



Survey on Public Perceptions of Environmental Risks

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EXECUTIVE SUMMARY

Project aim and objectives

Collingwood Environmental Planning (CEP) Ltd (UK) was commissioned, in partnership with the University of A Coruña (Spain), University of Latvia (Latvia), Oikos (Slovenia), Sapienza University of Rome (Italy) and West University of Timisoara (Romania), by the European Commission's DG Environment to undertake a research project on the public perception of environmental risks in Europe.

The overarching aim of the project was to understand the differences between public perception and scientific assessment of environmental risks and the main factors influencing the evolution of public perspectives in Europe. The specific objectives of the project were:

- A comparison of the public perception of environmental risks with the scientific assessment of environmental risks.
- A qualitative assessment of the public perception of environmental risks.
- An overview of the main factors influencing the perception of environmental risks.

Research approach and methodology

The project used a mixed methodology research approach that combined a quantitative scientific assessment with a qualitative exploration with members of the public of the main factors influencing public perceptions of environmental risks. The lay assessment of environmental risks also drew on the results of the Eurobarometer survey of public attitudes towards the environment (European Union, 2014). The list of 14 environmental risk categories used in the Eurobarometer survey were used in this study.

The research comprised the following elements:

- An online survey of European experts to provide a scientific classification of a list of the 14 environmental risks included in the Eurobarometer survey.
- Focus groups with members of the public to investigate why the public perception of environmental risks differs from the scientific assessment of the same risks, explore the ways in which people think about and assess environmental risks and understand what influences their thinking.

The analysis of the results compared the assessment of environmental risks made by experts (through the survey) and by members of the public (in the focus groups and Eurobarometer) to identify the factors contributing to the assessment of environmental risks by each of these groups and any differences within groups.

The results were considered in relation to the different contexts in which they were obtained, to explore the transferability of the findings and their value in explaining behaviours in similar geographic, socio-economic and cultural contexts.

Expert survey

The expert survey was employed to provide a scientific classification of the environmental risks included in the Eurobarometer, based on probability and significance of negative impacts on the environment (including biodiversity and ecosystem services, water, air, noise, land use, soil) and human health.

A total of 415 scientific experts across European Union Member States were invited to participate via email. The survey achieved a response rate of 56% and a total of 104 valid responses (with a target of 100 responses), satisfying a pre-agreed set of respondent criteria.

Focus groups

The focus groups allowed the research team to delve into questions of how members of the public develop understandings of environmental risks, how they prioritise these risks, which factors influence this prioritisation and why.

Two focus groups were held in each of the six partner countries. A single recruitment questionnaire was used by all partner countries to ensure the participants' profile was the same in terms of the following criteria: gender, age, nationality and residence, employment and educational qualifications. The profile of the participants in the two focus groups in each country was the same, with the exception of the educational qualifications variable, to allow for comparison between the two groups.

In total, 108 people attended the 12 focus groups, generally eight to twelve at each focus group. The composition of the groups complied with the criteria that were established; almost all participants were EU nationals and residents of the project partner country with a good balance of gender, age and employment status.

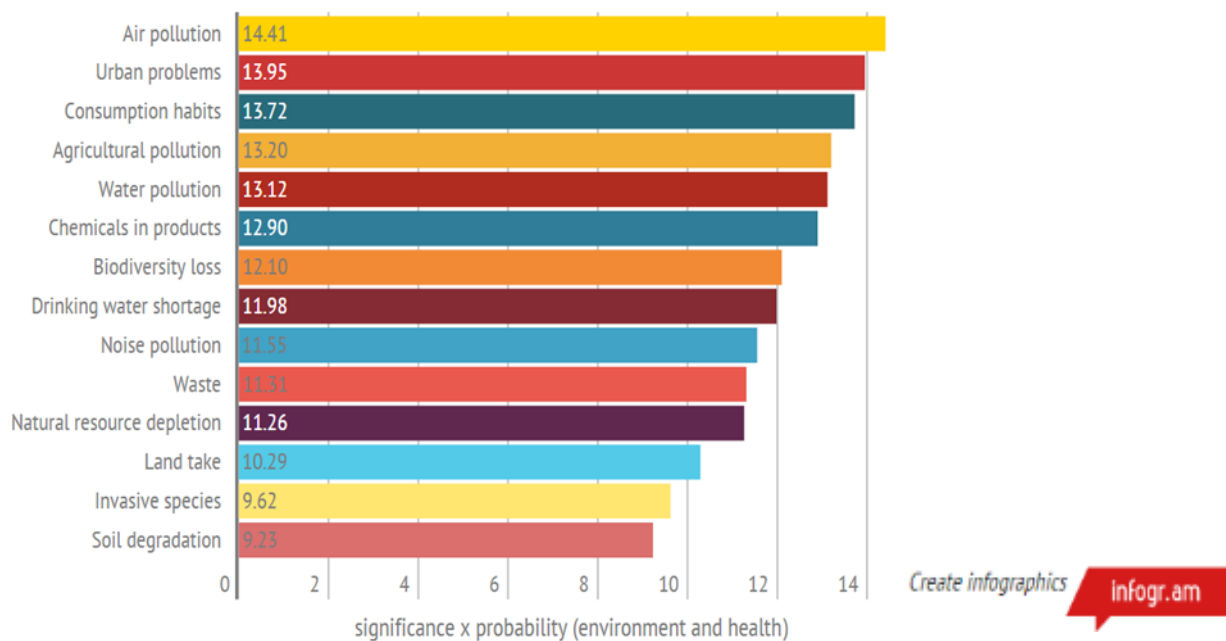
The analysis of the themes emerging from the focus groups drew on insights from an extensive academic literature on risk perception.

Quantitative results

Expert assessment of environmental risks

Based on the definition of risk assessment, a risk level can be generated by the equation: **Risk = Significance x Probability**. Using this equation for the 14 environmental risks, the mean values assigned by respondents for the significance (or severity) of the impact were multiplied by the mean values assigned by respondents for the probability that each of these impacts will occur. This calculation was undertaken twice for each risk to obtain an assessment of both their environmental and human health impacts. The results of the scientific assessment were used to create a ranking of the risks.

Figure A: Expert assessment of environmental risks overall



Variance (in standard deviation and average score) was established to estimate the level of consensus among the experts on assigning values for risk impacts. Analysis of those results revealed:

- There was greater consensus among experts on impacts on the environment compared to impacts on health of the risks.
- The area of participants' expertise did not have a great impact on the assessment of impacts on the environment and impacts on human health.

- The biogeographical region¹ where the experts were working appeared to have some influence on their assessment of some of the environmental issues.

Public assessment of environmental risks

The focus group participants were asked to pick the five main environmental issues (out of the 14 included in the Eurobarometer survey) that they were most worried about (following the wording used in the survey). The total number of responses across levels of education was aggregated and subsequently converted to an overall ranking and public assessment of risks.

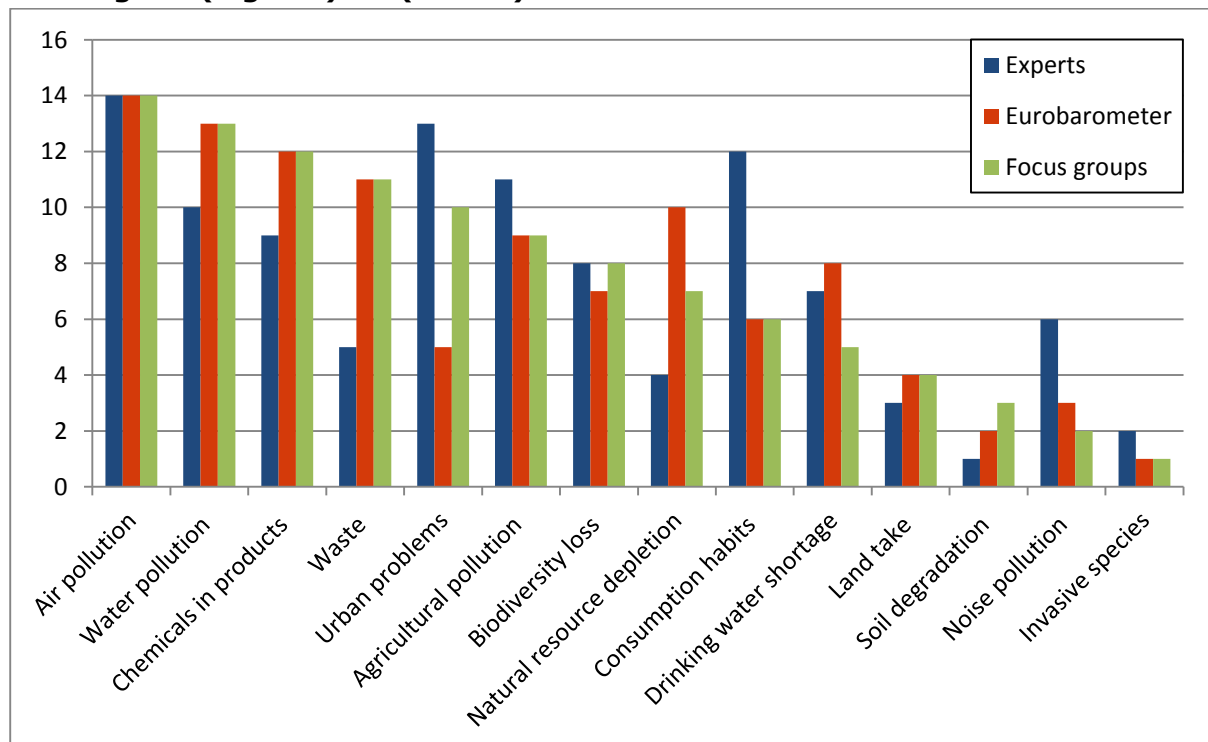
Results looking across participant characteristics showed:

- The impact of the educational level of participants on their assessments of environmental risks appeared to be small.
- Looking at the aggregated results across countries, participants from different countries agreed in their assessments of Air pollution, Water pollution and Chemicals in products as High to Medium priority risks, and Noise pollution and Invasive species as Low priority risks. There was greater variation in the assessments of the remaining risks.

Comparison of ranking of environmental risks by type of respondent

The rankings of environmental risks (14 highest - 1 lowest) by the three types of respondent - Experts, Eurobarometer and Focus group respondents - are presented in Figure B, as they emerged from the experts’ survey, the Eurobarometer survey and the focus group discussion respectively.

**Figure B: Comparison of ranking of environmental risks by experts and members of the public (both Eurobarometer and the project focus groups)
Ranking: 14 (highest) - 1 (lowest)**



Some key observations from this comparison are:

¹ The analysis used the four predominant biogeographical regions in the European Union: Northern Europe, North-West Europe, Central and Eastern Europe, and Mediterranean Europe (EEA, 2012:27)

- Air pollution was ranked as the highest risk across all three types of respondent.
- There were considerable differences in the assessment of Urban problems, which was ranked high for experts and focus groups but was only mentioned as a principal concern by 23 per cent of Eurobarometer survey respondents.
- Consumption habits ranked third most important in the experts' ranking but the issue was of medium importance for both types of public respondents.
- Both Eurobarometer and focus group participants were concerned about the growing amount of Waste and the Depletion of natural resources, which ranked lower with experts.
- Invasive species, Soil degradation and Land take ranked low with all types of respondents.

Differences between expert and public assessments of environmental risks

Expert or technical assessments of environmental risks take account of a range of possible impacts of an environmental phenomenon and the different ways these may be felt by different receptors (e.g. humans, animals, water bodies, etc.). The survey showed that the assessment was also affected by the perspective adopted, for example whether the focus is on impacts on human health or on the environment. Members of the public also took account of these factors in their assessment, along with other factors which were identified during the focus groups.

Overall, the environmental risks seen as being of highest concern across the focus groups were similar to the top risks identified by experts: Air pollution was ranked highest, with both experts and focus group participants also including Urban problems and Water pollution in their top five issues. Chemicals in products was one of the top five issues for the focus groups and ranked sixth by experts. Agricultural pollution was in the top five risks for experts and was ranked sixth by focus group participants.

The one issue that appeared high in the list of concerns for experts but that was generally ranked much lower across the focus groups was Consumption habits: only the UK focus group participants included it in the top five risks. For some participants Consumption habits was closely related to other issues such as Chemicals in products or Waste. However, whereas in other instances a connection between issues was seen as a cause for heightened concern, this was not the case for Consumption habits.

The main issue of concern to public participants that was not ranked highly by experts was Waste. Focus group respondents in Italy, Latvia, Slovenia and the UK ranked Waste in their top five environmental issues.

Local conditions and issues seem to have had an influence on focus group participants' perception of environmental risks. This included references to the presence of specific national natural resources, local industries and livelihoods, issues that received publicity on the local/national news etc. The influence of location-specific factors on the assessment of risk was also observed in the case of experts.

Qualitative analysis and discussion

Many years of academic research on risk perception have identified a number of factors that appear to influence public perceptions of risk. More recently, efforts have been made to develop an integrative model of risk assessment (Breakwell, 1994; Renn and Rohrman, 2000:221; Renn, 2008) which shows the interrelationship between a number of levels of understanding and response to environmental risks, within a framework of cultural values and norms and a structure of socio-political and economic systems and processes. Insights from these approaches inform the qualitative analysis.

Framing of the Eurobarometer issues

The way that environmental issues are described in the Eurobarometer survey is not easy to understand with the result that the issues can be interpreted to mean different things. The Eurobarometer survey has been developed to provide a snapshot of environmental attitudes and its methodology and questions have been shaped with this

in mind. However, this could be a limitation for future development of similar research on public perceptions.

Key findings regarding the influences on understandings of environmental risk

The focus group discussions allowed participants to explore their perceptions of environmental risks from a range of perspectives, with an emphasis on understanding differences between their assessments and those made by experts. Comparing the risk factors identified in academic literature with the evidence obtained from the 12 focus groups, some key findings emerge:

- Scale and severity: the likelihood that a risk will affect a wide area or a large number of people, or that its impacts will be serious, was taken into account both in technical risk assessments and by focus group participants. For the focus groups, this increased the sense of risk, for example, in relation to Air and Water pollution, Chemicals in products and in some countries, the Depletion of natural resources.
- Proximity of environmental risks contributed to making these appear to focus group participants as a more immediate and pressing concern. This seemed to influence the prioritisation of Urban problems and Waste as well as being mentioned in relation to risks like Air pollution. However, it was also noted that people become accustomed to living with some kinds of risks and cease to be so aware of them.
- A sense of personal control and efficacy can reduce concerns about environmental risks, for example where consumer choices allow people to avoid Chemicals in products or noisy places that could damage their health. In contrast, the idea that people are exposed to risks over which they have no control tends to exacerbate concerns.
- Social values can have a strong influence either to reinforce or attenuate the sense of risk. Social values related to taking care of one's own living space appear to have been an important factor in heightening concern about Waste; this is not considered a high risk from the point of view of a technical or scientific assessment.
- An important factor that differentiates lay and technical (expert) risk assessment is the tendency of lay people to look for an institution or individual responsible for the issue and its management. The loss of trust in authorities is associated with increased concern about those risks for which they are seen as responsible, for example Air and Water pollution.

Comparison between countries

Given the importance of contextual factors – both the geography, physical features and climate of the place one lives as well as its socio-economic, political and cultural systems – in shaping risk perceptions, focus groups in the six project countries would be expected to have different views of some or all of the environmental risks discussed. While responses to many risks were similar, the influence of geographic, cultural and socio-political context was apparent in relation to others.

Comparison between groups with different educational qualifications

Comparison between the focus groups in terms of educational qualifications suggests that there were some differences both in the focus of discussion and in the results of the ranking. In some countries, such as Latvia, the groups with higher educational qualifications appeared to be better informed, while in others the lower educational groups appeared to be less interested in global influences. However, there was no clear pattern in the way that risks were ranked and no general conclusions can be drawn about differences in the level of concern about risks of people with different levels of educational qualifications.

One of the main areas of difference between participants with different educational qualifications was in their sources of information and the way in which they obtain information about environmental issues.

Learning about and developing understandings of environmental risks

The ways in which members of the public find out about and develop their understanding of environmental risks was explored in different ways during the focus groups.

Members of the public varied considerably in their views about how well-informed they were on environmental issues. The UK participants were most confident that they were well-informed, with the majority of participants in both focus groups saying they were either fairly or very well-informed, whereas there was a greater range of views within the Italian and Spanish focus groups. People's perceptions are likely to be influenced by both external factors like the amount of information on environmental issues that is available to them and its accessibility, as well as their own attitudes about what kind of information they should have.

In all countries participants reported using a range of different sources to get information about environmental risks. The main sources were:

- Internet: in every country, half or more of the focus group participants used the Internet as a source of information on environmental issues.
- TV news as well as programmes and documentaries on TV continue to be an important source of information on environmental issues and were ranked the most important source by participants in Romania, Slovenia and the UK.
- There were considerable differences between countries in terms of the importance attributed to conversations with relatives, family, friends, neighbours and colleagues as a source of information on environmental issues. While this was reported to be a fairly important source of information in Italy, Latvia, Romania and Spain, it was mentioned by only a very small number of participants in both Slovenia and the UK.

The proliferation of information through the internet, social media and multiple TV channels tended to create confusion. In some cases, respondents claimed to consciously avoid information.

However, discussions in the focus groups showed that many people were using multiple sources of information to develop their understanding of what are often complex environmental issues. Most people check information about new and unfamiliar subjects: several participants said that it is important to confirm information they come across or look for opposing arguments.

Conclusions

Factors that influence lay and expert perceptions of risk

- Both expert and lay risk assessments reflected the context of the risk and the focus of the person making the assessment. While the detailed analysis of the expert assessment of the set of environmental risks did not find evidence of bias in favour of the experts' own areas of expertise, regional differences were found between expert assessments. Similarly, evidence from the focus group assessments indicated that lay people are influenced by their individual identity and background and by the collective cultural, institutional and socio-political systems and values within which their lives and activities develop.
- Location-specific factors reflected in the focus group discussions included environmental and climatic characteristics, history, geography, politics and economic development.
- A number of qualitative characteristics of environmental risks were found to influence many aspects of lay assessments of environmental risks. These included factors such as scale and severity, proximity and personal control.

- Cultural factors, attitudes and behaviours may differ between geographic regions, countries, administrative districts and even local areas.
- Social values can have a strong influence either to reinforce or attenuate the sense of risk.
- A loss of trust in authorities seen as responsible for managing risks was associated with increased concern about those risks.
- The focus group discussions provided evidence of the influence of cultural factors, social values and lack of trust in authorities on lay perceptions of risk. The evidence available on expert prioritisation of environmental risks did not address the possible influence of these factors.

Transferability of the findings of the research

Transferability is concerned with the extent to which the findings of one study can be applied to other situations, in this case, the possibility of generalising from the findings of the expert survey and lay focus groups to other parts of the European Union or to Member States.

Given the small number of participants in the research (104 experts and 108 lay people) and the limited geographical coverage of the focus groups (six countries), the findings cannot be generalised in a simplistic way to the entire European context. However, if certain contextual elements are taken into account, some of the results could be used to suggest likely responses to environmental risks in some specific contexts. The main contextual elements considered to be of relevance are:

- Urban density: risks associated with urban living (e.g. Urban problems, Air pollution, Waste) are more relevant and immediate for urban dwellers and appear to be heightened in more densely populated urban locations (e.g. London, Rome, Riga);
- Geographical and climatic factors: concern about pressures on natural resources including water are likely to be heightened in locations where people have direct experience of the relevance of these to society and the economy (e.g. Romania, Slovenia and A Coruna in Spain);
- Political economy: people in countries that have experienced recent major political and economic change may feel greater uncertainty about the future along with lower levels of confidence in institutions and their ability to manage environmental risks.

In relation to the issue of trust in institutions, it is important to note the low level of trust in both public and private institutions that was expressed across all the focus group locations.

Pathways to understanding environmental risks

The main conclusions regarding the ways in which participants receive information and develop their understanding of environmental risks are:

- A small proportion of lay people spontaneously search for information on environmental issues.
- The majority of people sometimes search for information on environmental issues if these are made relevant to their own interests.
- Information on action and response is of particular relevance and interest.
- Once members of the public become interested in or engage with a particular environmental risk, they tend to look for multiple sources of information and employ search strategies to check information.
- There is a widespread lack of trust in many sources of information, including scientists who are often seen as tied to the interests of those that fund them. Institutions like the European Commission are considered as potential sources of more impartial information but currently not relevant to the information needs of ordinary people.

- The prevalence of the Internet as a source of information is reinforcing the 'information overload' where lay people's information strategies become as much concerned with filtering out information that does not support their own world view or priorities, as they are about accessing a wide number of information sources.
- It is important to present information in a way that is engaging and easy to comprehend in order to capture people's interest.

Methodologies for researching lay assessments of environmental risks

The use of a mixed methods approach to the research made it possible to obtain quantitative and qualitative data, which enriched the analysis and conclusions of the study. The expert survey was easy and quick for participants to complete, and a healthy response rate was achieved. No qualitative information was collected and this is an aspect that might be reconsidered if the survey is to be conducted again in the future.

The use of focus groups in different Member States with participants from two different levels of education made it possible to collect data which was then analysed to explore a number of different aspects:

- Expert versus lay perception and assessment of environmental risks.
- Responses of participants with higher versus lower educational levels; and between each of these levels and the expert assessment.
- Participant responses across six Member State countries.
- The main factors influencing the evolution of public perspectives in Europe.
- A qualitative assessment of the public perception of environmental risks.

This method could be applied in future research or for monitoring public perception of environmental risk to inform future policy-making.

1 INTRODUCTION

Collingwood Environmental Planning (CEP) Ltd was commissioned, in partnership with the University of A Coruña, University of Latvia, Oikos, Sapienza University of Rome and West University of Timisoara, by the European Commission's DG Environment to undertake a research project on the public perception of environmental risks in Europe.

1.1 Project aim and objectives

The overarching aim of the project was to understand the differences between public perception and scientific assessment of environmental risks and the main factors influencing the evolution of public perspectives in Europe. The outcomes of the project will also contribute towards developing a methodology and tools for monitoring public perception of environmental risk to inform future policy-making.

The specific objectives of the project were:

- A comparison of the public perception of environmental risks with the scientific assessment of environmental risks.
- A qualitative assessment of the public perception of environmental risks.
- An overview of the main socio-cultural (including behavioural) factors influencing the perception of environmental risks.

1.2 Research methodology

To meet these objectives, the research employed a mixed methods approach, utilising the qualitative and quantitative social research techniques of:

- An online survey of European scientific experts: to provide a scientific classification of a list of the environmental risks included in the Eurobarometer survey of public perceptions (2014), based on probability and significance of environmental and health impacts.
- Focus groups with members of the public: to investigate why the public perception of environmental risks differs from the scientific assessment of the same risks.
- Analysis of the results: to compare the assessment of environmental risks made by experts (through the survey) and by members of the public (in the focus groups and Eurobarometer survey), to analyse the factors contributing to the assessment of environmental risks by each of these groups and any differences within groups and to identify and analyse any environmental risks that emerged during the research.

1.3 Report outline

This report is structured in the following sections:

- Section 2: Project approach and methodologies
This section briefly describes the approach and methodologies used in the design of the two main research methods (the expert survey and the focus groups) and for the analysis. It also includes a short explanation of the approach to the transferability of results.
- Section 3: Expert and public prioritisation of environmental risks
This section presents an expert ranking (based on the expert survey) and a public ranking (based on the Eurobarometer and focus groups) of the 14 Eurobarometer environmental risks along with a comparison between the expert and public classifications.
- Section 4: Analysis and discussion
This section analyses the factors contributing to the assessment of environmental risks by focus group participants and explores differences between the assessments made by focus group participants and experts, between countries and between educational levels.

- Section 5: Conclusions
This section identifies key topics and findings deriving from the research, discusses implications for the communication of environmental risks and comments on the transferability of the findings.

2 PROJECT APPROACH AND METHODOLOGIES

The project used a mixed methodology research approach that combined a quantitative assessment with a qualitative exploration of the main factors influencing public perceptions of environmental risks.

This methodology allowed comparisons to be drawn between three sources of information (a Eurobarometer survey, a survey of experts’ prioritisation of environmental risks and focus groups held with members of the public in six European Union Member States), while it also gave the research team the flexibility to delve into questions of ‘how’ members of the public develop understandings of environmental risks, ‘which’ factors lead them to classify them as such and ‘why’.

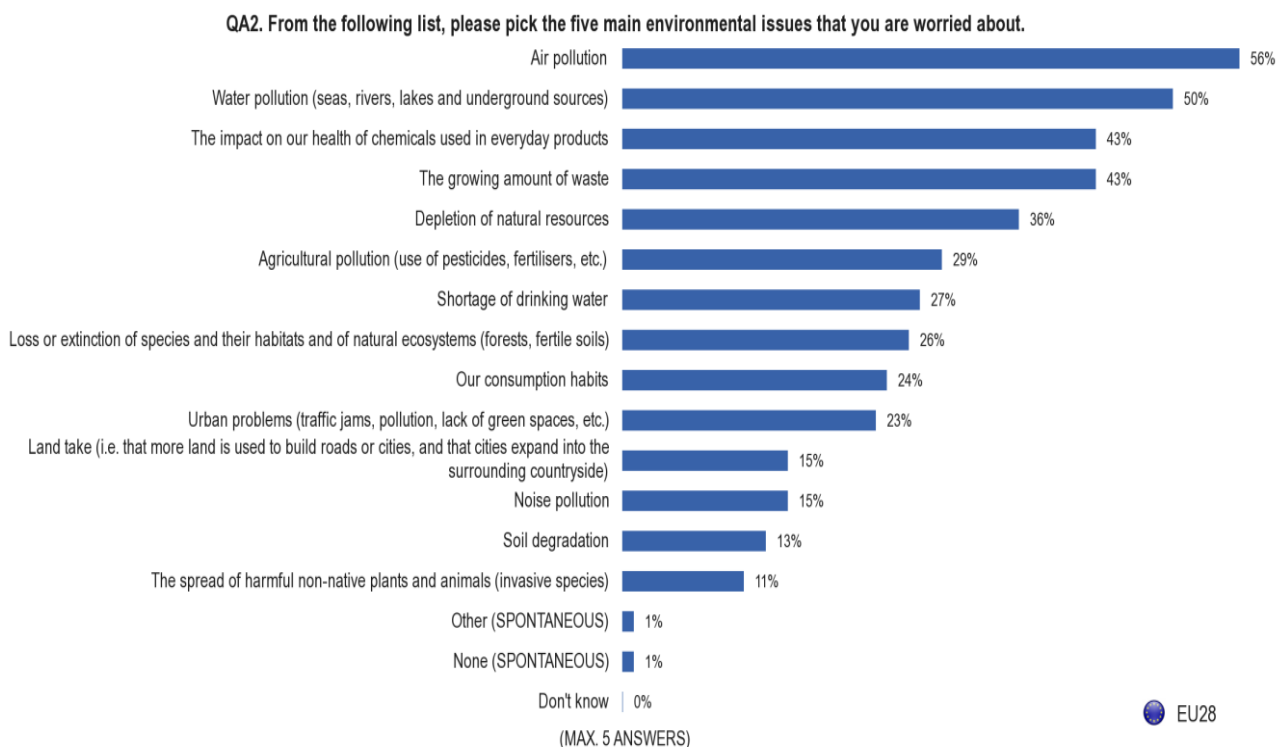
The elements of this approach and the methods used are summarised in Table 1.

Table 1: Project approach

	Scientific assessment	Lay assessment	
Method	Expert survey	Focus Groups	Eurobarometer survey
Approach	Quantitative	Qualitative	Quantitative

The lay assessment of environmental risks drew on the results of the *Special Eurobarometer 416: Attitudes of European citizens towards the environment*² (European Union, 2014). Specifically, a list of 14 environmental issues identified in the Eurobarometer survey were used in this study. Figure 1 presents the results of the prioritisation of these issues.

Figure 1: Responses to Special Eurobarometer survey (2014) (QA2)



² Unless otherwise specified, references to the Eurobarometer survey results and respondents refer to EU-wide results collected from respondents across countries.

2.1 Expert survey

An online survey with scientific experts was employed to provide a scientific classification of the environmental risks included in the Eurobarometer survey, based on probability and significance of negative impacts on the environment (including biodiversity and ecosystem services, water, air, noise, land use, soil) and human health.

2.1.1 Survey design

The European Commission's online survey tool, *EUSurvey*, was used to design and disseminate the survey. To help achieve a satisfactory response rate, the survey was carefully designed and piloted to ensure it was straightforward and did not exceed a maximum of 15 minutes to complete.

The final format agreed with DG Environment after iterations included a set of Likert scale questions asking respondents to rate (1 (low) – 5 (high)) the significance³ and probability of environmental and health risks. Qualitative risk assessment involves making a formal judgment on the significance (or 'severity') of the impact of a risk and the probability (or 'likelihood') of the risk occurring. As defined by a European Commission report dedicated to the harmonisation of risk assessment procedures (2000: 5), risk is "the probability and severity of an adverse effect/event occurring to man or the environment following exposure, under defined conditions, to a risk source(s)." Based on this principle, a risk level can be generated by the equation: **Risk = Significance x Probability.**

A total of 415 experts were invited to participate in the survey, with the overall target of obtaining 100 valid responses from scientific experts across European Union (henceforth EU) Member States. A two stage sampling methodology was used to ensure the sample population was representative of all relevant scientific disciplines and EU countries. Phase 1 of the survey included a wave of 200 invitations, with responses received and checked for validity against the recruitment criteria. The profile of respondents was analysed to identify any countries or areas of expertise that were underrepresented in the dataset and was followed by Phase 2 and a second targeted wave of 215 invitations. The number of invalid and valid responses and response rates received for Phases 1 and 2 of the survey of experts is presented in Table 2.

Table 2: Survey responses

Phase of the survey of experts	Number of experts invited to participate in the survey	Number of valid responses	Response rate – valid only (%)	Number of invalid responses	Total response rate (%)
Phase 1	200	51	25.5	63	57.0
Phase 2	215	53	24.7	64	54.4
Total	415	104	25.1	127	55.7

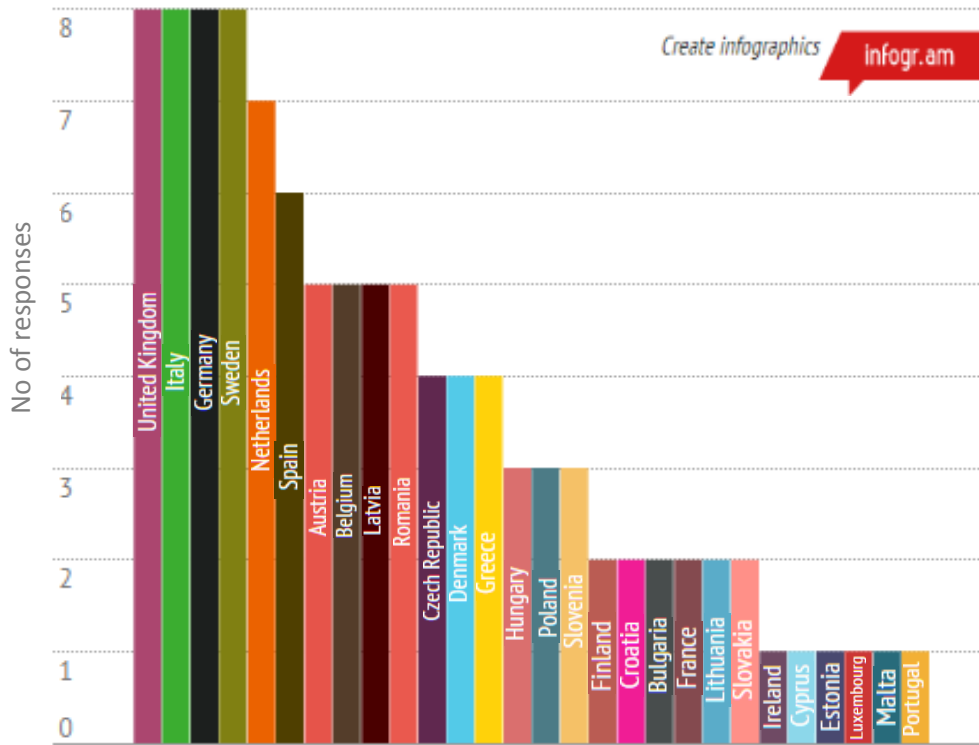
2.1.2 Characteristics of the Respondents

Data received were sorted by area of expertise and by country in which respondents were working. Figure 2 illustrates the number of experts from each EU Member State. The survey has captured valid responses from experts currently working in all 28 EU Member States. The UK, Italy, Germany and Sweden are well-represented, with eight responses from experts in each of these Member States. In contrast, one response was

³ The term 'significance' here is used in the meaning of 'severity' and is not to be confused with statistical significance.

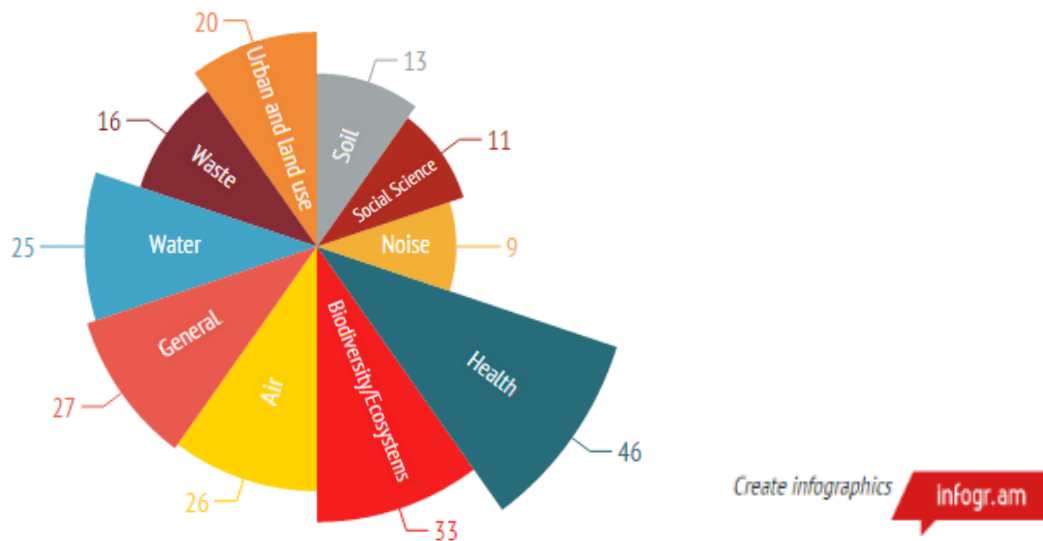
received from a single expert in Ireland, Malta, Luxembourg, Cyprus, Portugal and Estonia.

Figure 2: Number of responses by EU Member State



Out of the 104 experts whose responses were taken into consideration for data analysis, the majority (59) work for public academic/research institutions. The remaining 45 valid responses are from experts employed by public/government agencies. Respondents reflected a good spread across a wide range of scientific expertise and 46 per cent had expertise in health, which is close to the target of 50 per cent of respondents having expertise in this area. The areas of expertise with the highest representation were health and biodiversity / ecosystems (46 and 33 experts, respectively). Noise pollution (9) and social science (11) were the areas of expertise least represented. It is important to note that respondents were able to select more than one area of expertise, as relevant, and therefore the total number of areas of expertise identified and represented in Figure 3 is higher than the total number of respondents.

Figure 3: Number of responses by area of expertise



2.1.3 Data analysis

From the pool of 104 valid responses, based on the scores assigned by the scientific experts on a Likert scale of 1 (low impact) to 5 (high impact) the frequencies of values and the averages for distribution of values (mean, mode and median values) were calculated for each of the 14 environmental risks under the following four categories of assessment:

1. Significance of negative impacts on the environment
2. Significance of negative impacts on human health
3. Probability of negative impacts on the environment
4. Probability of negative impacts on human health

Using the risk equation ($Risk = Significance \times Probability$) for the 14 environmental risks, the mean values assigned by respondents for the significance of the impact were multiplied by the mean values assigned by respondents for the probability that each of these impacts will occur, both on the environment and on human health. The results of this calculation provided rankings of all the risks as judged by the scientific experts that could be compared with the results of the Eurobarometer public survey.

Blank fields corresponding to 'no response' from respondents were removed when calculating variance and standard deviation. Only the responses with values were considered as valid responses. Any missing scores were excluded from analysis on a pairwise basis, which means that if a respondent has a score missing for a particular variable then their data are excluded only from calculations involving the variable for which they have no score.

2.1.4 Limitations

The single number selected by a respondent from a Likert scale of 1(Low) – 5(High) for the probability and significance of each environmental risk represents a person's view but this assessment is subjective, based on value judgments, knowledge and experience. Further, one person's view of 'high', 'low', 'probability', 'significance', or the values applied to the 1 – 5 scale can be very different to another's and what exactly it represents to an individual cannot be known through this approach. Therefore, there is a risk of giving too great a significance to the resulting numbers as these are inherently qualitative and subjective data.

The detailed methodology for the expert survey is described in Appendix 1.

2.2 Country focus groups

2.2.1 Objectives of the focus groups

The purpose of the focus groups was to understand how and why public perception of environmental risks differs from the scientific assessment of the same risks. The Eurobarometer survey provides quantitative data about public perceptions of environmental risks across Europe. The focus groups provided an opportunity to explore the ways in which people think about and assess environmental risks and to understand what influences their thinking. Specifically, the focus groups were intended to:

1. Clarify what members of the public think that environmental risks are, in order to compare their definitions with an expert definition (that includes both significance and probability of environmental and health impacts).
2. Compare public perceptions of environmental risks with the scientific assessment of environmental risks, particularly looking at:
 - The way that members of the public prioritise environmental risks;
 - The factors that they take into account in making sense of and assessing environmental risks.
3. Identify pathways for lay understandings of environmental risks and the main socio-cultural (including behavioural) factors influencing the perception of environmental risks.
4. Capture different narratives or ways in which members of the public rationalise their assessment of environmental risks.

2.2.2 Design of focus groups

Recruitment criteria

Two focus groups were planned with 8-10 participants each, to take place in each of the six partner countries. A single recruitment questionnaire was used in all partner countries to ensure participants' profile was the same in terms of the following criteria: gender, age, nationality and residence, employment and educational qualifications.

The profile of the participants in the two focus groups in each country was the same, with the exception of the educational qualifications variable, to allow for comparison between the two groups. The rationale for using educational qualifications as the variable for comparison was:

- Clear recruitment process / question
- Comparable across all partner countries
- Consistency across all partner countries
- Potential for comparison with experts (assumed to be university educated) e.g. knowledge and assessment process

Based on this decision, participants in the two focus groups in each of the six countries under study had to fit the educational qualifications presented in Table 3.

Table 3: Variable for comparison within and between the focus groups

	Focus group 1	Focus group 2
Educational qualifications	No higher education degree or trade / vocational training (schooling to 18 years)	Higher education degree or trade / vocational training

It is worth noting that although educational qualifications is the only established variable differentiating between the two focus groups in each country, there may be other differentiating variables that it was not possible or practical to test for, considering the scale and purposes of this research.

A detailed description of focus group recruitment is included in Appendix 2.

Fieldwork

Across the partner countries all but one of the focus groups were held with eight or more participants, as specified in the focus group design. In a few cases respondents withdrew or failed to attend the discussion on the day and had to be replaced at short notice, resulting in the intended distribution of some of the participant characteristics (e.g. gender, educational qualifications) not being fully achieved. The possibility that participants may drop out is an inherent risk in any social research method and the project teams had recruited participants above target.

Location

In each country, the participants for the two focus groups were recruited in the same geographical area. The venue was also located in the area. The venues were checked against a set of established criteria of accessibility (near to public transport services and accessible for people with physical disabilities) and comfort to ensure that participants felt able to contribute freely.

Running of the focus groups

The first focus group was held in the UK and was used as a pilot to test the discussion guide and materials. An extensive report was produced on the lessons from the pilot and adjustments were made to improve the focus group design and delivery. This was used as the basis for the delivery of the remaining focus groups.

The focus group session was divided into two sections: the first lasting one hour and twenty minutes, and the second lasting 50 minutes, with a twenty minute break in between. The structure described below was principally followed for all focus groups with slight improvements incorporated following the pilot focus group.

The whole group were together for all but one exercise, when the group was divided into two, so that participants would have more time to give their views on the list of Eurobarometer issues. One facilitator worked with each group. The second facilitator was also essential in determining the two risks to be discussed using the methodology described in Appendix 3, while the first facilitator continued with the session.

It was crucial to have two facilitators both for the initial reception and welcome, creating the right atmosphere for the session and making people feel at home, as well as for the management and continuity of the sessions and ensuring that the discussions were captured. An audio recording was made of the whole session which was supplemented by detailed notes taken by the facilitators.

2.2.3 Characteristics of participants

In total, 108 people attended the 12 focus groups, eight to twelve at each focus group⁴, meeting - and in some cases slightly exceeding - the target for attendance (eight to ten participants).

Table 4: Characteristics of participants in Focus Groups per country

		UK	Italy	Romania	Spain	Latvia	Slovenia	Total
Participants		18	16	17	23	20	14	108
Level of education	No qualifications	0	3	0	2	0	0	5
	High school graduate or equivalents	5	5	9	9	10	4	37

⁴ With the exception of Slovenia, where one of the two focus groups had six participants.

Survey on Public Perceptions of Environmental Risks

		UK	Italy	Romania	Spain	Latvia	Slovenia	Total
	Vocational training or equivalents	3	0	1	3	0	4	16
	Undergraduate degree or higher	10	8	7	9	10	6	50
Gender	Male	9	10	9	10	10	6	54
	Female	9	6	8	13	10	8	54
Nationality	Nationals of the project partner country	18	16	17	22	20	14	107
	Nationals of other EU countries	0	0	0	1	0	0	1
Employment status	Employed	11	4	10	12	14	9	60
	Retired	3	3	1	3	2	0	12
	Homemaker	1	0	1	1	0	0	3
	Student / Apprentice	3	8	3	6	2	2	24
	Unemployed	0	1	2	1	2	3	9
Age	18-24	3	4	4	3	3	4	23
	25-39	4	6	6	9	8	7	38
	40-54	5	3	4	3	5	1	21
	55+	6	3	3	9	4	2	26

The composition of the groups complied with the criteria that had been established:

- All participants were EU nationals
- Almost all participants were nationals of the project partner country (target: at least 70 per cent)
- There was a good spread between the four major age categories: 18-24; 25-39; 40-54; 55 and over
- A balance of genders: overall there were 54 men and 54 women
- An adequate representation from all statuses of employment: participants in employment, students, homemakers, retired and unemployed were all represented
- The two groups in each partner country represented the two different levels of educational qualifications, the characteristic chosen to be explored as an explanatory variable of the public's perceptions around environmental risks. The first focus group in each country was run with the group with lower educational qualifications, where all participants had high school level qualifications, vocational qualifications or below. The second focus group was conducted with the group with university level educational qualifications.

2.2.4 Description of focus group structure and discussion guide

A fairly detailed schedule was designed for the session, taking participants through a series of activities that included responding to questions, verbal and visual prompts, ranking and sorting exercises and group discussions. After discussion within the team, it was decided that the use of pictures or photographs as prompts for discussions would be limited to the final session exploring pathways of understanding, to avoid these suggesting interpretations of the risks.

For consistency across countries, the guide was fairly prescriptive and detailed. Indicative timings were provided for each section of the programme as well as a set of

prompts to elicit information if that did not emerge from the initial activity or discussion. However, there was sufficient flexibility to allow new or unexpected information to emerge and to ensure that the discussion was not artificially limited to pre-established topics. The schedule for the focus group is shown in Appendix 4.

The key sections of the session were:

- **Scene setting and general questions about the environment**
This section had a dual purpose: on the one hand to put participants at ease and introduce them to the sorts of topics that would be covered during the focus group; and second, to compare the members of the focus group's general views towards the environment with those reflected in the Eurobarometer survey. Participants were asked to answer a short set of questions about their attitudes towards environmental issues; those questions were all taken from the Eurobarometer survey.
- **Prioritising environmental issues**
During this part of the session participants individually ranked the 14 Eurobarometer issues and then discussed the reasons for the ranking. After the sessions the individual rankings were combined to generate a ranking for the group which could then be compared with the ranking of issues by the experts and by the Eurobarometer respondents. The group discussion was used to encourage participants to start reflecting on the way they think about environmental issues and the things that make them consider issues more or less worrying.
- **Environmental risks**
The purpose of this section was to explain to participants how experts assess risks in terms of probability and consequence and to encourage them to explore whether using this approach might change the way they think about environmental issues.
- **Detailed discussion of two environmental risks**
These discussions focused on individual risks and explored participants' perceptions and understandings, leading to reflections on the processes involved in making sense of these risks (e.g. associations, narratives, reasoning, etc.). A particular focus of these sessions was to explore how members of the public think about environmental risks in order to contrast this with what is known about the ways in which experts think about the same risks. For this reason, in each focus group the facilitators looked at issues where there is a considerable gap between the importance attributed to the risk by experts and the lay assessment of the same risk. The methodology followed to decide these is detailed in Appendix 3.
- **Pathways for understanding environmental issues and risks**
This section looked at the sources of information, prompts and processes that participants follow in building up a narrative or understanding of specific environmental risks. It encouraged participants to reflect on the sources of information that prompt them to think about specific risks, to what extent they are active or passive in relation to these sources of information and the factors that encourage them to pursue particular lines of reflection or questioning. A power point presentation was used to prompt discussion.

2.2.5 Focus group analysis

The analysis of participants' discussions during the focus groups involved identifying and examining the themes emerging.

All the focus groups were recorded and transcribed in each partner country's language. The six country reports in English were the basis for the cross-country analysis. An inductive (bottom-up) as well as deductive (top-down) thematic approach was used.

Broadly this involved coding the data according to themes which are either already named (deductive) or emerge from the data (inductive).

The six focus group reports were imported into Dedoose, a computer-assisted qualitative data analysis software (CAQDAS) package, which facilitated the management, coding and grouping of the qualitative data. A code tree was developed before starting to code the data (see Appendix 5). This included eight main code headings:

1. Background (how participants feel about environmental issues)
2. What do people understand by environmental issues?
3. Reasons for worry / concern about environmental issues
4. Reasons for low concern about some issues
5. Ranking of environmental risks by participants
6. Sources of information
7. Additional environmental risks raised by participants
8. Conceptual understanding of environmental 'risks' versus 'issues'

During coding, additional codes were added to capture emergent themes from the focus group reports. Once the data were coded, excerpts relating to a code were exported and then analysed further looking for links and relationships within and between codes across the focus groups.

In the discussion of these themes, we have drawn on insights from an extensive academic literature on risk perception. We identify similarities and differences in perceptions of environmental risks across countries and educational levels. Throughout the report there are also comparisons drawn between the combined results of the focus groups and the expert survey, as well as the Eurobarometer survey. We have also looked at possible reasons for the observed results using insights provided by focus group participants and any influences of the specific country context and background.

2.2.6 Limitations

As with all research methods there are limitations to focus group research. It is important to remember that each focus group comprises different individuals with their own attitudes, behaviours and views that have been purposively recruited for the study. It should not be assumed that the participants in the 12 focus groups are representative of Europe's population, but as explained in Section 2.3, contexts and characteristics can be identified that allow the transferability of findings. Any comparisons between focus group participants, experts and the Eurobarometer survey were made based on observations of small groups of people who discussed these topics for 2.5 hours.

Further, all focus groups were undertaken in urban environments which has possibly influenced what the focus group population identified as high priority environmental risks and other aspects of their discussions. For instance, air pollution might have been seen as less important were the focus groups undertaken in rural settings. The locations of the focus groups as well as the individual country contexts (see section 2.3) must be taken into consideration.

Focus groups rely heavily on assisted discussion, so the role of the facilitators is critical. Facilitators in the project focus groups were aware of potential impacts of:

- The 'Hawthorne effect'– whereby participants are aware they are being studied and therefore may say what they think the facilitator wants to hear or just generally change their behaviour because of the study and the unnatural social setting. (Merrett , 2006)
- 'Groupthink'– where participants actively hide their own viewpoints on a topic and just agree with the dominant view/individual in the group, generally to avoid conflict, achieve consensus or due to feeling inhibited. (Rose, 2011)

These impacts were mitigated by selecting experienced facilitators, setting a clear agenda, steering discussion and ensuring that all participants were involved and interacted with others.

2.3 Approach to transferability

The specification for this project asked that there should be “*an extrapolation of the results from the focus groups to the entire EU, thus providing an EU-wide analysis*”. Given the qualitative nature of the data and the small scale of the project, the type of extrapolation that is possible is what is termed ‘transferability’. Typically qualitative research - such as focus groups - is not amenable to the generalizability⁵ that is possible with large random samples of the population; hence it is not possible to extrapolate from the results. However, one measure of the quality of qualitative research is that of “*transferability*” (Lincoln and Guba, 1985). This is the extent to which researchers consider the context in which the data has been gathered to be significantly similar to another context so that they feel able to suggest there would be similar findings in that context.

Therefore, in this project we have considered if findings from one country with a certain set of characteristics could be transferable and make sense for another European country.

⁵ The word 'generalizability' is defined as the degree to which the findings can be generalized from the study sample to the entire population (Polit and Hungler, 1991:645)

3 QUANTITATIVE RESULTS

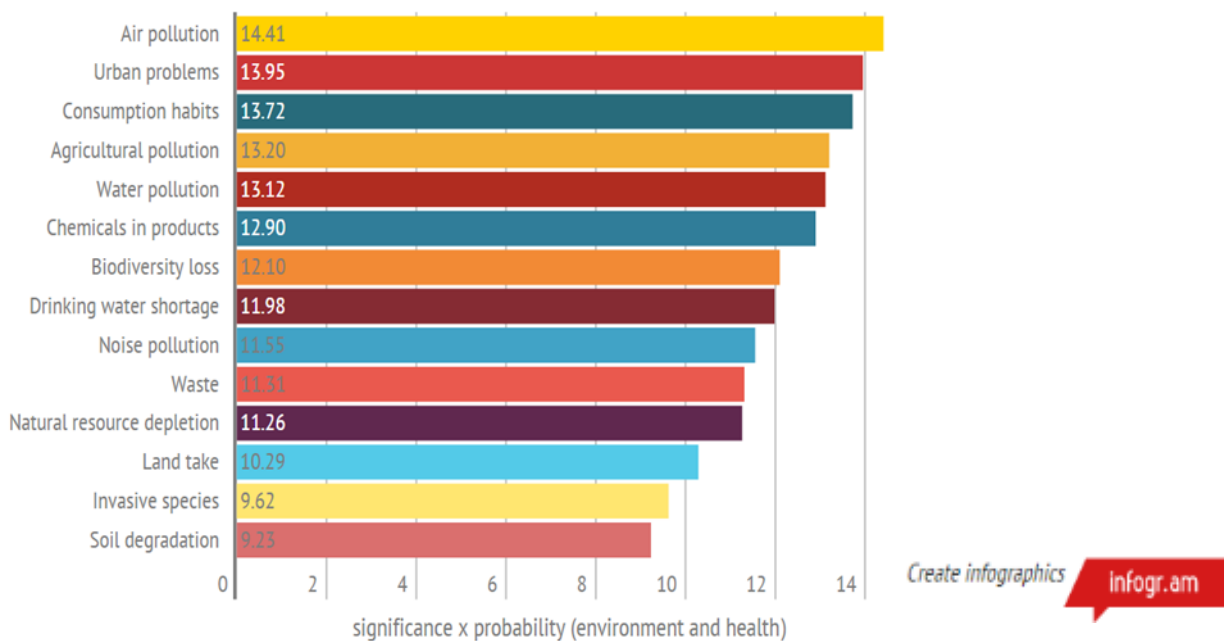
3.1 Expert assessment of environmental risks

3.1.1 Summary of survey results and expert ranking

In the first phase of the project, scientific experts were invited to participate in an online survey about environmental risks. Respondents were asked to make a scientific assessment of each one of the 14 Eurobarometer environmental risks⁶, in terms of the probability of the issue occurring and the significance of its impact if it should occur; and the results were used to create a ranking. This was achieved by firstly conducting separate analyses on experts' assessments of potential negative impacts of all risks: 1) on the environment, and 2) on human health.

Applying the definition of risk, whereby risk is "a function of the probability and severity of an adverse effect/event", the average value for the Significance (or severity) of negative environmental impacts was multiplied by the average value of its Probability. This calculation was undertaken to obtain a numerical value for the risk of environmental impacts. The same process was followed to obtain a numerical value for the risk of health impacts. This equation was applied to each risk (Appendix 5 presents the results for significance and probability of each risk with separate and aggregate calculations for the health and environmental impacts of each risk). The two values were added and divided by 2, to provide the expert assessment of risks overall. Figure 4 shows the ranking of the risks from the perspective of the scientific expert respondents.

Figure 4: Expert assessment of environmental risks overall

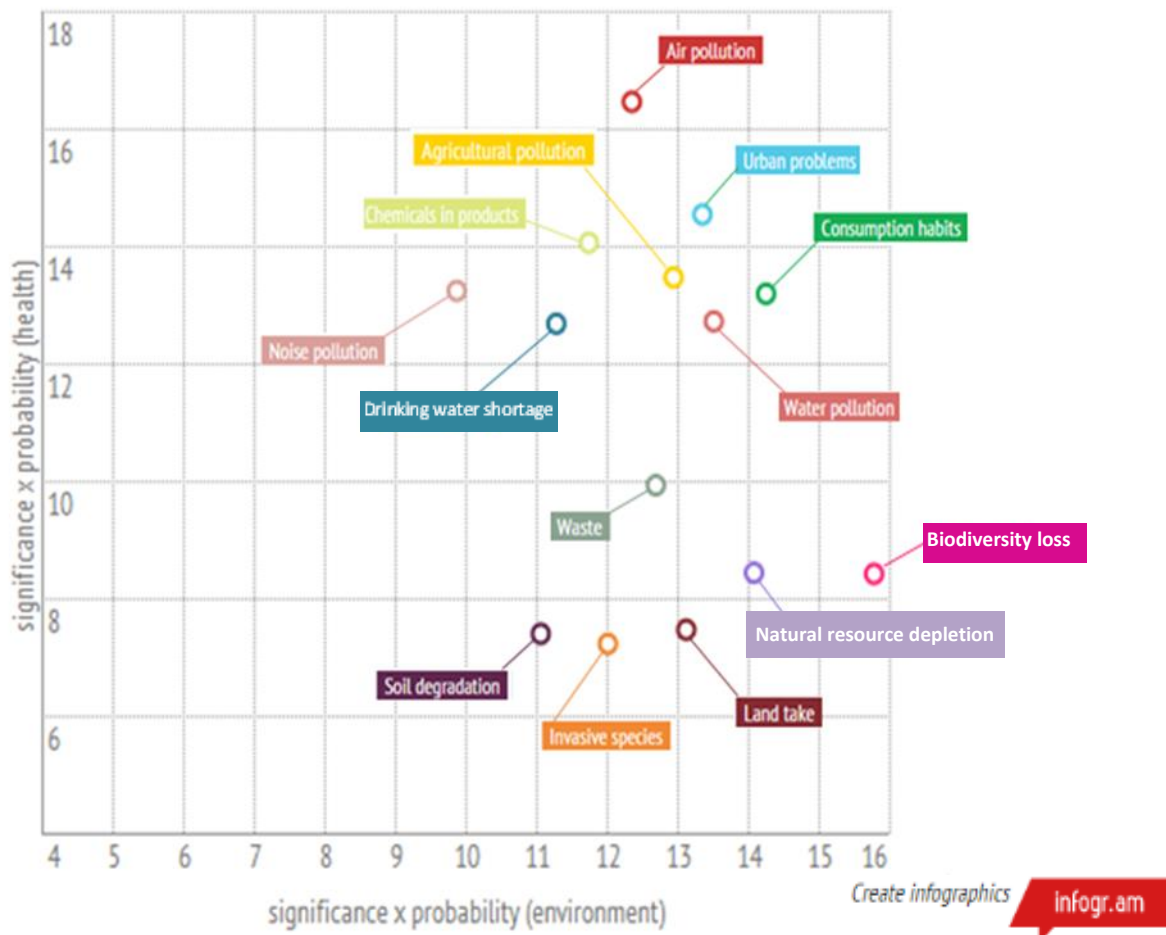


Projecting the mean values for the environmental and the health impacts of risks on a Cartesian coordinate system captures the spatial scattering of these values. Any given location on a Cartesian coordinate system is defined by its coordinates; a pair of values corresponding to either one of the axis. The horizontal axis in Figure 5 represents the mean values of the environmental impacts, while the vertical axis represents the mean values for the health impacts of each risk (both calculated as a function of significance and probability - see Appendix 6). Each dot on Figure 5 is therefore a risk defined by the

⁶ It is worth noting that the 14 environmental risks identified in the Eurobarometer survey do not necessarily have the same level of granularity, as some risk categories encompass a range of risks. E.g. Urban problems encompass traffic jams, air pollution, lack of green spaces etc.

values of its environmental (horizontal axis) and health impact (vertical axis) assessments. Therefore, a risk located at the top right corner of Figure 5 was assessed high both in terms of its health and environmental impacts. If a risk is located lower on the vertical axis, this implies that its health impact was assessed as being lower, while any movement to the left along the horizontal axis would imply that its environmental impact was assessed as being lower. Considering the narrow range of the Likert scale (1-5) the differences in results can be perceived as relevant. Air pollution, Urban problems and Consumption habits are placed considerably further apart in the scale than risks such as Land take, Invasive species and Soil degradation. It is also interesting to note that some risks, such as Biodiversity loss and Depletion of natural resources, were assessed particularly high in terms of their environmental impact but considerably lower in terms of their health impact. On the contrary Noise pollution was assessed in the top five for its health impact but particularly low for its environmental impact.

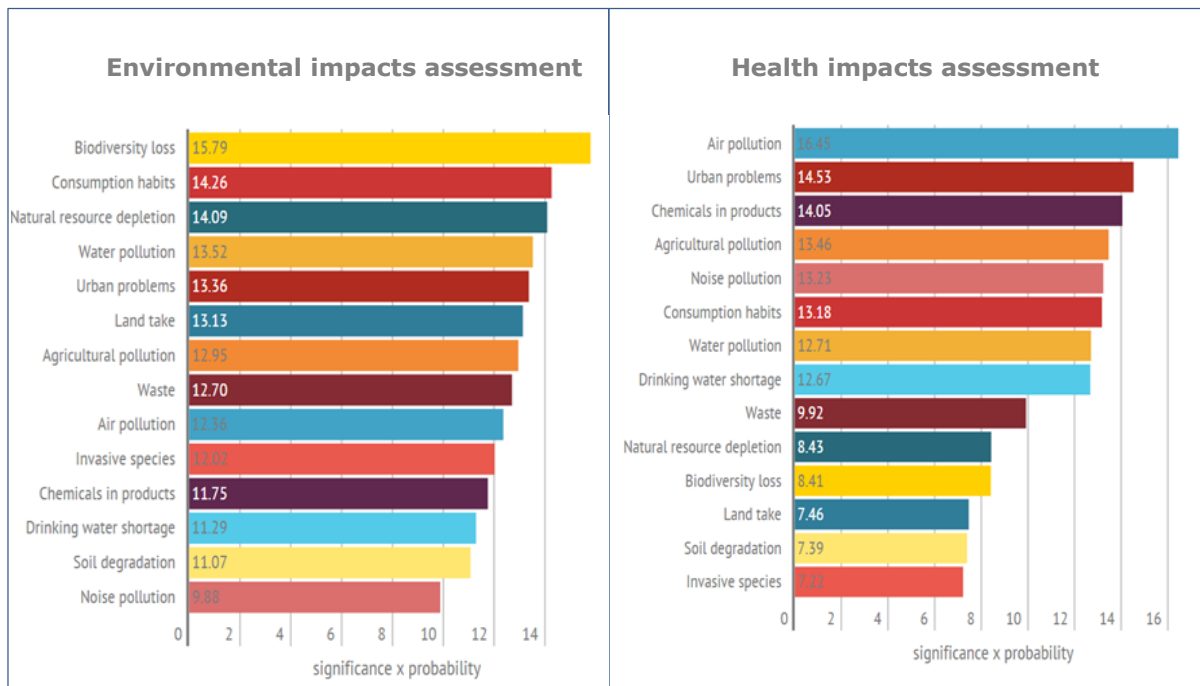
Figure 5: Expert assessment of environmental risks overall on a Cartesian coordinate system (Horizontal axis: assessment of environmental impacts, Vertical axis: assessment of health impacts)



3.1.2 Comparing assessments of impact on the environment versus impact on health

Looking at the differences between the expert scores for the environmental and the health impacts of the risks, the ranking changes considerably, as shown in Figure 6. Air pollution, the environmental risk ranked highest overall by experts and the one that is most commonly considered as a cause of worry by members of the public, is clearly the top-scoring risk in terms of health impacts but appears in the bottom half of the experts’ ranking of environmental impacts.

Figure 6: Expert assessment of risks in terms of significance and probability of environmental (left) and health (right) impacts



Urban problems is the only risk in common in the top five risks for both human health impacts and environment impacts as assessed by survey respondents. Soil degradation and Invasive species are ranked in the bottom five and Waste in the middle for both categories of impact. The differences between rankings for risks based on human health or environmental impacts also present interesting findings, for example: Noise pollution and Chemicals in products both feature in the top five based on human health impacts but are in the bottom five for environmental impacts; Biodiversity loss and Natural resource depletion are in the top five risks for environmental impacts but in the bottom five for human health impacts.

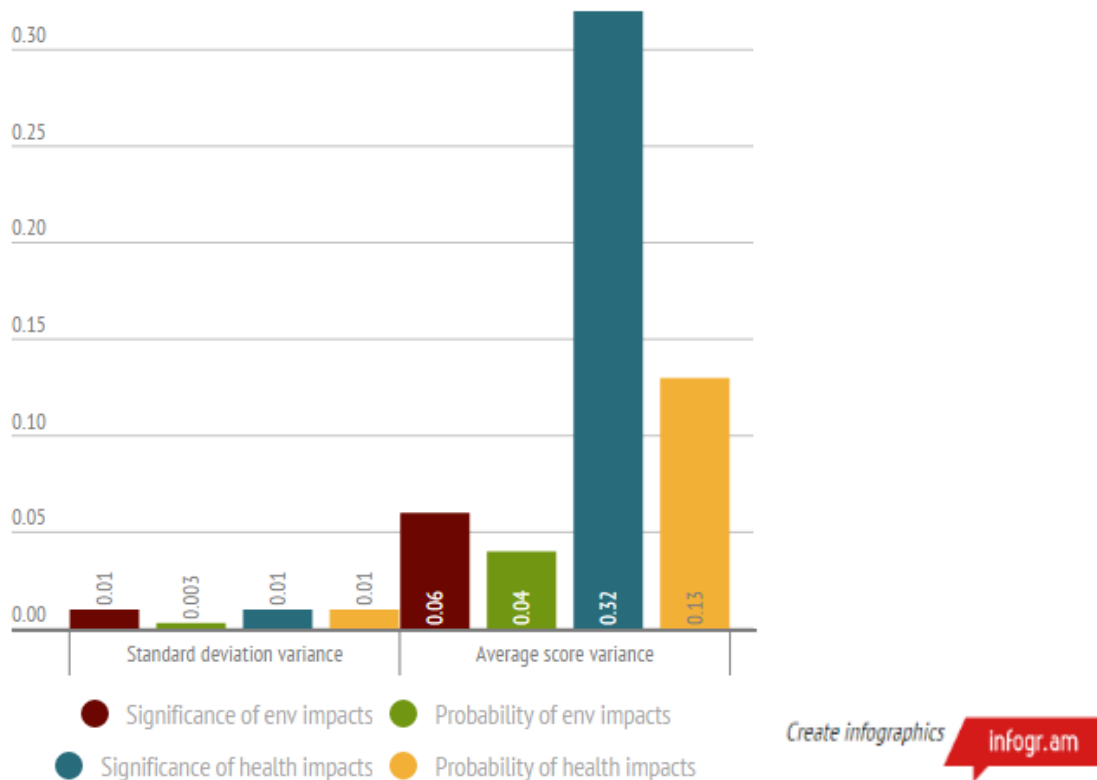
There is considerably greater variation in the scores for the health impacts of risks than the variation in the scores for the environmental impacts or the composite scores. The scores for health impacts range from 16.45 – 7.22 (i.e. over 9 points) whereas the variation across both environmental and composite scores is less than 6 points.

Considering these findings, it would be useful for future research to explore whether the experts had a different way of conceptualising risks when evaluating their impact on the environment versus their impact on human health.

3.1.3 Comparing assessments among experts

Variance was established to estimate the level of consensus among the experts on assigning values for risk assessment. Both standard deviation and average score variances were calculated by identifying the highest and lowest assessment values of a risk in all of the four categories. Figure 7 shows the range in values for both standard deviation variance and average score variance, with the latter providing greater clarity and more compelling evidence. Significance of health impacts show the greatest variance in both standard deviation and mean score values. There could be a number of explanations for these differences, for example, the greater consensus on environmental impacts could possibly be the result of a more extensive and established evidence base, but this cannot be conclusively demonstrated here.

Figure 7: Variance in standard deviation and average score



Level of consensus by area of expertise

Due to the high proportion of experts in the environment and in human health in the data set, analysis was undertaken to compare the differences in assessment of impacts on the environment and impacts on human health by area of expertise. The two expert groups compared were a group of experts who had selected 'health' as one of their areas of expertise and a group who hadn't.

The mean values for both expert groups for the probability and significance of impacts on both the environment and human health were multiplied and the results of this analysis showed a minor change in assessment values across the risks. This result goes against the hypothesis that experts representing a particular area of expertise will cause higher probability and significance values for the risk associated with their area of expertise. This is not to say that there were no differences between the experts in terms of their assessments, but that the differences cannot be explained by bias in favour of the expert's own discipline.

Some risk assessment literature advises against aggregating the results of different experts' assessment of risks⁷, arguing that different experts use different lenses to make sense of the same information:

But, while some see a grand unification of all knowledge as an inevitable product of scientific advance (Wilson, 1998), thus far the growth of disciplinary scientific methods and bodies of knowledge results in an increasing disunity that translates into a multitude of different yet equally legitimate scientific lenses for understanding and interpreting nature. (Sarewitz, 2004: 390)

⁷ For example, Bedford, T. and Cooke, R. (2001) *Probabilistic Risk Assessment*. Cambridge: Cambridge University Press; Sarewitz, D. (2004) *Environmental Science & Policy* 7: 385-403

The standard deviation variance observed in this survey supports the view that experts may have 'different but equally legitimate' ways of assessing risks. This is also endorsed by the findings of comparative analysis undertaken of the results for each risk to examine the potential bias inherent in a respondent's area of expertise as a factor in how a risk was assessed.

Ultimately, as Sjöberg argues, "*Risk assessment is not only a question of factual judgment; values enter necessarily*" (2002: 447). It is likely that a number of other personal and professional values and factors, in addition to area of expertise, are involved in each expert's risk assessment. As human beings, experts cannot divorce themselves from the values they hold that will inevitably affect how they judge and conceptualise an environmental risk.

Level of consensus by European region

Analysis of data across the four predominant biogeographical regions in the European Union⁸ (EEA, 2012) showed results of the assessments for the environmental risks of Consumption habits and Agricultural pollution to be particularly interesting. For each region, the average values were calculated for significance and probability of impacts on both the environment and human health. The mean value for significance was multiplied by the mean value for probability to determine the overall assessment of impacts on both human health and the environment.

Overall, Air pollution and Urban pollution were included in the top five for all bioregions. While Consumption habits were included in the top five risks for experts in Northern and North-Western Europe, this was less of a concern for experts in the Central-Eastern and Mediterranean regions. Agricultural pollution was ranked highest in the Central-Eastern region, whereas it was assessed fifth in the rest of the regions. Detailed figures across each biogeographical regions are included in Appendix 7.

3.1.4 Other environmental risks identified by experts

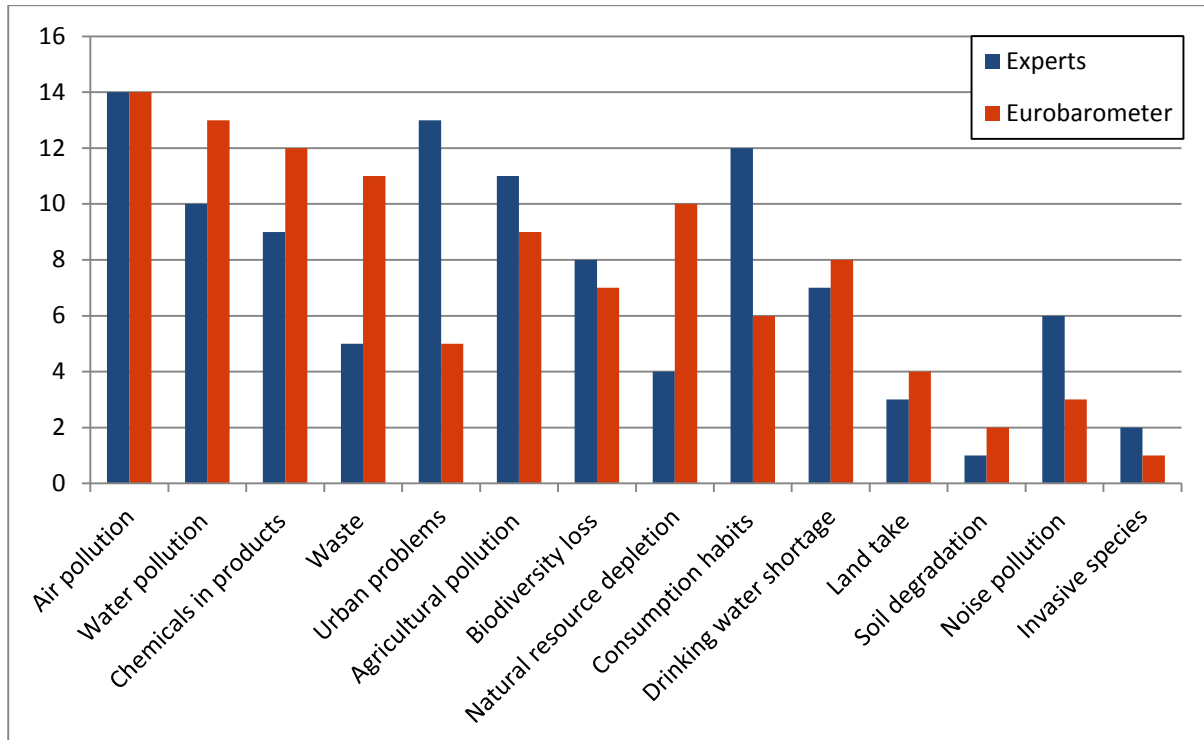
The experts were invited to identify additional risks that should be included in the list of environmental risks. A total of 24 new risks were identified by 37 experts. The additional risk mentioned most frequently was climate change, which was suggested by 9 respondents. Flooding was suggested by three respondents. None of the other new risks were proposed by more than two experts.

3.1.5 Implications of the expert survey results for focus group research (Phase 2)

The analysis of the results of the survey of experts highlighted a number of differences between the experts' assessments and the Eurobarometer survey of public attitudes and suggested some fruitful areas for exploration in the focus groups (see Figure 8).

⁸ For the analysis, the four predominant biogeographical regions in the European Union (Northern Europe, North-West Europe, Central and Eastern Europe and Mediterranean Europe) were chosen and countries were allocated to the region where most of their territory is located.

Figure 8: Comparison of environmental risk assessment between experts and Eurobarometer respondents



Some key observations indicating interesting lines of investigation included:

- Two of the top three in the expert ranking of environmental risks are not commonly considered to be of concern by those responding to the Eurobarometer survey: these are Urban problems and Consumption habits.
- Depletion of natural resources came out as one of five top risks in the Eurobarometer survey, being mentioned by 36 per cent of respondents, whereas the same risk was in the bottom four risks for experts.
- It does not appear that the assessment of either the health or the environmental impacts of the issues is more important in determining the experts' overall score.
- The biogeographical region where the experts are working appears to have an impact on their assessment of some of the environmental issues (Consumption habits and Agricultural pollution). No evidence was collected that would have made it possible to ascertain the reason for this influence.

This preliminary analysis informed the design of the focus group discussions.

3.2 Focus group assessment of environmental risks

The Eurobarometer survey developed a ranking of environmental risks by providing respondents from the general public with a list of 14 environmental issues and asking them to pick the five that they were most worried about.

The focus group participants were given a set of cards, each with one of the environmental issues from the Eurobarometer survey. They were asked to read through the cards and then pick out the five main environmental issues that they were worried about (this is the wording used in the survey).

3.2.1 Comparison between different levels of education

Table 5 presents the aggregate findings of the individual ranking of the participants, with the first five rows representing the overall top five priority environmental issues across the six partner countries. The third and fourth columns show the results by the level of educational qualifications of participants. The 'Total' columns refer to the total number of

Survey on Public Perceptions of Environmental Risks

responses while the 'Ranking' columns converts the total number of responses into a ranking of the risks, where 14 is the highest risk and 1 is the lowest risk. These rankings were extracted from the aggregation of results across levels of education and the subsequent conversion of the total number of responses to ranks. Where the number of total responses was the same for two or more risks, the risks have been ranked in the same position.

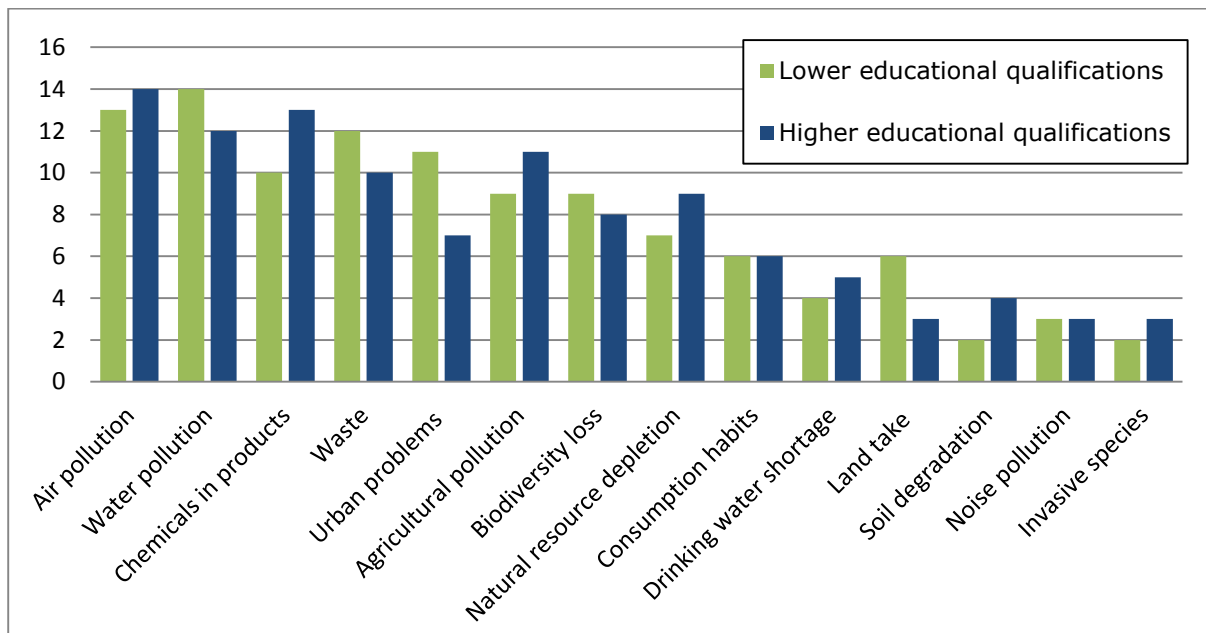
Table 5: Aggregate ranking of environmental risks

Environmental Risk	All participants <i>(column 1)</i>		Lower educational qualifications <i>(column 2)</i>		Higher educational qualifications <i>(column 3)</i>	
	Total	Ranking	Total	Ranking	Total	Ranking
Air pollution	78	14	39	13	39	14
Water pollution	74	13	45	14	29	12
Chemicals in products	58	12	27	10	31	13
Waste	54	11	31	12	23	10
Urban problems	46	10	28	11	18	7
Agricultural pollution	44	9	20	9	24	11
Biodiversity loss	39	8	20	9	19	8
Natural resource depletion	38	7	16	7	22	9
Consumption habits	31	6	14	6	17	6
Drinking water shortage	26	5	11	4	15	5
Land take	20	4	14	6	6	3
Soil degradation	14	3	4	2	10	4
Noise pollution	11	2	5	3	6	3
Invasive species	10	1	4	2	6	3

Base: Total (All 108 participants), Lower educational qualifications (58 participants), Higher educational qualifications (50 participants)

These results are also presented in Figure 9.

Figure 9: Comparison of environmental risk ranking by educational level



Base: Total (All 108 participants), Lower educational qualifications (58 participants), Higher educational qualifications (50 participants)

There appears to be little impact of the educational level of participants in their assessments of environmental risks. Looking at the aggregated results, participants with different educational levels had four out of five of the same top concerns: Air pollution, Water pollution, Chemicals in products and Waste. The more highly qualified participants ranked Agricultural pollution as one of their top five concerns, whereas those with lower educational qualifications included Urban problems (ranked considerably lower by those with higher qualifications). The other main differences were that lower-qualified participants ranked Water pollution top in their priorities, while Air pollution ranked second: these rankings were reversed for the participants with higher educational qualifications. Overall, there were no striking differences, with the variation becoming less important when also considering the difference in the total number of respondents per group.

It might be argued that members of the focus groups with higher educational qualifications had better knowledge of risks that are less tangible or observable in daily life, such as the depletion of natural resources. Better understanding of these risks and their impacts could result in higher levels of concern, though there are other factors that appear to have a stronger impact on levels of concern for the majority of participants. The perception that one has the capacity to control deal with or mitigate some of the impacts and risks identified could also explain some of the lower rankings of issues such as Urban problems by higher educational qualification participants. These are further explored in Section 4.

3.2.2 Comparison between different countries

The evidence from the expert survey shows that experts rank environmental risks differently, according to whether they are considering the environmental or the human health impacts. This reflects the fact that there may be a range of possible impacts of an environmental phenomenon such as air pollution and these may be felt in different ways and by different receptors (e.g. humans, animals, water bodies, etc.) The assessment of the risk will depend on where the air pollution occurs, for example whether it affects urban or rural areas, whether there are particularly sensitive receptors, etc. The assessment is also affected by the perspective adopted, for example whether the focus is on impacts on human health or on the environment.

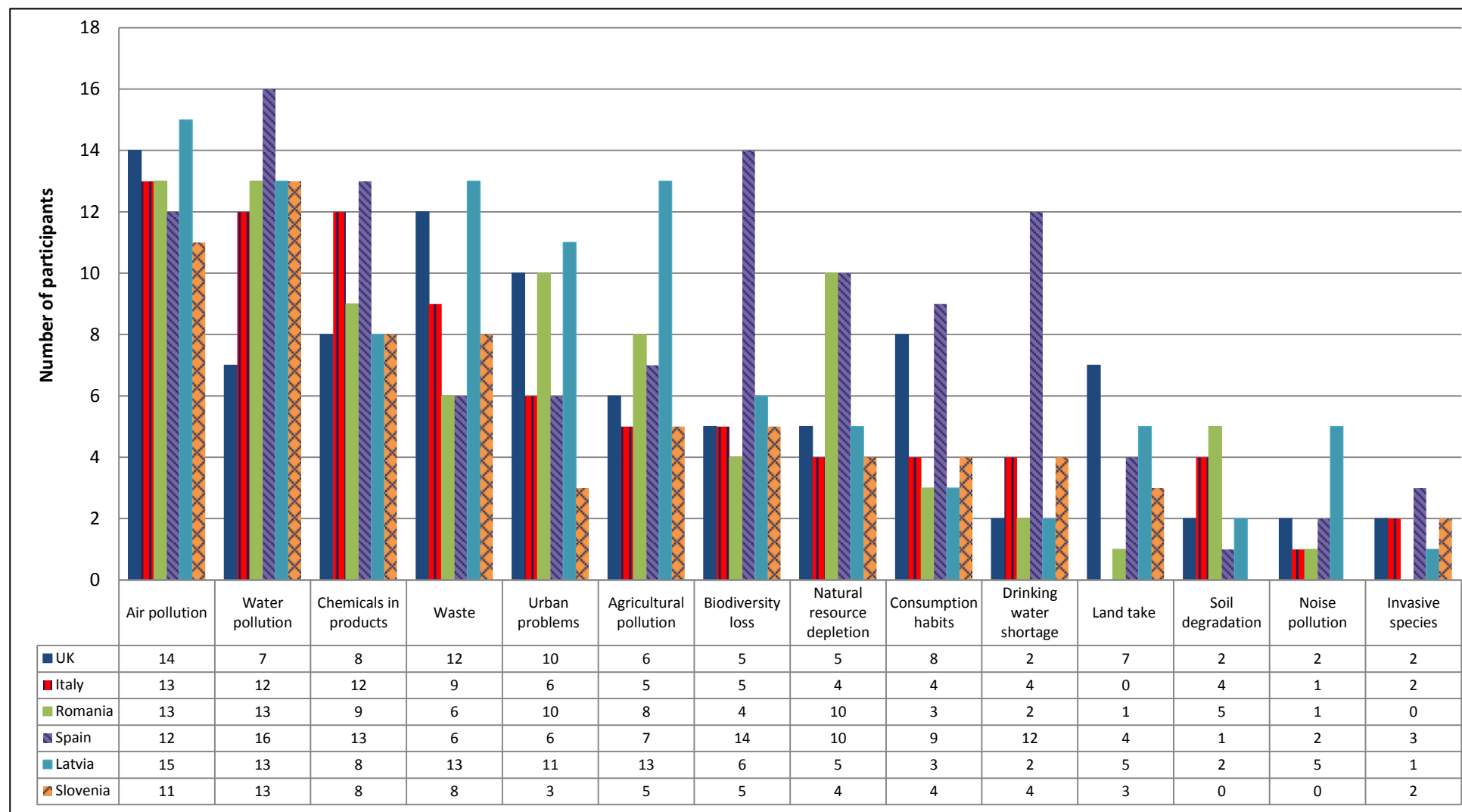
Similarly, the assessments made by members of the public also take account of the context in which risks occur. Some relevant background on the contexts in which the focus groups took place in each of the six project countries is useful for understanding these factors.

- Participants in Italy were quite concerned about chemicals in products and waste, while they also identified problems with drinking water and soil degradation that were ranked low across the six countries as a whole. This result could be linked to attention and discussion in the media at the time of the focus groups of the challenges in dealing with soil and water pollution due to illegal dumping activities. The inappropriate disposal of waste and other industrial by-products was linked to negative effects on agricultural products, through the release of chemicals into the soil and water. Similar media attention, though more localised, explored cases of drinking water pollution determined by the presence of harmful substances.
- Urban problems, waste and agricultural pollution were among the top five most frequently mentioned concerns in Latvia. Noise pollution also ranked high in comparison to all other countries. The ranking of urban problems, waste and noise as top priorities is directly linked to the geographical spread of the Latvian population – almost 50% of population lives in the capital city - while agricultural pollution was an issue that received high coverage in the media (TV, Internet, newspapers).
- Romanian participants ranked the issues of depletion of natural resources and urban problems among their highest concerns; they also assessed agricultural pollution and soil degradation higher than participants from other countries. Romania has a long agricultural history with a farm population five times bigger than the average EU level (Luca, 2009). The fall of communism in Romania led to a rise in the population involved in agriculture to 43.5% in 2001 (compared to 28.5% in 1989). By 2008, the population involved in agriculture had fallen back to around 30%, as new opportunities became available in urban areas. However, this percentage is still staggering when compared to Western Europe; in France the population employed in agriculture stands at 3.4%, in Germany it is 2.2%, and in Great Britain it is only 1.4% (Alexandra and Luca, 2008). Since agriculture represents such an important aspect of Romania's culture and history, it is not surprising that participants from the focus groups rated agricultural pollution higher than participants in other countries.
- Slovenia was the country whose participants were least concerned with urban problems, possibly because of the small size of urban areas and the fact that the majority of the population lives in rural areas. All but one of the participants included water pollution in their priority risks. Slovenia has vast water resources but is lacking in natural resources (such as fossil fuels) which could be exploited to provide significant benefits for the economy. Water is often perceived as the one natural resource the country is rich in and therefore its importance, as well as the population's awareness of water-related issues, is amplified.
- Participants in focus groups in Spain mentioned drinking water and the increase in biodiversity loss as two of their major issues of concern, driving up the EU-wide rankings of these risks. Consumption habits also caused concern for a number of participants. The belated economic modernisation and urbanisation in Galicia, the Spanish region where the focus groups took place, means that since the 1980s (López Iglesias, 2000), broad layers of the population have been working either in agriculture or fishing, both sectors strongly tied to the state of the natural resources. This may help to explain the importance given to water and biodiversity.
- UK participants were the least concerned about water pollution among the six countries, whereas they were considerably more worried about urban problems, land take, consumption habits and waste. The issues identified as priorities in the UK are directly linked to the focus groups both being held in London, which is the

largest city in Europe and home to a population of 8.6 million people. The issues prioritised appear to reflect the urban experience of the participants and the high levels of consumption that characterise UK society. The lack of concern about water pollution was also linked by a number of participants to visible improvements in the river water quality.

The prioritisation of environmental risks by country is shown in Figure 10.

Figure 10: Comparison of countries' prioritisation of environmental risks (in number of total responses)

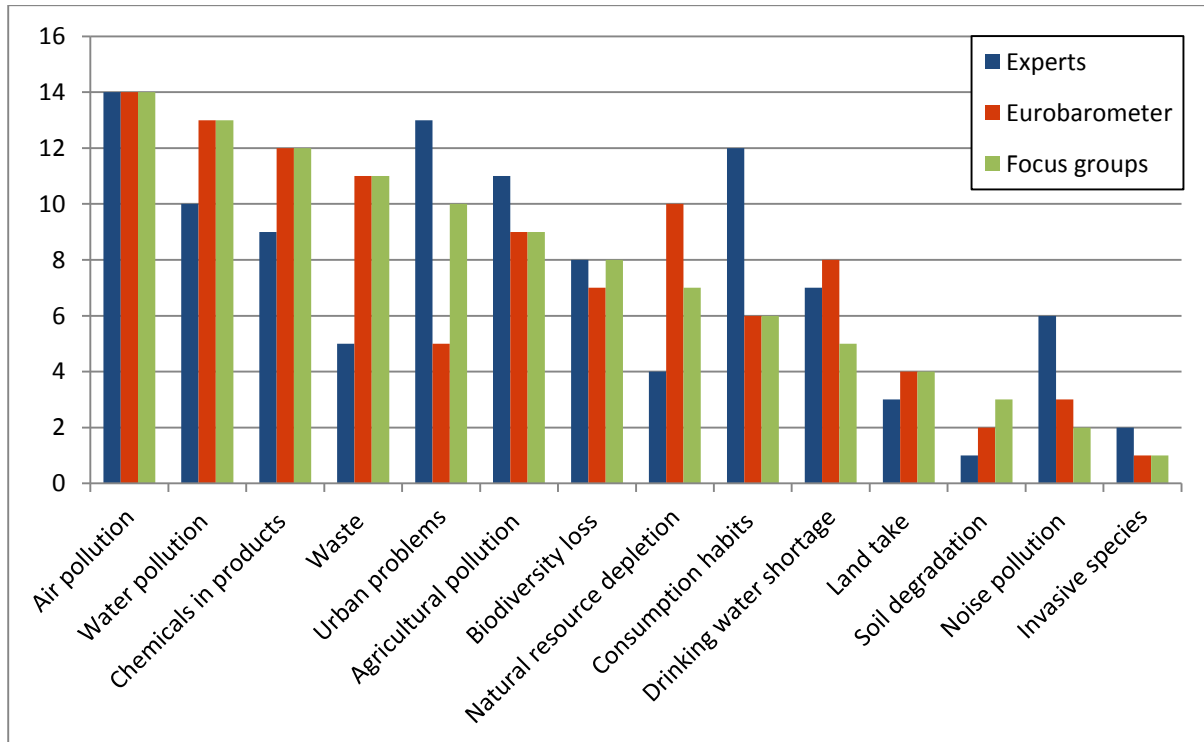


Base: UK (18 participants); Italy (16 participants); Romania (17 participants); Spain (23 participants); Latvia (20 participants); Slovenia (14 participants)

3.3 Comparison of ranking of environmental risks by type of respondent

Figure 11 presents the rankings of the 14 environmental risks from the experts' survey (Phase 1 research, 2015), the focus groups (Phase 2 research, 2015) and the Eurobarometer survey results (2014).

Figure 11: Comparison of ranking of environmental risks by type of respondent. Ranking: 14 (highest) - 1 (lowest)



Overall, the focus group and Eurobarometer assessments were reasonably similar indicating that the focus groups provided a good representation of lay perceptions of environmental risks in a European context.

The environmental risks seen as being of highest concern across the focus groups were similar to the top risks identified by experts.

- Air pollution was ranked as the highest risk across all three types of respondent.
- Both experts and focus group participants included urban problems and water pollution in their top five issues.
- Chemicals in products was one of the top five issues for the focus groups and ranked sixth by experts.
- Agricultural pollution was in the top five risks for experts and was ranked sixth by focus group participants.

There are considerable differences in the assessment of urban problems: this issue came second in the experts' ranking of environmental issues; it was mentioned as a principal concern by 23 per cent of public respondents to the Eurobarometer survey; and it ranked in the top five concerns by the focus group research participants. The urban locations of the focus groups undoubtedly influenced this result.

The main issue of concern to public participants that was not ranked highly by experts, either in terms of its environmental or its health impacts, was Waste. Focus group respondents in Italy, Latvia, Slovenia and the UK ranked Waste in their top five environmental issues.

Consumption habits ranked third in the experts' ranking; the issue was mentioned by 24 per cent of public respondents to the Eurobarometer survey; and it was ranked sixth by the focus group participants. Only the UK focus group participants included Consumption

habits in their top five risks. Even in countries such as Italy and Spain, this issue was considered to be of only low to medium importance.

The depletion of Natural resources was another issue that was of greater concern to members of the public - both Eurobarometer respondents and focus group participants - than to experts.

Three issues ranked by experts as being of lower risk (the spread of Invasive species, Soil degradation and Land take) were similarly not key concerns for many Eurobarometer survey respondents or focus group participants.

Initial analysis suggested there might be a link between focus group responses and the concerns of experts about the health impacts of issues: three of the top five issues for focus group participants (Air pollution, Urban problems and Chemicals in products) were ranked higher by experts for their health impacts than for their environmental impacts. While consumption problems were ranked third by experts in terms of both their environmental and health impacts, they were ranked sixth when only health impacts were taken into account which is closer to the focus group ranking (ninth for groups with both lower and higher educational qualifications). However, the focus group rankings were not always closer to the experts' rankings in terms of health impacts: notably, experts included noise in the top five risks in terms of health impact, but this was ranked among the lowest risks by focus group participants.

Local conditions and issues seem to have had an influence on participants' prioritisation of environmental risks:

- Biodiversity loss was a high concern for focus group participants in Spain but was ranked of medium concern by the focus groups in other countries and Eurobarometer respondents. This may be because the region of Galicia, where the focus groups were held, is an area where biodiversity has been affected by a number of high profile oil spills as well as of the intensive exploitation of natural resources, for example from industrial scale fishing: these factors were both mentioned during the focus groups.
- In Slovenia both urban problems and consumption habits were ranked as low: urban settlements in the country are small and although consumption has grown since the 90s' this was not viewed as an issue.
- In Italy Waste was generally considered a very important issue. This is a prominent issue in Italy, particularly in Rome where the focus groups were held.
- Land take was assessed as a high concern by focus group participants in the UK, whereas this issue was ranked low by both experts and Eurobarometer survey respondents from the UK. This might be explained by the fact that focus group participants were urban dwellers of the expanding London area.

The influence of local conditions and concerns on the assessment of risk was also observed in the case of experts (see section 3.1.3). The importance of location-specific factors on judgements of this kind should not be underestimated.

To explore this further a comparison was drawn between expert and focus group respondent rankings for each of the six partner countries. The results are presented in Table 6, with gaps in rankings within the same country that are higher than five highlighted red. The hypothesis was that if location is an important factor then one might expect to see smaller differences between experts and focus group respondents from the same country, compared to the differences observed when looking across six country focus groups and a European pool of experts (Figure 11).

Table 6: Comparison by country between Experts (EXP) and Focus Group (FG) respondents

Risk \ Country	UK		Italy		Romania		Spain		Latvia		Slovenia	
	FG	EXP	FG	EXP	FG	EXP	FG	EXP	FG	EXP	FG	EXP
Air pollution	14	11	14	13	14	12	11	14	14	6	13	7
Water pollution	9	12	13	14	14	6	14	12	13	14	14	9
Chemicals in products	11	14	13	11	10	7	12	10	9	5	12	2
Waste	13	9	11	2	8	12	6	12	13	11	12	12
Urban problems	12	6	10	8	12	13	6	14	12	11	5	11
Agricultural pollution	7	8	9	8	9	14	7	8	13	2	10	14
Biodiversity loss	6	13	9	6	6	2	13	4	8	11	10	11
Natural resource depletion	6	8	7	13	12	9	9	8	7	14	8	14
Consumption habits	11	2	7	5	5	12	8	10	7	5	8	8
Drinking water shortage	4	6	7	11	4	9	11	5	6	12	8	1
Land take	9	10	1	11	3	3	4	8	7	11	5	5
Soil degradation	4	6	7	5	7	6	1	1	6	11	2	4
Noise pollution	4	2	2	1	3	2	2	4	7	5	2	4
Invasive species	4	6	3	5	1	6	3	2	6	2	3	7

Focus Group base: UK (18 participants); Italy (16 participants); Romania (17 participants); Spain (23 participants); Latvia (20 participants); Slovenia (14 participants)

Expert Survey base: UK (8 participants); Italy (8 participants); Romania (5 participants); Spain (6 participants); Latvia (5 participants); Slovenia (3 participants)

The following observations can be made about the data above:

- The expert survey assessed Noise pollution higher than focus groups and Eurobarometer respondents. However, looking at the results by country, experts and focus group respondents in all six partner countries agreed on the assessment of this issue.
- With the exception of Slovenia, experts and focus group respondents made a similar assessment of the impacts of Chemicals in products. However, at a European level there was a larger gap between expert and lay assessments of this issue.
- Smaller differences were noted in the assessment of Waste, with only two countries showing differences in assessments, while in one of those experts assessed the issue higher than the focus group participants opposite to what the pool of experts across Europe assessed Waste.
- There were considerable differences in the assessments of Drinking water shortage between experts and focus group participants in four of the six countries, which was not present at a European level analysis.

It is difficult to draw any conclusions from the analysis. This result is not surprising, given the very small size of the samples of both experts (a maximum of eight experts in the UK and a minimum of three in Slovenia) and focus group participants (between 23 in Spain and 14 in Slovenia). Specific regional or local factors may have as strong an influence as national characteristics or developments.

Another of the hypotheses explored in the analysis of the focus group results was that there might be greater similarities between experts' assessment of environmental risks

and the assessments made by lay people with higher educational qualifications. It was suggested that people with higher educational qualifications would be more likely to have encountered and used technical risk assessments and that they would therefore apply this approach to their assessment of environmental risks. There was no clear evidence from the discussion that participants with higher educational level would be more likely to use a technical assessment of risks. A comparison of the rankings made by experts and those of the focus group participants shows no clear evidence to support this hypothesis.

For example, focus groups with lower educational qualifications ranked Urban problems higher (in fourth place) than the focus groups with higher educational qualifications (in eighth place) which is closer to the experts' ranking of second place (both when ranked in terms of combined health and environmental impacts and just looking at health impacts). On the other hand, focus groups with higher educational qualifications ranked Waste slightly lower and Agricultural pollution slightly higher than groups with lower educational qualifications: this is closer to the expert ranking. Across all focus groups results are inconclusive, though in certain countries the impact of the educational level was more prevalent than in others (see Section 4.6).

The detailed focus group analysis in the next section explores the factors and perspectives that inform the assessments made by members of the public, drawing on the discussions in the 12 project focus groups.

4 QUALITATIVE ANALYSIS

This section explores the main themes emerging from the focus group discussions, based on a qualitative analysis.

The discussion of each of the themes includes comparisons between the focus group and expert results as well as a consideration of any relevant differences between the six partner countries and between participants of different educational levels.

4.1 Risk perception theory

In focusing on the factors that influence lay perceptions of environmental risks, the main source of evidence comes from the data collected during the focus groups. However, researchers have been studying the factors that influence risk perception for many decades (e.g. Fischhoff, 1978; Slovic, 1987; Pidgeon *et al.*, 2003; Renn, 2008). Referring back to this body of research offers a means of testing the findings of the focus groups.

Wachinger and Renn (2010) provide a set of qualitative characteristics of environmental risks that have been found to influence people’s perceptions. These are shown in Table 7, along with the way in which they tend to influence risk perceptions, that is, whether they tend to increase or decrease concern about the risk.

Table 7: Qualitative risk characteristics (based on Wachinger and Renn, 2010:9)

Factors affecting individuals’ perception of risk	Description	Direction of Influence
Personal control or efficacy	Risks that people believe they know how to and are able to avoid	↓
Institutional control	Risks that are seen as being controlled by an institution or institutions	↑ ↓
Voluntariness	Risks that individuals choose to take (e.g. smoking or driving fast)	↓
Familiarity and proximity ⁹	Risks that are close, in the sense that they affect the individual’s living space	↓
Dread	Risks that are associated with particularly frightening or dreaded outcomes, frequently related to health	↑
Inequitable distribution of risks and benefits	Risks that are likely to have the most severe effects on the people least able to cope: while there is a strong social incentive to reject the risk, its existence may benefit some people	↑
Artificiality of risk source	Source of risk seen as unnatural or man-made: this tends to amplify attention to the risk and often decreases risk tolerance	↑
Blame	Responsibility for the risk and its potential negative impacts can be attributed to some person or persons. This tends to encourage a search for social and political responses	↑

⁹ Some risks are seen as less threatening by those who live nearest to them: this is the case with nuclear power stations, for example.

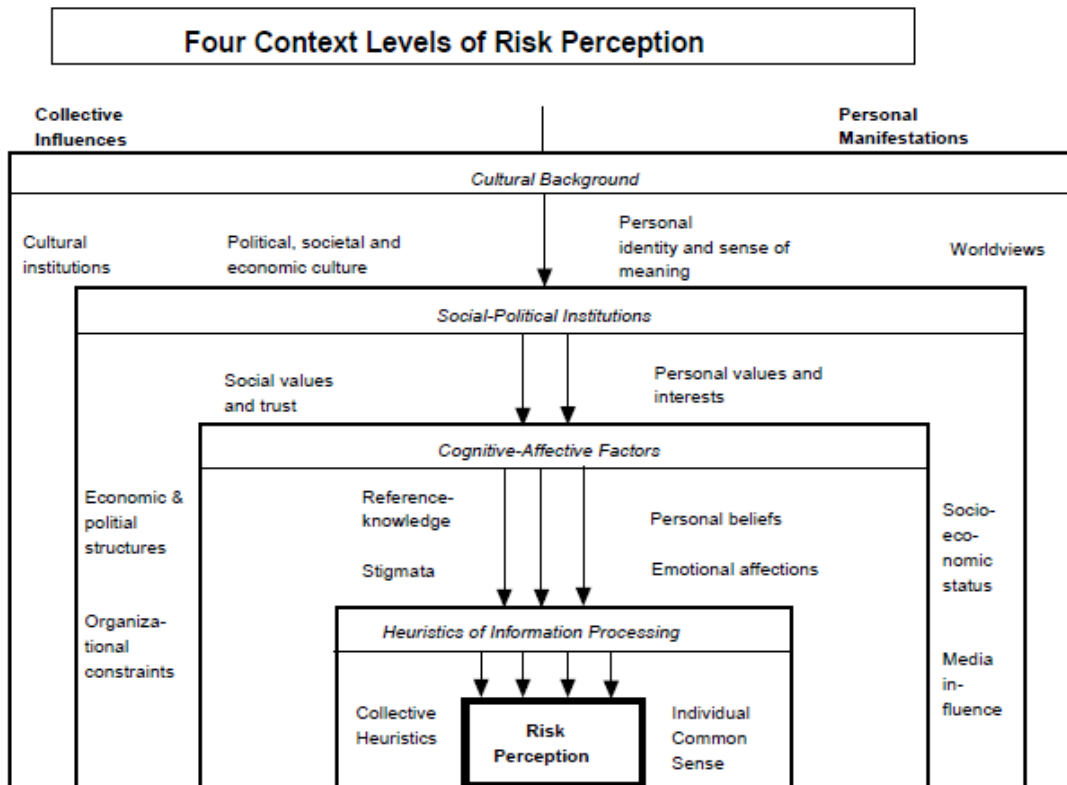
Other risk characteristics known to influence risk perception include:

- **Scale and extent of the risk and relationships between risks:** the greater the area or range of things that could be impacted by an issue or phenomenon, either directly or through knock-on effects, or the more severe the impact, the worse it is considered to be. This is associated with the risk's 'catastrophic potential' (Slovic *et al.*, 1982:84). As a rule of thumb, people tend to be more worried by risks that occur infrequently but that could potentially have catastrophic results (such as nuclear accidents) than by risks that are likely to occur more often but with less catastrophic results.
- **Effects on children or future generations:** this is linked to a number of the qualitative risk factors listed above such as Voluntariness and Personal control, as future generations have no choice over risks taken today. Where risks are seen as having impacts that will be felt by future generations, this tends to increase concerns (Covello *et al.*, 1991:67).
- **Formal and informal education:** environmental education and social-psychological contributions have highlighted the importance of early experiences for adults' pro-environmental attitudes and behaviours (Chawla, 1999; Vining and Merrick, 2012).
- In general, **past personal experiences** affect the present day and future person-environment links. This idea further expands the concept of a full-ecology approach (Bonnes and Bonaiuto, 2002), where the ecosystem is a complex system (people and environment) evolving across time including both previous person(s)-environment transactions and their history, as well as the social-psychological constructs and processes (values, norms, habits) stabilising them. In fact, childhood and adolescence environmental experiences, both formal and informal, are seen as contributing to the formation of the personal environmental agendas that people will follow in later life, in terms of values, norms, cultures, habits, behaviours.
- **Trust:** Wachinger and Renn (2010:18) note that:
...trust is used as a shortcut to reduce the necessity of making rational judgments based on knowledge by selecting trustworthy experts whose opinion can be considered as accurate (Siegrist and Cvetkovich, 2000: 714). This can result in a reduction of the uncertainty, but due to the fundamental affective dimension of trust (which involves items like honesty, integrity, good will or lack of particular interests), the people may feel more at risk if their trust in experts is lacking or damaged (Espluga, 2009: 268).

Trust is not a characteristic of risks but of the context in which risks are perceived. If people lose trust in experts or authorities, it can be very difficult for that trust to be recovered (Petts, 2002:10).

In an effort to bring these diverse elements together in a single model, a number of writers have sought to develop integrative models of risk perception (Breakwell, 1994; Renn and Rohrman, 2000:221). Figure 12 shows Renn's model consisting of four levels of contexts for risk perception (2008).

Figure 12: Four context levels of risk perception (Renn, 2008)



This model suggests that an individual’s perceptions are influenced by both collective as well as individual factors. At the broadest level, there is the influence of their cultural background including wider political, societal and economic values as well as their personal identity and cultural values. Below this come the levels of socio-political institutions (including national and international governance systems), cognitive-affective factors such as knowledge, personal beliefs and feelings and mechanisms or heuristics for processing information, including ‘common sense’. This model suggests the complexity of the interactions between value systems and risk perception factors.

The focus groups have provided an opportunity to explore these factors and the relationships between factors in shaping perceptions of individual risks. In some cases, for example in relation to familiarity, the direction of influence has been found to vary from that shown in Table 7 (frequently familiarity and proximity were found to increase awareness of and concern about environmental risks, instead of increasing tolerance of those risks). Renn *et al.* (1992) explain the evidence that some risk factors can either increase or decrease perception of risk as the result of ‘social amplification or attenuation’ processes. Social amplification occurs when psychological, social, institutional, and cultural processes act to increase or decrease perceptions of a hazard and shape behaviour (Pidgeon *et al.*, 2010) This can either lead to the emergence of a social demand to mitigate the hazard (in turn generating a perception of the risk as being greater) or on the contrary, increase tolerance of it. Socioeconomic factors together with environmental awareness affect the process of amplification, but recent research (García-Mira and Lema Blanco, 2007) has proven that the role of trust and information is key when explaining the different levels of tolerance that a familiar risk can achieve.

Studies on climate change (Whitmarsh, 2008) have shown that people who have had direct experience of flooding or those with asthma are more likely to accept that climate change is a serious risk, even when social norms or available information suggests a different view. The primacy of direct experience over second hand information received

through the mass media and other channels helps to explain why social amplification processes might result in different levels of tolerance to a familiar risk.

4.2 Describing environmental risks: the Eurobarometer issues

Analysis of the focus group discussions indicates that the way that environmental issues are described in the Eurobarometer survey is not easy to understand with the result that the issues can be interpreted to mean different things. Participants in all the focus groups had questions about the way that the environmental issues were framed: some saying that they saw all the issues as interrelated and therefore difficult to rank individually (Latvia, UK) while others noted that some risks are caused by others (e.g. the relationship between Consumption habits and Waste was mentioned in the Spanish focus groups). Participants in all countries asked questions about the issues in order to get a better understanding of what they meant or covered. This could be one reason for differences between the results of the Eurobarometer survey and this research because quite often some additional explanations were needed.

4.3 Focus groups' discussions of the individual environmental risks

This section compares the ranking of individual risks by focus group participants and experts and examines the focus group discussions of these risks in order to understand how they have been prioritised.

4.3.1 Air pollution

As shown in Figure 10, this risk is ranked highest according to all three measurement techniques used in this report: Eurobarometer, project expert survey and focus groups. Air pollution was considered a high risk by focus group participants in all six partner countries, with all but Slovenia and Spain ranking this risk highest.

Air pollution is an 'established' risk which most people come across early in their lives:

Ever since I can recall, when I was young, maybe at primary school, we only thought about ozone depletion and atmospheric pollution [...] That was the first time I thought about pollution, when I think about pollution, that is the first thing that comes to mind... (Italy, Higher Educational Level)

One participant in Italy said that he saw Air pollution as linked to and a factor in other risks; in this sense, Air pollution appears to be a higher order risk.

I considered air and water as elements that carry everything. (Italy, Lower Educational Level)

Participants in all countries said that they considered Air pollution to have a significant negative impact on human health. Experts also considered the health risk associated with Air pollution as much more important than its environmental risk: it was ranked only ninth as an environmental risk.

Participants mentioned that difficulties in accessing information about air pollution aggravated concerns as it made people feel that the scale of the impact was being covered up:

I think information about air pollution isn't available because government institutions don't want it to be. It's better not to know the actual pollution level and remove monitoring devices from sensitive and high polluted areas. (Latvia, Higher Educational Level)

On the other hand, some participants felt that they could control their exposure to Air pollution and that therefore this issue was not of high concern:

I don't think that noise and air pollution is a big problem. I spend a lot of time in my car and I don't think I'm affected by these issues. (Latvia, Higher Educational Qualifications)

Participants in Slovenia said that they didn't need to worry about Air pollution because of the small size of their cities. In other places participants were very aware of Air pollution because of specific local problems: emissions from an oil refinery and cargo ships in A Coruna (Spain), a very recent Air pollution incident that had been in the news in London.

4.3.2 Water pollution (seas, rivers, lakes and underground sources)

This risk was ranked high by Eurobarometer respondents, focus group participants and experts, with experts putting the risk slightly lower than the other two types of respondent. Focus group participants in Spain put Water pollution first in their risk ranking. The UK was the only country where water pollution was seen as a medium rather than a high risk. It is interesting to note that only the Spanish focus group participants ranked both Water pollution and Drinking water as high risks.

Local issues around Water pollution in certain locations can make this a highly visible issue for participants. In A Coruna, there has only been a water treatment plant since 2011, before that people were very aware of the risk of faecal pollution and waste water being pumped into the sea. Another factor could be the two oil spills that have affected the Galician coastline, one of which was the Prestige Disaster¹⁰. The adverse effects on biodiversity and economic activities related to the exploitation of natural resources were significant. One participant in Spain also mentioned Water pollution in relation to fracking (hydraulic fracturing), which had been the focus of political campaigns.

Some locations are less affected by some of the urban, modern society problems common to big cities like Rome or London.

I think we are just very fortunate here and so we cannot grasp either issue [polluted water or polluted air]... I just think... we basically have everything. (Slovenia, Higher Educational Qualifications)

Water is valued as a basic human need throughout Europe.

Box 1 looks at the case of Slovenia, where the risk of Water pollution was discussed from a range of perspectives, bringing out how shared views about the importance of this resource lead to greater interest and concern about its protection.

Box 1: Reasons for concern over Water pollution in Slovenia

Almost all Slovenian participants (13/14) ranked Water pollution as one of the issues highest in their concern. Water pollution was ranked high by the majority of countries, however Slovenian participants referred to a wide range of reasons for their concern, identifying various aspects and routes of understanding in relation to the same issue. For instance Agricultural pollution, Drinking water shortage, Waste and Depletion of natural resources, were all reviewed in relation to Water pollution. In particular, Agricultural pollution was viewed by members of both educational levels mainly as water pollution caused by agriculture: both water pollution and agricultural pollution were included in their priority concerns. Experts in Slovenia also ranked Water pollution as a medium to high risk.

As in other countries, some participants commented that water (along with air) was one of the essential elements of the environment and a prerequisite for human life. As such its preservation was considered as of most importance:

Can you survive longer without air or water? – this is the question (Slovenia, Higher Educational Level)

Because water is, as we say, the true source of life, one of the key elements... So

¹⁰ The Prestige Disaster was the name given to the oil slick over the winter of 2002 and 2003, which was caused by the sinking of the oil tanker Prestige off the coast of Galicia. It contaminated more than two thousand kilometres of the coastline in Spain, Portugal, France and other neighbouring countries.

everything starts and ends with water, not only in appearance, but it also affects the wider environment, therefore it has an impact on the quality of life ...It has influence on every individual, transport, industry, waste; practically everything. (Slovenia, Lower Educational Level)

I will just say that the basic privilege for good quality of life of any individual is to have clean water and breathe clean air. (Slovenia, Lower Educational Level)

Maintaining the quality of water appeared to be a collective or social value in Slovenia. Focus group participants talked about the need for action to deal with water pollution and were keen to preserve an important resource that provides benefits to the national economy:

Water pollution is somehow more important for livelihood than air pollution, because we live in Slovenia, we do not live in Munich or London or similar cities, where air pollution is greater. (Slovenia, Lower Educational Level)

We've got a lot of water and it is of good quality, so it would be very wise to do something to retain this quality and do something for the environment. (Slovenia, Lower Educational Level)

Slovenia's vast water resources were therefore seen as - one of the few - national, natural resources. Participants argued that the Depletion of natural resources comprises various types of pollution and since water is a natural resource, its pollution is in a sense part of the depletion/abuse of natural resources. One of the participants mentioned a concern that water quality could also be at risk if water were to become a focus for conflict:

It would be sad if we fight over water, but the question is whether this is already happening. (Slovenia, Lower Educational Level)

Participants commented that information about water-related topics was readily available from a number of different sources, ranging from public utility companies to public campaigns and documentaries, as well as the Ministry of the Environment. This suggests that there are strong social values about the importance of clean water which are in turn reinforced by information and awareness campaigns.

4.3.3 The impact on our health of chemicals used in everyday products

This risk was ranked high by Eurobarometer respondents and focus group participants as a whole. However, a breakdown of results between countries shows that this risk was only ranked high in Italy and Spain; focus groups in Latvia, Romania, Slovenia and the UK gave the same ranking of medium as the expert respondents.

One of the most frequent associations made by participants was between chemicals and negative impacts on human health and the environment. Participants in the Romanian focus groups were concerned about what they perceived as links between chemicals and health conditions that are known to be particularly dreaded such as cancer and genetic abnormalities as well as allergies and respiratory diseases. Participants gave the example of creams damaging the skin of young women and girls, seen as vulnerable. A more detailed discussion is provided in Box 2.

Box 2: Public concerns about Chemicals in cosmetics in Romania

The two main sources of concern for participants in Romania, with reference to Chemicals in products, were the negative health impacts associated with chemicals in cosmetics and food.

Cosmetics were believed to affect users' skin, causing rashes, allergies and premature aging of the skin:

You buy a cream because it says it does your skin good, but then you wake up with

all sorts of pimples. (Romania, Higher Educational Level)

This was seen as a disturbing issue as it affects vulnerable members of the population, since such products are often used by young women:

There are many girls of 16, 15, 14 years old that have their faces destroyed due to cosmetics. A lot of foundation cream, which attacks the skin...diseases and everything. (Romania, Lower Educational Level)

A similar point was made by a participant in Spain:

I think it is important because it affects our health. Because every day I see so many allergies, many ... because of the chemicals ... that we can check. As a housewife I check what will affect my family. (Spain, Lower Educational Level)

Participants in Slovenia referred to the negative health impacts of Chemicals in everyday products as a source of concern. One participant in Slovenia noted:

Now we actually feel polluted air and contaminated water... but how many actually feel the chemicals? And how little you are actually informed of who fell ill because of I don't know what. (Slovenia, Lower Educational Qualifications)

However, one participant in Latvia pointed out that there were benefits as well as risks of having chemicals in everyday products. This is likely to diminish attention to the risks of these products:

But I believe that chemicals in food are responsible for obesity. But on the other hand our life expectancy is getting longer and longer. So it means we are well adapted and better medicines are available. (Latvia, Higher Educational Qualifications)

4.3.4 The growing amount of waste

There was a considerable difference between the expert and lay ranking of this risk, with experts seeing it as a low risk while Eurobarometer respondents and focus groups assessed the risk as high. There were also noticeable differences between countries: focus groups in Italy, Romania, Slovenia and Spain only ranked Waste as a medium risk, while in Latvia and the UK the focus groups ranked this as a high risk.

There was a strong tendency for focus group participants in all the countries to consider the moral issues associated with waste management. A participant in one of the Romanian focus groups, for example, had been struck by a documentary showing the impact of waste on ocean environments:

I saw a documentary about waste in oceans and there are islands of waste, penguins eating plastic. The environment is affected by the carelessness of people. (Romania, Lower Educational Level)

A similar focus on the moral and social responsibility aspects of waste issues is reflected in the example from the UK focus group.

Box 3: Personal, corporate and social responsibility for waste management in the UK

Following from the discussion on potential solutions, participants looked at the sources of waste and identified both private and corporate responsibility. Household waste was mentioned by a few respondents and was linked to individual responsibility in our consumer choices and recycling habits.

At a corporate/company level participants focused on food waste from restaurants:

The waste as well, from all the restaurants, and all the oil that goes into the gutter.

I've worked in places since I was 16, in MacDonald's and stuff, and the amount of

stuff we used to waste, even Woolworths, every single day we were throwing stuff in a bin and we couldn't take it home... (UK, Higher Educational Level)

One person made the case that companies encourage over-consumption in order to increase their sales and their profits:

Why are we over-consuming? (...) What's behind that is businesses making money... they've got to sell goods and they want us to buy them and we're buying things we don't need necessarily... (UK, Higher Educational Level)

Responsibility was also attributed to the government not for being a source of waste but for inaction in dealing with the issue:

The government should get fined if they don't make the companies deal with the waste properly, but their levels of what they have to do are nowhere near what they should be, and that's the problem. The fines should be a lot bigger and the companies should be told they have to recycle much more than they do. (UK, Higher Educational Level)

One of the youngest participants argued that he would be encouraged to do more if he felt part of a greater cause and a greater effort from the government to improve what is currently being done on this issue. This can be linked to similar comments on proportionate responsibility and how it can affect people's sense of responsibility and willingness to contribute towards the solution.

There's no government effort really ... okay, there probably is but at least I don't see a big effort ... I'm not going out looking for it because again I'm not feeling that I'm joining a cause of enough people in this country. (UK, Higher Educational Level)

The distrust of institutions and poor governance was one of the reasons invoked by participants to give greater relative importance to some environmental issues. Overall, environmental protection was assessed as insufficient and erratic. Many of these comments were made in relation to the issue of waste management.

That is, you're killing yourself recycling and in the end you do not know where all this waste is going. (Spain, Higher Educational Level)

Some time ago I started to collect glass, metal, plastics and food remains in separate bins. And I also taught it to my child. But then I saw that all bins were emptied in one car! My enthusiasm disappeared. I'm not doing it anymore. (Latvia, Higher Educational Level)

I think governmental and controlling institutions are not able to control; e.g. in Scandinavia penalties are much higher. (Latvia, Higher Educational Level)

4.3.5 Urban problems (traffic jams, pollution, lack of green spaces, etc.)

These risks were ranked high by focus group participants as a whole and very high by experts: this was the second highest risk in the expert ranking. However, the risk was ranked low by Eurobarometer participants.

The description of this risk is not very specific and this may have led participants to interpret it in different ways. The two focus groups in Slovenia ranked the risk differently, with over half of the group with lower educational qualifications considering it a high risk while none of the group with higher educational qualifications saw it as a priority. Participants in the group with higher educational qualifications said that they had taken into account the scale of urban settlements in other countries, especially in longer-standing EU Member States and felt that things considered Urban problems in Slovenia would be minor local issues when viewed on an international scale.

4.3.6 Agricultural pollution (use of pesticides, fertilisers, etc.)

This risk was ranked medium by both Eurobarometer respondents and focus groups; while experts ranked it high, the gap between the overall scores of the experts and those of the two lay respondent groups was small.

Some participants in Slovenia mentioned their concerns about the impact of agricultural pollution on water resources. The direct involvement of some focus group participants in growing vegetables meant that they many had direct experience of the risk:

You are drinking on the terrace and a neighbour comes along in a mask and starts spraying pears there, apples here, using ... you don't want to know what product. And you ask yourself, is this stuff going on the herbs I keep on the terrace? (Slovenia, Lower Educational Qualifications)

4.3.7 Loss or extinction of species or their habitats and of national ecosystems (forests, fertile soils)

This was ranked as a medium risk by all three types of respondent. Only the Spanish focus groups ranked Biodiversity loss in their top five risks. The relatively greater importance given to biodiversity can be explained by the fact that the region of Galicia, where the focus groups were held, is an area where biodiversity has suffered from several threats during recent years; two oil spills affected the Galician coastline, one of which was the Prestige Disaster. The adverse effects on biodiversity and economic activities related to the exploitation of natural resources were significant.

In Slovenia, loss of biodiversity was seen as a future more than a current risk, associated with the kinds of development that participants felt were likely to take place once the economy recovered:

If we had more prosperity, if the economy was booming and we had higher [economic] standards, even more highways would be built... (Slovenia, Higher Educational Qualifications)

In Italy participants were concerned at the lack of objective and reliable information about biodiversity:

...with respect to the extent of the phenomenon [loss of biodiversity], information is completely missing. (Italy, Lower Educational Qualifications)

4.3.8 Depletion of natural resources

This risk was ranked low by experts, high by Eurobarometer respondents and medium by focus group participants. Focus group participants in Spain ranked this risk sixth, reflecting the dependence on natural resources of Galicia, where the groups were held.

I have chosen the depletion of natural resources because for me this also includes water and I think without these natural resources the chain of life is broken. That is, if there are no natural resources, then there is no food, no ... anything. (Spain, Lower Educational Qualifications)

4.3.9 Our consumption habits

This risk was given a high ranking by experts but was ranked low by Eurobarometer respondents and focus groups as a whole. However, the focus group average hides quite a range of values: UK focus groups ranked Consumption habits as one of the top five risks, Spanish focus groups ranked it as a medium risk and the remaining country focus groups ranked it as a low risk.

While Consumption habits weren't generally seen as a high risk by focus group participants, most groups talked about the impacts on the environment of the drive for increasing consumption:

This is us, people. We want to have highways to get fast from one location to another, we want to have internet, the phones; this is the consumer, that then sets the rule of the game, isn't it? (Slovenia, Lower Educational Level)

In Spain participants linked a number of environmental issues with changes in lifestyle and the abandonment of traditional livelihoods. They suggested that in recent years and as a result of these changes people have become disconnected from nature and fail to recognise how society continues to depend on natural resources. In addition, participants highlighted environmental problems that stem from contemporary lifestyles, with one of them commenting that *"We live as if we had another planet"* (Spain, Higher Educational Level)

In Italy some participants commented that people could and should play a role in avoiding or reducing risks:

You can avoid it with information, for instance checking where the product comes from, what is inside the product, there is also a part you (can play). (Italy, Higher Educational Level)

This pollution should really be taken into account and each of us should take a good hard look at ourselves and pollute as little as possible. (Italy, Lower Educational Level)

Similarly participants in Latvia recognised a level of personal and social responsibility in the short-term as well as looking forward into the future. Here Consumption habits were seen as the main tool for developing more sustainable behaviours, rather than as a risk:

Our consumption habits are important: we can choose food, lifestyle. I think the supply-demand relationships are working here as well. If our needs are very low and we agree to consume low quality food, then the market will be full of low quality goods. (Latvia, Higher Educational Level)

4.3.10 Shortage of drinking water

All three types of respondent ranked this as a medium risk with Eurobarometer and experts giving it slightly higher priority than focus groups. Some participants said that drinking water is an important issue because of the centrality of water to life:

I think air pollution is more important, air or water pollution are more important than it [loss of biodiversity] because air and water pollution include it. (Italy, Lower Educational Level)

However, for many participants, shortage of drinking water is a distant risk in the sense that it is seen as affecting people in other countries but not being likely to affect participants or those that they know. Proximity of a risk can be seen through two different dimensions/scopes, though its effect on how people respond to environmental risk is the same. Specifically, participants considered less concerning those risks that were deemed to be distant, in either of the following aspects:

The hardest thing to consider is something that is considered to be so far away in time as drinking water shortage. (Italy, Higher Educational Level)

Without personal experience, participants often found it difficult to relate to environmental issues or understand their importance.

4.3.11 Land take (i.e. that more land is used to build roads or cities and that cities expand into the surrounding countryside)

This risk was ranked low by all three types of respondent. In the case of the focus group participants, the main reason seems to have been a lack of familiarity with the concept. The UK focus groups ranked the risk slightly higher than the experts. Discussions of pressures on land are topical in London. However, few other groups seem to have considered it. In Slovenia the lack of interest in the topic of land take was explained by

the fact that Ljubljana, where the focus groups were held, is a smaller, less developed city.

4.3.12 Soil degradation

This was ranked as a low risk by all participants, with focus groups giving it a slightly higher priority.

Romania was one of the countries where the risk of soil degradation was discussed. Participants considered there were links between Soil degradation and Depletion of natural resources, with both risks associated with current practices in the food industry, such as the use of chemicals to replace natural ingredients missing from everyday food products. Participants recognised the issue as important, but felt that measures could be applied to address the risk, such as controlling the use of pesticides and fertilizers, to moderate soil degradation.

4.3.13 Noise pollution

Experts ranked this a medium risk while the lay respondents (Eurobarometer and focus groups) ranked it a low risk.

Noise is experienced directly by people and by many people in living in cities. This makes it an immediate risk:

Sometimes I think about environmental issues. I think quality of food, air and noise pollution are the issues that most affect my life (Latvia, Lower Educational Qualifications)

However, for others Noise pollution was a low priority risk. For these people, familiarity was equivalent to "getting used to" the issue and made it appear a lower rather than a higher risk. Familiarity therefore appears to be a secondary risk factor, either amplifying or reducing the level of concern depending on the initial perception of the importance of the risk.

Participants in group with higher qualifications in the UK considered that people could control their exposure to noise:

I used to live in London and complain a lot about the noise and somebody had said 'if you don't like noise don't live in London' and I saw that they were absolutely right, so I'm happier now that I've moved out. (UK, Higher Educational Level)

Participants in Slovenia commented that Ljubljana, where the focus groups were held, is a smaller, less densely populated city and noise is not a significant issue.

4.3.14 The spread of harmful non-native plants and animals (invasive species)

This was ranked low by all three types of respondent. The decoupling of modern lifestyles from care for nature means that many people have little understanding of ecosystems and their complexity and the homogenization of species is socially accepted. In Spain one participant talked about the way that the spread of (non-native) eucalyptus was no longer seen as an issue, because people have forgotten what other species of tree look like.

Introduction and diffusion of invasive species does not seem to concern people at a first sight (it was never chosen as a priority risk). However, during the discussion both focus groups found examples of species (mainly parasites), which have recently appeared in Italy, that have important consequences on human life, agriculture and economics.

Overall, this issue seemed to be hard for people to grasp initially but was actually quite familiar once they had understood it. This was partly because of some recent highly-publicised examples:

I personally eradicated an invasive plant with an excavator and 4 years later this plant is bigger and stronger than before. (Italy, Lower Educational Qualifications)

4.4 Key findings regarding influences on understandings of environmental risk

Comparing the risk factors identified in academic literature with the evidence obtained from the twelve focus groups, some findings emerge about the way that this sample of lay people understood and assessed the environmental risks presented to them.

- Scale and severity is an element of scientific risk assessment which was also taken into account by focus group participants. Participants in all countries discussed the range and scope of the effects of the different risks including the potential loss of the benefits provided by the environmental resource at risk and stressed the consequences and knock on effects across issues. Looking at the interrelationship between issues, the higher the degree of overlap between issues, the higher the importance participants assigned to them.

Participants also considered how some issues affected other ones (e.g. Agricultural pollution affects Drinking water shortage). The more an issue was felt to affect people, places and other issues, the more important it was perceived to be. The direction of causality between issues was another criteria used when prioritising risks. If participants perceived a problem as the cause of others, this was highlighted:

If we did not have a certain way of life we might not have had this problem with water, with air ... so the problem that then becomes most important for me is consumer habits. Water and air are not polluted by themselves. (Spain, Lower Educational Level)

The impact of chemicals can be seen in daily products, agriculture, on fauna and soil...it has a complete impact. (Romania, Higher Educational Level)

This includes both overlaps between environmental issues as well as relationships between risks, in particular causal relationships in which one environmental risk or issue was seen as giving rise to others. Risks that were thought to influence many other phenomena or areas tended to be seen as more important by participants:

I considered air and water as elements that carry everything. (Italy, Lower Educational Level)

- Several participants recognised the link between risk and uncertainty:

[Risk] sounds to me like uncertainty ... something that may happen or not. It is not known. (Spain, Higher Educational Level)

Although some focus group participants appeared to make a link between the concept of risk and the element of uncertainty, it is not clear from the discussions whether this factor increased their worry and, if so, in what circumstances and with what results. One Romanian participant explained that he felt risks are higher when they are uncertain and when they are happening at a larger scale. For example, he considered global warming an uncertain risk because people do not know when the consequences will happen or how disastrous those might be. Other participants noted that the greater the uncertainty, the bigger risks seem to be.

- Impacts that occur over the long term or that are likely to affect children or future generations were seen by many to be particularly worrying:

(...) when buying products I want to know where this comes from, what that is ... and I don't want fracking being used and then having to drink the water ... I don't want this for myself, nor for those left behind me if I die. (Spain, Higher Educational Level)

- Certain kinds of impacts are known to be particularly dreaded, for example because of their “invisible, imperceptible and corrupting nature, which, like a poison, is able to penetrate into the body and even into the genetic material of the people, affecting not only them but their offspring as well.” (Wachinger and Renn, 2010:17) Participants mentioned health impacts such as cancer and diabetes as causes of concern when discussing Chemicals in products, for example.

For me, it seems that risk is connected to fatality. (Romania, Lower Educational Level)

- Familiarity and proximity: participants generally showed greater interest in and concern about issues that were close to them in the sense that the issues were seen as affecting their living space. Proximity and familiarity were the factors mentioned most often by participants to explain their prioritisation of environmental risks. While familiarity with risks tends to increase risk tolerance, where proximity is combined with other factors that heighten the perception of risk, particularly dread, proximity means that the problem feels more pressing and urgent and can contribute to increase concern.

In Italy participants stated that they considered issues that impacted them directly as more important than ones which had an impact on other people. Across the countries, most of the participants made the point that the environmental issues they can see and experience feel more immediate:

For me, the problem is what I can see. (Slovenia, Lower Educational Qualifications)

When asked about environmental risks, most focus group participants first mentioned environmental issues that are close to them and that are associated with negative impacts on their own lives or the daily lives of friends, neighbours or family. Focus group participants talked about unpleasant smells, health effects (particularly on vulnerable people like children and older people):

Food contains a lot of chemicals – my family and a lot of people I know are suffering from allergies mainly due to the chemicals in food. (Latvia, Higher Educational Level)

This reflects a vested interest (Sivacek and Crano, 1982). This is the perception that something (in this case a certain kind of environmental risk) is both important and relevant to one’s own wellbeing, for example, because of its harmful health effects. Vested interest increases people’s perception of environmental risk, and strengthens the relationship between attitudes and behaviours, making it more likely that they will take preventive and/or coping measures (De Dominicis *et al.*, 2014). It has also been shown that communications about environmental risks that refer to vested interest are more effective in promoting preventive and coping behaviours than ones that are not based on vested interests (De Dominicis *et al.*, 2014).

- Degree of personal control or efficacy: people said that they felt more worried about environmental risks when they didn’t know how to or could not avoid them:

I’m worried about water quality in public beaches. I’m afraid to swim there because information about water quality is not available. (Latvia, Higher Educational Level)

Similarly, participants felt that they were able to control some environmental risks like noise and therefore worried less about them:

I am close to Trieste Street, we have a railway and a city ring road, but now the windows are noise-proof so when you close them everything disappears. (Slovenia, Lower Educational Level)

However, the nature of environmental risks means that it is often impossible for individuals to control them or limit their exposure (for example to air pollution). In these cases, the degree to which the responsible authorities are seen to be controlling these risks affects how people see them.

A sense of personal control seems to have reduced the concerns of focus group members about risks such as Chemicals in products (where information was available and people were effectively able to choose between products with or without chemical ingredients).

- Social values: most people felt that they and others should take some responsibility for their environment, for example by not littering and by recycling. People tend to feel angry and concerned by evidence that others are not doing their bit. This affects perceptions of environmental issues like waste. This moral dimension of environmental risk appears to differentiate lay from expert assessments. However, in the absence of qualitative work with experts, it should not be assumed that expert judgements take no account of moral considerations.
- Lack of trust in institutions: this relates to a belief that institutions (both public authorities and private companies) are not managing environmental risks effectively. Concern associated with the lack of trust in the efficacy of institutions was exacerbated when the institutions were also considered to be unwilling to control the risk, for unethical reasons like greed or corruption or if they were not truthful or transparent about what they were doing:

People in the Environmental Ministry are bureaucrats, they are just pen pushers simulating activity on paper at their desks. (Latvia, Lower Educational Level)

Because we are full of reports that are paid by companies under the table and while they say everything in this product is wonderful, we are getting poisoned. (Spain, Lower Educational Level)

The distrust of institutions and poor governance was one of the reasons invoked by participants to give greater relative importance to some environmental issues. Overall, environmental protection was assessed as insufficient and erratic, leaving a negative balance that includes the proliferation of agents harmful to the environment and health such as GMOs¹¹, and the generally poor conditions of natural resources. Participants in most of the focus groups contrasted the situation in their own countries with information they had seen or direct experience of countries like France, Germany and Sweden which were cited as exemplary and where the environment itself is said to be a priority.

Several respondents in Spain referred to the free market economy as a source of environmental problems and resource depletion. The excessive influence of interest groups on governments was used to explain a governance model where the state of the environment is not a priority but is even threatened by international trade agreements, in which context the TTIP (Transatlantic Trade and Investment Partnership) between Europe and America was mentioned. A number of participants in other countries also pointed to profit-driven corporations for a series of environmental issues and highlighted that the state is responsible for imposing the legislation, monitoring and controlling compliance and safeguarding the citizens.

In contrast with the generalised lack of trust in the authorities and the media, a number of participants – though not all – did express confidence that science and technology would bring progress and solutions to some of the issues being discussed.

¹¹ Genetically Modified Organisms

Overall, participants in Italy seem not to trust institutions and to feel powerlessness and as though they had no personal control over environmental risks. Yet at the same time, participants seem to have quite a lot of trust in progress, considering that scientific discoveries and education will help to improve the current situation and overcome some problems. Participants in the Lower Educational Qualifications group suggested that there should be a central institution to provide clearer and more trustworthy information about environmental risks.

We need a central institution to provide transparent scientific communication.
(Italy, Lower Educational Qualifications)

However, it is also important to point out that several participants in the Italian focus groups said they do not use the websites of institutions like the European Union. One participant in the group with lower educational qualifications said that the information these sources provide is too technical and diffuse and thus hard to understand and use. The importance of media and education in shaping representations and raising awareness about environmental issues suggests that it is very important to talk about these issues, either in the media, at school or in families.

One additional factor discussed in some focus groups (for example in Spain and the UK) related to the global dimension of some environmental risks. While local risks (proximity) and familiarity with their actual or potential impacts was clearly something that many participants took into consideration when assessing the risks, some also mentioned the relevance of global dimensions. For example, one Spanish participant expressed concern about the deforestation of the Amazon, describing it as "*the loss of the lungs of the planet*" (Spain, Higher Educational Level).

Different processes appeared to be at work in leading focus group participants to raise to global dimension of risks. In the UK the group with higher educational qualifications included several people who had lived abroad as well as one participant who had a particular concern about global justice. This meant that global perspectives were repeatedly brought into the discussion in this group, whereas the UK focus group with lower educational qualifications rarely touched on global concerns. It may be that people with higher qualifications are more likely to travel abroad or to have studied or be familiar with information about other countries, but this would need further investigation.

Like proximity and familiarity, the degree to which a global dimension acts to amplify or attenuate the perception of riskiness seems to depend on whether or not the risk is initially perceived as high.

Finally, there was also evidence of efforts by participants to find ways of focusing on the positive elements of risks, either consciously or unconsciously. One consideration that was mentioned by a number of participants as mitigating concerns about environmental risks was the belief that science would find solutions to the problems that exist today:

(...) new technologies are also reducing pollution. If oil disappears, I mean now, tomorrow perhaps we will have an alternative energy ... (Spain, Lower Educational Qualifications)

Some participants were explicit about wanting to avoid thinking about things that would make them angry or upset:

I think sometimes we prefer misinformation for comfort. I mean I'd rather not know what I'm getting into if it is cheaper, more affordable, and more convenient ...
(Spain, Higher Educational Qualifications)

These discussions reflect perceptions and concerns of members of the public that seem very different from the type of calculation of risk made by experts. However, as the analysis of the expert survey findings suggests, there are also great differences in

perspective between experts and this should be considered in any attempt to generalise findings.

4.5 Comparison across countries

4.5.1 Comparison between six focus group countries

Given the importance of contextual factors – both the geography, physical features and climate of the place one lives as well as its socio-economic, political and cultural systems – in shaping risk perceptions, focus groups in the six project countries would be expected to have different views of some or all of the environmental risks discussed. While responses to many risks were similar, the influence of geographic, cultural and socio-political context was apparent in relation to others.

Table 8 uses a ‘traffic light’ system (High, Medium, Low priority concern) to show the similarities and differences between countries based on focus group participants’ levels of concern (see Appendix 8 for an explanation of how responses have been converted to a ranking).

Table 8: Comparison of environmental risk concern across partner countries

Environmental Risk	UK	Italy	Romania	Spain	Latvia	Slovenia
Air pollution	High	High	High	Medium	High	High
Water pollution	Medium	High	High	High	High	High
Chemicals in products	Medium	High	Medium	High	Medium	High
Waste	High	High	Medium	Low	High	High
Urban problems	High	High	High	Low	Medium	Medium
Agricultural pollution	Medium	Medium	Medium	Low	High	Medium
Biodiversity loss	Low	Medium	Low	High	Medium	Medium
Natural resource depletion	Low	Medium	High	Medium	Low	Medium
Consumption habits	Medium	Medium	Low	Low	Low	Medium
Drinking water shortage	Low	Medium	Low	High	Low	Medium
Land take	Medium	Low	Low	Low	Low	Medium
Soil degradation	Low	Medium	Low	Low	Low	Low
Noise pollution	Low	Low	Low	Low	Low	Low
Invasive species	Low	Low	Low	Low	Low	Low

Key

- High priority
- Medium priority
- Low priority

The table indicates that the focus groups had a similar view of the priority risks: the top two risks (Air and Water pollution) were each prioritised in five out of six countries; in both cases, the country that did not prioritise the risk (Air in the case of Spain and Water pollution for the UK) recognised it as a medium risk. The risk ranked third, Chemicals in products, was also seen as either a high or a medium risk in all countries.

There is a similar uniformity of approach at the bottom of the table: all countries ranked Noise pollution and Invasive species as low risks.

Urban problems (a high risk for experts) were generally seen as a higher risk in countries where the population in city centres is larger in size and density, while these

problems were less of a concern for focus groups taking place in smaller urban centres. However, the Spanish focus groups took place in a small city (A Coruna): this appears to have been a more important factor in participants' perception of the risks associated with urban problems than the fact of being citizens of a country with a number of large and densely populated urban areas. The Spanish focus groups assessed urban problems as a low risk.

Surprisingly, there is no such focus on local experience in evidence in the Spanish focus groups' assessment of the risk to drinking water (a medium risk for experts). Spain was the only country to rate this as a high risk, reflecting the pressures on water resources in the country. However, A Coruna does not share these water problems, being one of the wettest parts of the country.

Consumption habits (a high risk for experts) were considered a medium or low priority by the focus group participants. The UK was the country where Consumption habits was ranked highest, probably reflecting the UK's high levels of consumption but also a widespread awareness of the problems of waste associated with this level of consumption.

4.5.2 Transferability of the findings of the research to the European level or to other Member States

Transferability is concerned with the extent to which the findings of one study can be applied to other situations, in this case, the possibility of generalising from the findings of the expert survey and lay focus groups to other parts of the European Union or to Member States.

Given the small number of participants in the research (104 experts and 108 lay people) and the limited geographical coverage of the focus groups (six countries) the findings cannot be generalised in a simplistic way to the entire European context. However, if certain contextual elements are taken into account, some of the results could be used to suggest likely responses to environmental risks in some specific contexts. The main contextual elements considered to be of relevance are:

- Urban density: risks associated with urban living (e.g. Urban problems, Air pollution, Waste) are more relevant and immediate for urban dwellers and appear to be heightened in more densely populated urban locations (e.g. London, Rome, Riga);
- Geographical and climatic factors: concern about pressures on natural resources including water are likely to be heightened in locations where people have direct experience of the relevance of these to society and the economy (e.g. Romania, Slovenia and A Coruna in Spain);
- Political economy: people in countries that have experienced recent major political and economic change may feel greater uncertainty about the future along with lower levels of confidence in institutions and their ability to manage environmental risks.

In relation to the issue of trust in institutions, it is important to note the low level of trust in both public and private institutions that was expressed across all the focus group locations.

4.6 Comparison between groups with different educational qualifications

Comparison of the risk rankings by the two focus groups in each country shows some differences in results. However, there is no clear pattern in the way that risks are ranked and no general conclusions can be drawn about differences in the level of concern about individual risks of people with different levels of educational qualifications.

Within each country, research teams looked for relevant issues related to educational qualifications. The following points were identified:

- In some countries like Latvia, participants in the higher educational level groups appeared to be better informed about environmental issues. In Latvia some of the participants in the lower educational level group were surprised at some of the environmental risks mentioned (such as Noise) and asked for more information about them. However in other countries like the UK, there seemed to be little difference in levels of knowledge, with the lower educational level participants also demonstrating considerable knowledge about topics that were of interest to them.
- In all countries, participants of both educational levels used a range of information sources. There were some differences between the groups with different educational qualifications in terms of how they looked for or checked information. However, in general most participants from both levels used a range of strategies. Their choice of strategies and types of information seemed to be related to a number of factors, of which educational level and background was only one.
- One channel of information about environmental risks that did seem to be used predominantly by participants in the higher educational level group was the medium of publications and books.
- Higher educational level groups in general were more ready to question and criticise authorities and experts, giving an impression of greater scepticism about the information available. For example several participants in the UK group with higher educational qualifications commented that they didn't trust any individual source of information, even experts:

They [scientists] are often commissioned to either prove the fact of something or disprove it, depending on who's funding. And so they go in there, it's a job. (UK, Higher Educational Qualifications)

I don't think generally scientists are biased, but they get it wrong, and sometimes that happens, doesn't it? They believe it at the time and they think they've proved it and then something else ... we advance more and then something else ... and then they say 'oh right, well no, that's not what I think anymore.' (UK, Higher Educational Qualifications)

- Participants with higher educational qualifications seemed to be more careful in talking about the level of personal control they could have over environmental risks and their ability to influence the situation. They also seemed to be more ready to analyse and explain their choices and evaluations.

4.7 Learning about and developing understandings of environmental risks

While scientists and experts use a technical definition of 'risk', it is less clear how members of the public understand and use the term. This was explored in different ways during the focus group: participants were asked how well-informed they were about environmental risks and where they get information on environmental risks. They were also given a short explanation of the technical definition of risk and invited to comment on it.

This section examines the way that the focus groups discussed these topics and what their conversations reveal about the way that lay people understand and make judgements on environmental risks.

4.7.1 Knowledge of environmental issues and understanding of risks

Members of the public vary considerably in their views about how well-informed they are on environmental issues: this was reflected in the Eurobarometer survey results and was borne out by the focus groups. The UK participants were most confident that they were well-informed, with the majority of participants in both focus groups saying they were either fairly or very well-informed, whereas there was a greater range of views within the Italian and Spanish focus groups. People's perceptions are likely to be influenced by

both external factors like the amount of information on environmental issues that is available to them and its accessibility, as well as their own attitudes about what kind of information they should have. The perception of at least half of the Spanish focus group participants that they were only moderately well-informed about environmental issues may have been linked to a concern voiced in the first focus group, that modern life has become detached from the natural world and natural processes, with the result that awareness of environmental issues has decreased.

Even though many participants said that they were quite well-informed about environmental risks, very few seemed to be familiar with the use of a technical definition of risk in assessing environmental risks. In discussion, few participants seemed to think that the difference between 'environmental risks' and environmental issues or problems was very great or significant. Most said that they did not think there was much difference between the terms, while some, for example in Latvia, seemed to accept that there might be differences but felt that these were hard to understand, implying that this was not relevant for lay people.

A small number of participants in several countries did say that they had come across technical assessments of risk focussing on significance and probability, some in the context of getting their homes or property insured.

None of the participants who were familiar with technical assessments of risk made the case for using this approach to help rank environmental risks.

4.7.2 How lay people get information and develop understandings about environmental risks

Focus group participants were asked to look at a list of potential sources of information about environmental risks and tick all the ones that they used.

They were also able to add other sources of information. Table 9 shows the scores for different sources of information obtained in each country (the country scores aggregate the results of the two focus groups).

Table 9: Sources of information

Source of Information	UK	IT	RO	ES	LV	SI	TOTAL
Social media and the internet	11	11	9	17	16	7	71
Television news	13	9	9	9	13	10	63
Films and documentaries on television	12	7	13	12	11	8	63
Conversations with relatives, family, friends, neighbours etc.	3	8	7	10	8	2	38
Newspapers	8	7	2	10	4	6	37
Publications, brochures or information materials	3	4	6	4	4	5	26
The radio	3	3	2	1	6	3	18
Magazines	1	4	0	5	4	1	15
Books	0	1	1	10	1	0	13
Events (conferences, fairs, exhibitions, festivals, etc.)	0	2	2	2	0	0	6
Other	0	0	0	3	0	0	3
Total sources mentioned	54	56	51	83	67	42	353
Total number of FG participants	18	16	17	23	20	14	108

Base: Focus group participants' response to a multiple choice question. Participants were able to select several information sources.

In every country, half or more of the focus group participants said that they used the Internet as a source of information on environmental issues; however, given the penetration of these technologies across Europe, it is perhaps surprising that so many participants did not use these channels (one half of participants in Slovenia, for example and more than one-third in the UK). Latvian participants reported the highest use of the Internet and social media, at 80% of the two groups.

TV news as well as programmes and documentaries on TV continue to be an important source of information on environmental issues and were ranked the most important source by participants in Romania, Slovenia and the UK. Two possible reasons for the importance of TV as a source of information about environmental issues are that it is a channel that people are likely to encounter regularly (for example, in their own or others' homes) and that the format and presentation is more accessible.

There were considerable differences between countries in terms of the importance attributed to conversations with relatives, family, friends, neighbours and colleagues as a source of information on environmental issues. While this was reported to be a fairly important source of information in Italy, Latvia, Romania and Spain, it was mentioned by only a very small number of participants in both Slovenia and the UK. In several countries (Latvia, Romania, Spain), getting information from these informal sources was mentioned more frequently in the focus group with lower educational qualifications; however in Italy no such difference was observed.

National institutions, habits and culture may influence where people get information about environmental issues. A higher percentage of participants in Spain said that they used newspapers and books to get information about environmental risks, especially in the group with higher educational qualifications: this was associated with a Spanish culture of reading in cafes and bars. In Romania a participant referred to the habit of talking about issues to neighbours while doing community work like clearing waste; another participant said that this sharing of ideas between community members had developed during the 1989 revolution.

Box 4: Information use by educational level in the Spanish focus groups

In the results for the Spanish focus groups there is a clear difference in the information resources preferred by those with higher qualifications and those with lower qualifications. The more educated group tended to use more books, magazines and newspapers while those with lower qualifications said that they used informal resources like talking to relatives much more frequently.

This can be explained as an expression of a Mediterranean culture of spending time in the street, talking to friends, but this behaviour is also a consequence of the lack of trust that people feel towards mass media in Spain, especially television which was the third most-used resource for the group with lower educational qualifications. Higher education is linked to more critical attitudes. There is evidence that political disaffection and distrust on the part of people engaged in conflict with the authorities over an environmental risk make people more likely to recur to resources or information coming from organizations (environmental NGOs¹² – are most often mentioned as credible sources of information) or opinion leaders and this kind of information is more commonly found in books, magazines and the internet (Garcia-Mira *et al.*, 2007:76)

Apart from in Spain, few participants said that they used books to get information on environmental issues. Magazines were mentioned more often in Italy, Latvia and Spain. One magazine that has made an impact in several countries in terms of reporting on

¹² Non-Governmental Organisations

environmental issues is the National Geographic. A UK participant attributed this to the format and striking visual presentation of the information.

There were significant differences between countries in terms of the amount of information that was felt to be available about certain environmental risks and the degree to which people are aware of and interested in these issues. In Latvia, Slovenia and Romania, participants suggested that there was limited information on Chemicals in everyday products, particularly food products. This was a cause for concern, as chemicals were seen as making food 'unnatural' (by enhancing colour, increasing shelf-life, etc.) and might have similar unnatural impacts on consumers. In Slovenia, the lack of labelling or information on imported foods tended to heighten concerns about unfamiliar production processes and controls in the countries of origin.

In almost all cases when participants mentioned an event or story about environmental issues, they could not remember or name their particular source of information. This suggests that they weren't using any single or a small range of sources of information. The reasons why people look for environmental information seem to depend on daily needs, e.g. what to do with waste, what the weather will be like, etc. However some participants said that they do not necessarily search for specific information on environmental issues, but if an interesting looking article pops up while they are browsing the internet, they are likely to read it. This is in line with literature on how people form their opinions regarding environmental risks (Petts *et al.*, 2001).

The proliferation of information through the internet, social media and multiple TV channels was seen as tending to create confusion. In some cases, respondents claimed to consciously avoid information:

No, if you read all the leaflets you would not understand anything. (Spain, Lower educational qualifications)

Sometimes it's better not to know all the details about all chemicals in waste. (Latvia, Lower educational qualifications)

However, discussions in the focus groups showed that many people are using multiple sources of information to develop their understanding of what are often complex environmental issues. Members of the public use a range of different sources to get information about environmental issues. Most people check information about new and unfamiliar subjects: several participants said that it is important to confirm information they come across or look for opposing arguments:

You have to balance it, like with anything really, you listen to both views don't you and you have to trust somebody in the end I suppose. And you base it on hearing both sides. (UK, Lower educational qualifications)

Here lack of trust in public institutions combines with lack of trust in the mass media. The lack of trust in information about environmental risks has been shown to be associated with poor communication strategies used by institutions responsible for the management of environmental risks; poor communications foster the perception among members of the public that no-one is taking responsibility for these issues and there is a lack of control. (Hallman and Wandersman, 1992)

Box 5: Trust and information in Italy

Focus group participants in Italy appeared to have a deep distrust in institutions and sources of information on environmental issues; this distrust is unlikely to be addressed and resolved in a short time. Its origins and causes are multiple and not limited to the contexts of environment management and preservation.

However, it is also important to notice that while on the one hand focus group participants complained about the lack of institutional and reliable information, on the other they said that they did not use the websites of institutions like the European

Union. This raises a question about the content and presentation of these websites, or, at least, how they are perceived by people in Italy. Maybe, as suggested by a participant in the group with lower educational qualifications, people think that the information these institutions provide is too technical and scattered and thus hard to understand and use.

Information on environmental issues and risks could be improved, especially the information provided on websites and social networks, which seemed to be among the main sources people used to get information on these topics. The importance of media and education in shaping understanding and raising awareness about environmental issues suggests that it is very important to talk about these issues in the media, at school and in families.

Scientists and experts were not always seen as being less biased or more trustworthy than other sources. Scientific information was also perceived as inaccessible: participants mentioned several reasons why they would be unlikely to read scientific reports (e.g. too boring, too complex). In some countries, attitudes to scientific information showed some differentiation between educational levels (participants with higher educational qualifications in Italy and Spain were more likely to read books, documents and magazines, for example), while no such distinction appeared in other countries like the UK.

In general participants had sceptical attitudes and distrust toward information sources, including scientific information. However some participants felt that research could be well-presented and influential:

I am more willing to believe a piece of research that has hypotheses, findings and analysis – who participated, in what amount, what problem was solved - than a book that one person wrote. Especially if the research is well presented. (Slovenia, Lower Educational Qualifications)

5 CONCLUSIONS

5.1 Main findings about expert and lay perceptions of environmental risks

The focus group and Eurobarometer assessments of the 14 environmental issues were very similar: eight risks were scored the same, three had minor differences in scores and there were significant differences in the scores for a further three risks: Urban problems (focus groups considered this a higher priority risk), Depletion of natural resources and Drinking water shortage (Eurobarometer respondents considered these higher risks than the focus group participants).

There were also similarities between the focus group and expert assessments: two environmental risks were assessed the same (Air pollution and Biodiversity loss) and most of the others were close. The difference between the expert and focus group assessment was quite high for Water pollution (the focus groups considered this a higher risk) and Consumption habits and Noise (both considered higher risks by the experts).

The environmental risks seen as being of highest concern across the focus groups were similar to the top risks identified by experts.

- Air pollution was ranked as the highest risk across all three types of respondent.
- Both experts and focus group participants included urban problems and water pollution in their top five issues.
- Chemicals in products was one of the top five issues for the focus groups and ranked sixth by experts.
- Agricultural pollution was in the top five risks for experts and was ranked sixth by focus group participants.

There are considerable differences in the assessment of urban problems: this issue came second in the experts' ranking of environmental issues; it was mentioned as a principal concern by only 23 per cent of Eurobarometer respondents; and it ranked in the top five concerns of the focus group participants. The urban locations of the focus groups undoubtedly influenced this result.

The main issue of concern to public participants that was not ranked highly by experts, either in terms of its environmental or its health impacts, was Waste. Focus group respondents in Italy, Latvia, Slovenia and the UK ranked Waste in their top five environmental issues.

Consumption habits ranked third in the experts' ranking; the issue was mentioned by only 24 per cent of public respondents to the Eurobarometer survey and was ranked sixth by the focus group participants. Only the UK focus group participants included Consumption habits in their top five risks.

The educational qualifications of focus group participants seem to have had only a minor impact on their assessment of environmental risks.

The differences between the assessments made by focus groups and experts in different countries suggest that local conditions and issues influenced prioritisation of environmental risks for both lay people and experts. Despite the lack of conclusive results from the comparison of the rankings made by expert and focus group respondents from the same countries, the importance of location-specific factors on risk assessments should not be underestimated.

5.2 Factors that influence lay and expert perceptions of risk

5.2.1 Both expert and lay risk assessments reflect the context of the risk and the focus of the person making the assessment

While the detailed analysis of the expert assessment of the set of environmental risks did not find evidence of bias in favour of the experts' own areas of expertise, regional differences between expert assessments suggest that these have been influenced to

some extent by geographical or politico-economic factors such as quality of natural resources or the focus of national or regional economic activity. This suggests that while it is grounded in scientific evidence, expert assessment of environmental risk is contextualised, that is, it takes account of some elements of the context in which the environmental risk occurs and of the perspectives of the expert making the assessment.

Similarly, evidence from the focus group assessments indicates that lay people are influenced by their individual identity and background and by the collective cultural, institutional and socio-political systems and values within which their lives and activities develop.

5.2.2 Location-specific factors reflected in the focus group discussions include environmental and climatic characteristics, history, geography, politics and economic development as well as cultural factors

A good starting point for developing an understanding of how a group of lay people may interpret or respond to environmental risks is to consider the contextual factors that are likely to influence their values, beliefs and experience. The focus group results indicate that participants tend to be more concerned about the status and protection of the natural resources of their own area or country (e.g. the Slovenians' concern about water pollution; A Coruna residents' prioritisation of biodiversity loss and water issues).

A focus on geography can also provide insights: for example, differences in perspectives on environmental risks can be observed between major urban centres like Rome and London and smaller urban areas like Timisoara and Ljubljana which maintain strong connections to the surrounding countryside. Similarly, History, Politics and Economics may all be relevant for understanding the risk context. For many countries, the shared history as part of the former Eastern bloc countries provides common reference points in the experience of a period of reform and restructuring of the political and economic institutions following the demise of the Soviet Union, accompanied by rapid economic development in the early 2000s which has subsequently slowed.

Finally, cultural factors, attitudes and behaviours may differ between geographic regions, countries, administrative districts and even local areas. Most people identify the cultural features that differentiate them from people from other countries or areas and tend to believe that they have shared national or local characteristic and behaviours which differ from those of other states. In several of the focus groups unfavourable comparisons were made between the lack of pro-environmental attitudes and practices in the local area or country and what were seen as responsible behaviours in countries held up as 'good' examples, such as Germany, Sweden and France.

5.2.3 Qualitative characteristics or factors' explain many of public attitudes to and perceptions of environmental risks

A number of qualitative characteristics of environmental risks were found to influence many aspects of lay assessments of environmental risks.

- Scale and severity: the assessment that a risk will affect a wide area or a large number of people or that its impacts will be serious is an element of technical risk assessment and was also mentioned by focus group participants as a factor that increases the sense of risk for example in relation to Air and Water pollution, Chemicals in everyday products and in some countries, the Depletion of natural resources.
- Proximity of environmental risks contributed to making these seem a more immediate and pressing concern. This seemed to influence the prioritisation of Urban problems and Waste as well as being mentioned in relation to risks like Air pollution. However, it was noted that people often become accustomed to living with some kinds of risks and cease to be so aware of them. It was suggested that proximity tends to amplify or attenuate other risk factors.
- A sense of personal control and efficacy can reduce concerns about environmental risks, for example where consumer choices allow people to avoid

Chemicals in everyday products or noisy places that could damage their health. In contrast, the idea that people are exposed to risks over which they have no control tends to exacerbate concerns.

The wider context in which individuals or groups see and experience environmental risks was also found to be an important factor in determining feelings about environmental risks. Social values can have a strong influence either to reinforce or attenuate the sense of risk. Social values related to taking care of one's own living space appear to have been an important factor in heightening anger and concern about Waste, although this was not considered a high risk from the point of view of a technical or scientific assessment.

One of the main factors that differentiates lay and technical (expert) risk assessment is the tendency of lay people to look for an institution or individual responsible for the issue and its management. Trust in authorities or those seen as managing certain risks was another contextual factor that was discussed in all the focus groups. The loss of trust in authorities is associated with increased concern about those risks for which they are seen as responsible, for example air and water pollution.

Irresponsibility in the management of an environmental issue is a significant factor in a lay assessment of risk and this is clearly illustrated in the case of waste. Members of the public see small scale waste problems all around which may cause negative impacts on their quality of life in terms of visual impacts, smells and liveability; if management does not improve, there is a risk that the problem could escalate and ultimately lead to more serious consequences such as criminality and the loss of property values.

One implication of the centrality of institutional and social responsibility in public perception of environmental risks is that efforts to monitor the evolution of public interest in or concerns about a particular risk should not consider those seen as responsible for managing the risk as independent or separate from the risk, but as being bound up with it. Improvements in management or regulation will tend to mitigate concern (although other factors may intervene to change this).

Bound up with the issue of trust or lack of trust in the institutions responsible for managing the risk, is the importance of the individual's own personal responsibility for managing risks that might affect them or those people and things that are close to them. Where individuals recognise that they have a responsibility for managing risks, for example in terms of eating healthily, this tends to be associated with heightened interest in the issue. The level of interest in eating well and avoiding food and other products that might damage one's own health or that of one's family was a recurring theme in most of the focus groups. This heightened interest may find expression in practical action and many participants talked about looking for information about what they could do about risks of this kind.

If people feel that they are being prevented from taking effective action to mitigate risks to their health or that of their families and friends, this is likely to exacerbate concerns and could ultimately lead to outrage, or a sense of being the victim of something that is wrong, that encompasses both the authorities and institutions associated with the risk as well as the risk itself. One of the environmental risks about which some participants expressed levels of concern bordering on outrage were chemicals in everyday products: it was suggested that producers and public officials were equally complicit in allowing these products to be sold and used in ways that were seen to threaten health.

5.2.4 Trust and information

One of the main factors that characterises lay assessment of risk is the level of trust in the institutions or individuals seen as responsible for its management. This was brought up during the focus groups, with the majority of participants expressing a low level of trust both in national authorities and in experts. The reasons participants gave for their lack of trust included concerns about corruption and lack of official responsibility (for

example in the case of waste management), lack of confidence in the efficacy of the institutions to control risks and lack of transparency.

Lack of trust in public institutions went hand-in-hand with a lack of trust in the mass media. Participants suggested that didn't even trust scientists or experts to give them information about environmental risks, because these experts were seen to be working with or funded by private companies or people with interests to promote, and that therefore they could be seen to be promoting, or at least not to be coming out with criticisms of, these interest groups' agendas.

Given this lack of trust in the mass media and traditionally-respected sources of scientific information and the new possibilities for accessing a wide range of different sources of information, members of the public are developing new strategies for making sense of environmental risks. These include:

- Seeking out multiple sources of information about issues of concern or interest. Rather than just relying on a single TV news programme or newspaper, members of the public now believe that there are, and look for, different sides of a story.
- Seeking out information from more trusted sources. Despite the criticism of a lack of objectivity in much current research, some participants said that scientific research was more credible than other information because it is based on rigorous methods of gathering data to test hypotheses. These participants suggested that institutions like the European Commission were potential sources of more impartial information but were currently not providing information relevant to the needs of ordinary people.
- Being clear about the agendas of those communicating about environmental risks. People tend to lose trust in institutions that are seen as not being transparent about their own interests in a topic.

A number of participants did express confidence that science and technology would bring progress and solutions to some of the issues being discussed. This suggests that there is an appetite for information from scientific institutions particularly where this includes discussion of the ways that the problems identified might be solved. Information is more likely to be useful if it is targeted to specific audiences and contexts. This is likely to mean that institutions seeking to reach wider audiences will need to become more nimble in designing communications for different information channels (social media and broadcast media as well as specialist publications, for example) and in responding to shifts in public interest.

5.3 Transferability of the findings of the research

The focus groups suggested that there were some contextual factors that influenced lay people's assessment and prioritisation of environmental risks, for example urban contexts were, unsurprisingly, associated with heightened concerns about urban problems, as well as with issues such as waste and air pollution. On the other hand, people in urban areas that had closer ties with the countryside and rural economies appeared to be more aware of and concerned about pressures on the natural environment.

When considering the transferability of findings, it is worth noting that that local settings may vary from the national norm, because of differences in landscape and geography but also differences in socio-economic conditions, regional history and identity. For instance, Galicia, where the Spanish focus groups took place, had experienced damage to natural resources as a result of major oil spills affecting the coastline. These kinds of local characteristics or conditions should be identified and taken into account in any attempt to generalise from a small study.

5.4 Pathways to understanding environmental risks

The main conclusions regarding the ways in which participants receive information and develop their understanding of environmental risks can be summarised as:

- A small proportion of lay people spontaneously search for information on environmental issues.
- The majority of people sometimes search for information on environmental issues if these are made relevant to their own interests.
- Information that informs action and response is of particular relevance and interest.
- Once members of the public become interested in or engage with a particular environmental risk or concern, they tend to look for multiple sources of information and employ search strategies to check information.
- The prevalence of the Internet as a source of information is reinforcing the 'information overload' where lay people's information strategies become as much concerned with filtering out information that does not support their own world view or priorities as they are about accessing a wide number of information sources.
- The pathways for accessing information and understanding risks were areas where some difference was observed between respondents with different levels of education. Respondents of higher educational qualifications were more critical of the various information sources, while in some countries they expressed a preference for more formal sources of information, such as books and articles. On the contrary, participants with lower educational qualifications in several countries attributed importance to conversations with relatives, family, friends, neighbours and colleagues as a source of information on environmental issues.
- The need to capture people's interest highlighted the importance of presenting the information in a way that is engaging and easy to understand, regardless of the source.

5.5 Methodologies for researching lay assessments of environmental risks

The use of a mixed methods approach to the research made it possible to obtain quantitative and qualitative data, which enriched the analysis and conclusions of the study. The expert survey was easy and quick for participants to complete, and a healthy response rate was achieved. No qualitative information was collected and this is an aspect that might be reconsidered if the survey is to be conducted again the future.

The use of focus groups in different MS with participants from two different levels of education made it possible to collect data which was then analysed to explore a number of different aspects:

- Expert versus lay perception and assessment of environmental risks
- Responses of participants with higher versus lower educational levels; and between each of these levels and the expert assessment
- Participant responses across six MS countries.
- The main factors influencing the evolution of public perspectives in Europe
- A qualitative assessment of the public perception of environmental risks.

This method could be applied in future research or for monitoring public perception of environmental risk to inform future policy-making.

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Appendix 1: Detailed methodology of expert survey

Sampling method

The study population was scientific experts currently working in EU Member States. Firstly, to generate a list of experts for the survey's sampling frame, a database comprising details of over 800 scientific experts was compiled from the following sources: lists of contacts from project partners within their own Member States, existing lists and databases of European experts in environmental and health risks; the knowledge of the project partners of relevant experts within the six Member States where they are located in particular, as well as from wider expert networks; and lists of experts known to members of the Steering Group. Secondly, a purposive sampling method was then used to select the sample population to ensure respondents met the criteria for inclusion in the sample. The selection criteria for experts are presented in Table A1.1.

Table A1.1: Inclusion and exclusion criteria for selection of experts to invite to participate in the survey

Criteria	Valid	Not valid
Country in which the expert is currently working	Any EU Member State	Other
Area of expertise	Air, Biodiversity/Ecosystems, Health, Noise, Social Science, Soil, Urban and Land Use, Waste, Water, General ¹³	Other
Type of organisation for which the expert works	Public/Government; Academic/Research	Other; Private; Non-governmental organisation
Expert's number of years of professional activity in the specified area(s) of expertise	Five years or more experience in the area(s) of expertise specified	Less than 5

Experts were contacted in two phases (as described below), to enable the team to monitor responses and to ensure that the respondents reflected a balanced distribution across the selection criteria. Within the database of experts, based on the inclusion criteria outlined in Table A1.1, an initial set of 200 contacts were selected to be invited to participate in Phase 1 of the survey, with the following priorities:

- Type of organisation: prioritised experts from national agencies, public research institutes and national contacts for European networks.
- Area of expertise: experts from national agencies for the environment and health within the EU with a broad remit covering a range of risk areas.
- Country in which a respondent is currently working: experts were included from all the Member States.

On receipt of responses from the Phase 1 of the survey, the profile of respondents was analysed to identify any countries or areas of expertise that were underrepresented in the dataset. A further set of 215 experts was then specifically selected from the database to target these gaps. In particular, additional experts were purposefully sought from any Member States with 0 respondents (Republic of Ireland, Portugal and Hungary)

¹³ Areas of expertise categories for the survey are based on the environmental issues listed in the results presented for QA2 of the Special Eurobarometer 416 (2014).

and any areas of expertise with less than 15 responses (air, environmental health, noise pollution, social science and soil, urban and land use, water).

Survey pilot

To ensure that the potential for misunderstanding was minimised and that questions were as precise and unambiguous as possible, a preliminary pilot of the survey was conducted with two to four experts in each of the six project partner countries. The survey was revised in accordance with feedback from respondents to the pilot survey, members of the team and Steering Group. The main revisions made were to:

- Clarify the wording of introductory, explanatory and question text.
- Change the format of the assessment table so that it is more straightforward

Data analysis

Firstly, the survey data from experts' responses was cleaned, with entries checked against the inclusion and exclusion criteria, and entered into an Excel spreadsheet for analysis.

Variation

As stated by Bryman (2004: 229), "*The amount of variation in a sample can be just as interesting as providing estimates of the typical value of a distribution, for example, it becomes possible to draw contrast between comparable distributions of values.*" For example, in this case, is there more or less variability in the severity of impact values given for impacts on the environment as compared with health for each of the 14 environmental risks? The dispersion was measured through standard deviation, which essentially provides a measure of the average amount of variation around the mean and how well the mean represents the data (Bryman, 2004). For this measure, any effects of outlier values are offset by dividing the number of values in the distribution. The standard deviation provided a measure of the consistency in scores assigned by respondents across the sample: the smaller the differences and the closer to 0 in the standard deviation values, the higher the level of certainty across the sample of the probability and/or significance of the impact.

Regional analysis

Data were sorted by area of expertise and by country in which respondents' are currently working. The latter was based on the biogeographical regions in Europe presented in the European Environment Agency's (EEA) *State of the Environment Report* (2015). Four regions were determined: Northern Europe, North-West Europe, Central and Eastern Europe, and Mediterranean Europe. These categories were used to compare the average values of assessment of environment and health impacts by region.

Limitations

Due to the subjectivity in the responses of the experts, described in Section 2.1.4, the only statistical conclusion that can be stated with a high confidence level is that the values provided by respondents are relative.

It is also important to note that due to the methodological decision to elicit separate measurements from respondents for probability and significance of impacts for each risk on both the environment and human health, values for probability have been included in the analysis twice.

Missing data / no responses

Blank fields corresponding to 'no response' from respondents were removed when calculating variance and standard deviation. A variety of reasons could be speculated for why missing data could have occurred, such as: respondents accidentally missing out a field or exerting their right to not to answer a question. What is most likely for this survey is that respondents adhered to the survey's instruction: "*You may leave some rows blank if there are risks you do not have sufficient information for.*" Therefore, it can

be assumed that the majority of no responses are due to respondents not feeling they had enough knowledge about a risk, or the environmental or health impacts of a risk, to make an evidence-based assessment.

Appendix 2: Focus group recruitment

Recruitment was the responsibility of each project partner team. However, a detailed recruitment questionnaire was drafted and used in all partner countries to ensure the participant profile satisfied the criteria in Table A2.1. The socio-structural variables that were used for comparison between the two focus groups in each of the six countries under study are also described in the last column of Table A2.1.

Table A2.1: Variables for comparison within and between the focus groups

Variable type	Categories for inclusion	Notes / Quota
Level of education	<ol style="list-style-type: none"> 1. No higher education degree or trade / vocational training (schooling to 18 years) 2. Higher education degree or trade / vocational training 	<ul style="list-style-type: none"> • Main variable for comparison between the two focus groups. • Each focus group to fit a specific range of educational background as follows: • Focus group 1: All respondents to have no higher education degree or trade / vocational training (schooling to 18 years); • Focus group 2: All respondents to have higher education degree or trade / vocational training.
Socio-economic class	<ul style="list-style-type: none"> • / Self-employed • Employed Retired • Student • Unemployed / Out of employment • Homemaker 	<ul style="list-style-type: none"> • A good spread. No hard quota.
Age	<ul style="list-style-type: none"> • 18-24 years old • 25-39 years old • 40-54 years old • 55 years or older 	<ul style="list-style-type: none"> • A good spread across all four major age categories. • No participants under 18 years of age.
Gender	<ul style="list-style-type: none"> • Male • Female 	<ul style="list-style-type: none"> • A good spread. No hard quota.
Nationality and Residency	<ul style="list-style-type: none"> • Open question 	<ul style="list-style-type: none"> • All respondents to be EU nationals and residents of the partner country hosting the focus group • Ideally, 70% of the nationality of the partner country hosting the focus group

Participants were offered a financial incentive on completion of the focus group, to encourage participation. A letter was provided to participants that clearly outlined the purpose and details of the focus group.

Appendix 3: Methodology for focus group risk selection

The main criterion for the selection of the two environmental risks for the focus groups' in-depth discussion was the gap between the experts' assessment and the lay assessment of the same risk.

The experts' assessment was the result of the first stage of the project and the expert survey. For the pilot focus group, the results of the Eurobarometer survey were used as the lay assessment which compared to the expert assessment helped identify and pre-select the two risks to be discussed to the focus group. However, it was found that these sometimes differed significantly from the focus group participants' ranking. Therefore this methodology was amended for the remaining 11 focus groups so that the lay assessment was representative of each focus group participants' assessment and was therefore different for each.

During the environmental risk prioritisation exercise, participants of the focus groups were asked to choose five environmental risks (out of the 14 included in the Eurobarometer) that they were most concerned about. To determine the focus group assessment, the participants' individual selection of the top five risks were combined to give a single score and then translated into a risk classification of High (H), Medium (M), and Low (L), to enable comparison with the ranking undertaken by experts in the survey. Table A3.1 presents the conversion equivalences which were used to take into account the focus group size.

Table A3.1: Conversion of numbers of risks to a ranking for the Focus Group

Number of participants	Ranking for				
	Group of 6	Group of 8	Group of 9	Group of 10	Group of 11-12
0 - 2	L	L	L	L	L
3	M	M	L	L	L
4	H	M	M	M	L
5	H	H	M	M	M
6	H	H	H	H	M
7 - 12	H	H	H	H	H

In Table A3.2, the figures in column 4 show the risk ranking by the experts. The environmental risks in column 1 have been ordered by the size of the gap between the expert and Eurobarometer assessment: the risks for which the gap is greatest come first and those for which the gap is smallest come last. In order to select the two risks for the detailed discussion in the second focus group, participants' top five priorities were added for each risk in column 2 of Table A3.2. Then using Table A3.1 of the equivalences the number for each risk was converted into a ranking and added to the third column of Table A3.2.

Table A3.2: Establishing the gap in ranking between the focus group and experts

Column: 1	2	3	4
RISK	FOCUS GROUP (Total in numbers)	FOCUS GROUP (H,M,L)	EXPERT RANKING (H,M,L)
Urban problems			H
Waste			L/M

Column: 1	2	3	4
RISK	FOCUS GROUP (Total in numbers)	FOCUS GROUP (H,M,L)	EXPERT RANKING (H,M,L)
Consumption habits			H
Natural resource depletion			L
Water pollution			H
Chemicals in everyday products			H/M
Noise pollution			M
Agricultural pollution			H
Drinking water			M
Land take			L
Biodiversity loss			M
Invasive species			L
Soil degradation			L
Air pollution			H

Based on this methodology a decision was made, on the day, by calculating the gaps between how the experts and the members of the focus group ranked each risk. The aim was to have two risks where:

1. the expert's ranking was the opposite to the ranking made by focus group members, i.e. experts rank H while focus group ranks L, or experts rank L while focus group ranks H (largest gap) and
2. were highest in Table A3.2

Due to differences between the partner countries which were inherent to the different facilitation teams, recruitment methods and participants, there have been variations in the methodology followed by some countries, though the majority of risks selected for further discussion represent those with the largest gap in expert and lay assessments. Table A3.3 presents the differences identified in the methodology of risk selection.

Table A3.3: Differences in methodology

	Modification in risk selection methodology	Reason for modification
UK	NA	NA
Italy	In the second focus group two issues (instead of one) ranked High by participants and Low by experts were selected for further discussion.	No issue was identified that was ranked High by experts and was also ranked Low by participants.
Romania	In the second focus group, two risks that represented smaller gaps in rankings between experts and participants were chosen. These alternative risks were chosen on the basis that they sparked debate between participants in the focus group, while they also presented a gap between the second focus group and the	Both focus groups had similar risk prioritisations resulting in the same environmental risks yielding the biggest gaps between experts' and focus group's assessment. Therefore, for the second focus group, it was decided that it would be more valuable to explore two different risks.

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	Modification in risk selection methodology	Reason for modification
	Eurobarometer survey assessments.	
Spain	The results of the Eurobarometer survey were used as the lay assessment, which, compared to the expert assessment, helped identify and pre-select the two risks to be discussed in the focus groups.	This was the initial methodology which was only modified following the Pilot Focus Group in London. There was no time to incorporate changes in methodology for the focus groups held in Spain.
Latvia	NA	NA
Slovenia	In both focus groups, one of the risks selected was ranked High by focus group participants, while it was also ranked High by experts.	Only a small number of risks were ranked High by the focus group participants (the small number of participants might have had a role in the majority of rankings emerging as Low) and those were ranked similarly high by experts. Therefore another approach was followed focusing on the difference in understanding of the risk between the participants with different levels of education.

Appendix 4: Focus group schedule

The following schedule was written as a script for the focus group. *Sentences or sections in italics are instructions about what to do.*

TIME	Content	Time (minutes)
10.30	<p>1. Welcome, introduction and background to the session.</p> <p><i>[Turn on tape recorder on main table]</i></p> <ul style="list-style-type: none"> • Good morning and thank you for coming to this session. • This morning we are going to be talking about environmental issues, that is: problems affecting ecological systems or human health and which are caused by physical things (chemicals, waste etc.), activities or events. • This is part of a study being carried out by the European Commission's Environmental Directorate to understand how ordinary people think about and assess environmental issues and how this differs from the assessments that scientists or experts make. The study is also interested in exploring what factors influence the views of non-scientists. We are looking at the European Union countries as a whole and groups similar to this one are being held in six countries: in addition to the UK, they are being held in Italy, Latvia, Romania, Slovenia and Spain. • This session will give you a chance to help to increase understanding of the way that people think about environmental issues. • Collingwood Environmental Planning is carrying out this research for the European Commission. My name is Paula Orr and with my colleague Liza Papadopoulou we will be leading the session today. • Basic housekeeping: <ul style="list-style-type: none"> - We will be recording the session so that we don't miss anything, but we won't be producing any information that gives the names of the people involved. - The programme for the morning is on the wall: we will have a break at 11.35 and finish at 1 pm. We will give you your cash incentives before you leave. - Bathroom next to the door. - Can go out into the courtyard in the breaks – please don't smoke inside the building - No fire alarm planned – if the alarm goes off please go right out of the door, along the corridor and downstairs the way you came up. • Programme for today includes lots of time for conversations. Please feel free to ask for further clarification at any time. 	10
10.40	<p>2. Participants introductions / Icebreaker –M&M Confessions</p> <p>Please take two M&Ms but don't eat them for the moment<i>[pass the bowl round the group]</i></p> <p><i>[After everyone has taken two M&Ms, go round the group]</i> Please say your name, where you have come from today and something about yourself, according to the colour of the M&Ms</p>	5

TIME	Content	Time (minutes)
	<p>you chose:</p> <p>Red – Favourite hobby Green – Favourite place on earth Blue – Weirdest food you have tried Yellow – Wildcard (tell us anything about yourself!)</p> <p><i>[It may be useful to have these codes written on a flipchart which is made visible when this explanation is given.]</i></p> <p><i>[Hand out workbooks]</i></p>	
10.45	<p>3. Setting the scene with some general questions about attitudes towards the environment</p> <p>We are going to start with a few general questions about what you think about the environment. We are going to run through these quite quickly before going on to more detailed topics. You each have these questions written down in the notebooks you have been given – have a look now. I will read out each question and give you time to tick your answer before moving on to the next question. Please ask if you don't understand any of the questions.</p> <ul style="list-style-type: none"> • To what extent do environmental problems affect your everyday life? (scaled response) • How important is protecting the environment to you personally? (scaled response) • How far do you agree or disagree that, as an individual, you can play a role in protecting the environment in the UK? (scaled response) • In general do you consider that you are very well, fairly well, fairly badly or very badly informed about environmental issues? • From the following list, which are your three main sources of information about the environment? <ul style="list-style-type: none"> - Newspapers - Publications, brochures or information materials - The radio - Television news - Films and documentaries on television - Events (conferences, fairs, exhibitions, festivals, etc.)? - Magazines - Conversations with relatives, family, friends, neighbours or colleagues - Social media and the internet - Books - Other <p><i>[Go through the questions]</i></p> <p><i>If time when finished, invite people to discuss the first question:</i></p> <ul style="list-style-type: none"> • To what extent do environmental problems affect your everyday life? <p>Are there ways in which environmental problems affect you</p>	10

TIME	Content	Time (minutes)
	<p>issues, first we'll look at them in two groups, so please could the five of you at this end of the table come with me to the round table by the wall to continue our conversation there. Please bring your cards with you. The other group will work with Liza here.</p> <p><i>[Turn on second tape recorder at small table]</i></p> <p>Now could you each put down on the table the five cards you have chosen, leaving them face up so that everyone can read them.</p> <ul style="list-style-type: none"> • Does anything immediately strike you about the cards that you have all chosen? <i>[Prompt: Common issues? Different issues? Missing issues?]</i> • Let's put together the cards that are the same: we'll write on the front how many people chose each card and put the duplicates to one side. • <i>[Going round the group]</i> Could you say what one or two issues are the most worrying for you and why? <i>[Allow each person to talk without interruption].</i> • That's really interesting. From what you've now heard about how other people think about these issues, are there things that you would like to say about the way that you thought about these issues <i>[Prompt from issues that were mentioned during people's initial comments]</i> • Before we join / are joined by the other group, are there three things that you would like to tell them about what we discussed? <i>[Facilitator writes these down]</i> 	<p>(6)</p> <p>(6)</p> <p>(2)</p>
<p>11.20</p>	<p>6. Prioritising environmental issues (2) <i>[Small group returns to main table. Facilitators put the two groups' issue cards on the table. Give people a chance to look at the other group's cards.]</i></p> <p>Let's talk about what you have just done.</p> <ul style="list-style-type: none"> • Group 1 wanted to share three things that came up in their discussion. These are: <i>[Ask one or two people in Group 1 to read out or comment on things that came up; facilitator prompts/reminds if necessary]</i> • Group 2 also wanted to share three things that came out in their discussion: <i>[Ask one or two people in Group 2 to read out or comment on things that came up; facilitator prompts/reminds if necessary]</i> <p>Does anyone want to comment further on [read out one that is relevant to the research]? <i>Move discussion on to other relevant topics that have come up in discussion – max 8 mins)</i> <i>[At this point one facilitator gathers up the priority issue cards and takes them to another table to sort. The cards should be sorted into piles in order to find two issues where there is a significant difference in the assessment of experts and Focus Group members]</i></p> <p>From the discussion, xxx (& xxx) seem to be issues that people find most worrying. What makes them worrying for you? <i>[Go</i></p>	<p>15</p> <p>(5 - 8)</p> <p>(7 - 10 mins)</p>

TIME	Content	Time (minutes)
	<p><i>round the group. Prompts: number of people or size of area potentially affected? What is affected, for example: the economy? The environment? People’s health or wellbeing? How likely do you think it is to happen? Does that matter?]</i></p> <p>What about the things that you considered less worrying? What makes these issues less worrying? <i>[Prompts: Unlikely to happen? Possible to control? What things (people, environments, infrastructure, etc.) potentially affected?]</i></p> <p>Does this capture most of your views? Does anyone have a very different view?</p>	
<p>11.35</p>	<p>7. A detailed look at an environmental risk</p> <p>We’ve just been talking about some of the things that might make you more or less worried about an environmental issue. Two of the things we talked about were:</p> <ul style="list-style-type: none"> • How big or severe the consequences might be – for example, you said... <i>[example from the previous discussion]</i> • How likely it is to happen – if you are certain that something bad is going to happen fairly soon, that may make you worry more than if it seems unlikely to happen in the short term. For example, if you find out your house is at risk of flooding but you have never experienced flooding, how much do you think that information would worry you? <p>These are things that experts look at when they are deciding how big a risk something like an environmental problem poses for society; what they decide about the level of risk will probably influence how much money or resources a business, the local council or the government puts in to deal with it.</p> <p>Do you have any comments on how far you take account of probability and consequence in thinking about environmental issues? <i>[Prompt, If necessary: higher risks to people in car transport than in flights; higher risks from carbon than from nuclear energy etc.]</i></p> <p>Today we are exploring how people like you think about these kinds of environmental risks and when and why you views differ from those of experts.</p> <p>Now we are going to look in a bit more detail at a risk which seems to be assessed high (H) in the focus group’s priorities and low (L) by experts: <i>[Topic 1: the second facilitator introduces the risk identified using Appendix 4]</i></p> <ul style="list-style-type: none"> • Let’s start by describing the issue: <ul style="list-style-type: none"> - Can you tell me if a particular image or memory comes to mind when you think of this issue? What is it? - What do you know about the issue? Where or in what contexts have you come across it? - Is it a familiar or unfamiliar issue? <p><i>[Prompts (if time)]</i></p> <ul style="list-style-type: none"> - Are there aspects of the issue that are more familiar or unfamiliar? Do you see it as something that you 	<p>20</p> <p>(5)</p> <p>(5)</p>

TIME	Content	Time (minutes)
	<p>can control? Why / why not? <i>[this will provide contextual information]</i></p> <ul style="list-style-type: none"> - How big an impact do you think this has or might have? - Who or what do you think would be most affected? People, the environment or something else? (Further prompts: what kinds of people: everyone? people living in cities? elderly people? children? people who are ill?) - In what ways do you think this issue might affect people's health <i>(Further prompts: immediate effects like diarrhoea or vomiting; longer-term chronic illnesses like asthma; potentially life-threatening conditions like cancer)</i> <ul style="list-style-type: none"> • From your earlier discussions, this seems to be an issue you are concerned /not very concerned about... <ul style="list-style-type: none"> - How much and what kind of information do you have about it? <i>[Prompts (if time)]</i> <ul style="list-style-type: none"> - Have you ever actively looked for information about this? In what situation(s) and why? Where or how did you look for information? How easy or difficult was it to find the information you were looking for? - Do you ever avoid talking or hearing about this issue? In what situations and why? • Thinking about the ways you have heard or learned about this, do you trust the channels of information or the people giving it? Why / Why not? <p>Let's have a break so that you can move about a bit, get another drink and something to eat. Feel free to go down into the courtyard. Please be back in 20 minutes, at 12.15.</p>	<p align="center">(5)</p> <p align="center">(5)</p>
11.55	BREAK	20
12.15	<p>9. Making sense of a specific risk:</p> <p>Now we are going to talk about an issue which is assessed high (H) by experts and low (L) by the focus group: <i>[[Topic 2: facilitator introduces the risk identified using Appendix 4]</i></p> <p>Let's start by describing it:</p> <ul style="list-style-type: none"> - Can you tell me if particular images or memories come to mind when you think of this risk? What are they? - In what ways do you think this issue does or might affect people's health or the environment? <i>(Prompts: immediate effects like diarrhoea or vomiting; longer-term chronic illnesses like asthma; potentially life-threatening conditions like cancer).</i> - Who or what do you think would be most affected? <i>(Prompts: people living in cities; animals; plants; elderly people; children; people who are ill)</i> <ul style="list-style-type: none"> • How much would you say you know about this issue? <ul style="list-style-type: none"> - Is this a familiar or unfamiliar risk? <i>[Prompts (if time)]:</i> <ul style="list-style-type: none"> - Are there aspects of the risk that are more familiar or unfamiliar? 	<p align="center">20</p> <p align="center">(5)</p> <p align="center">(5)</p>

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TIME	Content	Time (minutes)
	<ul style="list-style-type: none"> - Do you see it as something that you can control? Why / why not? <i>[this will provide contextual information]</i> • <i>From the earlier conversations it seemed like this was something you were / were not very worried about. Where have you heard about this?</i> <ul style="list-style-type: none"> - <i>How much and what kind of information do you have about it?</i> <p>[Prompts (if time)]:</p> <ul style="list-style-type: none"> - <i>Have you ever actively looked for information about this? In what situation(s) and why? Where or how did you look for information? How easy or difficult was it to find the information you were looking for?</i> <ul style="list-style-type: none"> • <i>Is there anything else that makes you feel more or less worried about this?</i> 	<p>(5)</p> <p>(5)</p>
12.35	<p>10. Pathways for understanding risk: Understanding how people make sense of these issues</p> <p><i>[Play relevant PowerPoint presentation]</i></p> <p>Finally, we would like to think about the ways that you get information about these issues. Thinking about the familiar problem of air pollution:</p> <ul style="list-style-type: none"> • Where do you get your information from? <ul style="list-style-type: none"> <i>[Prompt people who say they <u>do</u> get information about this:]</i> <ul style="list-style-type: none"> - Where do you see/ hear /encounter this information? - To what extent do you compare or check information? Where would you go for this? - What sources do you trust / not trust? Why? - Do you get any information about environmental risks from scientific institutions? What about from European Union institutions, like the European Commission? - Do you think these are useful sources of information? In what way? <ul style="list-style-type: none"> - What makes information useful or not? • <i>[Prompt people who say, 'I don't go looking for information about this']</i> <ul style="list-style-type: none"> - Do you remember ever hearing about any of the environment issue we have been discussing, for example on weather reports, internet sites, newspapers, twitter? - Have any of the issues come up through community activities e.g. neighbours warning people known to have problems like asthma. <p><i>[Make this session quite open so that people can explore ways they might get information].</i></p> 	15
12.50	<p>11. Any additional issues?</p> <p>Are there any issues that weren't included in the list of issues we have been talking about that you feel are also very worrying? What are they and why do they worry you?</p>	5
12.55	<p>12. Final comments and close</p> <p><i>Ask participants to complete the feedback form and then collect their incentives</i></p>	5
TOTAL TIME		2h30m

Appendix 5: Thematic framework for analysis

Table A5.1 provides the thematic framework used for the analysis of the country reports.

Table A5.1: Thematic framework

Theme
1. Background - how participants feel about environmental issues
1.1 Extent environmental problems affect everyday life
1.2 Importance of protecting the environment
1.3 How well informed about environmental issues?
1.4 Role in protecting the environment
2. What do people understand by environmental issues?
2.1 Components
2.2 Associations (e.g. organic and fair trade food 'not like' chemicals in everyday products)
3. Reasons for worry / concern about issues
3.1 Perception of risk and sense of efficacy
3.1.1. Ability to control
3.1.2 Perceived likelihood of the risk
3.1.3. Perceived severity of the risk (e.g. number of people potentially affected by the risk)
3.2 Proximity and familiarity of environmental risk - e.g. impact in the area they live and people they know
3.2.1. Personal experience
3.2.2. Family members impacted
3.3 Trust in institutions associated with the management of environmental risks
3.4 ADD OTHERS AS APPROPRIATE...
4. Reasons for lower concern about some issues
4.1 Perception of risk and sense of efficacy
4.1.1. Ability to control
4.1.2 Perceived likelihood of the risk
4.1.3. Perceived severity of the risk (e.g. number of people potentially affected by the risk)
4.2 Lack of proximity and familiarity of environmental risk
4.2.1. Personal experience
4.2.2. Family members impacted
4.3 Trust in institutions associated with the management of environmental risks
4.4 ADD OTHERS AS APPROPRIATE...
5. Ranking of environmental risks by participants
5.1 Variation / disagreements between participants
5.2 Consensus /agreement between participants
5.3 Comparisons with rankings of scientific experts
6. Sources of information
6.1 Information channels (e.g. newspapers, TV, internet, etc.)
6.2 Information contexts (e.g. election, air pollution incident)
6.3 Credible / trusted sources (e.g. corporations, politicians, celebrities, etc.)
6.4 Untrusted sources
7. Additional environmental risks raised by participants
7.1 ADD AS APPROPRIATE

8. Conceptual understanding of environmental risks v. issues

8.1 No difference between environmental risks / issues
--

8.2 Yes, differences identified

Appendix 6: Significance and probability of environmental and health impacts

The tables below present the mean values calculated for both the significance (severity) and probability of the negative environmental impacts (Table A6.1) and similarly the negative health impacts (Table A6.2) of each of the 14 environmental risks.

Table A6.1: Significance and probability of negative impacts on the environment for each risk

Environmental risks	Significance of impact (mean)	Probability of impact (mean)
Biodiversity loss	3.99	3.96
Water pollution	3.79	3.56
Natural resource depletion	3.79	3.72
Consumption habits	3.75	3.80
Agricultural pollution	3.63	3.57
Drinking water shortage	3.56	3.17
Urban problems	3.52	3.80
Waste	3.49	3.64
Air pollution	3.48	3.55
Land take	3.48	3.78
Soil degradation	3.39	3.26
Chemicals in products	3.37	3.49
Invasive species	3.29	3.66
Noise pollution	2.93	3.37

Table A6.2: Significance and probability of negative impacts on health for each risk

Environmental risks	Significance of impact (mean)	Probability of impact (mean)
Air pollution	4.08	4.03
Drinking water shortage	3.89	3.26
Agricultural pollution	3.72	3.62
Chemicals in products	3.71	3.79
Urban problems	3.63	4.00
Water pollution	3.61	3.52
Consumption habits	3.60	3.66
Noise pollution	3.57	3.71
Waste	3.00	3.31
Natural resource depletion	2.77	3.04
Biodiversity loss	2.65	3.17
Soil degradation	2.55	2.90
Land take	2.48	3.01
Invasive species	2.40	3.01

The average value of each risk's probability was multiplied with the average value of the risk's significance (according to the risk equation). This calculation was repeated for the environmental impacts and the health impact and the results are presented in Table A6.3. These two values were added and divided by 2, to provide the overall expert assessment of risks shown in Table A6.4 (also presented in Figure 4, Section 3).

Table A6.3: Mean respondents' assessments for all risks of the negative impacts on the environment and human health

Environmental risks	Environmental impact (mean probability x mean significance)	Health impact (mean probability x mean significance)
Biodiversity loss	15.79	8.41
Consumption habits	14.26	13.18
Natural resource depletion	14.09	8.43
Water pollution	13.52	12.71
Urban problems	13.36	14.53
Land take	13.13	7.46
Agricultural pollution	12.95	13.46
Waste	12.7	9.92
Air pollution	12.36	16.45
Invasive species	12.02	7.22
Chemicals in products	11.75	14.05
Drinking water shortage	11.29	12.67
Soil degradation	11.07	7.39
Noise pollution	9.88	13.23

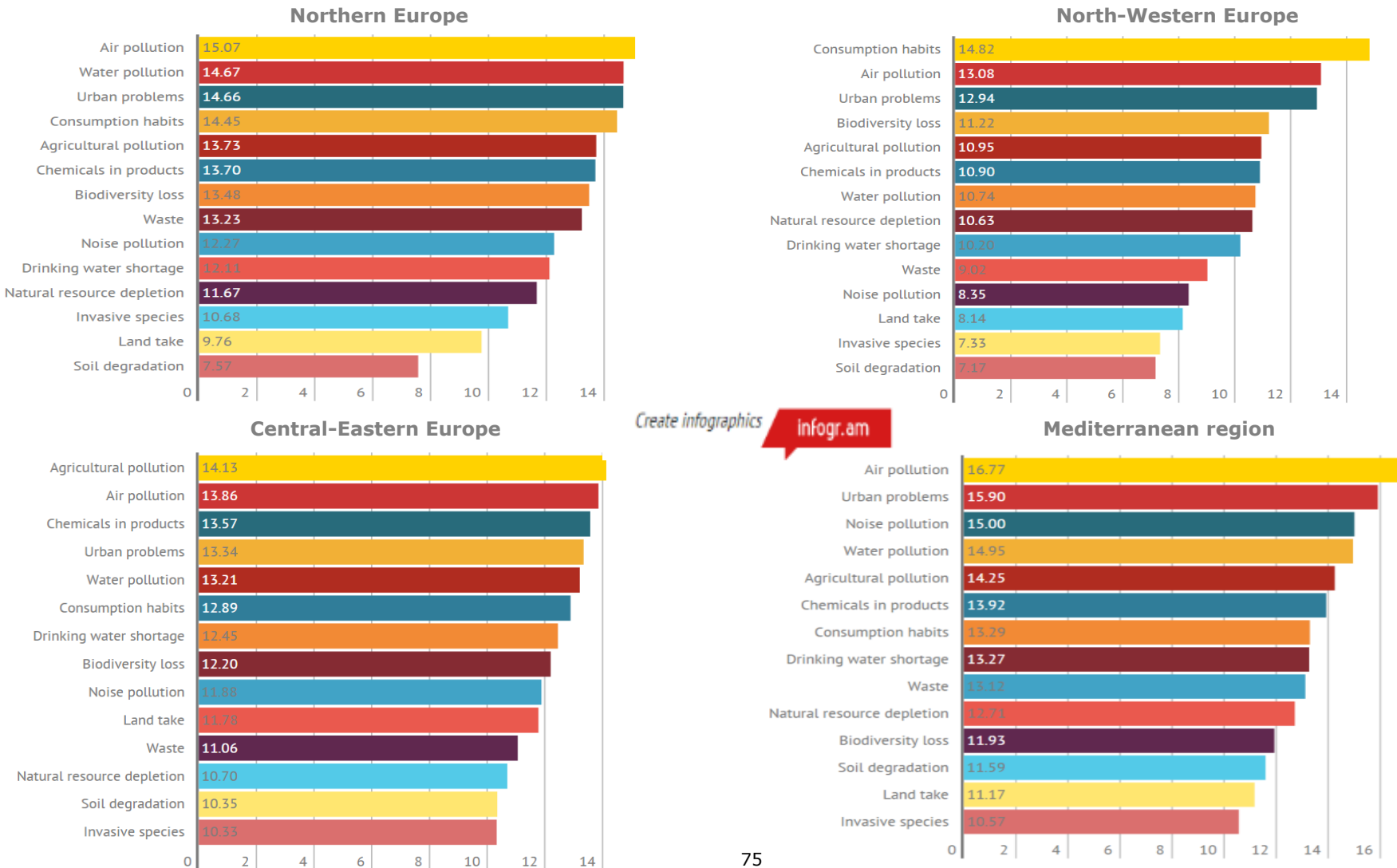
Table A6.4: Overall averages of significance and probability scores given by respondents for environment and environmental health risks

Environmental risks	Overall averages of significance and probability scores given by respondents for environment and environmental health risks
Air pollution	14.41
Urban problems	13.95
Consumption habits	13.72
Agricultural pollution	13.20
Water pollution	13.12
Chemicals in products	12.90
Biodiversity loss	12.10
Drinking water shortage	11.98
Noise pollution	11.55
Waste	11.31
Natural resource depletion	11.26
Land take	10.29
Invasive species	9.62
Soil degradation	9.23

Appendix 7: Comparing assessments by European region

Figure A7.1 compares the overall assessments of risk (average of significance x probability for environmental and health impacts) by European biogeographical regions.

Figure A7.1: Assessment of risk of environmental impacts by experts from Northern Europe (top left), North-Western Europe (top right), Central-Eastern Europe (bottom left) and from the Mediterranean region (bottom right).



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Appendix 8: Environmental risk prioritisation and ranking

Table A8.1 provides a detailed view of the risk prioritisation and ranking by the level of education and by each of the six partner countries.

Table A8.1: Environmental risk prioritisation and ranking

Environmental Risk	Educational qualifications		Total number of responses per country						Total	Ranking
	Lower	Higher	UK	Italy	Romania	Spain	Latvia	Slovenia		
Air pollution	39	39	14	13	13	12	15	11	78	14
Water pollution	45	29	7	12	13	16	13	13	74	13
Chemicals in products	27	31	8	12	9	13	8	8	58	12
Waste	31	23	12	9	6	6	13	8	54	11
Urban problems	28	18	10	6	10	6	11	3	46	10
Agricultural pollution	20	24	6	5	8	7	13	5	44	9
Biodiversity loss	20	19	5	5	4	14	6	5	39	8
Natural resource depletion	16	22	5	4	10	10	5	4	38	7
Consumption habits	14	17	8	4	3	9	3	4	31	6
Drinking water shortage	11	15	2	4	2	12	2	4	26	5
Land take	14	6	7	0	1	4	5	3	20	4
Soil degradation	4	10	2	4	5	1	2	0	14	3
Noise pollution	5	6	2	1	1	2	5	0	11	2
Invasive species	4	6	2	2	0	3	1	2	10	1

Appendix 9: Country comparison using Traffic light system

Table 8, in Section 4, uses a traffic light system (High, Medium, Low priority concern) to showcase the similarities and differences between countries. These ranks are attributed according to the total number of responses per country, using Table A9.1 for the conversion.

Table A9.1: Conversion of numbers of respondents to ranking

Number of participants	Ranking for					
	Group of 14 (Slovenia)	Group of 16 (Italy)	Group of 17 (Romania)	Group of 18 (UK)	Group of 20 (Latvia)	Group of 23 (Spain)
0 - 2	L	L	L	L	L	L
3 - 5	M	M	L	L	L	L
6 - 9	H	H	M	M	M	L
10 - 13	H	H	H	H	H	M
13 - 16	H	H	H	H	H	H

Base: UK (18 participants); Italy (16 participants); Romania (17 participants); Spain (23 participants); Latvia (20 participants); Slovenia (14 participants)

RÉSUMÉ EXÉCUTIF

But et objectifs du projet

La direction générale de l'environnement de la Commission européenne a chargé Collingwood Environmental Planning (CEP) Ltd (UK), en partenariat avec l'université de La Corogne (Espagne), l'université de Lettonie (Lettonie), Oikos (Slovénie), l'université de Rome « La Sapienza » (Italie) et l'université de l'Ouest de Timisoara (Roumanie), de réaliser un projet de recherche sur la perception du public à l'égard des risques environnementaux en Europe.

Le projet visait avant tout à comprendre les différences entre la perception du public et l'évaluation scientifique des risques environnementaux, ainsi que les principaux facteurs influençant l'évolution des perspectives du public en Europe. Les objectifs spécifiques du projet étaient les suivants :

- Une comparaison de la perception du public et de l'évaluation scientifique à l'égard des risques environnementaux.
- Une évaluation qualitative de la perception du public sur les risques environnementaux.
- Une vue d'ensemble des grands facteurs influençant la perception sur les risques environnementaux.

Approche et méthodologie de recherche

Ce projet a utilisé une approche méthodologique mixte de recherche associant une évaluation scientifique quantitative et une exploration qualitative des principaux facteurs influençant les perceptions du public sur les risques environnementaux. L'évaluation des risques environnementaux par les membres du public s'est aussi inspirée des résultats de l'enquête Eurobaromètre sur les attitudes des citoyens européens vis-à-vis de l'environnement (Union européenne, 2014). Cette étude a utilisé la liste des 14 catégories de risques environnementaux de l'enquête Eurobaromètre.

La recherche s'est appuyée sur les activités suivantes :

- Un sondage en ligne auprès d'experts européens pour parvenir à une classification scientifique des 14 risques environnementaux compris dans l'enquête Eurobaromètre.
- Des groupes de discussion avec des membres du public pour déterminer pourquoi la perception du public sur les risques environnementaux diffère de l'évaluation scientifique des mêmes risques, révéler les modes de réflexion et d'évaluation des citoyens européens vis-à-vis des risques environnementaux, et comprendre ce qui influence cette réflexion.

L'analyse des résultats a comparé l'évaluation des risques environnementaux par des experts (à travers le sondage) et des membres du public (à travers les groupes de discussion et l'enquête Eurobaromètre) afin d'identifier les facteurs y contribuant dans chacun de ces groupes et toute différence au sein de ces groupes.

Les résultats ont été analysés en fonction des différents contextes dans lesquels ils ont été obtenus afin d'explorer la transférabilité des constats et leur capacité à expliquer les comportements dans des contextes géographique, socioéconomique et culturel comparables.

Sondage auprès des experts

Le sondage auprès des experts a servi à fournir une classification scientifique des risques environnementaux compris dans l'Eurobaromètre. Elle était basée sur la probabilité et la gravité des impacts négatifs sur l'environnement (y compris sur la biodiversité et les services écosystémiques, l'eau, l'air, le bruit, l'utilisation des terres et le sol) et la santé humaine.

Enquête sur les perceptions du public sur les risques environnementaux

En tout, 415 scientifiques de plusieurs États membres de l'Union européenne ont été invités à participer par e-mail. Le sondage a obtenu un taux de réponse de 56% et 104 réponses valides (pour une cible de 100 réponses), satisfaisant un ensemble de critères convenus à l'avance pour les répondants.

Groupes de discussion

Les groupes de discussion ont permis à l'équipe de recherche de déterminer comment les membres du public approfondissent leur compréhension des risques environnementaux, comment ils hiérarchisent ces risques, selon quels facteurs, et pourquoi.

Deux groupes de discussion ont été organisés dans chacun des six pays partenaires. Un questionnaire de recrutement unique a été utilisé par tous les pays partenaires pour veiller à sélectionner des participants de profil similaire pour les critères suivants: sexe, âge, nationalité et résidence, emploi et qualifications. Afin de pouvoir mener des comparaisons, le profil des participants aux deux groupes de discussion de chaque pays était le même, à l'exception du critère de niveau d'éducation.

En tout, 108 personnes ont participé aux 12 groupes de discussion, chaque groupe comptant huit à douze participants. La composition des groupes respectait les critères mis en place; la quasi-totalité des participants étaient des citoyens européens et des résidents du pays partenaire avec une représentation équilibrée des hommes et des femmes, des différentes catégories d'âge et du statut d'emploi.

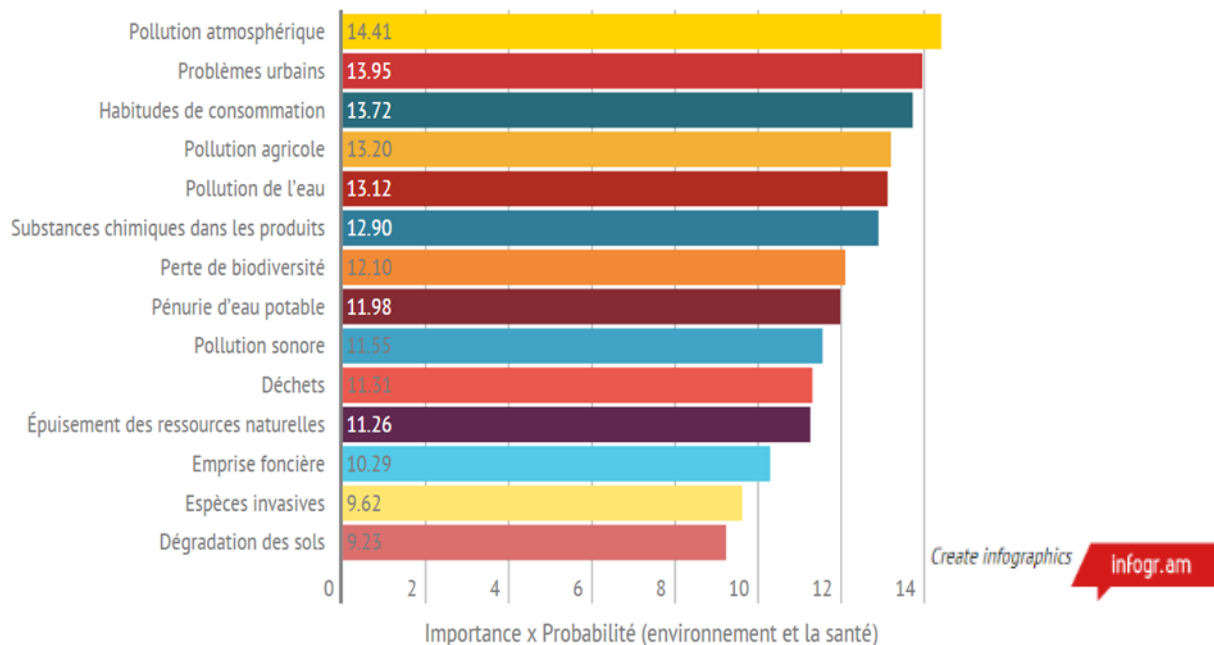
L'analyse des thèmes qui sont ressortis des groupes de discussion s'est basée sur les constats de nombreuses publications universitaires sur la perception du risque.

Résultats quantitatifs

Évaluation des risques environnementaux par les experts

Selon la définition de l'évaluation du risque, un niveau de risque peut être généré par l'équation suivante: **Risque = Importance x Probabilité**. Nous avons utilisé cette équation pour les 14 risques environnementaux: les valeurs moyennes attribuées par les répondants à l'importance (ou gravité) de l'impact ont été multipliées par les valeurs moyennes attribuées par les répondants à la probabilité d'apparition de chacun de ces impacts. Ce calcul a été réalisé à deux reprises pour chaque risque afin d'obtenir une évaluation de leurs impacts sur l'environnement et la santé humaine. Les résultats de l'évaluation scientifique ont mené à un classement des risques.

Graphique A: Évaluation des risques environnementaux généraux par les experts



La variance (des écarts-types et du score moyen) a été établie pour estimer le niveau de consensus entre les experts pour l'assignation de valeurs aux impacts des risques. L'analyse de ces résultats a révélé ce qui suit:

- Par rapport aux impacts des risques sur la santé, les impacts des risques sur l'environnement faisaient l'objet d'un consensus plus important entre les experts.
- Le domaine de compétence des participants n'avait pas d'influence significative sur l'évaluation des impacts sur l'environnement et la santé humaine.
- La région biogéographique¹ où travaillaient les experts semblait avoir une influence sur leur évaluation de certaines questions environnementales.

Évaluation des risques environnementaux par les membres du public

On a demandé aux participants des groupes de discussion de choisir les cinq grands enjeux environnementaux (sur les 14 compris dans l'enquête Eurobaromètre) les inquiétant le plus (c'est la formulation employée dans l'enquête). Le nombre total de réponses pour tous les niveaux d'éducation a été agrégé, puis converti en classement général et en évaluation des risques par le public.

Du point de vue des caractéristiques des participants, les résultats ont montré ce qui suit:

- Le niveau d'éducation semblait avoir un impact faible sur l'évaluation des risques environnementaux.
- L'analyse des résultats agrégés pour tous les pays a montré que les participants de pays différents jugeaient tous la pollution atmosphérique, la pollution de l'eau et la présence de substances chimiques dans les produits comme des risques de priorité élevée à moyenne, tandis que la pollution sonore et les espèces invasives étaient considérées comme des risques de priorité faible. Les évaluations des autres risques présentaient une plus grande variation.

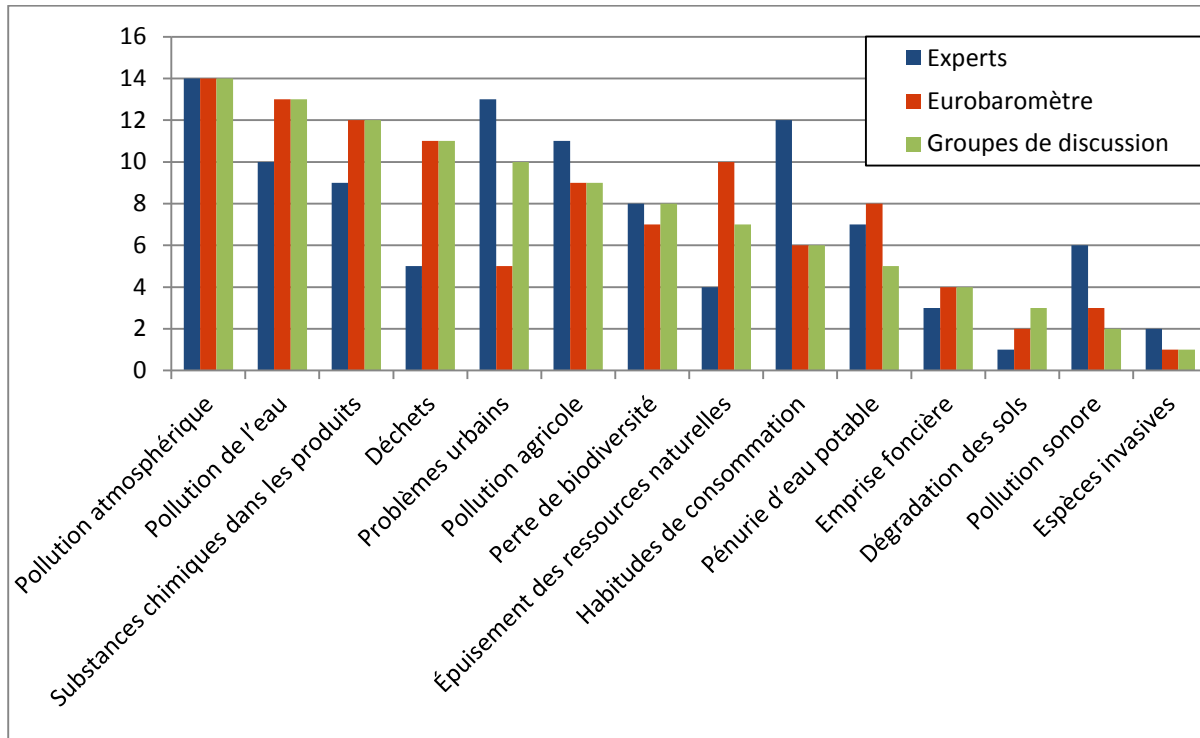
Comparaison du classement des risques environnementaux par type de répondant

¹ L'analyse a utilisé les quatre principales régions biogéographiques de l'Union européenne : l'Europe du Nord, l'Europe du Nord-Ouest, l'Europe centrale et de l'Est et l'Europe méditerranéenne (EEA, 2012:27)

Enquête sur les perceptions du public sur les risques environnementaux

Les classements des risques environnementaux (14 étant le plus élevé et 1 le plus faible) par les trois types de répondants (experts, Eurobaromètre et groupes de discussion) ressortant du sondage auprès des experts, de l'enquête Eurobaromètre et des groupes de discussion sont présentés dans le Graphique B.

Graphique B: Comparaison du classement des risques environnementaux par les experts et les membres du public (enquête Eurobaromètre et groupes de discussion): 14 (le plus élevé) - 1 (le plus faible)



Quelques observations clés:

- La pollution atmosphérique était classée comme le risque le plus élevé par les trois types de répondants.
- L'évaluation des problèmes urbains présentait des différences considérables; ils obtenaient un classement élevé pour les experts et les groupes de discussion, mais seulement 23 pour cent des répondants à l'enquête Eurobaromètre y voyaient une préoccupation majeure.
- Les habitudes de consommation arrivaient en troisième place du classement des experts, mais cette question était d'importance moyenne pour les deux types de membres du public.
- Les participants à l'enquête Eurobaromètre et aux groupes de discussion s'inquiétaient de l'augmentation des déchets et de l'épuisement des ressources naturelles, jugés moins graves par les experts.
- Les espèces invasives, la dégradation des sols et l'emprise foncière arrivaient en queue de classement pour tous les types de répondants.

Les différences entre les évaluations des risques environnementaux par les experts et par le public

Les évaluations techniques ou par les experts des risques environnementaux prennent en compte une gamme d'impacts possibles d'un phénomène environnemental, et les différentes manières dont ils peuvent être ressentis par différents récepteurs (humains, animaux, plans d'eau, etc.). L'enquête a montré que l'évaluation dépendait aussi de la perspective adoptée; par exemple, s'agissait-il des impacts sur la santé humaine ou sur l'environnement. Dans leur évaluation, les membres du public ont aussi pris en compte ces facteurs et d'autres éléments identifiés pendant les groupes de discussion.

Dans l'ensemble, les groupes de discussion s'accordaient avec les experts dans leur jugement des risques environnementaux considérés comme les plus inquiétants: la pollution atmosphérique arrivait en tête du classement, les experts comme les participants des groupes de discussion plaçant aussi les problèmes urbains et la pollution de l'eau parmi les cinq enjeux les plus graves. Les substances chimiques dans les produits se trouvaient parmi les cinq principaux enjeux pour les groupes de discussion, tandis que les experts leur attribuaient la sixième place. La pollution agricole comptait parmi les cinq risques les plus graves pour les experts, et arrivait au sixième rang pour les participants des groupes de discussion.

Les habitudes de consommation étaient un enjeu jugé grave pour les experts, mais beaucoup moins critique pour les groupes de discussion: seuls les participants du groupe de discussion britannique l'ont classé parmi les cinq risques les plus graves. Pour certains participants, les habitudes de consommation étaient étroitement liées à d'autres enjeux, comme les substances chimiques dans les produits ou les déchets. Cependant, alors que dans d'autres cas, un lien entre les enjeux était considéré comme un facteur aggravant, ce n'était pas le cas pour les habitudes de consommation.

Le sujet de préoccupation principal pour les membres du public n'arrivant pas en haut du classement des experts était celui des déchets. Les répondants des groupes de discussion en Italie, en Lettonie, en Slovaquie et au Royaume-Uni plaçaient les déchets dans leurs cinq principaux enjeux environnementaux.

La situation et les enjeux sur le plan local semblent avoir influencé la perception des risques environnementaux des participants aux groupes de discussion. En effet, ils mentionnaient des ressources naturelles, des industries locales et moyens de subsistance spécifiques à leur pays, des enjeux apparaissant dans les nouvelles locales et nationales, etc. L'influence de facteurs spécifiques à des endroits précis sur l'évaluation du risque était aussi observée chez les experts.

Analyse qualitative et discussion

De nombreuses années de recherches universitaires sur la perception du risque ont identifié plusieurs facteurs semblant influencer les perceptions du risque par le public. Plus récemment, des efforts ont été mis en œuvre pour construire un modèle intégré de l'évaluation du risque (Breakwell, 1994; Renn and Rohrmann, 2000:221; Renn, 2008) montrant la corrélation entre plusieurs niveaux de compréhension et de réponse aux risques environnementaux dans un cadre de valeurs et normes culturelles et une structure de systèmes et processus sociopolitiques et économiques. Les constats tirés de ces approches alimentent l'analyse qualitative.

Le cadrage des enjeux de l'Eurobaromètre

La description des enjeux environnementaux dans l'enquête Eurobaromètre est difficile à comprendre; en conséquence, les enjeux peuvent être interprétés de différentes manières. L'enquête Eurobaromètre vise à fournir un aperçu des attitudes vis-à-vis de l'environnement, ce qui a influencé sa méthodologie et ses questions. Cependant, cela pourrait être un facteur limitant dans le développement futur de recherches similaires sur les perceptions du public.

Principaux constats sur les facteurs influençant la compréhension des risques environnementaux

Les groupes de discussion ont permis aux participants d'approfondir leurs perceptions des risques environnementaux en fonction d'une gamme de points de vue, l'objectif étant de comprendre les différences entre leurs évaluations et celles des experts. Des constats clés émergent de la comparaison des facteurs de risque identifiés dans les publications universitaires et des éléments ressortant des 12 groupes de discussions:

- **Échelle et gravité:** la probabilité qu'un risque touche une vaste zone ou un grand nombre de personnes, ou que ses impacts soient graves, a été prise en compte à la fois dans les évaluations techniques du risque et les groupes de discussion.

Pour les groupes de discussion, cela intensifiait la perception du risque, par exemple pour la pollution atmosphérique et de l'eau, les substances chimiques dans les produits et dans certains pays, l'épuisement des ressources naturelles.

- La proximité des risques environnementaux contribuait à augmenter leur immédiateté et leur urgence pour les participants aux groupes de discussion. Cela semblait influencer la hiérarchisation des problèmes urbains et des déchets, et elle était mentionnée dans le cadre de risques comme la pollution atmosphérique. Cependant, il a aussi été noté que les gens s'habituent à vivre avec certains types de risques, et qu'au fil du temps, ils en sont moins conscients.
- Un sentiment de contrôle et de choix personnel peut diminuer les inquiétudes vis-à-vis des risques environnementaux, par exemple quand les consommateurs décident d'éviter les substances chimiques dans les produits ou les endroits bruyants susceptibles de nuire à leur santé. En revanche, l'idée d'être exposé à des risques hors de son contrôle a tendance à exacerber les inquiétudes.
- Les valeurs sociales peuvent avoir une forte influence et soit renforcer, soit atténuer la perception du risque. Les valeurs sociales liées à l'entretien de l'espace de vie semblent avoir eu pour effet d'intensifier les préoccupations vis-à-vis des déchets, qui ne sont pas considérés comme un risque élevé par l'évaluation technique ou scientifique.
- Un facteur important différencie l'évaluation du risque par les membres du public et les experts (évaluation technique): la tendance qu'ont les gens à tenir une institution ou un individu responsable de l'enjeu et de sa gestion. La perte de confiance dans les autorités est associée à une préoccupation croissante à l'égard des risques qu'elles sont censées gérer, comme la pollution atmosphérique et de l'eau.

Comparaison entre les pays

Compte tenu de l'influence des facteurs contextuels (géographie, caractéristiques physiques et climat du territoire habité et systèmes socioéconomiques, politiques et culturels) sur les perceptions du risque, on aurait pu s'attendre à ce que les groupes de discussion dans les six pays du projet aient des opinions variées quant à certains ou la totalité des risques environnementaux considérés. Les réponses à de nombreux risques étaient similaires, mais l'influence du contexte géographique, culturel et sociopolitique était manifeste pour d'autres.

Comparaison entre les groupes de niveaux d'éducation différents

La comparaison des groupes de discussion ayant des niveaux d'éducation différents suggérait des variations des sujets de discussion et des résultats du classement. Dans certains pays, comme en Lettonie, les groupes avec un niveau d'éducation plus élevé semblaient mieux informés, tandis que les groupes ayant un niveau d'éducation plus faible semblaient moins intéressés par les influences mondiales. Cependant, aucune tendance claire n'a été constatée dans la classification des risques, et aucune conclusion générale ne peut être tirée quant à l'influence du niveau d'éducation sur la préoccupation vis-à-vis des risques.

L'une des principales différences entre les participants ayant des niveaux d'éducation différents était leurs sources d'information et la manière dont ils s'informent sur les questions environnementales.

S'informer sur les risques environnementaux et les comprendre

Les stratégies employées par les membres du public pour s'informer à l'égard des risques environnementaux et les comprendre ont été explorées de différentes manières par les groupes de discussion.

Les membres du public avaient des opinions très variées quant à leur niveau d'information sur les enjeux environnementaux. Les participants des deux groupes britanniques étaient les plus confiants à cet égard, la majorité d'entre eux pensant être relativement ou très bien informés, mais les groupes italiens et espagnols présentaient

une gamme d'opinions beaucoup plus large. Les perceptions sont sans doute influencées par des facteurs externes, comme la quantité d'informations à leur disposition et leur accessibilité, mais aussi par leurs propres opinions quant au type d'information dont ils devraient bénéficier.

Dans tous les pays, les participants ont indiqué utiliser une gamme de sources différentes pour obtenir des informations sur les risques environnementaux, les principales étant:

- L'Internet: dans chaque pays, la moitié ou plus de la moitié des participants aux groupes de discussion utilisaient l'Internet pour s'informer sur les questions environnementales.
- Le journal télévisé, mais aussi les programmes et documentaires télévisés, continuent à représenter une importante source d'information sur les enjeux environnementaux, et ils étaient classés en tête des sources d'information par les participants en Roumanie, en Slovénie et au Royaume-Uni.
- On a constaté des différences considérables entre les pays du point de vue de l'importance attribuée aux conversations avec les parents, la famille, les amis, les voisins et collègues en tant que source d'information sur les enjeux environnementaux. Elles étaient considérées comme une source d'information relativement importante en Italie, en Lettonie, en Roumanie et en Espagne, mais elles n'étaient mentionnées que par un nombre très restreint de participants en Slovénie et au Royaume-Uni.

La prolifération d'informations sur l'Internet, les médias sociaux et les nombreuses chaînes de télévision avait tendance à semer la confusion. Dans certains cas, les répondants ont affirmé faire le choix d'éviter les informations.

Cependant, les échanges pendant les groupes de discussion ont montré que de nombreuses personnes utilisaient plusieurs sources d'information pour mieux comprendre des enjeux environnementaux souvent complexes. La plupart des gens vérifient les informations obtenues sur des sujets nouveaux et sortant de l'ordinaire: plusieurs participants ont dit qu'il est important de confirmer la véracité des informations obtenues, ou de s'intéresser aux points de vue contraires.

Conclusions

Facteurs d'influence sur les perceptions du risque des experts et des membres du public

- Les évaluations par les experts et les membres du public reflétaient le contexte du risque et la perception de la personne. Alors que l'analyse détaillée de l'évaluation par les experts des différents enjeux environnementaux n'a pas trouvé de preuve de partialité due à leur domaine compétence, des différences régionales en sont ressorties. De même, les conclusions tirées des évaluations des groupes de discussion ont indiqué que les membres du public sont influencés par leur identité et leur parcours individuels, et par les systèmes et valeurs culturels, institutionnels et sociopolitiques de la collectivité à laquelle ils appartiennent et où se déroulent leurs activités.
- Parmi les facteurs spécifiques à des endroits précis mentionnés dans les débats des groupes de discussion, les caractéristiques environnementales et climatiques, l'histoire, la géographie, le système politique et le développement économique.
- Plusieurs caractéristiques qualitatives des risques environnementaux influencent de nombreux aspects de leur évaluation par les membres du public. Parmi ces facteurs, l'échelle et la gravité, la proximité et le contrôle personnel.
- Les facteurs, attitudes et comportements culturels peuvent varier entre les régions, les pays, les districts administratifs et même les localités.
- Les valeurs sociales peuvent avoir une forte influence et soit renforcer, soit atténuer la perception du risque.

Enquête sur les perceptions du public sur les risques environnementaux

- Une perte de confiance dans les autorités considérées comme responsables de la gestion des risques est associée à une aggravation des préoccupations vis-à-vis de ces risques.
- Les échanges pendant les groupes de discussion ont fourni des preuves de l'influence des facteurs culturels, des valeurs sociales et du manque de confiance dans les autorités sur les perceptions du risque des membres du public. Les éléments de preuve disponibles sur la hiérarchisation des risques environnementaux par les experts n'ont pas pris en compte l'influence possible de ces facteurs.

Transférabilité des constats de la recherche

La transférabilité concerne la mesure dans laquelle les constats d'une étude peuvent s'appliquer à d'autres situations. Dans ce cas, la question est de savoir s'il est possible de généraliser les constats de l'enquête auprès des experts et des groupes de discussion avec les membres du public à d'autres régions de l'Union européenne ou des États membres.

Compte tenu du nombre restreint de participants à la recherche (104 experts et 108 membres du public) et de la couverture géographique limitée des groupes de discussion (six pays), les constats ne peuvent pas être généralisés de manière simpliste au contexte européen dans son ensemble. Cependant, si l'on prend en compte certains éléments contextuels, une partie des résultats pourrait être utilisée pour suggérer des réponses possibles aux risques environnementaux dans des contextes spécifiques. Les principaux éléments contextuels considérés comme étant pertinents sont:

- La densité urbaine: les risques associés à la vie urbaine (par ex., problèmes urbains, pollution atmosphérique, déchets) sont plus pertinents et immédiats pour les habitants des villes et semblent plus graves dans les zones urbaines plus densément peuplées (par ex. Londres, Rome, Riga);
- Les facteurs géographiques et climatiques: les préoccupations quant aux pressions subies par les ressources naturelles, comme l'eau, sont plus fortes dans les régions où les gens sont directement en prise avec leur impact sur la société et l'économie (par ex. Roumanie, Slovaquie et La Corogne en Espagne);
- Économie politique: les habitants de pays qui ont récemment connu des bouleversements politiques et économiques peuvent considérer l'avenir avec plus d'incertitude, et avoir moins confiance en les institutions et leur capacité à gérer les risques environnementaux.

En matière de confiance dans les institutions, il est important de noter le faible niveau de confiance dans les institutions publiques et privées exprimé dans tous les groupes de discussions, quel que soit le pays.

Les voies de la compréhension des risques environnementaux

Les principales conclusions sur les méthodes employées par les participants pour obtenir des informations et approfondir leur compréhension des risques environnementaux sont les suivantes:

- Une faible proportion de membres du public recherche spontanément des informations sur les questions environnementales.
- La majorité des gens recherchent parfois des informations sur les questions environnementales si leurs intérêts propres sont en jeu.
- Les informations sur les actions et les réponses sont particulièrement pertinentes et intéressantes.
- Une fois que les membres du public s'intéressent ou ont affaire à un risque environnemental particulier, ils ont tendance à rechercher plusieurs sources d'information et à utiliser des stratégies de recherche pour vérifier ces informations.
- De nombreuses sources d'information inspirent une méfiance généralisée, y compris les scientifiques, qui sont souvent considérés comme protégeant les

intérêts de leurs financeurs. Les institutions comme la Commission européenne sont considérées comme des sources potentielles d'informations plus impartiales, mais actuellement, elles ne répondent pas aux besoins de la population.

- La prévalence de l'Internet aggrave le « trop-plein d'information » : les stratégies des membres du public visent tout autant à filtrer les informations contraires à leur propre vision du monde ou à leurs priorités qu'à accéder à un grand nombre de sources d'information.
- Il est important de présenter les informations de manière intéressante et facile à comprendre afin de capter l'intérêt des gens.

Les méthodologies de recherche des évaluations des risques environnementaux par les membres du public

L'utilisation d'une approche méthodologique mixte de recherche a rendu possible l'obtention de données quantitatives et qualitatives, ce qui a enrichi l'analyse et les conclusions de l'étude. Le sondage auprès des experts a été facile et rapide à remplir, et un bon taux de réponse a été obtenu. Aucune information qualitative n'a été collectée, et c'est un aspect qui pourrait être revu à l'avenir, le cas échéant.

L'utilisation de groupes de discussion dans différents États membres, avec des participants ayant deux niveaux d'éducation différents, a permis de collecter des données qui ont ensuite été analysées pour explorer plusieurs aspects différents:

- La comparaison de la perception et de l'évaluation des risques environnementaux des experts et des membres du public.
- La comparaison des réponses des participants en fonction de leur niveau d'éducation; et la comparaison de chacun de ces niveaux et de l'évaluation des experts.
- Les réponses des participants dans six États membres.
- Les principaux facteurs d'influence sur l'évolution des perspectives publiques en Europe.
- Une évaluation qualitative de la perception du public sur les risques environnementaux.

Cette méthode pourrait s'appliquer à des recherches futures ou au suivi de la perception du risque environnemental par le public pour alimenter l'élaboration de politiques future.

Abstract

English

The aim of this project was to understand the differences between public perception and scientific assessment of environmental risks and the main factors influencing the evolution of public perspectives in Europe. The project used a mixed methodology research approach, including a survey of experts and focus groups with members of the public.

Overall, the environmental risks seen as being of highest concern by members of the public were similar to the top risks identified by experts. However, consumption habits appeared high in the list of concerns for experts but was generally ranked much lower across the focus groups. Waste was an issue of concern to public participants that was not ranked highly by experts.

Factors that influence lay perceptions of risk include individual identity and background, collective cultural, institutional and socio-political systems, social values and degree of trust in authorities. A number of qualitative characteristics of environmental risks were also found to influence many aspects of lay assessments of environmental risks. These included factors such as scale and severity, proximity and personal control.

Discussions in the focus groups showed that many people were using multiple sources of information to develop their understanding of what are often complex environmental issues.

(199 words)

French

Ce projet visait à comprendre les différences entre la perception du public et l'évaluation scientifique des risques environnementaux, ainsi que les principaux facteurs influençant l'évolution des perspectives du public en Europe. Le projet a utilisé une approche méthodologique mixte de recherche associant un sondage en ligne auprès d'experts européens et des groupes de discussion avec des membres du public.

Dans l'ensemble, les groupes de discussion s'accordaient avec les experts dans leur jugement des risques environnementaux considérés comme les plus inquiétants. Cependant les habitudes de consommation étaient un enjeu jugé grave pour les experts, mais beaucoup moins critique pour les groupes de discussion. Le sujet de préoccupation principal pour les membres du public n'arrivant pas en haut du classement des experts était celui des déchets.

Les membres du public sont influencés par leur identité et leur parcours individuels, par les systèmes et valeurs culturels, institutionnels et sociopolitiques de la collectivité à laquelle ils appartiennent, les valeurs sociales et la confiance dans les autorités. Plusieurs caractéristiques qualitatives des risques environnementaux influencent aussi de nombreux aspects de leur évaluation par les membres du public. Parmi ces facteurs, l'échelle et la gravité, la proximité et le contrôle personnel.

Les échanges pendant les groupes de discussion ont montré que de nombreuses personnes utilisaient plusieurs sources d'information pour mieux comprendre des enjeux environnementaux souvent complexes.

(219 words)

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