



Living with Flood Risk in a Changing Climate

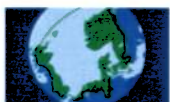
FLOWS report WP2A - 2

Expert panel study

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Interreg North Sea Region

Report no.: FLOWS WP2A-2

Publisher: Norwegian Water Resources and Energy Directorate

Author: Irina Krasovskaia

Key words: expert panel, flood hazard, perception

Subject: Expert panel study

Print: NVE's printing office

Number printed: 75

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NVE, September 2005

Facts are facts but perceptions are reality

Slogan of European Environment Agency

EXPERT PANEL STUDIES

By Irina Krasovskaia

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Foreword

Expert panel studies were the second main component in the investigation of perceptions of flood hazard within FLOWS Project Workpackage 2A. The study was carried out by a task group consisting of the representatives of all partner countries: Alison McErlain and Denys Ngu (Norfolk County Council, UK); Sandra van der Vegt (Flevoland, the Netherlands); Barbro Näslund-Landenmark (SRV, Sweden); Timm Ruben Geissler (Technische Universität Hamburg, Germany); Lars Gottschalk and Irina Krasovskaia (University of Oslo, Norway) and Halvard Berg (NVE, Norway, WP2A leader). Irina Krasovskaia led the investigation. The task group worked out, distributed and summarised the answers to the questionnaires to decision makers and experts and organised national and international expert panels. This report reviews the answers to questionnaires and summarizes the main findings from the national expert panels and finally the international one. The national expert panels have been carried out in all the FLOWS countries but the Netherlands and followed the same structure in the UK, Germany and Norway in order to facilitate the comparison. In Sweden the discussions of similar topics were organized as part of a workshop. Reports from the national expert panels were prepared for Germany by T.R. Geissler, for Norway by H.Berg and for the UK by D.Ngu. Report from the International Expert panel was prepared by D. Ngu assisted by I. Krasovskaia and H. Smith (see Annex I). Denys Ngu's amendments of the language contributed much to the readability of this report and are highly appreciated by the task group. Special thanks are also due to Rune Stubrud for his cheerful illustrations.

1. Introduction

Expert panels is a method that allows utilization of the professional experience of specialists (here - experts and decision makers) in some area to assess a problem/problems with relation to this area. Besides bringing forward valuable qualitative information that is not readily available, expert panels elucidate the perceptions of flood hazard by people representing authorities in flood assessment. Confronting the specialists with the opinions of general public on similar topics provides a necessary feedback essential for decision making and stimulating an open discussion of flood related issues with citizens. Collaborative discussions of different views within expert panels help reaching consensus on many difficult topics. They also stimulate a network building among the specialists dealing with floods and flooding at a national and international level. Expert panels is an often used investigation tool that is well established in natural and social sciences as well as engineering (e.g. Swales & Harris, 1995; Kuikka & Varis,1997; Climate Change 2001, 2001; Kumaret.al.,2001; Expert Panel...,2002).

2. Questionnaires to the decision-makers and experts.

In order to get an idea about the perception of some important topics concerning flooding, questionnaires were sent out to experts and decision-makers in each country. The selection of the specialists in this study was a responsibility of each country. The ambition was to obtain a representative sample with respect to the existing national practices in flood assessment with links to spatial planning. Local and regional levels were given priority to facilitate later comparisons of perceptions of flood hazard by laymen and decision makers respectively living and working in flood prone areas. The number of received responses varied between the countries, as seen from Table 2.1, which depended on the number of questionnaires sent out and to some extent willingness to respond. The aim was to get around 30 answers per country.

Table 2.1. The number of responses from the experts received in each country.

Country	Number of responses
Germany	35
Netherlands	30
Norway	55
Sweden	14
UK	27

Questionnaires to the decision-makers and experts represented an important part in the study. The main purposes with the questionnaires were:

- Getting insight into the perception of flood hazard by the experts and decision makers in the partner countries
- Identifying similarities and differences in the answers given by the experts from different countries
- Identifying the important topics for discussion at the expert panel meeting
- Identifying similarities and differences in the opinions of experts and laymen about similar topics.

This knowledge was indispensable for the organization of the national and international panel meetings that followed.

The questionnaires have been developed in cooperation between the partners and were similar in all the countries with only some few questions of a purely national interest included in some of them. Annex II presents the Master Questionnaire. The main topics included in the questionnaire were organized in the following blocks:

- General awareness of the flood hazard
- Previous experiences from floods
- Knowledge, info channels
- Willingness to “buy safety”/ adapt to risk (risk-benefit)

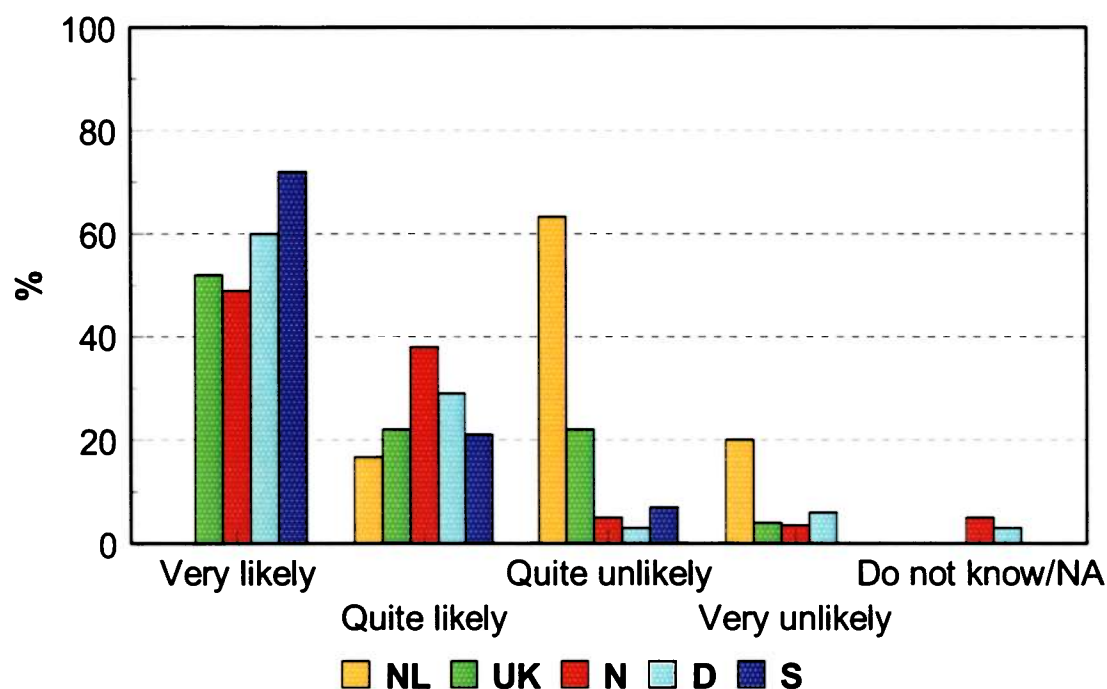
- Personal background.

These blocks offer a direct parallel to the questions asked during the poll study among laymen (see Krasovskaia, 2005). The answers received are commented on in the report following this subdivision.

The number of responses received does not allow any strict statistical analysis and is used only to identify tendencies in the perceptions without any claim for generalizations. The ambition was rather to use the information obtained as a background for the discussion confronting different views among the specialists and also the specialists' views with laymens' views.

2.1. General awareness of the flood hazard

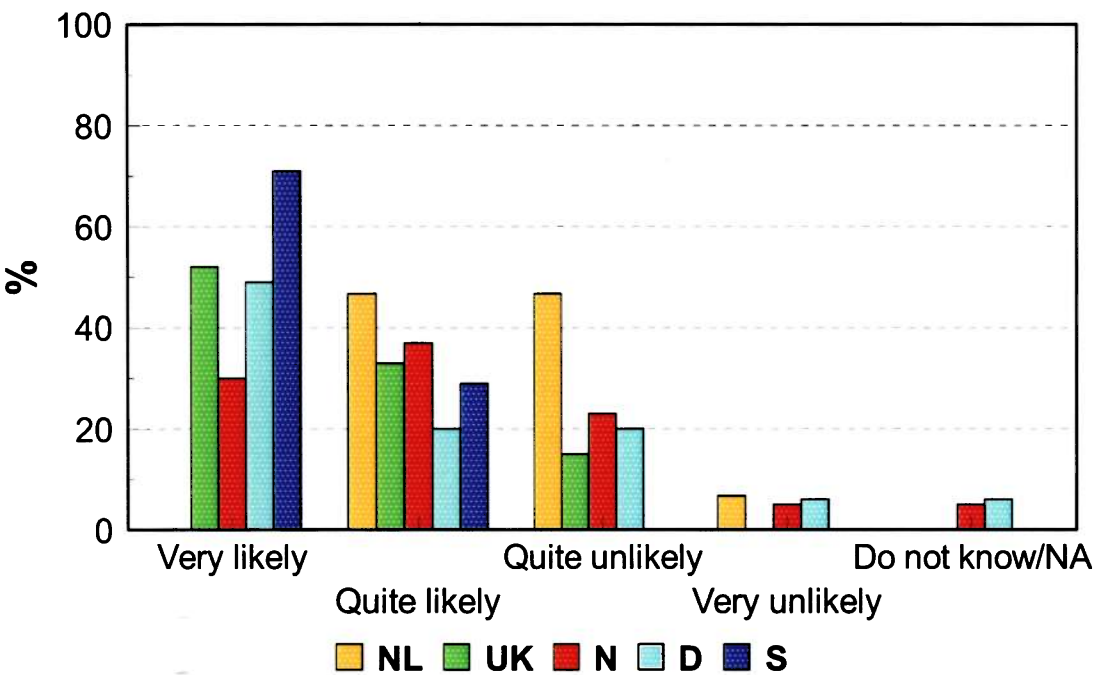
Awareness of the flood hazard is a necessary premise for a successful management of flooding problems. **Are the experts aware of the flood hazard?** Analyzing the diagrams in Fig. 2.1 we can see that on the average the majority of the respondents consider a major flood to be very or quite likely with an exception of the Dutch experts, who thought such an event to be quite or very unlikely (about 80% of responses). A possible reason might be very high “risk of failure” levels used in the design practice in the Netherlands, as well as relying on the advanced technical measures undertaken to prevent flooding, especially by the sea. In contrast to the Dutch experts nine in ten Swedish experts considered a major flood to be very or quite likely.



Do you think that a major flood could occur in your area within the next 20 years?

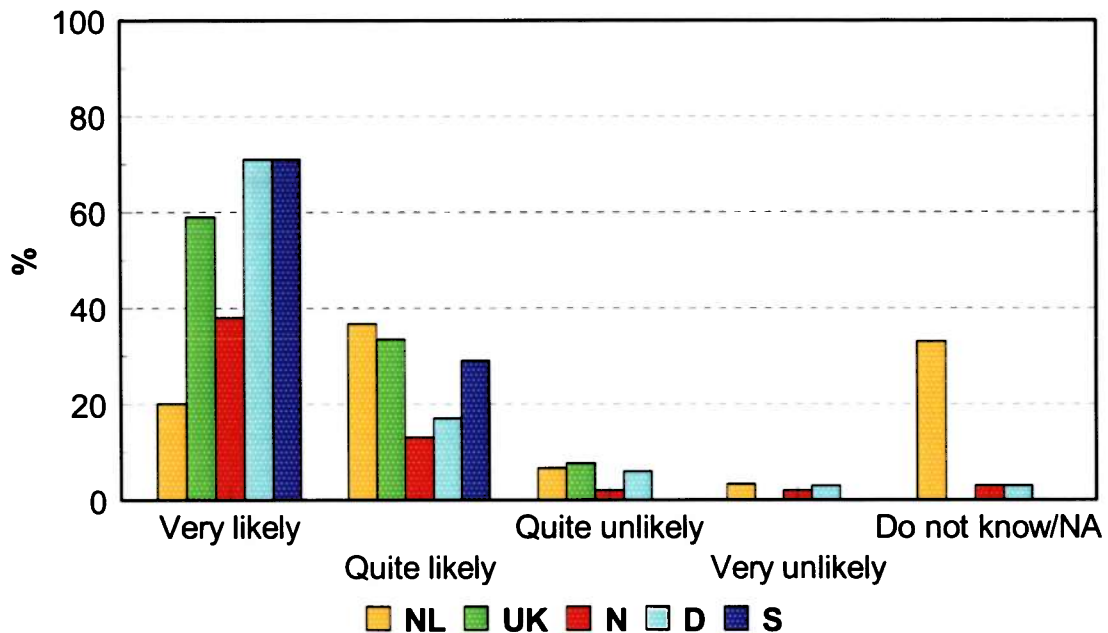
Figure 2.1. Possibility of flooding within the next 20 years as perceived by the experts.

Flooding of homes is one of the most serious consequences of a flood. Do the experts expect that this can happen in the near future? Similar to the answers given about a major flood in general, the majority of the experts consider flooding of homes to be very or quite likely (Cf. Fig.2.2). Still more British and Swedish but also Dutch experts chose the alternative “very” or “quite likely” than before. It might indicate that flooding of homes may have become so frequent that it is no longer associated with “a major event”. On the contrary more German and Norwegian experts than before chose the alternative “quite unlikely”, which may depend on many reasons, good flood protection standard or favourable relief being some of them.



Do you think that homes could experience flooding within the next 20 years ?

Figure 2.2. Possibility of flooding of homes as perceived by the experts.



Do you think that other property (farmland, gardens, shops etc.) could experience flooding within the next 20 years?

Figure 2.3. Possibility of flooding of other property as perceived by the experts.

Flooding of other property (like gardens, farmland, shops etc.) is considered also to be very or quite likely by Swedish, British and German experts especially and also by Dutch and Norwegian experts though to a smaller extent (Cf. Fig.2.3).

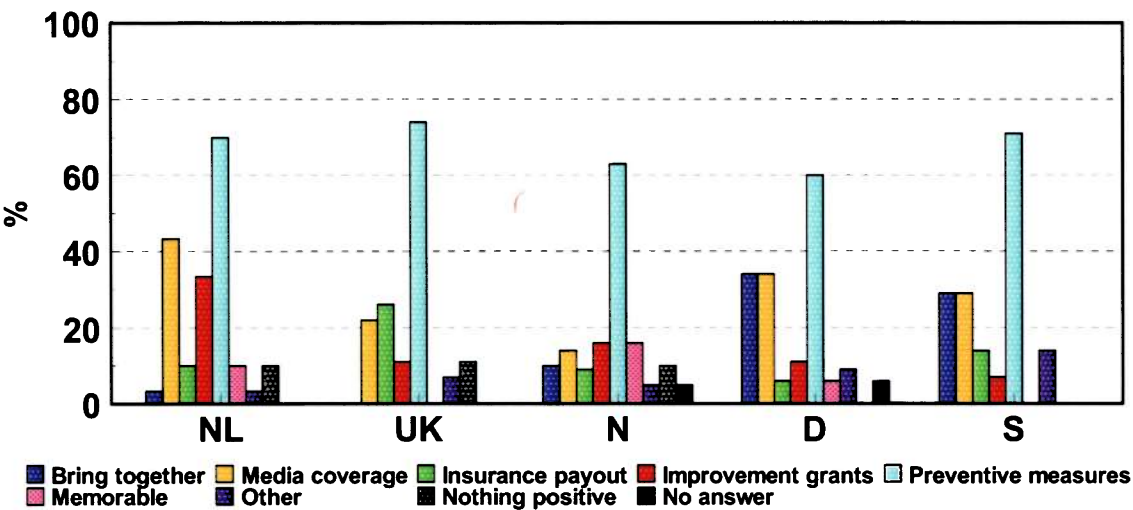
A general conclusion can be that experts in all the countries are quite aware of a flooding problem including flooding of homes, which in some countries seems to have become common.

2.2. Previous experiences from floods.

Floods are usually associated with negative experiences. To encourage the specialists to remember floods also in positive terms some ideas about their positive consequences have been suggested when asking about eventual positive effects of floods. **Judging from the responses, shown in a diagram in Fig. 2.4, it is seen that very few of them associated floods with only negative experiences.**

Preventive measures undertaken after a devastating flood were considered as the most important positive effect of such an event by the majority of experts in all the countries. In the Netherlands, Germany and Sweden three to four in ten experts appreciated media coverage during flooding. In the UK and Norway, however, this was not so pronounced. Improvement grants after flooding seem to have been appreciated by the Dutch experts

and decision makers but few specialists in other countries considered this to be really important. In the UK it was insurance payouts that were named and in Germany and Sweden – bringing the community together was appreciated by about one fourth of the experts (as much as media coverage). In Norway all the suggested positive effects of flooding except for preventive measures seem to have lower importance (appreciated by one-two experts in ten), which is in contrast to all other countries. Flooding as a memorable event was mentioned by the experts in Norway, the Netherlands and Germany. The differences in attitudes indicate differences in experiences originating in national flood assessment practices.



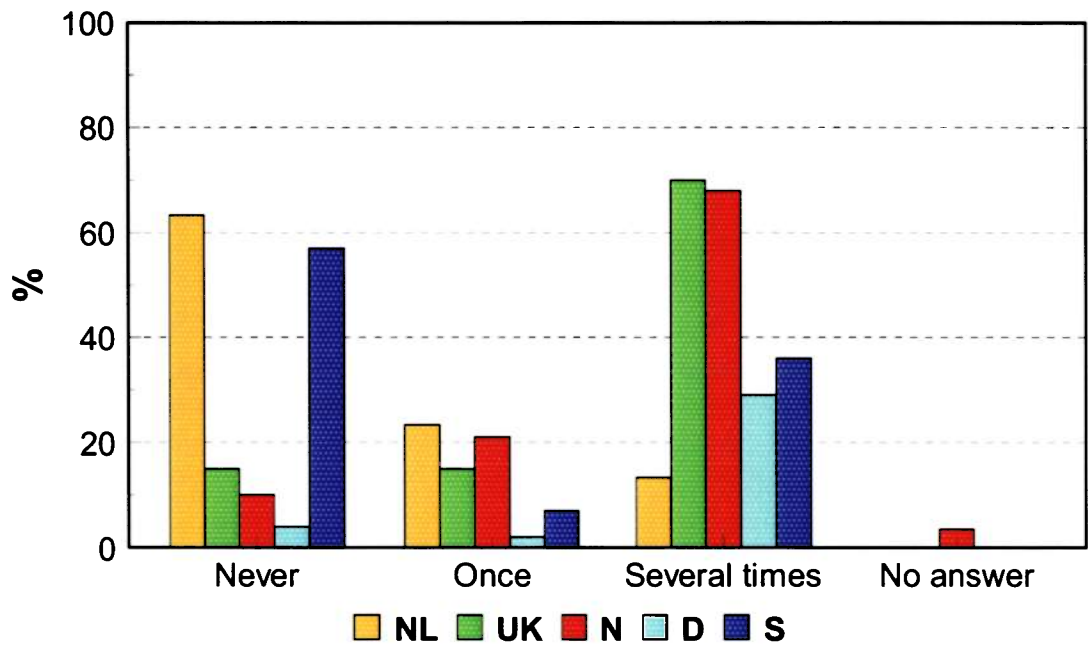
Would you say that there were any positive effects of the last flood?

Figure 2.4. Positive effects of flooding as perceived by the experts.

The answers demonstrated a reasonable attitude towards flooding as an event that might have some positive effects, such as stimulating investments in preventive measures, appreciated in all the countries. Flooding also might trigger more social responsibility and draw public attention to the communities otherwise merely known.

As noted earlier, differences in the attitudes to flooding may depend on the experience the experts have. As seen in Fig. 2.5 the majority of the Dutch and Swedish experts responded that the area where they work had never been flooded, while the majority of the Norwegian and British experts had experienced flooding of the area several times. Thus when the latter based their answers on their own experience, the former might be

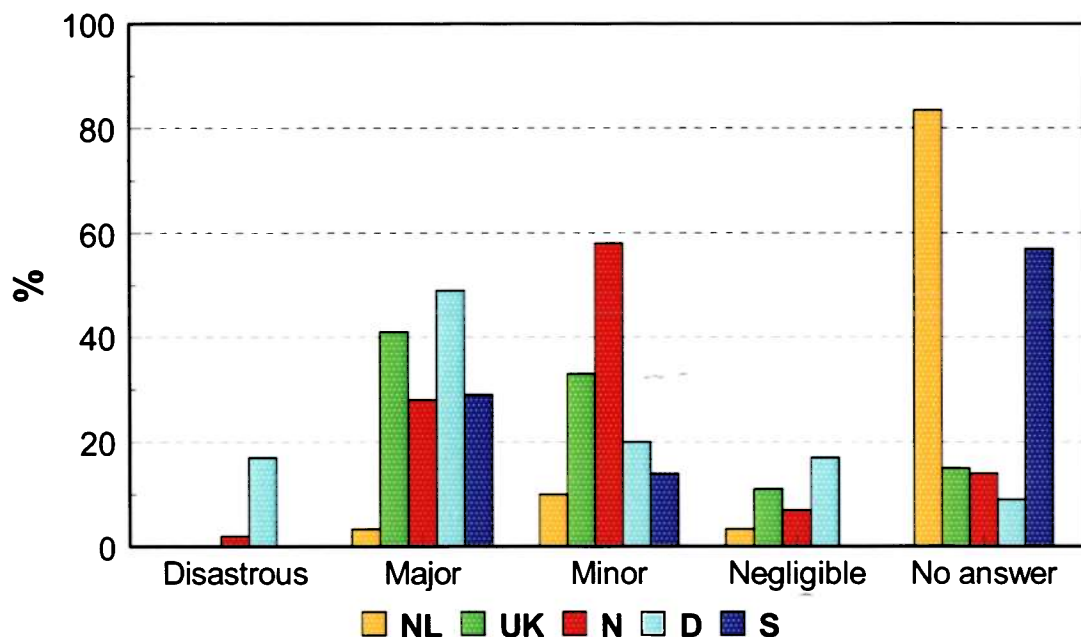
answering the questions from a more general perspective. The differences in the answers noted earlier give some evidence: almost one fourth of the Dutch experts did not give any answer to the question about a possible flooding of properties in the area and the majority of them think that a major flood event is quite unlikely in contrast to the experts from the other countries. More Swedish experts (three to four in ten) than the Dutch have experienced flooding several times and consequently, they are more inclined to think that a major flood event might occur in the area where they work (Cf. Figs. 2.1 and 2.2).



Has this area ever been flooded since you have been working with flood issues?

Figure 2.5. Previous experiences with flooding of the area of responsibility.

Flood losses seem to have different economic impact in different countries as seen in Fig. 2.6. While the majority of the Norwegian experts evaluated the losses as minor, four to five in ten British and German experts answered that the loss was major, and for almost one fifth of the latter the economic impact of the losses was disastrous. Remarkably many Dutch and Swedish experts did not answer this question, which might depend on their absence of experience with flooding in the area noted earlier.



How would you evaluate the loss in relation to the total economic impact?

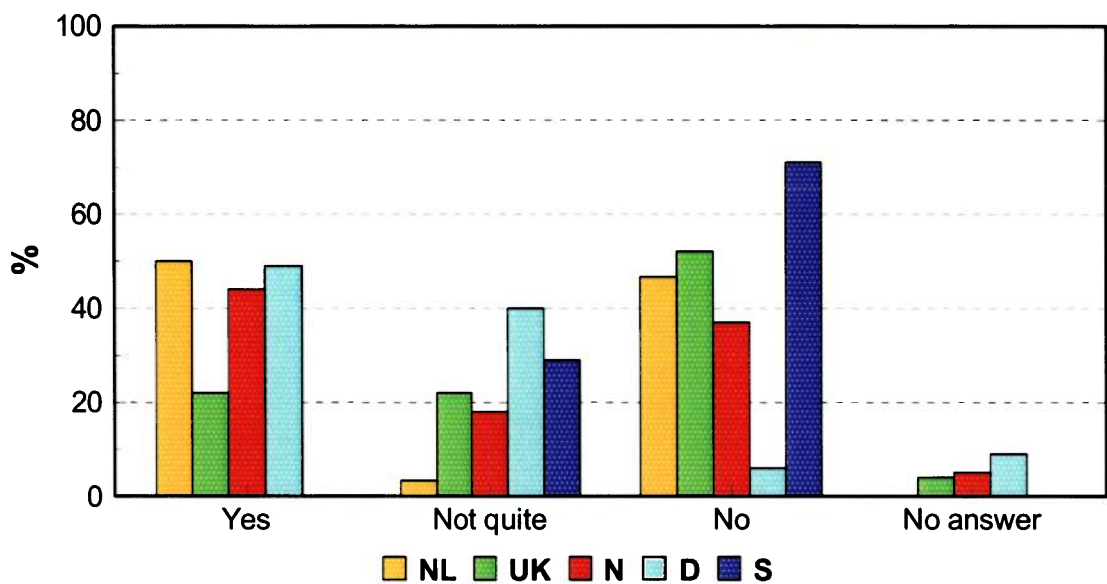
Figure 2.6. Economic impact of flooding as perceived by the experts.

A general conclusion might be that both experiences with flooding and opinions about its impacts vary among the expert groups from limited or none to frequent experiences and drastic economic losses during flooding.

2.3. Knowledge, info channels

Preventive measures that followed flooding were appreciated by the specialists (Cf. Fig.2.4). All of them could name a long list of flood defence measures existing at present in the areas of their responsibility. **Do they think that flood management and defence at present provide satisfactory standard of safety?** As evident from Fig.2.7 the majority of the experts do not consider that the defence measures really provide a sufficient standard of safety. The Dutch, Norwegian and German experts are split in the middle in their opinions. It was seen earlier that only about half the Dutch experts and one fourth in the two latter groups considered flooding of homes to be very or quite unlikely (Cf. Fig.2.2), which illustrates the doubts about the standard of safety. The Swedish experts show the most negative appraisal of the sufficiency of defence measures. None of them considered these measures to provide an adequate defence against flooding. At the same time they also were quite inclined to expect a major flood event (Cf. Fig.2.1), which is alarming. Also the British experts seem to be remarkably unsatisfied by the existing defence measures, quite in accordance with their answers

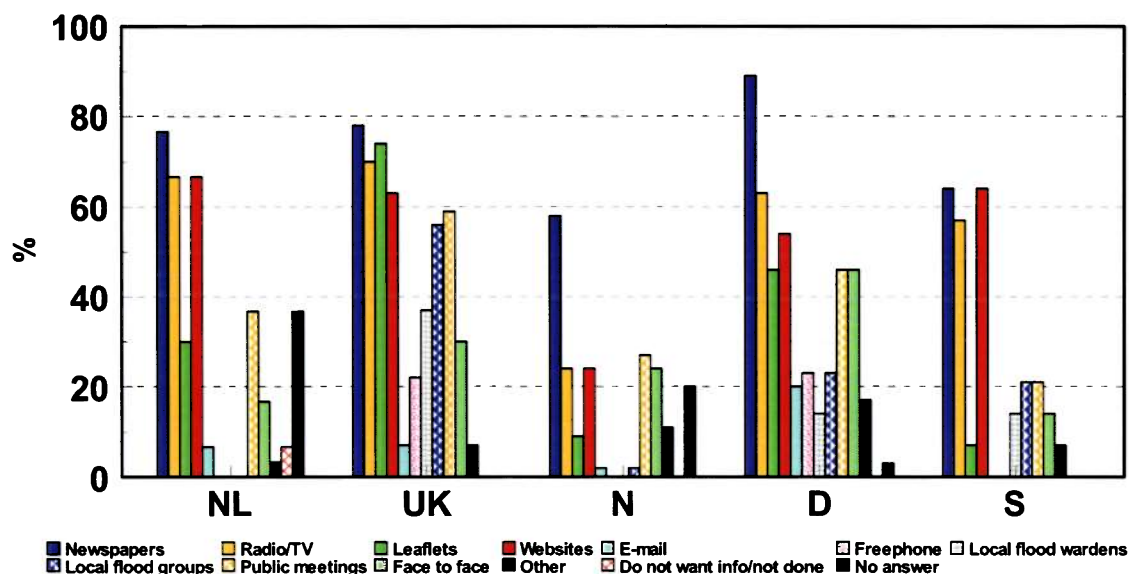
given earlier (Cf. figs.2.1-2.3). **It might be concluded that in general the experts have doubts that existing defence measures provide an acceptable level of safety to the citizens.**



Do you think that flood management and defence measures provide a satisfactory standard of safety?

Figure 2.7. Sufficiency of the flood management and defence as perceived by the experts.

Internet is used more and more as an important information link and many countries provide information on flooding electronically. **What are the preferences among the specialists in this matter?** Fig. 2.8. offers an illustration of the answers given. It is seen that **traditional information sources such as newspapers and radio and television are still highly in use.** In all the countries but Norway the majority of experts ranked highly also the website information. Flood information in form of leaflets appears to be much more popular among the British experts compared to the other countries. A long tradition of using this link for information about floods by the UK Environment Agency is one of the most plausible explanations. Leaflets with information seem to have found certain appreciation also among German experts. Traditional links serve information about floods to citizens and do not require much effort to find it.



How is information on flood management and defence measures communicated to your community?

Figure 2.8. Flood information preferences by the experts.

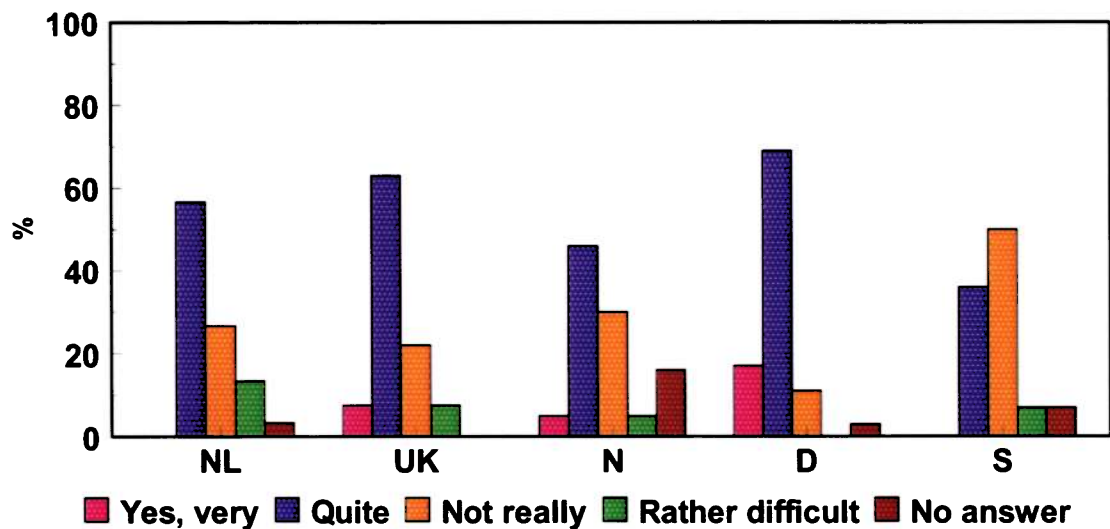
How do the experts rank direct contacts with laymen? In general, direct contacts with public are ranked lower by the experts in all the countries, as the information coverage is naturally lower in this case (Cf.Fig.2.8). On the other hand, direct contacts with laymen offer a possibility of a dialogue and encourage active public participation in flood assessment. This possibility seems to have been especially appreciated by the British experts the majority of whom ranked public meetings nearly as high as the website information. Public meetings appear to be also much appreciated by the German and Dutch experts. Willingness to meet citizens “face to face” was the biggest in Germany (ranked highly by almost half of the experts) followed by the British experts. Existence of local flood groups may be regarded as a sign of public engagement in flood assessment. Such groups seem to be highly appreciated as an information link by the British specialists who rank them almost equally with public meetings. This information link seems still to be much less used in other countries.

It can be concluded that generally traditional information links are given preference for disseminating information on flooding. In some countries, and especially in the UK, there are obvious indications of efforts undertaken to involve laymen in disseminating information on flooding.

Existence of information on flooding is a necessary but not sufficient condition to be of a benefit for population. Most important is that people are aware of such information and

that it is adequate and easy to understand. **Do the specialists consider the information about flood management and defence measures to be adequate and user-friendly?** As seen in Fig.2.9 the majority of experts from all the countries except Sweden consider the information provided to the population to be very or quite adequate and user-friendly. In Sweden less than a half of experts were satisfied with the information provided. About five to seven per cent of the experts, and in the Netherlands almost twice as many, considered that the information was rather difficult, which certainly leaves room for improvements. Amazingly many Norwegian experts (16%) did not give any answer to this question. Also the number of Swedish experts leaving this question without an answer was twice as high (6%) compared to the other countries except for Norway.

A general conclusion might be that the information on flood management and defence measures is on the average appraised as adequate and user friendly by the experts but improvements are still needed.



Do you consider the information on flood management and defence measures in your area to be adequate and user-friendly?

Figure 2.9. Quality of information about flood management and defence as perceived by experts.

Public engagement in flood assessment is acknowledged more and more as one of necessary conditions of it success. As noted earlier, direct contacts with public have already found appreciation among the specialists in some countries. **How active are these contacts with laymen on flooding?** As evident from Fig. 2.10 the situation is

different in different countries. While in Germany the experts almost unanimously answered that they had such contacts, followed by Norway and the UK, in the Netherlands the majority (60%) answered that they did not. Only slightly more than half of the Swedish experts replied positively to this question. The responses given by the German experts and also by the British ones are well in accordance with their high appreciation of “face to face” contacts with public (Cf. Fig.2.8).

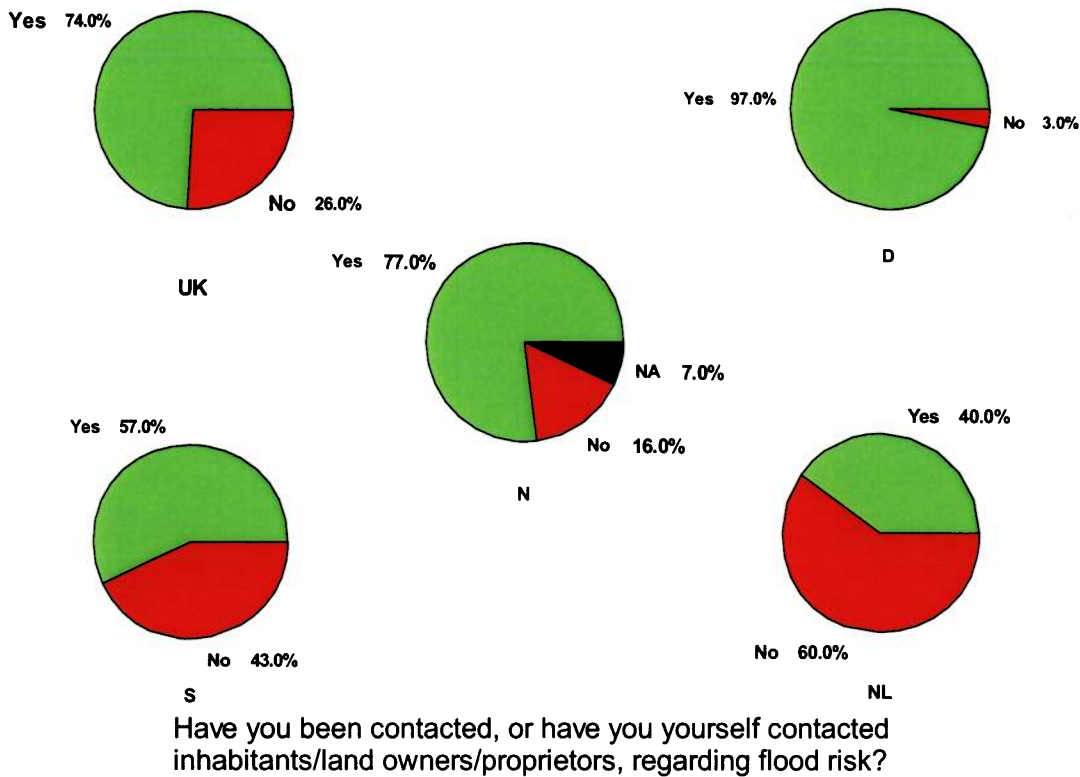
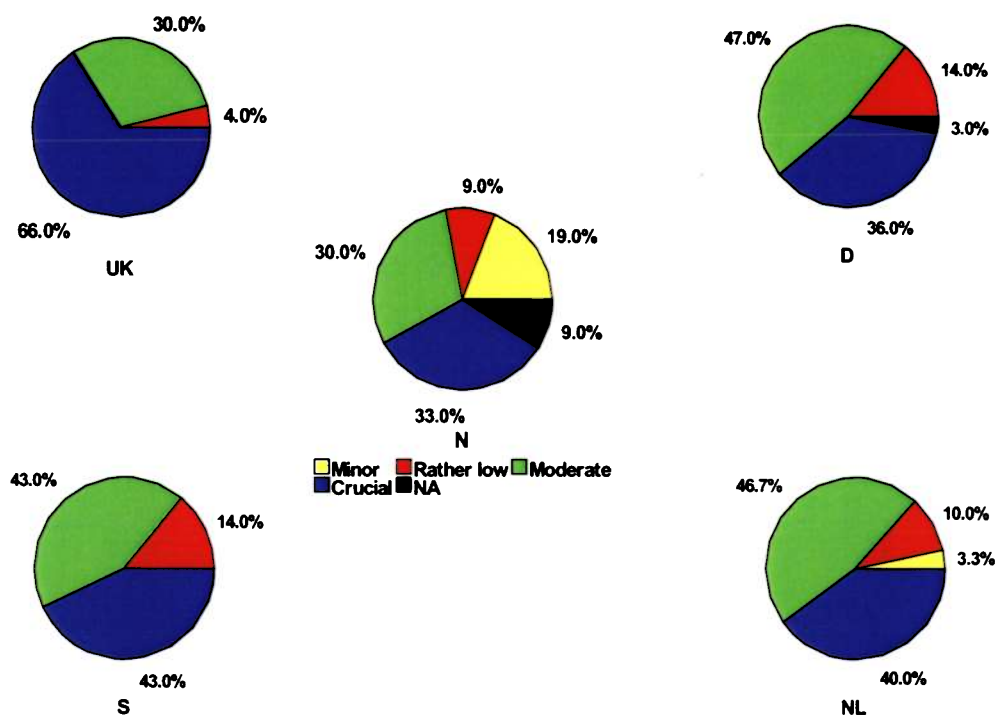


Figure 2.10. Appreciation of contacts with public.

“Public” is the majority of the society and a flood protection level cannot be imposed on them without a discussion. Laymen can also reduce the adverse effects of flooding in their homes if they are better prepared and contribute in this way to flood assessment. These are only some examples illustrating the importance of public participation in flood assessment. **How do the experts rank the importance of public participation in flood and defence measures for the success of the latter?** It is not surprising with regard to the answers given earlier (Cf. figs. 2.8 and 2.10) that it is the British experts who assign crucial importance to public participation. The whole 66% of them answered so, which is by far more than in any other country (see Fig.2.11). In all the other countries the experts were more inclined to assign only moderate importance to public participation in flood assessment. The Norwegian specialists seem to be most reserved in their appreciation of public participation: only each third of them really gave importance to it and as many as about 20% considered it to be only of minor importance for the success of flood

management. Low ranking of the importance of public participation could be also traced among a small group of the Dutch experts.

A general conclusion might be that public participation in flood assessment has still not found its true value in the perception of the experts and decision-makers with the exception of the UK.

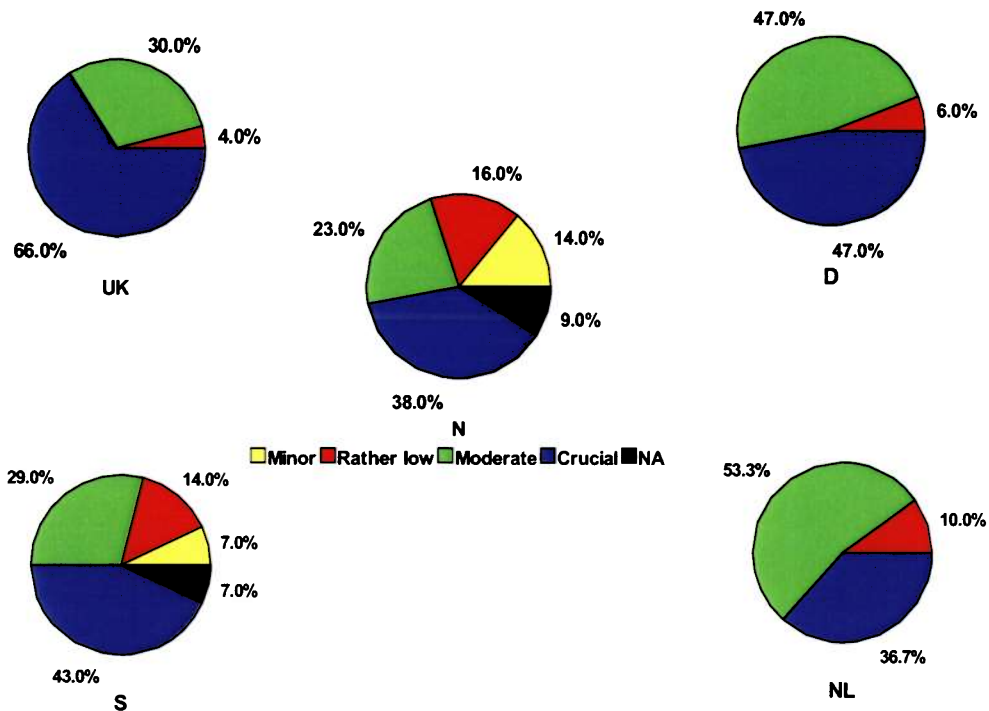


How do you rate the importance of regular public participation in flood management and defence measures for the success of the latter?

Figure 2.11. Attitudes toward the importance of public participation in flood management and defence measures.

Adequate communication of risk is in the heart of all risk problems. **Do the experts put some value to regular public information on flood management and defence measures?** Hardly surprising, the majority of the British experts estimate regular information to public as crucial (Cf. Fig.2.12). As for the rest of the countries, it is still a minority of the experts that do so, remaining around 40%. In the two Scandinavian countries there were specialists (14% in Norway and 7% in Sweden) who assigned only minor importance to the regular information to the public on flood issues.

There is an indication of an underestimation of the importance of regular information to laymen on flooding in all the countries but the UK, which is a direct consequence of a rather low appreciation of public participation in flood management and defence, expressed earlier (Cf. Fig.2.11).



How do you rate the importance of regular public information on flood management and defence measures?

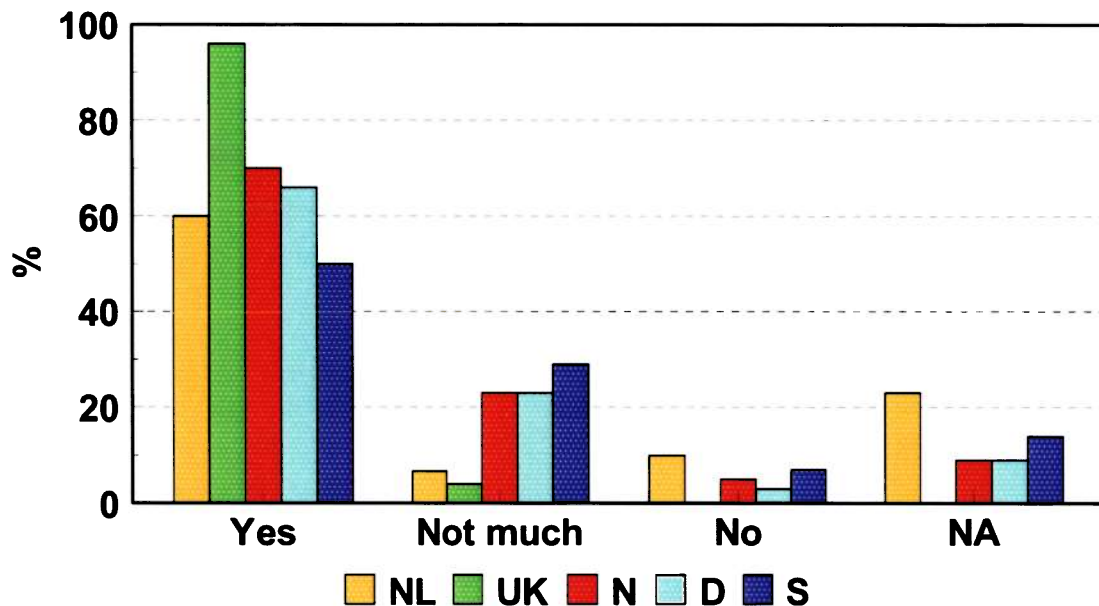
Figure 2.12. The importance of regular information on flood issues as appreciated by the experts.

We in the House of Lords are never in touch with public opinion. That makes us a civilized body.
Oscar Wilde

2.4. Willingness to “buy safety”/ adapt to risk (risk-benefit)

Consideration of flood hazard in spatial planning may reduce the losses caused by flooding significantly. **Is flood risk taken into consideration in the local plans?**

As seen in Fig.2.13 flood hazard seems to have gained importance in local plans in the UK, where almost all the specialists gave a positive answer to this question. Even though this hazard is also considered, according to the experts, in all the other countries, many of them (around one third) answered that it is still not done much, not done at all or did not give any answer to this question. **There is an obvious need to enhance consideration of flood hazard in local planning in all the countries (possibly with the exception of the UK).**



Is flood risk taken into consideration in your local plan(s)?

Figure 2.13. Consideration of flood risk in local plans.

Whenever flood hazard is considered in spatial planning it often requires public investments to increase safety. Is there a willingness to invest public money in flood protection? Examining the diagrams in Fig. 2.14 it is seen that the attitudes appear to differ among the countries. The willingness to invest public money in flood safety seems to be quite high in the Netherlands (and quite consequently the Dutch experts do not expect a major flooding in the near future, cf. Fig.2.1), where eight in ten experts answered positively to this question. Also in the UK and Germany public money seems to be invested to raise flood safety, though to a less extent than in the Netherlands. The situation seems to be opposite in Sweden, where around 70% of the specialists answered that public money was barely invested (or not invested at all) to improve flood protection, an opinion shared also by the majority of the Norwegian experts. Such a big difference in responses given by the experts from the two Scandinavian countries might depend on a comparatively lower impact of flooding there compared to the rest of the countries. Amazingly many experts in all the countries but the Netherlands did not give any answer to this question.

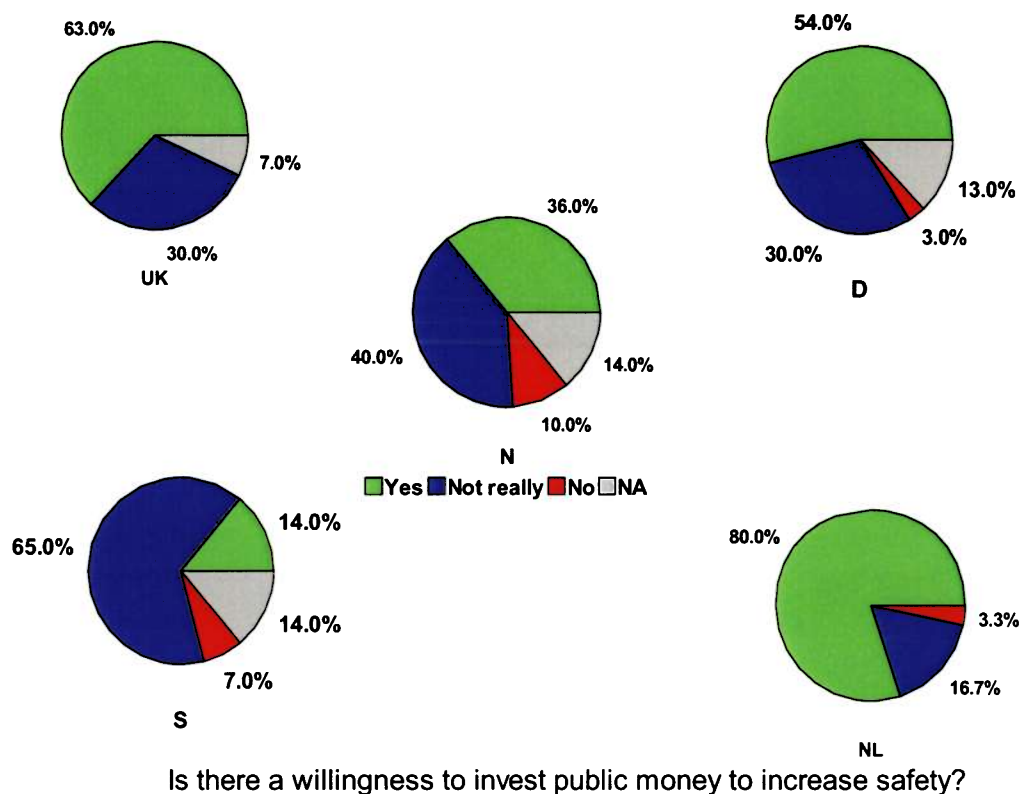
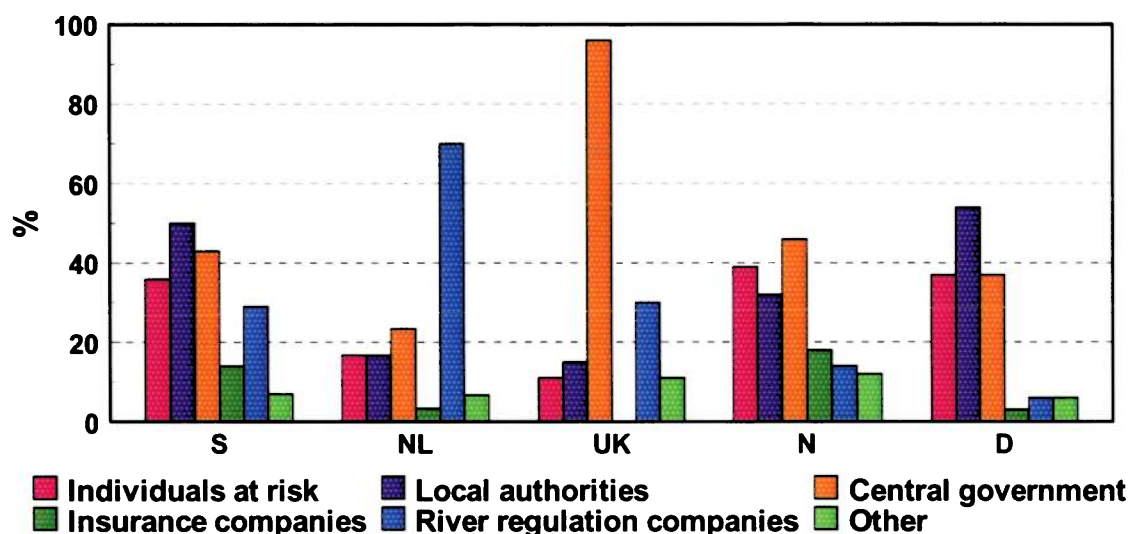


Figure 2.14. Willingness to invest public money in flood safety as perceived by the experts.

A question about investments to increase flood safety is usually followed by a discussion about **who should pay for safety improvements**. Fig.2.15 elucidates the opinions of the experts on this matter.

It is seen that the opinions differ which most probably depends on differences in the practices of flood assessment. While in the UK the specialists almost unanimously responded that central government is responsible for such investments, the major responsibility is attributed to river regulation companies by the Dutch experts. The Swedish and German experts assigned the main responsibility for payments to the local authorities, central governments being considered only as the second potential investor and the ranking by the Norwegian experts is vice versa. In the Scandinavian countries and Germany about 40% of the experts considered that individuals at risk should pay for safety improvements, which is in contrast to a rather modest proportion of the Dutch and British experts (17% and 11%, respectively), who shared this opinion. The role of insurance in funding of flood protection seems to be rather modestly appreciated by at most 18% of the experts.



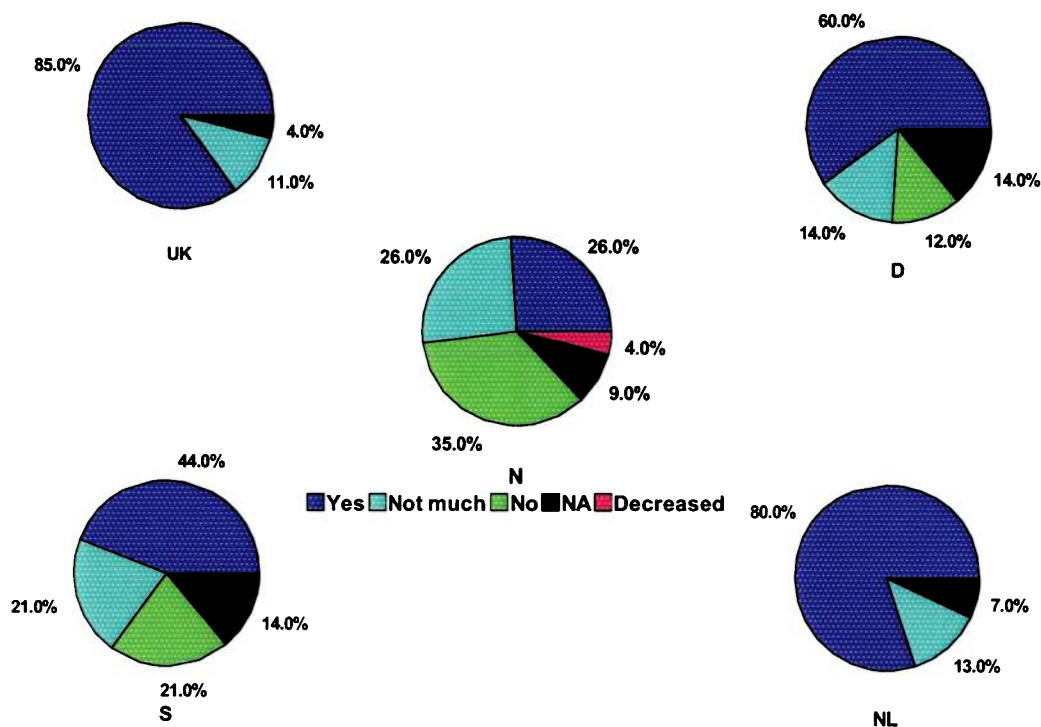
Who should pay the costs for flood safety improvement?

Figure 2.15. Responsibilities for paying the costs for flood safety improvements as perceived by the experts.

The differences in opinions suggest a variety of practices and indicate an advantage of exchanging practices in order to mobilize all the resources available to combat flooding.

Reports about devastating flooding in North-Western Europe appear more and more often in press. **Have the costs of flood management and defence measures increased in recent decades as a response of the society to this natural hazard?** Studying the diagrams in Fig.2.16 it is seen that indeed **the British, Dutch and German specialists really thought that such costs had increased.** This is in agreement to the answers about willingness to invest in flood safety in these countries (Cf. Fig.2.14).

Among the Norwegian specialists the preferred alternatives were “no” and “not much”. Meanwhile, about 70% of them declared that they had experienced flooding in the area of their responsibility several times (Cf. Fig.2.5), which seems not to have stimulated investments in flood safety. At the same time they have appraised the economic impact of flooding as only “minor” or “negligible” (Cf. Fig.2.6), which suggests a possible explanation. The Swedish experts were split in the middle in their opinions although many did not give any answer to this question. Bearing in mind that none of them considered the flood defence management to be sufficient such responses are rather confusing.

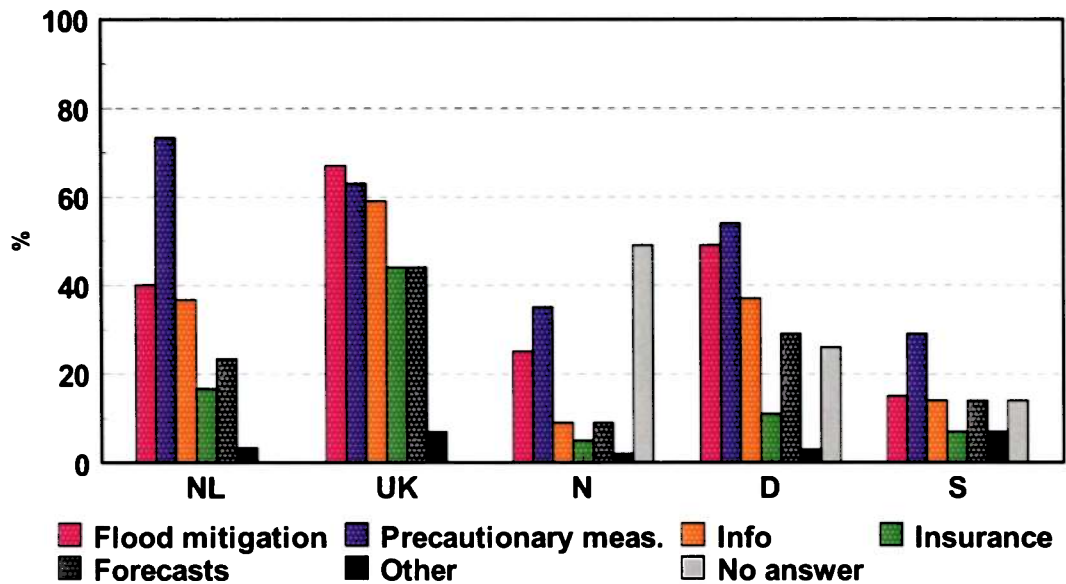


Have the costs of flood management and defence measures in your area increased in recent decades?

Figure 2.16. Increase in costs of flood management and defence measures as perceived by the experts.

A follow-up question was about **which costs have increased in connection to flood management and defence measures**. Fig.2.17 presents the opinions of the experts on this matter.

In the Netherlands the majority of the experts attributed the increase in costs to mainly costs for precautionary measures. In all the other countries it is not only these but also several other costs were considered to have increased by as many experts, such as costs for direct flood mitigation, information, insurance and forecasts. These latter costs have also increased in the Netherlands but comparatively less than those for precautionary measures. Almost half of the Norwegian experts did not give an answer to this question, though this depends rather on technical reasons (missed the question on the reverse side of the paper). The answers are well in accordance to the answers given earlier about investments (Cf. figs.2.14 and 2.16).

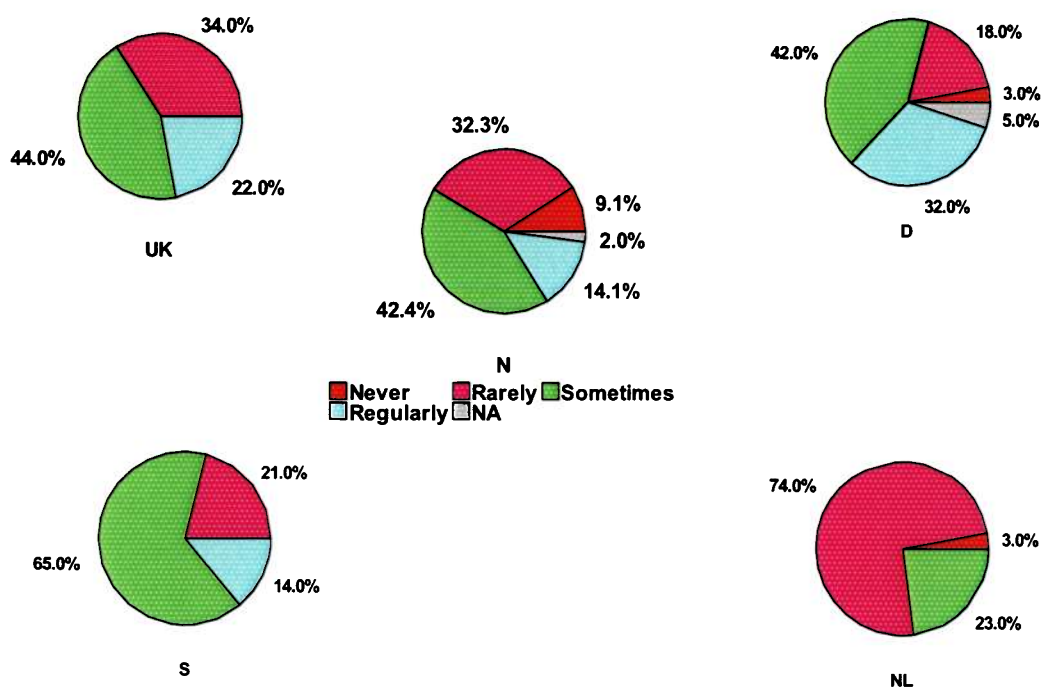


Which of the following costs have increased?

Figure 2.17. Distribution in recent cost increase for flood management and defence measures as perceived by the experts.

No flood management and defence measures can guarantee total flood safety, as there is always a risk that the defence constructions can be overtopped or fail due to other reasons. Such risk is taken into consideration when constructing flood defence and reflects a degree of risk the society can reckon on. That is why it was interesting to find out **what risk of flooding level experts and decision makers really reckon on**. Fig. 2.18 illustrates their opinions on this matter with respect to homes and other private property.

In contrast to the answers of the experts from the other four countries but in a full agreement to their answers about the probability of a major flood event, investments etc. (Cf. figs. 2.1, 2.2, 2.14, 2.16, 2.17) the majority of the Dutch experts never reckoned on such event or reckoned on it only on rare occasions. In the UK, Norway and Germany “sometimes” seems to be an alternative preferred by most respondents (around 40%). In Sweden much more experts could reckon on flooding of homes sometimes or even regularly, which is in agreement to their poor confidence in adequacy of flood management and defence measures (Cf. Fig.2.7). Regular flooding of homes is something the British, Norwegian and especially German experts also reckon on, which is quite expected considering their answers given earlier (Cf. Fig.2.2).

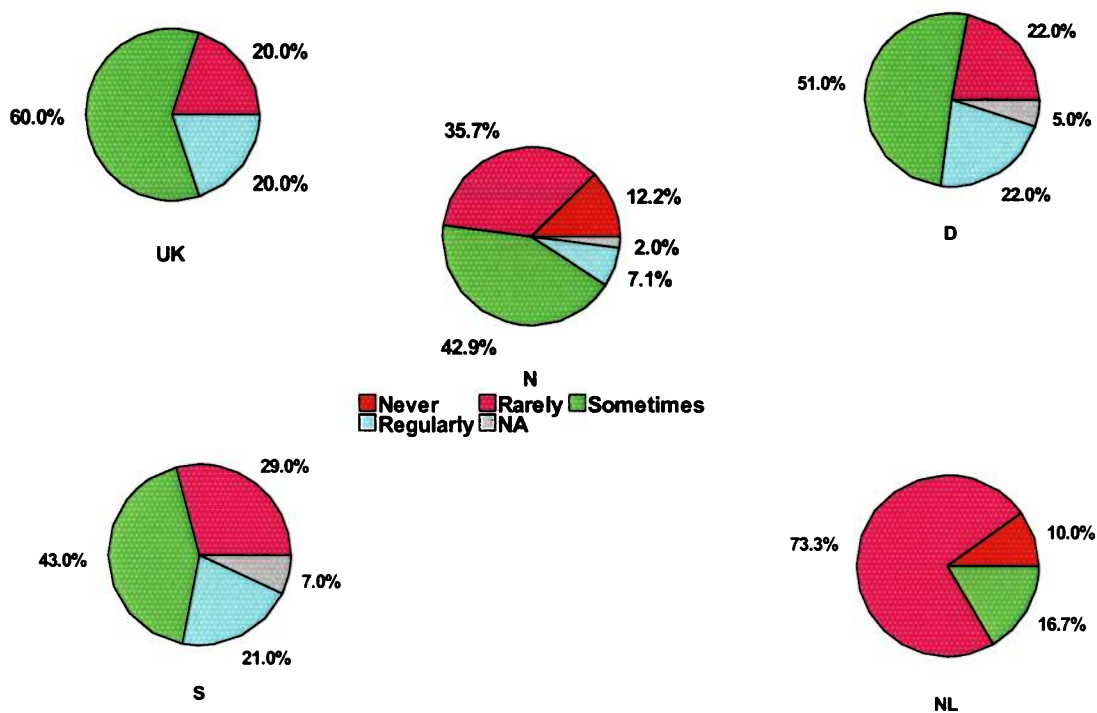


How frequently do you reckon on homes and/or other private property (gardens, garages, shops etc.) getting flooded?

Figure 2.18. Reckoning on flooding of homes and private property.

A general conclusion might be that flooding of homes has become something that experts and decision makers really reckon on in the countries of the North Sea region with the exception of the Netherlands, where they seem to have a slightly different perspective in mind speaking of flooding of homes.

Private homes have one of the highest protection priorities, **how often do the specialists reckon on flooding of public buildings?** Diagrams in Fig.2.19 illustrate their answers. It is easy to notice that **the answers closely resemble those given to the previous question**. More Dutch experts than in case of private property, however, answered that they never reckoned on such an event but “rarely” was a clearly preferred alternative among them. “Regular flooding” was not chosen by any Dutch expert as something that they could reckon on. “Sometimes” was in general the most frequent answer given by the experts from the other countries, quite similar to their answers about flooding of homes. About 20% of the British, German and Swedish experts could also reckon on regular flooding of public buildings. The Norwegian and German experts were less inclined to reckon on regular flooding of public buildings than private homes, while the Swedish experts on the contrary could reckon on regular flooding of public buildings more.

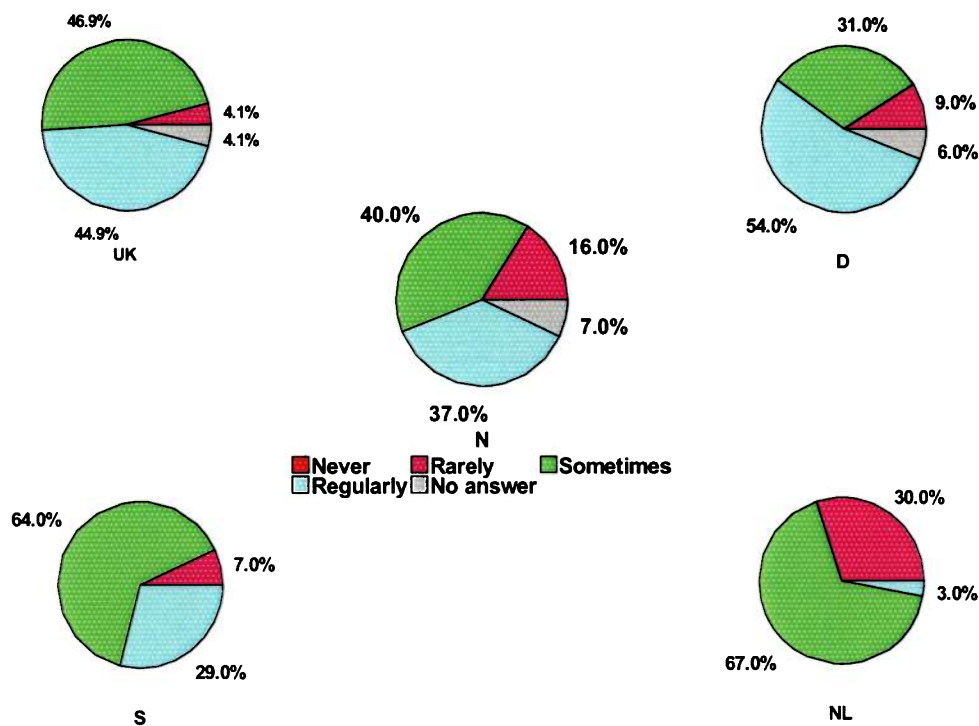


How frequently do you reckon on public buildings getting flooded?

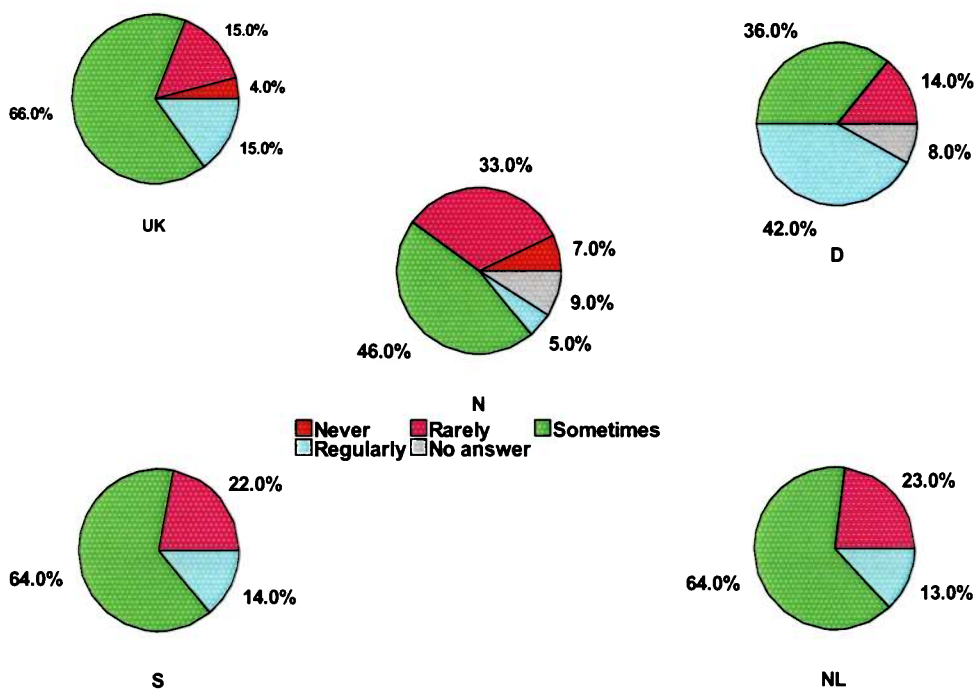
Figure 2.19. Reckoning on flooding of public buildings.

The experts shared similar opinions with respect to flooding of agricultural and natural areas as evident from Figs.2.20a and b. “Sometimes” was the alternative preferred by most of them except for the Germans. For them “regular” seemed to be more relevant.

The answers give evidence that flooding is no longer an exceptional event in the area of study. All specialists could recon on flooding of agricultural areas. Only very few of them (in the UK and Norway) could never reckon on flooding of natural areas.



a



b

Figure 2.20. Reckoning on flooding of agricultural land (a) and natural areas (b).

2.5. Experts' suggestions for improvements at municipal and individual levels

Some of the questions concerned knowledge of flood management and defence measures in the area of responsibility and possible suggestions for improvements. Table 2.2 offers generalized information on these topics.

Table 2.2. Suggestions for improvements received from the experts

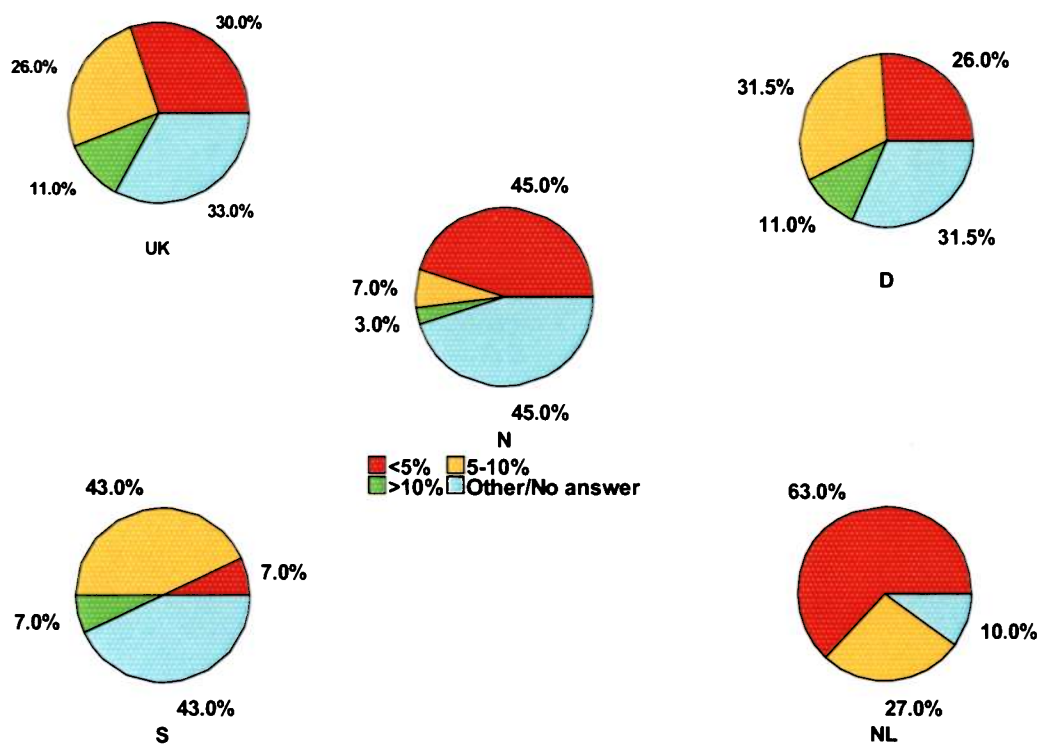
Question/ Country	If the funds were available, what would you suggest to reduce the loss resulting from flooding?	Have you any suggestions as to what individuals can do to better adjust to flood risk?
Germany	<p>Flood adapted building and land use.</p> <p>No building in flood plains, even behind protection line, retreat from flood prone areas.</p> <p>Avoid raising damage potential.</p> <p>Adapted use of flood prone areas.</p> <p>Strengthen hazard awareness providing adequate information.</p> <p>Enhance cooperation between all water management institutions.</p> <p>New dikes, reconstruction and maintenance of technical flood protection.</p> <p>Extending technical flood protection, to the level of 100-200 year flood.</p> <p>Early flood warning.</p> <p>Improving forecasts.</p> <p>Flood hazard maps.</p> <p>Emergency training.</p> <p>Civil protection plans / action plans.</p>	<p>Preparedness.</p> <p>Adapted building/use of the house.</p> <p>Private flood protection.</p> <p>Return valves.</p> <p>Timely evacuation.</p> <p>Isolation flaps for doors and windows. Emergency kit.</p> <p>Building up personal awareness.</p> <p>Note flood protection facilities.</p> <p>Think of possible impacts of a big flood. View flood hazard maps focusing on the location of your home.</p> <p>Read info leaflets.</p> <p>Riparian owner should maintain riverbed / plains.</p> <p>No building in flood plains.</p> <p>Delay direct runoff by using rainwater, retention pools etc.</p> <p>Decentralised draining and infiltration.</p>
Norway	<p>Dikes.</p> <p>Consideration in spatial planning.</p> <p>Better information.</p> <p>Moving away houses in dangerous zones.</p> <p>Flood hazard maps.</p> <p>Evacuation channels for flood water.</p> <p>Adapt agricultural land use.</p>	<p>Do not turn cellars to computer rooms etc.</p> <p>Prevent blocking of evacuation channels by vegetation.</p> <p>Be informed, use flood hazard maps if available.</p> <p>Adapt to nature rather than adapt nature.</p> <p>Use existing knowledge when planning for new land</p>

	Use river regulation better. Better warning systems. Better maintenance of infrastructure.	developments. Adapt agricultural practice to the actual flood hazard. Adapt the house (pumps etc). Respect municipal spatial planning. Risk awareness.
Sweden	Expropriation. Risk maps. Preventive measures. Comprehensive plans. Land-use planning. Dikes infrastructure. Private measures.	Technical measures to adapt homes. Respect building restrictions. Risk awareness. Get more knowledge.
UK	Flood defence to 1 in 200 years. Identification of hot spots and then increased defences. Grants to householders to implement flood defences. Increase awareness. Advice from EA on household flood protection. Public education program. Encourage self-help. Planning control. More comprehensive and unified system of flood management and mapping. Consider managed retreat. Creation of 'washes' both upstream and downstream of Broads settlements. More attention to maintenance of rivers. Early response.	Be aware of risk to their land/ property. Be better informed – education. Proper flood risk assessment of property and implement findings. Prepare action plans in advance. Make homes more flood resilient. Purchase of flood preventative tools. Flood proofing measures – barriers, ground floor doors, etc. Cover air bricks. Not to rely on council providing sandbags. Question seller/ developer when purchasing property. New development only permitted in river flood plains in exceptional circumstances.

It is easy to see that the suggestions are rather similar (locally-related suggestions are not shown in the table (with the exception of the Broads which covers both Norfolk and Suffolk). **There are some key words emerging in the suggestions, such as “awareness”, “adaptation”, “considering flood hazard in spatial planning”, “information and education”.** At municipal level also removals of properties in especially dangerous localities have been proposed. Many of the suggestions are relatively simple and demand rather thought and caution than really big investments. Many of them are also similar at municipal and individual levels, which indicate good possibilities for cooperation and joint actions. A necessary premise for such cooperation is, however, an open dialogue between specialists and laymen.

Some flood safety improvements require investments by the owner of the house. **How big is the level of investment required (as a percentage of house value) to reduce the loss from flooding?** Fig.2.21 illustrates the answers given by the experts.¹ It is seen that in general very few experts estimated such costs for adjustments of homes as higher than 10% of house's value. It was mostly estimated to be 5%-10% or less. Many experts had difficult to answer this question.

A general conclusion may be that the improvement costs can hardly be the only reason for the owners for not taking steps to increase flood safety of their homes revealed by the poll study. Unawareness and low ranking of flood hazard might be a more plausible reason (Krasovskaia, 2005).



How do you estimate the level of investment required (as a percentage of house value) to reduce the loss from flooding?

Figure 2.21. Investments required for reducing the loss from flooding.

2.6. Experts' personal background

As already mentioned, the selection of the experts and decision makers involved in the study was made individually in each country following the existing experience and

¹ Some British experts related the expenses to certain conditions. For generality such answers are joined together with the alternative "No answer".

practical possibilities. Such a procedure inevitably introduces a certain bias, which must be taken into consideration when analyzing the results. Fig.2.22 illustrates the background of the experts. We can see, for example, that females are strongly underrepresented among the specialists in all the countries but Sweden. This might reflect a still existing gender distribution among experts and decision makers in the countries involved in the study but may as well be a consequence of attitudes or chance.

The age distribution seems to be rather representative for the societal structure with experts between forty and sixty dominating with a somewhat higher percentage of younger persons in the Dutch and Swedish samples.

Education levels are somewhat more difficult to compare due to differences in the education systems. Anyway, the absolute majority of the experts had university education and postgraduate education.

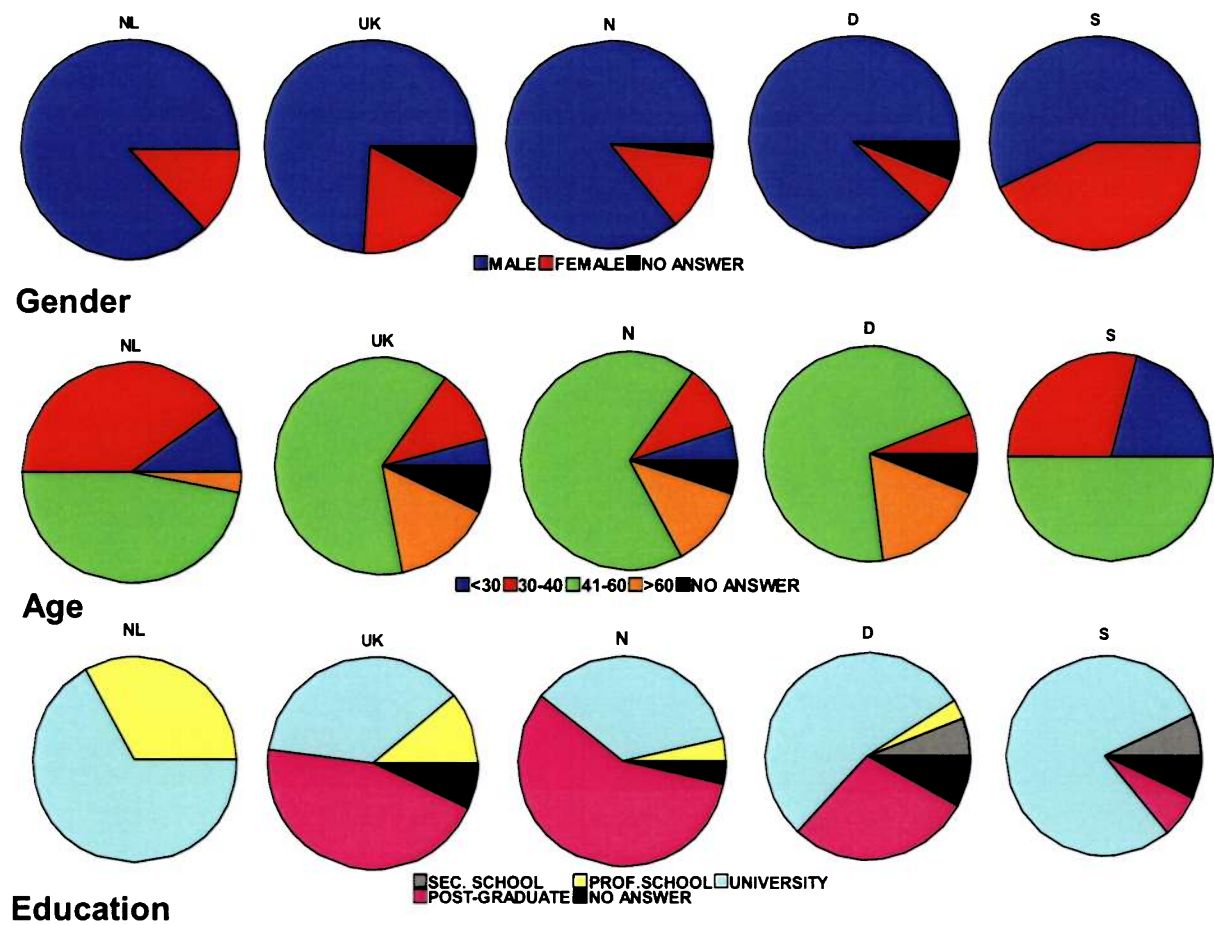


Figure 2.22. Experts' background

The majority of the experts in all the countries live in the same area where they work, which probably offers not merely professional insight into the flooding problems in the area.

In Norway, Sweden and the UK most of the specialists do not have flood assessment as their major activity, while the majority of them in Germany and especially the Netherlands do. Thus some difference in perspectives might be expected. At the same time the sample as a whole gains from the heterogeneity of professional backgrounds.

Finally, affiliations of the experts differ considerably between the countries. The majority of the Dutch and Norwegian experts and approximately half of the British work at the local level. In the German sample the proportion of experts coming from central governmental organizations is much bigger, those coming from local authorities being only about one fourth. It is in the German and British samples that we can see the biggest variety of affiliations with business, insurance and also laymen (only in the UK) represented. This undoubtedly brings forward new valuable perspectives. A composition of the Swedish sample is totally different from all the other with all specialists coming from regional governmental authorities. This, together with its small size, calls for great caution when making any general conclusion using this sample.

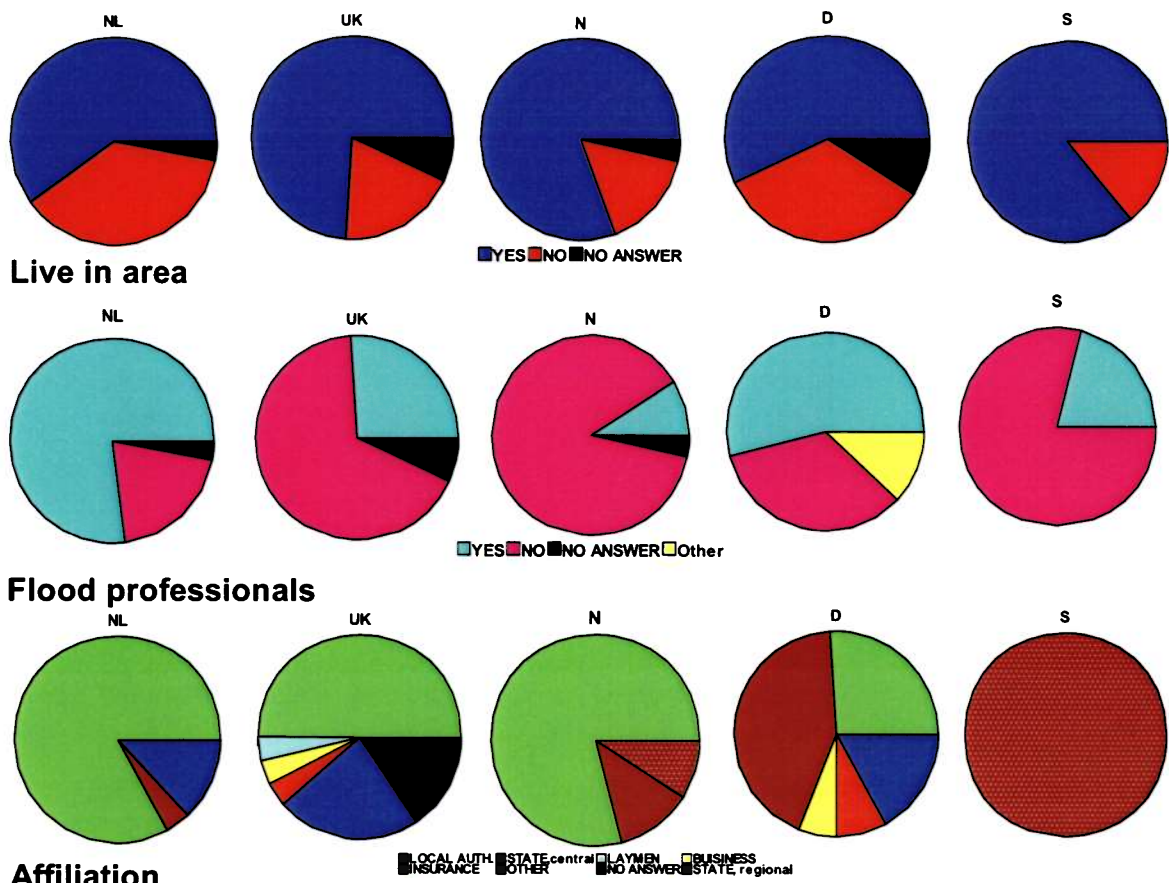


Figure 2.22 (continued). Experts' background

Sample composition as a total gives an impression of a rather fair description of experts and decision makers dealing with flood assessment in the partner countries.

2.7. Conclusions, questionnaire study

The study revealed many similarities but also differences in the perceptions of flood hazard by the specialists in the partner countries. Among the perceptions that are very similar are:

- Obvious awareness of flood hazard. Experts in all the countries are quite aware of a flooding problem including flooding of homes.
- Reasonable attitude towards flooding as an event that might also have some positive effects, such as stimulating investments in preventive measures, appreciated in all the countries. Flooding also might trigger more social responsibility and draw public attention to the communities otherwise merely known.
- In general the existing defence measures are not considered to provide an acceptable level of safety to the citizens.
- Traditional information links are given preference for disseminating information on flooding, electronic information being also appreciated. In some countries, and especially in the UK, there are obvious indications of the efforts undertaken to actively involve laymen in disseminating information on flooding.
- Information on flood management and defence measures is in general appraised as adequate and user friendly.
- Public participation in flood assessment has not yet found its true value in the perception of the experts and decision-makers with the exception of the UK.
- Importance of regular information to laymen on flooding is not yet perceived to have crucial importance in all the countries but the UK.
- An obvious need to enhance consideration of flood hazard in local planning in all the countries (possibly with the exception of the UK).
- The majority of the specialists attributed the increase in costs to the growth of expenses for precautionary measures (especially the Dutch experts) but also several other costs were considered to have increased, such as costs for direct flood mitigation, information, insurance and forecasts (especially in the UK and Germany).
- Flooding of homes has become something that the experts and decision makers really reckon on in the countries of the North Sea region.
- Flooding of agricultural and natural lands seems no longer to be an exceptional event but something that specialists reckon on.

What are the main differences in the perceptions? Below some of the most striking differences are noted country-wise.

Already reading about the main similarities it is easy to notice that perception of many important issues by the British experts shows a clear difference. They seem to be much more open towards public participation in flood management and defence, considering it to be crucial for the success of the latter. Also consideration of flood hazard in spatial planning seems to have gone much ahead in the UK. Insurance payouts after flooding were appreciated much more by the British experts indicating the established practices. Another difference is a high appreciation of leaflets for disseminating information on flooding (shared with the experts from Germany).

The Dutch experts revealed perceptions of some topics that were slightly different. Many of them neither can think of a major flood event in recent future nor flooding of homes or public buildings. Actually more of them than in any other partner country (except for Sweden) have never witnessed flooding in the area of their responsibility. Willingness to invest public money in safety seems to be highest in the Netherlands and the costs for preventive measures have increased there more than any other costs. Responsibility of regulation companies for flood safety is estimated higher than in any other country reflecting the important role of the Water Boards. Improvement grants in connection to flooding were appreciated more by the Dutch experts, which might be an indication of a well-developed practice. Less Dutch experts seem to have had direct contacts with laymen on flooding matters.

The German experts take the leadership in the direct contacts with public but still the majority of them do not perceive the importance of public participation in flood management as crucial (an opinion shared with all but the British experts). Regular flooding of homes is something that especially the German specialists reckon on. Many of them considered that besides central and local authorities, individuals at risk should pay for safety improvements (an opinion shared with the experts from the two Scandinavian countries). The German experts (together with the Swedish ones) appreciated bringing the community together as one of the positive effects of flooding.

The Swedish experts were those most convinced that a major flood event could happen in the area of their responsibility in the near future and at the same time were (together with the Dutch) those with less direct experience from flooding. They were most unsatisfied with the existing flood protection measures as well as with the information on flood matters. At the same time many of them demonstrated (together with their Norwegian colleagues) rather low appreciation of informing public on these matters. The majority of the Swedish experts thought that there was no actual will to invest public money in flood safety, which is in contrast to the experts from the other countries. Similar to the German specialists, more of them gave the responsibility for flood protection to local authorities but also to individuals at risk of flooding. Reckoning on flooding of private homes was also somewhat higher among the Swedish experts.

The Norwegian experts, similar to their British colleagues, had more experience with flooding in the area of their responsibility than the others. They evaluated the flood damage as only minor more than any other expert group. The Norwegian specialists showed the lowest appreciation of the importance of public participation in flood

management and defence and also most of them (as also the Swedish) did not give value to regularly informing the general public on flooding issues. Many Norwegian experts (sharing the opinion with their German and Swedish colleagues) considered that individuals at risk should pay the costs for flood safety improvements alongside central government. Among them were found the only experts who have stated that the expenses for flood management and protection had decreased during recent decades. The expectance of flooding of private homes and natural areas seems to be the lowest among the Norwegian specialists.

Many of the differences noted depend on the differences in practices of flood management and defence applied in the partner countries. This indicates that there are many approaches and calls for an active exchange of experiences between the decision-makers from different countries to really benefit from the positive examples of their colleagues and avoid repeating the same mistakes. Such an exchange will allow establishing and maintaining a network among them. This will offer a possibility to share and efficiently utilize a great competence accumulated in different countries in combating flooding.

3. Do experts and laymen have similar opinions about flood management and defence?

Any flood assessment strategy needs to be based on the agreed policy between individuals and society with respect to what level of risk is tolerable. How well do the opinions of laymen and experts agree? A comparison between the opinions demonstrated by these two groups on a number of topics that are important for consensus is presented below. The presentation follows the same blocks of topics as in the previous chapters.

3.1. Will a big flood come in the near future? - It depends on whom you ask!

As shown earlier in this report, the experts are well aware of the risk of flooding, including flooding of private homes. At the same time it was concluded on the basis of the poll investigation among the population living in flood prone areas that their awareness of the flood hazard was very low. Diagrams in Fig. 3.1 compare country-wise the views expressed by the general public (p) and experts and decision-makers (e) grouped into two blocks “very or quite likely” and “very or quite unlikely”².

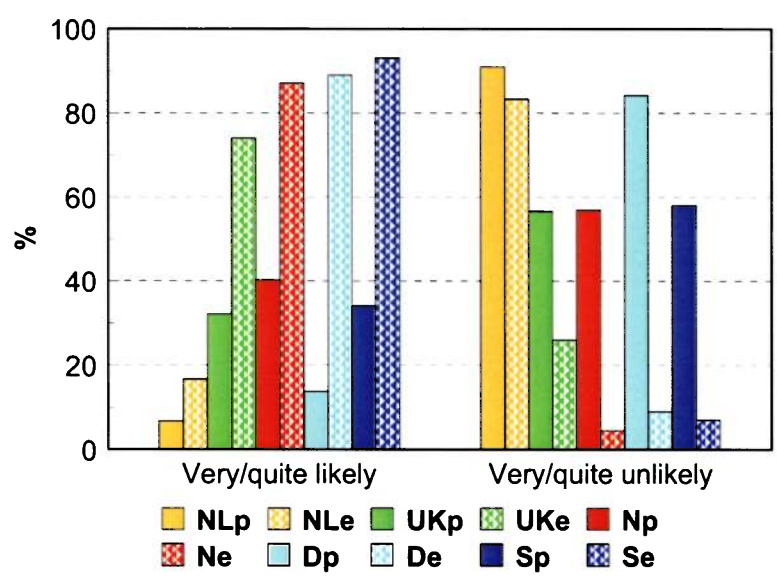


Figure 3.1. Opinions about a possibility of a big flood event in the next 20 years.

It is easy to see that **except for the Netherlands the opinions about a likelihood of a big flood event in the near future are very different among experts and laymen.** While the majority of the former consider this to be very or quite likely the majority of the latter think that it is very or quite unlikely. The reasons for such a big discrepancy may be different. The poll investigation has shown that for example in Germany only one in ten was aware of living in an area at risk of flooding. Missed information and or negligence of the flood hazard by laymen may explain the differences in opinions. In the

² The complete diagrams showing public views on flooding are found in the report from the poll investigation by Krasovskaia (2005).

Netherlands there seems to be a reasonable agreement in the views of laymen and experts on this topic, both groups do not expect a major flood event in the nearest 20 years, which is however in discrepancy with the opinions of the experts from the other four countries. Differences in the opinions between specialists and laymen persisted concerning the views about possible flooding of homes and other private property.



Different awareness of flood hazard

3.2. Flood experiences – two different perspectives

Awareness of flood hazard as well as opinions about flooding depend much on personal experiences. Judging from the poll investigation the overwhelming majority of the population (eight in ten) had never experienced flooding with the exception of Norway. Among the Norwegian and British experts the majority had experienced flooding of the area where they work several times, while such experiences were more limited among experts from the other three countries, and especially the Dutch and Swedish. Comparing the opinions about flooding among the laymen and experts, illustrated by diagrams in Fig.3.2, it is easy to see that the perspectives are somewhat different.

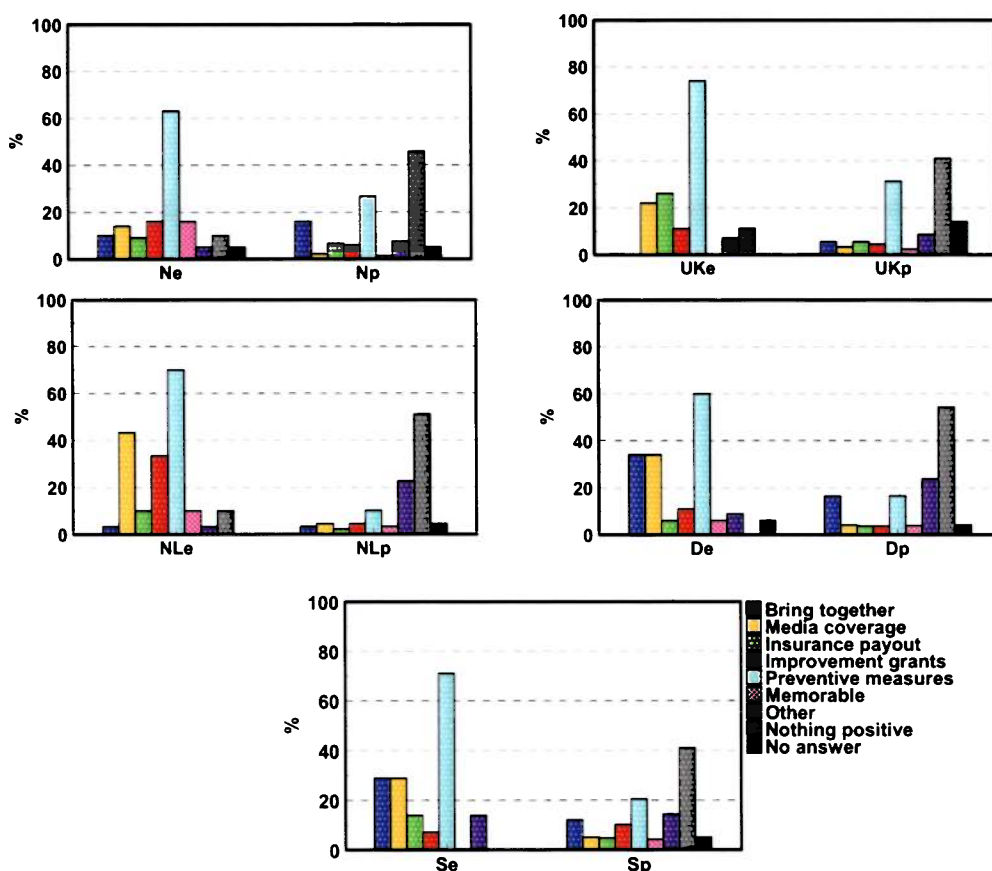


Figure 3.2. Opinions about effects of flooding.

Even bearing in mind that here we deal with personal and professional reflections, it is obvious that while **the majority among laymen do not see anything positive with floods, this opinion was shared only by few experts**. Lacking own experiences, laymen often form their views from the image of flooding presented by mass media, which often cares more for “a shocking story” than elucidates many facets of the event. The investments in preventive measures triggered by flooding were appreciated by the majority of the experts. This opinion was shared by some laymen, especially in the UK and Norway, but totally negative appraisal of flooding still dominated among them. Delayed and/or insufficient compensation for the losses caused by flooding may also contribute to the negative views among the few laymen with experience of flooding.

Media coverage during a flooding event (obviously attracting attention to their region) was appreciated by the experts but hardly meant anything to laymen. In Germany, Sweden and partly also in Norway, the consolidating effect on communities of such an extraordinary event as flooding seems to have been appreciated by both experts and general public. The discrepancies indicate that **laymen tend to underestimate the positive effects of flooding for the community focusing only on its negative side, though many of them never were flooded themselves**.

At the same time the majority of laymen in the Netherlands, Norway, Germany and Sweden and about a half in the UK answered that flooding affected their lives not too badly or slightly at all. The experts, with an exception of the German, seem to share this opinion (many Swedish and Dutch experts gave no answer making a comparison impossible). The German experts estimated the losses as quite or very bad but the population in the area seems not to have been affected so seriously.

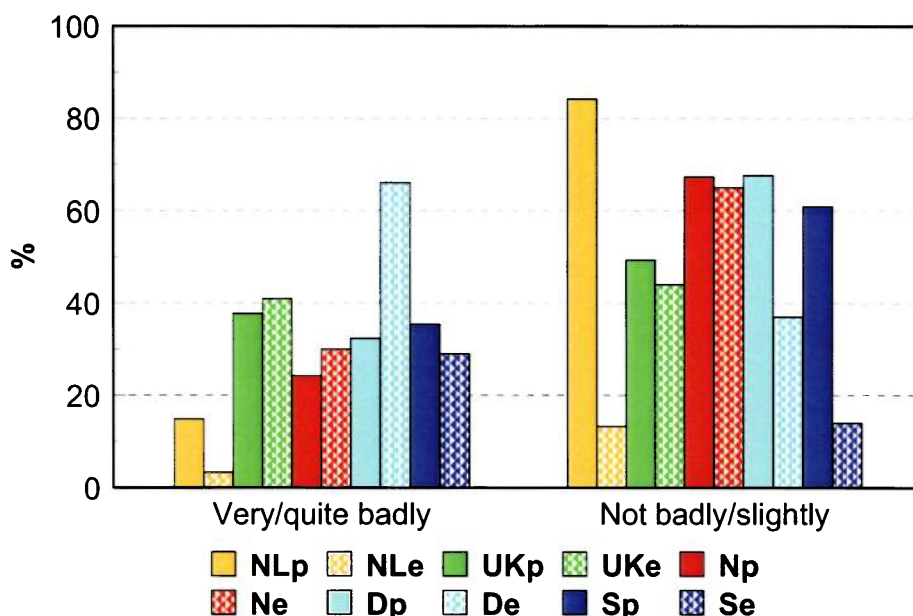


Figure 3.3. The effect of flooding on life in general (laymen) and economic loss (experts).

3.3. Information on flood management and defence, for whom?

Opinions about flooding can originate from personal experiences but for the majority they are still built on indirect information. The poll study revealed a rather poor knowledge about the existing defence measures in flood prone areas. **On the average only about half of the laymen felt that they were well informed about flood issues.** Are the information links used for disseminating this information really those appreciated most by laymen? Diagrams in Fig. 3.4a,b,c present a comparison of appraisal of some information links by laymen and experts, respectively.

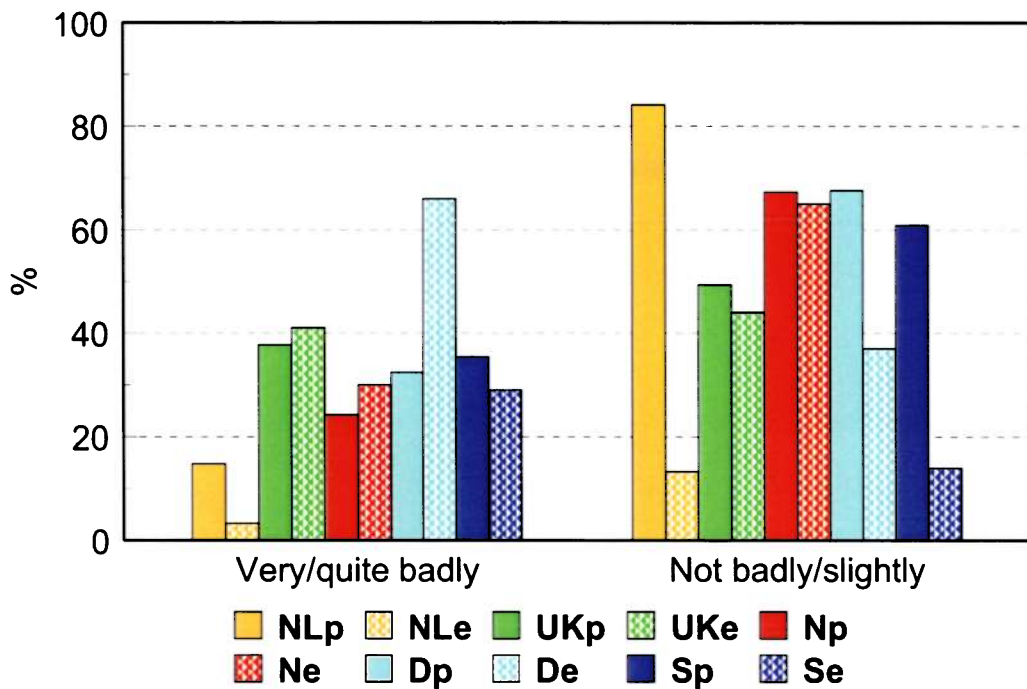


Figure 3.4a. Appraisal of traditional information sources on floods by general public and experts.

The poll study has shown that **traditional information links as newspapers and radio and television are still much appreciated by laymen as information sources on flood issues**. As evident from Fig.3.4a these information sources are appreciated as highly by the experts from Norway and Germany, and still higher by the British, Dutch and Swedish experts.



A traditional information link

Is website information appreciated by laymen? Examining the diagrams in Fig.3.4b it is obvious that **websites are much more popular as an information source among experts than laymen**. Only in Sweden citizens seem to appreciate websites almost as high their specialists. Passiveness among laymen noted in the poll study might be one reason for privileging the information sources that “serve” the information without any effort. Inaccessibility of internet from home and/or lack of experience of using it might be as important reasons.

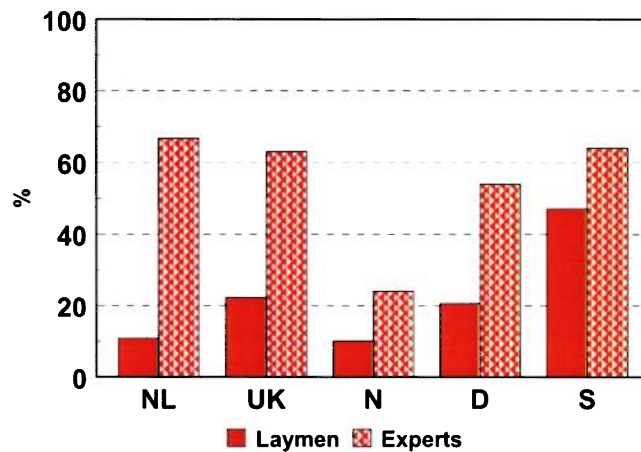


Figure 3.4b. Appraisal of websites for as an information source on flooding by public and experts.

Direct contacts with public were ranked rather low by the experts in all the countries but Germany (Cf.Fig.2.8). **Do laymen appreciate “face to face information” about flooding?** As evident from Fig. 3.4c **they rank this information source still lower than specialists except for the Germans**. German public seems to share a rather high appreciation of “face to face” information with German specialists.

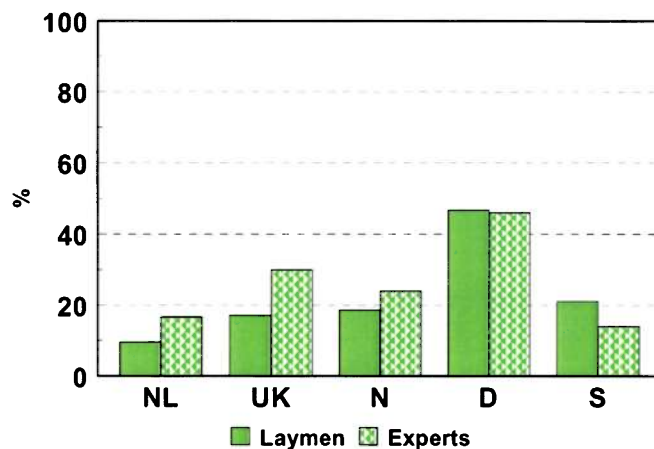


Figure 3.4c. Appraisal of “face to face” contacts as an information source on flooding by public and experts.

It was generally felt by the laymen in the poll study that the information supplied was insufficient or inadequate; especially Germans, Swedes and Dutch felt being ill informed. The majority of the experts, except the Swedish, on the contrary considered the information provided to population to be very or quite adequate and user-friendly (cf.Fig.2.9). The gap in opinions is obvious calling for alternative ways of informing general public on flood issues.

3.4. Considering risk of flooding – two different opinions

The fact that floods represent a natural component in river flow regimes and it is not possible to have 100 percent safe protection against flooding seems to have been well understood by the experts. The majority of specialists, except for the Dutch, reckon on flooding of homes in near future (cf. Fig. 3.5). The population living in the areas at risk of flooding on the contrary considers such an event to be very or quite unlikely. The tendency of a severe underestimation of the danger of flooding persisted in the opinions of laymen regarding their other property (such as gardens, garage, farmland etc.), as was evident from the poll study, while the experts reckoned much more on such events than on flooding of homes.

Also on this topic a clear gap in opinions is evident and originates from dissonant perception of risk, risk denial (a notorious “this cannot happen to me” attitude) or absent, missed or misunderstood information. People who are not reckoning on flooding of their house can hardly be expected to prepare for it!

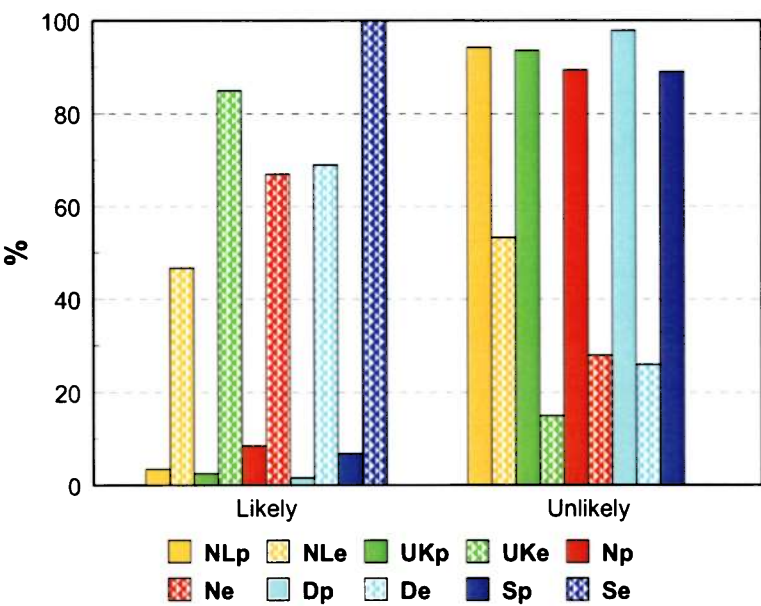


Figure 3.5. Reckoning on flooding of homes, two different perspectives.

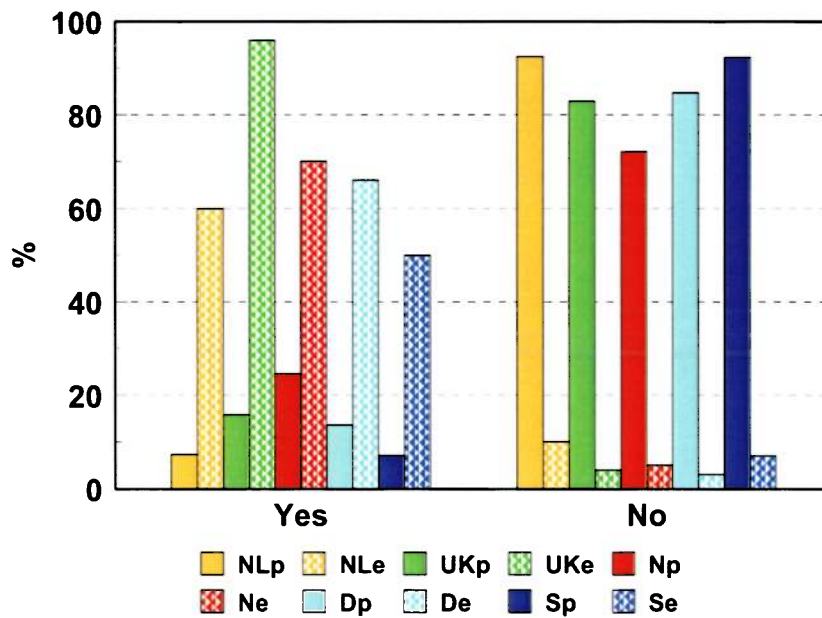


Figure 3.6. Considering the flood hazard by laymen and experts.

Quite expected the majority of specialists (with an exception of the Swedish) confirmed that the flood hazard is considered in local plans (cf. Fig.3.6). All, except the British ones, thought however that much more could be done, while the interviewed laymen almost unanimously answered that they did not consider this hazard when moving to the area. The poll study has shown that people move to and live in flood prone areas mostly due to sentimental reasons. This suggests that in order to fill in the gap in the attitudes towards the flood hazard among decision makers and population it might help to let information on floods appeal not only to the logics but also to the feelings.

3.5. Taking responsibilities

Almost none of the interviewed laymen ever considered moving thus neglecting the flood hazard, whether they knew about it or not. On average, 80 % of laymen did not take any steps to reduce vulnerability of their homes. The decision makers on the contrary came with a lot of suggestions about what can be done like raising flood resilience of homes (no cellar, barriers at the doors etc.); having flood preventive tools; organizing local self-help groups; looking for information etc. This information probably has not reached its destination or failed to alert laymen to take action.

Own investments to reduce the flood hazard seem not to be part of the plans for the majority of laymen (cf. Fig.3.7), only two in ten could think of doing so. Among the experts, except for the Swedish, the majority considered that there is a wish to invest public money to increase flood safety, though in many countries such efforts were obviously not considered as sufficient.

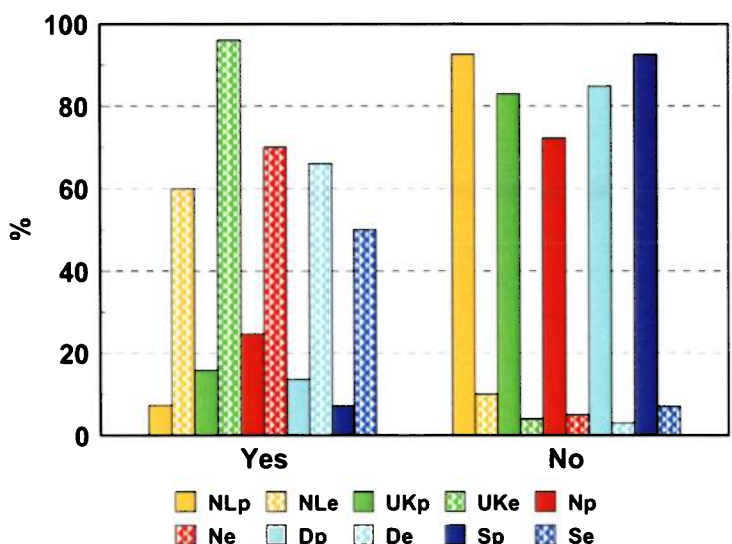


Figure 3.7. Willingness to invest in reducing the flood hazard.

Whose responsibility is the investments in flood safety? Even though in all countries but the Netherlands this responsibility was attributed by the majority among both laymen and experts to central and/or local authorities, the opinions were more divergent concerning individual responsibility and responsibility of insurance and regulation companies as evident from Fig. 3.8.

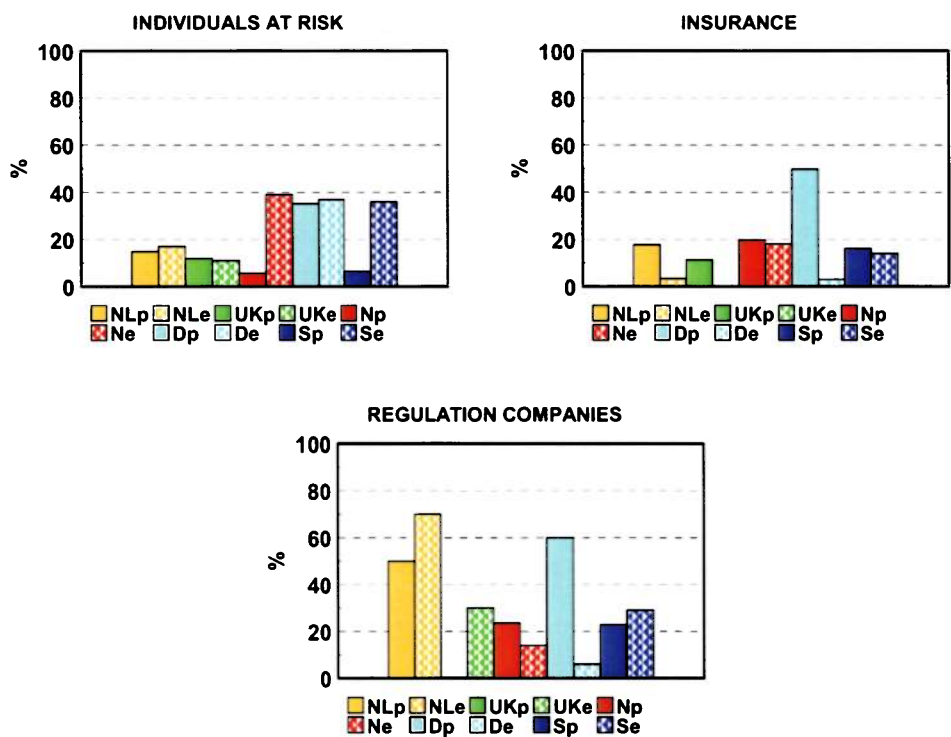
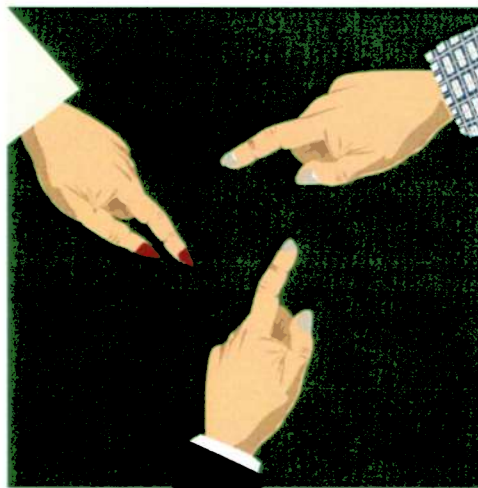


Figure 3.8. Opinions about responsibility for flood safety.

We can see that while in the UK and the Netherlands very few among both decision makers and laymen thought that individuals at risk should pay; in Germany about 40% in both groups shared this opinion, while in the Scandinavian countries the decision makers expect higher responsibility than laymen are ready to accept (cf. upper left diagram in Fig. 3.8). Insurance is attributed responsibility by half of German laymen but very few German decision makers (Cf. upper right diagram in Fig. 3.8). In the Netherlands both people and decision makers acknowledge high responsibility of water regulation companies. Their role is also highly appreciated by the laymen in Germany but this opinion seems not to be shared by many decision makers there (Cf. bottom diagram in Fig. 3.8).



Taking responsibility...

Giving responsibility for preparedness for flooding mainly to the authorities, not all people at the same time have confidence in their ability to assess flood safety well enough (Krasovskaia, 2005). Among the decision makers there also seem to be some doubts that flood management and defence measures provide a satisfactory standard of safety (Cf. Fig.3.9). At the same time it is seen that in Sweden and the UK, for example, laymen who are confident in the ability of public authorities to handle flood issues properly are almost as many as the decision makers who doubt that flood management and defence measures are sufficient. “Not quite” was a rather frequent answer from both groups however (Cf. Fig.2.7). Better communication between specialists and general public and better transparency of the decisions are obviously needed. This will help citizens to have a more realistic appraisal of the possibilities of flood protection and also raise their confidence in public authorities. Better communications however would demand efforts from both authorities and public.

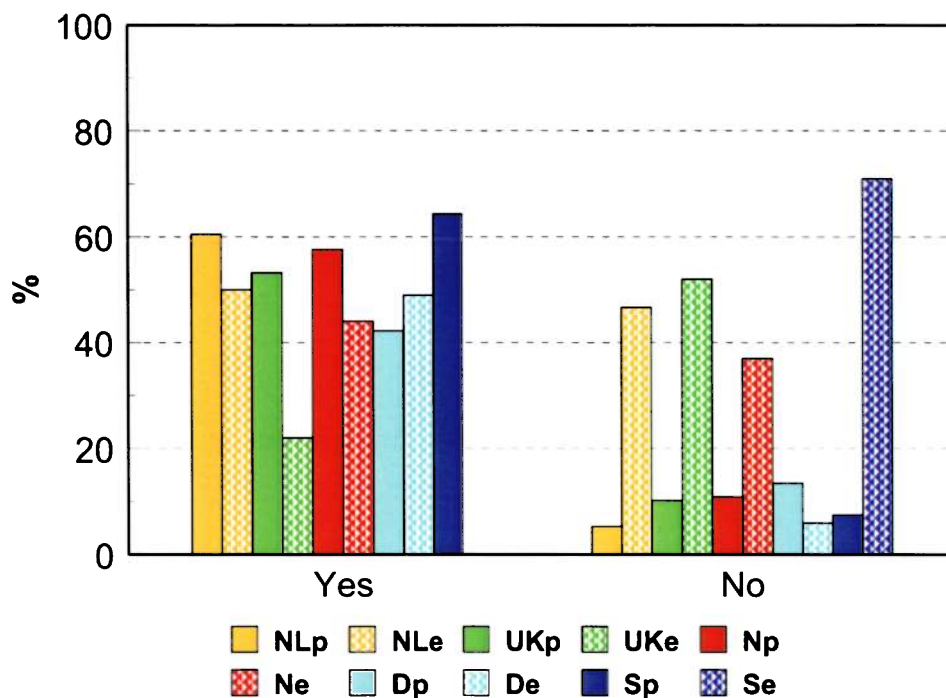


Figure 3.9. Confidence in the ability of public authorities to handle flood safety.

3.6. Conclusions, different perceptions

A comparison of the answers given by the decision makers and public to similar questions concerning flooding allowed the following main differences in their opinions to be identified:

- High awareness of the flood hazard among decision makers and rather low among laymen.
- Laymen associate floods with mainly negative impacts while decision makers see also certain positive impacts.
- Public has rather poor knowledge about flood management and protection and in general do not think that they are well enough informed while the decision makers consider information on floods to be adequate. They appreciate websites for disseminating information much more than laymen do.
- Reckoning on flooding is much more pertinent among the decision makers than laymen.
- Willingness to invest in flood safety by the society is high and among laymen - low.
- Even though in general the main responsibility for flood safety is attributed to public authorities there is an indication of a higher appreciation of the individual responsibility by the decision makers but not laymen in some countries.
- Laymen in general rely on the ability of public authorities to provide flood safety but the decision makers often do not consider that flood defence and protection measures are sufficient.

Some of the discrepancies in opinions obviously originate from different perspectives, i.e. individual versus societal. On the other hand the discrepancies found may indicate insufficient communication between public and authorities on the matters concerning flooding. It may also indicate insufficient/ inadequate information on flood issues. It is evident that this information is obviously missed or neglected by the major part of the population. Whatever the reasons are, they can be efficiently assessed by a better communication between the decision makers and public. The findings here were used to identify the topics for discussions at the expert panels, which are seen as a first step in engaging a dialogue between the decision makers and laymen.

4. Expert panels

4.1. Panels' organization

Expert panels were held in four partner countries: Germany, Norway and the UK in autumn 2004 and in the beginning of 2005 in Sweden. The panel meetings were arranged as one or one and a half days event and gathered 20-25 experts and decision makers involved in flood assessment. Most of them have also responded to the questionnaire described earlier. The participants were presented with a comparison of the answers to similar questions about flooding by themselves, their colleagues in other partner countries³ and laymen based on the poll and focus groups' studies among general public. There were also a number of independent invited presentations on the theme flood assessment at some of the panels. A structured discussion of the results focused on previous experiences from flooding; flood management methods; impacts of flooding; flood information. The panels were led by a professional facilitator and/or an expert on water resources management. After the discussion participants were split into working groups, each of them containing as far as it was possible specialists with different background. Each group were asked to discuss and present their opinion on one of the following topics outlined using the experience from the comparison of the answers to questionnaires:

1. Awareness of flood hazard
2. Building trust in land-use planning
3. Communicating flood risk
4. Individual versus public responsibility.

Each group presented their conclusions at the plenary session for discussion and comments by their colleagues. The facilitator resumed the conclusions of the discussions highlighting the most important topics. Reports from national expert panels have been prepared by each partner country (see Annex I).

³ When this information was available at the moment of the panel.

4.2. A review of the panel discussions

Lively discussions of the answers to questionnaires as well as of the four main topics have taken place at all panel meetings. The participants appreciated the opportunity to exchange opinions with their colleagues and showed high engagement in trying to find solutions to many difficult problems connected to flooding and how it is perceived. Below follows a review of the panel discussions in three countries viz. Germany, Norway and the UK⁴. As many of the opinions were shared by the experts from all the partner countries, they are presented together. The formulations are taken directly from the national reports and their origin is noted in the brackets.



*Group discussion at the Norwegian Expert Panel, Hammar 2004
(photo by N-R. Saelthun).*

Awareness of flood hazard and how to raise it

The public is not considered to be sufficiently aware of the flood hazard. Often people are not clear enough about the areas most at risk of flooding. Rather, there is a lot of confusion (e.g. different maps). Flood hazard maps are a powerful tool in raising awareness but they need to be coherent (UK). Certain areas may still lack flood hazard maps, especially in the mountains, where such mapping is extremely difficult. Alternative ways to alert people are needed in such areas (N). There is a clear hierarchy in the level of awareness: local decision makers and politicians are clearly more aware of the flood hazard than population in flood prone areas. The awareness among the developers is still worse counteracting awareness of laymen. People behind dikes are often not aware of the risk. In front of the dikes the lack of awareness originates from inadequate spatial planning, which shows no interest for the needs of flood protection (D). The risk of death through

⁴ The review is based on the national reports from the expert panels and notes taken by the author during two of them.

flooding is often seen as extremely low (due to the fact that few people have died in recent floods in Europe) therefore people regard the severity of the risk as low (UK, N).

There is a difference between knowing about the risk and accepting it. Many people do not want to know. Some communities do not want to raise awareness because of property values falling (UK). Showing flood prone areas explicitly results in a feeling of danger that may be unwelcome in spatial planning. There is a conflict of goals with spatial planning that the planners have to learn to deal with (D).

Awareness of the flood hazard must be carefully maintained. It takes a major event to get general awareness, and people forget easily (N, UK). Flood incidents have helped to raise awareness in local authorities by bringing flooding to the fore of peoples' minds. Without regular flooding Government loses interest therefore regular reminders are required to push it up the agenda (UK). The hazard awareness quickly dwindles after flood incidents, resulting in insufficient motivation for preventive measures. Integration of laymen in flood assessment builds awareness (D).

Improving and maintaining awareness of the flood risk can be assessed in different ways but these ways need to be associated with local references and appeal to feelings and not just logic. Visualisation in public places was a crosscutting idea expressed during the discussions. Flood level marks, flood stones are simple and inexpensive reminders that are easily understood by people (UK, N). A combination of art and information is very good at sparking interest and attracting attention to the possible hazards. There is however a danger that some time after they have been inaugurated people tend to forget why this has been done. Reviving the interest is necessary from time to time. Integration of citizens and the delegation of tasks which involve confronting the possible hazard (e.g. a possibility to see tubing inlets and monitor water levels there) might help to maintain awareness of the flood hazard (D).

Bringing flood awareness into the environmental education curriculum may not only help to raise awareness among the future generations, but also reach their families (UK, N). This can also be achieved outside the curriculum through well designed and innovative project work like, for example, involving children in monitoring and control tasks (they observe with much more attention and are more curious than adults as a rule) (D).

To sustain public interest through a long sequence of flood-free years, efforts should be made to continue to discuss flood issues locally. Central information centres have proven to be ineffective as the target audience does not feel to be directly addressed, the information remains superficial. People tend to find the higher level national campaign information rather nebulous, but focused local discussion is helpful (UK, N, D). To build and sustain awareness of flood hazard, meetings are a good means, as are flood awareness days (in similarity to "fire awareness days"; "battery change days" etc) (UK, N).

Campaigns do adequately target those at greatest risk and may be especially effective when they include practical advice on house retrofitting and clearly demonstrate the advantages of a precautionary approach. Flood risk is often seen as another in a long list of potential problems and scores very low on the list of priorities. Suggesting simple measures that can lower this risk might help to avoid its total negligence. Involvement of people with flood experiences in such campaigns might enhance information

dissemination considerably (UK, N). Also the role of insurance companies in giving advice in raising flood safety deserves to be enhanced (N). Local action groups are seen to be helpful in promoting practical guidance (especially in self-help) in addition to their role in lobbying (UK).

However, some caution is necessary whatever approach is chosen for assessing awareness. Over-dramatisation and frightening people is not effective (UK, N). People tend to regard flooding as “act of God” remaining passive. Neither is finger pointing recommendable as it also leads to false conclusions: the one to blame is also held responsible for reducing the hazard (D). Insufficient information and speculation about flood causes and possibilities of its reduction counteract awareness leading to confused concepts. Problems were seen to arise in cases where there emerge expectations that “authorities will be prepared next time”. It must be realised that the authorities cannot be expected to stop floods happening again (D, UK, N).

More attention should be paid to correct wording when presenting the flood hazard. Terms like “residual risk” suggest something unimportant that can be ignored while in reality it refers to the actual risk. There is an overriding need for clarity of language- – it must be easy to understand what is meant by the terminology applied. A reconsideration of the use of ambiguous terms might be necessary (D, UK). Overexposure to information may counteract the efforts to raise awareness (e.g. excessive and/or false warnings) (D, N, UK).

Building trust in land-use planning

Bringing new ideas and concepts into spatial planning as an essential part in combating flooding is in the focus of the FLOWS Project. This topic attracted much attention among the participants of the expert panels many of whom were spatial planners. Experts presented their views on how land-use planning can be improved and enhanced and also drew attention to some unresolved conflicts and weak points within spatial planning.

One of the important tasks is making the planning process more transparent through trust, working in partnership. There is a need to work together; communities should be worked with not for! The administration feels they are open, but the communication is mainly one-way (N). The overall aim is to avoid inappropriate development in flood-risk areas and to ensure that a new development does not increase flood risk. The conflict potential in spatial planning is often camouflaged by the mode of wording (D). Defended areas are still at risk from failure and so people are still in the flood warning system – that is, the needs of those defended against all but an extreme flood are not necessarily adequately met (UK, D, N).

Raising the legal status of flood protection was taken up by many participants. Strict regulations of new developments already exist for areas prone to landslides and rock fall. For the flood risk there are recommendations that are followed in general but do not have any stronger legal status, a situation that seems to suit the decision makers rather well. Flood resistant building must become a rule in flood prone areas (N). Technical decisions aimed at raising flood safety should not be compromised (D). It is unreasonable to expect a new developer to improve an old situation. Rather they should not make it worse or keep it at the same level. The objective should not however just be about maintaining the

status quo, but taking opportunities to improve the situation. It is necessary to realise the full impact of development anywhere on flooding. However, decisions on new buildings designed to mitigate flooding, e.g. raised floor levels, may not be deemed appropriate for the local area (UK).



Building trust in land-use planning

Spatial planning shows no interest for the needs of flood protection (D). As already noted, different land use interests often lead to conflicts (e.g. between regulations concerning the use “100 year flood areas” and city planning in Germany). Often the problems are shoved aside and have to be dealt with at implementation time. Strategies, which consider possible impacts of flooding in future and aim to achieve flood resilient development, are indispensable in spatial planning and especially urban development. Flood prone areas should be identified and urban development there should be restricted. Runoff retention areas should be allocated and carefully dimensioned (D). Further development behind dikes can be allowed (except in old water courses and oxbow lakes) on condition that damage reducing measures are envisaged. Hazard classification of the area might be useful. It is important to allocate in advance places where the dikes can be opened in case of emergency and an extra protection of the most important objects (secondary dikes), as well as “green corridors”. Neglecting such demands may lead to the presence of unresolved interest conflicts in newly developed areas (N, D).

Flood hazard maps as a tool in spatial planning were discussed at all the panels. However, acknowledging their usefulness for spatial planning some limitations were noted. There are different types of flooding and different maps that do not always contain coherent information. Water depth maps are neither hazard maps nor risk maps, strictness in terms is necessary. (UK, D). Hazard mapping at present does not give a measure of the degree of risk, as it does not consider the consequences of flooding and or failure of flood defence (loss) (UK, D). "Loss minimisation functions" are the catch term denoting the functional relationships between specific losses and specific measures of flood prevention, which can be used to describe the achieved benefit. Flood risk maps are an effective tool for steering decision making, however such maps are still not readily

available (D). Flood hazard maps can still be missing for small and medium size rivers (N). Flood hazard mapping is not an exact exercise and inaccuracies may translate into subjective “adjustments”. A flood hazard map is only an estimate. Including confidence margins into the maps might help raising their credibility and contribute to their correct interpretation (N). More efforts are needed to make all kinds of flood maps easily understandable and accessible to both decision makers and laymen.

Generally, the existing capacity in spatial planning is not felt to be sufficient enough to fully cope with flooding. An ever-important argument in politics is a cost-benefit analysis and the damage evaluation. Given current capacities, this sort of work can not be performed in spatial planning. Administration is often too slow, the responsibilities are split disturbing the planning process (D). Lack of resources within the municipality administration for land use planning (posts, economic prioritisation) is wide spread and can even lead to job losses. Lack of resources often limit flood assessment and warnings to major waterways, but flooding also often comes from other sources, such as small tributaries, sewers and drainage systems (N, UK). Maintaining high competence among spatial planners with respect to flood safety should be given due attention and resources (D).

Communicating flood risk

The importance of communication of the flood hazard was stressed by all the participants of the panels. Awareness of the flood hazard is closely related to how well this message was communicated and approaches for raising awareness often referred to better dissemination of information. It was noted that though information on flooding is generally available, communication of flood risk could be streamlined and improved. There is a clear need to deliver information effectively and cheaply (UK).

Dissemination of flood hazard information to the population on a regular basis as part of municipality activities must be considered. This helps to keep the public updated and interested in the topic (N). Humans tend to forget and suppress uncomfortable memories. Hence, a regular repetition of information is necessary (D). It takes a major event to get general awareness, and people forget easily. Regular reminders are therefore required. (UK). Long-term preventive risk-communication must address both organized and non-organised citizens, as well as local authorities (D).

Local input to the information is very important to really capture attention (UK). The authorities should take the initiative for spreading information on flood hazard. Laymen should not be expected to ask for information or to be put on mailing lists, it is the authorities that should identify and actively inform those living in areas with the flood hazard (UK, D, N).

Information on flooding should be clear and easy to understand and easily accessible. Frightening people should be avoided but so should promises of unrealistic safety levels.

It is important to coordinate information, especially during emergency situations, in order not to confuse people with contradicting messages (N). To reduce confusion of householders and local authorities by the range of information received on flood issues it may be an idea to produce reference guides which are locally formulated (UK, D, N).

When disseminating information on the flood hazard it is very useful to supply at the same time information on what people can do themselves to prepare for flooding (e.g. adapting their homes; having emergency plans and necessary equipment etc.)(N, UK, D). Experiences in dissemination of information on other types of risk (e.g. fire brigades, insurance companies) can be very useful (D, N).

Information on flooding can be effectively spread using citizens themselves. It can be people who have experienced flooding; organisations involved in flooding and water topics in general; parishes; women's groups. Shared experience could be beneficial, but must be geographically appropriate and relevant. Flood wardens and community awareness co-ordinators are an ideal method of informing people. It could be attempted to dispel false notions of absolute security against flooding through use of television or computer graphics at critical times, maybe using celebrities (UK). As noted earlier schoolchildren may be used for disseminating information on the flood hazard (UK, N, D).

To better accommodate flooding into the frame of spatial planning, organisational issues are also of importance. The local experiences with flooding and the acquired knowledge should be documented and actively used in decision support. Stamina, persistence and continuity of the technical work, the personnel and the integration/development of knowledge and the local experience should be ensured (D, N).

Information on flooding should appeal not only to logic but also to feelings. Loss of economic value during flooding is often accompanied also by the loss of values that cannot readily be estimated in economic terms (like photos, letters, destroyed aesthetic value of landscape etc.). Addressing topics of a more emotional character might help stimulate people to take steps to be better prepared for flooding (N, D). Low awareness of the flood hazard among the residents in flood prone areas may indicate weakness in dissemination approaches used. "Flood fairs"; thematic exhibitions (including art); excursions to places with memories from historical floods; colloquia around the "flood theme" in literature, music, cinema are only a few examples of information that appeals to emotions (D, N, UK).

Superfluous information on flooding counteracts its purpose. Warnings tend to be issued at very low thresholds (missed warnings are severely criticised) and there are more and more warnings. However, people become annoyed with flood warnings when nothing happens, therefore they are more likely to ignore them the next time (UK, N). General overexposure to daily news makes people filter information they receive (D).

Communication of emergency information requires special attention. Effective flood warning hinges upon awareness rather than dependence. It can be confusing if the same type of alarm is used for different warnings (UK). Sirens do not reach all the residents and represent only the last link in the information chain. Hazard awareness is crucial to perceive the alarm, as well as the knowledge of the signals. Training exercises might be useful (D).

Information may need to be adapted to different groups. A different approach is needed between people who have already experienced flooding and people who are yet to succumb to flooding (D). Information provided by governmental organisations to local authorities should be streamlined to fit the local needs (N).

Information is often “one way” viz. from authorities to laymen, who are not always interested (N). There is not enough integration of the opinions of citizens in planning processes (D). It is also necessary to get information to people who may face flooding but are not taking threats seriously. The challenge is how to inform the uninterested. A financial incentive could serve as the ‘carrot’ and flood premiums the ‘stick’ (UK).

Individual versus public responsibility

Provided awareness of the flood hazard exists, an important question arises about who is responsible to take steps and assess this hazard. It was generally accepted that it is important for individuals to be flood resilient but in no circumstances should there be public responsibility for flood protection to individual homes (UK,D). Individuals should be encouraged to adapt homes/ habits to live with flood risk through grants and better information (UK, D, N).

At the same time misplaced development is seen to require strategic rather than piecemeal solutions and the consensus is for retrofitting of flood defences in such circumstances to be funded centrally (UK). New developments in flood prone areas must include flood safety in the prices. Land owners in rural areas (except for in settlements) must financially contribute to flood protection, which however remains the responsibility of central authorities (N).

Citizens don't want personal responsibility, especially when they are not personally affected or do not feel personally affected. Awareness of the flood hazard often leads to demands to the authorities to protect them (higher dikes, etc). Such a passive attitude might have different reasons. One of the most important ones is lack of real integration of citizens in decision making in their communities (D). An effective tool for stimulating people to take responsibility for safety of own homes may be differentiated insurance premiums (N, UK). A legislative obligation of informing about the existing flood hazard to a property might raise responsibility-taking for protecting it (N).

It is necessary to show explicitly what flood preparedness can accomplish, how it works and how much it costs. Laymen often do not take responsibility because they simply do not know what they can do themselves and where to find this information. Simple practical information of how to prepare to flooding (Cf. the previous chapter) and raise resilience of homes will stimulate taking steps to protect their homes (D, N, UK).

Promoting local and national citizen groups involved in flood problems might not only, as noted earlier, raise awareness and help disseminate information but also stimulate responsibility-taking (UK, N, D). The sense of responsibility may also be stimulated via active public participation in all stages of flood assessment, from planning phase to training and direct flood mitigation (D).

Giving full tribute to the importance of taking individual responsibilities the experts warned against a possible conflict between self-help initiatives and the flood risk to others (building a mound around own property may make others more vulnerable) (UK). Building own flood protections must be coordinated with the authorities that must provide individuals with professional advice. Also emergency actions during flooding and making homes more flood resilient need to be supervised by authorities to avoid

aggravating the situation instead of improving it (N). It was also noted that many measures of individual flood preparedness cannot be expected to counteract the negative impact of bigger flood incidents (D).

Structured discussion of questionnaires

Discussion of the answers to questionnaires was an important part at the expert panel meetings. The plenary discussions, as noted earlier, focused particularly on the following main areas: positive effects of flooding; previous experience of flooding; flood management methods; public participation.

Among the positive effects of flooding taken up were: raising awareness among laymen and decision makers; legislative response (e.g. Planning Policy Guidance Note 25 in the UK); enhanced funding for emergency activities; more attention to maintenance of urban water courses and sewage systems and responsibilities for this; stimulating laymen to organize into self-help groups (like “Parish Flood Warden” schemes, “National Flood Forum” (UK); “Oslo Elveforum”(Norway)); some positive ecological effects.

The topic of climate change and all the uncertainties that it induces on planning was taken up by many participants. Alongside demands for better information there were opinions about trying to consider the necessity to adapt to the uncertainty while planning.

Plenary sessions offered a welcomed forum for specialists dealing with flooding to “speak out”. Positive and negative experiences were discussed among the specialists with different backgrounds in search for the appropriate approaches (e.g. “Rhineland-Palatinate flood notification system”, “Trummen-Patenschaften” initiative actively engaging citizens; visualization example from the city of Wangen in Allgäu in Germany; “Flood Fairs” in the UK; “adoption of a river”-practice from Norway). Among worries expressed were insufficient attention to flooding problems in the regulation schemes of water regulation companies (N); stopped flood warden schemes in some places (UK); difficulty to get enough money to assure proper maintenance of drainage systems and sewers (UK); lack of continuity and permanent structures for information about the flood hazard and insufficient information (D). It was also noted that risk assessments to meet health and safety directives can lead to restrictions (to limit liability) being introduced that reduce the effectiveness and flexibility of the emergency response – both professional (such as the Fire Service) and voluntary (for example, flood wardens) (UK).

An interesting topic was a discussion of public participation in flood assessment. While in the UK “The National Flood Forum” is already considered as a valuable partner, in Norway and Germany much still remains to be done and “one way” communication prevails. An initiative of active integration of the citizens in flood assessment in Germany revealed the conflicting opinions: “Integration builds awareness” vs. “The citizen doesn't want any responsibility”. In Norway the attitudes are rather towards “guiding” the citizens than actively looking for their advice with the same excuse as in Germany: “The citizen doesn't want any responsibility”.

4.3. Combating flooding together. International Expert Panel

International Expert panel was a finalising activity in the frame of expert panel study and gathered 24 experts from five partner countries, among them two representatives from lay organisations. British, German and Norwegian delegations had specialists who previously had participated in their respective national panels. The panel was organised as a one-day meeting and was led by two facilitators with a background in water management and social sciences, respectively. The complete results from the poll, focus groups and national panels were presented to the participants. Two invited speeches (both from the UK) focused on raising public awareness from decision makers' and lays' perspectives, respectively. Building on the knowledge acquired from the previous studies within the project the following themes were suggested for group discussions at the panel:

1. **“Promoting active citizenship”**. Engaging a dialogue between laymen and decision makers: what are the existing methods for involving laymen in flood assessment in relation to spatial planning? Are they adequate and used on a regular basis? What new structures or processes can you suggest? Pros and cons of such activities (if any).
2. **“Extending memories”**. How to transfer the existing knowledge and experiences amongst laymen and decision makers to newcomers in near and more distant future? Should there be structures for doing this?
3. **“Sharing responsibilities, society and individuals”**. Responsibilities of individuals and of authorities, ways to reconcile the opinions about responsibilities; insurance/economic stimuli in taking responsibility; importance of transparency in decisions and public participation; “flood enlightening”.
4. **“Trade-off”**. Uncertainty versus safety (safety level that is plausible with regard to all uncertainties (e.g. connected to changing climate, changes in socio-economic development etc.)), communicating uncertainty to laymen; tolerable risk: society and individuals, ways of reconciling the opinions.
5. **“A risk among many”**. A contradiction between enormous societal losses caused by flooding and low ranking of flood risk among general public, how to assess the gap? Increasing resilience - prepared instead of scared: investing in preparedness, assessing vulnerability (structural and non-structural measures, stimuli, conflicts (e.g. changing environment; changing land-use)).

The groups consisted of specialists with different backgrounds from all five countries and two of them also had representatives from two lay organisations. Such a multinational and multidisciplinary structure of the groups stimulated an active exchange of opinions bringing forward new ideas and solutions. The conclusions by each group were presented for an open discussion at the plenary meeting and were summarised by the facilitators. The group discussions sometimes resulted in conclusions that were partly overlapping and they were organised into a slightly different blocks to avoid repetition.



Sharing ideas and experiences

The message from the International Expert Panel can be summarised as follows⁵:

1. **“Promoting active citizenship”**

- Good participation characterized by:
 - early consultation
 - feedback to active participants
 - targeted communication, engagement with media
 - sustained involvement.
- Poorly handled public participation is disaster:
 - waste of time
 - waste of money
 - waste of public interest
 - kills involvement.
- To be able to participate, you need to know what your part should be:
 - citizens need to know what authorities can and cannot do.

2. **Awareness (“Extending memories”, “A risk among many”).**

- High mobility reduces collective memory
- Authorities must be the keepers of local memory
- Interactive maps of historical events
- Flood risk information: actively distributed or passively available?
- Newcomers are particularly vulnerable – shift from “right to know” to “duty to inform”?
- Important message to the public:
 - flood defences do not remove risk
 - the past does not predict the future perfectly
- Maps are powerful instruments for presenting risk and facilitating decision-making:

⁵ Based on the summary provided by the facilitators: Nils Roar Saelthun and Humphry Smith and notes taken by the author.

- different maps for different uses and users
- consistent information across different maps
- multilayer maps combining information, for instance different hazard types
- maps should be combined with other information, for instance emergency actions

3. “Sharing responsibilities, society and individuals”.

Table 2.3. Individual and societal responsibilities at different perspectives

Who / Perspective	Long-term	Short-term (emergency)
Authorities	Information infrastructure Physical planning Defences Warning system “Keeping the topic alive” Transparency	Warning Emergency management Relief Sustain normal functioning
Individuals	Accept and understand risk Emergency plans Protective measures Insurance	Act on information Act on indications Minimise private losses

4. Risk aspects and instruments for changing behaviour (“A risk among many”, “Trade-off”).

- Gradation of tolerable risk level according to vulnerability
- Funding up to that level by Local Authorities and Government
- Residual risk to be covered by individuals at risk
- Holistic approach:
 - Integrated flood management/flood action plans
 - There is more to flood planning than floods alone
- Communication isn’t always enough:
 - Legislation – more protection for house-buyers
 - Financial incentives – grants to subsidise cost of private protective measures
 - Insurance pricing to encourage more rational behaviour

5. Conclusions

The expert panel studies brought forward important information about the views of the experts and decision makers from five countries on the problem of flooding in the communities of the North Sea region. These views as well as the discrepancies in views with laymen were assessed during the International Expert Panel trying to find the reasons and ways for improvement.

During the discussions a clear shift towards high appreciation of public involvement in flood protection could be noted compared to the opinions expressed earlier in the answers to questionnaires. It seems that the strength of the participatory approach was perceived by the majority stimulated by positive examples demonstrated by their colleagues. Strengthening public participation goes hand in hand with raising public awareness of the flood hazard and clear definition of responsibilities. Adequate and regular information to citizens is a powerful instrument in raising their awareness but it needs to be complemented by legislative and financial incentives to be really efficient. The time of “one way” information is over, feed back from lay organizations, bringing local knowledge and experiences, is highly welcomed. Flood protection should no longer be considered as a separate activity but needs to be integrated with other activities within planning; legislation; water management; education etc.

The most important conclusions form the expert panel study can be summarized as follows:

- **Strong promotion of active public participation in flood management and defences.**
- **High importance of raising public awareness of the flood hazard and stimulation of taking responsibility for flood safety.**
- **Promoting the holistic approach: integrated water management/flood action plans; legislative and financial incentives.**
- **Gradation of tolerable risk level according to vulnerability and funding up to that level by the authorities.**

The presence of representatives from lay organizations offered an opportunity to directly consider their experiences and opinions when developing strategies for combating flooding. The important dialogue between authorities and individuals has been started. The synergy effect of the expert panel meetings was also triggered network building among specialists and laymen engaged in the topic of flooding. Such networks may help transference of knowledge and experiences between these two groups as well as between and within the partner countries.



Flooding in Norway (photo by N-R. Saelthun)

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WP 2A -1: Perception of Flood Hazard in Countries of the North Sea Region of Europe

Author: Irina Krasovskaia, Norwegian Water Resources and Energy Directorate (NVE)

WP 2A -2: Expert panel study

Author: Irina Krasovskaia, NVE, Norway

WP 2A -3: Qualitative studies of the public's comprehension of flood risk

Case studies from the UK and Norway

Author: Melita R. Hasle, NVE, Norway

WP 2A-4: Combating flooding together

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