

enhance
Partnership for Risk Reduction



ENHANCE

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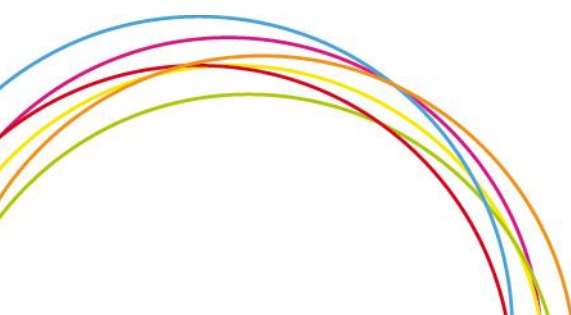
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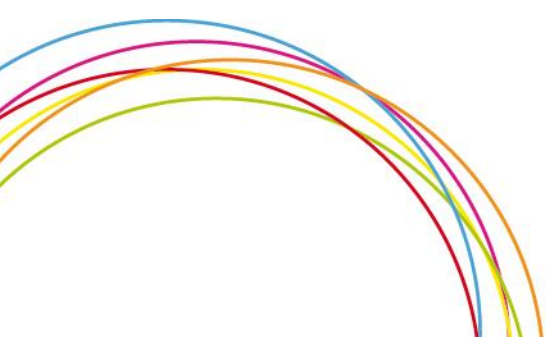


Executive summary

Enhanced risk management of natural hazard events has to integrate different rationalities and concerns of various institutions, sectors and the public. This in turn requires multi-stakeholder involvement as much as the understanding that participation and societal support have to be understood as crucial for successful risk management processes. Based on this approach, dealings with risks in the trilateral Wadden Sea Region (WSR), which is characterized as a multi-hazard area, have to cover more than the quantitative processes of identifying risks, their potential impacts on society and assessments with regard to monetary terms. Rather more important are social negotiations as basis for successful management processes and implementation of technical and economic disaster risk reduction (DRR) measures. In order to implement DRR measures effectively, a broad acceptance among the stakeholders and the society at large is necessary. The perception of risks and the understanding how to face these risks will change over time. Therefore, risk management processes need to be flexible to adapt to changing or new conditions.

The analysis of the WSR identified a multi-hazard situation in which different types of risks, e.g. storm surges, demographic change, conflicting spatial uses or other risks resulting from environmental changes, are significant. The analysis further elucidated that storm surge events are perceived as threats to the region but their potential threat is well managed and taken care of by the current management strategies – there is no urgent need for improvement. This common position had been underlined by the results of a stakeholder consultation, detecting that additional economic DRR instruments (e.g. insurance schemes) are declined by the stakeholders.

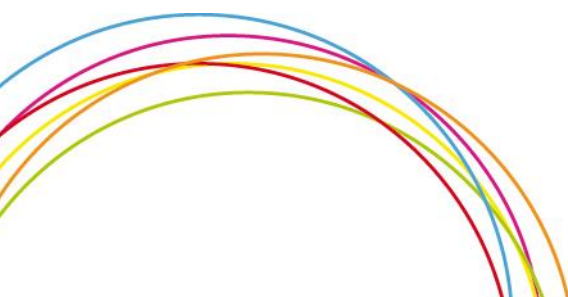
The analysis in ENHANCE made clear that improvement in risk management processes in the WSR has to be driven by the need of increased individual initiative as much as by the need of more participatory and collaborative process. The work of ENHANCE substantiated the Wadden Sea Forum's (WSF) potential role in this process. The WSF is a multi-sector partnership (MSP) of a cross-national composition, advice-giving and independent, and represents a type of MSP which can support risk management in the trilateral WSR. Its strength lies in its capability to increase communication and to enhance integration of stakeholders and society's risk perception in transnational risk management. In order to take the maximum advantage out of the WSF's existing political weight in current debates, the WSF is highly dependent on the personal engagement and commitment of each participant. Moreover, stakeholders' capabilities to be open towards new issues, being able to discuss and reflect ongoing processes as much as the capacity to be flexible in order to react on changing conditions are major fundamental pillars for a successful performance of the WSF in collaborative, societal-based risk management. In this regard it became clear that the MSP itself has to be understood as important DRR solution that is needed in the WSR for the moment and in the future.





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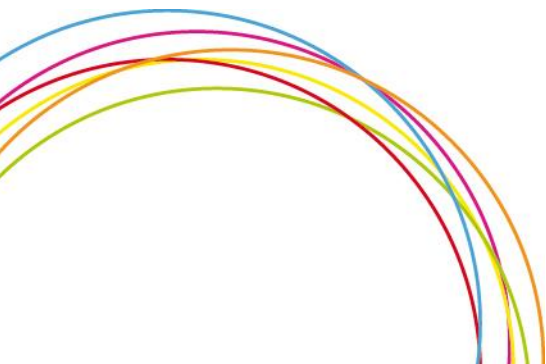


1 What is at stake?

Widening the perspective in risk management towards broader and more people-centred approaches has been and is still a general endeavour in risk management (see e.g. Hyogo Framework for Action, United Nations ISDR 2005). The complex and dynamic nature of environmental problems and risks resulting from natural hazards requires flexible and transparent decision-making that have to embrace a diversity of knowledge and values (Renn 2008, 2417) in order to successfully deal with related effects and impacts of these problems and risks on the society. Related theoretical and conceptual discussions are reflected amongst others in the fields of disaster and risk governance (comp. Gall et al. 2014; Renn 2008; IRGC 2005, Wanczura et al. 2007, Greiving& Glade 2013).

The increased need of information and knowledge about values that have to be considered strengthen the requirement of enlarging the range of participants and create a multi-stakeholder environment for risk management processes. Prominent examples fostering the increasing demand for stakeholder participation and collaborative action in environmental and risk management processes are found in several EU-Directives, such as the EU-Flood Risk Directive and the Water Framework Directive as well as guiding papers such as the White Paper on Governance of the Commission of the European Communities (2001). The most recent Sendai Framework for disaster risk reduction 2015-2030 (2015), an update of the Hyogo Framework for Action 2005, clearly stated that “disaster risk governance at the national, regional and global levels is of great importance for an effective and efficient management of disaster risk” (United Nations ISDR 2015, p.17). Within this context, “clear vision, plans, competence, guidance and coordination within and across sectors as well as participation of relevant stakeholders are needed” (United Nations ISDR 2015, p.17) to foster collaboration and partnership across mechanisms and institutions.

The ENHANCE case study “Risk culture, perception, and storm surge management (North Sea coast)” is pursuing this challenge and focuses its risk management approach on the inclusion of the society and stakeholders as much as to support a dialogue between them. The trilateral Wadden Sea Region (WSR) includes, besides the Geest and marshland, the low-lying, tidal coastal regions along the Dutch, German and Danish North Sea coast. It represents a coherent intertidal ecosystem characterized by a shallow body of water, tidal flats and wetlands. The WSR includes the Wadden Sea, the seaward areas of the respective areas as well as the coastal region behind the dykes. Major natural threats for the inhabitants and the areas in human use derive mainly from hydrological events like the rising sea level and from short-term storm surge events. Both have set significant challenges to the society in the WSR since the area has been settled and they do until today. The majority of the scientific community agrees on projections of potential future changes predominantly comprising an existing increase in mean sea level during the last decades (Church et al. 2001; Katsman et al. 2008) and an on-going increase for the coming decades (IPCC 2013; Katsman et al. 2011). Increased sea level could also affect the future storm surge water level at the North Sea coast. Numerical research shows that there might be a slight increase in extreme storm surge water





levels and in the mean number of severe storm surges (e.g. Woth et al. 2006, Weisse et al. 2014)¹.

For this reason, storm surges represented the starting point of the discussion facilitated by ENHANCE. Currently coastal risk management processes are predominantly understood as and realized by technical measures. The three Wadden Sea countries look back to a long-standing tradition of living and dealing with the risks resulting from storm surges and raising sea level. Over time, the management of these risks has often been comparatively similar, not at least based due to the systematic embankment and drainage of the coastal marshes by the Dutch dyking system invented in the 10th century and spread northwards along the Wadden Sea coast (Lotze et al. 2005, Oost et al. 2012, Wadden Academy 2013). Exchange of knowledge about effective protection measures and shared experiences over the centuries in the entire WSR is widespread. Storm surge management and coastal engineering is nowadays exclusively in the hands of the governments. However, no storm surge risk management processes are in place across the national borders, even though the risk appears on trilateral scale and affect all the three countries in a similar way. Management processes have taken place exclusively within national and in Germany within the Bundesländer boundaries.

Under these circumstances it is necessary to question whether the current understanding and structures of risk management allow the implementation of risk management processes in form of broader cross-national and more people-centred approaches. One of the major emphases to answer these questions includes the characteristic of a cross-border risk area. This enhanced spatial dimension in coastal risk management in the WSR could presumably strengthen the call for collaborative actions in risk management on a trilateral level. In this regard, a Multi-Sector-Partnership (MSP) could represent a potential improvement.

Our case study aims towards a rethinking of risk management processes in the trilateral WSR and represents an excellent example for transboundary challenges in risk management. The case study aims at analysing benefits, disadvantages and limits of establishing an MSP in storm surge management. New in this process is the idea to organise risk management processes on a cross-national level with the help of a MSP, without creating a new organisational body. The MSP can support an increased, multi-sectoral stakeholder involvement in risk management in the WSR. Moreover, the MSP can use its already existing trilateral grass-root structure to foster a trilateral collaboration in storm surge risk management processes - since currently no storm surge risk management processes are in place beyond the national borders. For the case study's work, we refer to the Wadden Sea Forum (WSF), an already established transnational MSP, to cooperate in trilateral risk management in the Wadden Sea.

¹ For a more detailed description see also Gerkenmeier et al. 2013 (Deliverable 7.1).





1.1 The Multi-sector-partnership in the WSR case study

The MSP we are looking at and cooperate with is the WSF². It is an independent platform of stakeholders from Denmark, Germany and the Netherlands, once established to contribute to an advanced environmental protection scheme and sustainable development of the WSR. In particular, this means integrating specific cross-sectoral and transboundary strategies, actions and techniques which are environmentally sound, economically viable and socially acceptable (Wadden Sea Forum 2013).

The participating stakeholders represent the sectors Agriculture, Energy, Fisheries, Industry and Harbour, Nature Protection, and Tourism, as well as local and regional governments from the three Wadden Sea countries. National governments are represented as observers (Wadden Sea Forum 2005; Wadden Sea Forum 2010; detailed description is given in D7.2, Gerkenmeier et al. 2014).

The topic of risk management has been put on the agenda for the WSF following the 12th Trilateral Governmental Conference on the Protection of the Wadden Sea in Tønder (Common Wadden Sea Secretariat 2014) so that the ENHANCE case study was able to take advantage of the situation, support the WSF in developing its newly declared objective and investigate the potentials to integrate risk management in the WSF's future activities. The partnership could play a major role especially with regard to the need for improved governance processes in coastal risk management structures in the WSR. Particularly the establishment of transnational activities in risk management could be enhanced by the MSP. Incorporating new objectives need consideration of the possible scope of action. Consideration of these conditions is essential to investigate tasks and responsibilities that are realistic and doable for the WSF.

Regarding its legal status and competencies, the WSF is equipped with an advisory function in the Wadden Sea Board, the governing body of the Trilateral Wadden Sea Cooperation on the protection of the Wadden Sea. Although the WSF has a legal status as a non-profit society, the WSF has no normative power in decision-making outside the forum. Consequently, this MSP will not have any direct influence on developing or instructing technical and economic measures in the three Wadden Sea countries. Nevertheless, experiences over the years showed, that a trilateral MSP, also anchored in decision-making as an advisory board, will not be ignored and prove its communicating and advisory power. In consequence, for the target to enhance risk management as people-centred and as requiring acceptance and understanding within society with its stakeholders and interest groups, the WSF is an appropriate existing MSP to cooperate with.

Keeping this role in mind is essential for the detailed discussion and elaboration of the scope of actions and specific role of the MSP in risk management. Experiences during the collaborative actions will show the potentials and limits of this performance type of MSP in coastal risk management.

² Established in 2002





1.2 The Wadden Sea Region: a multi-risk-area

The work with the WSF underlined the fact that the WSR is faced with a multitude of risks resulting from different natural hazards and socio-economic developments., Natural hazards in the area, particularly storm surges, represent major risks – but discussion within the MSP made obvious: storm surge risks have to be seen as one risk embedded in a multi-risk situation in the WSR.

The workshops with the stakeholders of the WSF defined storm surge risks as the major risks – but declared at the same time that there is no urgent need for improved risk management in this regard. Storm surge risks are perceived as currently well managed³. Admittedly, climate change, changes in storm surge patterns, and an increased sea level rise have to be addressed in future risk management processes. In addition, climate change is seen as a major risk for increased inland flooding events, as well as increased temperatures and changes in precipitation patterns – triggering further impacts on different sectors which need to be considered in future management strategies.

Risk deriving from socio-demographic changes is attributed the second highest importance in the WSR. The current situation, as described by the stakeholders and underpinned by statistical data, is characterized by a population decline⁴ in most of the region's municipalities⁵ for the past decade. This development is combined with a relatively small and still declining share of young inhabitants⁶ and an increased share of older inhabitants. In depth discussions with the stakeholders highlighted the awareness of an increased individualism as much as limited and egotistical thinking in social and political processes - which both negatively influence cooperative management processes of socio-demographic changes in the WSR. Stakeholders expressed their expectations that consequences of socio-demographic changes will affect the coastal communities in all three countries in a similar, mostly negative way. These consequences might include unemployment, out-migration from the WSR, especially of young and highly qualified people, an ageing society and increasing social disintegration.

The collaborative analysis of the risk resulting socio-demographic changes in the WSR made clear, that this issue is of highest priority for the stakeholders with regard to immediate need of action and improvement of risk management processes.

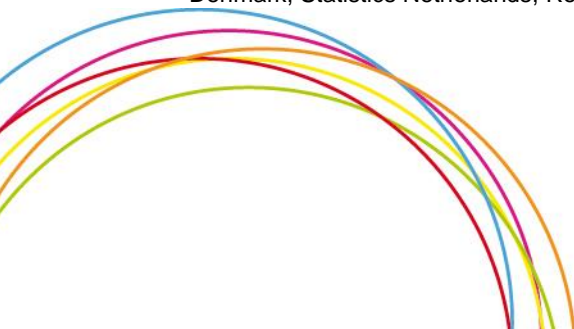
Third rank of major risks were attributed to conflicting spatial uses between different user interests in the WSR and demands high priority for enhancing risk management activities. With regard to economic and ecological risks and uncertainties, shipping and oil tanker accidents

³ Stakeholders often referred to the existing high developed coastal protection measures along the Dutch, German and Danish North Sea coast provide a high protection level under current climate conditions and most likely for the next decades (comp. MLR 2001; MELUR-SH 2013; NLWKN 2007; Delta Programme 2013, Sterr 2008). These currently applied storm surges management is characterised by a dominance of governmental actors, where decision-making processes are organised in a hierarchic top-down order (for more details see Gerkenmeier et al. 2013, 2015)

⁴ Years 2002, 2009-2011 are evaluated

⁵ Available data for specific research area from WSF

⁶ 15-24 years, compared to the total national population, data from 2003-2011, Source WSF, based on Statistics Denmark, Statistics Netherlands, Regionaldatenbank Germany

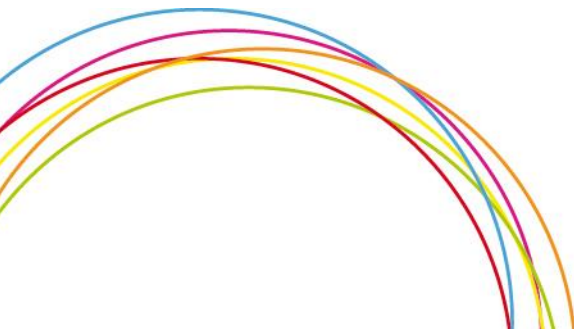




and the improvement of prevention measures have also been considered as pending risks. Furthermore, negative effects from economic crises on global and regional level will also bear uncertainties to deal with. To underline the multi-risk situation in the WSR, the stakeholders itemized risks and uncertainties with regard to emissions (especially CO₂), pollution of rivers and the North Sea, loss of biodiversity and increase of alien species in the WSR. They also highlighted the availability and sustainable management of energy supply as an upcoming future challenge in the WSR which is related to many current uncertainties.

In conclusion, the work with the WSF's stakeholders made clear that not only the WSR is faced with a multitude of risks, but that there is also a need for improved risk management strategies beyond technical storm surge protection. Discussions with the stakeholder disclosed that both the perception of risks and the awareness for management needs, essentially contribute to the determination of points for action in risk management. With regard to the major risk of storm surges, stakeholders' awareness of the currently applied risk management measures disclosed that, roughly speaking, risks from storm surges exist but they are reduced to a societal tolerable degree in all the three countries, based on the applied measures. It is difficult, if not impossible for the MSP to introduce a transnational perspective in storm surge risk management; different historic pathways, diverging understandings and the current structures of national legislation and national implementation in storm surge risk management do not leave space for action in this regard. However, this barrier is not insurmountable and moreover leaves room for additional tasks beside the national ones to contribute to an improved management on a trilateral level. There is a certain danger that the trust and success of the recent technical measures and current technical-mathematic approach lead to a "perception of security" (von Storch et al. 2008). In this situation society might run into a lock-in situation in which continuous, successful investment in construction measures hinders a perspective on non-technical or mixed adaptation measures and strategies. Moreover, the all-out focus on technical measures restricts stakeholders and society from considering potential increased risks besides the storm surge risk in the WSR. The workshop discussions disclosed a high level of interconnectedness of the different risks, characterized by interlinkages delayed in time and space as well as cascading and surprising effects between different risks. Focusing on only one of these risks would not meet stakeholder expectations and risk management requirements. The ENHANCE challenge lies in the reframing of risk management, detecting mental lock-ins against alternative approaches and tackling potentials for trilateral cooperation in a multi-risk area. The WSR is understood as a multi-risk area where risk management perspectives draw attention to multifaceted future risks and challenges. This coherent perspective will require collaborative processes including stakeholders from all affected sectors in order to manage these risks.

The work with the WSF demonstrated that improvement in risk management in the WSR by an MSP is based on the aim to broaden the thinking about risks and uncertainties. Moreover, it has been the aim of the case study to stimulate a process of understanding risk management not as a purely technical endeavour. It should be understood as a social process and social negotiations are the basis for the implementation of technical and economic disaster risk reduction measures. These measures can only be successfully implemented if they find acceptance in the MSP and the society.





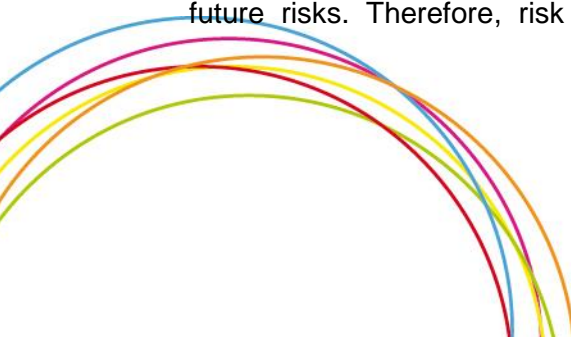
2 Testing the DRR solutions

Social negotiations provide the basis for successful implementation of technical and economic disaster risk reduction measures. Risk management and the implementation of disaster risk reduction (DRR) measures are long-lasting processes, which are changing their conditions and valuations over time. These kind of processes are mainly dependent on the acceptance of processes, measures and actions by persons or groups directly and indirectly affected by these measures and processes. Moreover, it is of major importance to listen to and include stakeholders (or societies) concerns and keep risk management processes flexible to adapt to changing or new conditions in the management process. Conducting a risk management process against the awareness of the society will often lack social acceptance and is thereby hampered in its successful implementation at the core. In other words, participation and societal support in risk management have to be understood as crucial for successful risk management processes. Participation of stakeholders play an important role and their commitment, goodwill, knowledge, experience and their resources will be required to successfully deal with and reduce risks (United Nations ISDR 2015). A risk management process is as much a learning process for stakeholders as for the decision-makers involved. Participatory processes allow time for stakeholders to communicate their perspectives to others as much as evaluate their perceptions with others in relation to empirical information, offered e.g. from science. Inclusion and evaluation of different perspectives create comprehensive, complementary and accepted grounding for risk management processes, and stakeholder participation essentially contributes to a successful practical implementation of risk management measures, policies and monitoring systems. This mutual learning process enhances awareness and acceptance of risk management measures and policies within the stakeholder community, since the decisions and actions taken by decision-makers or politicians become more transparent and comprehensible for the stakeholders.

2.1 Risk assessment as a basis to work on DRR measures

Within a participatory risk management process stakeholders are able to evaluate their perceptions with others in relation with empirical information. This process is central for the evaluation which risk the society is willing to take. With regard to the framework of the Integrative Risk Management approach (describe in detail in Gerkenmeier et al. 2015) this process is defined as risk assessment. Risk assessment is the process of identifying, describing and evaluating the form, intensity, likelihood, magnitude and impact of risks in a certain area. As such, assessing impacts of disastrous events like storm surges is a crucial step and provide a descriptive basis to evaluate DRR solutions with regard to their suitability, feasibility and effectiveness. Within the entire risk management process, risk assessment is the step where information is brought (in most cases with a policy objective) to consultation with stakeholders to evaluate and determine if it warrants an action.

In our understanding it is important to keep in mind that risk assessment not only involves the assessment of hazards or risks from a scientific point of view, but it also has to include societal experiences with hazardous events and their impacts on their life worlds. Information and experience are the basis for individual risk perception and influence the preparedness to take future risks. Therefore, risk assessment on storm surge risk in the WSR presented in





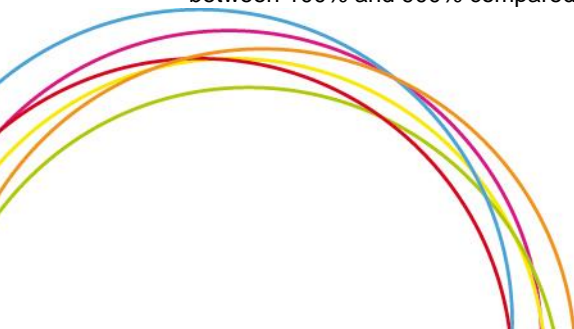
Gerkenmeier et al. 2015 highlighted that in the WSR risks can be more successfully assessed by a combination of quantitative and qualitative risk assessment approaches in order to arrive at an adequate integrated risk assessment. We combine three different perspectives to assess the impacts of risks to society. Causes and consequences of storm surges are assessed (i) with the help of climate scenarios, flood maps and (ii) a comprehensive state-of-the-art desktop study on storm surge damage modelling and (iii) by means of a perception study carried out through an online survey. A discussion of causes and consequences of multiple risks and their interlinkages with our stakeholders (iv) is supported by a bow-tie analysis (an IEC/ISO 31010 risk assessment technique) (for more detail see Gerkenmeier et al. 2015).

Integrative risk assessment activities have to include causes and consequences of storm surge risks and the interlinkages between these, as well as linkages with other risks in the WSR. The results of the risk assessment highlighted that management of the causes of storm surge risks is restricted by climatic and topographic boundaries. Existing coastal protection measures designed to deal with the causes work properly. To deal with the consequences of storm surges pose much greater challenges than to be confronted with the causes under current climate conditions and even more so in the future due to climate change. It follows that enhanced (storm surge) risk management in the WSR has to focus on the consequences of storm surges if society's capability of mitigating and successfully lowering these risks is to be improved.

Following this aim, quantitative risk assessments were conducted elsewhere by many different experts, since they help to analyse potential exposure to the physical effects of a hazard event or risk and to estimate the monetary vulnerability of the community when subjected to the physical effects of the event, taking into account the potential damage to goods, values and human life. These results support the government in setting priorities, in comparing and evaluating different measures and strategies and in deciding which kind of strategy should be implemented. However, modelling results differ largely based on different projections, specific boundary conditions, data sets and levels of detail defined in each project. In general, little research has been carried out at the national or transnational level, and damage estimates are of very limited significance and validity⁷. Under these circumstances, general transnational damage assessment remains rather vague⁸. With its broad range of values and vague quantification of annual losses this study underlines the general challenges in expressing losses at a large scale. Moreover, discussions with experts from science and the coastal protection authorities made clear that determining the consequences of flooding events is a highly sensitive, political issue, especially with regard to monetary values. Administrative coastal engineering staff has learned the hard way that published figures are a political issue and create disturbance in the affected population. Large scale assessment of storm surge

⁷ The majority of research focuses on the meso- and micro-scale level. A major challenge is an adequate process of damage estimation; often damages are estimated in different damage categories, each of which is related to certain estimations of values. Key aspects are the level of detail and the range of damages considered in the assessment of values, as these are essential for the level of detail of the estimated final risk – and in most cases call for a huge amount of data for each approach (see in detail Gerkenmeier et al. 2015).

⁸ An exemplary study by Schwerzmann & Mehlhorn (2009) highlights an increase of expected annual losses between 100% and 900% compared to today for all North Sea countries (Schwerzmann & Mehlhorn 2009).





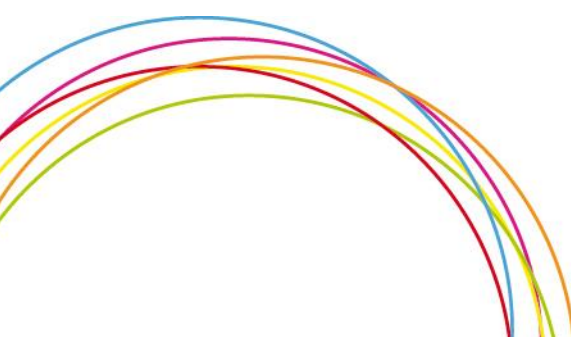
impacts and especially projection of monetary losses can cause discomfort among the people concerned and may have political implications.

Results of the qualitative assessment can merely support the essential negotiation process surrounding the risks to be taken by society. It becomes obvious that monetary assessment of storm surge damage does not often represent an appropriate way to determine starting points for new or enhanced DRR solutions. The highly sensitive nature of the topic, especially at a political level represents a critical barrier for open discussions and further development of economic DRR solutions based on economic triggers like the cost-benefit ratio.

Carrying out risk assessments as a collaborative and participatory process facilitates awareness rising in the WSR and underlines that risk management is not only a technical process but a social negotiation process. Stakeholder concerns with respect to the consequences of storm surges, their view on gaps in current storm surge risk management, as well as their estimates of their own active involvement in storm surge risk management set the scene for further negotiation of improved strategies and DRR measures.

2.2 Evaluation of DRR measures, based on stakeholders' perception and assessment

Following our understanding of an integrative risk management, we orient our work on DRR measures on stakeholders' assessment on potential DRR solutions. This evaluation is based on the discussions and findings from the three collaborative stakeholder workshops as much as it is based on stakeholder evaluations collected in a personalized online survey. We applied a personalized online stakeholder survey to explore stakeholder perceptions of risk and emergency management processes as well as psychological and social factors conditioning individual and community preparedness (for more detailed description on the methodical approach see González-Riancho et al. 2015). This concept was applied to investigate storm surge risk management along the German Wadden Sea coast, its perception and the resilience capacity of risk management personnel. The comprehensive set of stakeholder answers includes statements from stakeholders from private and public sectors. The assessment and evaluation following this survey-based concept allows us amongst other issues to identify stakeholders' risk perception beyond the representatives in the WSF and to identify their intention and capacities to prepare for risks. In addition, the approach allows the identification of preferences for DRR measures, benefits and limiting factors of these measures as well as potential new tools, especially economic tools, which could be helpful to foster storm surge risk management.



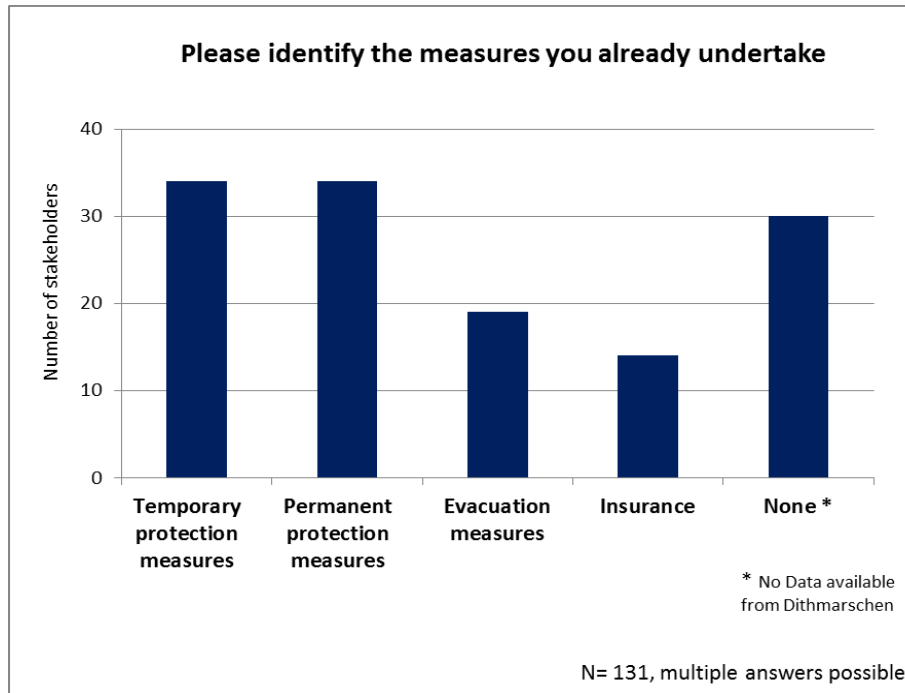
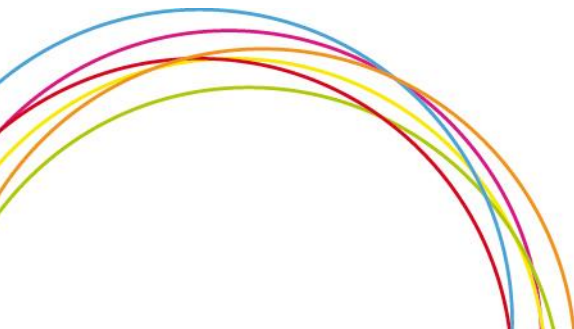


Figure 1 Measures in storm surge risk management undertaken by the stakeholders asked in the online survey

Currently, different DRR solutions with regard to storm surge risks are available. In general, these measures include temporary and permanent measures (which are in most cases constructive measures), evacuation measures (e.g. evacuation plans) and economic tools (e.g. insurances). Figure 1 gives a brief overview about the stakeholders' preferences for DRR measures along the German Wadden Sea coast. Permanent as much as temporary measures are equally often applied. Insurance, which is an essential economic instrument in DRR, is expensive and is therefore only a last option after doing nothing. The results presented in Figure 1 reflect the preferences within governmental storm surge management processes as much as stakeholders' preferences on an individual or sectoral level in storm surge risk management.

Stakeholders' main constraints to accomplish the different types of measures, including temporary and permanent measures, evacuation measures, and insurances, representing one of the major economic DRR tools, are shown in Figure 2. At this point, stakeholder's assessment made clear that major pressures result from time and cost constraints, lacking support from authorities to implement these measures is less a problem. Permanent measures that include most of all constructive prevention measures (dykes, barriers and sluices on a larger scale as much as protection measures on smaller scale such as protection measure on single buildings) are predominantly hampered by the huge financial sources that are needed to implement these measures.



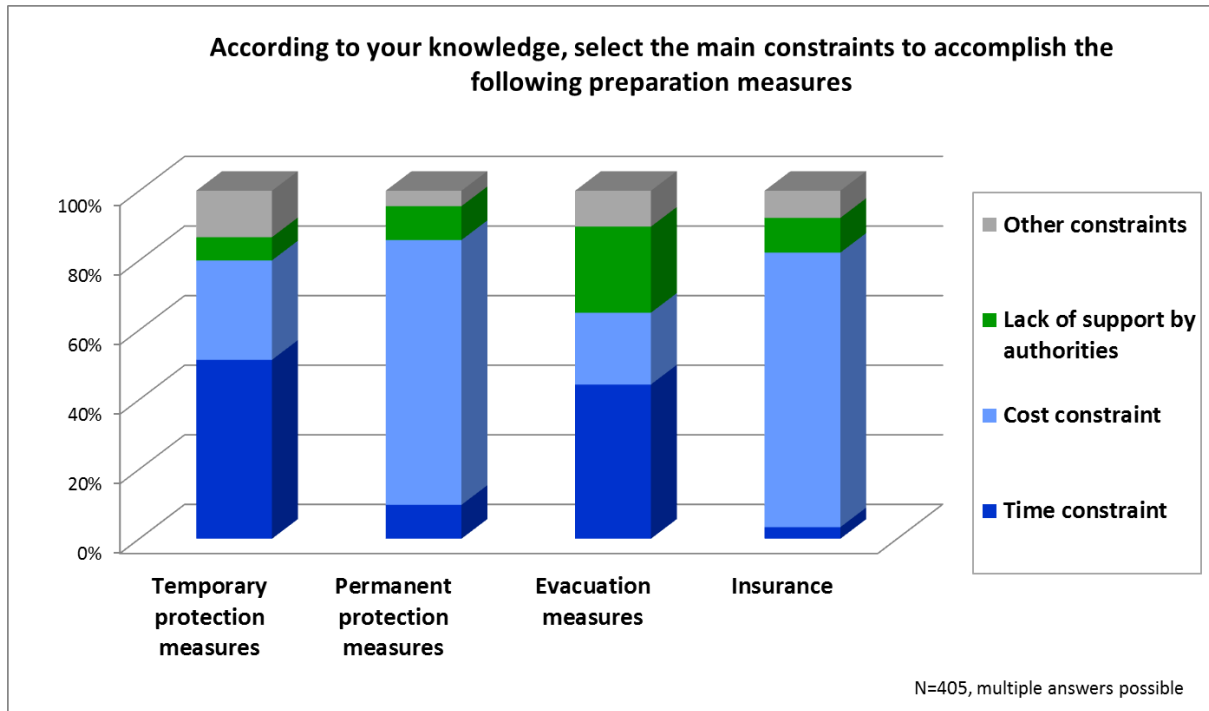
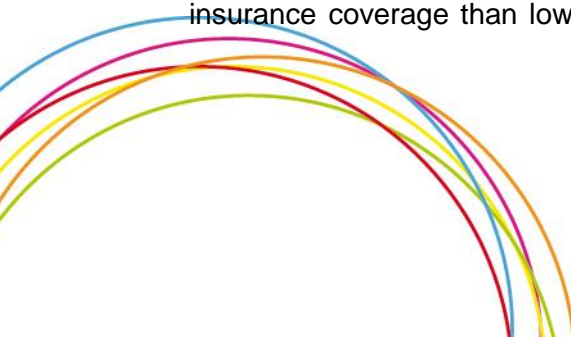


Figure 2 Stakeholders' main constraints to accomplish the measures applied in storm surge risk management (temporary and permanent measures, evacuation measures, insurances)

Even though cost constraints are hampering all of the measures given in Figure 2, cost constraints represent the most notable barrier for implementing insurances. Currently the availability of storm surge insurances along the German North Sea coast are limited to a small number of policies available only recently introduced. Stakeholder's assessment indicates a reluctant acceptance of insurances as an effective DRR solution in storm surge management.

2.2.1 Potential of insurances as DRR measure

In general, insurances can provide an opportunity to spread the risks and provide a way of dealing with damages in an economic context (European Commission 2013; Botzen & van den Berg 2008). However, insurance schemes barely exist for storm surge damages in the WSR. In the Netherlands, private flood insurance is generally not available, neither for storm surge damages nor for damages resulting from fresh flood events. In Denmark, a public storm surge scheme is the only way to cover damages from storm surges; a private insurance including these damages is not available. In Germany, storm surge damages were considered as natural hazard losses and have basically been excluded from the comprehensive insurance coverage and therefore generally have not been insurable. German insurance companies point out four main reasons for the long-lasting situation of non-insurability of storm surge damages in Germany. First, experts mention the effect of so-called "adverse selection" processes (Munich Re 2012). "Adverse selection occurs when high-risk individuals are more likely to demand insurance coverage than low-risk individuals. As a consequence, insurance companies will





suffer losses when premiums are based on the average probability of losses” (Botzen & van der Berg, 2008, p. 419). In this case the divergence between the interests of a potential insured and the insurance companies is too strong, and would lead to uneconomic insurance fees (Springer Gabler Verlag 2011). Second, the frequency of occurrence of storm surge events as well as inadequate data records provides an inadequate data basis for internal cost-calculations (Munich RE 2012). Third, the insurance companies worry about a regional cumulative risk. This term describes the risk of co-occurrence of several risks at the same time: namely the risk of damages from storm and floods. The fourth and most important argument focuses on the lack of influence of the insurance companies on the safety of dykes and other coastal facilities (Munich RE 2012). The level of safety of coastal protection measures is highly important for the determination of the insurance policy. However, the insurance companies have no influence on the construction of the coastal protection facilities which is of major importance for the level of safety. Therewith, the insurance companies are not willing to take responsibilities for the storm surge risks since they are not able to influence the protection measures in any manner (Kalenberg 1998, 31).

Despite these restrictions, there are signs indicating a recent shift in the German insurance sector. Since 2014, two insurance companies offer an optional storm surge insurance policy (*Itzehoer Versicherung* (Itzehoer Insurances)⁹ and *Internationale Assekuranz-Service GmbH* (Ias Bremen). In case of the Itzehoer Versicherungen, coverage of storm surge damages is only available as a combined insurance package for natural perils¹⁰, and solely within the most advanced out of three packages, premiums are bounded to a zoning approach that classifies areas with different susceptibility to damage (Itzehoer Versicherung, 2015). Except single cases, insurance coverage is available for the whole German North Sea coast (Kaspar, 2014). In contrast to the product of the Itzehoer Versicherungen, the insurance policy of the Ias Bremen is available as a single policy for individual, private insurance coverage of storm surge damages for private buildings and household goods. There is no obligation of a connection with the general insurance for natural perils (Ias Bremen 2014, 7). Similar conditions for both exist with regard to the amount of co-payment (Ias Bremen 2014). For both companies, no data with regard to demand, sales, and insurance density are available yet.

With regard to the availability of storm surge insurances, the situation for economic enterprises and agricultural businesses are comparable to private households. There is only one insurance company in Germany (the Carl Schröter international insurance service GmbH) who offers insurance policies for economic enterprises. With regard to the agricultural sector, actually no storm surge insurance policy is available on the German insurance market (according to personal information from the Chamber of Agriculture in Schleswig-Holstein).

This current situation on the Germany market shows that insurance schemes are no options for DRR against storm surge damages in the Wadden Sea. The individual level as well as the sectoral/business level lack of attractive offers on the insurance market. Novelty,

⁹ This development was reached in cooperation with Aon Benfield. Aon Benfield, in collaboration with the German Insurance Association e.V., developed a model to simulate storm surge scenarios along the German North Sea coast and permits a calculation of the damage potentials along the coast line (Aon Benfield, 2015)

¹⁰ damages from natural hazards, including damages from lightning, hail, storms and floods





uncommonness as well as exorbitant prices of insurance premiums create essential hurdles to stimulate insurance schemes as commercially viable and suitable for the market.

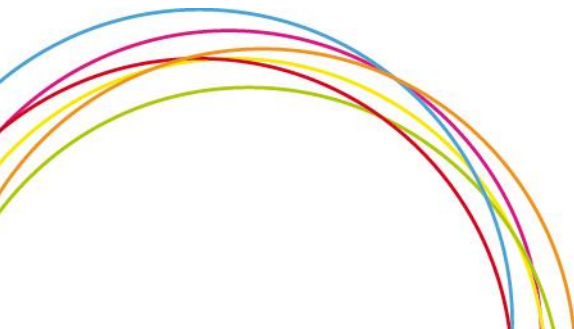
Based on these conditions the stakeholders' assessment displayed in Figure 3 (showing stakeholders' expectations about further economic measures in storm surge risk management) clearly indicates a refusal of insurances as an effective DRR solution in storm surge management. Moreover, the current risk situation demonstrates that risk perception is decisive (storm surges are a risk but we are safe behind the dikes) and trust in the constructive coastal protection facilities is a barrier for improved economic instruments on an individual as much as on a sectoral level.

2.2.2 Potential of economic instruments – beyond insurances – as DRR measure in the trilateral Wadden Sea Region

Insurances schemes are not an adequate option for DRR against storm surge damages in the WSR. Nevertheless, the analysis conducted so far made clear that improvement with regard to private as well as public storm surge management measures are necessary. This improvement has to be driven by the need of increased personal initiative as much as by the need of more participatory and collaborative processes. Improved measures to reduce the disaster risks, economic instruments have been discussed in the risk management community for some time. The effectiveness of these instruments in mitigating risks is frequently debated in the policy and science spheres, yet the evidence base on their effectiveness remains limited. Existing conceptual and numerical analyses (Agrawala & Fankhauser, 2008; Kunreuther & Michel-Kerjan, 2009; Aakre et al., 2010) suggest that risk transfer could play an important role in risk reduction by incentivising specific measures (Ward et al., 2008; Herweijer et al., 2009; Maynard & Ranger, 2011). Economic instruments are applicable at the individual level (e.g. insurances) as much as on the regional and national level (e.g. disaster relief funds). Different economic instruments could be implemented in different phases of the risk management cycle namely the prevention, response, and recovery phase.

In the online survey at the German Wadden Sea, the stakeholders were asked to specifically evaluate the potential for economic instruments to enhance storm surge management.

Figure 3 displays stakeholders' expectations about the adequacy of potential (increased) future economic measures in storm surge risk management.



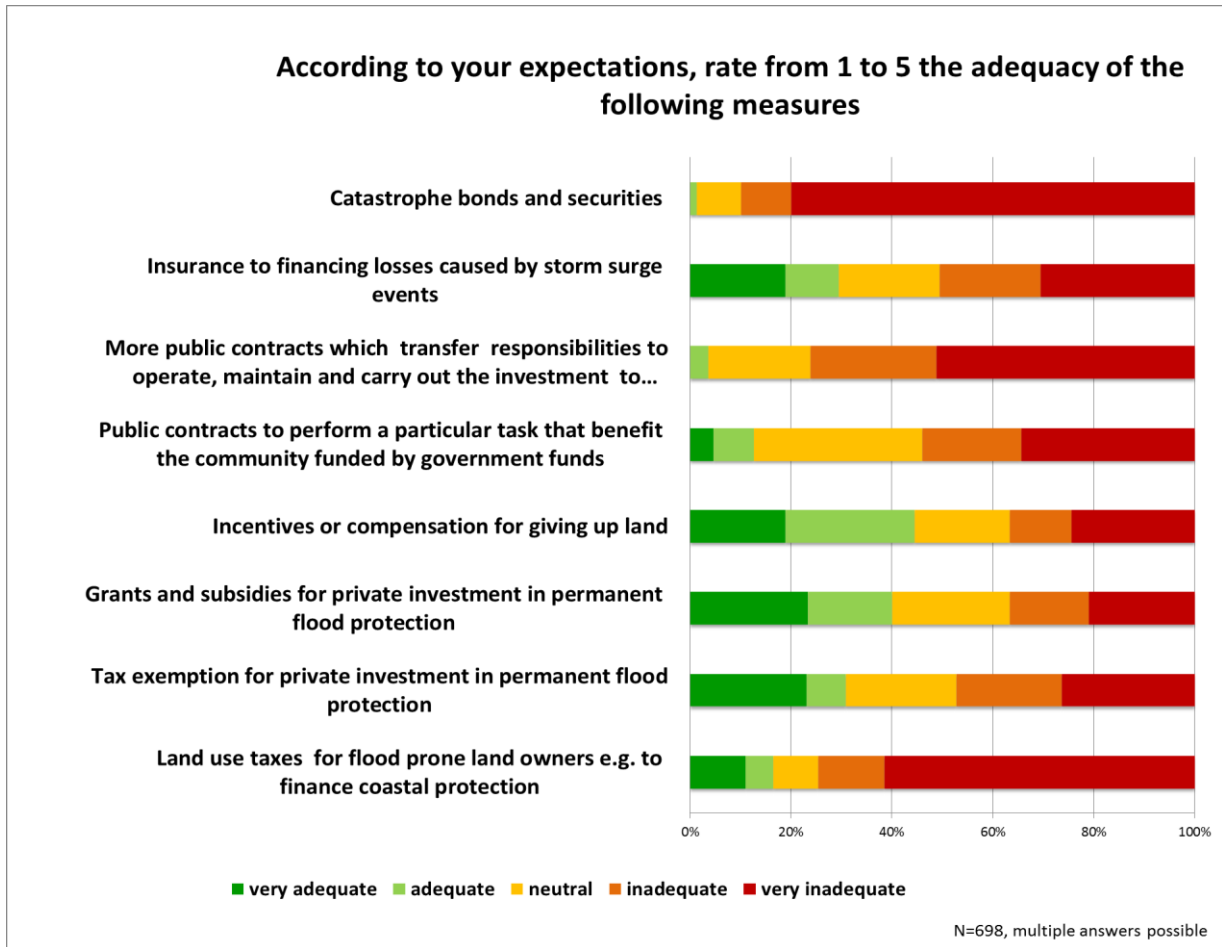
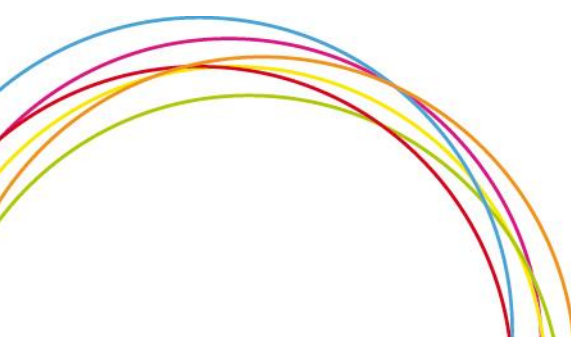


Figure 3 Stakeholders' expectations towards potential economic measures in storm surge risk management; most of these measures are potential measures that are currently not existent

The list of economic instruments given in Figure 3 includes private as much as state-supported economic instruments. None of these economic instruments is perceived by the stakeholders, addressed by the online survey, to be significantly adequate to handle storm surge risks along the German North Sea coast. Beside the fact that the majority estimates the adequacy of insurances as neutral and low, most of the economic instruments offered are estimated to be less adequate. Particularly rejected are measures like catastrophe bonds and securities as well as the potential economic tool of land use taxes for flood prone land owners. Incentives or compensation for giving up land and grants or subsidies for private investments in permanent flood protection are partly approved as adequate by approximately 40 percent of the stakeholders.

In addition to the given options (see Figure 3), especially on the regional and national level, disaster relief funds represent a potential short-term economic DRR solution; implied shortly after the event in the recovery phase. In Denmark, a disaster relief fund has been implemented by the Danish government, called *stormflodsordningen*. This scheme covers damages and





losses resulting from storm surges in the mid-1990¹¹. It is financed by a yearly fee that is included in the fire insurance policy (Nordic Insurance Association 2013). In the Netherlands, no specific disaster funds for storm surge damages are available. The situation in Germany is comparable to the situation in the Netherlands: no state-supported disaster relief fund is available. Enquiries to the finance departments of Lower Saxony, Schleswig-Holstein and Hamburg and to the federal ministry of the interior proved that no structural bases for long-term funds with regard to storm surge damages are available. According to the statements of the finance departments, financial aid and disaster relief funds are put in place on demand. At this point, disaster relief funds as much as other economic instruments are obviously hampered by the fact that currently no reference cases are available, since no severe storm surge events with substantial damages occurred during the last decades.

The analysis of the stakeholder's opinions showed that economic instruments, spreading the costs of storm surge risks (e.g. insurances) and compensating costs of storm surge risks resulting from low frequency-high impact events (e.g. disaster relief funds), are hampered in the WSR. This situation is in most cases closely linked to the lack of adequate offers by the insurance companies (see above) and the fact that extensive trust in the governmental-financed and governmental-managed coastal protection facilities blocks additional DRR measures. There seems to be no demand for other DRR measures than the existing ones (see in Figure 3 and a more detailed analysis the stakeholder survey presented for the district of Dithmarschen in González-Riancho et al. 2015).

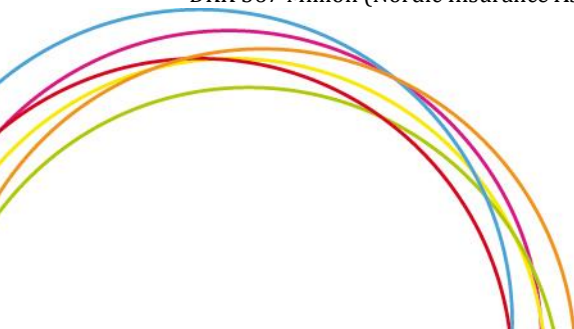
In conclusion, different rationales and concerns of various institutions, sectors and the public in successful risk assessment and evaluation of DRR solutions in the WSR are of major importance. The results of the survey showed rejection of most of the economic instruments by the stakeholders themselves. Acting against stakeholders' perceptions and acceptance of different measures and strategies, however, will consequently fail. Due to the fact, that risk management processes are long-lasting processes, which are changing the conditions and valuations over time, these kind of processes are mainly depending on the acceptance of processes, measures and actions by persons or groups directly and indirectly affected by these measures and processes. It is of major importance to include stakeholders (or societies) concerns and keep risk management processes flexible to adapt to changed or new conditions in the management process.

2.3 MSP as DRR solution in the WSR

Addressing the negligence of societal risk perception for the development of DRR solutions as well as to overcome the existing lock-in situation, improved activities on awareness raising, information and knowledge exchange as well as communication are essential actions for an improved trilateral risk management.

Experiences resulting from the cooperation with the WSF disclosed that the WSF, as an established organisation in the WSR, has the potential to support the improvement of these

¹¹ Since October 2012 the storm surge scheme has covered a total amount of storm surge damages of € 76 Million / DKK 567 Million (Nordic Insurance Association 2013)





activities. In case of the WSR the MSP is not only seen as a discussion forum for economic, built structures or early warning risk reduction solutions. Moreover, the MSP itself has to be seen as the important, structural disaster risk reduction tool, since the MSP performed a specific task that has not been adequately considered in risk management of the WSR until today. As already shown in other issues, the WSR can act as a structural unit in risk management processes. The MSP facilitates discussions and social negotiations processes as the basis for the acceptance and successful implementation of risk management measures. Moreover, as already shown in other issues the MSP is able to contribute even beyond its capabilities to enhance communication and discussions and develop tools¹² and provide strategies¹³ for enhanced risk management processes.

Assessing the current situation in the WSR and the potential for new or improved DRR solutions (presented in detail in Gerkensmeier et al. 2015), we detected a lack of understanding of the potentials for trilateral cooperation. As an MSP, the WSR represent an established structure on the trilateral level in the WSR. With regard to risk management, the WSR introduced its competencies into a new area of responsibility, since the forum focussed in the past on sustainable development solutions for the socio-economic development of the WSR. The WSR might assume a new coordination role in the discussion on risk management in the transnational, multi-risk area of the WSR. A major contribution of the MSP in this situation will be an increased risk communication beyond the limits of technical measures of storm surge management, acting as an information and communication platform. Although, not being equipped with decision making power, the contribution of the cross-sectoral, transnational WSR can facilitate an improved and integrated perspective on risks. Furthermore, the integrative perspective can be broadened across national boundaries – but only if there is a comprehensive understanding that risk management is a societal process which demands more than technical solutions but also a social and a political process.

The integrative risk management approach (IRMA) considers risk perception and risk awareness as equally important as the classic elements of risk management, commonly understood as risk analysis, risk assessment, development of strategies and measures, and monitoring. Successful risk management includes all six elements as interconnected elements. All of these steps of risk management take place within a specific societal frame with constantly changing and uncertain conditions; these in turn influence management processes. Accounting for these aspects requires collaboration between the public and governmental/administrative institutions, as well as participation and societal support from stakeholders and the public at large (for more detailed explanation see Gerkensmeier et al. 2015). The MSP as a communicator, multiplier and institution to raise awareness plays an important role in most of the six elements of IRMA. Each element (risk perception, risk awareness, risk analysis, risk assessment, development of strategies and measures, and

¹² For example the WSR developed a planning portal in order to visualize different spatial uses as much as to support stakeholders and decision-makers in coastal planning processes

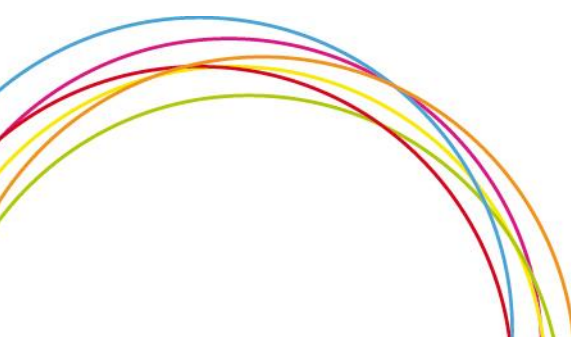
¹³ The WSR developed an ICZM strategy (Wadden Sea Forum 2013) and a shipping safety concept (unpublished) based on the identified necessity by the communal administration members of the Forum. However, for example the shipping safety concept still lacks of acknowledgment and implementation by the governing bodies.





monitoring) is facilitated by the MSP regarding the integration of different sectoral and societal interests and enhanced stakeholder participation, with special attention to stakeholder's perspectives, values and concerns.

The MSP in the WSR will be able to make a significant contribution to an increased communication and enhanced integration of stakeholders and society's risk perception in transnational risk management in the WSR. These improvements could pave the way for additional DRR solutions. Resulting from this it becomes clear that the MSP itself has to be understood as one of the most important disaster risk reduction (DRR) solutions that are needed in the WSR for the moment and the near future. With regard to the WSR the MSP (the WSF) represents a new governance arrangement on the trilateral level in risk management processes. Besides economic DRR solutions, better communication and the enhanced integration of stakeholders and society's risk perception are currently the most required improvements to establish a sound and acceptable transnational risk management in the WSR.





3 Stress-testing the MSP

Enhanced risk awareness and structured risk analyses are the basis for being prepared to play an active role in risk management processes. In order to identify and further test the MSP's ability to operate under critical conditions we applied a structuring tool (chapter 3.1) and used a participatory scenario approach (chapter 3.2). The scenarios together with the antecedent risk structuring exercise with the bow-tie tool helped to assess the capability of the MSPs and further discuss and negotiate the WSF's role, capacity and limits as MSP. These in-depth findings are essential to aim at an improvement of the MSP in the WSR as well as to assess the effects of new policies and measures.

3.1 Bow-tie analysis: a tool for structured discussions

Dealing with the multi-risk situation in the WSR implies a major challenge for the WSF. Against this background, causes and consequences of perceived risks need to be assessed for the WSR, keeping in mind that risk management in the WSR has to consider and negotiate different perspectives from different sectors and across the different countries. In order to enhance an understanding of this complexity, we introduced the bow-tie analysis as a structural tool to the stakeholder forum. The bow-tie analysis is a commonly used risk assessment method¹⁴ of the International Organization for Standardization IEC/ISO 31010 risk assessment techniques that is used to analyse cause and effect pathways of risk and enables the users to develop a common, sound understanding about the question what is a risk, what are its causes and what are the consequences to be faced. The bow-tie analysis facilitates the identification and analysis of the system of management controls which is necessary to adapt to the causes and to mitigate the consequences. As such, the bow-tie analysis is one of the risk assessment techniques listed by the International Organization for Standardization (ISO). The bow-tie analysis offers the possibility to integrate multiple causes as much as multiple consequences to one central element. In addition, within this international standard for risk Management the bow-tie analysis is highlighted as one of two tools (out of more than 30 risk assessment tools), which is able to assess a given system of management control (IEC/ISO 2009).

These characteristics meet our needs and claims for an enhanced participatory risk assessment in the multi-risk area of the WSR. Since the method offers the potential to assess the current system of management control in place (including policies, measures and strategies to adapt to the causes and mitigate the consequences), this method serves, beyond a descriptive risk assessment tool, as a tool to bring these risk assessment information in consultation with stakeholders, to evaluate it and to determine if it warrants an action. We used the bow-tie analysis to assess causes and consequences of perceived risks based on the results of the first workshop with WSF members. The bow-tie analysis was used to identify the risks identified in the WSR. As a result, the (perceived) causes for the different risks and the related (perceived) consequences and impacts that result from these threats could be distinguished. The result showed a spread over a multitude of different scales including

¹⁴ For more detailed description of the background and development of the bow-tie analysis in risk management see Gerkenmeier et al. 2015, chapter 2.



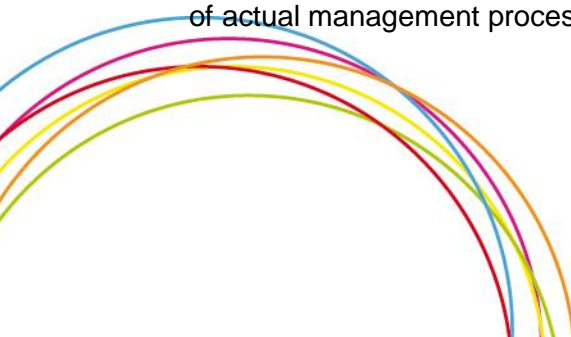


different sectors, and different spatial resolutions were identified. Impacts and damages affect social, physical and economic structures in comparable ways. Three major risk complexes were addressed: a) demographic change, b) environmental change and c) imbalanced development. The Bow-tie analysis also emphasized the interconnectedness of the different risks. Feedback as well as cascading effects between the thematic clusters can influence the performance of the others (detailed analysis about the discussion processes and results of the bow-tie analysis in Gerkenmeier et al. 2015).

The results of the collaborative work with the stakeholders on the bow-tie diagrams with regard to risks from climate change, including the risks of storm surges, the bow-tie analysis highlights the fact, that measures dealing with the causes are limited. Therefore, major challenges arise from mitigating the impacts and consequences on climate change – asking how to deal with the range of consequences and impacts resulting from the risks of climate change. It becomes obvious, that action and improvement is needed with regard to the question how to manage the consequences and it was highlighted where improvement in risk management could be fostered by the MSP. The bow-tie "demographic change" highlighted the fact, that especially with regard to changes in the societal structure and composition, causes for these situations lie in social processes. The analysis presented here underlines the need to include social processes in an integrative risk management approach.

The bow-tie approach facilitated the discussions in the stakeholder groups about responsibilities in risk management with a trilateral perspective. It became clear that in many cases risks are dealt with on different levels of responsibility. In addition, different administrative structures in the three Wadden Sea countries lead to different allocation of responsibilities for each country. But these differences in administrative structures are not seen as a major problem. Mainly lack of communication between different actors on different level and from different sectors hampers the development of a successful risk management. In consequence, the question emerged which role the trilateral level could play in any future risk management. In general, there are clear signs that multi-stakeholder involvement could be beneficial for dealing with risks and uncertainties in the WSR. The discussion, supported by the bow-tie approach, showed that there is support from the WSF for strengthening the trilateral level in risk management in the WSR. The results of the second workshop highlighted that communication and commitment on the trilateral level could trigger an exchange of experience and get people together to discuss common problems, risks and uncertainties that arise in all three countries. The feedback from the participants of the WSF made clear, that the bow-tie analysis supports a significant rethinking of the characteristics of risk management processes.

The interactive use of the bow-tie analysis in collaboration with the stakeholder of the WSF is a good a practicable addition to existing DRR solution with regard to enhanced communication. The bow-tie diagram is an iterative tool to continuously facilitate a state-of-the-art overview on risk management in the WSR and is a tool to reflect on and discuss existing measures and strategies as well as current needs in risk management. The tool enhances the stakeholders understanding of risk to identify responsibilities in risk management processes, including potential tasks for the trilateral stakeholder forum. The bow-tie approach provides, in addition to its contribution to risk structuring, a solid tool for identifying gaps and areas in need of improvement, as well as a tool providing feedback with regard to performance and efficiency of actual management processes and measures.





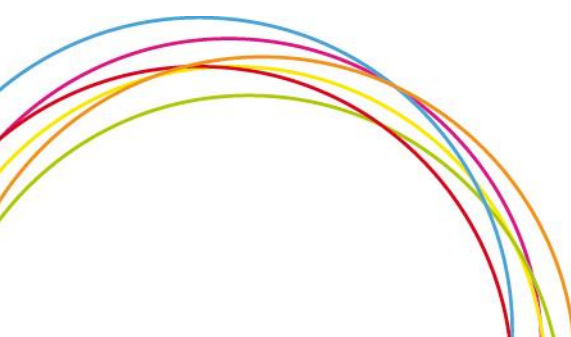
3.2 Qualitative scenarios: testing the capability of the MSP to deal with its new role

Scenarios development is one way of dealing with future development and anticipating possible outcomes of actual discussions. Qualitative scenarios provide a (negotiated) future vision about a certain area or sector. Qualitative scenarios are visionary narratives of future development based on experiences, regional cultural frames and a visionary dialogue process as defined by Possekkel (1999). These scenarios address mainly the negotiating process to create a common future vision about a certain area or sector. They are visionary, narratives of future visions and mostly founded on stakeholders' and / or publics' risk awareness and perceptions.

In our case, the scenarios are founded on stakeholders' perceptions. Therewith, the scenarios are based on expert judgements from the different sectors from all three Wadden Sea countries. With the negotiation process as a major element, narrative scenarios reflect the societal frame where feelings, concerns and interests set the scene for successful future development in resource management, planning or integrative risk management. For ENHANCE and the case study 3 this type of scenarios are crucial since these scenarios are deeply rooted in the understanding of risks as mental constructs which differ between individuals as well as institutions or sectors. Results from visionary, narrative visions can help to understand the culture of risk existing in the WSR.

Within this qualitative future scenario approach the MSP (based on the Future Search Method) was able to test its capacity to handle these situations within its scope as a voluntary, advisory stakeholder forum. Based on this stress-test for the MSP, the role, task as much as the limits of the MSP were elaborated.

In a third stakeholder workshop three different extreme risk scenarios, related to the risk prioritisation given by the stakeholders, were developed and discussed within small stakeholder-groups. The following visionary future risk situations were addressed: a) a very low pressure system heading towards the WSR; b) the closure of grocery shops in peripheries cause special problems of provision especially for the rural WSR; c) an oil tanker crashes in an Offshore Windfarm and leaked. Each working group received a small set of information that was used to set the scene. Based on this information the working groups were asked to look ahead to the year 2030 and describe the anticipated threat and the impacts of the crisis for the society and the region. Each working group consisted of members from different countries and different sectors. Therewith, experiences and knowledge from the different countries and expert judgement from different levels were included in the development process of the scenarios. Based on these extended future vision scenarios, discussions were requested to focus on how to handle gaps in management, how to strengthen already existing management strategies and measures, and how to define roles and responsibilities for these actions. The elaborated scenarios and respective future management needs, including the role of the WSF are briefly summarized here.





3.2.1 Scenario a) A very low pressure system heading towards the WSR

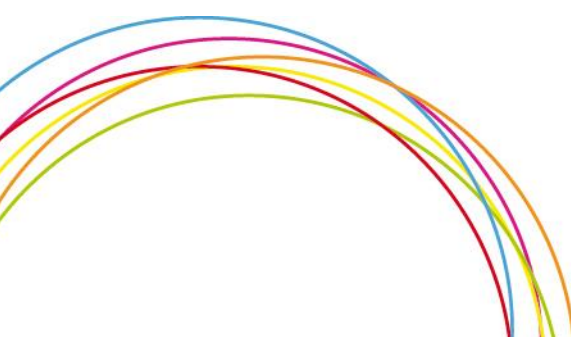
Based on the given pre-setting that a major storm sweeps across the Wadden Sea Area in November 2030 and caused severe damage to different sections of the WSR, the group developed the extended future risk scenario. The working group elaborated the scenario by the assumption that the coastal defence system remained in function and is considered still appropriate. However, the turbulences cause major damages in the region especially on the infrastructure. This development leads, amongst others to disturbance of the region's energy supply for days.

Based on this scenario the working group anticipated the following impacts in 2030: In 2030 changes in energy supply are able to dilute the impacts of the storm. The increase of individual energy supply and storage widely prevents outages in private households, but transport and mobility have suffered due to the storm. Individual mobility is reduced for several days and the limited road access handicaps emergency operations during the peak of the storm. Nevertheless, the overall damage can be remedied and no lives are lost. Storm surge management is not identified as essentially different to today's situation. Coastal defence systems in the WSR are designed to ensure safety against very high storm surges in 2030. However, preparation for severe weather situation need more coordinated spatial planning.

Based on this scenario description, stakeholder discussion focused on enhanced strategies and measures to handle this future situation. In the future there is potential need of a trilateral approach to coastal risk management and coordinated spatial planning. In such a situation the WSF can contribute by fostering awareness and coordinating trilateral approaches. With regard to the current situation in 2015 the stakeholder group highlighted the need to advertise and improve the already available WSF's planning portal tool in order to be also useful in the future. The currently applied contingency plans are working well and there is no need for improvement. The anticipated decentralized energy supply in 2030 might cause problems for industries which will call for a joined dedication and engagement in the field of energy supply. The WSF's energy working group might contribute, but a clear role for the WSF has not been detected, yet. The stakeholder group suggested that initiating discussions about the responsibility for infrastructure, infrastructure emergencies and joined energy grid might be a future task of the WSF.

3.2.2 Scenario b) numerous closure of grocery shops in peripheries in the WSR

Increased closure of grocery shops in peripheries in the WSR in 2030 cause special problems of provision especially for the rural WSR. Based on this information the group developed the extended future risk scenario: The elaborated scenario of the working group highlights major developments in society, particularly in terms of supply and communication in 2030. These developments transform peoples' way of living in the rural areas along the Wadden Sea coast. Retail shops and other facilities have been closed and replaced with multi-functional spaces that combine the changing needs of society and overcome the obstacles of decreasing infrastructure in rural areas. The community integrates the individual, thus increasing individual responsibility and sharing. New technologies support the interconnection between villages' inhabitants and facilitate gatherings, contributing to the development of a new way of living.





This scenario clearly highlights, that societal changes and the need to think differently have created new possibilities in the WSR.

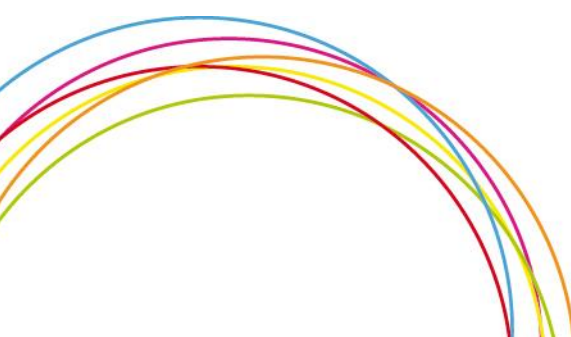
Based on this scenario, the working group discussed strategies and measures that could be proposed and fostered by the WSF in order to contribute the deal with this future risk situation: The stakeholder group made it clear, that most of the desirable changes, as assumed in the scenario have to be done by ourselves - meaning by the WSF as much as by each of the participants. Facing this aim, the WSF could find its role as ambassador and promote role models. Defining a common goal and understanding itself as a common best practices project, could be a major task for the WSF. Supporting and promoting best practice examples, as well as communicating these to the public could enhance public discussions.

3.2.3 Scenario c) An oil tanker crashes in an Offshore Windfarm and leaked

In 2030 an oil tanker on its way from Rotterdam to Hamburg harbour crashes in an offshore wind farm and loses great amounts of oil.

Based on this setting, the working group further elaborated this scenario, assuming that the oil spill causes severe consequences for all three countries in the WSR. The oil pollution affected animals and plants both off-shore and on-shore and will be still recognizable even two years after the crash. In addition, the cleaning of the coast causes huge financial losses. The oil pollution also affects main economic sectors of the Wadden Sea Area, including the shipping sector, the fishing sector as well as the energy sector, since the crash also has a direct, albeit not quite as serious, impact in the energy sector itself. Due to the accident, the connecting cable is damaged and electricity supply is been hampered for several days. The tourism sector begins to dwindle as the region suffers from the strong and long-lasting pollution of the World Heritage Site. The disaster impacts not only on the economic but also the political sphere. The incompetence of responsible politicians has political consequences, with some voices even demanding re-elections.

Based on this scenario description, the stakeholder group discussion focused on enhanced strategies and measures to handle this future situation. The stakeholders made it clear that such a future risk situation needs enhanced management strategies and an integrated trilateral approach. Preventing ships from taking dangerous routes requires trilateral, mandatory shipping routes. Whereas shipping safety in the WSR has been addressed already in many fora, the resulting available recommendations need implementation and application in these days to provide a solid basis for future risk management activities in the WSR. With regard to this management need, the WSF and the Wadden Sea Board should cooperate and promote the implementation of adequate safety measures. Windfarm installations based on harmonized rules and laws on a trilateral level would be a supportive action. At this point the already existing planning portal tool as well as the already existing shipping safety management strategy of the WSF should be promoted. In addition, reinforcement of the WSF working group shipping could create structural links between the discussions in the shipping sector and other interest groups.





3.3 Negotiating the role of the MSP

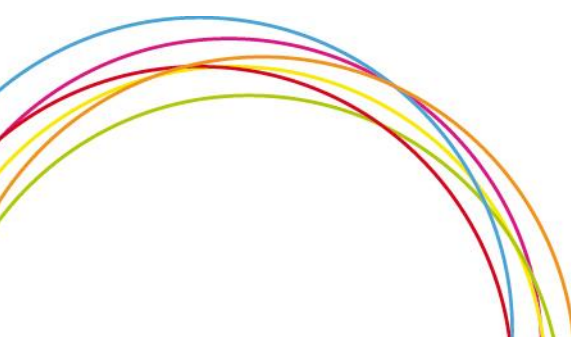
Testing the MSPs capabilities in three different extreme risks situation provided the basis to discuss and negotiate the role of the MSP in risk management. The reflexion on the role of the WSF and its potential areas of responsibilities was essential to strengthen the commitment of the stakeholder community in the WSF to adapt the new tasks in risk management. The scenario exercise demonstrated that the WSF is able to picture them in a decisive role in transnational risk management.

Defining the role of the MSP needs as well a discussion about limits and barriers for the MSP and its role in transnational risk management. A major barrier for the WSF is given by the lack of legally binding power (which excludes the possibility to establish measures or binding agreements). The WSF is based on voluntary participation and provides an opportunity for stakeholders and actors to present their interests and support decision-making processes. However, the WSF could improve the function as a consultant body regarding the development of advice for European and national governmental authorities.

These precondition discussions with the stakeholders highlighted the major role of the MSP in the field of communication and exchange of experiences, as well as improved cross-sectoral sensitization of stakeholders towards different coastal risks. Within the stakeholder forum itself a clear definition and common understanding by all participants of the Forum about their role as an MSP heavily influenced the effectiveness of the work of the MSP. A clear common understanding and commitment of all members about the role and tasks of the MSP is an essential basis to speak with one clear voice. The latter is essential on the way of the WSF to improve its political weight and visibility on the trilateral political level.

Collective reflection on the current status of the WSF as well as the discussion along the qualitative future scenarios underlines the need for the WSF to become more visible in the context of risk management processes in the WSR. In order to reach the aim to play a key role in these processes on the trilateral level, communication of the WSF's aims, tasks and position to the public is essential and has to be strengthened. The WSF sees its strengths in its role as a bridging organization that facilitates communication, cooperation and awareness-raising among stakeholders and sectors from all three countries in the WSR. Moreover, the WSF plenary sees their role as ambassador to communicate and highlight best practice examples in risk management in the WSR.

Since the qualitative scenarios and the future search method leaves enough room for discussions, more detailed examination of these tasks were possible and highly valuable. Reaching these aims and strengthening the position of the WSF in trilateral risk management could only be reached if all members of the forum enhance their active contributions within the WSF and its working groups. Increased engagement and commitment of each stakeholder is a necessity. Therefore, the first steps might include more use of out of the network capacities of the WSF which is already given by the fact that each (key) stakeholder participating in the Forum, has its own network that he or she could increasingly use to start or enhance discussions on burning topics and issues, detected by the WSF. Moreover, strengthening the role of the MSP in risk management require an increased cooperation and exchange with other





institutions especially with regard to close related institutions (e.g. the Wadden Sea Board¹⁵ in order to join forces for example to implement existing rules and strategies. In addition, existing products of the WSF and reinforcing specific working groups within the WSF were requested to be essential.

Both tools the bow-tie analysis and the qualitative future scenarios have demonstrated to be of essential assistance since they support an enhanced risk structuring process and improved reflection on the new role of the WSF. The ENHANCE project was able to be of constructive support in this respect stimulating a process of self-determination and restructuring the objectives of the WSF. Risk management understood as a societal process can be supported and improved by a newly oriented WSF. But the WSF must grow into its new role in the field of risk management.

¹⁵ The Wadden Sea Board supervises the performance of the Common Wadden Sea Secretariat (CWSS) that was established in 1987 and is located in Wilhelmshaven, Germany.



4 Findings for a successful cross-border MSP

The testing of the MSP made clear that the WSF must grow into its new role in the field of risk management. In this respect we would like to address potential improvements of the MSPs in order to strengthen its capacity to deal with the new tasks as an MSP in trilateral risk management. We will start to discuss improving the specific MSP Wadden Sea Forum, followed by a transfer of lessons learned from the WSR case study to a meta level, and finally discussing benefits and barriers for performing MSPs in risk management in a wider context.

4.1 Improving the trilateral MSP in the Wadden Sea Region

Performing the different steps of risk management in close collaboration with the stakeholders of the WSF underpinned the **significance of risk awareness and risk structuring** as the bottom line for the preparedness of getting active and involved in risk management. The successful application of the WSF as transnational MSP has to consider the basic principles describes above. Throughout the work with the WSF, the Forum's strengths as much as it's limiting conditions have been analysed, not only due to the organisational structure but also with regard to the capacity to deal with a newly introduced, multifaceted topic, which risk management is. Regarding its current organisational structure, the WSF is characterised by a **comprehensive representation** of stakeholders from all three countries as much as from the public and private sectors on local, regional and national level. The current composition of the WSF seems to be successful and comprehensive; there is actually no urgent or essential need for increased personal capacities.

As a voluntary approach, advice-giving stakeholder forum in the WSR, the WSF is highly dependent on the **personal engagement and commitment** of each participant. The collaborative actions of the stakeholders could be very beneficial for the political level and their decision makers. The stakeholders and representatives of the society address topical issues, express acceptance and concerns as much as deliver profound advice with regard to management processes. This is where close collaborative activities enable stakeholders to formulate policy advice outside the traditional scientific and traditional cadre. Furthermore, the MSP can function as bridging body using their network and contacts for communication and acceptance of necessary decision in risk management. The work within ENHANCE made clear that the stakeholders of the forum are **open towards new issues**, are willing to discuss and reflect ongoing processes and are able to react on changing conditions. In order to continuously improve the stakeholders' commitment, the WSF recently convened a workshop to strengthen and reinforce the stakeholders' responsibility for such an improved scope of actions. In order to provide a sound basis for dealing with new emerging issues like risk management, it is of major importance to provide appropriate **structural and financial support**. At this point, improvement is needed with regard to the WSF. Without secured long-term structural and financial support, the success of the WSF's work is at risk. There is, nevertheless, visionary potential and engagement in the WSF. But this engagement has to be supported and underpinned in order to sustain a broad commitment and to achieve a win-win situation for the voluntary stakeholder organization and the normative political level. However, the analysis of the current level of activity and responsibility makes it clear that all parties involved do not make the maximum use of this win-win situation for the time being. The WSF



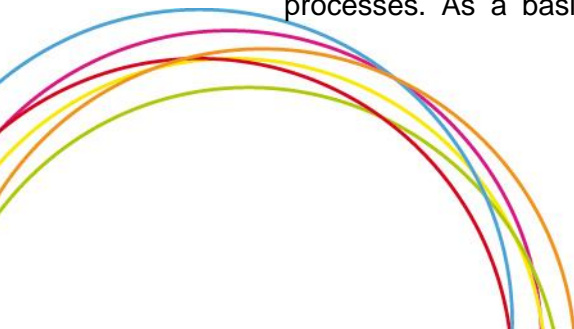
does not use the potentials and its **political weight** in current debates. In order to improve this, the WSF has to **become more visible and need to be heard** at the political level in the WSR. On the other hand, the political level widely ignores the advantage of close cooperation with and financially supporting the WSF to reach acceptance for decisions and management measures.

Improving the WSF's visibility and make its voice better heard is a long-lasting process. The role of the WSF in the field of risk management was established during the last 3 years with the support of the ENHANCE project – but improving structural and financial support as much as enhancing the WSF's integration in decision-making processes in the WSR will take much longer. The development of the WSF underlines its flexibility to adapt their agenda to the pressing challenges of the WSR, which should, nevertheless, be accompanied by a constant process of self-reflection. This however will reach beyond the scope of the ENHANCE project.

4.2 General recommendations

Fostering disaster risk governance is of major importance in order to improve risk management of natural hazard events. Following the Sendai Framework for Action, this challenge of improvement includes the demand that “there has to be a broader and a more people-centred preventive approach to disaster risk. Disaster risk reduction practices need to be multi-hazard and multisectoral, inclusive and accessible in order to be efficient and effective” (United Nations ISDR 2015, 10). MSPs, as discussed within ENHANCE, represent multifaceted opportunities to deal with the challenges of disaster risk governance and are suitable to a wide range of different situations in natural hazard risk management. Based on our experiences with the WSF, we are able to extract general recommendations on how an MSP could contribute to improved risk management processes. These recommendations address risk management processes in a multi-risk area, on a cross-border scale. In this context an inclusive and integrated perspective is essential and depends on a shared understanding of risk management as a societal process requiring more than technical solutions. Following this understanding of risk management as a societal process, recommendations given here will focus on the role of an advice-giving, independent stakeholder forum. An advice-giving MSP, established to support environmental management across national and regional boundaries, can take on a decisive role in transnational risk management.

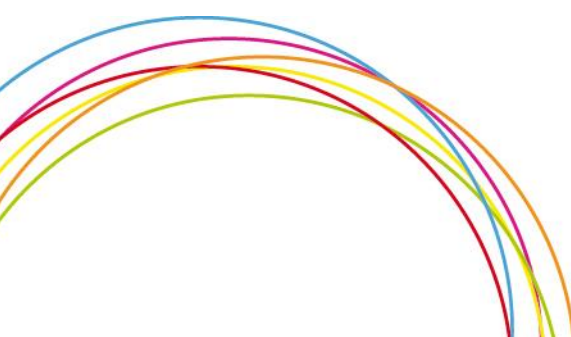
- Even without decision-making power, an advice-giving MSP can play its role and can constructively and decisively contribute to an inclusive and integrated perspective on transnational risk management since risk management has to be understood as an iterative, on-going process that has to be continuously fed back with the society. These requirements on risk management process claim for an MSP as a **long-lasting supportive institution**.
- Promoting stakeholder engagement within an MSP is highly dependent on the accountability and mandate given to the MSP. Especially in terms of an advisory stakeholder forum it is essential that the MSP clearly communicate its role, its aims and its capabilities – the MSP need a high visibility and has to be heard in decision-making processes. As a basis for these activities the MSP need **financial security and**





organisational stability for the long-term coordination of their activities and make efficient use of its reputation.

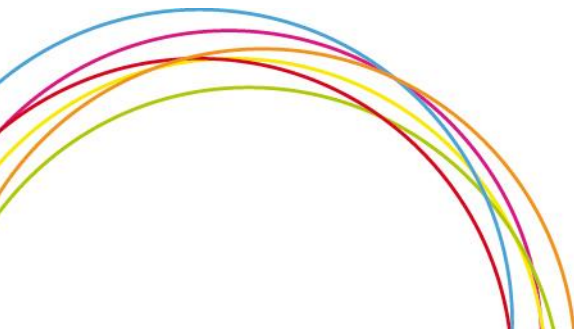
- A **commitment of MSP stakeholders** is necessary for being engaged in the development and implementation of collaborative, transnational solutions. Strong commitment of the MSP's stakeholders and the involvement of visionaries who are willing to **take ownership**, are the fundamental basis of an independent stakeholder forum in risk management processes.
- The MSP must have the **capability and the willingness to critically reflect** about its own role in risk management processes. Reflexion and feed-back are essential in a continuous iterative process like risk management. To question own actions and tasks periodically need assurance about the needs and requirements of the society.
- In order to ensure a continuous exchange and feedback to current management processes as much as to continuously adjust risk management processes to the societal frame it is essential that the MSP has to **learn and work in a structured way**. Especially if an MSP is dealing with multifaceted or multiple risks, a structured differentiation between causes, consequences, adaptive and mitigation measures is of major importance to channel the capacities of the MSP to the right (and manageable) tasks.
- Regarding the performance of MSPs in risk management processes an independent stakeholder forum can **act as a communicator, ambassador and multiplier** in risk management, which is of major importance.
- The MSP might contribute to enhanced risk management strategies using its networks to **communicate new developments** as well as to support **the implementation of already existing strategies**.
- For an MSP it is essential to keep in mind that stakeholders, especially in a voluntary stakeholder partnership, participate and work for the MSP beside their "normal" jobs. It is important to **acknowledge stakeholders' effort** to the voluntary MSP – mutual appreciation is one of the key elements of successful interactions within the MSP. Commitment is a fundamental pillar of collaborative, societal-based risk management – and is needed continuously. Establishing an MSP is just half of the process. **Keep an MSP successfully running over a longer period requires a huge amount of effort and support from each of the stakeholder and regional roots.**





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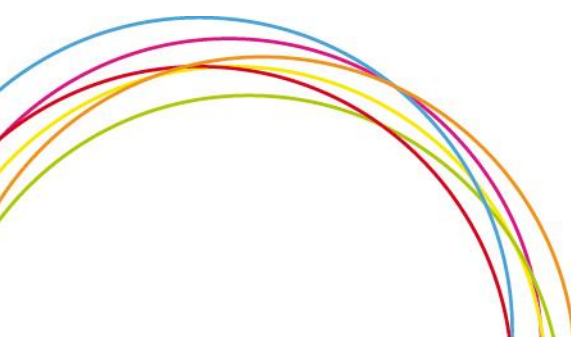
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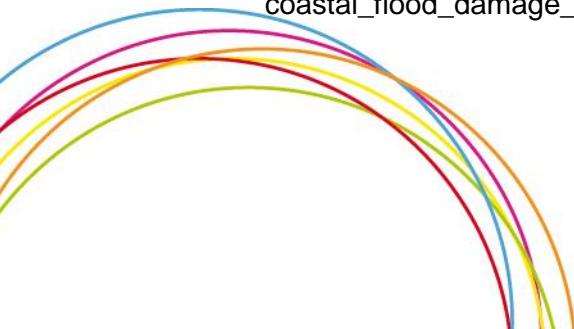
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