PLANNING AND EVALUATING PARTICIPATORY FLOOD RISK MANAGEMENT

Therese Stickler[1], Norbert Sereinig[2], Stefan Greiving[3], Mark Fleischhauer[4] and Katja Firus[5]

ABSTRACT

The EU Flood Risk Management Directive aims at an active involvement of interested parties in the setting up flood risk management plans. It is currently being implemented in the EU Member States. Thus, decision makers and authorities have to find appropriate tools for a communication and participation process which is one of the requirements of the directive. Two approaches for risk communication within flood risk management are presented in this paper:

- an indicator based model for the assessment of stakeholder cooperation and the institutional framework;
- the concept of social milieus to ensure a tailor-made participation campaign.

The indicator based model is a benchmarking tool to evaluate the performance of flood risk management systems in regard to risk governance principles.
The concept of social milieus was used to gain a picture of people living in the test case regions and to use this knowledge to plan information and participation activities.
This paper presents the approach and results of the ERA-Net CRUE project IMRA (Integrative flood risk governance approach for improvement of risk awareness).The conceptual framework of the project was tested in river basins in Germany, Austria and Italy. In all three case studies the elements of the communication strategy that were implemented were the start of an information and communication process which aimed at involving the stakeholders as well as the public. In general, the project activities had some impact, however this shall not be over-estimated and have to be carefully distinguished between the case studies.

Keywords: risk management, risk governance, risk awareness, participation, indicators, social milieus

INTRODUCTION

The overarching goal of the IMRA project was to influence and change real decision-making in flood risk management in three case study areas and to produce best practice examples which could serve as references for other authorities in Europe.
The test case areas represented different ecological conditions, socio-economic settings and cultural backgrounds:

- a mid-European hilly land river basin district, densely built-up, mainly prone to winter floods and flash floods: the river Wupper (Germany);
- an alpine river basin, prone to flash floods and debris flows: the river Möll (Austria);
- a Mediterranean river basin, prone to torrential floods: the river Chiascio (Italy).

To reach the aim of improving flood risk management, rather well known and already used methods for flood risk communication as well as tools and approaches from other risk communication fields and social marketing were collected and tested by the project team.

[1] Dr. Therese Stickler. Umweltbundesamt/Departement for Sustainable Development, Spittelauer Lände 5, A-1090 Vienna, Austria (e-mail: therese.stickler@umweltbundesamt.at)
[2] DI Norbert Sereinig. Amt der Kärntner Landesregierung/Abt. Wasserwirtschaft, Austria
[3] Prof. Dr. Stefan Greiving. TU Dortmund University/Institute of Spatial Planning (IRPUD), Germany
[4] Dr. Mark Fleischhauer. TU Dortmund University/Institute of Spatial Planning (IRPUD), Germany
[5] Katja Firus, T6 Società Cooperativa, Italy

The conceptual starting point of this paper as well as the tools that were elaborated and selected in the study are corresponding to the following research questions:

1. How can public participation in flood risk management be increased through better risk communication and greater risk awareness?
2. How can participation in the establishment of flood risk management plans be encouraged and improved as a feature of "good governance"?
3. What can institutions learn from improved understanding of risk communication approaches, tools and techniques? How can this learning be applied to improve the effectiveness of communications to the public (across a range of flood risk management activities, e. g., mapping, planning, event management, etc.)?

A conceptual framework was elaborated by the project team at the beginning of the project and was used as a roadmap for all activities. The first part of the concept consists in theoretical knowledge on risk perception, risk communication and good governance with a strong focus on participation. The other part of the concept describes tools and approaches selected for the application in the test case regions. The framework reflected the interdisciplinary (natural and social sciences) and transdisciplinary (scientists and persons from flood risk administrations) structure of the project team. There was a strong focus on the connection between theoretical concepts and the practical application of the tools due to the fact that the flood risk administrations of the three test case regions were included in the work as full project partners. To ensure that the conceptual framework fulfilled on the one hand scientific standards and on the other hand was practical enough to be used by flood risk administrations, the concept was discussed with external experts from other ERA-Net CRUE projects as well as practical experts from administration two times: once in the very beginning of the project and a second time after the collection of the results from the text case regions (validation phase). The results of these discussions lead to in slight adaptations or additions of the conceptual framework.

INVOLVEMENT OF THE PUBLIC

The core of the project was the idea that an optimisation of the flood risk management process needs an explicit involvement strategy of the public. But who can be defined as public? Neither normative concepts like sustainable development or good governance nor the European Water Framework Directive do specify what public participation or the participation of users means in detail (Fleischhauer et al., 2010). Within the IMRA project it was distinguished between (Firus et al.., 2011a; BMVIT, 2008):

- (Institutional) stakeholders: Organised groups that represent specific interests. These can be (a) formal decision-makers that are involved in flood risk management in the case study areas and that have official tasks ("administrative" or "decision-making" stakeholders) and (b) those that influence decisions more indirectly (interest groups, NGOs etc.);
- Public: The broad public or parts of the broad public, e.g., people that have just moved to a hazard-prone area and that are not at all aware of the flooding hazard. The broad public is more or less unlimited group of persons that are affected by or interested in a topic or a project/a process.

Administrators, politicians on the national, regional and local level, representatives of farmers, hunting, fishery and tourism, NGOs, land owners, energy suppliers, civil protection and lay people: all their interests should be respected and considered. As the legal and technical requirements for integrated flood risk management are often complicated, possibilities for public participation sometimes arise only when taking a closer look. But often it is possible to find and use a scope for public participation also in such complex technical matters – if there is an honest intention to do so (BMVIT, 2008). This is in line with the requirements of Article 10 of the EU Flood Risk Management Directive which aims at an active involvement of interested parties in setting up flood risk management plans. Public participation therefore is much more than just an information campaign with regard to final results: "Member States shall encourage the active involvement of all interested parties into the production, review and updating of the flood risk management plans" (Article 10, § 2, Flood Risk Management Directive).

However, some legal constrains may hinder the ideal implementation of such an active involvement. The involvement strategy of IMRA aimed at an integrated flood risk communication and participation process and was accompanied by measures that were rather conservative, like – for example – collecting and describing the administrative and legal framework or already existing data, maps and guidelines concerning flood risk in the case study regions to get a clear picture of the formal conditions (Stickler et al.., 2011). As the IMRA approach was intended on a real application on the ground, any participation had to be in line with the given legal context a case study area is characterised by. This meant that in some case study areas like Carinthia and the Wupper catchment area, where the procedure for setting up hazard maps is legally defined, a formal public announcement has to be the first step in any case. It depends on the local administration how active the public is informed about this early stage of risk assessment and in most cases only the legal minimum requirements are met. (Fleischhauer et al., 2010). Therefore the interplay between formal (legally required) and informal (voluntary) participation has to be taken into consideration when defining the scope of public involvement.

Stakeholders and the broad public can both be involved in public participation projects; but not necessarily at all stages of a project and in the same intensity (Carney et al., 2009).

In this article, we use the term "involvement" or "participation" which includes different levels of engagement from passive reception of information, participating in a consultation process up to involvement in decision making (Rowe & Frewer 2000; Standards of Public Participation 2008).

The intensity of participation reached in all three case study areas from information (e.g. by folders, public meetings) to consultation (workshops, informal meetings with stakeholders). In the Austrian and the German case studies the stakeholders were also included in the decision-making process e.g. in Austria stakeholders were asked to rate further dissemination activities or the design of maps. (Firus et al., 2011b).

Setting up participation processes needs some tacit knowledge in dealing with participants outside science or administration. However, scientists, technicians and persons from administration often still tend to see stakeholder participation as a tool to educate the stakeholders/the public so that these eventually understand the value and necessity of the actions proposed by the scientists/the administration. But most people feel intuitively if they are included in a dialogue as a full partner or are educated/instrumentalised. An educational approach is a barrier to create the basis for all participation processes based on deliberation: trust. Scientists, technicians and administration representatives need to understand that a qualitative high involvement process is an important learning process for all. Technical, administrative, legal, economic, social as well as common knowledge have the same importance and the same usefulness in a dialogue. Getting insight in the knowledge, perceptions and needs of others is not of less worth than technical expertise. (Firus et al., 2011a)

THE 12-STEP APPROACH

Additionally to elements of the involvement strategy (like a stakeholder analysis tool, an assessment of the social milieus in the regions and an assessment of the status of risk governance) selected methods for participation and communication in flood risk management were applied in the three case study areas during the IMRA project. . The experiences made with all applications were compiled in a handbook on planning and implementing communication and public participation processes in flood risk management – one of the central outputs of the project (Firus et al., 2011a). The handbook is designed to support decision makers and others that are responsible for the implementation of the Flood Risk Management Directive especially concerning the active involvement of interested parties by presenting a set of participation and communication methods. In particular it is targeted to the technical staff of 1) regional administrations, water authorities and river basin authorities and districts responsible for planning and carrying out flood risk management communication and participation processes; 2) local authorities in charge of implementing flood risk management communication and participation processes.

The handbook is structured along an ideal 12-step process of flood risk communication and participation. It shows how the strategic elements can contribute to successfully implement an involvement strategy and further allocates appropriate communication and participation methods to the steps of the approach. It leads the reader through the planning, preparation, implementation and evaluation phase of a risk management process. Each phase is composed of one or more step with a reference to methods which can be applied in a single step. The handbook provides a collection of (innovative) methods or activities, respectively, and their assessment for the purposes of the implementation of the Flood Risk Management Directive. They proved to be highly suitable for a communication and participation process in flood risk management. However, they are just examples and cannot be considered exhaustive.
The methods/activities presented are structured along the planning phase of a governance process, information, consultation and common decision-making, related to different intensity levels of participation. Nevertheless, there are overlapping areas among these sections and some methods/activities fit in either of them. The elements of the involvement strategy play a central role in a flood risk management process. On the one hand they support each step of an ideal flood risk management process. On the other hand each element of the involvement strategy can be implemented by different communication and participation methods and activities.
Two approaches for dealing with risk perception and risk communication, which have been used in other risk communication fields or social marketing but never before in the area of flood risk management, will be described in detail:

- a new indicator based model for the assessment of stakeholder cooperation and the institutional framework of this cooperation;
- the concept of social milieus to ensure a tailor-made participation campaign.

ZOOM IN: RISK GOVERNANCE ASSESSMENT TOOL

The vulnerability of societies in general can be distinguished into different dimensions such as social, economic or ecological vulnerability but also institutional vulnerability. The institutional vulnerability can be seen as one of the main framework conditions in dealing with risks because the whole risk cycle from mitigation, preparedness, response to recovery is embedded in an institutional system (Birkmann, 2006).
The aspect of institutional vulnerability can in principle be understood as lack of ability to involve all relevant stakeholders and effectively co-ordinate them right from the beginning of the decision-making process and according to risk communication processes. It refers both to organisational form and function as well as to guiding legal and cultural rules (Young, 2002; Greiving, 2005).
In a former project (MIDIR – Multidimensional integrated risk governance) a set of a core principles of and prerequisites for successful multidimensional and integrative risk governance has been developed (Greiving et al., 2007). Within the IMRA project the responsible water administrations used this approach twice to assess and monitor the performance of the existing management systems in terms of attention paid to risk governance principles.
The adapted indicator system was an important outcome of the IMRA project, since monitoring and evaluation of governance processes are relevant for a learning process towards recreating trust in public decision-making. The risk governance assessment tool presented here supports decision makers to optimise the quality and performance of the planned and/or implemented risk governance process by evaluating it against a set of ideal risk governance indicators. Thus, it is mainly a self-assessment tool. However, it can be also used for external communication to other stakeholders and to the public by showing already achieved goals within the process and by pointing at still existing deficits. The following table 1 shows the key performance indicators with their main attributes.

Tab. 1 Overview of key performance indicators

Keyword	Key question	Objective	Key Performance Indicator
Principles	What are the guiding principles?	Definition of guiding principles and a consistent "target system".	Degree of operationalisation of the guiding principles.

Trust	How far is attention paid to relevance of an atmosphere of mutual respect and trust?	Between all relevant stakeholders and decision makers an atmosphere of mutual respect and trust exists.	Reflection of trust concerning people/institutions.
Objectives	What are the concrete protection goals for subjects of the protection?	Definition of a comprehensive and obligatory understanding of the damage-protection-relation.	Degree of obligation concerning the protection goals for the subjects of the protection.
Accountability principle	How far is accountability defined at each level (process, each risk)?	Each actor knows his responsibilities and acts accordingly.	Definition of the responsibility.
Justification	How far is the activity concerning the management of existing risks justified?	Justification of action in the area of risk management.	Definition and agreement on a justification concerning the exposure to risk.
Representation	How far are all relevant social groups (and their representatives, stakeholder respectively) and their expectations known?	Identification of all relevant social groups and their expectations.	Degree of high profile of all social groups and their expectations.
Access to information	How far is information for all stakeholders accessible?	Access for all stakeholders to the relevant information.	Degree of the availability and understandability of the relevant information for stakeholders.
Tolerance process & outcome	How far do the stakeholders tolerate/accept the risk governance process and its outcomes?	All involved stakeholder tolerate/accept the risk governance process and its outcomes.	Degree of the tolerance/acceptance on the part of involved stakeholder.
Dialogue	To what extent is a constructive dialogue with the relevant stakeholders available or conducted?	Establishment of custom discourse-processes concerning risk topics.	Quality of discourse-processes with relevant stakeholders (i.e. public or private representatives).
Financial Resources	To what extent do the available financial resources meet the requirements of the defined Risk Governance Process?	Allocation of sufficient financial resources for a successful risk governance process.	Degree of realisation of a financial concept.
Staff Resources	To what extent do the staff resources (technical qualification and number of people) meet the requirements of the defined Risk Governance Process?	Allocation of adequate staff resources.	Realisation of a staff assignment concept.
Role	How far has the role of experts been defined?	If experts are involved, their role within the decision-making process has to be defined.	Degree of definition and agreement concerning the role of experts.
Co-ordination	Is the flood risk management process appropriately co-ordinated?	Realisation of a concept to co-ordinate decision-making procedures.	Commitment of relevant stakeholders to a co-ordination agreement.
Co-operation	To which degree do the relevant stakeholders co-operate with each other?	Degree of definition and agreement concerning the responsibilities of stakeholders.	Existence of an institutionalised process of co-operation.

The performance of the institutional risk governance process is illustrated similar to a balanced scorecard. The method enables decision makers in the area of risk governance/communication to optimise the performance of their activities by assessing it along selected risk governance indicators. It helps to identify priorities for the next steps of the governance process. After a first round the

assessment should be repeated after a certain period of time (e.g. 1 or 2 years) in order to evaluate the progress towards an ideal governance process.
The self-assessment can be extended by a parallel external assessment by other relevant stakeholders. This gives the institution in charge the opportunity to compare the own view with the external perspective. The application of the method can be considered successful if the results of the 2nd or any other consecutive assessment rounds show an improvement in the risk governance performance. Further, similar internal and external assessment results can also be interpreted as a part of a successful application. However, also the implementation of the different steps can be seen as a success as objectives, priorities and responsibilities can be defined.

Example: Assessment of a regional river authority.

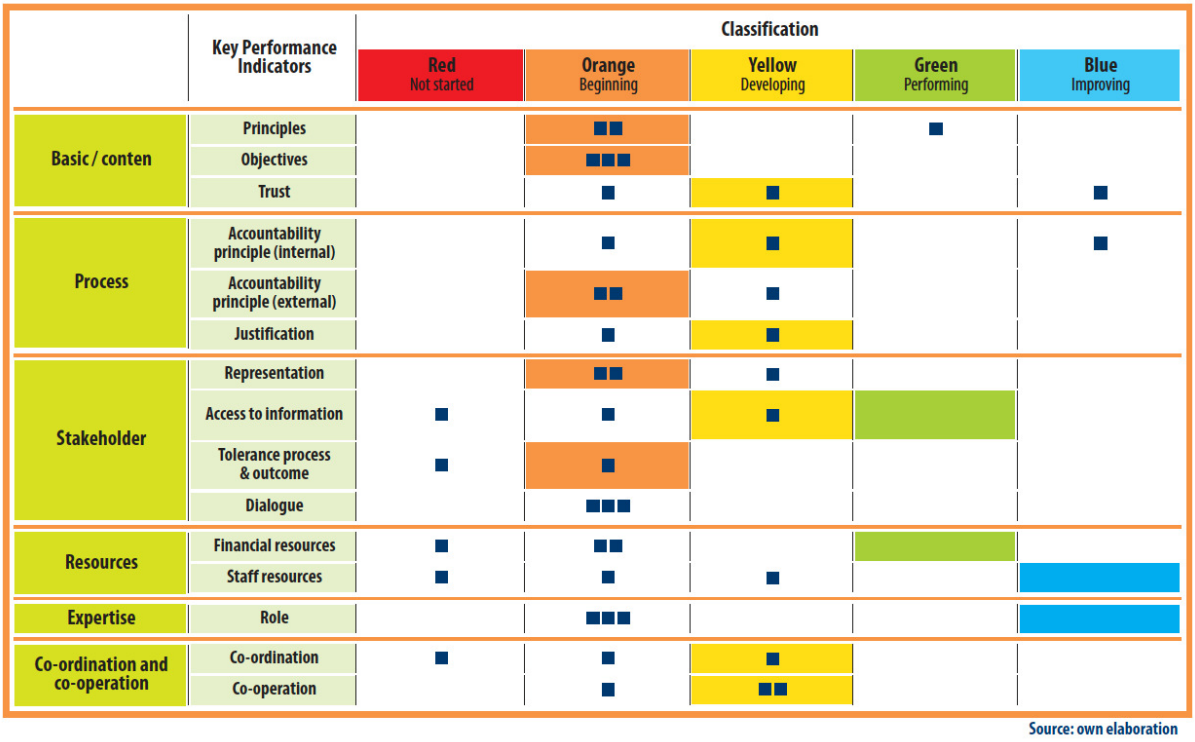

Fig. 1 Feedback on self-assessment of water authority (Firus et al., 2011a)
Explanation: The self-assessment by the regional water authority is marked with colors. The estimation results of the three stakeholders are marked with

The results of the self-assessment described in Figure 1 show that the regional water authority has already achieved some important steps (marked in blue or green) in the following areas:

- access to information;
- financial resources;
- staff resources;
- role-

The result is of course not representative but gives an idea on how the internal and external views of the local authority's work converge or diverge, respectively, in this respect. The feedback results show that in general the external and internal views are not that far away from each other. However, concerning some elements there are significant differences:

- access to information: estimated lower than by the regional water authority itself;
- financial resources: significantly lower (red/orange external view compared to green);
- staff resources: significantly lower (red/orange/yellow external view compared to blue);
- role: here the external experts judge the work of the regional water authority rather low (all orange) compared to the regional water authority itself.

The application of the indicator set is seen as a good tool for structuralising and prioritising topics of risk governance:

- Austrian case study: Austria has a tradition of administration and law how to deal with flood risk and many areas the indicators deal with are formally defined and without much scope. Many principles, goals, responsibilities, etc. cannot be influenced by AKL because they are defined by law or other regulations. But the Indicators are seen as a tool (similar to a SWOT analysis) to structuralise and prioritise the discussion on cooperation fitness in areas that are informal and/or without administrative tradition. The MIDIR indicators show room for improvement, but an improvement of the situation is often depending on resources allocation (e.g. for participation activities) that is not in the responsibility of the partners;
- German case study: The German partners concluded that the indicator set is most important as an internal assessment tool in order to structuralise and prioritise issues on flood risk management. The Wupperverband would have wished to receive earlier responses in order to improve the quality of their work;
- Italian case study: An assessment with indicators seems to be a good way to analyse the performance of the organisation, as it provides a clear structure. It is a new way of monitoring in the administration. It seems that these kind of benchmarking and monitoring processes are more common in the Northern part of Europe. Only discussing the indicators and the values, highlighted some issues that were previously not taken into consideration.

ZOOM IN: SOCIAL MILIEU APPROACH

Risk perception is affected by attitudes and values – values filter information and colour perceptions. To plan a risk communication strategy it is necessary to discover

- the status of knowledge and risk perception of the local population;
- which values and attitudes can affect risk perception the target groups.

Attitudes, values and other socio-cultural features can be assigned to social groups, to "milieus". Research on social milieus is traditionally performed by market research and psychology. It was not foreseen or possible within the IMRA project to perform a detailed socio-cultural analysis of the target groups in the regions of the subprojects. But an overview on the national level on which kind of target groups do exist, what their attitude and values are and what kind of information material might reach them can give valuable input to a risk communication strategy.
Understanding how values filter information and colour perceptions is of critical importance to design and implement public information campaigns (Roser-Renouf and Nisbet, 2008). It should not be neglected that there are also voices (Sjöberg, 2000) which do object that the social context per se by no means is the sole determinant of risk perception. However, the social milieu approach can be regarded as valuable for building up communication strategies and therefore it was used as a working hypothesis.

Social milieus on the local or the regional level can be identified and described by market research companies or similar institutions/organisations. Within the IMRA project such a detailed analysis was not carried out but the Sinus Milieus® acted as a tool to discuss how to reach local target groups in the case study areas. After Kleinhückelkotten (2007) the question is not: "What is wrong with these people, why won't they understand?" but "What don't we understand about our target audience?"

To have a basis for a discussion, available social milieu analyses like the Sinus Milieus®, developed by the market research companies INTEGRAL (Austria) and SINUS-Institut, Heidelberg (Germany), can be used. These Sinus Milieus® give an overview of social groups on the national level for all case studies. Integral (2009) points out that the Sinus Milieus® combine demographic characteristics such as education, profession and income with the real living environments of the people, which means with fundamental value orientations and attitudes towards working and leisure time, family and relationship, consumption and politics. The social milieus were used in the IMRA project to plan the risk communication strategy: what to communicate, how to communicate und which cannels to use.

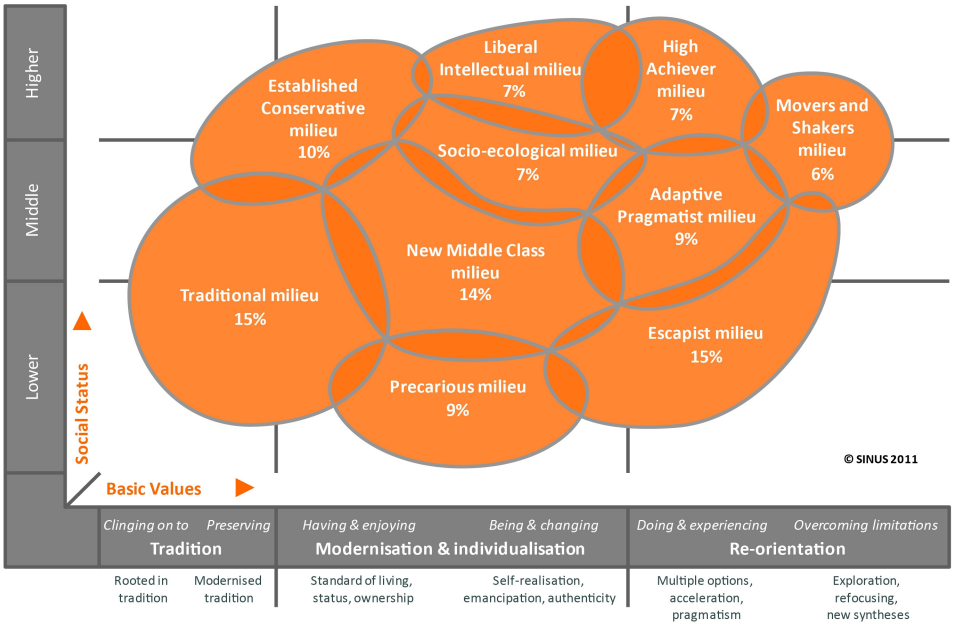

Fig. 2 Social milieus in Germany (Source: SINUS-Institut, Heidelberg, 2011)

The social milieus described above were not just a theoretical exercise but were used to design tailor-made communication strategies in the case study areas. Social milieus can act as a mean to discuss how to reach local target groups in the case study areas. E.g. in the Austrian case study in the valley of the River Möll in Carinthia, the project team used statistical data about formal education, age, income, employment rate, sectors of employment as well as the results of the last elections. The results of the analysis of social milieus showed that most parts of the population belong to the rural-traditionalist, the working class and the middle class milieus.

Fig. 3 Symbolic representatives and kind of media: post-materialist and traditional/middle class (all photos: Stickler)

In the communication and participation approach all methods and also the selection of multipliers were adjusted to the social milieus: the stakeholder workshop, the exhibition and the school projects. According to the identified milieu, low-threshold approaches with a strong focus on historic local events and oral history involving the local population were implemented.

An example: An exhibition about past flood events in the 1965/66 in the community of Großkirchheim consisted of only one panel about the scientific backgrounds (meteorological data, hydrological information) of the floods, but 8 panels with information concerning the devastation in Großkirchheim and 3 panels featuring the media coverage 1956/66. The 8 panels consisted of a rather small amount of text and this written information was about flood witnesses experiences and written in the local dialect. The opening of the exhibition was planned as a mixture of an information activity and a social event with contributions of flood witnesses.

Additionally to the social milieu the target groups may also differ in their age. This can also affect the decision on what information channel to use. Children are more attracted to new media than older persons. This could be seen in the Carinthian case study during one event, where traditional forms of media like an exhibition and new electronically media were used. Children went immediately to all forms of electronically media, whereas the older generation focussed on the exhibition panels.

Fig. 4 Age and media preference during a flood risk event in Carinthia (Photos: Revital (left); Stickler (right)

The difference in the selected approaches in the three case studies had its basis not only in the results of the indicator based analysis but also in the social milieu approach that helped to understand that not all people can be reached with one communication means e.g. the same kind of flyer.
Results of the social milieu approach in the three case study areas:
In Austria and Germany it is seen as a very useful tool for planning target group oriented risk communication activities. In Italy it was seen as one useful parameter for the identification of the communication activities.
Data and information used for the analysis of social milieus were in Austria statistical data from Statistik Austria, additional data was researched by internet. In Germany statistical data from Information und Technik Nordrhein-Westfalen and the City of Leichlingen; in interviews with local stakeholders/key questions on social milieus were asked. And in Italy the data came from the ISTAT 2008 Yearbook and ISTAT 2009 Yearbook: regional data about Umbria and data by Internet research.
The barriers for the analysis of the social milieus were the same in all three case studies: no very detailed socio-demographic data is available at such small scale. In Germany additional qualitative information by interviews was needed.
In the Austrian case study, the results of the analysis of social milieus showed that most parts of the population belong to the social milieus of rural-traditionalists, the working class and the middle class (according to the Austrian Sinus milieus). In the German case study most parts of the population belong to the social milieus of rural-traditionalists and the middle class (compared to the German Sinus Milieus). The large part of population of the Italian case study region can be classified as ambitious Middle Italy (compared with the Italian Sinus milieus).
In the Austrian case study all methods and also the selection of multipliers was adjusted to the social milieus: stakeholder workshop, exhibition, school projects. In Germany the approach as such helped to look carefully whom to address with the elements of the communication strategy; however, this step was not directly linked to certain social groups. In Italy communicating with students and teachers during meetings in different schools (with videos, games, competitions) in order to involve their families was also chosen according to the social milieu of the region.

IMPACT OF BETTER PUBLIC AWARENESS AND PARTICIPATION ON REDUCTION/ALLEVIATION OF FLOOD RISK

In the Wupper case study the impact of the stakeholder workshops and the self-assessment on the group of relevant stakeholders was quite high as for the first time all stakeholders relevant for the

implementation of the Flood Risk Management Directive met and discussed especially on the issue of communication and participation. It helped to identify responsibilities of the stakeholders and revealed open issues. The Wupperverband and the local communities can build on these results ror the further communication strategy the responsible authorities from the State of North Rhine-Westphalia.
Concerning public awareness the impact of the communication activities have to be rated rather low although the 2nd survey revealed a slight increase in the awareness of flood risk. About a third of the people who answered the survey had recognized either of the activities. However, local stakeholders had the impression that there was no broad impact on the local population so far – and of course it is not clear if and how those people that have been better informed through the activities will participate in the process and maybe even will take self-protection measures.
Nevertheless, the exemplary implementation of different communication methods helped the local, regional and State authorities to gain experiences and to design the future communication and participation process.
In the Carinthian case study along the river Möll all local stakeholders already knew each other but had no common understanding of the residual risk. The stakeholders had a clear understanding of their duties and responsibilities but saw some potential for improvement in the spatial planning coordination and disaster prevention training. It was highly appreciated that the cooperation within the project resulted not only in "talking" but in specific actions and requirements.
The communication activities of questionnaires and the exhibition had a rather high impact on the local population to establish some peer-to-peer communication within the local community. But continuous activities have to follow to stabilise the risk awareness. However, there is still a very low feeling of personal responsibility for risk prevention or financing flood risk protection activities.
The workshop on comprehensibility of information material gave valuable input to the provincial as well as the national authorities responsible for food risk maps. A further result was a folder concerning flood risk in Großkirchheim that was designed after the suggestions of the lay participants of the workshop.
Some important aspects from the implementation of the communication strategy in the Chiascio case study area are that the presentation of the topic of flood risk in general contributes already to an awareness raising of the importance of the topic, especially at the stakeholders in the public administration. This became obvious from the several meetings. Key people who have a particular interest in the topic (as e.g. the technician of the municipality of Assisi or some teachers in schools) are of high importance to promote any activity and involvement. During the IMRA project schools were included in the project to convey "the message" to people and to use them as vehicles to forward the information to families. This was confirmed by the results of the second survey which showed an increase in risk awareness. Visual communication tools, focusing on problems of the area, and interactive games seem to be successful tools to involve people in a way that have an impact on the awareness of the problem.

CONCLUSIONS

In all three case studies the elements of the communication strategy that were implemented were the start of an information and communication process which aims at involving the stakeholders as well as the public. In general, the project activities had some impact, however this shall not be over-estimated and has to be carefully distinguished between the case studies.
The experiences made with the practical applications in the case study areas of the project IMRA were the basis to design a 12-step approach and to allocate appropriate methods of risk communication and public involvement to these steps which are now described in a handbook for flood risk practitioners. As any kind of guidance or handbook it has to deal with the following questions: Which of the recommendations compiled from literature or case study experiences can be transferred to other cases? Are the applied and tested methods and approaches flexible enough? Which elements are generally transferable and which are context related and have to be adapted to other circumstances?

The 12-steps concept presented in the handbook is a general frame for involving and informing stakeholders and the public in flood risk management. It can be generally applied to other cases. The specifications within each step and the design of approaches and methods, however, need to be adapted to the specific situations because every case has its own context and specificities which depend on the characteristics of the risk setting itself (e.g. existing level of acceptance with respect to risk governance), political (e.g. legal system), economic, social (e.g. risk culture), institutional and other aspects. These characteristics have a large influence on the implementation of any concept for participatory flood risk management. (Firus et al., 2011a)

REFERENCES

Arbter K., Handler M., Purker L., Tappeiner G. & Trattnigg R. (2005). Das Handbuch Öffentlichkeitsbeteiligung ,Österreichische Gesellschaft für Umwelt und Technik (ÖGUT) und Bundesministerium für Land-, Forstwirtschaft, Umwelt und Wasserwirtschaft (Hg.). Wien.

Birkmann J. (2006). Indicators and criteria for measuring vulnerability: Theoretical bases and requirements, in: Birkmann, J. (2006) (Edt.): Measuring Vulnerability to Natural Hazards – Towards disaster resilient societies, United Nations University Press, New York, 55-77.

BMVIT Bundesministerium f. Verkehr, Innovation u. Technologie (2008). Leitfaden: Öffentlichkeitsbeteiligung im Hochwasserschutz; Wien.

Carney S., Whitmarsh L., Nicholson-Cole S.A. & Shackley S. (2009). A Dynamic Typology of Stakeholder Engagement within Climate Change Research. Tyndall Centre for Climate Change Research, Working Paper 128.

European Parliament and the Council of the European Union (2000). Directive 2000/60/EC of the European Parliament and of the Council Establishing a Framework for Community Action in the field of Water Policy, published in the Official Journal (OJ L 327) on 22 December 2000.

European Parliament and the Council of the European Union (2007). Directive 2007/60/EC of the European Parliament and of the Council on the Assessment and Management of Flood Risks, published in the Official Journal (OJ L 288) on 6 November 2007.

Fleischhauer M., Stickler T., Greiving S., Wanczura S. (2010). IMRA concept for participatory flood riskmanagement aiming at the improvement of risk awareness and increased public participation, Del. 1.2 of the IMRA project.

Firus K., Fleischhauer M., Greiving S., Grifoni P., Stickler T. (2011a). Planning and implementing communication and public participation processes in flood risk management. Procedural guidelines and toolbox of methods, Technische Universität Dortmund, Dortmund.

Firus K., Fleischhauer M., Greiving S., Stickler T., D'Andrea A., Ferranti C., Flex F., Koboltschnig G., Fangucci G., Scheibel M., Ebers M., Sereinig N., Malvati P., Grifoni P., Bagnini S., Guzzo T., Vitale V. & Wanczura S. (2011b). IMRA - Integrative flood risk governance approach for improvement of risk awareness and increased public participation. (2nd ERA-NET CRUE Research Funding Initiative - Final Report).

Greiving S. (2005). Concepts and indicators for measuring institutional vulnerability, Proceedings of the 2nd meeting of the UN expert group on vulnerability. UNU-EHS. Bonn.

Greiving S., Wanczura S., Voßebürger P., Sucker K., Fourman M. (2007). Scalable resilience and risk governance concept including guidelines on stakeholder involvement. Del. 1.2 MIDIR Project.

INTEGRAL (2009): Die Sinus Milieus® in Österreich. Available at: http://www.integral.co.at/de/sinus/milieus_at.php.

Kleinhückelkotten S. (2007). Soziale Milieus als Zielgruppen in der Bürgerbeteiligung und Engagementförderung Freiburg, 20.10.2007, available at: http://www.21-kom.de/fileadmin/user_upload/PDFs/02_Sinus_Milieus/Soziale_Milieus_und_Engagement.pdf.

Roser-Renouf C. & Nisbet M. (2008). The measurement of key behavioral science constructs in climate change research. International Journal for Sustainability Communication, 3, pp. 37-95.

Rowe G. & Frewer L.J. (2000). Public Participation Methods: A Framework for Evaluation. In: Science, Technology, & Human Values, Vol. 25, No. 1:3-29.

Sjöberg L. (2000). Factors in Risk Perception, in: Risk Analysis, Vol. 20, No. 1, 2000, pp. 1-11.

Standards of Public Participation (2008); adopted by the Austrian Council of Ministers on 2 July 2008.

Stickler T., Fleischhauer M., Greiving S., Koboltschnig G., Malvati P., Grifoni P., Firus K. (2011). Planning and Evaluating with New Participatory Flood Risk Management Tools, in: UFRIM. Urban Flood Risk Management. Proceedings of the International Symposium, Technische Universität Graz, Graz.

Young O.R. (2002). The Institutional Dimensions of Environmental Change. Fit, Interplay, and Scale. Cambridge, Mass., London 2002, MIT Press.