Economic Analysis of Law, pg. 180 a 184

\textsuperscript{14} Pioneer on the systematic compensations goals and the reasons to be careful on accidents situations, Guido Calabresi, in his work The Costs of Accidents (1972) argues that the Civil Liability has three main Social Costs associated with accidents. The primary, secondary and tertiary costs (…) The most relevant ones are the primary costs which are the total amount - in utility – of the damage suffered by the victim (…) The risk spread (secondary costs) can let the economic activity to develop (which in other circumstances would not occur). Even that the welfare state can be seen as a insurance system: government incentives such as income support, housing and benefits does not assure the individual on life, but does not allow new risks creations (…) The tertiary costs are those involved on the administration of the damage. (Schäffer Hans-Bernd and Ott, Claus, Economic Analysis of Law, pg. 113, 120 e 122)

\textsuperscript{15} According to the Hand's formula, one is considered liable when does not invest in the optimal prevent costs enough to avoid the damage considered to be inefficient. In [1], where pH represents a expected damage (when ph means the damage’s occurrences probability and H the damage itself) and L the precaution necessary to avoid it. The expected damage is inefficient when the monetary value expected to prevent it is smaller than the damages occurrence’s generated costs representation. [1]. And is considered to be efficient when the value generated by the event is smaller than the prevention costs involved. [2]. L<phH [1]
To illustrate the environmental accidents costs involved, we’ll utilize the Pfennigstorf follow diagram:

1. Acts or events damaging an individual’s health or property as part of the environment
2. Injury or damage to individual as consequence of environmental impairment

1. General expenses for environmental control (research, prevention, administration, enforcement)
2. Cleanup expenses for specific kinds of pollution (e.g., oil spills)
3. Damage to public property
4. Loss of tax revenue

1. a The Game Theory applied to the State Environmental Damages’ liability

To analyze the National State’s liability we’ll make use of the Game Theory instrumental, a recognized method in Law and Economics academy that intent
to predict actions made by rational actors based on each actor payoffs (the greatest wealth to acquire, or the lowest loss level expected taking on account the game’s rules); This theory is based on life itself as if it was a true game where the rules are based on economic incentives and the players search for a real goal such as economic wealth or reduction of economic losses, illustrated by their payoffs (mostly represented by numbers to help the analysis).

The first situation to be considered is the possibility that the Polluter State deserves not or cannot be considered liable, for the inefficiency of the solutions brought by the legal system or by inexistence of legal predictions on the matter.

To help on the game proposal that follows, let’s admit that the prevention costs are -50 taking on account that the prevention costs are lower than the costs generated by the damage, which will be represented by the value -100. The character P will represent the Polluter State and A the Affected State.

The tables of each game proposal will be observed to analyze the established payoffs, the Polluter State payoff that would be: to avoid liability (non-liability situation) letting the costs to be beared by the Affected State or for

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The second lies on the risk theory, since the activity considered legal on the territory is responsible by the pollution at stake. Considering the State liable by the licenses it gives to its Industry which produces Environmental Pollution’s risks. Which accords to the RIO declaration on its principle 16th’s polluters must pay rule that predicts: the authorities must make efforts to promote the internalization on environmental costs and use economic instruments minding that the international Market should not be affected by its mistakes.

Pfennigstor, adds: what’s necessary than is a re-thought on public policies and principal under the damages caused by pollution must be restored, minding the knowledge of nowadays and the effects caused by pollution to allocate the costs and expenses caused by pollution on the current risk spread administration policies. (Pfennigstorf, Wener, Environment, Damages and Compensation; Law & Social Inquiry, Volume 4 Issue 2, American Bar Foundation Pg. 347-448. Disponivel em: <http://www3.interscience.wiley.com/journal/119606542/abstract> p 354).

18 (The game theory) is the decision’s theory’s branch which studies the problems related to the strategic interactions between two individuals. It seeks to predict the rational actions to be taken by the actors following their payoffs. (BERNI, Dúlio de Ávila, Teoria dos jogos: jogos de estratégia, estratégia decisória, teoria da decisão; Rio de Janeiro: Reichmann & Afonso Ed. 2004, pg 05).
the immediate responsible by the fact in the form of the Polluter Industry located in its territory, or at least a mitigated liability; the affected State to search for a full polluter State’s liability, a Industry’s liability or a mitigated liability as a last resort.

For our study’s purpose the numbers involved we’ll be simplified and restricted between -0 a -150. The value 0, correspond to the non-liability situation without any prevention costs by any player, -50 to the situation that one tries to prevent the damage without the other game’s concern to prevent as well; -100 for the situation of caused damage without any liability and – 150 in the situation that the damage occurs with eventual prevention costs involved.

For this paper’s purposes, the incentives involved concerns only the actions under the National State’s government control, excluding the Act of God and force majeure concepts.

The last hypothesis will be excluded from our analysis, is the situation where the prevention costs cannot actually deter the damage, so the maximum payoff can be really limited to -100.
Polluter State’s no liability System.

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According to the table above, which represents the first game proposed, through the established payoffs, we can get to the follow dominant strategy: the affected State shall not prevent (the best payoff is 0) and the polluter State has no interest either to prevent (the best payoff is also 0).

Following that situation, without prevention costs on either side is unavoidable the occurrence of environmental damages (regarding that is barely impossible for the Affected State to has real conditions to prevent the damage outside its territory by the high transactional costs involved on that situation).

We can conclude then by this first table that the possible result in this hypothesis is the last line (0/-100) thus the no prevention costs by any part (in special concern the polluter State) the damage will prevail and thus the affected State will bear the burden of the damages costs (-100) which is the worst payoff expected on this game rules, making this system useless to our deterrence goal.

Discarding this first hypothesis, the follow ones will be considered, firstly the Polluter State’s liability in the Negligence System and then the Strict Liability system taking as the damage’s value the amount of -100.
Polluter State’s Liability in the Negligence System

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According to this table, we can foresee that the dominant strategy of the affected State still is not to prevent, since the situation described concerning the impossibility to prevent the risk by real transactional costs is still on table.

Nevertheless, the Polluter State’s strategy would be now to prevent, since the -50 payoff is now the best it can gets in this particular situation, than the society’s prevention costs would be now -50 and we’d have a deterrence effect fulfilled on this new proposal.

Even thought that this system seems to be a better solution, the negligence system, has it owns issues, due the difficulties brought by the burden of proof system that risks due the difficulties involved on proving on Environmental Damages scales, the efficacy of this liability system to ensure the Polluter States policies to bring any deterrence effect fulfilled on this new proposal.

19 Shavell e Polinsky says: There are several reasons why injurers sometimes escape liability for harms for which they should be liable under a liability rule. First, it may be difficult for the victim to determine that the harm was the result of some party’s act – as opposed to simply being the result of nature, of bad luck. This might be the case, for instance, if an individual develops a form of cancer that could have been caused by exposure to a naturally occurring carcinogen but which was in fact caused by exposure to a man-made carcinogen. Second, even if the victim knows that he was injured by a person’s conduct and not by nature, it might be difficult for him to prove who caused the harm. (Polinsky, A. Mitchell and Shavell, Steven Punitive Damages, Encyclopedia of Law and Economics, pg. 768 disponível em: <http://encyclo.findlaw.com/3700book.pdf >, Acesso em: 09 de maio de 2007.)
research both on the affected local, trekking the trail that would lead to the
origin and to make a clear relation established between the fact that caused the
damage to the local governments public policies that involves legislation experts
on this other country’s system).

One possible solution to this dilemma is the inversion of the burden of proof,
that would repast the proof’s costs to the Polluter State, but still would be high
costs to the society that could be avoided by the follow proposal to be analyzed.

Polluter State’s Strict Liability.

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This new system to be analyzed, predict the same payoffs, but the most
significant characteristic that defines this system as worth to consider is the
lack of the proof the negligence of the Polluter State’s necessity, which
diminishes the social costs at minimum to ensure the deterrence effect.

In conclusion, through the models studied so far than, the best system to
defend our deterrence goals that at the same time is the most efficient solution
which leads to the society’s benefits in the maximization of its own wealth, is the
Strict Liability system thus its potential to avoid unnecessary proof costs and
pollution’s damage-related costs.

Established than the liability system to be followed, we’ll analyze the
compensatory damage’s costs per se to suite our goals (to optimize the trans-
border environmental damages prevention costs and to deter eventual damages to occur).

1.a.1 Game theory applied to the Compensatory Damage amount’s election.

Through the Strict Liability model, we could reach our desirable deterrence effect goal, but therefore is still necessary to determine how much the proper damage’s amount necessary to achieve that goal is.

To achieve such analysis results we’ll take on account the administration social costs such as difficulties involved on measure the damage’s effects in cases of environmental damages.

Starting this study, we’ll analyze the damage amount followed by an intermediary proposal between the damage’s costs and the prevention costs and concluding, the prevention costs.

Damage’s full costs.

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As previously studied, the damage to be charged based on the very damage caused costs could be suitable to deter the Polluter State’s actions or lack of public politics suitable to avoid those kinds of damages.
Nevertheless, when it comes to the charge that amount, the follow practical issues come to life: the damage’s measure costs, which involves a technical team to determine the magnitude of the effects of this particular event, that could be doubled in case of discussions with a technical team hired by the other party involved on the juridical discussion and other marginal costs such as official translated documents, operational costs, etc.

These kinds of costs which make a large list to be listed can per se make the amount of the damage to seem an unsuitable solution in terms of social costs reduction\textsuperscript{20}. Which will lead us to the next proposal.

An intermediary proposal.

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The table above shows the hypothesis of an intermediary value between the prevention costs and the complete amount of the damage effects due the

\textsuperscript{20} Shavell e Polinsky, discusses the punitive damages application on cases of difficult to measure as follows: Even if injurers are always found liable when they are responsible for harm, if the magnitude of harm is underestimated, compensatory damages will be less than harm and deterrence will be inadequate. This possibility is realistic because hard-to-measure components of harm (such as no pecuniary losses) often are excluded from damages. Such missing components of harm are commonly mentioned as a reason to impose punitive damages. (...) there is a problem with employing punitive damages as a substitute for missing components of compensatory damages. Namely, a component of harm might be excluded from compensatory damages because of the difficulties and expense that would be encountered in its estimation. For example, were the pain and suffering experienced by the friends of a person who dies included in compensatory awards, the number of claimants in cases of wrongful death could become quite large, and the cost of litigation would also increase as parties contested the degree of their psychological losses. It may well be best, then, for the law to exclude from compensatory damages many such speculative, difficult-to-determine elements of harm, even though these elements are real and their omission does undesirably dilute deterrence. If a component of loss is excluded from compensatory damages for such reasons, arguably it should be excluded from punitive damages for the same reasons.\textsuperscript{21} (Polinsky, A. Mitchell and Shavell, Steven Punitive Damages, Encyclopedia of Law and Economics, pg. 769 disponível em: <http://encyclo.findlaw.com/3700book.pdf>, Acesso em: 09 de maio de 2007.).
difficulties to measure the damage and the inefficiency of the establishment of a damage amount below the prevention costs, since our preview conclusion that a damage amount above the prevention costs could make a deterrence effect on the polluter, since the payoff at stake would be -50.

In the application of this hypothesis it would be a real possibility the addition of undesirable prevention costs\(^{21}\). And yet, being an arbitrated value, it could bring elements to contribute to a distortion on the incentives and therefore breaking the balance between the players by the insecurity of the methods utilized, that would lead us to the final proposal of solution.

Prevention costs value.

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According to this model, the best payoff offered by the Polluter State is still the value -50. Therefore, the action of this player would be to prevent either if the polluter is considerable liable or not. But still, taking on account the administration costs related to a legal process, is desirable that the prevention

\(^{21}\) In places where this kind of measures are taken against real polluters, it seems to has only a few arguments to sustain it – it is a common quote on modern environmental policies that the polluter must pay and nobody has a license to pollute the environment, the prevention costs, to minimize the pollution and compensatory damages must be internalized and reflect on the products prices. If the mayor costs take polluters out of the market, considerable economic losses would emerge, not only for the industry, but for employees, network agents and other related business to the company. The third parties affected can represent an economic distortion which could lead to environmental agencies and legislation to reduce the anti-pollution policies or even to incentive the polluters; in other perspective, the side effects can be considered unavoidable and not taken in account letting these effects to insurances solutions. (Pfennigstorf, Wener, Environment, Damages and Compensation; Law & Social Inquiry, Volume 4 Issue 2, American Bar Foundation Pg. 347-448. Disponível em: http://www3.interscience.wiley.com/journal/119606542/abstract p 361)
measures were taken, making this model suitable to the deterrence effect and to the maximization of the social wealth thus it brings the lower social costs sum -50.

It also seems the more suitable method to calculate the damage, since the difficulties encountered to measure the exact damage value can still make a lower value than the necessary to prevent the damage and thus would not serve the deterrence proposal or even could be higher than the prevention's cost that would still not serve to our goal.

Established that the damage that suits better our goals is equal to the prevention costs, we should now establish which prevention costs are on discussion. Are those related to public measures to avoid environmental damages, the industry costs to avoid this kind of damages of both?

It is known by now that the better liability system to suit our goals is the one based on the Strict Liability theory, and that the value of the damage to be charged for the polluter's attitude or lack of attitude must be calculated under the prevention costs to attend our goals. But should the State, the Industry of both of them carry the burden of the damage to itself/themselves?

First of all, we should establish the payoffs between the State and the Industry. The State best payoff would be to pass through all the costs to the Industry without any liability, the second best would be to transfer the liability via return effect to the Industry, or at least to leave some costs to it sharing the liability, whereas the opposite is also the best payoffs to the Industry.

To simplify the analysis we'll utilize again the values 0 to -100 to represent the payoffs hypothesis presented.
State’s exclusive liability

<table>
<thead>
<tr>
<th>State / Industry</th>
<th>Maximum prevention</th>
<th>No prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum prevention</td>
<td>-50 / 0</td>
<td>-50 / 0</td>
</tr>
<tr>
<td>No prevention</td>
<td>-50 / 0</td>
<td>-50 / 0</td>
</tr>
</tbody>
</table>

In the State’s exclusive liability hypothesis, the State does not have the right to share the liability with the industry, therefore, the incentives to the State to take prevention measures through public policies are high, since that is not desirable to the State to cause an international incident with the affected State by not paying an eventual damage and it’s best payoff will be attended in this situation.

Nevertheless, the incentives regarding the industry to prevent the possible damages caused would be 0 and it would be still affected by the tax charge emerged by this particular system, which does not suit our goal thus every Industry, polluter or not would be affected by a tax policy, which would result to bad externalities on this country’s market.

The other effect to be considered for this system’s application would be the difficulty to the State prevents the damages on its own by the high costs involving to analyze the different possible situations on the several kinds of activities under its territory.
Mitigated liability

<table>
<thead>
<tr>
<th>Maximum prevention</th>
<th>Maximum prevention</th>
<th>No prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevenção máxima</td>
<td>-25 / -25</td>
<td>0 / -25</td>
</tr>
<tr>
<td>No prevention</td>
<td>-25 / 0</td>
<td>-25 / -25</td>
</tr>
</tbody>
</table>

In the mentioned hypothesis, limiting the liability sharing between the State and the Industry to create incentives for both parts, the State would have incentives to create public policies to avoid it’s share and the industry would do the same.

But one real possibility when both are possibly liable is to consider that if one take the prevention costs necessary to avoid the damages the other does not need necessarily take the measures to avoid it because it would be enough that one of them took the prevention costs to itself.

And even if the measures was taken, the incentives would lead to social costs of -25 for each part that would not be sufficient to avoid the damage, that would be the value -50 necessary to fulfill our prevention effects goal. In this case the society would bear the -50 sum of both prevention costs plus the damage costs as well.
In this last hypothesis the logical path would be to infer that the State would not have any incentive to promote public policies, but the Industry would bare all the damage costs to itself at the end.

That could most possibly provoke the Industry to take the measures sufficient to avoid the Damages risk. Therefore, considering the administration costs involving the legal dispute, trying to avoid the transfer of the liability burden to itself through prevention would be worth to be considered as a serious solution for the responsible Industry.

Concluding, on this hypothesis the State would not take public measures, which would avoid marginal costs affecting the society as a whole and let the externalities of the Industrial activity that caused the risk.

That solution would satisfies the maximization of social wealth through the reduction of the prevention costs turning up to be the most suitable hypothesis.
2. The Game theory applied to the Forum election.

Since we established the necessity to make the Polluter State and his polluter Industry liable, and the Strict Liability system as the more suitable to our goals and finally settle the liability distribution between the State and his Industry; is time now to make a stand over the Forum Election on trans-border environmental damages issue.

Who is the Judge that suits better the matter in discussion? Should the Affected State be the one to decide the lawsuit outcome or should be the Polluter State the one to receive the legal demand? Is it desirable to let an International Court to solve the demand?\(^\text{22}\)

\(^{22}\) The subject is also mentioned on Jedrzej’s work: This case concerned thousands of former Cape plc workers in South Africa who suffered from asbestos-related illnesses. Cape plc has had no presence in South Africa since 1989. A claim was brought to an English court by two former Cape plc workers and three residents living nearby exposed to asbestos, who were able to obtain legal aid in the UK. In 1999 further claims were issued by over 1,500 claimants; by the time the judgment was handed down from the House of Lords in July 2000, over 3,000 people were part of the suit and about 100 had already died. The House of Lords stated that the suit should be tried in England, as ‘the plaintiffs would have no means of obtaining the professional representation and the expert evidence’ in South Africa (website : House of Lords; Ward 2002). In December 2001, the claimants (over 7,500 people by now) agreed on a settlement whereby Cape plc was to pay £21 million into a trust fund, but the company failed to honour the settlement. Further litigation ensued and the South African mining company Gencor was added as a defendant alongside Cape (Gencor had acquired assets that were previously owned by Cape). In a new settlement in March 2003, Cape and Gencor agreed to pay a total of £7.5 million and £3.21 million respectively in compensation to the 7,500 registered claimants.

... Beyond allowing some types of cases to be brought to English courts, the litigation has challenged the received wisdom on how firms may escape transnational litigation. The legal structure of companies tends to protect parent companies from claims brought against affiliates, since separate companies are regarded as being separate legal entities and their financial liability is limited up to the amount of the parent company's investment in the affiliate's shares (cf. Magaisa 2001). But the English courts have now and again worked around this old doctrine, which has enormous implications. Nor can firms necessarily protect themselves against lawsuits by going out of business or limiting the parent–subsidiary links. By the time the third court case against Thor Chemicals had been filed, the Thor Group had conducted a de-merger and all except three affiliates had been transferred to a new parent company. Thor Chemicals Holdings was left with three companies and only Thor South Africa – now renamed Guernica SA – was...
To make a statement about that particular subject, we are taking on account the follow hypothesis: a) a harmonized legal system between the involved countries. b) a non-harmonized legal system between the involved countries.

a) Harmonized legal system between the countries involved.

In this particular hypothesis, the social cost concerning the administration social costs connected to the knowledge of other legal systems loses its importance, since the legal systems involved are the same, or at least equivalent, making the effort involved on judging the matter lighter. Thus, the origin of the Judge would be equally irrelevant.

Moreover, looking from another perspective, through the issue of the access to justice by the victims, the high costs to demand in another country would difficult the probability of the Polluter Country and therefore the Polluter Industry to has incentives to deter the polluter activity.

In addition, the costs involved on the defense of the polluter would be equally hard if the affected country's forum were to be elected.

Considering this data alone for this analysis, we could stand for the affected State's courts election, but then we should consider two other hypothesis:

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still trading several years later. Yet, the Court of Appeal ruled in September 2000 that the 1997 demerger may have been initiated to put the group’s assets beyond the reach of claimants; subsequently, Thor Chemicals Holdings was forced to disclose documents on its de-merger and to pay £400,000 into court if it wanted to continue being part of the action (Ward 2002). Certain previous business strategies, which relied on complex organisational structures to escape legal liability for damage, may thus no longer be as effective as they used to be. (Jedrzej George Frynas (2004). Social and environmental litigation against transnational firms in Africa. The Journal of Modern African Studies, 42, pp 363-388 Disponivel em: http://journals.cambridge.org/action/displayAbstract;jsessionid=C27174C10A255862511CFE3667806EFETomcat1?fromPage=online&aid=240003 p 367 e 368)
equally developed countries involved on the dispute and economically despair countries litigating.

At the first assumption, there would be none problems to enforce the decision on any forum, since both States could take measures to ensure the enforcement of the legal outcome by political strength of even making economic blocks and trade strategies.

But in the second hypothesis, there would be a problem on the enforcement issue, since if the Affected State is less developed than the Polluter State; the lack of coercion power of the first could put at stake the enforcement of the legal decision of its own forum. 

Through these assumptions, it seems more adequate the possibility of an International Court to take care of the legal dispute and therefore, to bring balance between the parts and ensure the complement of the decision taken by its own coercive power, as for example the World Trade Organization (WTO) economic policies that enforce the efficacy of its own decisions.

23 Litigation against corporations in the United States has grown quickly since 1996, owing largely to the successful application of an ancient legal statute called the Alien Tort Claims Act (ATCA), which was originally passed as part of the 1789 Judiciary Act to allow victims of offshore piracy to sue onshore. Whilst previously ATCA had been used to sue individuals in US courts with regard to human rights abuses, the case of Doe v. Unocal pioneered the use of the statute to sue corporations for social and environmental damage committed outside the United States. In that case, a US court ruled in 1996 that the US firm Unocal could be sued in US courts for complicity in human rights abuses committed by Burmese authorities. In both the Wiwa v. Royal Dutch/Shell and the Bowoto v. Chevron cases, the courts have already affirmed that ATCA applies and that both companies can be sued over their complicity in human rights abuses in Nigeria (both cases are still pending). (Jedrzej George Frynas. Social and environmental litigation against transnational firms in Africa. The Journal of Modern African Studies, 42, pp 363-388 Disponivel em: http://journals.cambridge.org/action/displayAbstract?jid=MODAN&volumeID=10&issueID=3&articleID=24003 p 370).
To utilize an international forum on these matters off course we must consider some criteria’s to ensure our goals to be fulfilled.

The forum must have a regional character to reduce the transactional costs involved on wide international organizations as for example translations, issues involved on multi-languages disputes, etc.

In addition, if the forum is regional it has a better chance for the parts to have ensured their right to access justice as well.

On this matter, we consider the best option nowadays the International Courts connected to the Economic blocks like Mercosul, European Union, NAFTA, etc. considering the high costs to implement new courts for those matters and the facilitated path to ensure the harmonization on the legal systems on the States involved.

b) Non-harmonic legislation between the involved States.

The lack of harmonized legal systems would lead to several administration costs, such as the election of the legal system to be utilized, how does the legal system elected will affect the ensure of the environment’s defense and which legal system suits better the concrete situation.

Considering the applicable legal system, we could analyze the follow criteria: the legal system that benefits the affected State, which would lead to a balance estate when the States are economically or politically unbalanced. Another solution would be to choose a legal system that benefits the Polluter State, to avoid overcompliance effects. As for the last hypothesis the arbitration method could be another way to be considered.
In the first hypothesis the legal system that benefits the affected State could bring issues related to the overcompliance behavior, which is to take more measures to prevent than necessary to avoid the damage. That Situation could bring more social costs, and therefore inefficiency to the solution at stake.

In addition, the application of the chosen law costs involved, since the Judges in the territory would have capacitation costs higher than expected to deal with their own legal system; which is the same to imply that it would double the State’s costs with Judges capacitation.

In the international court hypothesis it would be not necessary to create any costs, since the very nature of this kind of court depend on their judges knowledge of both systems. And even to solve the problem with the economic lack of balance between the States involved.

In this second hypothesis, the under compliance behavior is also a problem to be considered\(^2\), since the Polluter State’s and his Industry, would have their best payoff to not prevent. Than the forum election would be irrelevant to the deterrence effect expected.

\(^2\) As Dicken (1998: 271) observed, one of the most striking developments in international business in the last few decades has been an intensification in competitive bidding between states (or between communities within states) for internationally mobile investment. TNCs can exploit regulatory differences between states by re-locating some of their manufacturing plants from one country to another, or by shifting the sourcing of their supplies to a different country with a more advantageous regulatory regime; this is termed ‘regulatory arbitrage’ (Leyshon 1992). TNCs may be able to play off one government against another, as states compete against each other to attract foreign investment by offering the best incentive packages. In addition to providing financial aid or favourable taxation rates for foreign investors, national governments may also be reluctant to impose environmental and social regulations on firms. (Jedrzej George Frynas (2004). Social and environmental litigation against transnational firms in Africa. The Journal of Modern African Studies, 42 , pp 363-388 Disponivel em: http://journals.cambridge.org/action/displayAbstract;jsessionid=C27174C10A255862511CFE3667806EFE.tomcat1?fromPage=online&aid=240003 p 365)
In conclusion, the applicable law elected under an arbitrary method would bring elevated transactional costs by the insecurity brought by a high number of possible decisions from the court.

Therefore, to attend our goals, it would be necessary to guarantee that objective criteria’s should be considered on this decision. For example “the damage should be the value of the best payoff expected by the polluter” criteria to establish the damage’s amount.

Concluding, the harmonic legal system should attend the same criteria to bring a uniform efficient legislation or should be up to the judge to have a limited action on the criteria to determinate the damages to be opposed upon the polluter to guarantee an efficient legal outcome from the dispute.

Conclusion.

Through our studies, we could infer the follow conclusions: the goals that suits better the environment defense in the trans-border damages situations are the ones that concern a preventive criterion; since the externalities brought by those kinds of damages are necessarily higher than the prevention measures necessary to avoid the damage’s costs.

A complementary goal to be considered as well is the social welfare maximization, since the society must not bear a burden bigger than necessary to avoid the environmental damages and ensure the economic growth as a good side effect of the environment protection in an efficient way.

Therefore, the rule to be applied in these cases must take on account the optimization of the damage to be enforced which is an intermediary value
between those that do not attend the deterrence effect and the ones that make measures higher than the necessary to avoid the damage.

The solutions that suits the best those criteria’s are the strict liability of the Polluter State which could bring the incentives to be created prevention measures to avoid the damage; the shared liability between the State and the Industry to avoid a perverse effect that would bring the Industry to close their doors and at the same time create the incentives necessary to the industrial activity take care of their externalities to now affect the environment and to avoid that the State take an overcompliance public politic that affects the society as a whole making unnecessary high social costs.

The forum election must attend the goals established and therefore must take on account the costs involving the know-how of the Judgment of International disputes, which would lead us to an International Court as a best solution to this issue.

Finally, harmonized rules concerning the trans-border environmental damages should bring an efficient effect on the treatment of those issues and should make easier to bring a fair Judgment on eventual disputes, maintaining the rule of law as an important matter to be considered as well.
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