THE VOID BETWEEN RISK PREVENTION AND CRISIS RESPONSE

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ABSTRACT

In this paper we present the results of a study in the Netherlands, in which we have studied the information needs and the use of geo-information in risk prevention and crisis response. The central question in this study was: ***"What are end-users requirements for the further development of geo-information and geo-information science for risk prevention and emergency response?"***. We have concluded that the end-users in risk prevention and emergency response differ in their informational requirements and that they have different priorities for the further development of information models and systems. In addition to this, we conclude that there is also a 'void' between risk prevention and crisis response that can be 'bridged' and strengthened by the further development of geo-based informational systems.

1. INTRODUCTION

It is often argued whether it is best to invest more in risk prevention or more in emergency response. A good risk prevention policy is important in order to decrease the chance and magnitude of a possible incident. However, good organisation and coordination between emergency teams is just as critical in saving lives and protecting property after a disaster happens.

One could argue that it is better to invest in risk prevention to ensure that accidents do not take place at all. However, in spite of this, we all know that we cannot achieve a 'zero risk' situation. There will always be a small statistical certainty that an incident will take place and therefore we will need our emergency services now and then. An experienced 'disaster manager' will therefore argue that we need to invest in both risk prevention and crisis response if we want to reduce the vulnerability of our society to disasters.

Geo-information science is seen as an important instrument for supporting decision-making in both risk prevention and crisis response (*Greene, 2002*). For the further development of geo-information science for both risk prevention and crisis response we have carried out research in the Netherlands in which we have studied the information needs and the use of geo-information in risk prevention and crisis response. The central question in this study was: ***"What are end-users' needs for the further development of geo-information and geo-***

information science for risk prevention and emergency response?" In this study, geo-information science is used in its broadest sense to include the suite of geographical information methodologies, models, processing and visualization techniques such as GPS, GIS, remote sensing and spatial analyses (*Cutter, 2003*).

In this paper we present the results of this study. The paper is organised as follows: Section 2 describes the research methods which we have used to get an insight into the end-users' needs for the further development of GIS based models and systems. Then the paper continues with a description of the organisation of risk prevention and emergency response in the Netherlands. GIS based systems and tools are seen as important support tools for decision-making in both risk prevention and crisis management. Therefore numerous initiatives have been taken to develop GIS based models and systems. Some examples of recent developments will be discussed in Section 5. Although numerous initiatives have been taken and though many end-users recognise the added value of GIS based systems and models in improving information exchange, end-users' state that there is still much that can be achieved. These end-users' opinions and comments on crisis response and risk prevention are presented in our concluding paragraph.

2. METHOD

To get an insight into the end-users' needs for the further development of GIS we have studied the existing organisation and practices for risk prevention and emergency response within the Netherlands. Our conclusions are derived from:

- literature study,
- workshops,
- interviews,
- participation in training.

The literature study aimed to investigate the organisation of risk prevention and crisis response and the 'state-of-the-art' in GIS technology used for crisis response and risk prevention. The existing 'GIS' used in different organisations was studied with respect to the task it was designed to serve, the functionality it provided, as well as the scale to which a particular system was used in practical application. Special attention was devoted to systems, which attempted to deal with multi-risk problems (see Section 3, 4 and 5).

Several workshops were organised to discuss existing problems and to identify where improvements were required and where those could be successfully implemented. Two of the workshops were especially important because they mainly focused on the work and information requirements of the emergency response and risk prevention sector. The first workshop was attended by fire brigade departments, police departments, para medic teams, provinces, water boards and universities. The second seminar hosted representatives from advisory organisations in risk prevention, such as the Ministry of Transport, Public Works and Water Management and knowledge organisations that focus on public safety and flood management were also involved. During these seminars we have discussed a large number of carefully selected questions. The participants were 'encouraged' to identify critical bottlenecks in their current work practices and to specify their most critical demands for near feature (see Section 6).

Additional insight into end-users' requirements in risk prevention came from interviews, which were carried out with representatives of the National Institute for Public Health and the Environment, a province, and a municipality.

The final instrument used in the familiarisation of emergency response in the Netherlands was particularly interesting and fruitful, because it allowed us to observe the collaborative work of all emergency service actors in 'real-time'. Our research team participated in the organisation of a major training exercise focused on a simulated nuclear disaster in the Province of Zeeland. Amongst others the Netherlands Ministry of Housing, Spatial Planning and the Environment, the National Institute for Public Health and the Environment, the province of Zeeland and the municipalities surrounding the nuclear plant were involved in this training exercise. Our function within this training exercise was to support information exchange at ministry level. Before this training exercise we carried out an analysis of this information requirement which we have subsequently used in our scoping study. We have also observed a comparatively smaller training exercise in the Province of Gelderland, which simulated a traffic accident between a school bus and a train. The train as well as the bus was heavily damaged with many casualties (Figure 1).

Figure 1: 'Snap shots' of the training exercise in Arnhem, Province Gelderland.

Finally, we have visited a flood management training exercise in the Province of Gelderland, where a (imminent) breach in a dyke was simulated. Agencies participating in this exercise were the Province of Gelderland; the water board; emergency services; and several municipalities. During this exercise initial steps were taken to integrate geo-information based systems and models into the decision-making process.

3. RISK PREVENTION IN THE NETHERLANDS

Before we discuss the future information needs and the essential need for further development of geo-information science for crisis response and risk management, we must first discuss the existing organisation of risk prevention and crisis response.

Risk assessment procedures and risk prevention policies in the Netherlands are based on a natural science approach. In this tradition, risks are often quantitatively expressed as a product of the estimated chance and magnitude. Experts often study several hazards separately, like

flooding, tornadoes, storage of hazardous materials, transport of hazardous materials etc. In risk policies in the Netherlands, risks are expressed in (*Bottelberghs, 2000*):
- the Individual Risk (IR) at a given location,
- the Societal Risk (SR) for an establishment.

The IR is defined as the statistical probability that a person who is permanently present at a certain location in the vicinity of a hazardous activity will be killed as a consequence of an accident within that activity. The SR is defined as the statistical probability that in an accident more than a certain number of people may be killed *(Ale, 2002, VROM, 2005)*.

For the risk prevention phase, risk criteria have been developed to decide whether the risk, defined as a chance and magnitude, are acceptable or not. For example, the IR for housing areas, hospitals, schools and the like may not exceed the legally determined standard of one in a million per year 10^{-6}. A very specific example is the risk of flooding. Flood risks criteria have been developed to describe normative conditions and their expected frequency (like the heights of the water level) that dykes should be able to resist. These risk acceptability criteria differ from location to location. Densely populated areas with intensive land use have stricter criteria then less populated areas.

In our scoping study we have focused on the role of land use planning in risk prevention. Land use planning plays an important role in risk prevention. The vulnerability of a location does not only depend on the presence of natural or technological hazards. The vulnerability of a location also depends on the way we deal with these hazards. We can for example reduce the degree of flood hazards by flood control works like building (higher) dykes. However, if we decide to permit building in these hazard prone areas, then we will increase the potential for catastrophic loses. Appropriate land use planning, like regulation of land use in hazard prone areas by zoning or by building codes can therefore significantly reduce risk and damages from natural and technological hazards (*Mileti, 1999*). Land use planners are therefore major (daily) users of risk criteria, risk estimates, and the possible consequences for developing spatial development plans, when deciding whether or not, they can give planning permission.

In the Netherlands, all three tiers of government (national government, province and municipality) have planning powers (*Van der Valk, 2002*). The local land allocation plan on municipality/local level can be seen as the central instrument within spatial planning in the Netherlands. It is the only plan with direct legal consequences for citizens. The land allocation plan is also the framework on which requests for planning permissions are judged. Besides land allocation plans, structure plans are another important type of plan in spatial planning. Structure plans are made on local (optionally), provincial (obligatory) and national (obligatory) level. Structure plans can be seen as strategic plans that contain the important spatial planning principles and guidelines for future spatial developments. In order to guarantee consistency in different plans on different levels, the Dutch Spatial Planning Act includes a consistency requirement. When plans are not consistent with the over-scale ones, corresponding authorities have the right to impose binding measures (*Van der Valk, 2002*). This is the traditional Dutch planning process which addresses building by consensus. This kind of interventions is rarely activated (*Faludi and Van der Valk*, 1994).

Spatial planners at municipalities and provinces are the main end-users of geo-information for risk prevention. For example, they use assessment to get insight in risk estimates and consequences. They can use this information to check whether a proposed building site meets the safety criteria. Risk models can also be used to get insight in the consequences of a local development plan. Will the Societal Risk exceed the normative criteria if we intensify the number of dwellings in a hazard prone area? Even though risk analysis can never predict the future, it can help planners make better evaluations in reaching more informed conclusions about, whether or not, to allow spatial developments or about where best to focus mitigation efforts (*Greene, 2002*).

GIS based models and systems can provide this essential critical decision-making information and are therefore an invaluable support 'tool' for spatial planning activities.

4. Emergency Response in the Netherlands

Nevertheless in spite of our best efforts to prevent disasters, by building dykes or by maintaining safety zones around hazardous installations, misfortune cannot totally be prevented. There is still the statistical probability of disasters even in safety enhanced areas and in that event we remain heavily reliant upon efficacious emergency services.

The organisation of emergency management response in the Netherlands during a disaster, can be divided into; a local level, that is, the site of an incident; the regional level (emergency services are regionally organized, supporting several municipalities; the provincial level (the Netherlands exist of 12 provinces); and the national level (*Diehl and Heide, 2005*). Most emergency incidents of a minor nature are responded to at the local level. The fire brigade, para medic teams, and police are involved in the management of the emergency. When there is a need for a structured coordination, a coordination team of representatives of the emergency services is formed at the site of an incident. Depending on the nature and magnitude of the emergency, other parties at other administrative levels can become involved.

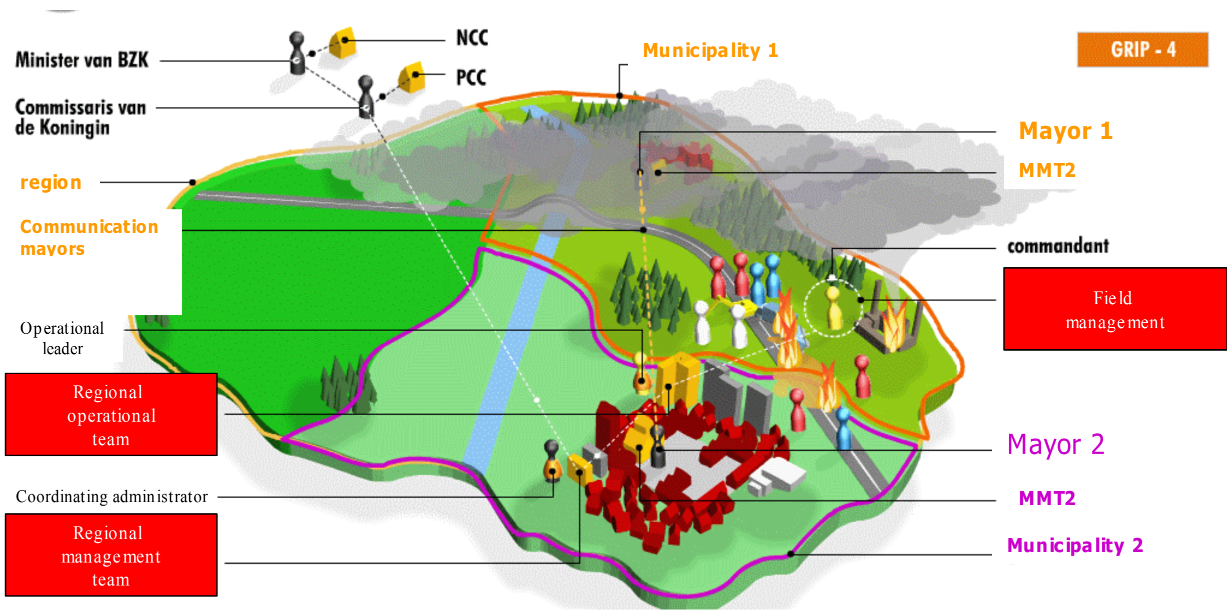

Figure 2: The highest Fourth level of emergency according to the Dutch classification system.

If the magnitude of an incident increases and the effect area goes beyond the incident area itself, then a regional coordination team will be formed in liaison with the operational coordination team at site. The regional coordination team is often situated in a regional office remote from the incident (e.g. a joint office of the regional emergency services). If a regional coordination team is formed, then the mayor of the municipality in which the incident is taking place takes the administrative lead. On municipality level, a policy team is formed to support the mayor.

When the potential magnitude of an incident leads to a serious threat to a large section of the community in the incident vicinity, to the environment, or to anticipated severe damage to property, emergency officers at provincial or national level are informed. If the effects of an incident extend beyond provincial borders (e.g. a toxic cloud after a nuclear incident) the Ministry of Internal Affairs may take the administrative lead. They will work together with coordination teams at national, provincial, regional and local level to manage and mitigate the disaster.

Many more bureaucratic structures will be involved in ‘managing’ the crisis when several provinces (or neighboring EU Member States) are affected. The nature of a particular disaster may require the need for the involvement of extra-specialised organisations. During a (imminent) flood, experts from the water board, the Ministry of Transport, Public Works, and Water Management will be involved in coordinated teams. For example, when we have to deal with a nuclear disaster, experts from the National Institute for Public Health and the Environment will be asked to join the crisis management team (Figure 2).

The emergency response units (fire brigade, ambulance, police,) require other specific types of information compared to the land use planners. They are, of course, also particularly interested in risk estimates and in regularly re-evaluating this data. It has, for example, particular value for the fire service in estimating the weight, type, and manpower requirements of the ‘first strike’ predetermined response required when responding to initial emergency calls to pre identified ’risk’ categories of premises; or especially when deciding which areas might need to be evacuated or which group of people might be under threat; all fundamental pre-planning for the most important issue for them which is the containment, control, and mitigation, of the incident. In carrying out their strategic and tactical pre-planning emergency services will ask themselves different questions. How much time it will take to evacuate an area? Are there many elderly people? Which emergency routes are available? Are there possibilities to shelter? Will emergency services be able to reach a disaster area and if so, how much time will it take? Where are the nearest hospitals? What is their capacity? What is the magnitude and direction of a toxic cloud, when will water levels exceed critical heights and so on and so on.

5. THE DEVELOPMENT OF GIS BASED TOOLS AND SYSTEMS

There is a great need for better information services for both risk prevention and crisis response. This conclusion can be reached by the numerous initiatives that have been taken at both local and regional level. Numerous initiatives have been taken to improve the ‘tools’ used in risk prevention and emergency response: tracking vehicles and patients, mobile services (*Togt et al 2005*), etc. In our study we have concentrated only on systems that use spatial information in one form or another, GIS based models and systems designed to improve information supply and exchange in risk prevention. In this section we discuss several initiatives in the Netherlands: the risk map project; risk models to visualise societal risks, flood models, and projects for communication in crisis management. We realise that this is not a complete overview of all initiatives that have been taken, although we believe that these initiatives give a good overview of current developments in the Netherlands.

Risk map project

The Enschede disaster[1], sharply focused central government's attention on the critical need for geo-information in risk management in the Netherlands. The Dutch government believed that the knowledge of the existence of and the possible consequences of hazardous installations on adjacent communities should be improved *(Pronk, 2002)*. There was also the issue of compliance with the EU Seveso II Directive on the recording and monitoring of certain qualifying hazardous sites. As a consequence, sites with dangerous substances are now centrally registered by the Netherlands National Institute for Public Health and the Environment (RIVM). In this database, detailed information about (amongst other issues) the type of dangerous substances, the related IR and risk contours and the maximum permissible amount (according to the license of the company) of dangerous substances which is stored. It is expected that the National Register of Dangerous Substances will be filled within a year.

The information from this database is available for experts within the government (e.g. in municipalities or provinces). The Dutch provinces have added additional information to the RIVM database: vulnerable and less vulnerable objects, flood risks or the impact of incidents on the local community. Planning experts and environmental experts may use the information for the development of spatial plans. In the foreseeable future they will have access to detailed information about the nature of hazardous establishments in their municipality or province, including the Individual Risk and Societal Risks that are caused by these establishments.

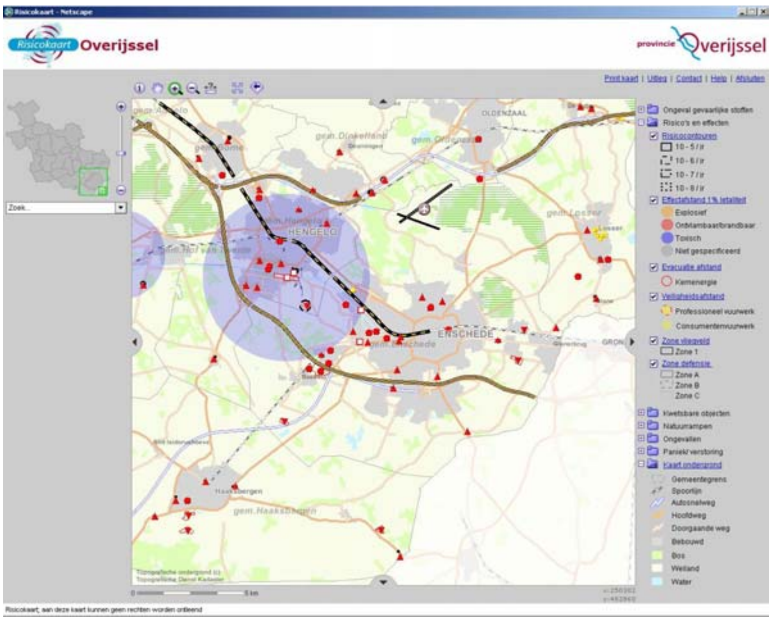

Figure 3: Risk map of Province Overijssel, the Netherlands (www.risicokaart.nl)

This data can also be used in 'risk' assessment evaluations for building development plans or when granting planning permission. There already are some provinces that are implementing

[1] In 2000, a fireworks warehouse in a residential area in Enschede, the Netherlands, exploded. Over 800 people were injured and 22 people were killed.

these risk maps for professionals and it is expected that in the foreseeable future other provinces will implement similar schemes. There are also plans to integrate the different sources of information and to create a software portal where information data about different kinds of risks (such as dangerous substances, flooding or gas pipelines) can be brought together. Less detailed and less security sensitive information on this database can be consulted by the public, by risk maps. On the internet one can find risk maps that give an overview of locations of hazardous installations at almost any location within the Netherlands. The public may use these maps to find out what major risks are present in their vicinity and within their communities (Figure 3).

Models to visualize societal risks

Individual risks can be mapped by risk contours. Until now, it was much harder to visualise group risks. TNO, a Dutch knowledge organization developed a concept to visualise Societal Risks (*Wiersma, Roos and De Wit, 2005).* The results of their models are presented in three digital maps. The first map visualizes the SR by three colours. Green means that the SR is below the normative criteria. The normative criteria will be influenced but not exceeded by an increase in population at a specific location (e.g. by development). Orange means that the normative criteria will be exceeded by an increase in population at a specific location. No colour means that an increase in population a specific location will not influence SR at all.

In addition to these societal risk maps, another map is produced, i.e. a map with ‘hot spots’. This map shows ‘hot spots’ which are highly likely to contribute to the societal risk. These risk maps have been field tested at a municipality and at a workshop. Planning experts who participated at this workshop agreed that the risk model can be a valuable support tool in dealing with safety issues in land use planning (*see Wiersma, Roos and De Wit, 2005*).

Flood risk modelling

The Dutch government is recalculating the probabilities and consequences of flooding in the Netherlands. New computational models, which give a more accurate quantification of the probabilities of flooding do this. Instead of looking at the highest water level that a dyke can retain (which is the traditional approach), the probability of flooding of an area is calculated. Besides the mechanism of overflow and overtopping (on which the traditional flood calculations were based) there are other mechanisms which can cause a breach in a dyke. For example, erosion of the dyke revetment, sliding of the dyke and piping (when the water streams underneath the dyke, can also cause a weakening of the dyke. By including these other failure mechanisms into the flood calculation, a more accurate assessment can be made of the probability of flooding. This information can then be used for spatial planning in areas that are susceptible for flooding.

In addition to the flood module an evacuation module has also been developed. The evacuation modules use traffic models to calculate the parameters necessary for the evacuation of an area. The module can then be used to estimate the time needed for successful evacuation of an area.

Multiteam and VNET: Systems for communication during the disaster

In contrast to risk prevention, the software available for crisis response aims at assisting the work of the rescue units. Since the most critical aspects in this stage are good command, control and co-ordination, most of the systems (that use spatial information) currently focus on providing an appropriate communication tool. Some examples are Multiteam (Figure 4) and VNET (Figure 5).

In both systems the different responding agencies in the crisis response (fire service, para medic, police, municipalities, other special units) can access the system and give the location of their mobile-units (using special symbols) or mark important areas e.g. those not accessible to the public. The user of the system can send e-mails and request different maps as a background. The systems differ slightly in their functionality and access to the information. While Multiteam has a quite large local database with information, the concept of VNET is accessing distributed information (stored within the organisations responsible for their own service delivery). In both systems, however, (spatial) analyses are not available yet. The only existing functionalities are map overlay and visual inspection. Simulations (as discussed in flood risk management) are not available at the moment. In addition, compatible communication systems are being developed to improve communication during imminent floods.

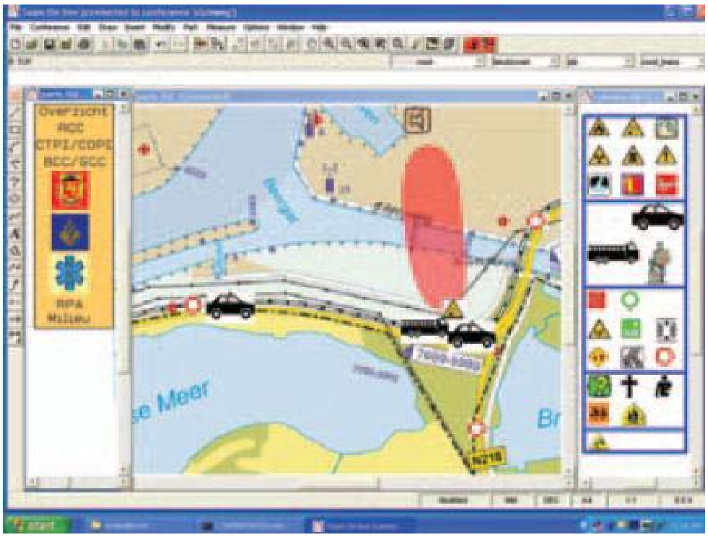

Figure 4: Interface of Muliteam, in use in west and middle part of the Netherlands.

Figure 5: Interface of VNET, in use in the Province Gelderland.

6. End-Users' Needs for Further Development

The workshops that were held with the two different user types, namely, risk prevention, and crisis management have revealed many differences in users' anticipated requirements and priorities which must be included in the future development of geo-information based models and systems.

The first very important principle we need to consider is time. Respondents from emergency services stated that their service requirements are time critical and in emergency response they demand almost instant and reliable responses from mobilising systems. On the other hand most procedures in risk prevention are not time critical and data response can be acquired over many hours or even days.

The technical requirements for a supporting system also vary. In a crisis response system heavy emphasis is placed by operators on simple intuitive interfaces with simple methodologies for communication and data access. The requirements for extended functionality or even artificial intelligence in support of decision-making are minimal. In situations of stress, system operators place more reliance on their own judgment and the judgment of other human beings than they do on any form of artificial intelligence. Inter-related to this is the desire to have a system that can be used in daily routine work that they are 'comfortable' with. The motivation behind this is directly related to the specifics of crisis response. Working with a non-familiar system will contribute to critical delays, will contribute directly to operator stress which will inevitably lead to 'expensive' errors when mobilising emergency resources to life threatening situations.

For risk prevention, we can recognize an ambiguity in the need for extended functionalities. On the one hand, planning experts would like to have more extended functionalities to make better-founded argumentations for the evaluation of longer-term alternative policies based on statistical data. For example, one would like to have more extended models to define group risks to get insight in the safety consequences of proposed developments. Yet, on the other

hand, simpler applications using non-technical language are desirable for communicating with non-experts, such as stakeholders or governors.
An important issue in risk prevention is the way in which (strategic) geo-information is communicated and used by agencies involved in the decision-making process and in which way geo-information influences decisions. Our respondents state that numerous GIS based models and systems have been developed to support decision-making in risk prevention. However, there is a demand for more feed back in the role and use of this information in the decision-making process. Respondents are, for example interested in the way a governor uses the information the respondents have supplied in arriving at a decision.

Interestingly enough, we have encountered many similarities in end-users' needs as well.

Spatial information in form of maps, models and various simulations is highly appreciated in both sectors. Requirements for advanced spatial visualisations are the subject of topical discussions within risk prevention sector. The use of more 'natural' representations (realistic 3D visualisation, videos, images, etc.) is increasingly recognised, especially amongst younger generations.

Communication and coordination between the different agencies is a critical issue for both risk prevention and crisis response. Most of the systems that are currently available for crisis response are initiated on a very low level by the end-users (fire brigade, police, municipality). Because these activities are initiated at a local level, many low-level users have to deal with issues of the poor interoperability of these systems by the use of local initiatives in the user group in the 'operational' area.

For risk prevention, the issue of communication and coordination is less urgent. There are already some national initiatives and standards, such as the National Register of Dangerous Substances and National Standards, such as the standard for provincial risk maps and GIS based land allocation plans that contribute to a better information exchange between agencies in risk prevention. Nevertheless in spite of these local initiatives, our respondents argue that sharing information still needs to be improved. There is for example a great need for the sharing of information and experiences from EU intrastate emergency services.

The problems with information sharing were often mentioned with slight nuances. The information is spread out over many parties, is available in different models and formats, and is not always reliable and accurate. The bottleneck is not really in the technical aspect but mostly in achieving agreements between different holders of information. Numerous initiatives are already on the way to improve the exchange of administrative and geographical information between involved stakeholders. For example, several provinces have taken initiatives to improve geo-information services to facilitate the exchange of (spatial) data in the crisis preparedness and response phase. At national level, a task force has been formed to stimulate and structure information exchange.

Security and authentication of information is another critical aspect in both phases. Availability of risk maps on Internet is under serious consideration. Currently, it is totally impossible to monitor who consults information and, consequently, their use. Paradoxically, in giving priority to the 'right to know' of citizens, a free access to information may represent an indirect threat to their security. Similar discussion is going on within the crisis response sector. Sometimes sharing of information can, understandably, be sensitive even between the different crisis management units because of the nature of their public service role.

7. CONCLUSIONS

We have started our study with the hypothesis that investment in geo-information for both risk prevention and crisis response can reduce the vulnerability of our society to disasters. Based upon the results of our inquiry amongst end-users, we can confirm this statement to be accurate.

During our study, we have seen that the two disciplines mentioned above have their own specifics and more importantly, the types of users, the informational requirements and priorities for further development of geo-information services also profoundly differ. In the Netherlands for example, one group of agencies is working on crisis prevention and a different group organises emergency services in case of a disaster. Other than some broad general similarities the specifics of the decision-making process of each discipline profoundly differ also.

Our first conclusion is that risk prevention and crisis response should be seen as different disciplines with different priorities for the further development of geo-information but the essential need to share common critical data. This means that the research question***… "What are end-users' requirements for the further development of geo-information and geo-information science for risk prevention and emergency response?"…*** has different answers for the different disciplines and phases of a disaster management cycle. The crisis response sector may well stress the urgency for real time data, while the risk prevention sector is more interested in how the information systems and models that have recently been developed, are actually used and can be used in their proprietary decision-making process.

Although the emergency response forces and land use planners work in different situation, environments and time frames, they broadly work on the same safety issues (e.g. flooding or technological hazards). It is a very interesting observation that land planners are increasingly recognising the need to study disasters in order to be able to improve quality of their planning decisions and especially to ensure preventative evacuation in threat of disaster. The emergency sector, in a convergence of disciplines, is also seriously considering the implications of risk criteria and vulnerable objects used by the land use planners. For example, current risk maps in land use planning only represent the chance and magnitude of a possible incident, but do not deal with the controllability of a possible incident. It is for example not clear whether it would be possible to evacuate an area when the water reaches a near critical level. Emergency response services have developed useful models to answer this question, however they are hardly ever used in land use planning. Would municipal or provincial authorities if they knew that an area might be more vulnerable to a disaster, because the escape routes are poor, still allow the same spatial developments? On the other hand, systems that are used in land use planning contain information on hazard sites and the location of vulnerable objects that can be extremely useful for emergency services.

Therefore we believe that the void between risk prevention and crisis management should be strengthened and 'bridged' by the use of more effective open standard geo-database systems. We argue that a new generation of appropriately designed system architectures can be the first step in realising this. Appropriate system architectures can link the numerous local initiatives and can enable organisations in both crisis response and risk prevention to use each others data, which builds a new bridge for greatly improved information exchange and coordination between crisis response and risk prevention disciplines.

The following recommendations might be considered during the development of such system architectures:

- It is very important to remember that the interface for emergency response should not be different from the every day interface. The end-user should not notice the difference in requesting information; only the variety of servers to be accessed has to be extended.
- The system should be service-centered (based on open standards) and not application-centered. Such a conceptual approach can be followed in the risk prevention sector as well. Sharing data via standardised services would allow for dynamic exchange of information between risk prevention and risk management.
- Special attention has to be paid to the organisational structure and archiving of data before, during, and after a disaster happens. Such organisational structure would assist in not only analysing the current situation but will provide spatial planners with historical data for reducing risks in the future.

There is much commitment amongst end-users to the further development of appropriate system architecture, because there is a great need for an improved informational exchange capability between and with other agencies. Facilitating the use of each other's data, by an appropriate system architecture, will contribute to a further recognition of inter-dependency between the different agencies whose common function is to contribute to the safety of the communities they serve. This recognition will hopefully also stimulate the process of making agreements on a higher level about the use and exchange of geo-information.

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