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Peer review – report Cyprus 2018



Peer review

Cyprus 2018

2018-2019 Programme for peer reviews in the framework of EU cooperation on civil protection and disaster risk management.



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- ▶ **Edward Foale**, Assistant Director of Catastrophic Emergency Planning, Civil Contingencies Secretariat, UK Government's Cabinet Office;
- ▶ **Mihkel Mäeker**, Adviser, Estonian Rescue Board (ERB);
- ▶ **Giorgi Ghibradze**, Head of National Crisis Management Centre, Emergency Management Service of Georgia;
- ▶ Lieutenant Colonel **Azwar Al Dabubee**, Director of the Disaster Department in the Jordan Civil Defence Directorate.

Figure 1: Peer review team and representatives from the Cyprus Department of Forests

(From left to right: Azwar Al Dabubee, Niels van Wanrooij, Loizos Loizou, Kostas Papageorgiou, Haralambos Alexandrou, Mihkel Mäeker, Claudia Berchtold, Edward Foale, Karolina Kalinowska, Giorgi Ghibradze and Petros Petrou)



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The peer review was financed by the EU.

Figure 2: Cypriot and EU flag



List of abbreviations

Abbreviation	Definition
CCD	Cyprus Civil Defence
DG ECHO	Directorate-General for European Civil Protection and Humanitarian Aid Operations
DoF	Department of Forests
DRA	Disaster risk assessment
DRM	Disaster risk management
DRR	Disaster risk reduction
DSA	Digital Security Authority
EC	European Commission
EU	European Union
GSD	Geological Survey Department
HQ	Headquarters
INFORM	Index for risk management
MoI	Ministry of the Interior
NRA	National risk assessment
NSACC	National Strategy for Adaptation to Climate Change
SOPs	Standard operating procedures
UCPM	Union Civil Protection Mechanism
UK	United Kingdom
WDD	Water Development Department

1. Introduction

Peer review is a governance tool where the performance in disaster risk management (DRM)/civil protection of one country ('reviewed country') is examined on an equal basis by experts ('reviewing peers') from countries participating in the Union Civil Protection Mechanism (UCPM) and eligible neighbouring countries. The process is based on exchange of experiences and results in non-binding recommendations aimed at policy improvements in DRM and civil protection. The peer review process provides an effective way to (1) facilitate exchange of good practices, (2) strengthen mutual learning and common understanding and (3) deliver credible and trusted recommendations.

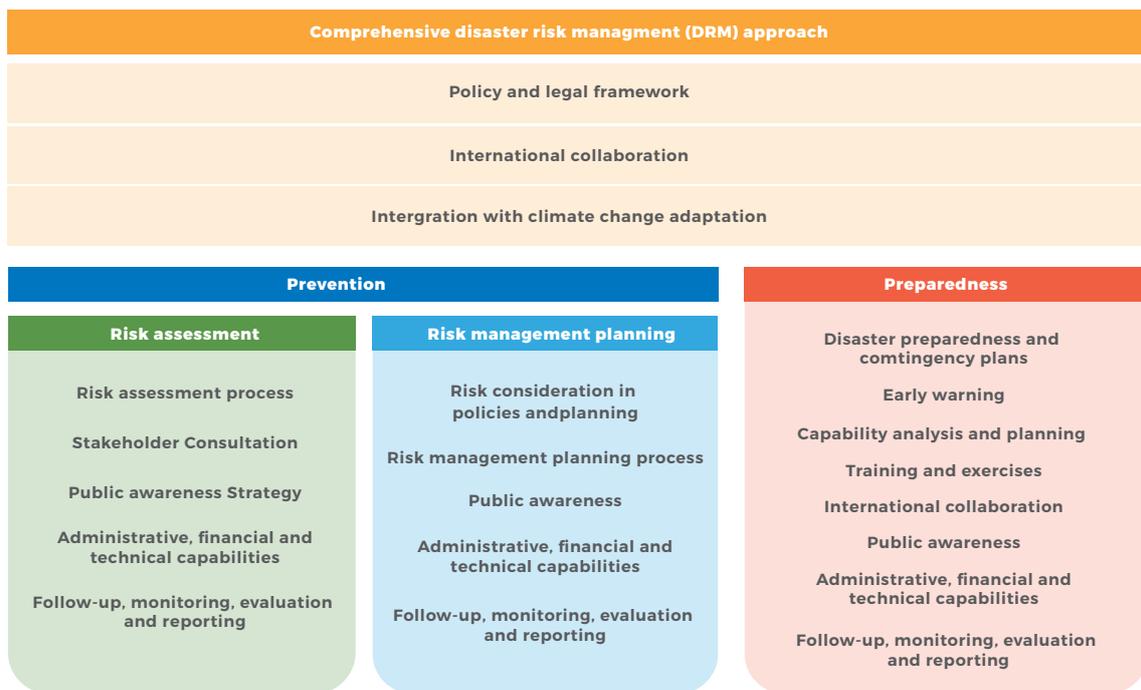
Under the EU civil protection legislation (Decision No. 1313/2013/EU on a UCPM), peer reviews can contribute to both prevention and preparedness policy. The scope of the peer review is defined by the 'reviewed' country, which can opt for either a 'thematic' or a 'comprehensive' peer review. Peer reviews strengthen cooperation between Participating States and contribute to an integrated approach to DRM by linking risk prevention, preparedness and response actions. The peer review process consequently has the potential to foster wider policy dialogue in Europe, improve consistency and steer progress in critical areas for EU cooperation on civil protection and DRM. After two pilots (Finland and the UK), a first round of peer reviews took place between 2015 and 2016, covering Bulgaria, Estonia, Georgia, Malta, Poland and Turkey. The peer review of Cyprus is part of the second round, which also covers Algeria, North Macedonia, Portugal, Serbia and Tunisia. The concrete objectives of the peer review programme are as follows:

- ▶ Contribute to improved policymaking on national DRM and civil protection through mutual learning and external assessment by reviewing experts from other countries acting as peers;
- ▶ Contribute to the development and implementation of relevant EU policies and steer progress in priority actions for the EU cooperation on DRM and civil protection, including where relevant a contribution to the implementation at national level of the international framework for disaster risk reduction (DRR) (the Sendai Framework for Disaster Risk Reduction);
- ▶ Increase consistency between the different national DRM and civil protection policies and stimulate transferability of good and innovative practices;
- ▶ Foster policy dialogue in Europe and enhance regional cooperation between countries exposed to common or similar hazards and risks;
- ▶ Encourage awareness raising through involvement of all stakeholders in the review process and wide dissemination of the results;
- ▶ Ensure visibility and political commitment at high levels to promote the DRM agenda.

1.1 Scope of the review

As part of its participation in the 2018-2019 peer review programme, Cyprus opted to undergo a 'thematic' review, focussing on risk assessment as part of the DRR process. The general 2018-2019 peer review framework incorporates comprehensive principles developed at both the global level (namely: the Sendai Framework for Disaster Risk Reduction, and its predecessor, the Hyogo Framework for Action) and European (namely the UCPM) level. This general framework was further specified in line with the thematic focus. The resulting review framework also covers the processes of risk assessment and risk management planning. Guiding questions were developed for each of the sub-processes to streamline the peer review process across participating countries. An overview of the sub-processes explored during the Cyprus peer review can be found in Figure 3 below.

Figure 3: Overview of the thematic review framework for Cyprus



Based on reviewed aspects as detailed in the framework, this report identifies good practices and areas for improvement and proposes a series of recommendations. It is for the government of Cyprus to consider and determine whether and how the recommendations should be implemented to contribute to their policy goals.

1.2 Review process

Once Cyprus' participation in a thematic DRM peer review was confirmed, a call for nominations of experts was sent to countries participating in the UCPM and eligible neighbouring countries. Two peers from EU Member States — Estonia and the UK — were chosen to participate, in addition to a peer from Georgia and a peer from Jordan. The peers were supported in their tasks by the European Commission and a project team contracted by the European Commission.

The peer review mission was conducted over a five-day period from 12 to 16 November 2018. The review opened with a meeting with representatives of several Cypriot ministries and agencies, including the Cyprus Civil Defence (CCD), the Water Development Department, the Department of Forests, the Digital Security Authority, the Geological Survey Department and the Cyprus Fire Service. The European Commission representative addressing the meeting, Modris Stasuls, expressed his appreciation to Cyprus for its 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 with and interviewed stakeholders from many different organisations, government agencies and/or authorities, volunteer organisations and academia. They were also given access to a number of documents concerning risk assessments and disaster management in Cyprus. A full list of these documents can be found in Annex I.

Interviews took place with representatives of the following entities and organisations:

- ▶ CCD
- ▶ Water Development Department
- ▶ CCD volunteers
- ▶ Ministry of Finance
- ▶ Department of Forests
- ▶ Digital Security Authority
- ▶ Seismological Centre of the Geological Survey Department
- ▶ Cyprus Fire Service.

The peer review team presented the findings outlined in the draft report during a stakeholder meeting in Nicosia on 4 March 2019. The review was discussed during a panel discussion as well as in smaller groups with the representatives of various government departments present.

This report represents an analysis of the situation in Cyprus as of November 2018. Later developments are not taken into account.

1.3 Country profile

1.3.1 Overview¹

Cyprus is the third largest island in the Mediterranean, after Sicily and Sardinia, encompassing an area of 9.251 km². It is situated 300 km north of Egypt, 90 km west of Syria and 60 km south of Turkey. The Greek isle of Karpathos lies about 400 km to the north-west.

Figure 4: Map of Cyprus²



The country boasts two mountain ranges: the Pentadaktylos range, running along almost the entire northern coast, and the Troodos massif in the central and south-western parts of the island and includes the peak of Mount Olympus. The fertile plain of Mesaoria lies between the two mountain ranges. Cyprus' coastal line is jagged and rocky in the north with long sandy beaches in the south.

The climate of Cyprus is characterised as a Mediterranean climate, with typical seasonal variation in, for example, temperature and rainfall. Fast changes in weather characterise the short autumn and spring, and separate the hot, dry summers (mid-May to mid-September) and the rainy and quite variable winters (November to mid-March). As far as natural water resources are concerned, owing to its island nature, Cyprus depends exclusively on rainfall. In recent years, water desalination has been recognised as having water resource potential.

1 Sources: http://ec.europa.eu/echo/files/civil_protection/vademecum/cy/2-cy.html; National Risk Assessment of the Republic of Cyprus, 2016.

2 Copyright: European Union, 2013. Map produced by EC-JRC. The boundaries and the names shown on this map do not imply official endorsement or acceptance by the European Union.

The Republic of Cyprus attained independence in 1960 and has been a Member State of the EU since 2004. Since 1974, the government effectively controls only the southern 57% of the island. The northern part is inaccessible due to the presence of Turkish troops. A buffer zone between these two parts is controlled by the UN's Peacekeeping Force in Cyprus (UNFICYP), which encompasses 3% of the territory of the island. Additionally, 2.8% of the island's territory is covered by two British Sovereign Bases, one at Akrotiri/Episkopi and the other at Dhekelia.

1.3.2 Disaster risk profile

Please note that the Cyprus peer review took place before the 2018 Cypriot National Risk Assessment (NRA) was published, so this section builds on other sources. The top five natural disasters reported in Cyprus for the period 1990 to 2018 sorted by number of persons killed or affected and economic damage are detailed in Table 1 below:

Table 1: Disasters caused by natural hazards³

Disaster	Year	Damage (USD)
Storm	2003	10 000
Earthquake	1995	4 340

Disaster	Year	Affected people
Earthquake	1995	1 865
Extreme temperature	2000	400
Epidemic	1996	280
Extreme temperature	1998	100
Storm	2003	30

Disaster	Year	People killed
Extreme temperature	1998	52
Extreme temperature	2000	5
Extreme temperature	2007	4
Earthquake	1995	2

³ Source: <https://www.emdat.be/index.php>.

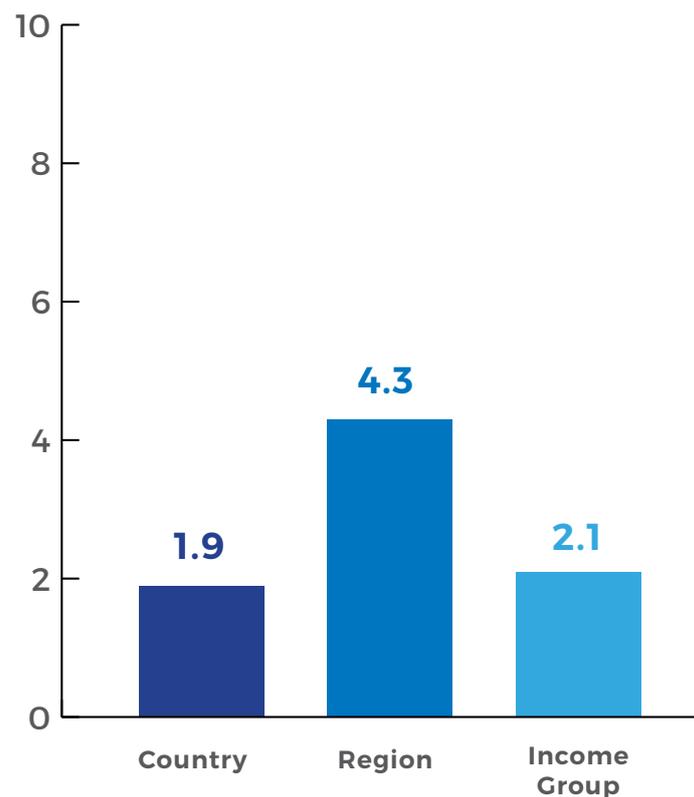
In the EM-DAT database, only two technological disasters are registered for the period 1990-2018, as outlined in Table 2:

Table 2: Disasters caused by technological hazards⁴

Disaster	Year	Damage (USD)
Transport accident	2005	31 000
Miscellaneous accident	2011	13 000

According to the INFORM country risk profile, hazard exposure is relatively low for Cyprus compared to the region (western Asia) and other high-income countries. Most hazards to which Cyprus is exposed are of natural origin.

Figure 5: Hazard and Exposure⁵



⁴ Source: <https://www.emdat.be/index.php>.

⁵ Source: http://www.inform-index.org/Portals/0/Inform/2018/country_profiles/CYP.pdf.

Compiling data from INFORM, Think Hazard, the European Commission Civil Protection Profile for Cyprus and the 2016 NRA of the Republic of Cyprus, the following five hazards are most relevant to Cyprus:

Table 3: Hazard exposure in Cyprus

Type of disaster		Risk factor
1	Wildfire	High
2	Coastal floods	High
3	Extreme temperatures	High
4	Earthquakes	Medium
5	Tsunamis	Medium

A detailed overview of different hazards, compiled from different sources (INFORM, Think Hazard, European Commission Civil Protection Profile for Cyprus and the 2016 NRA of the Republic of Cyprus) can be found in Table 4:

Table 4: Detailed overview of hazard exposure

Hazard	Regional exposure	Prevalence	Additional details
Wildfires	<ul style="list-style-type: none"> ▶ Wildfires are considered a hazard in all regions across Cyprus. ▶ The southern coast and the centre of the island is most at risk of forest fires. 	<ul style="list-style-type: none"> ▶ Chances of weather conditions facilitating the eruption of wildfires that are likely to cause loss of life and property are estimated to be greater than 50% per given year. ▶ The risk is highest between June and August. 	<ul style="list-style-type: none"> ▶ The 2016 NRA describes fire as 'by far the most destructive single agent'. ▶ Climate change can be expected to increase the risk and impact of wildfires. ▶ Wildfires are linked to droughts/water scarcity and extreme heat.

Hazard	Regional exposure	Prevalence	Additional details
Coastal floods	<ul style="list-style-type: none"> ▶ The region of Limassol is considered especially high risk. ▶ Larnaca and Famagusta are considered to be at medium-level risk. ▶ Larnaca and Limassol are also especially vulnerable to coastal erosion. 	<ul style="list-style-type: none"> ▶ Potentially damaging coastal floods are expected at least once in the next 10 years. 	<ul style="list-style-type: none"> ▶ Think Hazard lists coastal flood as the most serious hazard to Cyprus. ▶ The risk of coastal flooding may increase with climate-change-related sea level rise.
Floods	<ul style="list-style-type: none"> ▶ The only type of floods relevant to Cyprus to date, are relatively short-term flash floods in the zones surrounding watercourses (rivers or ephemeral streams) and in urban areas due to a localised storm water drainage surcharge. ▶ Mainly urban areas. 	<ul style="list-style-type: none"> ▶ Drainage networks in city centres and commercial areas are designed for surcharge with a probability of 20%. ▶ Pipe surcharge in a period of 20 years is almost 99%. ▶ Climate change has an adverse effect on the probability and intensity of extreme events and hence drainage pipes will be surcharging more frequently than 20% in any one year. ▶ Between 29 October 1859 and 31 January 2011, there were 93 deaths due to floods in Cyprus. 	<ul style="list-style-type: none"> ▶ This type of flooding causes significant damage to movable flood prone items (such as automobiles, electrical goods etc.) since there is little, if any, warning of the event and removing the exposure factor is not possible. ▶ The number of people presently at a significant risk of flooding (5% in any one year) is 5 370. This number will rise to 15 170 due to urbanisation.

Hazard	Regional exposure	Prevalence	Additional details
Extreme temperatures/heat	<ul style="list-style-type: none"> ▶ - The risk of extreme heat is spread evenly across Cyprus. 	<ul style="list-style-type: none"> ▶ - Extreme heat is likely to occur within the next five years with 25% probability. ▶ - Historical data shows extreme temperatures to be one of the most prevalent hazards in Cyprus. 	<ul style="list-style-type: none"> ▶ - The overall hazard level is medium. ▶ - The occurrence of extreme heat events is likely to increase due to global warming. ▶ - Extreme temperatures have caused the most loss of life since 1990, compared to other hazards. ▶ - Extreme heat is directly linked to the occurrence of droughts/water scarcity and wildfires.
Earthquakes	<ul style="list-style-type: none"> ▶ The risk of earthquakes is medium for all of Cyprus. ▶ The areas projected to suffer most damage are Paphos and Limassol. 	<ul style="list-style-type: none"> ▶ The likelihood of potentially damaging earthquakes within the next 50 years is estimated to be at 10%. 	<ul style="list-style-type: none"> ▶ The overall hazard level is medium, but the consequences could be devastating.
Tsunamis	<ul style="list-style-type: none"> ▶ The regions of Paphos and Limassol are historically most at risk of tsunamis. 	<ul style="list-style-type: none"> ▶ The likelihood of tsunamis with potentially damaging consequences within the next 50 years is estimated to be 10%. ▶ The average recurrence rate of tsunamis is at 30 years for moderate events, 120 years for strong events and 375 years for very strong events. 	<ul style="list-style-type: none"> ▶ The tsunami risk in Cyprus is low compared with the (western) Mediterranean. ▶ Tsunamis in the Mediterranean are usually near-field tsunamis with short warning times (5-45 minutes).

In addition to this, marine pollution poses a potential man-made threat. The exposure of infrastructure such as energy supply increases the likelihood of indirect effects from natural hazards on the population via infrastructure failures.

Table 5: Marine pollution and infrastructure breakdown

Hazard	Regional exposure	Prevalence	Additional details
Marine pollution	<ul style="list-style-type: none"> ▶ Coastal areas ▶ River areas ▶ Lakes 		The 2016 NRA describes oil pollution as the most dangerous aspect, due to frequent transit of tankers and onshore oil-handling facilities.
Energy supply	All of Cyprus	According to the 2016 NRA, direct risks to energy supply caused by natural disasters are low.	Sea level rise poses a low risk to power stations, according to the 2016 NRA. Infrastructures most at risk are cooling-water disposal facilities.

According to the 2016 NRA of the Republic of Cyprus, climate change poses a threat to the island's coastal zones, leading to increased erosion of coastal areas and coastal flooding. It may also increase the likelihood of droughts and wildfires, and can lead to increased desertification and soil erosion, largely due to the combination of increasing temperatures and decreasing rainfall.

Finally, it is also important to note that Cyprus encompasses a large number of sites and assets listed on Unesco's Memory of the World Register that are exposed to hazards. Among the other archives available are the national inventories and the catalogues of the Antiquities Department, which consist of 1 300 sites divided in two categories: (1) state-owned antiquities and (2) non-government-owned ones.⁶

⁶ Source: PROMEDHE Country profile Cyprus.

1.3.3 Vulnerability

Vulnerability relates to the set of characteristics and circumstances of a community or system that make it susceptible to the damaging effects of a disaster. It can also be understood as the ‘human dimension of disasters’.⁷ For the purpose of this country briefing, vulnerability is measured through reference to the vulnerability variable included in the INFORM index.

According to the INFORM country risk profile, the vulnerability for Cyprus is slightly higher than for the region (west Asia) as a whole, and significantly higher than of other high-income countries. Vulnerability mainly stems from vulnerable groups, the main factors causing vulnerability being uprooted people (such as refugees), food security and inequality. The overall scores are presented in Figure 6 and Table 6 below:

Figure 6: Vulnerability⁸

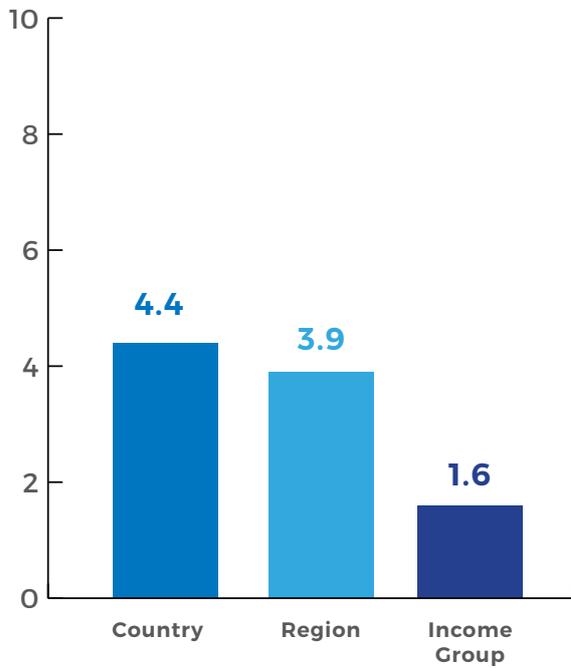


Table 6: Vulnerability⁹

Vulnerability	Score
Socio-economic vulnerability	1.2
Vulnerable groups	6.6
Overall vulnerability	4.4

N.B. Score scale = 0 (best) to 10 (worst)
Total is a weighted average

7 Source: <https://www.preventionweb.net/risk/vulnerability>.

8 Source: http://www.inform-index.org/Portals/0/Inform/2018/country_profiles/CYP.pdf.

9 Source: http://www.inform-index.org/Portals/0/Inform/2018/country_profiles/CYP.pdf.

1.3.4 Lack of coping capacity

Lack of coping capacity derives from structural shortcomings (whether institutional or infrastructural) that limit a country's ability to respond effectively to, and prepare for, disasters. For the purpose of the country profile, this is measured through the 'lack of coping capacity variable' included in the INFORM index.

Cyprus has a relatively low value in this category (indicating a good response system) compared to the region¹⁰ and also in comparison to other high-income countries (e.g. other EU countries). The overall scores are presented in Figure 7 and Table 7 below:

Figure 7: Lack of coping capacity¹¹

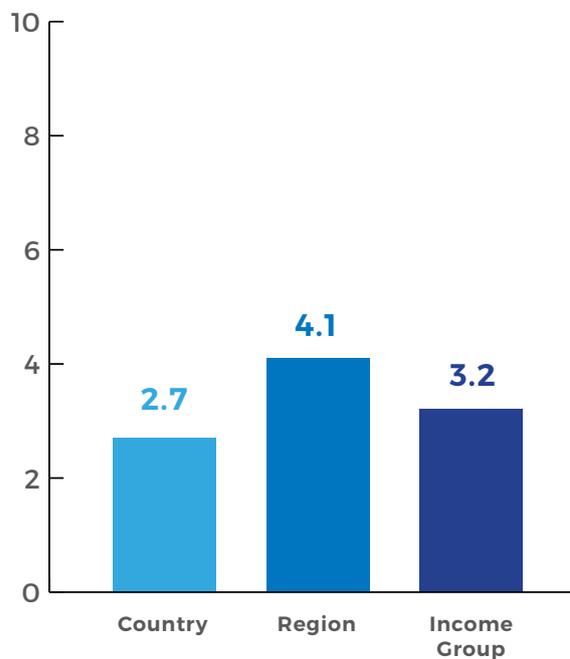


Table 7: Coping capacity¹²

Lack of coping capacity	Score
Institutional	3.7
Infrastructure	1.5
Overall lack of coping capacity	2.7

N.B. Score scale = 0 (best) to 10 (worst)
Total is a weighted average

¹⁰ Note that the INFORM geographic comparison is with western Asia.

¹¹ Source: http://www.inform-index.org/Portals/0/Inform/2018/country_profiles/CYP.pdf.

¹² Source: http://www.inform-index.org/Portals/0/Inform/2018/country_profiles/CYP.pdf.

1.3.5 National disaster management system

Since the establishment of the Republic of Cyprus, the need for an organised civil defence force was pronounced. With the enactment of the Civil Defence Law of 1964, a provision was made for organizing civil defence forces and services on a compulsory and voluntary basis for the organisation of the Civil Defence Force, for training citizens in the Force, for the supply and storage of equipment and supplies, for creating shelters and for requisitioning, purchasing and leasing of real estate or chattel.¹³

According to civil defence legislation, any government service deemed 'essential' for civil defence has to enact measures pertaining to prevention, preparedness and response. The main mission of the CCD focuses on taking measures in response to natural or man-made disasters which might cause serious consequences, the size of which may cause hazards to the life and welfare of citizens or extensive damage to the environment and natural resources of Cyprus. These measures to manage the consequences of a disaster include a series of actions for the prevention, preparation, response, design, education and mitigation of the negative results. Additionally, Civil Defence Force has the responsibility of protecting the civilians in periods of hostilities.¹⁴

In 2016, the CCD, under the Ministry of the Interior, published its second report on the NRA of the Republic of Cyprus.¹⁵

The report covers background information about Cyprus as well as projections on population development and climate change. Risk assessments were conducted for the following hazards:

- ▶ earthquake
- ▶ tsunami
- ▶ floods
- ▶ coastal erosion and sea level rise
- ▶ forest and wild fires
- ▶ risks for human health
- ▶ land desertification
- ▶ risks for water resources
- ▶ risks for biodiversity
- ▶ risks for energy supply
- ▶ marine pollution
- ▶ cyber risks.

In 2018, after completion of the peer review, Cyprus submitted its third report on the NRA of the Republic of Cyprus.

13 Source: http://www.moi.gov.cy/moi/cd/cd.nsf/index_en/index_en?opendocument.

14 Source: http://www.moi.gov.cy/moi/cd/cd.nsf/page03_en/page03_en?OpenDocument.

15 Source: [http://www.moi.gov.cy/moi/cd/cd.nsf/all/0C74FEE8301614EAC2257F16002D8656/\\$file/2ND%20NRA%20REPORT_CYPRUS.pdf?openelement](http://www.moi.gov.cy/moi/cd/cd.nsf/all/0C74FEE8301614EAC2257F16002D8656/$file/2ND%20NRA%20REPORT_CYPRUS.pdf?openelement).

1.3.6 Disaster management entities

At **ministerial level**, the Minister of the Interior is responsible, on behalf of the Council of Ministers, for the implementation of the Civil Defence Law and the relevant regulations, and has the overall supervision and control of the civil defence system. The minister coordinates the services and organisations that are declared 'essential' for civil defence purposes. Thus, the responsibility of the civil defence rests primarily with the Ministry of the Interior.

The **emergency services** come directly under the central government, but are scattered among different ministries:

1. the Police and Fire Services under the Ministry of Justice and Public Order;
2. the Medical Services under the Ministry of Health;
3. the CCD under the Ministry of the Interior.

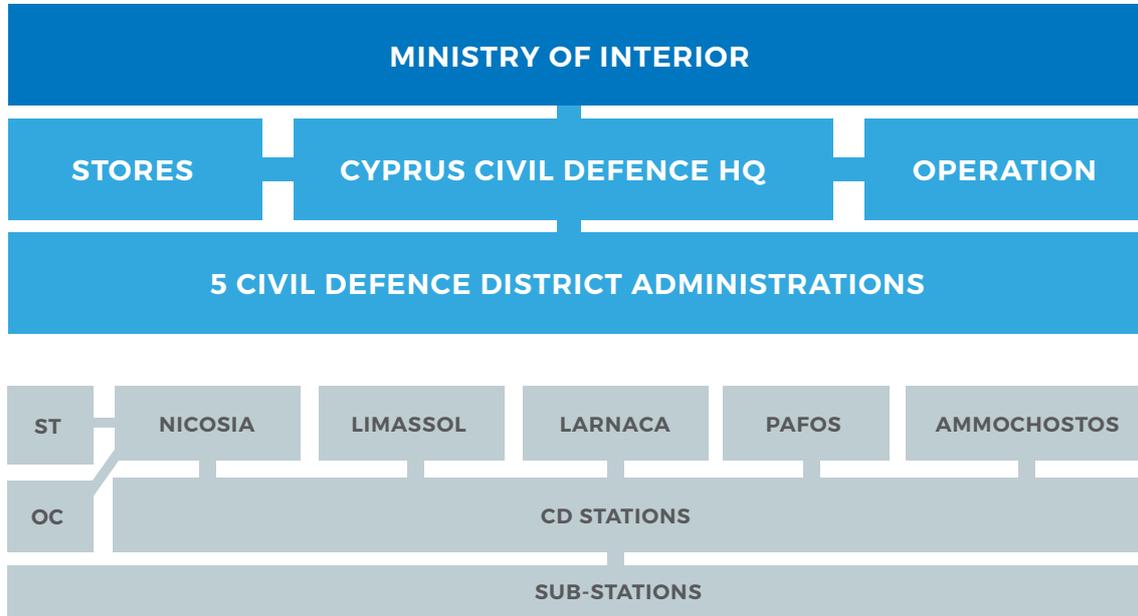
The emergency services have offices in all five Cypriot districts, through which they deal with their routine work independently. In case of a major incident or disaster, the relevant department takes over intervention efforts. Depending on the magnitude of the crisis at hand, an ad hoc ministerial committee may also be activated.

The **Cyprus Civil Defence (CCD)** is a department of the Ministry of Interior. Its main mission is to perform various humanitarian tasks intended to protect the civilian population and help it recover from the immediate effects of hostilities or disasters as well as to provide the conditions necessary for its survival. The CCD is staffed by permanent personnel, a number of volunteers and conscripts obligated to serve in the Civil Defence Force.

The **Civil Defence Force** is organised as civil defence units in almost all the urban areas, large villages and villages near the ceasefire line. Most of the units are mainly manned by conscripts and volunteers. The CCD members, who are apportioned among the various units, receive basic training and are later trained and positioned in different divisions of the CCD. These different divisions are the First Aid Section, the Telecommunication Section, the Welfare Section, Search and Rescue and the Neighbourhood Watch Sections. In 2017, there were over 500 volunteers in the Civil Defence Force.

Figure 8: Structure of the Cyprus Civil Defence Force

Source: Cyprus Civil Defence



As per the **compulsory service**, all citizens of Cyprus from the age of sixteen and above are subject to mandatory service, which does not exceed two years, in the Civil Defence Force.

In general, training is provided in-house and through the UCPM for permanent staff and volunteers. The volunteers provide training to conscripts, while the permanent staff provides for the training of civil service members. In this framework, training exercises are planned at different levels (strategical, operational and tactical).

The CCD includes the **General Civil Defence Administration** (GEDPA), a national office which defines civil defence policies and is in charge of coordinating national activities and the five district administrations (PEDPA) located in Nicosia, Limassol, Larnaca, Paphos and Famagusta.

The yearly budget of the CCD amounts to 0.0452% of the country's GDP. However, funding for emergencies and disasters is scattered among the CCD, district administrations, Fire Service and other stakeholders. Expenses for civil protection purposes allocated to other government agencies have not been estimated.¹⁶

¹⁶ Sources: http://ec.europa.eu/echo/files/civil_protection/vademecum/cy/2-cy-1.html, http://www.moi.gov.cy/moi/cd/cd.nsf/index_en/index_en?OpenDocument, PROMEDHE Country Profile Cyprus, National Risk Assessment of the Republic of Cyprus, 2016.

1.3.7 Disaster risk reduction-relevant sectors

In addition to the CCD, which covers the departments of First Aid, Welfare, Neighbourhood Watch and Telecommunications, as well as Search and Rescue, the following governmental departments were involved in the creation of the 2016 NRA:¹⁷

Environment

- ▶ Department of Environment
- ▶ Department of Meteorology
- ▶ Department of Forests
- ▶ Water Development Department
- ▶ Department of Fisheries and Marine Studies
- ▶ Geological Survey Department
- ▶ Department of Lands and Surveys
- ▶ Agricultural Research Institute
- ▶ Hunting Fund

Infrastructure

- ▶ Department of Public Works
- ▶ Road Transport Department
- ▶ Civil Aviation Department
- ▶ Department of Town Planning and Housing
- ▶ Cyprus Energy Regulatory Authority
- ▶ Office of the Commissioner of Electronic Communications and Postal Regulation

¹⁷ Source: National Risk Assessment of the Republic of Cyprus, 2016, Section 10.

Health

- ▶ Department of Hygiene Services
- ▶ Medical and Public Health Service Department

Other

- ▶ Department of Statistics
- ▶ Antiquities Department.

(Source: National Risk Assessment of the Republic of Cyprus, 2016)

During the peer review mission, interviews with the following authorities and organisations were conducted: CCD, Water Development Department, CCD volunteers, Ministry of Finance, Department of Forests, Digital Security Authority, Seismological Centre of the Geological Survey Department and Cyprus Fire Service.

2. Overall disaster risk management approach

The disaster risk management (DRM)¹⁸ system in Cyprus was assessed in terms of its comprehensive approach and in terms of risk assessment and risk management planning (see 1.1 Scope of the review). Since the response phase was not part of the review and the risk management cycle was not fully covered, the report will in the following chapters mainly refer to disaster risk assessment (DRA), national risk assessment (NRA) and disaster risk reduction (DRR)¹⁹ instead of referring to DRM.

2.1 Policy and legal framework (at national, regional and local level)

All DRA and DRR activities are concentrated at the central level, because, despite Cyprus' division into administrative districts, there are no regional governments. This works well for Cyprus as it has a compact territory.

In terms of responsibilities, the Council of Ministers approved 'ZENON' which is a general framework encompassing 24 coping plans of different ministries. According to these roles, duties and responsibilities, each component of the civil defence system (mainly the 'essential services') has to elaborate how it will deal with contingencies resulting from disasters.

Overall, the 24 ZENON plans have been developed for managing a multitude of natural and man-made risks (some of the plans have not yet been officially approved). They cover mainly preparedness, response and, to some extent, recovery aspects (prevention is not sufficiently analysed). The plans describe the measures to be taken by each actor, but do not quantify the equipment or means to be used. The ZENON master plan is approved by the Council of Ministers and individual ZENON plans are approved by the concerned ministers.

18 DRM is defined as 'the systematic process of using administrative directives, organisations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster. [...] It is an extension of the more general term "risk management" to address the specific issue of disaster risks. DRM aims to avoid, lessen or transfer the adverse effects of hazards through activities and measures for prevention, mitigation and preparedness.' (Source: https://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf).

19 DRR is the 'concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.' (Source: https://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf).

At **ministerial level**, the Minister of the Interior is responsible, on behalf of the Council of Ministers, for the implementation of the Civil Defence Law and the relevant regulations. They have the overall supervision and control of the civil defence system and coordinate the services and organisations that are declared 'essential' for civil defence purposes (see also Section 1.3.6).

The emergency services fall directly under the central government, but are scattered among different ministries:

1. the CCD under the Ministry of the Interior;
2. the Police and Fire Services under the Ministry of Justice and Public Order;
3. the Medical Services under the Ministry of Health.

The emergency services have offices in all five Cypriot districts, through which they deal with their routine work independently. The **CCD's** main mission is to perform various humanitarian tasks intended to protect the civilian population and help it recover from the immediate effects of hostilities or disasters as well as to provide the conditions necessary for its survival. The CCD is staffed by permanent personnel and a number of volunteers and conscripts obligated to serve in the Civil Defence Force. In case of a major incident or disaster, the CCD takes over intervention efforts. It may be supported in fulfilling its tasks by the essential services. Depending on the magnitude of the crisis at hand, an ad hoc ministerial committee may also be activated.

Cyprus currently has no united national DRR strategy, nor does it have any DRR legislative process **beyond the Civil Defence Law of 1996**. Different state entities/authorities are elaborating, adopting and implementing particular actions necessary to reduce risks, as well as evaluating risks in their sphere of responsibility based on their respective legislative regulations. Accordingly, no single authority is designated for the coordination of the DRR process. The Water Development Department, Digital Security Authority and Department of Forests provide good examples of sectoral risk reduction. However, there is no holistic approach to reducing disaster risk, and the DRR responsibilities (prevention and preparedness) are shared among different state authorities.

The responsibility for the 24 ZENON plans is shared between the national authorities. Only five plans are assigned to the Ministry of Interior, four of which are the responsibility of the CCD and one of which is the responsibility of the Asylum Service – but which is implemented mainly by the CCD. They cover earthquakes, extreme weather events, evacuation of citizens and technological accidents, as well as the arrival of asylum seekers.

In relation to risk assessments and in line with EU legislation (Decision No. 1313/2013/EU on a UCPM, Article 6), Cyprus has completed its third NRA (see 3.1 Risk assessment) under the coordination of the CCD. According to information from the CCD following the publication of the new NRA (and based on it), there is an intention to launch a process of elaborating a more holistic DRR strategy.

Although this holistic approach is lacking at the moment, the CCD does have a clear understanding and vision that there is a need for coordination of the DRR process. A platform for trans-departmental risk reduction is being created by the CCD, within which several state departments will cooperate. Its goal is to establish a horizontal level cooperation and coordination among stakeholders, with a mandate to promote horizontal measures for preventing and managing the effects of risks. At the time of writing, it is not yet fully functioning. Cyprus's first risk management capability assessment report mentions that this platform will assist in ensuring the better dissemination of knowledge and improve the coherence of different governmental departments. However, this platform has not been institutionalised and does not have a legal mandate to conduct this process. Nevertheless, it might serve as an effective mechanism to share and disseminate results of the NRA among the state and non-state actors.

Good practice

- ▶ Several ministries and departments are already actively involved in reducing disaster risk and a range of risks is covered by the 24 ZENON plans.
- ▶ Every state authority has developed its own expertise capacity in their field of responsibility.

Recommendations

- ▶ A **holistic approach** including the development of a legal basis and **clear distribution of responsibilities** could enhance DRR in Cyprus. While the legal basis would leverage the mandate of the acting authority, clear responsibilities (overseen by a respective authority) would help avoid gaps or the duplication of efforts and could create synergies between activities.
- ▶ The **establishment/appointment of a coordinating agency** with responsibility and function to facilitate the inter-agency/multi-stakeholder cooperation process to develop the NRA) and DRR strategy (based on the NRA) is recommended. This would enable Cyprus to bring together all information concerning DRR, to have a multi-agency format discussion, to develop a joint position and to submit a common approach and agreed position to the government for the final decision-making. Having a common picture and an agreed multi-agency position will simplify the decision-making process for the government within this field. Moreover, when an agency is made responsible for coordination, the process of DRM coordination will become more efficient. Functions of this agency should be stipulated in the legislation, either primary or secondary.
- ▶ Such a coordinating agency would bring together the good work that is developed in several areas (the many existing formal and informal activities).
- ▶ Tasks of the coordinating agency would include:
 - ▷ coordinating capability building and mitigation measures overall (i.e. ensuring that mitigation of one risk does not lead to increased risk in other areas);
 - ▷ ensuring coherence of the planning processes, including monitoring and evaluations;
 - ▷ ensuring plans cover the whole DRM cycle (including prevention);
 - ▷ establishing a unified mechanism for DRR.

- ▶ An important additional task of such a coordinating agency would be to establish – together with the relevant departments – **standard operating procedures (SOPs)** in case of contingencies. This has the added benefit of also addressing the need for integrating response/preparedness in the risk management approach.
- ▶ The establishment of a **legal framework, in line with the amended UCPM legislation**,²⁰ for the process of DRR can be a very positive step in terms of its institutionalisation. Such institutionalisation should also include risk assessment procedures.
- ▶ **Plans could be more adaptable**, rather than risk-specific. Instead of 24 ZENON plans, consequence-based plans could be put in place: for example, a water shortage plan, mass casualty plan and mass evacuation plan. These should be informed by the NRA.

With regard to the central coordinating agency, two models can be envisioned: the coordinating agency could be assigned within an existing department, or a new agency could be created. Each model has different benefits and drawbacks.

Existing department

- ▶ **Benefits:** It could build on existing expertise and is quicker to establish, as it does not require legal amendments.
- ▶ **Drawbacks:** It might be difficult to choose which department; providing adequate staff might be more difficult (and additional resources would be just as necessary for this option as for a new agency); it would be necessary to consider the division of competences (to avoid duplication of work).

New agency

- ▶ **Benefits:** It may be perceived as more ‘neutral’ and it is possibly easier to obtain resources (staff, funds).
- ▶ **Drawbacks:** The new agency would need to build up new expertise; there would be additional bureaucracy; the cost would be higher; it would be necessary to consider the division of competences (to avoid the risk of mission creep).

It is the strong view of the peers that **formalising an already existing agency** would be the preferred model. When considering this, it is important that **Cyprus builds on the expertise that has already been acquired** in the field of DRR and DRM generally when making the choice for an agency.

²⁰ Source: Decision (EU) 2019/420 of the European Parliament and of the Council of 13 March 2019 amending Decision No. 1313/2013/EU on a UCPM.

2.1.1 Collaboration with relevant national stakeholders

Collaboration between relevant national stakeholders in the field of DRR is good in Cyprus. Scientific partners as well as volunteers and relevant state departments are involved in risk assessment and risk management planning. Since Cyprus is a small island state, actors are familiar with each other and collaborate well: there is a formal basis, which is strengthened by a strong informal element. At the same time – and potentially due to this fact – formal processes for DRR involving stakeholders, and thus a holistic approach to DRR, are lacking (see recommendations of the previous section).

Nevertheless, the risk assessment process already involves a range of stakeholders on a national level. The project manager for developing the third NRA (2018) has met different ministries and departments and has gained input from different bodies, including the Geological Survey Department, the Water Development Department, the Department of Public Works and the Department of Forests and the Fire Service. To strengthen the comprehensiveness and representativeness of the NRA, in addition to meetings with different ministries, meetings with private and third-sector bodies should also be included in the NRA process. This would help to develop a complete spectrum of different risks and different views on risks and how these risks can, when materialising, affect different sectors and stakeholders. This enables later phases of risk management, for example capability assessment, to be more precise and for risks to be managed better. Also, this process can create ownership over reducing disaster risk among those stakeholders. As it stands, the involvement of different stakeholders is difficult due to the lack of a legal basis and an institutionalised process (see 2.1 Policy and legal framework).

The engagement of volunteers works very well. At the same time, private stakeholders seem to be involved to a very limited extent. Also, the exchange between ministries involved in DRR seems to be relatively low. For example, it is not clear who contributed to assessing the impact of certain hazards (see also 3.1 Risk assessment).

The results of the risk assessment are mainly publicly available but are not actively communicated to the relevant stakeholders outside the government. Consequently, uptake of the findings so far remains limited. The risks identified in the first and second NRAs (2015 and 2016) have not been incorporated into various strategies, and no unified/national DRR strategy was developed. DRR activities remain isolated within responsible ministries and departments (see also 2.1 Policy and legal framework) and are not consolidated. Accordingly, there is no 'whole of government' approach or unified strategy that ensures implementation of cross-sectoral activities resulting from the NRA. The field of cyber security is an exception, however, as businesses are actively involved.

Good practice

- ▶ A very **good and trusted relationship** between the actors has already been established. This also allows for a quicker response time, because they have each other's direct contacts.
- ▶ Cyber-security-related DRR is a good example of involving private-sector stakeholders.

Recommendations

- ▶ Awareness of possible risks is most effective when there is good information available about the risks that could affect a state and its citizens or visitors. Involving different stakeholders at the national level is crucial in order to have a relevant and adequate risk assessment. Consequently, **the involvement of actors should be more holistic and transparent** (see also 2.1 Policy and legal framework).
- ▶ The process for development of the NRA should be **institutionalised in a legal document** that specifies who must be involved in the NRA and their responsibilities, including the role and responsibilities of the CCD.
- ▶ Other departments looking to involve private-sector stakeholders could **model this on the approach of cyber-security-related DRR**.
- ▶ It is essential that **all stakeholders in DRR make available the resources** in order to allow for coordination throughout the DRM cycle (NRA, planning and implementation). The stakeholders that need to be involved also need to make available the required resources (including staff and time).
- ▶ The **governance of regional and local collaboration** should be improved.

2.1.2 Measurability and evaluation of plans

The 24 national plans included in the ZENON master plan are developed by the governmental authorities under the responsible ministry and approved by the respective minister. The master plan was approved in 2013 and has not yet been assessed.

Monitoring, evaluating and revising each plan under ZENON is the responsibility of the respective authorities. Those actors responsible for their development and implementation revise the plans individually. Five of them fall under the responsibility of CCD within the Ministry of Interior. Depending on the plan, in general they cover mainly preparedness and response aspects, while prevention and recovery is only partly covered. All ZENON plans are assessed through yearly exercises: a full-scale exercise in one year, followed by a tabletop exercise in the next year. These plans are revised by government departments on a constant basis. The Ministry of Interior is currently in the process of engaging an expert to assess the plans under its jurisdiction. Additionally, the individual plans are updated on an ad hoc basis.

Overall, the current plans seem to lack interlinkages with the NRA, with no a feedback loop to integrate new NRA results into the ZENON plans.

Good practice

- ▶ **Exercises are conducted on a regular basis** (tabletop exercises and full-scale exercises alternating annually). They are a good evidence-based assessment for the monitoring and testing of preparedness plans and determine the actions to be taken to improve the plans.

Recommendations

- ▶ There is no **holistic** or **overarching approach** to enhancing DRR as each stakeholder revises its plan(s) individually. To address this, a **coordinating agency** should oversee the reviewing, revising and evaluating of the plans under ZENON. This coordinating agency should be assigned by the Council of Ministers. The task of the coordinating agency is to develop the mechanisms for reviewing, revising, monitoring and evaluating the plans within a time frame, and would be responsible for following up the implementation of the recommendations.
- ▶ Planning is a **continuous process** that does not stop when the plan is published. Plans should be monitored and evaluated in line with predefined indicators and standardised processes. Criteria for the measurability and evaluation of plans should be established.
- ▶ **Reviews of plans should be conducted at pre-agreed times** by the coordinating agency (see recommendations under 2.1). The reviewing process should be established by planning teams. Regular reviews and revisions of plans should happen every two years. In addition, ad hoc reviewing and updating of plans should be considered after the following:
 - ▷ a major exercise
 - ▷ a major incident
 - ▷ the enactment of new or amended laws or legislations
 - ▷ a change in the acceptability of various risks
 - ▷ an update of planning standards or guidance
 - ▷ a change in organisational structures, facilities, policies etc.
 - ▷ advances in technology
 - ▷ findings of audit and reporting.

2.1.3 Integration of lessons learned

In line with the evaluation of plans (2.1.2 Measurability and evaluation of plans), it remains in the responsibility of the individual government departments whether and how lessons learned feed back into the revision and further development of plans. Also, inter-ministerial and departmental exchange is not formalised, which leads in certain cases to a lack of action.

In addition to this, disaster losses are not centrally recorded, which complicates the decision-making process in terms of deciding about and prioritising certain lessons learned. Information regarding the assets that have been destroyed or damaged are collected and sent to the Ministry of Finance in order to request funds for damage repair, but there seems to be no central follow-up. The responsibility for recording the disaster loss data may also belong to different departments. For example, the area of agricultural land burnt may be recorded by one department, the loss of life by another and compensations for the affected citizens by a third department.

Good practice

- ▶ The majority of the relevant stakeholders contribute to the NRA.
- ▶ Lessons learned are developed at the departments with most expertise.
- ▶ The Department of Forests has employed good practice when it comes to integrating lessons learned, as they have a committee that meets four times a year which coordinates prevention and responses, exemplifying a cyclical lessons-learned process. This is operationalised in a yearly exercise as well.

Recommendations

- ▶ The integration of lessons learned, like other DRR processes, suffers from the **lack of a legally binding and holistic approach** to regulating and managing DRR planning and implementation on the national level. **The integration of lessons learned and information from the NRA process should be formalised** in order to ensure that action is taken by the relevant actors.
- ▶ Integrating lessons learned practice into DRR is crucial in order to have an adequate risk assessment, as well as proportional measures for preventing and mitigating risks. Lessons learned should therefore include **learning from previous disasters** that have taken place. For example, after floods, there should be post-event analysis regarding what went wrong and how any revealed bottlenecks could be avoided.
- ▶ **Benefits of investments in DRR/risk prevention should be quantified to advocate for action.** The process of DRM would be significantly improved by the coordinated process of collecting comprehensive data regarding the damage caused by a disaster (disaster loss data).²¹
- ▶ Until a robust disaster loss database is built up, which can demonstrate the reduction of losses over time, **examples from other countries should be used.**
- ▶ Disaster loss data should be synthesised, analysed and made available by a central actor. It would therefore help if there was a **central coordinating agency for collecting post-event loss data.** This would enable Cyprus to assess the scope of damages they face and decide where action needs to be taken. It would also provide an overview on the most effective measures to be taken. Having comprehensive disaster loss data will make the cost–benefit more visible, enabling the evaluation of funds spent on the reduction of negative disaster impact and economic losses caused. Finally, such a database could inform the impact assessment in the NRA.
- ▶ The key benefits of validated disaster loss data are clear identification and the ability to follow patterns of the negative impact of disasters, thus, contributing to the implementation of efficient and effective DRR programmes and policies based on the cost–benefit approach. Data collection is pivotal to the comprehensive assessment of disaster impact.
- ▶ Disaster loss data calculation includes different variables, such as financial cost (loss), damage to infrastructure and loss of life, which means that any potential negative disaster impact identified in the NRA could be compared with the existing data relating to past disasters. If those two calculations are more or less equal to each other, the cost–benefit of conducting particular DRR activities can be identified more easily.

²¹ Best practice here would be to collect comprehensive data of various types: economic, environmental, social, cultural, etc.

2.2 International collaboration

As an EU Member State, Cyprus participates in the UCPM. Decision No. 1313/2013/EU on a UCPM is the legal basis for civil protection cooperation between the EU and the Member States. It aims to improve the effectiveness of systems for preventing, preparing for and responding to natural and man-made disasters. Various means of cooperation are facilitated through the UCPM, including for example the implementation of peer reviews. As part of the UCPM, Member States also have different obligations, such as the development of risk assessments at national level. Furthermore, the UCPM legislation foresees the voluntary development of modules to meet priority intervention or support needs under the UCPM and the identification of other response capacities to support response operations. These resources may be deployed via the EU's Emergency Response Coordination Centre (ERCC) upon request by an affected Member State. The UCPM legal basis has been recently amended.²²

Cyprus has provided assistance through the UCPM to other Participating States, for example in response to the 2018 forest fires in Greece. It has also received help through the UCPM for forest fires and technological accidents.

Cyprus has also signed joint cooperation memoranda of understanding with Egypt, Greece and Israel. Cyprus is also a member of the International Civil Defence Organisation. Overall, there appears to be a high level of international engagement and collaboration on both strategy and mutual aid.

Cyprus also participates in a plethora of DRM strategic forums, through which it benchmarks its risk profiles against other nations, and learns from and informs international best practice. They encompass for example:

EU Forums:

- ▶ Civil Protection Committee – Directorate-General for European Civil Protection and Humanitarian Aid Operations (DG ECHO)
- ▶ Disaster prevention experts' meetings – DG ECHO
- ▶ Infrastructure protection expert group – Joint Research Centre
- ▶ Infrastructure protection academic group – Joint Research Centre

United Nations:

- ▶ Sendai Framework meetings and conferences.

²² Source: Decision (EU) 2019/420 of the European Parliament and of the Council of 13 March 2019 amending Decision No. 1313/2013/EU on a Union Civil Protection Mechanism

Good practice

- ▶ Cyprus has a **high level of international engagement**. It demonstrates positive relationships with many international organisations, draws on the resources they have to offer and makes valuable, demonstrable contributions to them.
- ▶ The country is very engaged in benchmarking and learning activities to enhance DRR.

Recommendations

- ▶ **A central authority and institutionalised DRR process**, building on a legal basis, would be useful (see also recommendations under section 2.1 Policy and legal framework) to oversee international cooperation.

2.3 Integration of disaster risk reduction with climate change adaptation

Cyprus has a National Strategy for Adaptation to Climate Change (NSACC),²³ the most recent iteration of which was published in April 2017. The NSACC emphasises that global warming is ‘indisputable’ (p.3) and outlines the variety of negative effects that climate change will likely catalyse, including a detrimental impact on:

- ▶ agricultural yields
- ▶ livestock management
- ▶ soil fertility
- ▶ deforestation
- ▶ aquaculture
- ▶ electricity supply
- ▶ human, animal and plant health.

Additionally, an increase in coastal erosion and a rise in sea levels are mentioned, as well as wider thematic social disruption and an impact on tourism and the economy. The NSACC thus captures and considers some of the complexities and interdependencies of the risks emerging from climate change: ‘The coordinated and faithful implementation of the National Adaptation Strategy, the systematic monitoring and adapting it to scientific, technological and other developments, preserves the constant protection and improvement of society, the economy and available resources and physical capital of Cyprus’ (p.4). It captures the problem and there is a clear aspiration to adapt, but the solutions within the NSACC appear to be lacking. It specifies an

²³ Source: <https://tinyurl.com/y7poobpd> (in Greek).

increase in the frequency of heat waves and the average temperature, but it does not specify timescales over which climate change impacts might worsen.

The relationship between the NSACC and the ZENON plans is unclear. However, during the visit, several references to the NSACC were made and the document seems to be known and used by the authorities contributing to the NRA. One of the main risks that climate change will increase is drought. During the review, the Water Development Department noted that Cyprus is the most water stressed Member State in Europe and this is likely to worsen due to climate change. The NSACC notes that more than 80% of agricultural land is irrigated by rain. Water supply for drinking and sanitation is prioritised, with water for irrigation supplied only if the former has been fully satisfied. Irrigation water is used both for forestry and agriculture. Since 1997, water supply needs were met only in 2012.

There have been some limited efforts to mitigate the risk of drought. Since the 2000s Cyprus has introduced compulsory water meters as a disincentive for water wastage. The NSACC explains that climatic phenomena have ‘enormous economic and social repercussions’ (p.3). Discussions with the Water Development Department demonstrated that they had considered the second and third order effects of a drought, including shortages of some foods and a price rise of others. These issues have the potential to hinder or bankrupt some agricultural or hospitality businesses, among others, which, if significant enough, could impact upon tourism. The CWB believed a simple cost-benefit analysis of the installation of one or more additional water treatment plants relative to possible impact on GDP would demonstrate such installations were cost effective and would pay for themselves relatively quickly. However, there was no central organisation with either the will or authority to conduct such an analysis.

In conclusion, it appears that although relevant stakeholders have treated the topic seriously, there is currently no mechanism to join up these considerations into a strategy that will facilitate meaningful, measurable change. However, this problem is visible across Cypriot DRM practice and is thus not exclusive to climate change (see 2.1 Policy and legal framework for more detailed conclusions and recommendations).

Good practice

- ▶ Cyprus has **developed a NSACC** that analyses a variety of negative effects that climate change will likely catalyse.

Recommendations

- ▶ Plans falling under the ZENON general framework should **first include prevention aspects** as standard procedure.
- ▶ While there is a firm commitment to climate change adaptation, and a great deal of analysis, it is **unclear how this evidence is fed into the ZENON plans, the NRA or capacity building**. Thus, no meaningful measures to solve the problems posed by, and adapt to, climate change have been identified. Integration of the NSACC into the ZENON plans, the NRA and capacity building should be enhanced.
- ▶ The centralised authority (as recommended in 2.1 Policy and legal framework) should **develop a method to factor climate change adaptation into their DRR strategy**, with measurable targets.

3. Prevention

The prevention section is divided into risk assessment and risk management planning.²⁴

3.1 Risk assessment

3.1.1 Risk assessment process

Since a legal DRR framework and central authority are lacking in Cyprus, there is also no legal framework or responsible authority identified for the risk assessment process, its methodology and adoption. Also, there is no single agency dedicated to coordinating the risk assessment process. The CCD has initiated the coordination of the three NRAs completed to date. However, the CCD is currently not empowered by a legal mandate. The risk assessment process varied for each of the assessments, as they were learning from experience and procedures were continuously enhanced.

Against this background and in line with the obligation stemming from the UCPM, Cyprus published its third NRA document in December 2018 (the first NRA was released in December 2015 and the second NRA was released in December 2016). For the latest assessment, the process drafting of the document had been outsourced to a consortium²⁵ coordinated by the Cyprus University of Technology: the risk assessment process becomes potentially more comprehensive and consistent if conducted and coordinated by a research institution. Also, extensive involvement of various authorities in the development process of the new NRA would greatly benefit the acceptability and usability of the final document for the authorities.

In the established process, the Cyprus University of Technology involved several departments and authorities to complete the assessment (see Table 8).

²⁴ Risk assessment 'means the overall cross-sectoral process of risk identification, risk analysis, and risk evaluation undertaken at national or appropriate sub-national level' (Decision No. 1313/2013/EU on a UCPM). Risk management, in contrast, is the 'systematic approach and practice of managing uncertainty to minimise potential harm and loss'. (Source: https://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf). Based on risk assessments and their analysis, it comprises the implementation of strategies and specific actions to control, reduce and transfer risks. It can be complemented or preceded by an assessment of the country's risk management capability.

²⁵ Members of consortium: Cyprus University of Technology, National Centre for Scientific Research Demokritos, Oceanography Centre, Centre for Risk and Decision Sciences, European University of Cyprus and KPMG.

Table 8: Departments and authorities involved in the third Cyprus NRA (2018) process

Department/authority involved	Hazards and risks
Geological Survey Department	Earthquakes
Geological Survey Department	Tsunamis
Water Development Department	Floods
Department of Public Works	Coastal erosion and sea level rise
Fire Service and the Department of Forests	Forest fires and wildfires
Medical and Public Health Service Department	Risks to human health
Department of Environment	Land desertification
Water Development Department	Risks to water resources
Department of Environment	Risks to biodiversity
Department of Meteorology	
Energy Regulatory Authority	Risks to energy supply
Department of Fisheries and Marine Research	Marine pollution
Office of the Commissioner of Electronic Communication and Postal Regulations	Cyber risks
Additional stakeholders	
District Administration of Nicosia	
District Administration of Larnaca	
District Administration of Limassol	
District Administration of Paphos	
Cyprus Port Authority	
Statistical Services	
Municipalities of Aradippou, Larnaca and Athienou	

The choice of authorities and departments corresponds with the selected risks that were considered in the NRA (see Figure 9).

Figure 9: National risk assessment process and selected risks²⁶

The types of hazards described in the 2018 NRA had been pre-identified by the CCD before the contracted consortium started its work. They encompass events which had never occurred before in Cyprus but are considered as plausible. Overall, however, the process and criteria for the initial selection of hazards was not transparent, and it is not evident why, for example, biological risks or pandemics are not part of the 2018 NRA.

In terms of the procedure and based on the requirements elaborated by the CCD, the consortium developed a methodology for risk assessment, which is in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, 2010 EU Risk Assessment and Mapping Guidelines and International Standards such as ISO 31000 and ISO 31010.

The methodology includes an evaluation of the likelihood of the occurrence of hazards and their negative impact. The likelihood assessments of different natural hazards vary, based on the scientific approach towards particular kinds of events. Data and calculations were provided to the University of Technology by a range of governmental departments (see Table 8). Data accessibility varies depending on hazard type. In particular, information on earthquakes, forest fires and floods are well documented: there is a

²⁶ Source: Kyriakides, N. (2018): Presentation during the peer review on behalf of the Cyprus Technical University, p. 10.

long history of data collection and analysis in Cyprus. Best practice in this context is demonstrated by the methodology and approach developed by the Water Development Department, as well as some of their tools (such as the implementation of Light Detection And Ranging of Laser Imaging Detection And Ranging (LIDAR) mapping, their methodology for measuring risks). The Department of Forests also has a methodologically advanced approach to modelling forest fire risks.

For some risks, such as tsunamis, there is a lack of data because they occur rarely. However, this gap can be balanced by the use of simulations. For other risks related to public health and energy supply there is mixed and often insufficient data. Based on this data, different types of hazard maps are developed for the particular hazard scenarios described in the document.

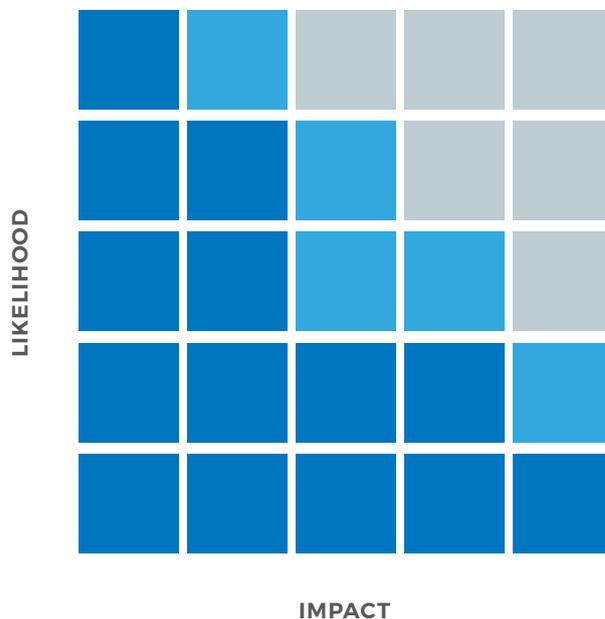
The impact calculation methodology is based on the EU guidelines and includes categories such as:

- ▶ human (number of humans impacted)
- ▶ economic (material damage, cost of reparation, negative impact on production, etc.)
- ▶ environmental (pollution, environmental damage, restoration cost, etc.)
- ▶ political/social (disruption of the social infrastructure, disruptions of vital societal functions, etc.).

For each of these dimensions, several indicators have been defined that allow for the quantification and comparison of different hazard impacts.

However, as indicated, there is no single agency responsible for collecting the (financial) disaster loss data in Cyprus, and therefore there is no holistic and evidence-based approach to impact assessment. Different competent Cypriot authorities are recording and estimating damages caused by the disasters. The details of these records are documented at the discretion of the responsible department, as there are no specifications in place for the common method of recording disaster data (see also 2.1.3 Integration of lessons learned). However, the relevant departments were sent the specifications of the Sendai Framework.

Every hazard has a calculated score of negative impact for different scenarios ('scenario analysis'). A compilation of the likelihood and impact of the hazard allows for the creation of a risk matrix and evaluates the level of the particular risk (see Figure 10).

Figure 10: Risk matrix

Based on the quantified risks of hazards, evaluation of risks is conducted: it is discussed whether the level of a particular risk can be tolerated or accepted, or whether there is a need to conduct measures to reduce the level of the risk. Prioritisation of DRR, based on the evaluation of risk levels helps in creating an integrated risk register. Such a register starts with the risks that most urgently need action and ends with the risks which can be potentially tolerated.

Uptake of the findings so far remains limited, as the risks identified in the first and second NRAs (2015 and 2016) have not been incorporated into various strategies, and no unified/national DRR strategy was developed. DRR activities remain isolated within responsible ministries and departments (see 2.1 Policy and legal framework) and are not consolidated. Accordingly, there is no 'whole of government' approach or unified strategy that ensures implementation of cross-sectoral activities resulting from the NRA. Nevertheless, it needs to be stressed that the 2018 NRA involved a range of governmental stakeholders and thus carries great potential to trigger DRR action by the authorities if a comprehensive approach is taken (see 2.1 Policy and legal framework and 2.1.1 Collaboration with relevant national stakeholders).

Good practice

- ▶ Cyprus underwent its **third NRA** in 2018 and has a very **professional approach** involving all central actors. The methodology of the NRA is based on the quantitative approach of calculating the likelihood and impact of each hazard scenario.
- ▶ The NRA is based on encompassing **risk data**. A good effort has been made to quantify hazard impacts. They are assessed by the respective specialists and impact is determined across the risks in a consistent manner.
- ▶ The NRA methodology is based on **multi-dimensional components** as suggested by the Sendai Framework for Disaster Risk Reduction 2015-2030, the 2010 EU Risk Assessment and Mapping Guidelines and International Standards such as ISO 31000 and ISO 31010.

- ▶ Evaluation of risk tolerance was based on a **risk matrix**.
- ▶ Relevant government departments were involved.
- ▶ Involvement of **research institutions** in the NRA process facilitates a comprehensive and consistent approach.
- ▶ Both the Department of Forests and the Water Development Department **implement evidence-based decision-making** where priorities are set based on the outcomes of their methodology.
- ▶ For the Department of Forests, prevention is an integral part of forest and rural fire management. This is incorporated in the relevant legislation.
- ▶ In the cyber field, **the law sets standards for annual risk assessments and an obligation to review these risk assessments**. Different entities have opportunities to set clear targets and mitigation measures. **The law does not prescribe a methodology; the Digital Security Authority gives guidelines**.

Recommendations

- ▶ A **legal framework** for the risk assessment process (as recommended in 2.1 Policy and legal framework) could be a very positive step in terms of institutionalising the process and ensuring implementation of the outcomes of the risk assessment.
- ▶ Further implementation of the NRA outcomes could be strengthened if the process for **identifying potential hazards** to be included in the NRA became more transparent. A final decision on the list should be made based on the consultations with the different stakeholders involved in the DRM process. As the process for selecting the hazards included in the 2018 NRA is not transparent, going forward it should be explained and be subjected to holistic decision-making based on criteria which are to be developed by a central coordinating agency.
- ▶ To ensure the effective functioning of the system, **comprehensive involvement of the participants** and bringing together all necessary activities, the responsibility of the established/dedicated agency should be identified by law or by secondary legislation.
- ▶ To ensure consistency and efficiency in the field of DRM and in particular in the direction of the risk identification and mitigation, it is recommended to have a **comprehensive approach**. Thus, the process must include:
 1. risk assessment (identification of the particular risks);
 2. prevention (planning and implementation of the particular countermeasures to reduce the risk and its negative impact);
 3. preparedness (creating/developing capabilities to respond if a disaster happens).

An example of the Georgian approach is given in Box 1 below.

- ▶ Having a single body which coordinates activities can provide more efficiency in the consolidation of efforts and resources.

- ▶ For **involving governmental actors**, it is important that ownership of the document is felt and taken by the various authorities, otherwise it could be perceived as the responsibility of one of the other authorities and proper attention may not be paid in terms of further usage.
- ▶ **Collaboration with the private sector should also be considered.** This could work through using private-sector data and methodologies, as these often have a more rigorous approach. In addition, the insurance industry should be approached as a disaster-risk-reducing actor; a partnership with them could be formed to enhance DRR. The insurance industry has certain tools to stimulate disaster risk reducing actions, while the public sector can set standards more legitimately.
- ▶ The **NRA** should be **adopted on the highest political level**, to make it a binding basis for decision-making by state authorities as well as for the representatives of various sectors, such as urban development. This would enable proper financial allocation, proper coordination, and the endorsement of its results and recommendations. It enables shared political ownership which determines budget allocation from the outset, secures funding and avoids ad hoc negotiation about specific funding needs.
- ▶ The Council of Ministers would adopt the NRA as a whole, with **one specific minister responsible for the coordinating agency** outlined earlier (the coordinating agency would operate at the working group level).
- ▶ To strengthen the comprehensiveness of the NRA, the **role of malicious risks** should be considered. This would also facilitate further integration of cyber risks.

Box 1: National Security Policy Planning in Georgia

National security policy

- ▶ This process ensures the identification, assessment, prevention and eradication of threats, risks and challenges that pose threats to the national interests of Georgia.
- ▶ The national security planning process is based on Georgian law ('Regulation on National Security Policy Planning and Coordination' adopted in March 2015 by the Parliament of Georgia).
- ▶ Based on the 'Regulation on National Security Policy Planning and Coordination', the national security policy planning defines the need to adopt national, agency and local level conceptual documents, strategies and their action plans in different security policy fields.

National threat and risk assessment

- ▶ The national threat assessment (NSA) document is a Georgian national conceptual document that identifies natural and man-made threats to national security, as well as related risks. Disasters listed within the NSA document are national or large-scale disasters due to their impact and likelihood.

- ▶ The production of the NSA is ensured within the Georgian law on 'Regulation on National Security Policy Planning and Coordination'.
- ▶ The NSA is a three-year document produced and developed within a multi-agency working group coordinated by the single lead agency responsible for security policy planning coordination. The agency is defined in the 'Regulation on National Security Policy Planning and Coordination'. The NSA is a scenario-based document that incorporates an elaborated national-level threat assessment methodology.
- ▶ The final draft of the document is approved by a special commission consisting of relevant deputy ministers and is sent to the Government of Georgia (GoG) for final approval.
- ▶ The NSA is updated every three years by the multi-agency working group, which is coordinated by the single lead agency responsible for security policy planning coordination.

National disaster risk reduction strategy

- ▶ The national DRR strategy of Georgia is produced to prevent and reduce natural and man-made disaster risks identified and listed in the NSA, as well as to establish a unified DRR system at national and local levels and to strengthen preparedness and response capabilities, as outlined in the Georgian law on 'Regulation on National Security Policy Planning and Coordination'.
- ▶ The national DRR strategy is developed within a multi-agency working group that is coordinated by the single lead agency responsible for security policy planning coordination, based on the Georgian law on 'Regulation on National Security Policy Planning and Coordination'.
- ▶ The strategy defines the main priority areas of the GoG and is developed in line with the UN Sendai Framework for Disaster Risk Reduction 2015-2030 and the UN Sustainable Development Goals. It aims to fulfil obligations outlined in the framework and goals, as well as obligations under the EU-Georgia Association Agreement.
- ▶ Together with the strategy, a four-year implementation plan – the action plan – is also developed by the multi-agency working group that defines priority areas, concrete activities for risk reduction, responsible and supporting governmental agencies and organisations, time frames, financial sources, budget and status of implementation. The action plan provides a unified framework for reduction of already identified national-level disaster risks. It has its own DRR budget that is approved by the GoG, in line with the state budget.
- ▶ The final draft of the national DRR strategy and its action plan are approved by a special commission consisting of relevant deputy ministers and is sent to the GoG for final approval.
- ▶ The implementation of DRR activities listed within the action plan of the national DRR strategy is monitored on yearly basis by the single lead agency responsible for security policy planning coordination. Within the implementation of the action plan of the national DRR strategy, identified risks might be reduced or even eliminated.

Disaster risk reduction strategy of a state agency

Based on the Georgian 'Regulation on National Security Policy Planning and Coordination', all state agencies in Georgia are obliged to assess risks within their territory and develop DRR strategies and action plans that should be in line with the national DRR strategy of Georgia.

3.1.2 Stakeholder consultation

As detailed in the description of the DRR system in Cyprus (2.1 Policy and legal framework), different ministries and departments deal with the specific risks for which they are responsible and for which they have a high level of expertise. Those departments were mainly involved in the NRA process in terms of providing hazard data and assessing the likelihood of hazard occurrence. The methodologies for assessing the likelihood of hazard occurrence differ from hazard to hazard. Consequently, approaches must be agreed with the relevant state agency. However, throughout the review, the peers got the impression that different departments that should be involved in the NRA were not sufficiently aware of the overall process and lacked engagement in terms of developing the NRA as a whole.

It did not become clear during the review how potential impacts were assessed or how different stakeholders, such as the private sector, were involved in this part of the NRA (see 2.1.1 Collaboration with relevant national stakeholders).

Good practice

- ▶ Every state agency has **very good specialists with strong expertise** in the field of their responsibility and their knowledge is well utilised within their department.

Recommendations

- ▶ **More engagement** of the departments in charge of different parts of the NRA, such as calculation of hazard likelihood, and permanent consultations with them during the process of the NRA production would leverage the level of the acceptance of the outcomes of the final document. The **platform created by the CCD for trans-departmental consultations could be leveraged as a tool** to facilitate the NRA process.
- ▶ The final NRA outcomes should be well communicated, shared and **accepted** by the **state agencies** involved in the process. Therefore, the final draft of the document, before its adoption, must be discussed with all the relevant state and non-state actors involved in the process (see also recommendations under 3.1.1 Risk assessment process).

3.1.3 Public awareness

There is no government entity responsible for dissemination of risk assessment information and there is no strategy to communicate the NRA to the population. Citizens are not generally involved in the NRA and planning procedures, although NRA results are openly available.

The Council of Ministers decides which information from the risk assessment is sensitive. The published risk assessment does not include an overview of the government's preparatory measures, but includes general advice on how the general public could be better prepared.

In general, risk awareness is built through different internet sites, on-the-spot lectures to citizens in risk areas and the publication of flyers, in addition to lectures given by CCD staff to other governmental services and public organisations. Also, conscripts and volunteers circulate flyers and information. DRA and DRR information are not included in school curricula but the Ministry of Education and Culture collaborates with relevant departments to organise risk awareness activities for students and teachers. Additional risk communication measures include television advertisements for the EU common emergency number (112) and promotional giveaways.

In addition to central activities, each department disseminates the (non-confidential) assessment results to the public via their website. Several departments have organised information events attended by journalists who conducted and published interviews with stakeholders. Examples of thematic dissemination and awareness raising include education (targeted mainly at children) about water preservation that has been developed by the Water Development Department, as well as education and awareness campaigns organised by the Forest Fires Service on the risk of wildfires, which target the population, visitors, tourists and children. There are also several ongoing projects and collaborations in the visitor centre of the Cyprus Troodos Unesco Geopark (initiated by the Geological Survey Department), including outreach and education to learn about plate tectonics, faults, earthquakes, seismometers and seismic networks. Additionally, the Digital Security Authority has launched campaigns targeting students, teachers and professionals working for critical infrastructure operators to raise awareness of cyber security. The units, with the support of CCD, have developed a 'yellow box' that contains awareness leaflets about chemical-related hazards (also known as Seveso-related hazards, a small first aid kit, masks and a manually rechargeable radio.

To disseminate the results of the 2018 NRA, a risk communication strategy will be prepared by the CCD. This will be implemented after agreement with the relevant departments. The aim of this strategy is to change public behaviour.

Good practice

- ▶ **Initiatives** deployed by **several actors** to increase awareness and education about risks and mitigation measures. This includes the Department of Forests' educational centre in the Troodos Mountains, as well as awareness raising by the Water Development Department about water shortages.
- ▶ **Participation of volunteers** in the dissemination of awareness-raising flyers and leaflets and giving awareness lectures.

- ▶ Distribution of a **yellow box** which contains awareness leaflets, small first aid kit, masks and a manually rechargeable radio in areas exposed to Seveso risks.
- ▶ **The siren system operated by the CCD** is a best practice for disseminating warnings and creating public awareness swiftly in case of emergencies.

Recommendations

- ▶ A **knowledge base** should be developed to increase risk awareness, i.e.:
 - ▷ understand how and through which activities risk awareness and preparedness increases;
 - ▷ identify risks and the vulnerable population;
 - ▷ identify the activities of the population at risk.
- ▶ The understanding of early warning systems signals should be increased: what situation is being warned for when specific alerts go off?
- ▶ A **national strategy** should be developed to strengthen public education and awareness. There should be a single entity which follows its approval (by the Council of Ministers) and monitors the implementation of the strategy. The strategy should be established based on the results of risk assessment and translated in capacity building measures. The strategy should include the following:
 - ▷ the objectives of the strategy (i.e. emphasise appropriate behaviour, change inappropriate behaviour, build a self-protection culture)
 - ▷ the responsibilities of all stakeholders and the mechanism of coordination
 - ▷ the activities to be carried out by stakeholders (TV advert, lectures, competitions, giveaways, etc.)
 - ▷ target groups (taking into account their age, education, etc.)
 - ▷ main messages to be delivered to the target groups
 - ▷ time frame of the strategy
 - ▷ identification of the required budget on a yearly basis (budgets to be dedicated for the strategy or from the budgets of relevant departments)
 - ▷ identification of the optimal use of available means of awareness
 - ▷ identification of innovative awareness tools.
- ▶ **Measure risk awareness** periodically as well as measures taken by individuals for preparedness (before and after communicational activities to measure and improve effectiveness). It should include a measurement of public awareness and a measurement of the effectiveness of communication activities in changing knowledge and behaviour.

3.1.4 Administrative, financial and technical aspects

The CCD is responsible for producing and submitting the NRA. For the third NRA in 2018, a tender was developed and the Cyprus University of Technology (in collaboration with other local universities) was contracted for the process. Additionally, a monitoring committee was installed. It included representatives from various governmental departments that have conducted specialised risk assessments or that have established strategies for prevention, preparedness and mitigation. Different governmental bodies provided input, particularly on hazard data. Hence, in terms of technical knowledge, the NRA involved the most relevant and experienced stakeholders. Nevertheless, there is still room for improvement, especially through involving the private sector, volunteers and representatives at the local level (see also 2.1.1 Collaboration with relevant national stakeholders). Also, some of the involved bodies in the NRA were not particularly aware of the risk assessment process as a whole. In this sense, it has to be questioned how deep their level of involvement was and to what extent they could meaningfully contribute.

In the absence of relevant holistic risk assessment legislation in Cyprus that specifies roles of different bodies during risk assessment, and activities after and between risk assessments, an independent budget is not available for assessing and reducing risk. A legal basis for DRR is however a crucial precondition for securing financial means for regular NRAs and, in later phases, for prevention, mitigation and preparedness when risks materialise.

At the time of writing, activities that are conducted in the DRR context generally have to be covered by the responsible department from their basic budget. This could lead to a situation where sufficient resources are not available to prevent and/or be prepared for possible emergencies.

Good practice

- ▶ There is **great administrative knowledge** in ministries regarding their own area of responsibilities.
- ▶ **Good expertise is involved** in the NRA process. An evidence-based approach and best knowledge from different bodies (ministries, departments) has been used in compiling the NRA.

Recommendations

- ▶ As indicated, **the NRA should be institutionalised and, together with a costing of various mitigation measures, form the basis for political decision-making and determining financial needs.** The costing of the various mitigation measures would be aided by the collection of disaster loss data.
- ▶ The ‘whole of government’, network-based approach could be used for **setting future priorities** in DRA and DRR.
- ▶ A **calculation of the DRR funds being spent nationally should be included in the budget.** This would be the sum of the various ministries’ budgets. This gives an overview and can be considered as ‘earmarked’ for DRR.

3.1.5 Follow-up, monitoring, evaluation and reporting

The NRA process started in 2015 and the new NRA document was completed in 2018, though there is no defined methodology for a mid-term update of the document. The relatively long period between the previous and the latest NRA may be explained by the fact that within the interim period no new risks have been identified. However, it would generally be useful for the process itself, if procedures stipulating how and when the NRA and the risk registry should undergo a (mid-term) review are included in the methodology of adoption and approval of the NRA.

According to existing practice, the final draft of the NRA is approved by the CCD. Without being adopted as a political document (or being incorporated into law) the NRA may not be considered as a compulsory and highly important manual/guidebook for different state or non-state actors.

Good practice

- ▶ **Periodical update** of the NRA and integration of updated data for the assessment of the likelihood and impact of risks constitutes a good practice in DRM.

Recommendations

- ▶ In order to achieve process continuity and results efficiency, it is recommended that the **NRA process be institutionalised** by indicating procedures for drafting, approval, review and mid-term updating within the primary or secondary legislation.
- ▶ A **mid-term evaluation** of the risks scenarios and impacts should be conducted to identify whether there are significant changes caused by the activities undertaken to reduce the level of the particular risk.
- ▶ **The results of the NRA should be disseminated** and permanent meetings with the agencies responsible for the different areas described in the NRA should be held to discuss outcomes from a cross-sectoral point of view.

3.2 Risk management planning

3.2.1 Risk consideration in policies and planning

DRR in Cyprus is highly decentralised with different ministries and departments responsible for their development, evaluation and adaptation (see 2.1 Policy and legal framework and 3.1 Risk Assessment). The responsible departments have great competence in terms of hazard knowledge and data, including possible worst-case scenarios that they can contribute to the NRA. For example, there is great knowledge about forest fire risks in the Department of Forests, about flooding and drought risks in the Water Development Department and about the possible earthquake and tsunami risk in the Geological Department. These departments plan their own risks into policies and plan their own DRR activities. For example, the Department of Forests educates people living near forests to reduce the possibility of forest fires by cleaning their gardens and cutting back trees. However, as indicated in chapter 2 (especially 2.1 Policy and legal framework), a holistic approach to developing DRR measures is thus far lacking. To overcome this gap, a central body and the development of a legal basis have already been recommended.

Good practice

- ▶ Departments use their own professional data for their own field of action and **develop prevention and preparedness activities**.

Recommendations

- ▶ A **comprehensive** approach for a holistic **DRR strategy** that builds on the NRA results should be developed.
- ▶ **Information** about different risks should be **shared and circulated** between different stakeholders, horizontally as well as whole vertically.

3.2.2 Risk management planning process

As detailed in 2.1 and 3.1, a coordinated DRR process is lacking in Cyprus. The different ministries and departments responsible for certain ZENON plans take care of their implementation and revision. For example, the Water Development Department manages water supply and drought mitigation strategies, and the Department of Forests manages forest-fire-related DRR strategies, plans and activities. Also, the Digital Security Authority can be considered as a good practice example in a sectoral point of view. However, there is no holistic approach to DRR. The link of the ZENON plans with the NRA seems not to be sufficiently clear and institutionalised yet.

One observation that struck the peers is that the decision-making process that is established in case an emergency should occur is currently not streamlined. A striking example is the protocol for engaging the early warning systems. If the seismological centre sends a warning of an impending tsunami to the CCD, the CCD Commander needs to be alerted. In turn, they need to await the approval of the Minister of the Interior before engaging the early warning sirens to alert the public. This process may take too long in situations where every second is vital.

Good practice

- ▶ Most departments can be regarded as **sectoral good practice** examples.
- ▶ The (governance) approach of the Digital Security Authority to engage with multiple stakeholders and raise awareness could function as a best practice example.

Recommendations

- ▶ A **coordinating agency** for developing and coordinating DRR activities across the actors involved should be established.
- ▶ The **process of decision-making for crisis events** should be **streamlined**. A good example would be delegating the authority for engaging the early warning systems to the CCD Commander, rather than the Minister of the Interior.

3.2.3 Public awareness

Since there are no specific public awareness activities, please refer to section 3.1.3.

3.2.4 Administrative, financial and technical aspects

Administrative, financial and technical aspects of risk reduction are crucial because it is through risk reduction planning that the identified risks are governed. If done properly, risk reduction gives confidence for the government and public that risks are properly thought through.

Risk reduction planning administration starts with the risk assessment process (Also see 3.1.1 Risk assessment process). Since DRR has to be governed holistically, it has to involve the people who are contributing and making use of the NRA on the managerial level, otherwise it is difficult to draw relevant information from the risk assessment for risk reduction planning. However, for Cyprus, there seems to be a gap in drawing together risk assessment and risk reduction planning administration. As previously noted, all governmental departments have knowledge about risks and what has to be done for risk reduction for their particular risks. Unfortunately, there is no holistic DRA/DRR approach. It would help to consolidate risks or link similar risk reduction activities.

As an example, the loss of fertile soil was given, which is a major risk for Cyprus. Opportunities to reverse this process already exist in Cyprus. However, due to a lack of an all-inclusive system, the relevant measures lack consistency and continuity. However, additional challenges are created by local acidity caused by the 25 abandoned mines and mining waste. Measures to neutralise acidity, such as the use of limestone available from the quarries across Cyprus or the use of compost to enrich the soil, are not brought together in an effective manner due a division of competences, ownership and a lack of holistic planning. The absence of a holistic approach is mainly due to a shortage of staff and time, which prevents the relevant departments from contributing to the extent necessary.

In terms of funding, budget for the development and implementation of DRR measures needs to be available. At the time of writing, it seems that there is no holistic view on developing DRR and allocating money for respective activities or programmes. All departments have to implement their own activities within the basic budget. A central fund for DRR activities should be established that would allocate money for universal activities to reduce risks and/or improve preparedness.

Recommendations

- ▶ The whole DRR cycle should **involve** all the different **stakeholders** who are important to have an adequate result of DRA and DRR.
- ▶ A **legally based approach** for a holistic and institutionalised DRR process should be developed.
- ▶ **Central funding** should be dedicated to DRR and streamline activities.
- ▶ Information about different risks and possible measures to address them should be shared and circulated between different stakeholders, horizontally as well as vertically.

3.2.5 Follow-up, monitoring, evaluation and reporting

The following up, monitoring, evaluation and reporting activities for DRR primarily need to be streamlined between the actors involved. A legal basis and central (overseeing) governmental agency should be responsible for the implementation of this process, which also takes into account the NRA results and updating the existing ZENON plans. These recommendations mainly relate to the comprehensive approach (see 2 Overall disaster risk management approach).

4. Good practices and recommendations

This chapter provides an overview of the good practices and recommendations given throughout the report.

4.1 Good practices

4.1.1 Overall approach and involvement of central actors

- ▶ Cyprus has a very professional approach to DRM that involves all central actors.
- ▶ The various ministries and sectoral departments in Cyprus are already engaged in DRR, and these agencies have strong expertise to deal with topics under their remit. Lessons learned are therefore developed at the departments with most expertise.
- ▶ There are plans that cover most of the relevant risks under the ZENON master plan. The majority of the stakeholders contribute to the NRA as well.
- ▶ The country is very engaged in benchmarking and learning activities to enhance DRR.

4.1.2 Approach to developing the risk assessment

- ▶ Cyprus underwent its third NRA in 2018, the methodology of which was based on multi-dimensional components as suggested by the Sendai Framework for Disaster Risk Reduction 2015-2030, the 2010 EU Risk Assessment Guidelines and International Standards such as ISO 31000 and ISO 31010.
- ▶ An evidence-based approach and knowledge from different bodies (ministries, departments) was used when compiling the NRA. Involvement of a research institution in the process of the NRA can facilitate a comprehensive and consistent approach.
- ▶ The periodic updating of the NRA and integration of updated data for the assessment of the likelihood and impact of risks constitutes good practice in DRM.

4.1.3 International engagement

- ▶ Cyprus has a high level of international engagement. It demonstrates positive relationships with many international organisations, draws on the resources they have to offer, and makes valuable, demonstrable contributions to them. Cyprus is actively involved in contributing to and benefiting from the UCPM.

4.1.4 Strong relationships between involved actors

- ▶ A very good and trusted relationship between the relevant actors in the field of DRR has already been established and enables fruitful collaboration.
- ▶ Participation of volunteers in the dissemination of awareness-raising flyers and leaflets and giving awareness lectures is one example of how beneficial such goodwill and strong relationships are.

4.1.5 Prevention and preparedness

- ▶ Departments use their own professional data for their own field of action and develop prevention and preparedness activities.

4.1.6 Awareness raising

- ▶ There are several initiatives deployed by different departments to increase awareness and education about risks and mitigation measures.
- ▶ One example is the distribution of a yellow box which contains awareness leaflets, a small first aid kit, masks and a manually rechargeable radio in areas exposed to Seveso risks.

4.2 Recommendations

Below, the main recommendations included in this report are presented in summary form, arranged by time-frame: actions to take in the short term, medium term and long term.

4.2.1 Short-term recommendations

- ▶ The NRA should be adopted on the highest political level, to make it a binding basis for state authorities, as well as for the representatives of various sectors, for the implementation of activities such as urban development.
- ▶ DRR activities should be focused more on prevention, including measuring public risk awareness and activities to raise public awareness of risks.
- ▶ Benefits of investments in DRR/risk prevention should be quantified to advocate for action. The process of DRM would be significantly improved by a coordinated process to collect comprehensive data about the damage caused by a disaster (disaster loss data).²⁷
- ▶ Until a robust disaster loss database is built up, which can demonstrate the reduction of losses over time, examples from other countries should be used.
- ▶ Further implementation of the outcomes of the NRA could be strengthened if the process for identification of the potential hazards that should be included in the NRA became more transparent.

4.2.2 Medium-term recommendations

- ▶ There is no holistic or overarching approach to enhancing DRR, as each stakeholder revises the plans individually. To address this issue, a coordinating agency should be appointed. This coordinating agency should be assigned by the Council of Ministers. The task of the coordinating agency is to develop the mechanisms for reviewing, revising, monitoring and evaluating the plans within a given time frame, and to develop relevant standard operating procedures (SOPs), together with the relevant departments. One of its tasks would be reviewing, revising and evaluating the plans under ZENON. The agency would be responsible for following up the implementation of the recommendations. This could be as an entirely new agency, or through assigning (and institutionalising) this task to an already existing agency. The peers consider assigning an existing agency preferable to creating a new agency, as it would allow Cyprus's DRM and DRR to build on the expertise built up in the past.
- ▶ Capability-based planning and how that should be integrated into preparedness should be emphasised.

²⁷ Good practice here would be to collect comprehensive data of various types: economic, environmental, social, cultural, etc.

- ▶ There should be a more holistic approach to determining the capabilities necessary to deal with the outcomes of the NRA. This would be facilitated by the instalment of a special Council of Ministers committee, as a non-biased and independent body that has the overview and can steer relevant activities in the relevant ministries. This committee operates on the political level and is distinct from the (working-group level) coordinating agency already discussed.
- ▶ Plans should be made more adaptable, rather than risk-specific. Instead of 24 ZENON plans, there should be consequence-based plans: for example, a water shortage plan, a mass casualty plan, a mass evacuation plan. These should be informed by the NRA.
- ▶ The role of malicious risks should be considered and incorporated in the same matrix as non-malicious risks. This would also solve the problem of how to incorporate cyber risks into the NRA. The malicious part could be classified as secret, as it is more sensitive.
- ▶ Disaster loss data should be synthesised, analysed and made available by a central actor. It would therefore help if there were a central coordinating agency for collecting post-event data.

4.2.3 Long-term recommendations

- ▶ The integration of lessons learned – just as other DRR processes – suffers from a lack of a legally binding and holistic approach to regulate and manage DRR planning and implementation on the national level. The integration of lessons learned and information from the NRA process should be formalised in order to ensure that action is taken by the relevant actors. The establishment of the legal framework for the process of DRR can be a very positive step in terms of its institutionalisation. It is noted that the legal framework is not an end in itself, but one way to raise the NRA's profile. There are other ways, such as adoption of the NRA at the highest political level. Both approaches can also be pursued in tandem.

Annex I – Terminology

Contingency planning — 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 — any situation that has or may have a severe impact on people, the environment or property, including cultural heritage.

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

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

Preparedness — 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 (1) where possible, preventing disasters from happening, and (2) where they are unavoidable, taking steps to minimise their impact.

Resilience — 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 by preserving and restoring its essential structures and functions.

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

Stakeholders — actors with an interest in DRM include scientific communities (including engineering, geographical, social, health, economic and environmental sciences), practitioners, businesses, policymakers, central, regional and local levels of government and the public at large.

Sub-national level — entities at the regional or local government levels tasked with DRM.

Annex II – List of documents

Policy documents

- ▶ Cyprus Civil Defence (2018), Introductory document on Cyprus and general features
- ▶ First Capability Assessment report of the Republic of Cyprus (2018)
- ▶ Second National Risk Assessment of the Republic of Cyprus (2016)
- ▶ Third National Risk Assessment of the Republic of Cyprus (2018)

Legislative documents

- ▶ [Law 117(I)/96] – The Civil Defence Law of 1996
- ▶ [P.I. 221/97] – The Civil Defence (General) Regulations of 1997
- ▶ [N. 42(I)/98] – The Civil Defence (Amendment) Law of 1998
- ▶ [P.I. 509/2004] – The Civil Defence (General) (Amendment) Regulations of 2004
- ▶ [P.I. 97/2006] – The Civil Defence (General) (Amendment) Regulations of 2006



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