International conference

"Contaminations, the environment, health and society: From risk assessment to public action"

Toulouse (France), 4-6 July 2018

Organised by : CERTOP (UMR5044 CNRS) et GET (UMR5563 CNRS)

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Web Site: https://cess.sciencesconf.org/

Call for papers

The quality of the environment is currently acknowledged as being a determining factor not only on health but also the social welfare of populations. Attention is regularly drawn to the harmful effects of environmental contamination on health and sustainable development at all levels, from local up to global. Environmental contaminants are usually classified according to their known impact on health and the potential health risks that they may cause:

- Carcinogenic, mutagenic or reprotoxic (CMR) substances such as bisphenol A;

- Some radioactive emissions are extremely carcinogenic and mutagenic;

- Persistent organic pollutants (such as polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), dioxins and pesticides) can affect reproduction, immune and hormone systems and may also be related to neurobehavioural disorders and cancer;

- Volatile organic compounds (degreasing agents, refined hydrocarbons, solvents, etc.);

- Emerging pollutants (pharmaceutical products, nanomaterials, plastics, etc.);

- Infectious agents (bacteria, parasites or viruses) behind microbiological hazards, which may originate in, be mediated through, or simply be integrated into the environment.

All the parts of the biosphere (atmosphere, hydrosphere and lithosphere) are concerned by contamination, bringing with it health hazards (contamination of the food chain up to humans). Environmental health risks, considered up to the end of the 19th century as limitations on the expansion of humankind, due to nature itself, are currently mainly attributed to human activities, consumption and development. These health risks are different (and multiple) depending on exposure pathways (ingestion, inhalation, skin contact), the toxicity of chemicals, the type of pollutants (metallic or organic: hydrocarbons, pesticides, etc.), the length and frequency of exposure, and exposure scenarios and social response to contaminants (standards, control systems, social practices, etc.). The uncertain consequences of their accumulation (cocktail effect) during unwanted exposure are potentially conflicting and damaging to health, thus making them a subject of concern.

This widely-used approach to health hazards nonetheless tends to hide the other social, political or economic risks that build up around environmental contamination. Yet issues such as human rights and development are closely linked to environmental dynamics. Vulnerability, environmental inequalities and society's response to environmental contamination result from the concurrence of physical conditions (exposure, geochemical properties of the environment, etc.) and socio-economic conditions (socio-professional category, representations of the environment, regulatory measures to control polluting practices, etc.) and specific policies. Studying environmental risks therefore requires an interdisciplinary approach, bringing into question scientific assessment methods and knowledge transfer to facilitate operations.

For all these reasons, in different parts of the world, local populations or public authorities do not always consider health a central issue (and may even sometimes neglect it); the issues surrounding environmental contamination may be diverse (type of pressure, exposure, consequences, legal framework, regulatory systems, the demands of civil society, health systems, media attention, etc.), and the responses to associated risks, radically different.

How do science and decision-makers come together to develop joint methodologies and reference frameworks for assessing and reducing risks associated with environmental contamination? For example, while the first steps towards convergence are demonstrated by the setting up of the Global Harmonized System (GHS) on labelling and the classification of chemicals, or by Europe's REACh regulation, major socio-technical efforts remain to be made.

The complexity of scientific assessment of risks associated with environmental contamination

The complexity of the scientific assessment of risks associated with environmental contamination is due to a series of constraints.

The issue of risk assessment (and management) concerning environmental contamination requires the joint collaboration of several complementary disciplinary skills. The first constraint is thus linked to the fact that this assessment, like any approach combining biophysical, societal and medical factors, requires a judicious mixture of different disciplines. Very quickly, issues arise about concepts, approaches and thus methodologies, lack of knowledge and major uncertainties. It is not easy for people in one discipline to communicate with those in another in order to set up an interdisciplinary risk assessment methodology. The challenge lies more exactly in defining how and on what criteria a scientific approach to assessment is built up or at least clarified. How can each discipline's knowledge be integrated without simplifying results? These questions have no easy answer, and work on the interfaces is often hindered because it involves shifting academic boundaries (particularly in terms of recognition of careers or scientific publications) or boundaries between scientific and operational worlds, with their different stakes and time scales.

The second constraint concerns the difficulties inherent to environmental assessments (choice of survey site, quantity and type of sample, seasonal influences, sampling frequency, accessibility, etc.), insufficient knowledge about contaminant transfer mechanisms between air, water, soil, flora and

fauna, accumulation phenomena in the food chain (bio-magnification), regular low-dose exposure (chronic exposure) or the effect of contaminant cocktails (poorly or rarely assessed), hybridisation of contaminants with natural hazards (such as the transportation of certain contaminants during flooding) and their possible transformation, not easily predictable. Then there is the added complexity of what scales of time and place should be considered (Boudia, Henry, 2015).

The third constraint concerns the difficulties in measuring the impact of contaminants on human health (existence and quality of epidemiological data; subjectivity of patients' observations; evaluation of the exposure; fate of the toxic substance in the organism, etc.). The effect on health of environmental contaminants, whether reversible or not, immediate or deferred, varies not only according to the intensity, pathway (ingestion, skin contact, inhalation, etc.), frequency and length of exposure but also according to the sex, age and health status of the exposed populations (Bonvallot and Dor, n.d.). Furthermore, the "signature" of environmental diseases is sometimes unclear and carers may find it difficult to recognise them, which is obviously less than optimal for prevention (Chevalier et al. 2003; Le Tyrant 2013).

The fourth constraint refers to the complexity of the scientific assessment of risks with respect to integration of the societal variable: often, "society" is only considered in terms of quantifiable variables. Yet various parameters of a more qualitative nature transform environmental contamination into health, social or economic risks, to name but a few. Some to be considered, for example, could be human vulnerability to contamination (social category, absence of standards and/or control, existence of other higher-priority stakes, economic dependency, etc.), the relationship to risk of individuals and communities (common knowledge; how contaminants are represented; protection strategies; usage and environmental issues, etc.) or again the social capacity to respond (available resources, organisation, regulatory modes, capacity for collective action, political attention, etc.).

Finally, scientific uncertainties permeate these different categories of complexity at all levels (original parameters, means of observing and tracking contaminants—especially volatile ones—the relevance of chosen contamination markers, a single indicator or different indicators depending on the climatic area under study, representativeness of a survey result, field constraints, sample size, scale effects, choice of the target population, etc.), uncertainties that it is not yet possible to assess or even communicate outside the scientific arena.

The relationship between science and decision-making

The relationship between knowledge (whether scientific or common knowledge), decision-making and standards (whether health and/or environment-related) remains neglected among scientific studies. The difficulties outlined lead to various operational issues, especially in terms of diagnosing contamination (i.e. monitoring), choosing risk assessment protocols, in terms of information (raising awareness, naming risks), prevention (being vigilant, raising the alarm) and protection of populations (securing or reducing the potential impact by reducing exposure and/or vulnerability). Questions such as, "How can we protect ourselves?" and "...protect ourselves from what?" thus balloon out of all proportion. They relate to political decisions and social issues. Beyond that, they raise the issue of environmental justice when deciding who to protect, i.e. identifying, informing and making the most vulnerable populations safe, this population tending to shift with the contaminant in question.

Communicating risks: a double-edged sword

One of the issues central to risk assessment is communicating these risks to the people potentially exposed.

One broadly accepted assumption is that an informed population is a better protected population because it follows "good practices". Thus, ignorance is often considered an aggravating factor: exposed

populations do not have the “right” knowledge or use the most suitable protection strategies in their daily life. However, the way in which risks are evoked greatly influences social representations and behaviour (Durand and Richard-Ferroudji 2016). Denial may actually be a deliberate stance (Becerra 2016 a): either it is knowingly maintained so as to pursue high-risk activities (irresponsible industrial practices, for example), or it is the reflection of a “captive” conscience, the exposed populations being aware of the risk but not protecting themselves either by prioritising the risks involved (needing to continue a risky practice so as to meet immediate needs), by cultural conviction, lack of means, to assert their rights, etc. Being aware of environmental health risks is therefore not always accompanied by self-protective behaviour, because there are stakes other than health that influence social experience of environmental contamination and related risks. What is worse, this awareness sometimes leads to the manipulation of contamination, reflecting an emergency culture for vulnerable populations (Becerra et al. 2016 b) which gives short-term economic issues priority over health issues.

Scientists too have accepted trade-offs in the light of economic and political realities by participating in the development of current standards (such as the acceptable daily intake (Jas 2015) or boundary values for occupational exposure (Henry 2015), whose pertinence is sometimes questionable in terms of current knowledge (low doses; cocktail effects; no threshold effects, etc.) but also, beyond health and economic issues (defence of human rights, development). These threshold values are often determined on the basis of a handful of available studies and averaging out the risk, too often neglecting variability in sensitivities/vulnerabilities to pollutants.

Conference objectives

The conference’s main goal is to bring together the scientific community working on environmental contamination and associated risks (sociology, anthropology, geography, economics, environmental chemistry, (eco)toxicology, medicine, etc.) and to review practices at disciplinary interfaces.

Another objective is to share and discuss the knowledge and practices of researchers, decision-makers and managers as to this issue of environmental contamination and resulting risks. The conference aims to act as a forum for comparing viewpoints, discussing the risks involved in environmental contamination and proposing recommendations and practices to implement or methodologies to share and/or communicate to better manage or reduce these risks.

The ultimate objective is to put into perspective, for both developed and developing nations, the characteristics, methodologies, constraints and challenges of assessing risks related to environmental contamination.

The proposed conference aims to answer the question of “What scientific progress has been made in the realm of toxicology linked to chronic exposure at low doses or contaminant cocktails?”; “…in the assessment of exposure of populations, particularly with regard to their vulnerability?”; “…in the measurement of the social and health impacts of environmental contamination?”; “…in the integration of disciplinary data?”

How do scientists and decision-makers converge to draw up shared reference frameworks and methodologies to assess and reduce risks stemming from environmental contamination? What stance can science take in the debate on communication about risks in view of current challenges (ecological transition) and future issues (long-term effects of contamination)?

How can we talk about and reduce environmental health risks without worsening social risks (conflict; social labelling, etc.) or economic risks (drop in value of farm products, for example)? What kind of uncertainty level should be communicated?

While some social science research has made progress in these areas (M. Callon, B. Latour, N. Jas, M. Lalanne, E. Remy, etc.), to set up effective risk-reducing interdisciplinary scientific activities and operational actions, such knowledge has to be shared and transferred.

Provisional programme

Three sessions are planned:

Session 1 (plenary introduction session) – Research experiments at the interfaces: interdisciplinary methodologies and tools to assess risks linked to environmental contamination.

This session will focus on feedback from interdisciplinary projects involving the pooling of knowledge from human and social sciences with knowledge from environmental and medical sciences.

Specifically interdisciplinary issues may be investigated: the construction of a collective scientific question; the question of analysis scales, methodologies for articulating physical and societal dimensions, integrated modelling practices (humanities and social sciences/natural and life sciences), etc. What institutional factors limit these approaches (recognised publication areas, science policy, researcher assessments) and what are current expectations/responses? Finally, what could have been improved? What lessons can we learn?

Session 2 – From hazard to risk: the contribution of different disciplines to an understanding and integrated assessment of risk

To understand the risks linked to environmental contaminations, a definition must integrate both environmental and societal vulnerability (social, economic, national, etc.): while it is necessary to study the mechanisms of contamination (understood by a "hazard") and their spatial effect, we also need to go further, towards a broader concept of vulnerability, then towards the implementation of protocols integrating environmental and social data.

The subjects could revolve around the following points:

1. Ways of assessing emissions, deposits and transfer of contaminants (metal, organic contaminants or emerging pollutants): air-soil-water-food; quantification of sources; bio-accessibility/bio-availability;
2. From spatialisation of hazards to that of risks;
3. Population exposure factors (geographical, climatic factors or social practices, etc.): what methodologies should be used? What are the difficulties in making assessments? What issues are [potentially] coupled? What are the uncertainties? Environmental exposure and societal vulnerability: what is their relationship? (exposed because vulnerable? vulnerable because exposed?);
4. From quantification of environmental exposure to the quantification of environmental health risks: coupling of contamination and vulnerability measurements; interdisciplinary assessment of health risks; assessment of chronic exposure with low intakes; assessment of the toxicity of contaminant cocktail effects; the place and propagation of uncertainties; etc.;
5. Social experience of contamination: the viewpoint of populations as to risks; local regulatory practices;
6. Indicators of societal vulnerability to environmental contaminants;
7. Assessing the long-term economic and social costs of environmental contamination: what approaches may be used? How can these costs be internalised based on risk assessment?

Session 3 – Sciences, decisions and action: from assessing to preventing and managing risks

How can scientific contributions be used on the one hand to draw up and disseminate widespread recommendations, and on the other, to make decisions by developing or reviewing public policies?

Should risks be managed or mitigated? How can new knowledge make it harder for public authorities to make decisions and take action?

1. Prevention: consideration at the same time of health, social and economic risks; information on prevention (place, practices and difficulties);
2. Health and environmental standards: from expected effects to the opposite effects of boundary values; regulation limits; drafting and implementing standards, etc.;
3. From fundamental research to the operational arena: knowledge transfer practices; position and role of NGOs; science/management cooperation difficulties; limiting institutional factors (recognised publication areas, science policy, researcher assessments); instruments to reduce the risk of contamination;
4. Risk indicators: how can scientific knowledge be made operational?
5. Feedback on different ways that risks may be expressed: protocols, challenges, constraints, reception by those being addressed; consequences.

Closing session: synopsis of discussions.

Expected audience

-Scientists
-Managers of contaminated sites
-Stakeholders in public health and environmental quality monitoring

Before the conference

Deadline for submissions of abstracts (no more than 500 words, times, 12pt): November 20, 2017
Response date to proposals: Tuesday, January 15, 2017
Deadlines for submission of a first written version of the communication (no more than 5000 words, times, 12pt, double-spaced text): Friday, May 4, 2018

To submit your abstract: Contributions can be made in either English or French, double-spaced, in 12 point Times New Roman font, justified margins, and could not exceed 2050 characters (approximately 250 to 300 words)

Email: cess@sciencesconf.org

After the conference

Publication of the best papers in special issues of scientific journals and/or a collective publication is subject to the submission of a written version of the communication before the conference and the scientific validation after the conference.

French is the only official language of the international conference

Simultaneous translation from English to French and from French to English will be provided.