





PEER REVIEW
MALTA
2016

Funded by
European Union
Civil Protection

PEER REVIEW
RISK ASSESSMENT
MALTA
2016

2015-2016 Programme for peer reviews in the framework of EU cooperation on civil protection and disaster risk management

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Contents

Annexes

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The time and expertise dedicated by the peers were essential to the achievement of this report. The peer review team was composed of four peers:

- *Major **Talal Soud Alghrair**, Director Deputy of Disaster Department, Head of Disaster and International Cooperation Section, Jordan Civil Defence*
- ***Nicholas Paris**, Head of International and European Relations Directorate, Cyprus Civil Defence*
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For the European Commission, Joanna Olechnowicz from Directorate General for European Civil Protection and Humanitarian Aid Operations (DG ECHO) prepared the review and took part in the mission. A consortium led by Falck B.V. assisted the Commission in carrying out the peer review. Veronique Császár from Falck B.V was project manager for Malta, providing technical and administrative support for the peers. John Roche participated in the peer review mission representing the OECD.

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1. Introduction

Peer review is a governance tool where the disaster risk management system of one country (the ''reviewed country'') is examined on an equal basis by experts (''peers'') from other countries. The EU programme for peer reviews in civil protection and disaster risk management was set up following two successful pilot peer reviews of the UK (2012) and Finland (2013) undertaken jointly with the Organisation for Economic Cooperation and Development (OECD) and the UN International Strategy for Disaster Risk Reduction (UNISDR).

The EU peer review programme aims to facilitate the exchange of good practices and identify recommendations for improving disaster management policy and operations in the reviewed countries. The programme encourages mutual learning and understanding and facilitates a policy dialogue both inside and between countries as well as among experts.

Malta expressed its interest to the European Commission in participating in a thematic peer review on **risk assessment**. The country had just set up a new risk assessment process and finalised a national risk assessment (NRA) for the first time. By participating in the peer review, Malta wished to gather expert feedback and recommendations to further improve the process, enhance its credibility and transparency and share expertise.

The peer review in Malta focused on the thematic review for risk assessment. The main objectives of this review are:

1. A coherent system of national, regional, local, cross-border and sectoral risk assessments is developed and used to provide a good understanding of the risks in the reviewed (member) state on all governmental levels and in the private sector;
2. Recommendations: the risk assessment results in specific recommendations for related policy field (if relevant);
3. The development and outcome of (national) risk assessments is transparent and accountable to the stakeholders and general public (with the exception of sensitive information).

Review process

Once Malta's participation in a thematic risk assessment review was confirmed, a call for nominations of experts was sent to countries participating in the EU Civil Protection Mechanism and eligible neighbouring countries. Three peers from EU Member States — Cyprus, the Netherlands and Portugal — and a fourth peer from Jordan were chosen to participate in the review. The peers were supported in their tasks by the European Commission and a project team contracted by the Commission. A representative of OECD participated in the mission.

The peer review mission was conducted over 5 days from 30 May to 3 June 2016. The review opened with a meeting with representatives of several ministries and agencies of Malta. The European Commission representative addressing the meeting

expressed his appreciation to Malta for their willingness to participate in the process and introduced the peer review team.

During the five-day mission in the country, the peer review team met and interviewed stakeholders from many different organisations, governmental authorities and agencies, NGOs and academia. They also had access to a number of documents concerning risk assessments and disaster management, including legislation and guidelines. A full list of these documents is annexed.

Scope of the review

The peer review of Malta focused on risk assessment and was based on the peer review framework for risk assessments. The detailed framework is annexed to this report.

This report identifies good practices and areas for improvement and proposes a series of recommendations. It is for the Maltese government to consider and determine whether and how the recommendations should be implemented so as to contribute to their policy goals.

This report represents an analysis of the situation in Malta as of May 2016. Later developments are not taken into account.

1.1 Key findings and recommendations

Malta recently set up a new risk assessment process and finalised a national risk assessment (NRA) for the first time. To do so, they brought in external expertise and used experts' feedback and recommendations, including from the peer review, to help improve existing processes and enhance the credibility and transparency of the process.

Malta has submitted its first national risk assessment report to the European Commission. The report provides a summary of the overall comprehensive NRA.

Good practices

- Malta has a comprehensive risk assessment as part of its risk management legislation, produced by international experts in coordination with national players such as ministries, academia, the private sector, civil society and public administration. It is based on international standards on robust methodology, including relevant parts of ISO 31000 and the European Commission's risk assessment and mapping guidelines.
- The risk assessment includes a risk matrix showing probability and impact estimates, as well as a vulnerability analysis. It clearly shows a link between the risk identification, vulnerability analysis and the final risk assessment.
- The NRA includes an action plan (Document D6: RR&M (risk reduction and management) strategies report) which outlines how recommendations will be implemented within 3 years, that is, before the start of the NRA follow-up.

- The Maltese risk assessment uses a number of advanced models and approaches, e.g. a systems approach, a pressure and release model and a contingency approach. The combination of the contingency and systems approaches ensures that the NRA includes the identification of hazards, threats and risks, the assessment of critical infrastructure (including emergency services) and the risk reduction strategies. The pressure and release model used takes into account different factors that make up the total vulnerability of a society and views hazards as trigger events that unleash disaster.
- A template was developed to identify the interdependencies between critical infrastructure (CI) components and the possible chain reactions caused by a loss or disruption.
- The Critical Infrastructure Protection Directorate (CIPD) in Malta was appointed as a specific entity within the Maltese Government with overall responsibility for coordination and management. The CIPD involves a wide spectrum of stakeholders from CIP operators, emergency services, public and private stakeholders and a number of effective forums to drive reform, manage preparedness, coordinate and build relationships across government departments and the emergency services.
- Changes to the structure, responsibilities and competences of government authorities were deemed necessary to achieve a less biased and more independent and critical approach towards risk assessment and comprehensive risk reduction.
- The establishment of the Risk Management Directorate facilitates the integration of risk management within the day-to-day operations and decisions taken by senior management within government ministries and entities. This ensures that keeping the risk assessment process high on the agenda is a strategic imperative. There is an interest and understanding among the government and stakeholders of the importance of conducting the NRA.

<u>Recommendations</u>

- Implement the risk reduction and management strategies report, based on NRA conclusions. This strategy should include expected outcomes, measurable indicators and estimated costs.
- Continue to analyse the available capabilities, as both the NRA and the capabilities assessment constitute a solid base and provide important inputs for risk reduction and mitigation strategies at all levels.
- Institutionalise the involvement and cooperation of the government and other stakeholders in a national platform for disaster risk reduction that includes all sectors of society (governmental, private, civil society, experts, academics, industry etc.).
- Strengthen the emergency management forums and increase the involvement of multiple stakeholders. Set up forums in all disciplines, particular risk communication. Press officers and communication advisors are particularly

important to design accurate, clear and timely information to provide to the public through mass media and social media.

- Involve decision-makers in the results of NRA and provide the financial support to implement the recommendations.
- Include multi-hazards, cross-border risks and complex crises in the NRA, especially as Malta is a small island and many large-scale disasters have significant cross-border impacts.
- Establish formal protocols with neighbouring countries to share data and information on hazards and risk monitoring. Additional international agreements or partnerships could be concluded to fund and build national capacities in disaster management to bolster Malta's limited resources.
- Develop a risk communication plan to inform local authorities and the public about non-classified parts of the NRA, facilitate delivery of information and disseminate the assessment results to all concerned parties and target audience. The public and local authorities should be kept informed of the progress of the risk management programme.
- Use the pressure and release model to identify measures that help reduce or even remove vulnerability factors and reduce the potential impact of a trigger event/hazard.
- Continue to strengthen disaster risk management planning: develop an environmental emergency plan, a risk awareness plan for tourists and an emergency plan that would link the top 10 risks in Malta to an action plan for every single risk or combinations of risks, including a comprehensive disaster response comprehensive exercise programme.

2. Risk assessment

Objective 1: A coherent system of national, regional, local, cross-border and sectoral risk assessments is developed and used to provide a good understanding of the risks in the reviewed (member) state on all government levels and in the private sector

2.1 Framework

Malta is a small archipelago situated in the Mediterranean Sea where three largest islands are inhabited (Malta, Gozo and Comino). It is one of the densest countries with population of 417 000 on the 316 km^2.Its coastline is 270 km long. ,The country's economic base includes commercial, industrial and tourist activities. It is highly dependent on national critical infrastructure for daily life.

Malta is an EU Member State. The political structure in Malta is centrally organised with central government having control of the country's administration. Local government is organised through a number of local councils (53 on the island of Malta and 14 in Gozo)[1]. There are no intermediate levels of authority between the local councils and central government. The local councils system in Malta is a basic form of local government that gives authority to citizens in the various localities to take control of some aspects of local community life and organisation such as traffic, road improvements and other social activities within the towns and villages they are elected to represent. Local council elections are held every 5 years. Local councils in Malta have a similar role to municipalities in other European Member States. Political control remains with central government and the local level is centrally managed at the national level.

The Civil Protection Act of Malta lays down the structure for the Civil Protection Department, including the task to carry out vulnerability and risk assessment task. The **Critical Infrastructure Protection Directorate (CIPD)** within the Cabinet Office in the Office of the Prime Minister (Figure 1) is the national agency responsible for 'critical infrastructure protection'. In addition, the CIPD coordinates and supports general emergency preparedness on a national level. The latter role entails the coordination of the emergency services, namely the **Civil Protection Department**, the Police, the Armed Forces of Malta, emergency, health and other related stakeholders, as may be required by specific national emergencies. This overall CIPD structure also includes designated sectoral forums, the Emergency Management Forum composed of the core emergency services, other specialist forums and the Government Contingency Centre. In addition, the CIPD is the national contact point with the European Commission on related matters. The Directorate's mission statement is '*To strengthen and secure the functioning and resilience of Malta's Critical Infrastructure and the National Emergency Services*'. In its role as national emergency coordinating body, the CIPD coordinated the first NRA exercise for Malta.

[1] https://gov.mt/en

In Malta, the emergency services are designated as a critical sector focusing on the protection of people, property and other sectors. The core group includes the Civil Protection Department, the Maltese Police Force, the Armed Forces of Malta and pre-hospital health. Chapter 411 of the Laws of Malta stipulates that the Civil Protection Department is the lead agency for rescue and hazard mitigation action in the event of any declared disaster. In addition to the core group, the extended group made up of the emergency services includes Transport Malta and the Works and Infrastructure Department in the Ministry for Transport and Infrastructure.

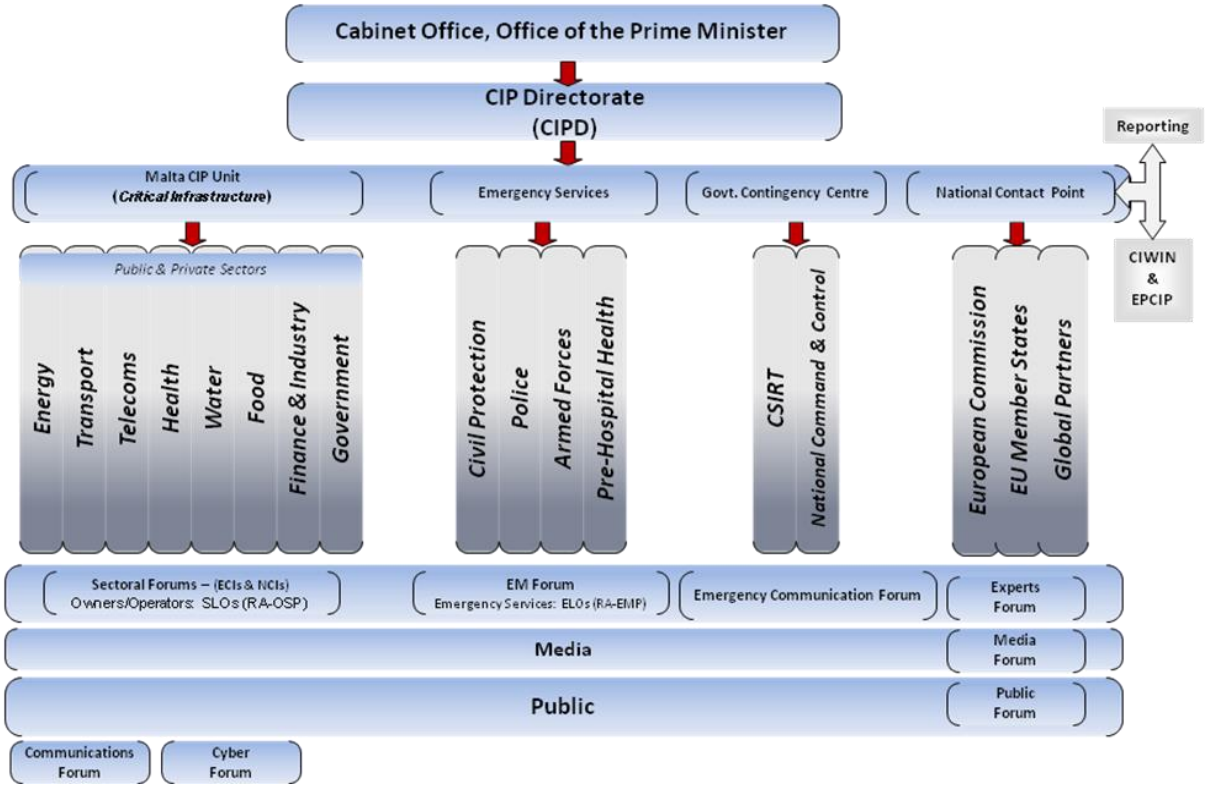

Figure 1: Critical infrastructure protection and emergency services structure in Malta (Source: CIPD, Cabinet Office, OPM).

The key document reviewed by the peers is the executive summary of the national risk assessment report (NRA report) for the Maltese Islands. The executive summary has been submitted to the European Commission in accordance with Article 7(a) of Decision 1313/2013/EU of the European Parliament and of the Council on a Union Civil Protection Mechanism.

Undertaking a national risk assessment is considered an important and brave step forward; building on the NRA results, a series of successive measures are necessary to protect lives and private and public assets. Malta is prone to different risks: although the risk level is low to medium, the consequences and effects of potential disasters would impact people, property, cultural heritage, infrastructure and daily life.

The national risk assessment was conducted as a comprehensive exercise aimed at establishing an agreed practice for defining priorities in emergency and disaster management. This would facilitate cross-sectoral coordination, while ensuring an appropriate balance of measures to prevent and/or treat vulnerabilities and risks.

The following reports were produced to capture the results of key phases of the NRA exercise:

1. Inception report, outlining the methodology subsequently followed throughout the exercise;
2. Hazard, threat and risk identification report;
3. Risk analysis and evaluation report;
4. Critical and other relevant infrastructure: assessment and mapping report;
5. GIS-based hazard, threat and risk maps, including critical infrastructure assets and systems;
6. Risk reduction (including disaster risk) and management strategies;
7. National risk assessment report for the Maltese Islands.

As such, the NRA adopted recommendations to reduce and mitigate risks. Potential risks and their effects were determined and identified, and the top 10 risks were selected.

By developing a comprehensive national risk assessment with specific goals, based on international and European standards, the Maltese authorities expect to support development of collaborative thinking on strategic needs and make all levels of government better at sharing common understanding and awareness on national threats and hazards across all levels of government and throughout the private sector.

Although there is a cross-sector coordination throughout the emergency services, the peers have observed that the existing crisis management structure within the Maltese Islands may need some improvements in terms of coordination. The completion of the NRA arose as a result of a number of requirements, including from multiple national, European and international regulatory documents, and an acknowledgement that the best possible outcome should be achieved in the event of a natural, technological or man-made disaster. The existing structures in place are adequate and effective to deal with major emergencies affecting the islands.

Internal Audit and Risk Management Directorate

There is a distinction between the NRA and the risk assessment conducted by local public organisations. Each of these organisations is duty bound to develop an internal risk assessment. The Internal Audit and Risk Management Directorate (IARM) within the Internal Audit and Investigations Department (IAID), through its compliance and risk management function, assists public service organisations and government departments in identifying risks and implementing risk registers. The IAID is 'independent by default', carrying out independent audits in which an objective assessment can be made on the risk assessment process on a national basis.

The public service sector in Malta has embarked on what was termed a renewal programme, in which one of its target areas includes policy-making. The process

involves developing a risk management competency framework to ensure that key social and economic sectors have risk management plans. That process, according to IAID, is part of commitments made to the European Commission in the Strategic Action Plan for better Governance 2014-2020, which is intrinsically linked to EU funds. According to documents read and interviews held during the mission to Malta risk management in the public sector is still in the initial stage with a number of initiatives being rolled out throughout the government ministries and entities. They include building knowhow and awareness, embedding risk management within day-to-day operations and an increased appreciation that risk management contributes to improved operations and improved decision-making. This is enshrined in Circular of the Office of the Prime Minister No 1/2016 sent to permanent secretaries, directors general, directors and heads of public sector entities in Malta.

One of the most important aspects of the risk management process is to monitor and update the risk register and to highlight any internal control weaknesses and high-risk areas that come to the attention of the officials carrying out the process. This process gives senior management the responsibility of taking ownership of, supporting and promoting risk management. It is the role of Internal Audit and Risk Management Directorate (IAID) to ensure that this process is fully implemented and embedded within departments and to communicate the benefits of risk management across all levels.

Although only in the development stage, this process will improve and contribute to improved operations and decision-making in crisis management and in the ongoing process of keeping abreast of the changing risk landscape and prevailing conditions which may affect the island. It is seen as a good practice, which places this process right at the centre of government and makes keeping the risk assessment process high on the agenda of government a strategic imperative.

Changes have been carried out at government level (in authorities' structure, responsibilities and competences) that were deemed necessary to achieve a less biased and more independent and critical approach towards risk assessment and comprehensive risk reduction. Examples include the decoupling of Malta's Environment and Planning Authority Environmental Resource Authority (ERA) from the Planning Authority, as well as the emphasis on the independent and proactive role of IARM. It shows that the Maltese Government continues to have a self-reflective attitude and is trying to create a more effective organisation.

Malta has developed a national climate change adaptation strategy, which was approved in May 2012. The strategy was developed in line with EU guidelines.

Good practice

- The executive summary of the NRA report for the Maltese Islands provides a comprehensive overview of the risks in Malta.
- The establishment of the Risk Management Directorate facilitates the integration of risk management in day-to-day operations and decisions taken by senior management within government ministries and entities. The Directorate can also

advise on their internal control environment. This ensures that keeping the risk assessment process high on the agenda is a strategic imperative.

- Both government organisations and private essential services designated as critical infrastructure are legally obliged to have an operator security plan (OSP). This is important by itself but also makes the different stakeholders focus on their interdependencies. Furthermore, in order to proceed with their OSPs, different organisations are indirectly encouraged to use the NRA or have a risk assessment specific to their field of expertise. This provides value added.
- Changes have been carried out at government level (in authorities' structure, responsibilities and competences) that were deemed necessary to achieve a less biased and more independent and critical approach towards risk assessment and comprehensive risk reduction.
- The CIPD has a strong coordinating role in the NRA and a central position within the Cabinet Office in the Office of the Prime Minister.
- A national climate change adaptation strategy exists since May 2012.

Recommendation

- Once recommendations included in NRA are implemented, allow institutional changes to stabilise and bed down for a defined period of time before evaluating and reorganising;. Many changes (in structure, responsibilities and competence of authorities) have taken place in a short space of time.

2.2 Coordination

The CIPD plays a central part in coordinating Malta's crisis management structures. This overall CIPD structure includes designated sectoral forums which meet on a regular basis and are chaired by subject-matter experts from government departments.

The different authorities did not have the capability to conduct the risk assessment themselves; this is the reason why the NRA was outsourced and international experts were contracted. Nevertheless, different authorities had the opportunity to input their knowledge in their field of expertise at the initial stages of the risk assessment. A total of 54 formal preparatory meetings were conducted with relevant stakeholders (sectoral forums, governmental agencies, academia, private entities and others). Some 144 experts with different backgrounds were consulted or otherwise provided information for the identification, analysis and evaluation of Malta's risks. For some assessed risks, the private sector was involved as well. There is no evidence that the interested public was involved at the information input stage, nor does it follow from the NRA that this was the case. There is also no evidence that neighbouring countries like Italy were involved in the process either.

Many experts were observed to be multi-functioning in their capability to deal with emergencies. During the visit to Malta the peer evaluation team was told that 'trust' was an important factor when dealing with and preparing for major emergencies in the country. While this can be sometimes seen as an intangible asset, it has been cited as a valuable tool when needed. The peer review has observed not only a strong interest within the government in the risk assessment process but also certain desire from the concerned entities in the private and general sectors to succeed in that process.

This is equally true for other jurisdictions throughout the world and should not be underestimated. The existence and functioning of these forums can be seen as good practice. The forums' structures were in the process of being re-evaluated, which is an ideal opportunity to strengthen this valuable tool to ensure the full involvement of all stakeholders in the prevention, mitigation and preparedness stages of the process. The media forum had not been put in place at the time of the peer evaluation visit to Malta, although this was the stated intention. Nor has a forum on cybersecurity been as yet set up either.

The coordination of the CIPD during the whole process was evident. However, the role of the different government and non-government organisations during the process was evident only at the initial stages of information sharing; their role is not yet institutionalised in a national platform.

Good practice

- The critical infrastructure protection and emergency services structure in Malta involves a wide spectrum of stakeholders from CIP operators, emergency services, public private stakeholders and, as mentioned, a number of effective

forums to drive reform, manage preparedness, coordination and build relationships across government departments and the emergency services.

- A range of stakeholders was involved in the process: all ministries, academia, the private sector, civil society and public administration participated in the initial phases to enrich and enhance the NRA.
- National workshops were conducted; local sectoral forums and public forums have been created and exist in reference to different components of risk assessment.
- Government and stakeholders understand the importance of conducting the NRA.
- It is evident that there is close cooperation among the different governmental and private organisations within Malta. Managers at different levels know each other personally. It can be inferred that cooperation concerning risk management is proportionately robust.

Recommendations

- Continue institutionalisation of the cooperation between different organisations and continue to collect their input of information for the NRA. This could be achieved by establishing a formal national platform for disaster risk reduction under the Sendai Framework for Disaster Risk Reduction 2015-2030. The frequency of the platform's meetings will need to be decided. A coordination plan should determine the responsibilities of all sectors and entities and agencies at all levels to avoid overlap. This platform could have an overview of risks faced by the country and coordinate implementation of actions recommended in the three-year action programme. It is important that this process is followed up.
- Strengthen the structures within the emergency management forums to increase the involvement of multiple stakeholders. Press officers and communication advisors are especially important in dealing with the requirement of the media and social media providers and users.
- Institutionalise the forums in working groups on all disciplines:
    - A cyber working group: it is essential to conduct a cyber-threat within the NRA: this was mentioned in the 'way forward' presentation as one of the strategic goals.
    - Integrate local sectoral forums into the national platform, for example as working groups so that the forums will have a formal constitution and mandate. Public, local citizens and external partners should make positive contributions to the NRA. The frequency of these working groups' meetings will need to be decided.
    - Establish specific working groups for different types of hazards, inviting representatives of different interested groups such as first responders, transport operators, early warning systems and climate change adaptation and, in some instances, also different levels of authorities i.e. local communities, neighbouring countries and external partners. Different stakeholders' contributions would not only concern initial information about different risks but also recommendations on risk management strategies.

- Enhance international cooperation and support the bilateral agreements that would make it possible to benefit and learn from good practices in this field.

2.3 Methodology

The NRA for the islands of Malta is strategic, concise but comprehensive. Due to the small size of the country it was not deemed necessary to carry out regional or local risk assessments. Malta's NRA focuses on three types of risks:

- contingency events with defined beginning and endpoints, such as floods, hurricanes, earthquakes and terrorist attacks;
- chronic societal concerns such as illegal immigration, and others not generally related to national disaster preparedness, including traffic accidents and money laundering;
- loss or disruption of critical infrastructure and climate change; these are considered horizontally.

There is no official NRA methodology for Malta; the consulting company Epsilon used a hybrid method, combining a systems approach and the conventional contingency approach. The 'systems approach' means an integrated approach of hazard, threat and risk identification, analyses and identification of critical infrastructure. It seems that the hybrid approach has not been used before. The hybrid methodology for risk assessment does not seem to be standardised and made official. Using the same standardised approach and a standardised methodology would make possible to compare NRAs results in future.

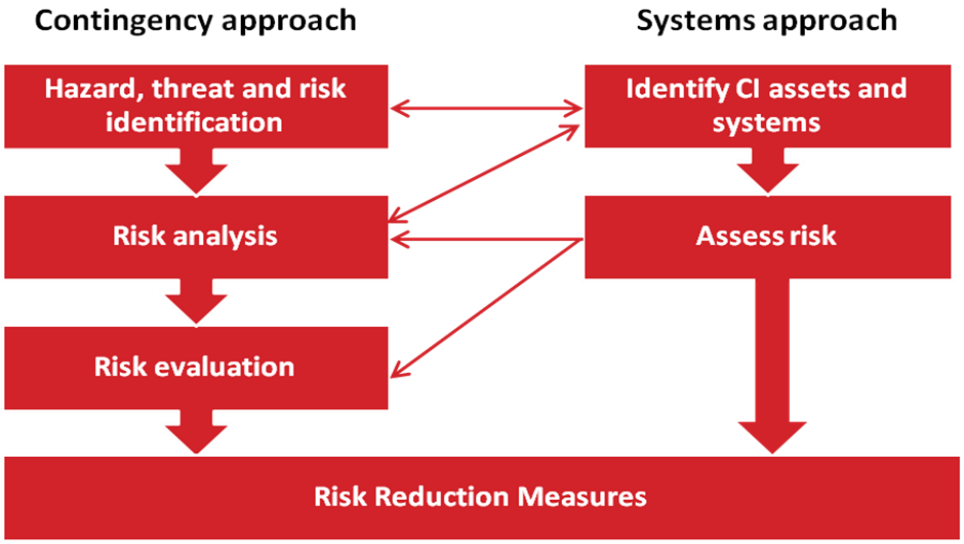

Figure 2: A combined contingency and system approach as adopted by Malta's NRA

A private consultancy company in partnership with the Maltese authorities developed and used the methodology, which took into account the overarching legal framework and NRA project management structure. The concept of a 'pressure and release model' (Blaikie et al., 1994) has been incorporated into a standard methodology

involving hazard, threat and risk identification. The methodology brings together risk analysis and evaluation, critical infrastructure assessment, risk mapping and indication. In addition, it outlines the way the risk reduction and management strategies can be deployed.

The NRA for the islands of Malta was based on the best practice ISO 31000 standards and the EU Commission Risk Assessment and Mapping Guidelines for Disaster Management (2010). It is a dynamic risk assessment, with revision considered every 3 years.

The Maltese NRA takes into account scenarios of a relatively small scale, multi-hazardous outcome as a result of chain reactions from the initial hazard (e.g. cascading events such as a storm that causes a maritime oil spill). However, the information provided[2] indicates that scenarios with a multi-hazard starting point or complex crisis have not been fully analysed. Different risks are described, including secondary and associated hazards. Associated hazards seem not to be developed in the summary of Malta's NRA, contrary to secondary hazards. 'Complex crises' not only refer to large-scale cascading events (such as the Great East Japan Earthquake and subsequent tsunami and Fukushima crisis) but also co-occurring events. This is a relatively new notion in risk management but has been recognised by European bodies as a possibility that must be examined when considering risk management programmes. Complex crises (that are co-occurring crises) are generally not clearly considered in the NRA, with the exception of climate change. According to the bibliography, the effects of such crises are not the mere sum of two disasters co-occurring separately: there is an additional degree of synergy attached to them.

However, since the NRA considers cascading events that follow different incidents, the assessment of critical infrastructure was not conducted as a separate exercise: all stages of risks have been conducted simultaneously with the assessment of critical infrastructure assets and system.

The probability of each hazard occurring has been determined during the risk analysis phase. The qualitative and quantitative scales have been used to provide a relative likelihood/probability of the occurrence of hazards.

[2] 'Information' here means documentation, presentations and discussions received during the preparatory meeting and peer review mission.

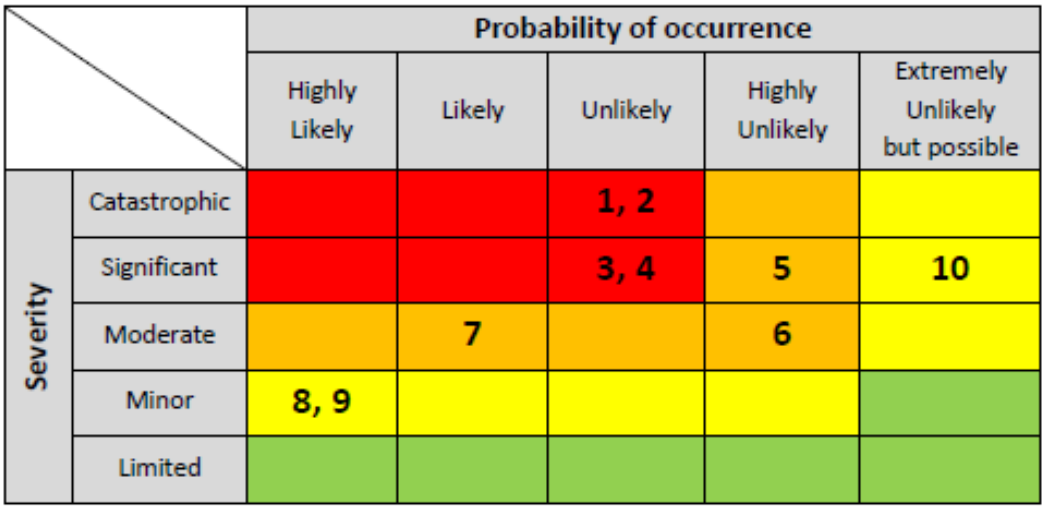

Figure 3: Risk level from all major hazards and threats in Malta

For someone not involved in the NRA process, the categories of probability could lead to misinterpretation of the matrix. The categories included in the NRA risk diagram are: highly likely, likely, unlikely, highly unlikely and extremely unlikely. This means that there are more 'unlikely' than 'likely' categories, and no neutral category. The risks described in the NRA with the most serious impacts all fall under the 'unlikely' categories. When it comes to deciding on investment of scarce resources and prioritising, the way risks are categorised might be misleading and not conveying an appropriate sense of urgency. This can lead decision-makers to think that 'unlikely' indeed means unlikely and thus the necessity for investment is less important. Although the matrix developed was not meant to be used in isolation, such diagrams catch the attention and might be misinterpreted.

Probability class	Quantitative	Qualitative
A	More than 10^{-2}/year	Highly likely *Has already occurred in Malta or may occur despite eventual mitigation measures.*
B	10^{-2}-10^{-3}/year	Likely *Has occurred or may occur in Malta.*
C	10^{-3}-10^{-4}/year	Unlikely *A similar event has occurred in another country under similar conditions, and there are no guarantees that mitigation measures can significantly reduce the probability of occurrence in Malta.*
D	10^{-4}-10^{-5}/year	Highly unlikely *Has already occurred in another country under similar conditions, but mitigation measures have significantly reduced its probability of occurrence in Malta.*
E	Less than 10^{-5}/year	Extremely unlikely but yet possible *Is not impossible based on current knowledge, but has not occurred in other countries under similar conditions.*

Figure 4: Five-class probability scale

Another remark is that the definition or description of the category 'unlikely' is not congruent with the general notion of the word 'unlikely'. The category 'unlikely' is described as: '*A similar event has occurred in another country under similar conditions, and there are no guarantees that mitigation measures can significantly*

reduce the probability of occurrence in Malta'. As this definition states a similar event has occurred and might happen, the use of the word 'unlikely' is not coherent with the explanation provided.

The severity of the impact of a hazard is a function of the hazard's intensity and the vulnerability to that hazard. A deterministic approach is used to estimate losses from a hazard occurring. The estimated losses have been used as an indication of the hazard's severity of impact in a risk assessment. Figure 4 illustrates the scale of severity (impact/consequence) ratings that were used.

Severity	Characteristics
Catastrophic	• Multiple deaths. • Complete shutdown of critical facilities for 30 days or more. • More than 50 percent of property severely damaged.
Significant	• Injuries and/or illnesses result in permanent disability. • Complete shutdown of critical facilities for at least 2 weeks. • More than 25 percent of property is severely damaged.
Moderate	• Injuries and/or illnesses do not result in permanent disability. • Complete shutdown of critical facilities for more than 1 week. • More than 10 percent of property is severely damaged.
Minor	• Injuries and/or illness treatable with first aid. • Shutdown of critical facilities and services for 24 hours or less. • Less than 10 percent of property severely damaged.
Limited	• Less than "Minor" effects.

Figure 5: Five-class severity scale

Although Malta is an archipelago, it is in close proximity to neighbouring countries where some of the risks included in the NRA could have their origin. Some areas of the NRA such as coastal marine pollution imply the need for cross-border cooperation. In the case of Italy, for example, such cooperation already exists. However, according to the information provided it is not evident that cross-border concerns are fully targeted in the NRA. Cross-border risk assessment would be important to assess the severity and probabilities of these risks.

Good practice

- The NRA's coherent system will support common understanding in the EU of the risks faced by Member States and the EU, and will facilitate cooperation over efforts to prevent and mitigate shared risks such as cross-border risks like seismic and tsunami risks and marine pollution.
- Malta's NRA shows a clear organised methodology and project management structure as the CIPD has overall responsibility for coordination and management. The methodology used for the NRA is robust, including elements of both the relevant ISO 31000 and the Commission's relevant guidelines. Malta's NRA is all-inclusive, containing all phases of risk assessment (hazard identification, risk analysis, vulnerability assessment, etc.). Contingency events (natural hazards, anthropic hazards) and social concerns were also considered. A revision of NRA is planned every 3 years.

- The Maltese NRA combines a system approach with the conventional contingency approach. This system approach consists of an integrated approach of hazard, threat and risk identification, analyses and the identification of critical infrastructure (including emergency services).
- The NRA addresses cross-cutting issues which are examined for each of the 10 main hazards, such as the critical infrastructure and key resources, cross-border concerns and climate change. The assessment of critical infrastructure was therefore not conducted as a separate exercise: all stages of the NRA were conducted simultaneously with the assessment of critical infrastructure assets and the critical infrastructure system. During the risk analyses phase, cascading effects on infrastructure are discussed for different risks.

Recommendations

- Establish the methodology used as a national Maltese methodology for the NRA so that comparable results will be produced by the forthcoming one in 2018. Ensure that other countries benefit from Malta's pioneering work. Share the methodology and your experience internationally. .
- Consider the worst case scenario for each risk so as to determine the capabilities and resources required to be allocated to an emergency situation.
- Include multi-hazard incidents such as complex crises in the next NRA. The multi-risks and crises methodology should determine actions for the future.
- Give the current middle category 'unlikely' a more neutral name that is congruent with the category's definition and which conveys the appropriate sense of urgency of the risk, e.g. 'moderate'.
- Establish formal protocols with neighbouring countries to share data and information on hazards and risk monitoring. Cross-border issues should be taken into account in the NRA, especially as Malta is a small island nation and given that many large-scale disasters have significant cross-border impacts.

2.4 Risk identification

Several sources of information have been used to identify the full range of known hazards, threats and risks in Malta, with structured interviews conducted with key experts on specific hazards, threats and risks. In total, 54 formal meetings and many more informal and preparatory meetings were held with stakeholders. A template was used to systematically gather information from different critical infrastructure stakeholders. This template, the critical infrastructure information sheet, collects detailed information about the critical infrastructure and visualises the interdependencies between critical infrastructure components and possible chain reactions caused a loss or disruption.

In addition, information was collected by reviewing the existing literature:

- official government reports;
- scientific papers and publications;
- newspaper or media articles;

- anecdotal information from long-time residents;
- information from experts on specific hazards, threats and risks.

During this initial phase, a large number of risks were identified. This large number of risks was reduced, by eliminating through a process of iteration all secondary risks or risks that were not directly relevant to the country. Major hazards were not left out. Mapping was also done for some of the top 10 risks.

As the level of the risk in Malta varies from low to medium, a total of 33 hazards and threats with different sources were identified, as well as 42 scenarios and 3 horizontal issues. Some 12 scenarios were further considered in-depth in the NRA: these were the top 10 hazards plus 2 additional planning scenarios, 1 on critical infrastructure and 1 on cyberattack.

Climate change is considered a horizontal risk and was examined in conjunction with the top 10 risks considered in the NRA. A risk diagram was plotted for these top 10 risks. Pandemics and coastal maritime oil spills are rated as the most severe risks.

The top 10 risks were selected based on preliminary estimation of the probability of occurrence and severity of each of these scenarios. The risks in the top 10 are equally important. The scoring criteria, including certain risks and excluding others (e.g. sea level rise and cyber risk), are not completely transparent, at least in the summary of the NRA report. The Maltese authorities considered and discussed a wide spectrum of risks in the initial stage: a total of 33 hazards and threats and three horizontal issues were identified in the final NRA. It is not clear how the top 10 risks were selected. It is understandable that some of them are at present found to be not urgent enough to be included in the first NRA. Another reason for excluding them was the estimation that sufficient mitigation measures were in place to absorb the impact. Although these are valid reasons for the risk selection, the criteria could have been made more transparent for the sake of accountability.

The identified risks correspond to the risks identified in other countries. As mentioned previously, cyber risk assessment is not included at this stage but is scheduled for the next risk assessment.

Each country has risks specific to its national context (either from its geographic position, cultural traditions, etc.); for Malta, these could include fireworks factories, a storm surge, a tsunami and a rise in sea level. Taking these country-specific risks into account is essential: for example, there is a very specific risk in Malta on fireworks that was not included in the NRA's top 10 risks.[3] Although a fireworks accident of high magnitude is not very likely in Malta, potentially there is still a risk that it could happen and have an enormous impact on the island.

Although sea level rise is discussed in the NRA it may need to be given special attention in the future. Low lying areas of Malta are vulnerable to effects from sea

[3] A fireworks accident can have devastating effects. For example, the explosion of a fireworks factory in the Netherlands in 2000 killed 23, injured more than 900 people and completely destroyed 200 homes while another 1500 homes were seriously damaged. The response to the disaster involved emergency services from all over the country and from Germany.

level rise and these effects could be more visible in areas such as underground piping of water, electricity and telephone services. There could be a fuller justification in the NRA why sea level rise was not included as a main risk faced by the country. There are locations elsewhere in the Mediterranean Sea that experienced a rise in sea level of more than 20 cm during the 20th century.

Malta's NRA included the development of a GIS-based (geographic information system) tool for mapping the risk of hazards and threats with a spatial component. It helps to assess the reliability, validity, specificity and relevance of existing hazard data. Specifically, the GIS-based tool includes layers for earthquake, flood and major industrial accident scenarios, as well as spatial information on critical infrastructure. A specific GIS application was developed to support the NRA. This information was analysed during the risk analysis and evaluation stage of the NRA to develop estimates of the potential losses for each of these hazards. For example, the earthquake layer illustrates the expected peak ground acceleration for the 475-year scenario. This layer was overlaid with the critical infrastructure layer, which helped identify the peak ground acceleration to which each critical infrastructure is exposed. It is also advisable to develop risk maps for maritime oil spills as this is one of the major risks the country faces.

Malta is currently working with the Joint Research Centre to upgrade the GIS-based tool developed during the NRA to the GRRASP (Geospatial Risk and Resilience Assessment Platform) GIS system developed by the JRC. Once this upgrade is carried out, the new system will be able to provide economic modelling and analysis of potential emergency scenarios. Once completed, it will be a first of its kind tool developed as an aid to the management of risks at national level.

The involvement of the public in the risk identification process as part of risk management is reinforced by the contemporary notions of public risk perceptions,[4] socio-technical disasters,[5] safety culture,[6] social amplification of risks,[7] the cultural theory[8] and many others that were developed during recent decades and especially after the Chernobyl disaster. Public participation in policy matters has been encouraged by the Royal Society since 1992 and through different EU directives (e.g. Directive 2003/35/EC). Public participation allows for societal consensus: it empowers citizens in relation to corporate and government interests, contributes to risk reduction through changed behaviour in what is regulated and enables society to realise the risks it faces. The methods of achieving public involvement, as practised in different European countries and in the USA, include referenda, barometers (a good example is the Eurobarometer), opinion polls, citizens' juries and other more specialised methodologies.

[4]Paul Slovic, (17 April 1987). *Perception of Risk*. Science 236, 280-285.
[5]Bill Richardson. *Socio-technical Disasters: Profile and Prevalence.* Disaster Prevention and Management: An International Journal, Vol. 3 Iss: 4, pp. 41 - 69.
[6]Nick Pidgeon. (2007) *Safety culture: Key theoretical issues.*
[7]Roger E. Kasperson, Ortwin Renn, Paul Slovic, Halina S. Brown, Jacque Emel, Robert Goble, Jeanne X. Kasperson, Samuel Ratick. (June 1988). *The Social Amplification of Risk: A Conceptual Framework.*
[8]M. Douglas, A. Wildavsky. (1983). *Risk and culture: An essay on the selection of technological and environmental dangers.*

Good practice

- An extensive list of risks was identified at the initial stage of the NRA. Both quantitative and qualitative data were used to identify a full range of hazards. The robustness of this initial risk identification process helped in the selection of the top 10 risks.
- A template – the critical infrastructure information sheet - was developed to gather details of critical infrastructure. This template visualises the interdependencies between critical infrastructure components and possible chain reactions caused by a possible discontinuity.

Recommendations

- Develop hazard and risk maps with spatial delimitation of areas prone to major risks considered in the NRA, such as geological maps indicating the risk of landslides. Multi-hazard maps would add a valuable contribution in all processes.
- Clarify the criteria that were to include certain risks and exclude others, such as sea level rise and cyber risk. Selection of risks could be more transparent, at least in the summary of the NRA report.
- Make the critical infrastructure template used for identifying the details of the critical infrastructure available to other authorities and member states. Ensure that the results of the analyses are shared with relevant stakeholders.
- Involve the general public in the risk identification process. This would help to reach a societal consensus and would enable society to realise the risks it faces.
- In future, Malta should consider having the NRA address more in-depth the risks related to fireworks factories, tsunamis, rises in sea level and climate change. Malta, as an island and a small country, is more vulnerable to climate change than inland and bigger countries.

2.5 Risk analyses

For some risks — and where applicable — there has been a quantitative assessment of probabilities and possible consequences. For example, this was the case for earthquakes. For other risks, such as coastal marine pollution, a multiplicity of probabilities meant that a quantitative approach was not possible.

The global outcome of the risk analysis was presented in Figure 3 in the chapter on methodology, on two axes: severity and probability of occurrence. In a risk matrix where 10 major risks are identified, pandemics and coastal marine pollution are potentially the most catastrophic ones.

The 'pressure and release model' (PAR model) was used, which takes into account different factors that make up a society's total vulnerability, such as poverty, lack of local markets, urbanisation and a fragile local economy. These factors determine how vulnerable (or resilient) a society is. The model considers hazards such as earthquakes or a technological accident as trigger events that unleash disaster. It shows the vulnerabilities of society and pressure on its resilience capacities. The PAR model understands a disaster as the intersection between socioeconomic pressure

and physical exposure. Risk is explicitly defined as a function of the perturbation, stressor or stress and the vulnerability of the exposed unit. In this way, it directs attention to the conditions that make exposure unsafe, leading to vulnerability and to the causes creating these conditions.

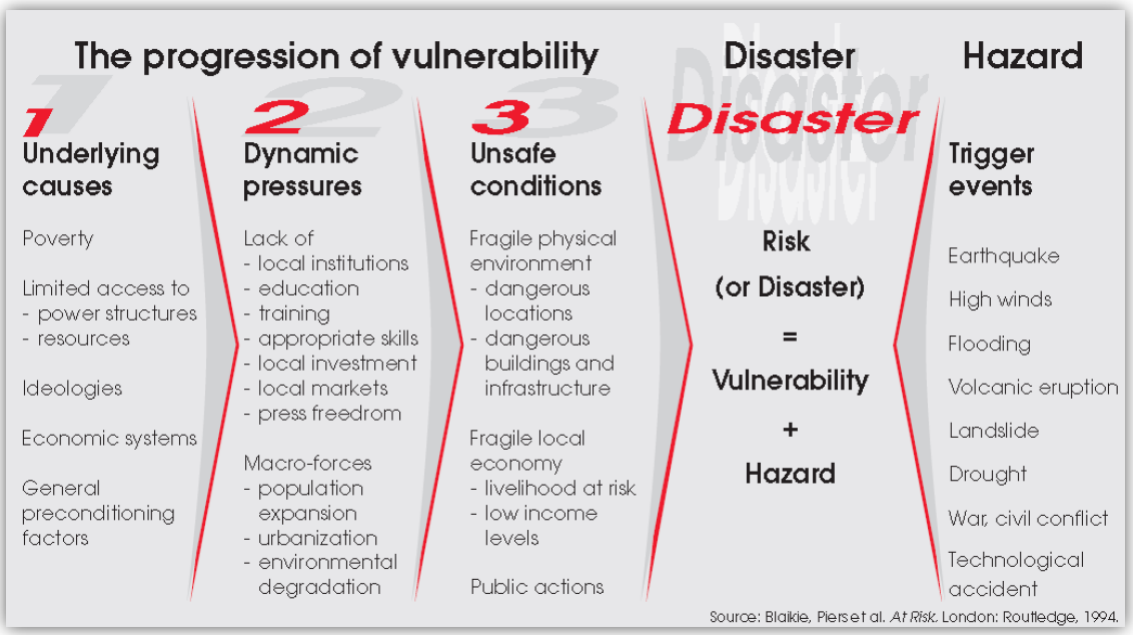

Figure 6: Pressure and release model

The model distinguishes between three components on the social side: root causes, dynamic pressures and unsafe conditions, and one component on the hazard side. Hazard x vulnerability = risk. This risk spells disaster when the vulnerability factors dampen resilience, resulting in a severe degree of societal disorder. Several vulnerability factors became apparent in almost all scenarios. The following are recurring vulnerabilities in Malta:

- insularity and small size of society
- urbanisation
- high population density
- coastal zones and territorial waters
- lack of natural resources (and hence strong dependence on imports)
- reliance on critical infrastructure.

Risk analysis was carried out using a three-step method: hazard analysis, vulnerability assessment and loss estimation. This leads to a comprehensive risk profile. When reviewing the NRA, it was noticed that pandemic scores are categorised as 'unlikely' on the probability scale. In most NRAs, pandemic scores are situated at the most likely range of the probability scale. It would be advisable for the scenario of pandemic risk to be reviewed by comparing it with other, internationally used scenarios to determine where the difference in probability comes from and whether this difference is warranted or not.

The population data is based on the census. However, that does not include the significant rise in population caused by tourists:[9] the number of visitors to Malta triples the total number of people in the country during the tourist season. If this enormous increase in numbers is not taken into account, it is difficult to calculate the human impact i.e. the number of affected people, the number of deaths, the number of severely injured or ill people and finally the number of permanently displaced people. The political and human impacts are currently not presented in detail. The procedure should include not only technical estimates but also social elements and social criteria.

Malta's NRA did not produce new knowledge/modelling/research but was solely based on existing knowledge. For future NRAs, though, there will be time for research concerning areas for which probabilities or impacts are somewhat vague. This could be the objective of some investigative work at a subsequent stage. However, there is strong collaboration between the Civil Protection Department and the University of Malta, for example on improving capabilities for evaluating seismic vulnerability and risks under the SIMIT — Integrated Civil Protection System for the Italian-Maltese Cross-Border Area project.

Good practice

- Collaboration between critical infrastructure protection in Malta and the University of Malta.
- The risk assessment includes probability and impact estimations, as well as a vulnerability analysis. It clearly shows how risk identification led to vulnerability analysis and the final risk assessment. The vulnerability factors identify recurring (and typically Maltese) vulnerability factors.
- The hazards in the NRA's top 10 were given a comprehensive risk profile.

Recommendations

- Develop earthquake and tsunami risk simulators for estimation of losses: deaths, injured people, damage to buildings.
- The estimation of losses (deaths, injured, damage to buildings) should also be developed. The estimations of the actual number of people in Malta should not only be based on inhabitants: scenarios should also consider the fluctuations resulting from the large number of tourists visiting the island at different times during the year.
- Internationally share the process of identifying recurring vulnerability factors that are typical to a national context. It would be ideal for other countries to benefit from Malta's pioneering work.
- Continue to identify measures that could reduce vulnerability. Use the pressure and release model to identify vulnerability-adding factors (like limited access to resources, urbanisation, dangerous locations/buildings/infrastructures) and then

[9] An overview of the number of tourists can be found at: https://nso.gov.mt/en/News_Releases/View_by_Unit/Unit_C3/ Population_and_Tourism_Statistics/Pages/Inbound-Tourism.aspx.

identify measures that help reduce or take away the potential impact of a trigger event/hazard. Examples of such measures would be: measures to reduce dependence on imported resources (e.g. energy) or building regulations that take into account specific local hazards (earthquakes, floods) in line with the recommendations from Maltese earthquake and building experts.

2.6 Risk evaluation

In general, the results of the risk analysis are not directly compared with risk criteria or quotas. This seems to be left for a subsequent phase, i.e. the capability analysis phase, which is included in a three-year risk reduction and management strategy action plan. For specific risks, however, risk evaluation is done in some detail. For example, under the 'major mass casualty incident' it is specifically stated that *'… it is also expected that such incidents would completely overwhelm Malta's health infrastructure and cause severe disruption of health services over a period of time extending beyond the pre-hospital response to the initial accident'*. In other cases no reference is made to thresholds.

The peer review mission was conducted shortly after the NRA was finished. This meant that at that point there had apparently not yet been any political decision-making process on the acceptability of the identified risks and on prioritising measures to prevent and prepare. Nevertheless, the fact that the acceptability of a risk was voiced during presentations means that this school of thought is being embraced.

The summary of the NRA provided includes a brief outline of the Risk Reduction and Management Strategies Report[10], an important document pointing the culmination of the NRA. It clarifies the policy objectives, defines intended results to be achieved and includes useful recommendations worthy implementation, for example: to achieve the policy objective to promote awareness and knowledge of risk reduction it is recommended to provide public education regarding hazard mitigation and disaster prevention.

Threshold or quotas could be set for the consequences of the different risks examined, taking into account Malta-specific factors such as the high fluctuation in numbers of people present on the island at any one time. This would help the country compare the current situation and determine whether the possible consequences of risks would be at tolerable levels. This would additionally help the country to produce a compatibility assessment study.

Good practice

- For some risks, the quantitative analysis is detailed and reference is made to bibliography, especially from the University of Malta. This aids the setting of thresholds for the purposes of capability analysis.

[10] More information could be found under point 3.3. Implementation of risk reduction strategies.

- The ambitions set out in the complete NRA document are high. The document includes recommendations and objectives that form the backbone of a thorough and comprehensive NRA and national risk management.
- In the NRA, the relation between each risk and the climate change impact is determined.

Recommendations

- Set thresholds for some risks to determine acceptable possibilities of occurrence or acceptable consequences, taking into account the actual number of people present on the island. This would help the country shape its intervention in order to limit the consequences for the population and the national economy. It would also help the government of Malta to allocate funds to mitigate the results of such incidents.
- Ensure that decision-makers participate in publishing of the risk analyses' results, accept risk estimation and agree on specific standards to deal with them.

2.7 Expertise

National experts in Malta participated in the assessment process. They could benefit from international experts' knowledge and share it/reflect it in their country.

The international experts working in Epsilon, the consulting company that carried out risk assessment process in Malta, have a high and international level of expertise and training. They led and supervised all preparatory meetings with the relevant people from all sectors. The company has a vast experience in risk-related projects: before developing the NRA for Malta, in 2012 it produced the NRA for another EU Member State, namely Greece.

All competent authorities and many other stakeholders (private sector, academia) were involved in some way in the NRA, mostly through the forums. However, the forums at present are still informal in nature.

Risk assessments are not always objective when competent authorities are involved in performing them. It is best to have the risk assessment moderated by someone experienced in risk assessment processes and methodology, while having participation over content by experts from as many disciplines as are relevant to the risk under assessment. It is good if experts differ in their opinion of likelihood and impact: this stimulates discussion and will challenge prejudices.

Training workshops were organised, such as training workshops on cyber threats, where information was shared and different stakeholders involved. There was strong cooperation between health authorities and civil protection over the Ebola crisis and the risk assessment process developed was based on lessons learned from real events.

Good practice

- Training workshops on 'Cyber incident handling' with involvement of relevant stakeholders on cyber threats.

- International tenders were invited for external expertise that included both a technical and financial part and the best tender, in both respects, was chosen. In addition, the Maltese authorities had input at the initial stages of risk identification and evaluation.
- The involvement of stakeholders from different sectors, including private sector and academia.
- The involvement of international experts with a good reputation and similar experience to enrich the assessment process is indicative of the government's strong interest in making this process a success.
- Strong cooperation between health authorities and civil protection, with lessons learned from the Ebola crisis included in the NRA.

Recommendations

- The expert teams, in coordination with the national authorities, should take all comments, feedback and suggestions into consideration to further improve the NRA methodology and risk assessment process in general.
- Keep inviting stakeholders from different entities to cyber workshops and training sessions. Involve major IT infrastructure networks (such as banks, logistics, financial services) and invite them to participate in such capacity building events.

2.8 Infrastructure and information management

During the NRA process, infrastructure such as the GIS system was further developed and applied. In addition to the template used (i.e. the critical infrastructure information sheet), this infrastructure is very useful and could be an example for other countries.

In the risk assessment process there seems to be a wish to obtain a lot of data: a feeling that 'all possible data is necessary before mitigation measures can be defined'. As mentioned earlier, the sources of information used to provide input to the NRA were: newspapers and historical records, plans, reports and official documentation, expert advice, websites and sectoral risk assessments. There is already a large amount of data collection and more is desired (through cameras and other tracking systems). However, there are several risks connected with this desire for more data. It could lead to an overload of information, making it harder to see the bigger picture and design the best mitigation measures for risks in the NRA. There are also legal possibilities and restrictions for this sort of large-scale data collection and combining of collected data, which are laid down in data protection guidelines and legislation. Finally, there is the possibility of misuse of data: protection against this would require increased and ongoing security measures.

There seems to be no institutional method for registering past incidents, a fact that would enable statistical analysis and the availability of data for risk and other assessments. Although the different government departments and even NGOs were able to provide such data to the consultants, there is not sufficient evidence that the collection of data is done in a systematic way or that there is a national registry for

incidents. There is, however, a procedure for public hearings after incidents involving loss of life or property. The Civil Protection Department is responsible for collecting, analysing and disseminating such data and implementing the lessons learned.

Suitable available documentation (historic record and statistics) for the private and public sectors on risks and accidents could be used to help establish an active information system. Such an information system could then be used for inputs to determine the nature of the risks and prevention and mitigation procedures.

Good practice

- There is a procedure in place for public hearings after incidents involving loss of life or property.
- The template used for identifying the details of critical infrastructure.
- The GIS system used for Malta's NRA.

Recommendations

- Ensure that an institution is responsible for gathering and disseminating the information gathered during public hearings for loss of life or property during disasters. Stakeholders such as the judicial system, the Department of Statistics and civil protection authorities should receive data about past incidents.
- Systematise and make publically available the already existing CPD register as a national risk, crisis and disaster registry that could provide future assessments with facts and figures about incidents; this could be used as a statistical input for future research.
- Develop a national database of disaster losses, based on historical events. If available, include information about direct and indirect costs.
- Develop a national spatial data infrastructure, ensuring compliance with EU directives on data security and data protection.

2.9 Financing

The government of Malta provided the financing to draw up the NRA and contracted a specialised consulting company to do this. Malta also provided the necessary capabilities to facilitate the process. There seems to be not only a three-year implementation plan for the mitigation of recognised risks but also for the next steps, like the capability assessment. Financing of the mitigation actions is waiting for approval. However, it was evident that the government of Malta will take political decisions on how to deal with the risks assessed.

There is interest from the government in implementing several projects aiming not only at prevention and mitigation but also at reducing natural and man-made risks.

An area of improvement would be to decide on the amount of resources to be used to deal with the recognised risks, to build resilience among the population and to mitigate risks. If this were achieved, the financing of all phases of the disaster management cycle (including restoration and normalisation) would then be in place.

Insuring and providing the necessary financial resources for disaster risks reduction procedures will need a political decision. The NRA is an important tool to help in taking such decisions. This could be achieved through promoting the results of the NRA at the higher levels of decision-making.

Disaster risk reduction mitigation projects such as national flood relief are considered a successful example of mutual financing shared between the national government and supporting partners such as the EU.

Good practice

- The government of Malta provided financing both for the consulting company to draw up the NRA (international tenders were invited for this purpose) and to involve different organisations in the identification and evaluation of risks.
- The government's support for implementation of NRA outcomes reflects its interest in setting priorities to pave the way for remedial and preventive procedures in the near future.
- The national flood relief project is considered a good example of how to mitigate the consequences of floods and save lives and property.

Recommendations

- Involve decision-makers in the results of NRA to provide the financial support to implement the recommendations. Ensure that there is budget for follow-up of recommendations from these NRAs.
- Ensure that there is sufficient budget to continue conducting the NRA and developing the evaluation methodology. Create a structural budget for the revision of the NRA every 3 years.
- Provide the financial support to undertake specialised scientific studies and research on seismic activity in the area to build resilience codes for earthquakes.
- Search for international partnerships (countries and organisations) to fund and build national capacities to deal with disasters, given the limited resources in Malta.
- Boost investment in disaster risk reduction to increase the capacity of people, communities and environment to cope with disasters at the economic, social, health and cultural levels (one of the Sendai framework priorities 2015-2030).

3. Risk management

Objective 2: Following the development of the national risk assessment and maps, the involved authorities should seek to interface in an appropriate way with the ensuing processes of risk management

3.1 Capability assessment

Capability assessment has not been undertaken until now, but there is a plan to do it in the next phase. Based on the procedure described in the previous chapter, it can be inferred that the basis for the capability analysis is in place and the risk management strategies has been formed. There is a three-year programme in place for follow-up of the NRA, including capability analysis and risk reduction measures. A complete NRA includes a risk reduction and management strategy that also covers areas that were not sufficiently dealt with in the current NRA.

The risk assessment and capability assessment are considered the cornerstone of building planning policies, mitigation efforts and facing risks. The acceleration of implementation capability assessment will also help accelerate establishment of disaster risk reduction procedures, in addition to highlighting weaknesses and strengths and determining the necessary requirements.

Keeping this in mind, the role of forums could be enhanced by involving coordinating line departments in major emergency response, in addition to the heads of government ministries or subject-matter experts who are chairing the forums.

It is clear that exercises are conducted by individual agencies and departments. The Civil Protection Department is participating in these exercises. A good example was provided by the Ministry for Health, which used exercises on response to pandemics to further develop the risk assessment and operational plans. The next phase is to establish a coordinated approach to mainstream emergency response, for example by having an inter-agency exercise programme consistent with the risks identified in the risk assessment process.

In a major accident, Malta's emergency response could be affected, as the total capacity of the island is limited. Malta has only one main hospital and private clinics that would cooperate and deal with casualties in an emergency. However, overall available capacities remain limited. In this situation, international assistance would have to be considered to support civil protection operations. Bilateral agreements with neighbouring countries would be important to face these challenges.

Tourism in Malta is an important sector for the economy. Malta receives every year approximately 1.8 million (2015)[11] foreign visitors. In addition to 'general' bilateral agreements (primarily with neighbouring countries) for international assistance, it is

[11] https://nso.gov.mt/en/News_Releases/View_by_Unit/Unit_C3/ Population_and_Tourism_ Statistics/Pages/Inbound-Tourism.aspx.

possible to have bilateral agreements with specific countries that are the main countries of origin for tourists. Malta's population triples during high season, with some countries supplying a large percentage of tourists. In a disaster, both Malta and tourists' home countries have an interest in an adequate response being in place. An agreement for assistance would serve both interests, plus might help in communication with affected tourists when their command of the English language falls short. The embassies of those countries should be added to the list of key actors during emergencies, if this is not yet the case. Since a significant part of Malta's economy depends on tourism it is important to protect this sector from possible disaster. Agreements for international assistance are mainly about response when disaster strikes (they are reactive and not preventive). However, agreements on cooperation to reduce vulnerabilities and risks (co-projects, sharing of best practices/expertise, etc.) can also have a preventive effect.

As the capability analysis is to be done within a three-year period, there are no recommendations at this stage. It makes sense to assume that the risk assessment must first be digested by the relevant stakeholders so that they can evaluate their capability to cope with the different risks assessed. An important aspect that should be taken into account in mitigation measures and preparation for disasters concerns limitations in national infrastructure, such as roads. Also, mitigation measures in one area can cause new hazards in another, so there should be a strategic overview.

Most of the underexposed risks/hazards seem to be included in the risk reduction and management strategy, although some Malta-specific risks do not appear here, for example fireworks explosions and rises in sea level. It would be worthwhile to specifically include these in the strategy.

Good practice

- Robust cooperation between the Civil Protection Department and the health sector that strengthens capacity for disaster risk management (command interoperability during an emergency).
- There is a three-year plan for capability analysis and mitigation measures. The infrastructure to implement this plan is in place and the intention to carry it out is there also. However, implementation will depend on political decisions to be taken in due time by the government of Malta.

Recommendations

- Prioritise capability assessment as it is a pre-requisite for both the building of resilience and for a response and recovery plan for the different risks recognised. The government should provide the suitable conditions to support this. Use the NRA to identify generic capabilities that can be used to mitigate different risks and different levels of severity and impact, as this is described as one of the goals for the 'way forward'.
- Develop a comprehensive exercise programme in the context of the NRA implementation plan to include the top 10 risks as a priority in an all-hazards approach exercise programme. These should include single agency exercises, inter-agency exercises and third party exercises across a three-year rolling programme of walkthrough, table-top, command post exercises and full

exercises. Involve neighbouring countries to test capabilities to receive international assistance in case of emergency.

- Establish bilateral agreements with neighbouring countries and countries from which a large number of tourists originate on sharing capabilities on emergency response.
- Adopt as much of the risk reduction and management strategy as possible, preferably all.
- Consider alternative sites for acute hospital services in case the hospital is severely damaged, cannot be reached or is overflowing due to the number of victims.

3.2 Implementation in policy fields

The risk assessment results in specific recommendations for related policy fields. The most important of these is the enhancing of emergency response capabilities as this would go a long way to improving resilience given Malta's size. The policy fields included in the strategy are:

- land use
- building design criteria
- disaster mitigation at all levels
- policy on chemical process and facility safety measures
- response planning.

Experts provided recommendations on several related policy fields that need implementation without delay, even if these are less popular measures. Some measures are not directly linked to the risk assessment per se, but indirectly reflect the Maltese authorities' determination to have a holistic approach to risk management. Risk assessment itself is just a tool for devising strategies on how to deal with risks identified and assessed.

A good example of a risk reduction strategy currently in place is the Strategic Plan for Environment and Development implemented by the Planning Authority. The plan includes policies to reduce risk hazards, particularly from rain water runoff from development. Another impressive initiative is the National Flood Relief Programme funded by the EU, which aims to mitigate the impacts of flash floods on population and urban areas and to create scope for water conservation as far as feasible. Building codes also include dimensions for water storage at private homes.

An example of a policy that should be implemented but which is currently not in place is the policy on anti-seismic building codes. Peak ground acceleration mapping as an Annex to Euro-code 8 for the anti-seismic design of structures is yet to be produced. This means that Maltese engineers lack the tools for the anti-seismic design of structures. In addition, domino effects on Seveso sites are currently not taken into account. The challenge is to secure both the political commitment and the funding for implementing the above-mentioned risk reduction and management strategies.

The development of organisational risk assessments in public organisations is in progress. Private organisations identified as Seveso sites are obliged to have internal risk assessments. An overall risk assessment of different activities within a single Seveso site seems to be lacking, as well as an overall risk assessment of Seveso sites in close proximity to each other and/or to critical infrastructure/populated areas. Worst case scenarios should be developed.

Implementation of early warning systems should be improved in order to inform civil protection authorities on risk occurrence and improve warning and information to the general population. The tsunami risk is not considered a priority, and problems with tsunami warning messages issued under NEAMTWS were raised, as sometimes contradictory messages and false alerts are published.

Good practice

- The Strategic Plan for Environment and Development is used as a basis for decisions on development and environment permits, for example floods.
- Water reuse (water storage) as part of the implementation of the national flood relief project, financed by EU.
- Building codes for water storage, dimensioned for average rainfall over 1 year and legislation about reuse of water in private homes.

Recommendations

- Implement recommendations by experts concerning land use planning and building design criteria, such as:
    - directing development away from areas prone to flooding;
    - considering flash flood scenarios, major accidents in Seveso sites and storm surge as inputs to land use planning guidelines and restrictions; re-naturalisation (i.e. returning sites to nature) could be a strategic goal;
    - using competent authorities for coastal zones as key players to increase resilience;
    - accelerating the discussion on building codes so as to achieve building codes that include seismic resistance.
- Integrate NRA conclusions in national policy, at cross-sectoral level and in civil protection action plans.
- Consider NRA conclusions to develop/update emergency plans/contingency plans/ recovery plans for all top 10 risks analysed.
- Different stakeholders should include NRA conclusions in the preparation of contingency plans.
- Develop overall comprehensive risk assessments for each Seveso site:
    - Internal: for each Seveso site, taking into account potential domino effects within the area where the Seveso site is located and all factors enhancing or mitigating those risk factors (e.g. specific activities, products used/stored, escape routes and routes for emergency services, the

surrounding area (population, vegetation, etc.), possible chain reactions).

- External: for Seveso sites in close proximity to each other and/or to critical infrastructure/populated areas, taking into account the same risk adding and mitigating factors mentioned above.

- Draw up guidelines on scenarios to harmonise the risk assessment developed by the operators of Seveso sites and provided to the Civil Protection Department to prepare the external emergency plans.
- Build facilities and institutions in line with disaster resilience codes so as to cope with disasters and floods and etc., and develop capacities to cope with disasters.
- Develop the national implementation system to monitor risks and provide a 24/7 early warning to the civil protection system for floods, earthquakes and severe weather. Ensure proactive involvement in international cooperation such as the Tsunami Early Warning and Mitigation System in the North-eastern Atlantic (NEAMTWS).
- Malta is encouraged to share the experience of the Flood Relief innovative project with international communities, even though the experience is very specific to Malta due to its size and topography.

3.3 Implementation of risk reduction strategies

A separate report was produced for reduction and management strategies.[12] The report clarifies the policy's objectives by providing precise and measurable statements. It sets the course of action to be followed and the intended results to be achieved, as well as the indicators by which to measure those results. The Risk Reduction and Management Strategies Report is planned to be implemented over a three-year period. The document has a number of highly detailed objectives (action statements) with relevant recommendations (action points) to be addressed. The sections presenting the risk reduction and management strategies that branch out from the NRA (page 47) are the following:

1. improvement of knowledge and awareness about hazards, threats and risks
2. mitigation of hazards and threats
3. protection of critical infrastructure and key resources
4. improvement of response and recovery capability

It was stated in Malta's NRA Report submission to the European Commission that 'this is perhaps the most important part of the entire risk assessment endeavour'. The peer evaluation team is of the view that this aspect of the risk assessment process is indeed very important and that its contents were very much worth including in this report. The risk reduction and management strategy is an excellent basis for a detailed implementation plan over a three-year timeframe. It appears to be an extrapolation of the main points of the NRA process, which needs to be implemented as soon as possible given the current risk profile. This strategy seems

[12] Ref. p. 47 Risk Assessment Report EC Submission, December 2015.

to fit in very well with the next step in the process. The process should follow such a large undertaking by the Maltese authorities in developing a NRA.

This plan seems to involve different stages of the disaster management cycle, like enhanced response, mitigation and preparation, although it is not evident that the plan involves a prevention element.

While Malta is at an early stage in the whole improvement process and much excellent work has been achieved, it is imperative that it now capitalises on this work, despite the reduced number of skilled resources and expertise that apparently exist within Malta. It is imperative also to use the existing skill set and personnel who already worked on the project when following through on implementation. There is a natural tendency to become somewhat war-weary in such a large and complex project and there is a danger of losing the momentum, resources and skills already built up in developing the project. While there is excellent buy-in at a senior level of the government at present, this should not be taken for granted in the context of the many changes that may arise. It is not clear when the implementation phase will begin, other that it will be implemented over 3 years, with appropriate budget facilities.

The political commitment to the way forward could have been more apparent, for example, through the funding of the relevant actions. A political decision, however, is yet to be seen, as the whole procedure is still at its initial stages: the risk assessment itself, for example, was finalised only by the end of 2015.

All concerned partners who participated in the national assessment phases should be involved in implementing the resulting recommendation from the NRA, each partner acting according to its specialisation and with full coordination with the concerned authority. Implementation should include the full disaster management cycle (prevention, preparedness, response and recovery).

Good practice

- The approach of separating sections of Malta's NRA, which runs to over 1 000 pages, into separate documents can be seen as good practice.
- A separate report was prepared on disaster risk reduction strategies and its management. This involves a three-year plan laying down the objectives, purposes and recommendations of the NRA with a high level of detail.
- A comprehensive and ambitious risk reduction and management strategy was formulated as a result of the first NRA.

Recommendations

- Consider the risk reduction and management strategy in relation to capability assessment, so as to form the basis for Malta to confront the possible risks facing it in a holistic way.
- Implement the risk reduction and management strategy without delay. Care should be taken not to lose momentum and skilled personnel; delay of budget allocation and implementation process would jeopardize the exercise.

- Ensure sufficient legal, financial and political support for the recommendations in the NRA report. Allocate a part of the governmental budget to implement the recommendations of the risk management strategies. The NRA is considered an official approved document, and its implementation depends on financial support from organisations to implement the risk reduction projects and activities.
- Ensure stakeholders are involved in implementing the subsequent phases of the NRA and participate in setting up outputs for proposed future activities.
- A continued iterative process should prevail, including a review of all aspects of the risk assessment outputs. These should include new and emerging threats over the three-year cycle. This will ensure the availability of technical and financial capabilities for the risk management and identification process that has already taken place.
- Hold national dialogue or general discussion about implementing the recommendations, so as to determine the implementation priorities and distribute responsibilities.

4. Risk communication

Objective 3: The development and outcome of (national) risk assessments is transparent and accountable to stakeholders and the general public (with the exception of sensitive information)

4.1 Risk communication to the public

A risk communication plan is not yet in place to inform both the organisations consulted and the public about the details of the final report, excluding information that is sensitive. A risk communication plan is expected not only to enlighten the stakeholders but also to be a tool for public consultation about the process of risk management.

There will be a dissemination of the results of the NRA to the public, excluding sensitive issues. However, there does not seem to be the necessary capacity to communicate the results to the public as there is no apparent risk communication strategy or specific communication plan in place to achieve this intention. However, improving knowledge and raising awareness about hazards, threats and risks is the first goal in the risk reduction and management strategy. Consultation and communication of findings and results will contribute to identifying capacities and resources available to reduce the level of the risk.

There was a policy decision made to not yet share the outcomes of the NRA. Sharing risks, scenarios and potential impact with the public without further communication about mitigation measures is not recommended. It is therefore understandable that communication to the public is delayed until mitigation measures are decided upon. However, risks and mitigation measures should be communicated to the public as soon as possible. This is especially important in such a small society as Malta where some citizens might be already aware of risks identified in the NRA through their professional channels because they either work for government or have been involved in the NRA as a private-sector expert, academic, etc.

It is worth underlining that the education and enlightenment of the public is a very important but challenging and complicated task, one that needs to take into account a society's perception of risk. Risk research has shown that the basic understanding of risks differs within societies, making risk communication even more important for effective and efficient risk management, because it helps improve the public's understanding of risks. Successful risk communication needs first a common understanding of the term risk and, second, common moral understanding, experiences and values with a common set of signs and symbols (Hampel, 2006). In this sense, effective risk communication needs to provide an adequate understanding of the known facts, including what can be perceived as uncertain and ambiguous.

It is therefore crucial to develop a communication strategy for the general public including the proposed mitigation measures and preferably a perspective on action

that the public can take itself to increase protection or resilience. Without such dissemination to all stakeholders (excluding sensitive issues), the NRA will just be another report, fulfilling the obligations of Malta to the European Commission, but not encouraging stakeholders to take the NRA a step further.

Besides the information element, a risk communication plan could seek to find out what other information or reassurances the public needs or requires for country-specific or region-specific information about the risks. A risk/hazard map accessible for the general public could support the communication and increase the communication to risk-prone areas and risk perception among the population.

There is much room for public consultation after removing the sensitive part from the NRA. There is room for consultation with government departments outside their field of expertise in order to put the NRA in a wider context. There has also yet to be any consultation with the public, as part of a bottom-up approach to this issue.

Planning for media management is an important part of a whole-of-society approach to crisis management. The key purpose of a media management strategy is to deliver accurate, clear and timely advice and information to the public and the media, so that the public can feel confident, safe and well informed during an emergency. The communication plan should include common principles for the Maltese response agencies on the provision of information to the public and on working with the media during emergencies. Specific information should be provided to the public about the particular risk that they may have to face in the event of a major emergency. An overall improvement in public consultation can be facilitated by putting in place a communication plan involving all the elements outlined above to give the public a realistic expectation of what may happen, how they can avoid such an eventuality or mitigate against it.

Good practice

- Close relations between different sectors in Malta will make it easier to communicate the result of the NRA within the country.

Recommendations

- Develop a national information and communication strategy on risks, in order to share information with the public. The risk communication plan could include instructions to the public how to be better prepared for different possible disasters but also how to react in case the unthinkable happens. Devise the communication plan in such a way that it also becomes a tool for public consultation and not just a means of enlightening stakeholders. The risk communication plan could include of the following actions:
    - Identify the target audience: include subgroups of the population, like government and NGOs, professionals and academics, who have an interest in being aware of the findings of the NRA.
    - Identify what the target audience has to do: some stakeholders may need to take action and others may be required to plan the next steps or even take decisions concerning economic development or land use.

- Identify the resources required to implement actions: resources will be required to implement the next phases of risk mitigation and to plan how to cope with different disasters.
- If possible, predict likely reactions and take pre-emptive action: this phase will include hands-on professionals, academics and the broad public.
- Decide on appropriate mediums for the communication: this may take the form of open presentations, internet sites, information campaigns, publishing a summary of the NRA, etc.
- Communicate using the chosen medium: this will require careful delivery of the messages to change the attitude of the audience, providing information, disseminating details etc.
- Monitor the effects of the communication: this step may not necessarily involve special methods and complex questionnaires. It may only require careful examination of the effects of the action taken.

- Promote the role of local councils as forums to give advice on self-protection and public education on disaster risk reduction.
- The public should be consulted during emergency planning and information about risk-prone areas should be shared.
- Organise media forums to better exchange information among the population.
- Include schools in promoting resilience and disaster risk reduction activities. Publish and release brochures, booklets, awareness materials and campaigns and if possible include awareness in the educational curricula for all phases.

4.2 Consultation of stakeholders

The political structure in Malta is centrally organised: the central government controls administration around the country. There are 54 local councils on Malta's main island and 14 in Gozo. It appears that there was no public consultation as such on the NRA; this is something that should now be considered.

However, there was widespread consultation across all sectors, both public and private. Experts in the field of crisis management, critical infrastructure protection and general government departments were involved in producing the NRA. This is a result of the relatively small size of the Maltese Islands and the country's small population. It is worth noting that crisis communication strategies and policies underpin overall risk management strategies. It is also essential to identify risk communication strategies for informing both the public and professionals. In the event of a major emergency involving large numbers of people, the likelihood that foreign nationals will be involved is great. There are plans for dissemination of the information produced during the NRA.

A summary of the risk assessment has been sent to the Commission, as requested. The full version of the risk assessment is classified and is not available outside the

Maltese authorities. There is a plan for a wider information and consultation with the public, as part of a three-year plan, but this has not yet happened.

It seems that stakeholders are consulted through the forums that have served to collect discuss and compare information, knowledge and experience for the purpose of the NRA. The necessary information was provided by governmental and private organisations to those considered as stakeholders. From this point of view, the participation was wide enough.

It is possible that the impact of floods in Malta will increase in severity in the future due to climate change, industrial and building developments and population increase. For this reason, all stakeholders and vulnerable people will need to be integrated in the planning process.

Good practice

- Involvement of relevant stakeholders during the process: all were informed about the risks and conclusion of the NRA.
- Different stakeholders' views on the identification and evaluation of risks were obtained at the beginning of the NRA exercise. Stakeholders included government organisations, NGOs and private companies, mainly from the maritime and transport sectors.
- There is a plan to disseminate the NRA's conclusions and stakeholders' participation in forming policies to deal with the different risks identified and assessed.
- The widespread consultation process entered into by the risk assessment development team across all sectors (both public and private) can be seen as good practice. Crisis management and critical infrastructure protection experts and general government departments were involved in producing the NRA. This process alone has the effect of encouraging awareness raising through the involvement of all stakeholders in the risk assessment process.

Recommendations

- Develop a national information and communication strategy on risks, as specified under section 3.2. It is important also to disseminate the results of NRA (except for sensitive information) to all concerned stakeholders and the public. Make sure that all those who took part in the NRA are involved so that they have a chance to be informed about its outcome and about the financing necessary to mitigate risks and build resilience in their field of expertise. In this way, the different stakeholders will have the opportunity to contribute to policy formation and decision-making on how to mitigate the assessed risks.
- Continue the broad consultation process into the implementation phase and set an adequate budget for it.

- Ensure that the Media Forum within the critical infrastructure protection and emergency services structure in Malta is strengthened and tasked with developing a comprehensive communication strategy in a consistent manner across all sectors of the crisis management response.

Annex I Terminology and abbreviations

The following definitions are working definitions for the purpose of the peer review documents only. They are based largely on EU legislation and guidelines. Where official EU definitions were not available, UNISDR definitions have been used.[13]

Definitions

Contingency planning is a management process that analyses specific potential events or emerging situations that might threaten society or the environment and establishes arrangements in advance to enable timely, effective and appropriate responses to such events and situations.

Disaster refers to any situation which has or may have a severe impact on people, the environment or property, including cultural heritage.

Emergency services refer to a set of specialised agencies that have specific responsibilities and objectives in serving and protecting people and property in emergency situations.

Early warning system is the set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organisations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss.

Peer review is a governance tool by which the performance of one country in a specific area (in this case risk management/civil protection) is examined on an equal basis by fellow peers who are experts from other countries.

Preparedness is a state of readiness and capability of human and material means, structures, communities and organisations enabling them to ensure an effective rapid response to a disaster, obtained as a result of action taken in advance.

Prevention is understood as (i) where possible, preventing disasters from happening, and (ii) where they are unavoidable, taking steps to minimise their impacts.

Resilience is the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential structures and functions.

Response is any action taken at national or sub-national level in the event of an imminent disaster, or during or after a disaster, to address its immediate adverse consequences.

Risk management capability is the ability of a Member State or its regions to reduce, adapt to or mitigate risks (impacts and likelihood of a disaster) identified in its risk assessments to levels that are acceptable in that Member State. Risk management

[13] http://www.unisdr.org/we/inform/terminology.

capability is assessed in terms of the technical, financial and administrative capacity to carry out adequate:
(a) risk assessments;
(b) risk management planning for prevention and preparedness;
(c) risk prevention and preparedness measures.

Stakeholders with an interest in disaster risk management include scientific communities (including engineering, geographical, social, health, economic and environmental sciences), practitioners, businesses, policy-makers, central, regional or local levels of government and the public at large.

Sub-national level is the regional, provincial or local government level tasked with disaster risk management.

Malta applies variations of standard definitions, which include the following:

Term	Definition
National critical infrastructure (CI)	An asset, system or part thereof located in Malta which is essential for the maintenance of vital societal functions, health, safety, security, economic or social well-being of people, and the disruption or destruction of which would have a significant impact in a Member State as a result of the failure to maintain those functions (Legal Notice 434 of 2011).
Critical infrastructure (CI) owners or operators	Entities responsible for investments in, and or day-to-day operation of, a particular asset, system or part thereof designated as CI or ECI (Legal Notice 434 of 2011).
European critical infrastructure (ECI)	A critical infrastructure located in Member States the disruption or destruction of which would have a significant impact on at least two Member States. The significance of the impact will be assessed in terms of cross-cutting criteria. This includes effects resulting from cross-sector dependencies on other types of infrastructure (Directive 2008/114/EC).
Disaster	A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources (UNISDR, 2010). Any situation which has or may have a severe impact on people, the environment, or property, including cultural heritage (Decision No 1313/2013/EU of the European Parliament and of the Council of 17 December 2013 on a Union Civil Protection Mechanism).
Disaster risk	The potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period (UNISDR, 2009). Disaster risk is the product of natural and technological hazards and vulnerabilities to these hazards.
Exposure	People, property, systems, or other elements present in hazard zones that are thereby subject to potential losses (UNISDR, 2009).
Hazard	A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage (UNISDR, 2009).
Preparedness	The knowledge and capacities developed by governments, professional response and recovery organisations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions (UNISDR, 2009).

Prevention	The outright avoidance of adverse impacts of hazards and related disasters (UNISDR, 2009).
Threat	A potentially damaging physical event, phenomenon or activity of an intentional/malicious character (EC, 2010).
Risk	The effect of uncertainty on objectives. An effect is a deviation from the expected — positive and/or negative. Objectives can have different aspects (such as financial, health and safety, and environmental goals) and can apply at different levels (such as strategic, organization-wide, project, product and process). Risk is often characterized by reference to potential events and consequences, or a combination of these. Risk is often expressed in terms of a combination of the consequences of an event (including changes in circumstances) and the associated likelihood of occurrence (ISO 31000:2009). The combination of the probability of an event and its negative consequences (UNISDR, 2009). The combination of the consequences of an event (hazard) and the associated likelihood/probability of its occurrence (EC, 2010).
Vulnerability	The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard (UNISDR, 2009).

Abbreviations

Abbreviation	Definition
AFM	Armed Forces of Malta
CI	Critical infrastructure
CIP	Critical infrastructure protection
CIPD	Critical Infrastructure Protection Directorate
CPD	Civil Protection Department
DM	Disaster management
DRM	Disaster risk management
DRR	Disaster risk reduction
ERA	Environmental Resource Authority
EU	European Union
GIS	Geographical information system
GRRASP	Geospatial risk and resilience assessment platform
IAID	Internal Audit and Investigations Department
IARM	Internal Audit and Risk Management Directorate
ISO	International Organisation for Standardisation
JRC	Joint Research Centre
MTI	Ministry for Transport and Infrastructure
NEAMTWS	Tsunami Early Warning and Mitigation System in the North-eastern Atlantic
NGO	Non-governmental organisation
NRA	National risk assessment
OECD	Organisation for Economic Cooperation and Development
OPM	Office of the Prime Minister
OSPs	operator security plans
PAR model	Pressure and release model
PGA	Peak ground acceleration
RA	Risk assessment
SIMIT	Integrated System for Trans-boundary Italian-Maltese Civil Protection
UNISDR	United Nations Office for Disaster Risk Reduction

Annex II Overview of stakeholders

Representatives of the following institutions in Malta were involved in the peer review:

Abbreviation	Stakeholder
ADI	ADI Associates
AFM	Armed Forces of Malta
CDRT	Centre for Development, Research and Training
CIP	Critical Infrastructure Protection
CIPD	Critical Infrastructure Protection Directorate
CPD	Civil Protection Department
CSIRTMalta	Computer Security Incidence Response Team National Agency Malta
DCA	Civil Aviation Directorate
EM	Emergency Management
Epsilon	Epsilon International SA
ERA	Environmental Resource Authority
IARM	Internal Audit and Investigations Department
MATS Malta	MATS Malta
Air Travel Services	Air Travel Services
MCA	Malta Communications Authority
MCC	Mediterranean Conference Centre
MFH	Ministry for Health
MFIN	Ministry for Finance
MHAS	Ministry for Home Affairs and National Security
MITA	Malta Information Technology Agency
MTI	Ministry for Transport and Infrastructure
OHSA	Occupational Health and Safety Authority
OT	Oil Tanking Ltd
PA	Planning Authority
PS-MHAS	Permanent Secretary, Ministry for Home Affairs and National Security
Police	Police
REWS	Regulator for Energy and Water Services
SEWCU	Sustainable Energy and Water Conservation Unit
TM	Transport Malta
UOM	University of Malta
VTS	Vessel Traffic Services
WD	Works Department
WID	Works and Infrastructure Department

Annex III List of documentation

The following documentation was used to prepare for the review:

Nr.	Title	Category	Date
1	Emergency Powers Act	Law/regulation	1963
2	Civil Protection Act	Law/regulation	1999 amended 2015
3	Critical infrastructure and European Critical Infrastructures (Identification, Designation and protection) order	Law/regulation	2011
4	Climate act	Law/regulation	2015
5	Malta National Risk Assessment Report	Report for EU	2015
6	Risk Assessment and Mapping Guidelines for Disaster Management Brussels 21.12.2010 SEC(2010) 1626 Final	EU legislation	2010
7	National Climate Change — Adaptation Strategy	Strategy	2012
8	National Strategy for Policy and Abatement Measures Relating to the Reduction of Greenhouse Gas Emissions	Strategy	2009
9	National Environment Policy	Policy document	2012
10	Risk Management Procedures Manual — Integrating Risk Management in day-to-day operations and decisions (IAID)	Manual	2015
11	Presentation Malta Infrastructure Protection — Peer review Poland	Presentation	2016

Annex IV Review framework for risk assessments

Peer reviews are conducted using standard frameworks that guide the peers in collecting information, analysing the disaster risk management structure in the country under review and the way policies are implemented The standard frameworks consist of objectives, requirements and indicators relating to different disaster risk management areas. Example questions included in the frameworks can be used to guide the peer review team in the preparatory phase and during the mission. The teams can develop further questions during their review.

The objectives and to a lesser extent the requirements are the essential policy components under review. Review questions should therefore relate closely to the objectives, particularly those where the preliminary information received was not sufficiently clear or showed gaps. The indicators cover a wide area of policies, tools and methodologies and can be used by peers to help them identify examples of good practice, areas for improvement or possible gaps. The indicators do not represent a 'checklist' against which the country should be formally assessed.

No.	Objectives — Requirements — Indicators
	This thematic peer review for risk assessments is based mainly upon the EU working paper for risk assessment and mapping guidelines for disaster management (RAMG). Version 21.12.2010 — SEC(2010) 1626 final. Objective 4 is based upon the Risk Management Capability Assessment Guidelines (RMCA), version February 2015
1.	**A coherent system of national, regional, local, cross-border and sectoral risk assessments is developed and used to provide a good understanding of the risks in the reviewed (member) state on all governmental levels and in the private sector**
1.1	**Framework: Up-to-date, multi-hazard risk assessments based on unitary methodology are available on different levels and in different sectors and are linked to climate change adaptation strategies. The risk assessment fits within an overall framework**
1.1.1	Multi-hazard risk assessments on different levels and in different sectors are available
1.1.2	Risk assessments are linked to climate change adaptation strategies
1.1.3	Risk assessments are carried out based on a clear legal and/or procedural framework
1.1.4	The role of risk assessments in overall disaster risk management is defined at the appropriate national and/or sub-national level

No.	Objectives — Requirements — Indicators
1.2	**Coordination: A risk management structure assigns clear responsibilities to all entities involved in the risk assessment. National risk assessments should aim to involve networks so that the relevant actors reach a common understanding of the risk assessment methodology, the risks faced and of their relative priority (same requirements for regional, local and sectoral risk assessments) The system for risk assessments shows coherence between the different levels of government and between different sectors**
1.2.1	At the beginning of the national risk assessment process one authority must be designated for the task of coordinating the work
1.2.2	There are clearly defined responsibilities and roles/functions assigned to the relevant entities participating in the risk assessment so that overlaps or mismatches between responsibility and capability are avoided
1.2.3	The responsibilities to assess specific risks are assigned to relevant entities
1.2.4	The cross-sectoral dimension of risks has been integrated in the risk assessments
1.2.5	The risk assessment method is developed in cooperation with the relevant authorities such as scientific communities, including government entities not directly involved such as social, health, economic and environmental sciences, practitioners, private sector, people at risk and policy makers
1.2.6	A stakeholder assessment is made before starting the risk assessment process and kept up to date (MiSRaR) [The stakeholders (public and private and on different levels of government) to be involved in the assessment are defined and invited to participate]
1.2.7	There is cooperation with the private sector where their risk assessments complement the efforts of public authorities
1.2.8	An (inter)national cooperation network for the formation of macro-regional risk analysis is established. Neighbouring countries are involved in the compilation of risk analyses and their risk analyses are taken into account
1.2.9	The risk assessments on other government levels and in different sectors are taken into account in the national risk assessment
1.2.10	The national government encourages and stimulates risk assessments by other levels of government and in different sectors
1.3	**Methodology: A methodology is developed to carry out risk assessments. Expected impacts of identified risks are assessed according to a methodology developed and risks accordingly prioritised by which a shared understanding is reached on both the range of risks considered relevant and the levels of severity for which preparedness planning would be judged appropriate**
1.3.1	The national or sub-national entity developed a methodology for risk assessment
1.3.2	The cross-border dimension of risks has been integrated in the risk assessments
1.3.3	The risk assessment considers infrastructure in the risk assessment
1.3.4	The concept of 'risk' and the main factors of risk which have to be taken into account in the risk assessment are defined and accepted
1.3.5	The scope or breadth of the risk assessment (and the justification for including or excluding specific risks) is defined and accepted
1.3.6	A categorisation of kinds of risks is defined and accepted
1.3.7	The scoring criteria for the risk assessment are defined and accepted
1.3.8	The methods used for the risk assessment are defined and accepted
1.3.9	A protocol for the use of expert opinions is defined and accepted
1.3.10	The uncertainty of the methods is justified
No.	**Objectives — Requirements — Indicators**

1.4	**Risk identification: The national risk assessment is based upon a sound risk identification: the finding, recognising and describing of risks**
1.4.1	There is a listing of separate risks and risk scenarios, each with their description
1.4.2	For each risk there is a separate risk map, showing the spatial distribution of the hazard and the vulnerabilities
1.5	**Risk analysis: For every risk and risk scenario identified in the previous risk identification stage, the risk analysis process carries out a detailed (and if possible quantitative) estimation of the probability of its occurrence and the severity of the potential impacts**
1.5.1	The risk analysis includes probability and impact estimations, as well as a vulnerability analysis
1.5.2	The impact analysis includes human impacts, economic and environmental impacts and political and social impacts
1.5.3	The separate impact scores of each risk are recorded and justified, with clearly identified and substantiated assumptions
1.5.4	The outcome of the risk analysis can be presented in a risk matrix for impact and probability
1.6	**Risk evaluation: The results of the risk analysis are compared with risk criteria to determine whether the risk and/or its magnitude is acceptable or tolerable**
1.6.1	(Political) risk criteria are set to determine whether the risk and/or its magnitude is acceptable or tolerable
1.6.2	A political decision is made about the acceptability of risks and the prioritisation of risk prevention and preparation
1.7	**Information & communication: An effective information and communication system for the assessment of risk is available**
1.7.1	The necessary administrative capacity is available to communicate the results of risk assessments to the public
1.7.2	The necessary administrative capacity is available at national and/or appropriate sub-national level to communicate internally the results of risk assessments, including scenarios lessons learned, etc.
1.7.3	The results of risk assessments are integrated in a risk communication strategy
1.8	**Expertise: The experts carrying out the risk assessment have the competencies and responsibilities and received adequate training to carry out the risk assessment**
1.8.1	The distribution of responsibilities for the assessment of the risks regularly is reviewed
1.8.2	The experts responsible for the risk assessment(s) are adequately informed, trained and experienced in the assessment of risks
1.9	**Infrastructure: The infrastructure and appropriate information is available to carry out the risk assessment**
1.9.1	ICT infrastructure is available to carry out risk assessments
1.9.2	Appropriate information and data (including historical data) is available to carry out risk assessments
1.10	**Financing: Financing includes the identification, estimation and reservation of funds required to carry out and update risk assessments**
1.10.1	The appropriate financial capacity is available to carry out and update work on risk assessments

No.	Objectives — Requirements — Indicators
2.	**Following the development of the national risk assessment and maps, the involved authorities should seek to interface in an appropriate way with the ensuing processes of risk management**
2.1	**Capability assessment: The risk assessment is followed by a capacity analysis and capability planning**
2.1.1	There is a plan or programme to perform a capacity analysis and develop capability planning on the basis of the national risk assessment
2.2	**Recommendations: The risk assessment results in specific recommendations for related policy fields (if relevant):**
2.2.1	for land use planning
2.2.2	for building design criteria
2.2.3	for community disaster mitigation/decentralised risk prevention policy
2.2.4	for the policy on chemical process and facility safety measures and for design of sustainable industrial processes
2.2.5	for designing and maintaining critical infrastructure
2.2.6	for monitoring and enforcement
2.2.7	for national and decentralised response planning
2.3	**Implementation: the implementation of the recommendations is ensured; relevant stakeholders are involved**
2.3.1	Agreement is reached about an implementation plan or programme
2.3.2	There is interconnection between the separate plans (national, decentralised, sectoral)
3.	**The development and outcome of (national) risk assessments is transparent and accountable to the stakeholders and general public (with the exception of sensitive information)**
3.1	**Risk communication: Potential risk scenarios are published to inform the population**
3.1.1	The risk assessment and the scenarios therein are published openly for the public
3.1.2	Specific information is provided about the particular risks the population faces (in certain areas)
3.1.3	The publication of the risk assessment includes an overview of the government's preparatory measures
3.1.4	The publication of the risk assessment includes advices on how the general public could be better prepared
3.1.5	The competent public body has decided which information from the national risk assessment is sensitive and will therefore not be published
3.2	**Consultation stakeholders: Draft risk assessments should be widely consulted with stakeholders and interested parties, including central and regional levels of government and specialised departments (RAMG p. 13)**
3.2.1	The risk assessment is published and announced for consultation
3.2.2	The stakeholders are informed on the particular risks they face
3.2.3	Interested parties are consulted on flood risk management plans at the catchment scale
3.2.4	Flood maps and plans are made publicly available