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The role of science in environmental adjudication

Questionnaire

Introduction

Science and technology enter environmental adjudication in various forms ranging from competing science-based arguments to scientific evidence. These invite highly technical assessment from adjudicators and fundamentally impact the dynamic of the judicial process. Different national jurisdictions adopt divergent approaches to interpret such scientific input and employ different methods for *inter alia* scientific fact-finding, standards of review, as well as the standard and burden of proof.

This questionnaire seeks to map and better understand the various judicial tools with which different jurisdictions handle and engage with the techno-scientific aspects of environmental disputes. Our aim is two-fold: to appraise the differences and similarities in the judicial engagement with science of different national jurisdictions, and to evaluate whether such divergences in the treatment of science allow for preserving adequate judicial control over the resolution of scientific disputes on the one hand, and ensure uniform application of EU environmental law on the other hand.

Please answer the following questions by briefly illustrating them with specific examples from your practice where you deem appropriate.

Questions

1) **Mandate of the court to review techno-scientific matters**
   a) In what forms do judges gather scientific advice (e.g. party-appointed experts, court-appointed experts, in-house experts, expert judges (legal adjudicators having a formal training in a certain scientific field), and/or expert assessors (scientific experts sitting with judges during the deliberation without the right to vote)? What is the task of these actors?

After a crime is committed the police can choose an expert- in order to obtain technical information when the case requires specialist knowledge.

The Public prosecutor, during the preliminary investigation, can also nominate an expert for the same reasons. In this case, the technical check can be repeatable or non-repeatable. In the first case its results can be used by the judge.

The judge himself can also use appointed experts.

The parties can also nominate their experts

In his sentence the judge is not required to consider their reports because for the law he is "peritus peritorum" but he has to explain why.

The role of these experts is to suggest the correct application of the science for the case.

In civil law we have a similar system, but the judgment, normally, is started by private parties

b) What forms of scientific references are acceptable as bases for making persuasive scientific findings (E.g. expert evidence, standards issued by competent international or national organizations, regulatory trends of other states, etc.)?

Normally there are no specific limits.

c) Can a higher court (e.g. appeal court, supreme court) in your jurisdiction investigate scientific questions, and/or review the scientific findings of lower courts? If so, to what extent?

The Supreme Court cannot. The Supreme Court deliberates on law not on fact.

Appeal Courts can review the scientific findings of lower courts only if it is necessary

d) How would you handle evidence derived from geospatial (GIS) technologies (such as satellite images, aerial photography, drones, etc.) (see for instance the use of geospatial intelligence in the Bialowieza case, C-441/17 R)? In what

e) type of cases and in what ways do you utilize them? How can they promote compliance monitoring and a more effective enforcement?

Evidence derived from geospatial technologies is normally admitted as documents "where facts, people and things are reproduced" according to art. 234 and 189 criminal procedure code (Supreme Court, n. 48178/2017, regarding to illegal building, whose conformation in a certain date was verified by photos from "Google Earth").

Illegal building are also detected by aerial photography.

Using this evidence it is possible to know not only a building conformation at a certain date but also verify every change over time.

As public prosecutor I developed, some years ago, a Satellite control of the territory using satellite images and **GRASS (Geographic Resources Analysis Support System)** a free Geographic Information System (GIS) software used for geospatial data management and analysis, image processing, graphics/maps production, spatial modelling, and visualization.

This system permits a "change detection", automatically comparing images where the same area is shown at two different times. It can be used against illegal buildings, for morphological ground analysis, excavations, dumps etc.).

It was presented at some conferences but never used in the field because the Public prosecutor office doesn't have an individual budget for this specific issue and there was not a real interest in effective and total control of the territory form the public administrations that could have supported the project.

2) **When do you gather expert advice?**

Normally, as wrote above, during preliminary investigations and, after, during the trial.

a) How do you distinguish between technical/scientific questions and legal questions in fact-intensive disputes, where science and law are closely interlinked in the underlying legal rules and concepts?

The judge is absolutely free to evaluate evidence. He only has to justify his findings.

b) Are there any types of cases and/or questions where gathering scientific evidence is mandatory under domestic law?

No, there are not, but in some cases the judge needs technical data, for example, when the case involves water pollution and it is necessary to know the level of some substances, chemical and physical parameters etc. or, in the case of waste, when analysis permits to classify it

c) To what extent are judges allowed to investigate the scientific dimensions of cases *ex officio*?

Whenever they need

3) **Rules of expert appointment**

a) What are the selection criteria of experts in your jurisdiction (e.g. having requisite training, being impartial, independent from the party, being enrolled on government-issued lists, etc.)?

Being impartial is, evidently, a primary criteria. Every Court has a list of experts but a judge (and the public prosecutor) can choose any expert he considers adequate for the specific case.

However, it is customary between judges (and public prosecutors) to ask each other for information about experts and their specific skills in order to select one who has already shown an adequate knowledge on a specific matter.

This especially occurs when the scientific question concerns the environment. There are not many experts in this field and the economic and politic interests that revolve around the environment require particular care in choosing an expert who is really independent.

b) Whether and on what basis can a party challenge the appointment of a party-appointed/court-appointed/in-house expert?

In some cases the criminal procedure code sets out some incapacity cases (nonage, mental disease, legal incapacity, incapacity on testify etc.), cases of abstention or recusal (if the expert has some interest in the procedure, a parental relationship with the parties, if he showed his opinion outside the trial etc.)

In this cases, the parties can report the issue to the judge.

Moreover, the parties can nominate their own experts, who can get involved in the scientific evaluation and express their opinion to the judge.

c) To what extent and in what ways do judges in your jurisdiction exercise control over the scientific fact-finding process (e.g. by defining precisely the scope of factual controversy needed to be addressed by experts)?

The Judge defines the scientific question to the experts with specific requests.

4) Evidentiary issues: standard and burden of proof

a) What is the applicable standard of proof for environmental cases in administrative, civil and criminal law (e.g. preponderance of the evidence, beyond reasonable doubt, etc.)? Is it set in domestic law, or are judges free to adjust the standard as they deem fit?

It is not an easy question to answer, because there are a lot of different rules...
In administrative, civil and criminal law standard of proof is set depending on specific procedural rules.
Normally, is also used a "free evaluation" principle (in civil and criminal cases): the judge is free to evaluate evidence but he has to motivate his decision.
The principle of "beyond reasonable doubt" must be applied in criminal cases.

b) What are the rules of allocating the burden of proof in science-intensive cases (maybe give one or two examples to indicate what is meant by science-intensive cases)?

In civil cases the burden of proof is allocated to the parties, in criminal cases to the public prosecutor. These rules do not change in science-intensive cases, however the evaluation by the experts has its own relevance.
For example, in cases of water pollution sampling analysis methods are relevant.
In cases of noise and electromagnetic pollution it could be relevant to verify EMF and noise intensity if there are multiple sources.
In waste pollution cases identification by chemical analysis is relevant, and only an expert can explain to the judge how the integrated geophysical methods for buried waste detection were used.

5) Rules of evaluating expert evidence: standard (intensity) of review

a) How do you choose between two competing or conflicting pieces of expert evidence?

As written above, the judge is free to choose between pieces of expert evidence, providing that he justifies his decision.

b) Could you review the scientific assessments and justifications made by a competent domestic authority (by conducting a *de novo* review of the evidence)? Or is your judicial review deferential towards the scientific claims of domestic authorities?

The judge can review the scientific assessments and justifications made by a competent domestic authority because his evaluation is free but obviously it has to be based on objective motivations

c) What is the applicable standard of review to scrutinize the scientific assessments of domestic authorities (e.g. scrutinizing 'manifest errors', or the reasonableness/consistency/coherence of their scientific conclusions, or interrogating the scientific validity and factual correctness of the evidence, or reviewing the procedural aspects of science-based decision-making process at hand)?

Every solution listed above is permitted providing that it is justified

6) The role of science and technology in the courtroom – an overall assessment

a) To what extent do you consider the difficulties of scientific fact-finding to be a defining challenge in environmental adjudication compared to other difficulties?

In environmental cases scientific evaluation is relevant. It is crucial, in my opinion, for the judge to avoid being influenced in his decision by the expert, to whom the decision should not be delegated

b) Do you consider the domestic rules of expert involvement to be appropriate to secure judicial control/monopoly over deciding environmental disputes? Or do you think judges should exercise greater control over the scientific fact-finding process?

I think the domestic rules are appropriate

c) Do you consider the limits of curial supervision of fact-intensive cases are appropriate for providing effective judicial protection and promoting uniform application of EU law?

Yes, I consider them appropriate

d) Do you think it is necessary and if so, in what ways, to improve the scientific engagement of judges (E.g. would you improve the procedural rules of scientific fact-finding, enhance the scientific competence of the judges through training and capacity building, or develop new legal tests to review contradicting scientific evidence, etc.)?

I think training judges is crucial, especially for environmental cases, that typically involve a strong connection between legal and scientific rules. They need a particular specialism and, last but not least, an awareness of issues with environmental cases which is not always present

7) Case study

How would you delineate applicable questions of law and science in the following cases, what types of expert evidence would be gathered, and how would they be evaluated?

Choose one of the following cases, according to your field of expertise:

a) The case brought before you is about a proposed artificial groundwater production plant that might impact a nearby Natura 2000 -site, whose conservation values are contingent on groundwater levels, thus being of concern when authorizing artificial groundwater undertaking outside the protected area. The Natura 2000 site has e.g. the region's largest sinkhole that has wetland at the bottom of it, and is thus connected with the groundwater formations. It also has coniferous forests on glaciofluvial eskers, and the site is generally described as having calcareous fens and springfens (all listed as Natura 2000 habitats). Up until now the plant has gained the required approvals. The groundwater model used in the proposed undertaking's plans modeled the water currents in the ground. As typical of such models, it was more uncertain in the rims of the area than in its centre. Coincidentally, these rims of the area also included especially sensitive and small wetland formation. The administrative authority, in its statement of reasons, discussed the role of the precautionary principle and scientific uncertainty, noting that neither formed as such a reason to not allow the venture. They only obliged the administration to establish such permit conditions that they adequately

curbed the harmful impact. However, an environmental NGO brings a claim against the permit arguing that the permit should not have been granted at all. They claim that since the scientific assessments presented before the administrative authority did not remove all justified scientific uncertainty on the undertaking's consequences, and since there are thus relevant risk of detrimental impact to the Natura 2000 –site, the plan should not be allowed to proceed.

b) The case brought before you is a case of illegal trade in birds protected under the EU CITES regulation Annex A (e.g. Red kite, Egyptian Vulture). Trade activities with respect to these birds are prohibited. There is an exception when one can prove that a specimen has been bred and born in captivity. These birds can obtain a CITES-passport, which makes them marketable. Through forgery of rings and breeder's declarations, the defendants obtained CITES-certificates for "captive-born and bred species", which allowed them to commercialise the birds in spite of the general prohibition to trade EU CITES Regulation Annex A species. A bird protection NGO becomes a party to the criminal proceedings and claims moral damages because of the loss of the birds. Would this be evaluated by an expert? If not, how would the court estimate the amount of the compensation?

Case b)

In Italy this matter is regulated by law n. 150\1992 that subjects to sanctions the possession of animals protected under the EU CITES regulation even if they are born in captivity (limited to the first generation).

In case of trade activities of these species the first issue is to verify if this trade is permitted by the authority and what documents the trader can provide.

Regarding scientific proof, a veterinary could first examine the remaining birds in order to verify if they are born in captivity. For example, in some cases, it could be possible to find some signs suggesting life in a narrow spaces, such as cages, e.g. wing underdevelopment or similar diseases or a reduced flying ability.

In order to estimate the amount of compensation an expert could specify to the judge the approximate worth of a single bird but the judge could estimate the final amount on an equitable basis.