



L-ERBATAX-IL LEGIŻLATURA

P.L. 5632

Dokument imqiegħed fuq il-Mejda tal-Kamra tad-Deputati fis-Seduta
Numru 359 tat-24 Ġunju 2025 mill-Ispeaker, l-Onor. Anġlu Farrugia.

Eleanor Scerri
Skrivan tal-Kamra



National
Audit
Office

MALTA

Climate Change Adaptation

Evaluating Malta's efforts
relating to Flooding and
Sea Level Rise



OUR VISION

To provide a multidisciplinary professional service to parliament, to Government and the taxpayer and to be an agent of change conducive to achieving excellence in the public sector.

OUR MISSION

To help promote accountability, propriety and best practices in Government operations.

Climate Change Adaptation

Evaluating Malta's efforts relating to Flooding and
Sea Level Rise

Performance Report

Our performance audits evaluate the efficiency, effectiveness, and economy of public sector activities to determine whether resources are being used optimally. We provide evidence-based recommendations to help public bodies enhance service delivery and achieve better outcomes for citizens.

Report by the Auditor General

This report has been prepared under sub-paragraph 8(a)(ii) of the First Schedule of the Auditor General and National Audit Office Act, 1997 for presentation to the House of Representatives in accordance with sub-paragraph 8(b) of the First Schedule of the said Act.



Charles Deguara
Auditor General

The Auditor General is head of the National Audit Office, Malta. He and the National Audit Office are totally independent of Government. He examines the accounts of all Government Ministries and Departments and may also examine other public sector bodies. He also has statutory authority to report to the House of Representatives on the economy, efficiency and effectiveness with which Departments and other bodies have used the resources voted annually to them in the Estimates.

National Audit Office
June 2025

Table of Contents

List of Abbreviations	5
Key Facts	7
Executive Summary	8
Why this Study?	8
NAO's Key Observations	8
What the NAO recommends	9
Chapter 1 Terms of Reference	10
1.1 Introduction	10
1.2 Background information	11
1.3 Audit Objectives	16
1.4 Methodology	18
1.5 Audit Limitations and Mitigation	18
1.6 Report Structure	19
Chapter 2 Risk Assessments	21
2.1 Introduction	21
2.2 Inherent complexities delayed the delivery of the Maltese-economy-wide climate Vulnerability and Risk Assessment	22
2.3 EWA undertakes flood hazard and risk assessments in accordance with the Floods Directive	23
2.4 Conclusions	26
Chapter 3 The regulatory and strategic framework	27
3.1 Introduction	27
3.2 The recently enacted Climate Action Act has brought about various positive developments	28
3.3 Adaptation measures incorporated in the Malta Low Carbon Development Strategy lack ownership as well as clear timeframes and KPIs	31
3.4 In December 2023 the European Commission identified multiple improvement opportunities regarding Malta's draft NECP	34
3.5 Malta's second Flood Relief Management Plan has improved significantly in line with the European Commission's recommendations	36
3.6 Conclusions	38

Chapter 4 Adaptation action and monitoring	40
4.1 Introduction	40
4.2 Effective implementation and monitoring of Adaptation measures included in the Malta LCDS is significantly hindered by the lack of prioritisation of measures, clear timeframes and KPIs	41
4.3 Measures emanating from the second Flood Risk Management Plan are being implemented and monitored in line with pre-established timeframes	43
4.4 Despite various CCA beneficial projects across different sectors, climate-related systematic monitoring and evaluation of such action was limited	48
4.5 Conclusions	51
Chapter 5 Cost-effectiveness of Adaptation measures	52
5.1 Introduction	52
5.2 Scientific literature increasingly supports the assertion that the cost of inaction on climate change already exceeds the cost of adaptation	53
5.3 Government is still in the process of better quantifying the cost of inaction on climate change and the cost of adaptation	57
5.4 Similar to global trends, national climate change budgets are on the increase but likely not commensurate with the investment needs	57
5.5 Conclusions	62
Chapter 6 Concluding Remarks	64
Appendix I Maltese-economy-wide climate Vulnerability and Risk Assessment	68
Appendix II Flood hazard areas and potential impact resulting from a low-probability 200-year extreme weather event (Malta's second FRMP)	71
Appendix III Summary of the methodology adopted for the second Flood Risk Management Plan for the Malta River Basin District	72
Appendix IV Residents at risk of flooding across the seven APSFR catchments (second FRMP)	74
Appendix V Cost of inaction on climate change and cost of adaptation	76

List of Tables

Table 1:	Comparative analysis of key elements of the former Climate Action Act – Cap. 543 and the present Climate Action Act – Cap. 643	29
Table 2:	LCDS (2021) climate change adaptation related measures by sector, type and relationship to flooding and/or sea level rise	33
Table 3:	EC’s recommendations on the first FRMP and Government’s actions to address such issues through the second FRMP	37
Table 4:	Climate Change Adaptation measures presented in the Malta Low Carbon Development Strategy	42
Table 5:	Malta’s second Flood Risk Management Plan, Programme of Measures (as at end 2024)	44
Table 6:	Climate Change budget line item and actual expenditure (2015-2023)	59
Table 7:	Recurrent budget and expenditure directly related to climate change (2015-2023)	60
Table 8:	Links between the NAO’s recommendations and audit conclusions	66

List of Figures

Figure 1:	Minimising loss and damage through climate change adaptation	12
Figure 2:	Positive impact of SDG 13 on other Sustainable Development Goals	13
Figure 3:	Projected mean Sea Level Rise (Malta)	15
Figure 4:	Governance structure for managing flooding related risks in Malta	16
Figure 5:	PLM for Flooding and Sea Level Rise	17
Figure 6:	The economic costs when evaluating the cost of inaction	53
Figure 7:	The four main types of Adaptation costs	54
Figure 8:	Economic costs of climate change and Adaptation investments	55
Figure 9:	Global tracked climate finance and average estimated annual needs through 2050	58

List of Abbreviations

APSFR	Areas of Potentially Significant Flood Risk
CAA	Climate Action Authority
CAB	Climate Action Board
CCA	Climate Change Adaptation
CCP	Climate Change Platform
CPI	Climate Policy Initiative
EC	European Commission
ECA	European Court of Auditors
EWA	Energy and Water Agency
FHM	Flood Hazard Maps
FHRA	Flood Hazard and Risk Assessment
FHRM	Flood Hazard and Risk Maps
FRM	Flood Risk Maps
FRMP	Flood Risk Management Plan
IMC	Inter-Ministerial Committee
IPCC	Intergovernmental Panel on Climate Change
ISSAI	International Standard of Supreme Audit Institutions
KPIs	Key Performance Indicators
LCDS	Low Carbon Development Strategy
MAFA	Ministry for Agriculture, Fisheries and Animal Rights
MEEC	Ministry for the Environment, Energy and Public Cleanliness
MTIP	Ministry for Transport, Infrastructure and Public Works
NAO	National Audit Office
NCAC	National Climate Action Council
NECP	National Energy and Climate Plan
PD	Potential Damage
PFRA	Preliminary Flood Risk Assessments
PLM	Programme Logic Model
SDG	Sustainable Development Goal
UM	University of Malta
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
VRA	Climate Vulnerability and Risk Assessment
WFD	Water Framework Directive

Key Facts

Sectors vulnerable to Climate Change



Scenario Analysis



Executive Summary

Why this Study?

The National Audit Office (NAO) sought to determine the extent to which Government is adapting to the existing climate change risks emanating from flooding incidents as well as slow onset events like sea level rise.

The potential socio-economic and environmental impacts resulting from the increasing frequency and intensity of extreme weather events, as well as the changing national priorities including those attributable to international developments, call for more effective and timely Adaptation action. Consequently, this Office opted to assess these specific climate change hazards due to Malta's vulnerabilities that are, in part, attributable to its geographical specificities.

This Review also forms part of an International Organisation of Supreme Audit Institutions (INTOSAI) Development Initiative (IDI) on the subject matter.

NAO's Key Observations

Government's commitment to better manage climate change matters is evidenced through various initiatives. These included the undertaking of an economy-wide climate Vulnerability and Risk Assessment (VRA), establishing a regulatory framework, the setting-up of the Climate Action Authority, implementing projects as well as embracing international and EU related reporting obligations.

Government Entities' involvement in various Climate Change Adaptation (CCA) related projects was intended to address different issues that were hindering the implementation of more effective Adaptation action. These include, among others, ongoing projects such as the CARDIMED, which aims to facilitate and harmonise data collection and assessment processes as well as the LocAll4Flood, which proposes an integrated multi-stakeholder governance model that combines climate prevention, adaptation, and mitigation actions.

However, this Office observed that infrastructural and greening projects with Adaptation related benefits were generally not being supplemented with climate proofing assessments that are undertaken from the design stage, unlike as required for certain EU-funded infrastructure projects with a lifespan of more than five years under the programming period 2021-2027. The increase in frequency and intensity of climate change events including flooding, calls for an approach that maximises the return on investment of Adaptation action, particularly in terms of strengthening the resilience to climate change.

CCA related strategies and plans, namely the Malta Low Carbon Development Strategy up to 2050 and the National Energy and Climate Plan for the period 2021 to 2030, did not always specify ownership for the implementation of the relative measures, nor include clear timeframes and Key Performance Indicators (KPIs). Furthermore, an attempt to assess the level of implementation of adaptation measures included therein revealed that these measures are not being systematically monitored and evaluated. On the other hand, flooding related measures emanating from the second Flood Risk Management Plan for the Malta River Basin District, were prioritised thus enabling more systematic implementation and monitoring.

Although climate change funding has been increasing over recent years, Government is still in the process of quantifying the cost of adapting to climate change whilst duly considering the findings of the recently concluded Maltese-economy-wide climate VRA. Such an approach will contribute towards securing budgets that are commensurate with investment needs. Whilst the impact of flooding events was generally contained over the last decades, slow onset events like sea level rise may require greater stakeholder participation including private investment.

To date, Malta has taken various steps to adapt to climate change hazards and risks. Despite recent developments, this Review also acknowledges a range of challenges which are yet to be addressed. Recent assessments by the European Commission have also echoed these concerns. Although some elements of climate change impacts may be gradual, the required investments to adapt to these hazards and risks call for immediate and a more collaborative approach involving national and to various degrees international stakeholders.

What the NAO recommends

In view of the improvement opportunities identified through this Performance Audit, the NAO is of the opinion that Government should strengthen the overall Adaptation planning function, mainly by developing more detailed hazard as well as sector specific measures with clearly assigned responsibilities, timeframes and KPIs. Such measures are to be supported with sound data and comprehensive Vulnerability and Risk Assessments. Thus, Government's more structured approach adopted for addressing flooding issues ought to be extended to all existing climate change hazards including sea level rise. Finally, the Government with the support of all the relevant stakeholders including the Climate Action Authority, relevant Ministries as well as the private sector, is to design a clear financial roadmap to ensure that Adaptation funding is sufficient, used efficiently and tracked effectively.

Chapter 1

Terms of Reference

1.1 Introduction

- 1.1.1 Climate change is being witnessed globally and is posing new threats and challenges. It is no longer a matter of '*if*' it will happen or not, but rather of '*when*', '*at which intensity*' and '*where it will hit worst*'.¹ In October 2019, the Maltese Parliament had unanimously declared a climate emergency, stressing the need to take new measures in response to climate change.²
- 1.1.2 Small islands like Malta are particularly vulnerable to climate change hazards.³ The extreme weather events such as intense rainfall causing flooding coupled with slow onset events like sea level rise, result in negative environmental and socio-economic impacts. These include coastal erosion, saline intrusion, the deterioration or potential loss of sandy beaches, as well as a negative impact on public infrastructure such as the electricity distribution network and roads.
- 1.1.3 Malta's climate change mitigation potential, that is, opportunities for reducing emissions are relatively limited. This situation materialised not only due to intrinsic limitations such as the geographical attributes including our size, as well as the recent developments regarding energy generation, but also when considering its transboundary nature.
- 1.1.4 Consequently, this Office opted to focus this performance audit on Climate Change Adaptation (CCA), specifically on any attempts to address the hazards of flooding and sea level rise. Moreover, this topic also featured prominently in the NAO's risk assessment for strategic planning and audits' selection. Furthermore, this Report will form part of a cooperative audit that is being carried out in parallel with another 48 State Audit Institutions (SAIs) within the auspices of the International Organisation of Supreme Audit Institutions Working Group on Environmental Auditing (INTOSAI WGEA).⁴

¹ Ministry for Environment, Climate Change and Planning, 2021. Malta Low Carbon Development Strategy, p. 71. [online] Available at: https://unfccc.int/sites/default/files/resource/MLT_LTS_Nov2021.pdf

² House of Representatives, Malta, 2019. Motion No. 273 – Private Members' Motion: Climate Change Committee. [online] Available at: <https://parlament.mt/media/103048/motion-no-273-private-members-motion-climate-change-committee.pdf>

³ Malta ranked 15th out of the 190 countries in the Climate Vulnerability and Resilience Index (COVRI) implying high risks of being harmed by climate change. Related aspects are further discussed in Chapter 4.

⁴ INTOSAI Development Initiative (IDI), n.d. Climate Change and the Role of SAIs (CCAA). [online] Available at: <https://idi.no/workstreams/relevant-sais/ccaa>

1.1.5 Unless it is specified otherwise, issues presented in this Report reflect the situation as at end 2024. Such date reflects a situation whereby Government and the Ministry responsible to coordinate climate change related matters, that is the Ministry for the Environment, Energy and Public Cleanliness (MEEC) were awaiting the conclusion of various important initiatives aimed at better addressing CCA, namely the:

- i. Maltese-economy-wide climate Vulnerability and Risk Assessment (VRA) that would enable more-informed prioritisation as well as the better allocation of the limited resources available; and,
- ii. operationalisation of the Climate Action Authority that was set up recently. This Authority is mainly *“responsible for the exercise of climate action, to co-ordinate and oversee mitigation and adaptation policy and measures and any matters ancillary thereto or connected therewith and to provide for the reporting of such climate action, as required”*.⁵

1.1.6 Notwithstanding these specific circumstances, that were mitigated to some extent as noted in Section 1.5, this Office opted to proceed with this performance audit. This decision reflects the importance being given to CCA and enhancing resilience to hazards like flooding and sea level rise, on both the international as well as the national level.

1.2 Background information

1.2.1 The United Nations (UN) Intergovernmental Panel on Climate Change (IPCC) defines CCA as: *“Adjustments in natural or human systems, in response to actual or expected climatic stimuli or their effects, which moderate, harm or exploit beneficial opportunities”*.⁶ Key to CCA is climate resilience, which can be defined as *“the ability to anticipate, prepare for, and respond to hazardous events, trends, or disturbances related to climate. Improving climate resilience involves assessing how climate change will create new, or alter current, climate-related risks, and taking steps to better cope with these risks.”*⁷

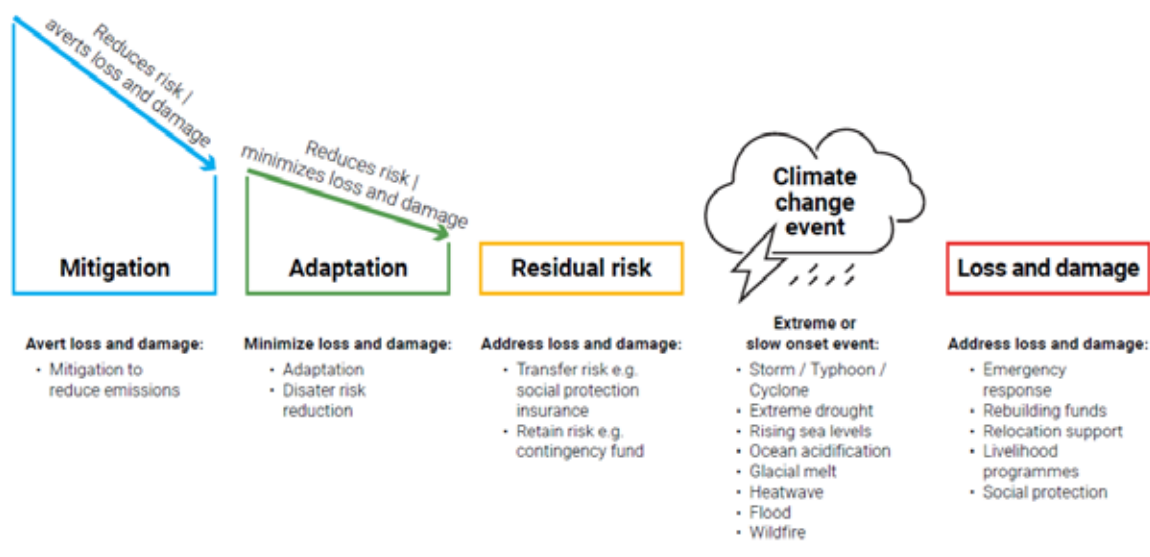
1.2.2 Figure 1 depicts the different climate change events as well as the required interventions. The latter include both risk reduction measures such as through CCA, as well as the need for supplementary action that is necessary to address any loss and damage associated with the residual risk.

⁵ Government of Malta, 2024. Act No. XVI of 2024. [online] Available at: <https://legislation.mt/eli/act/2024/16/eng>

⁶ Intergovernmental Panel on Climate Change (IPCC), 2007. *Climate Change 2007: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. [online] Available at: https://archive.ipcc.ch/publications_and_data/ar4/wg2/en/frontmattersg.html

⁷ Centre for Climate and Energy Solutions (C2ES), n.d. Climate Resilience Overview. [online] Available at: <https://www.c2es.org/content/climate-resilience-overview/>

Figure 1: Minimising loss and damage through climate change adaptation



Adapted from: Richards, J.A. (2022). <https://www.lossanddamagecollaboration.org/stories-op/how-does-loss-and-damage-intersect-with-climate-change-adaptation-drr-and-humanitarian-assistance>

Source: United Nations Environment Programme (UNEP) (2023). Adaptation Gap Report 2023.

1.2.3 In 2022, the UN IPCC identified flooding and sea level rise as two of the major impacts and risks for Europe.⁸ Moreover, as noted in the declaration of the tenth summit of the southern countries of the European Union in September 2023, *"Climate adaptation efforts are key to strengthening the Union's resilience and crisis response capacity"*.

1.2.4 The need to address such climate change hazards was recently voiced in different fora and by multiple stakeholders including Malta. These include the following:

- a. 28th meeting of the Conference of the Parties (CoP28) to the United Nations Framework Convention on Climate Change (UNFCCC).
- b. European Council Conclusions of 17 October 2023 (EUCO 14/23).⁹
- c. 10th Summit of the southern countries of the EU (MED-9).¹⁰

⁸ IPCC, 2022. Sixth Assessment Report, Working Group II – Impacts, Adaptation and Vulnerability. Geneva: Intergovernmental Panel on Climate Change.

⁹ Council of the European Union, 2023. Preparations for the 28th Conference of the Parties (COP28) of the United Nations Framework Convention on Climate Change (UNFCCC) (Dubai, 30 November – 12 December 2023)- Council conclusions [online] Available at: <https://data.consilium.europa.eu/doc/document/ST-14285-2023-INIT/en/pdf>

¹⁰ Department of Information, Government of Malta, 2023. Declaration of the 10th Summit of the Southern Countries of the European Union (EU) [online] Available at: <https://www.gov.mt/en/Government/DOI/Press%20Releases/PublishingImages/Pages/2023/09/29/pr231487/pr231487a.pdf>

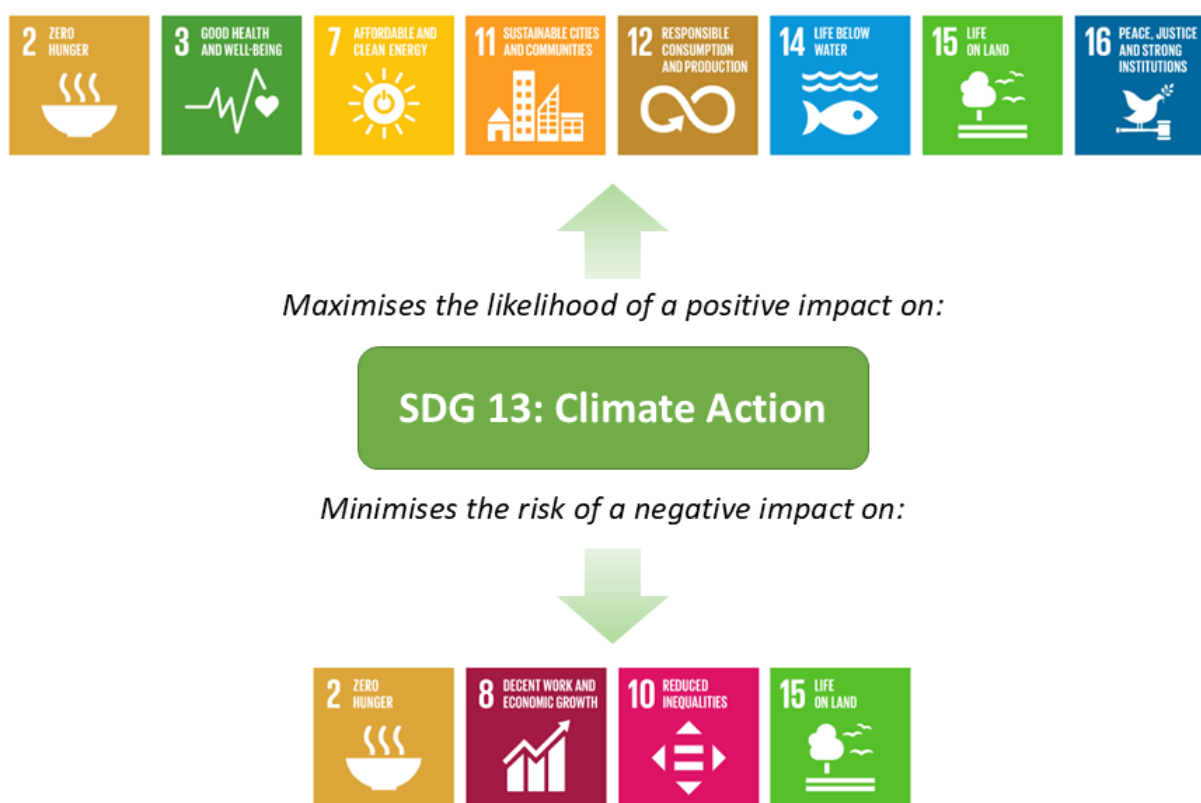
d. Joint declaration on climate emergency, signed by the Presidents of Malta, Croatia, Greece, Italy, Portugal and Slovenia in August 2023.¹¹

e. United Nations Security Council.¹²

Climate action and sustainable development

1.2.5 Sustainable development is key to reduce the risks associated with flooding and sea level rise, as well as to contain any related loss or damage caused by climate change events. Leading action on Sustainable Development Goal (SDG) 13, that is, 'Take urgent action to combat climate change and its impacts'¹³ would result in strong benefits for other SDGs. These include improved energy security (SDG 7), more liveable cities (SDG 11), resilient agricultural practices (SDG 12), as well as improved national security (SDG 16). Figure 2 refers.¹⁴

Figure 2: Positive impact of SDG 13 on other Sustainable Development Goals



Source: Adapted from United Nations Global Compact, SDG 13: Climate Action Narrative.

¹¹ Department of Information, Government of Malta, 2023. Appeal for the Mediterranean. [online] Available at: <https://www.gov.mt/en/Government/DOI/Press%20Releases/PublishingImages/Pages/2023/08/03/PR231209en/PR231209b.pdf>

¹² United Nations, 2023. Security Council Press Release: SC/15318. [online] Available at: <https://press.un.org/en/2023/sc15318.doc.htm>

¹³ United Nations, n.d. Goal 13: Climate Action. [online] Available at: <https://sdgs.un.org/goals/goal13>

¹⁴ United Nations Global Compact, n.d. SDG 13: Climate Action Narrative. [online] Available at: <https://blueprint.unglobalcompact.org/sdgs/sdg13/#narrative>

- 1.2.6 The impacts of flooding extend beyond SDG 11 (Sustainable Cities and Communities) and SDG 13 (Climate Action). In urban areas, flooding may also impact homes and workplaces, resulting in the disruption or even the elimination of jobs, thereby affecting SDG 8 (Decent Work and Economic Growth) and SDG 9 (Industry, Infrastructure, and Innovation). Additionally, flooding would directly impact upon SDG 1 (No Poverty) and SDG 2 (Zero Hunger). The indirect impact of flood events can also negatively impact other SDGs such as SDG 5 (Gender Equality) as well as SDG 15 (Life on Land).¹⁵
- 1.2.7 Similarly, the rising sea levels would result in a negative impact on several SDGs as this climate change event would lead to more frequent and severe coastal flooding and erosion.¹⁶ When considering Malta's geographical specificities as well as the coastal communities and economic activity, slow onset climate change events like sea level rise would still result in significantly negative socio-economic as well as environmental impacts.

Flooding and sea level rise impacts within the local context

- 1.2.8 As noted in 'The 8th National Communication of Malta' (8th NC) published in June 2023 under the UNFCCC, more investment is required to further reduce the risks associated with flooding and sea level rise¹⁷. The major investment to-date relates to the €54 million National Flood Relief Project (NFRP) that was partly financed through EU funds. To this end, the 8th NC asserts that *"Msida, Birkirkara, Balzan and Qormi are some examples of areas which will require considerable investment to remove the flooding threat"*.
- 1.2.9 In 2015, a local study concluded that *"The percentage of arterial roads prone to flooding was estimated at 10 per cent, whilst 6 per cent of distributor roads and 7 per cent of rural roads would be prone to flooding"*.¹⁸ The increase in the number of surfaced roads and consequently the increase in rainwater runoff because of the reduced absorption ability, coupled with other issues such as climate change and the changing rainfall patterns, resulted in a significant impact on our roads network, particularly coastal areas that would also be impacted by sea level rise.
- 1.2.10 Whilst acknowledging that, in the case of Malta, sea level rise is a slow onset event, it is to be noted that NASA's Sea Level Projection Tool shows an expected mean sea level rise of around 0.63 metres by year 2100, for the SSP3-7.0 scenario.¹⁹ Figure 3 refers.

¹⁵ SDG Action, n.d. Sustainable Development in the Face of Floods and Rising Sea Levels: Jakarta Case Study. [online] Available at: <https://sdg-action.org/sustainable-development-in-the-face-of-floods-and-rising-sea-levels-jakarta-case-study%E2%99%A2%BC/>

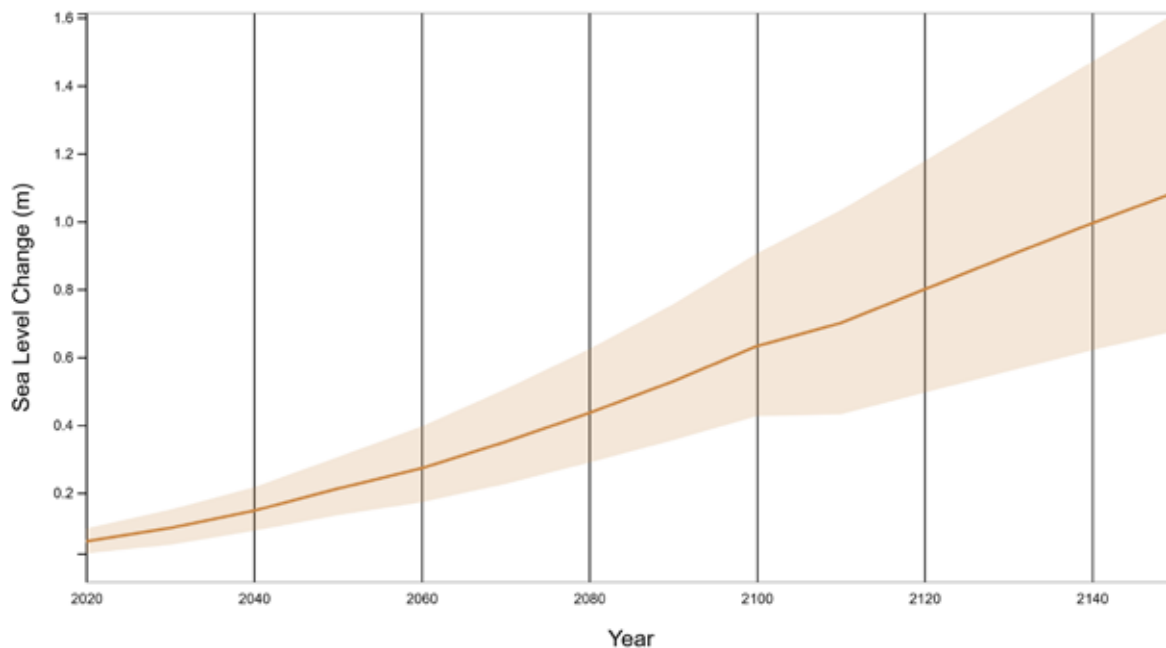
¹⁶ United Nations Statistics Division, 2022. Goal 13 Report 2022. [online] Available at: <https://unstats.un.org/sdgs/report/2022/goal-13/>

¹⁷ Ministry for Environment, Climate Change and Planning, 2022. The 8th National Communication of Malta under the United Nations Framework Convention on Climate Change, p. 197. [online] Available at: https://unfccc.int/sites/default/files/resource/NC8_Malta_2022_V6_resubmission_Final.pdf

¹⁸ Attard, M., 2015. The Impact of Global Environmental Change on Transport in Malta. Xjenza Online, 3:141–152.

¹⁹ SSP3-7.0 is a medium to high reference scenario resulting from no additional climate policy under the SSP3 socio-economic development narrative. SSP3-7.0 has particularly high non-CO2 emissions, including high aerosols emissions.

Figure 3: Projected mean Sea Level Rise (Malta)



Source: NASA Sea Level Projection Tool²⁰

- 1.2.11 The effective management of risks emanating from the climate change hazards under review in this performance audit, particularly flooding, requires the involvement of various stakeholders. Figure 4 presents the governance structure in terms of the main stakeholders involved in the management of flooding related risks in Malta, from the policy, regulation and implementation perspectives.

²⁰ NASA, n.d. IPCC AR6 Sea Level Projection Tool. [online] Available at: https://sealevel.nasa.gov/ipcc-ar6-sea-level-projection-tool?psmsl_id=1735&data_layer=scenario

Figure 4: Governance structure for managing flooding related risks in Malta

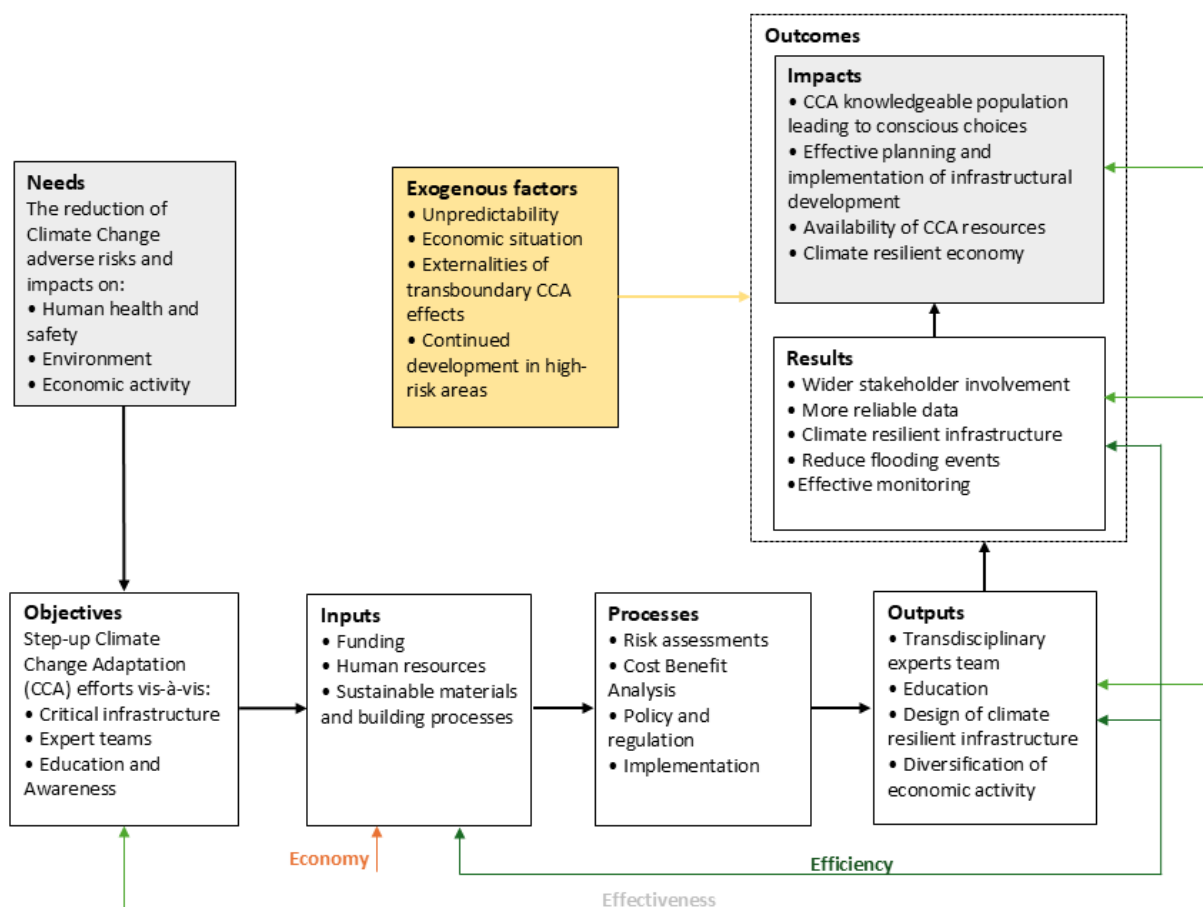


Source: Adapted from the 2nd Flood Risk Management Plan for the Malta River Basin District.

1.3 Audit Objectives

- 1.3.1 Against this background information, this Office employed the performance audit methodology used by the European Court of Auditors (ECA), namely the Programme Logic Model (PLM). This tool is mainly intended to help performance auditors to identify the socio-economic needs to be addressed through Government's CCA measures and interventions as well as the relative processes involved to attain the expected outputs, outcomes and impacts. Figure 5 also depicts the key Value for Money (VfM) elements, namely efficiency, effectiveness and economy.

Figure 5: PLM for Flooding and Sea Level Rise



1.3.2 Figure 5 shows that building resilience to climate change hazards like flooding events and sea level rise, necessitates the input of multiple stakeholders and resources. In the long run, addressing slow onset events like sea level rise may require considerable planning and investment. The identification of vulnerabilities and risks associated with these hazards, would enable more effective action.

1.3.3 Consequently, this performance audit sought to verify the extent to which Government is effectively managing the CCA risks emanating from flooding and sea level rise. This Study shall therefore determine the degree to which Government as well as the responsible Ministries and National Entities:

- i. carried out comprehensive assessments to determine the vulnerabilities and risks resulting from climate change;
- ii. developed the relevant governance framework to address CCA;
- iii. established sectoral plans and are implementing CCA measures efficiently and effectively;
- iv. set up a sufficiently robust monitoring framework; and
- v. estimated the costs of inaction as well as adaptation in financial, socio-economic, and environmental terms.

1.4 Methodology

1.4.1 The attainment of the audit objectives entailed various methodological approaches. These involved the following:

- i. **Adherence to ISSAIs and guidelines:** This audit was carried out in accordance with the Standard for Performance Auditing, International Standard of Supreme Audit Institutions (ISSAI) 3000. Furthermore, this Office also referred to guidelines establishing performance audit methodology such as the ECA performance audit manual.
- ii. **Documentation review:** This included an analysis of a broad legislative framework, together with various related strategies and policies.
- iii. **Semi-structured interviews:** These interviews enabled the collation of qualitative data, which in turn was utilised to corroborate information arising from other sources.
- iv. **Data analysis:** In an effort to quantify Government's contribution to climate change adaptation, this Office has attempted to identify the CCA related projects undertaken by various Government entities. This mainly entailed identifying those projects having direct or indirect CCA related benefits and analysing their respective attributes in terms of needs assessments, costs and potential impact.
- v. **Benchmarking:** Comparing CCA related efforts with other countries enabled benchmarking to evaluate national progress. To this end, the criteria selected were based on best-practice guidelines such as the EU Climate Proofing Guideline for Infrastructure and EU Climate Risk Assessment.

1.5 Audit Limitations and Mitigation

1.5.1 Auditing climate change related matters, in particular CCA, is characterised by various technical and operational challenges. The former relates to the impacts of adaptation actions that may only be visible over longer timeframes and the need to develop quantifiable metrics as well as a baseline or reference data to measure adaptation progress. On the other hand, operational challenges include those related to the tracking of adaptation performance, that would necessitate considerable improvements in data availability and quality, as well as data collection and management systems and resources.²¹

1.5.2 In addition to the limitations associated with auditing CCA in general, this performance audit was also subject to the following limitations within the local context:

²¹ INTOSAI Training on Climate Change Adaptation Actions delivered in 2023.

- i. The Climate Vulnerability and Risk Assessment (VRA) of the Maltese economy (SPD8/2021/004, MECP)²², originally scheduled to be delivered by 2023, was referred to Government in early 2025, that is, towards the final stages of this performance audit. Consequently, the NAO was not able to fully consider such assessment for the scope of this performance audit. This situation also precluded this Office from focusing more on the high-risk sectors identified through such an extensive and complex exercise, including information related to the cost of inaction. The audit team has mitigated this situation, to a limited extent, through a detailed documentation review of available studies including sector-specific assessments, as well as a number of semi-structured interviews with different stakeholders including the Climate Change Platform (CCP) at the University of Malta (UM), MEEC and in particular the Energy and Water Agency (EWA) as well as other key Ministries.
- ii. CCA is a cross-governmental issue that requires effective coordination amongst the various stakeholders involved. The Climate Action Authority was only established in October 2024. To mitigate such a situation, this Office consulted representatives from key entities including *inter alia*, the Ministry for Transport, Infrastructure and Public Works (MTIP), the Ministry for Agriculture, Fisheries and Animal Rights (MAFA), the former Climate Action Board (CAB), the CCP at the UM, and relevant Inter-Ministerial Committees (IMCs).

1.6 Report Structure

1.6.1 Following this introductory Chapter, the Report proceeds to discuss the following:

- i. Chapter 2 considers the Maltese-economy-wide vulnerability and risk assessment as well as other climate change risk assessments related to the hazards under review, that is, flooding and sea level rise. Understanding vulnerabilities as well as the risks resulting from climate change hazards are key for more effective and efficient CCA action, whilst minimising the residual risk and the resources required to address the remaining loss or damage.
- ii. Chapter 3 discusses the CCA governance framework in place, with a focus on the climate change hazards under review. The NAO's efforts to evaluate the legislation, policies, strategies and plans in place were primarily aimed at confirming not only that different roles and responsibilities are clearly defined, but also that the assigned measures are supported by clear timeframes and key performance indicators to enable their effective implementation.
- iii. Chapter 4 analyses the Government's efforts to implement and monitor measures related to CCA, both through local funds as well as with the support of EU funds. This Chapter discusses the efforts to evaluate the level of implementation of the measures included in Malta's Climate Change Adaptation Plan as presented in the Malta Low Carbon

²² Department of Contracts, Government of Malta, 2025. Call for Tender SPD8/2021/004. [online] Available at: <https://www.etenders.gov.mt/epps/cft/prepareViewCfTWS.do?resourceId=7474877>

Development Strategy (LCDS) up to 2050. Moreover, this Office has also taken stock of past and ongoing projects with CCA flooding and sea level rise related objectives, as undertaken by key Ministries including the MEEC and MTIP. Moreover, this study shall also discuss the monitoring mechanisms in place, both at a strategic level as well as at the project level.

- iv. Chapter 5 presents value for money considerations. It evaluates any attempt to quantify both the cost of inaction and the cost of adaptation to climate change, highlighting that a do-nothing approach is not an option.
- v. Chapter 6 includes the conclusions and recommendations emanating from this performance audit, in line with the objectives of this assignment as presented in Section 1.3.

Chapter 2

Risk Assessments

2.1 Introduction

- 2.1.1 Climate risk results from a combination of local conditions, including climate hazards, exposure and vulnerability.²³ The extent of vulnerability or risks Malta is exposed to, because of climate change, is directly related to the degree of adaptation measures that are required to ensure preparedness and resilience to the effects of such a phenomenon.²⁴
- 2.1.2 The Maltese-economy-wide climate Vulnerability Risk Assessment (VRA) is *“the first in-depth consideration of the interplay between the climate change impacts and the socio-economic realities of the Maltese Islands”*.²⁵ As noted in Malta’s 8th National Communication under the United Nations Framework Convention on Climate Change (UNFCCC) dated June 2023, this VRA was originally scheduled to be completed in 2023 and, is to *“give further information of Malta’s vulnerabilities, and will therefore serve to identify with a greater evidence basis the adaptation priorities”*.²⁶ Moreover, MEEC contended that such an economy-wide climate VRA is one of the first in Europe and possibly globally.
- 2.1.3 With respect to the climate changes hazards under review, that is flooding and sea level rise, Government’s efforts to carry out flood hazard and risk assessments reflect obligations emanating from the European Floods Directive (2007/60/EC). Such risk assessment is not only intended to identify the geographical areas at risk of flooding, but also to identify the areas at highest risk in terms of the potential impact on the receptors therein. In Malta’s case, the receptors assessed in the flood risk assessment included human loss, human health, economic activity, cultural heritage and the environment.²⁷

²³ European Environment Agency (EEA), n.d. Step 2: Assessing Climate Change Risks and Vulnerabilities. [online] Available at: <https://climate-adapt.eea.europa.eu/en/mission/knowledge-and-data/regional-adaptation-support-tool/step-2-assessing-climate-change-risks-and-vulnerabilities>

²⁴ Ministry for Environment, Climate Change and Planning, 2022. The 8th National Communication of Malta under the United Nations Framework Convention on Climate Change. [online]
Available at: https://unfccc.int/sites/default/files/resource/NC8_Malta_2022_V6_resubmission_Final.pdf

²⁵ Department of Contracts, Government of Malta, 2021. Tender for the Provision of Consultancy Services to Create a Climate Vulnerability and Risk Assessment of the Maltese Economy, Ref. SPD8/2021/004, p. 19.

²⁶ Ministry for Environment, Climate Change and Planning, 2022. The 8th National Communication of Malta under the United Nations Framework Convention on Climate Change, p. 187. [online]
Available at: https://unfccc.int/sites/default/files/resource/NC8_Malta_2022_V6_resubmission_Final.pdf

²⁷ Ministry for the Environment, Energy and Enterprise, 2023. 2nd Flood Risk Management Plan for the Malta River Basin District, September 2023. [online] Available at: <https://energywateragency.gov.mt/wp-content/uploads/2023/10/2nd-Flood-Risk-Management-Plan-Final-1.pdf>

- 2.1.4 Against this background, this Chapter discusses the contribution of:
- i. climate VRAs to the development of Climate Change Adaptation (CCA) strategies and plans; and
 - ii. flood hazard and risk assessments to the effective targeting of adaptation measures.

2.2 Inherent complexities delayed the delivery of the Maltese-economy-wide climate Vulnerability and Risk Assessment

- 2.2.1 In March 2021, the then Ministry for the Environment, Climate Change and Planning (MECP) on behalf of the Directorate for the Environment and Climate Change within MECP, issued a tender for the provision of consultancy services to deliver a climate Vulnerability and Risk Assessment (VRA) of the Maltese economy.²⁸ The tender was adjudicated within a couple of months and the relative contract with a duration of two years was signed on 6 August 2021. MEEC received the VRA final Report in May 2024.
- 2.2.2 MEEC referred the VRA Final Report to Government in January 2025. MEEC stated that such prolongment was primarily attributable to issues related to the complexities associated with this extensive exercise, as well as the detailed verifications and discussions undertaken by the Governmental stakeholders involved. In this regard, MEEC approved the Contractor's request to extend the performance period by ten months, subject to no additional financial commitment due to unforeseeable events.
- 2.2.3 The estimated procurement value for this tender was €500,000 excluding Value Added Tax (VAT). The financial offer of the five administratively and technically compliant bids ranged from €395,000 to €500,000.²⁹ The VRA was awarded to Ricardo-AEA Ltd at €452,540 (excluding VAT) on 21 May 2021, based on the most economically advantageous offer utilising the Best Price Quality Ratio award mechanism.
- 2.2.4 The scope of this climate VRA was to single out the priority areas within different economic sectors in terms of vulnerability to the impacts of climate change. In this regard, this assessment sought to identify and lay the groundwork for needed future sectoral climate VRAs, by ensuring that the most up to date and comprehensive information on vulnerability to climate change is available to decision-makers. Appendix I presents the main reporting deliverables of the VRA by date.
- 2.2.5 MEEC acknowledged the data limitations characterising this type of study. Nonetheless, MEEC recognises the results of the recently concluded economy-wide climate VRA as a potentially valuable input towards ongoing and future policy development. This applies to the development of forthcoming strategies and plans, including the National CCA Plan, as referenced in paragraph 3.3.6 of this Report.

²⁸ Department of Contracts, Government of Malta, 2025. Call for Tender SPD8/2021/004. [online] Available at: <https://www.etenders.gov.mt/epps/cft/prepareViewCftWS.do?resourceId=7474877>

²⁹ *Ibid.*

2.2.6 As at the time of drafting this Report, MEEC only made available to the NAO the Policy Review Report of the economy-wide climate VRA. This deliverable provided a summary of the key goals, targets, and commitments to which Malta is currently, or will be, committed for each NACE³⁰ Level 1 sector, in order to inform the projected baseline ratings of each sector's climate sensitivity and adaptive capacity. NAO's lack of visibility of the remaining deliverables constituted a limitation on this performance audit. In this light, the NAO looks forward to receiving this documentation as it will serve as an important input to any future evaluation on this topic undertaken by this Office.

2.3 EWA undertakes flood hazard and risk assessments in accordance with the Floods Directive

2.3.1 The Floods Directive (2007/60/EC) is mainly intended to assess and manage flood risk through the generation of a Flood Risk Management Plan (FRMP), aiming at the reduction of the adverse consequences for human health, the environment, cultural heritage and economic activity. This Directive was transposed into Maltese law through Subsidiary Legislation 423.41, Assessment and Management of Flood Risks Regulations, Legal Notice 264 of 2010, as amended by Legal Notice 477 of 2011 and Act XVII of 2024. Recently, these regulations were transposed to Cap. 549, vide S.L. 549.167.³¹

2.3.2 The Energy and Water Agency (EWA) developed the Flood Hazard Maps (FHM) and Flood Risk Maps (FRM)³² in line with Article 6 of the Floods Directive, forming the basis of Malta's 2nd FRMP.³³ FHMs should cover the geographical areas which could be flooded, whilst FRMs show the potential adverse consequences associated with these flood scenarios.

2.3.3 Through the Preliminary Flood Risk Assessment (PFRA)³⁴ that was carried out in view of the obligations emanating from the Flood Directive, the EWA identified seven catchments as Areas of Potentially Significant Flood Risk (APSFR) for low probability of occurrence events with 200 years return period time (or extreme events scenarios), namely Birkirkara, Burmarrad, Gżira, Marsascala, Ħal Qormi, Marsalforn and Xlendi. FHMs and FRMs were also developed for flood events arising from rainfall events with a medium as well as a high probability of occurrence, with a likely return period of approximately 50 and five years respectively. Five main criteria were considered for the identification of the APSFRs, namely the:

- i. size and location of the sub-catchment;
- ii. predominant land use of the sub-catchment;

³⁰ The Statistical Classification of Economic Activities in the European Community, commonly referred to as NACE (for the French term "nomenclature statistique des activités économiques dans la Communauté européenne").

³¹ Regulations have been transferred under Cap. 549 by Act XVII of 2024 noting that Cap. 423 has been repealed.

³² European Environment Agency (EEA), n.d. Flood Hazard and Risk Maps (FHRM), Malta. [online] Available at: https://cdr.eionet.europa.eu/mt/eu/floods2019/fhrm_2020/

³³ Ministry for the Environment, Energy and Enterprise, 2023. 2nd Flood Risk Management Plan for the Malta River Basin District, September 2023, p. 83. [online] Available at: <https://energywateragency.gov.mt/wp-content/uploads/2023/10/2nd-Flood-Risk-Management-Plan-Final-1.pdf>

³⁴ European Environment Agency (EEA), n.d. Preliminary Flood Risk Assessment (PFRA), Malta. [online] Available at: https://cdr.eionet.europa.eu/mt/eu/floods2019/pfra_2019/

- iii. runoff volume generated at the outlet of the sub-catchment;
- iv. documented flood events in the past within the sub-catchment; and
- v. vulnerability of the coastal zone to flooding from projected sea level rise.³⁵

2.3.4 The FHM as incorporated in Malta's second FRMP dated September 2023, show that overall, no 'significant' hazard was identified for the five-year return period time (RPT) event for the receptors at risk within the designated catchments. In this case, EWA adopted the risk thresholds for the zonation of risk areas within the respective catchments as proposed by the UK's Department of Environment, Food and Rural Affairs.³⁶

2.3.5 For the 50-year RPT flood event, the highest values of Hazard Rating (HR) are present in the catchments of Hal Qormi, Burmarrad and Marsalforn. In this case, the urbanised downstream part of this catchment is exposed to an 'extreme' degree of flood hazard, which is the highest possible degree of flood hazard.

2.3.6 With regard to the 200-year RPT event, that is, the most extreme scenario modelled, multiple receptors within each catchment would be impacted negatively. Appendix II presents a summary of the potential socio-economic impacts across all the seven catchment areas that could be affected by a low-probability 200-year extreme flood event.

2.3.7 As noted in Malta's second FRMP, flood hazard areas in the upper portions of the catchments, are generally the result of the presence of water retaining structures for the eventual natural recharge of the groundwater body in that specific location. On the other hand, flood hazard areas located towards the lower portion of the catchments are mainly due to the presence of urbanisation along natural valleys. Both situations are present in the Hal Qormi, Marsalforn and Xlendi catchments. However, neither industrial installations nor Water Framework Directive 2000/60/EC (WFD) protected areas are located within the identified flood hazard areas across the seven catchments, and hence these receptors are not considered to be at risk.

EWA adopted a risk-averse approach when assessing the risk to flood events due to insufficient vulnerability related data

2.3.8 Due to insufficient data about the order of magnitude, typology and frequency of flood events as well as the behaviour of the elements exposed to flooding, EWA opted for a more conservative approach. This entailed the adoption of a major assumption, that is, all exposed elements and/

³⁵ EWA contended that sea level rise and coastal floods constitute less of an immediate threat for the Maltese Islands as just 5 per cent of the total landmass has an altitude of less than 7.6 metres above sea level and only 1 per cent is located at an altitude of 1 metre (Source: European Commission – The economics of climate change adaptation in EU coastal areas- Malta's country overview and assessment (2008)). Moreover, EWA noted that the Physical Oceanography Research Group indicated an expected rise of 0.45 ± 0.15 cm/year (Source: Malta Resources Authority. Climate change reporting, groundwater abstraction regulation and quarry licensing (2019)).

³⁶ Ministry for the Environment, Energy and Enterprise, 2023. 2nd Flood Risk Management Plan for the Malta River Basin District, September 2023, p. 52. [online] Available at: <https://energywateragency.gov.mt/wp-content/uploads/2023/10/2nd-Flood-Risk-Management-Plan-Final-1.pdf>

or areas would not hold up against a flood event and consequently would result in a complete loss. Consequently, EWA utilised a broader safety margin to ensure that the potential damage caused by flooding is fully considered.

- 2.3.9 Through the FRMs, the EWA identified those areas at a significant risk of flooding. These areas have a high number of receptors at risk when considering a rainfall event with a high probability of occurrence, that is a rainfall event with a probability of occurrence of five years or with a 20 per cent chance to occur in any given year. Thus, the importance of prioritising these areas when selecting adaptation measures, particularly in view of the limited resources.
- 2.3.10 The development of FRMs enabled the identification of the receptors in danger within the flood prone areas. The human loss and health receptors were assigned the highest risk weightings, followed by economic activity, cultural heritage and the environment. Appendix III provides further details regarding the methodology adopted by EWA to develop the Flood Hazard Risk Maps and compile the ensuing Flood Risk Management Plan.

The analysis of the receptors at risk in the flood risk areas may be outdated since it does not reflect the recent significant demographic changes.

- 2.3.11 As noted in Malta's second FRMP, the households and residents at risk of flooding were identified based on the NSO's 2011 Census of Population and Housing. EWA utilised this data as evaluated in the second PFRA, to develop the flood hazard and risk assessment. Appendix IV outlines the residents at risk of flooding as of 2011 across the seven APSFR catchments.
- 2.3.12 However, the NAO noted that Malta's population has increased from 417,432 in 2011³⁷ to 563,443 by end 2023³⁸, which is equivalent to a significant increase of 35 per cent. In view of the considerable demographic changes and other externalities such as tourism, the NAO raises concerns whether such assessment may need to be updated. The 2021 Census of Population and Housing was published in February 2023 and consequently EWA did not utilise the information therein as this would have delayed Malta's submission of its second FRMP. MEEC stated that such an approach had to be adopted as the 2011 Census of Population and Housing was the only comprehensive study that was readily available. To this end, MEEC confirmed that EWA will be taking into consideration the latest census for the next cycle of the FHRMs in December 2025.

³⁷ National Statistics Office (NSO), Malta, 2014. Census of Population and Housing 2011 – Final Report. [online] Available at: https://nso.gov.mt/wp-content/uploads/Census2011_FinalReport.pdf

³⁸ National Statistics Office (NSO), Malta, 2024. World Population Day – 11 July 2024. [online] <https://nso.gov.mt/population/world-population-day-11-july-2024/>

2.4 Conclusions

- 2.4.1 Climate VRAs provide the foundation for effective climate governance by ensuring that policy frameworks are data-driven, equitable, adaptive, and aligned with broader development goals. This audit revealed that, from a risk assessment perspective, until the end of 2024, Government was not in a position to ascertain that it is effectively directing adaptation action towards the areas at highest risk.
- 2.4.2 Nevertheless, it is to be acknowledged that this climate VRA is the first in-depth consideration of the interplay between the climate change impacts and the socioeconomic realities of the Maltese Islands. Moreover, by commissioning and undertaking this economy-wide VRA, Government is, in part, addressing the first of four major issues of concern identified by the European Commission in its Impact Assessment of the new EU Strategy on Adaptation to Climate Change³⁹. This relates to gaps in data and methodologies that underpin decision making, due to insufficient knowledge and awareness on climate change adaptation, risk, vulnerability and resilience.
- 2.4.3 In terms of the flood hazard and risk assessments, whilst being carried out in accordance with the obligations emanating from the Floods Directive, this Office has noted that this study may not reflect the recent demographic changes. Such a situation materialised because the analysis of receptors at risk within flood-prone areas was not based on the most recent Census of Population and Housing, nor on more up-to-date data that captures the significant population growth over a short period, as well as other externalities such as tourism. Consequently, this risk assessment may need to be revised to ensure that Government is effectively directing adaptation action towards the areas at highest risk.
- 2.4.4 VRAs enhance resilience to climate change, optimise resource-use and foster inclusive as well as sustainable growth. Expediently addressing the issues raised in this Chapter, would enable Government to take more effective adaptation action. To this end, MEEC contended that the CAA has already started engaging with the most relevant Ministries to support the development of more detailed adaptation action plans, where necessary, preceded by any *ad hoc* assessments that may be required. Furthermore, such an approach is also expected to motivate the private sector as well as the public to contribute towards addressing flooding and sea level rise issues. Chapter 3 will discuss key aspects of the governance framework adopted.

³⁹ European Commission (2021) Commission Staff Working Document: Impact Assessment Report – Forging a climate-resilient Europe – The new EU Strategy on Adaptation to Climate Change. SWD(2021) 25 final. Brussels, 24 February. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021SC0025>

Chapter 3

The regulatory and strategic framework

3.1 Introduction

3.1.1 National climate governance is aimed at steering social systems towards preventing, mitigating or adapting to the risks posed by climate change.⁴⁰ Given their strategic oversight, the ability to integrate climate considerations into sectoral policies, and the mandate to drive the implementation of climate policy, central governments often hold the main responsibility for national climate policies and regulations. However, a centralised approach has its own challenges, including the frequently changing priorities, overburdened coordination, as well as citizens demanding little climate action from governments. This may suggest adopting a different approach but, transitions require rethinking and restructuring of society, government and the economy, aiming to maximise resilience to climate change impacts.

3.1.2 This Chapter discusses the governance mechanisms in place from a horizontal perspective, in view of the significant potential for contribution across various Ministries. Moreover, this Chapter focused on specific contribution by the lead Ministry for Climate Change Adaptation (CCA) related matters, that is the Ministry for the Environment, Energy and Public Cleanliness (MEEC).

3.1.3 The major elements of the CCA regulatory and strategic framework in place, that were considered for the purpose of this Review, namely included the following:

i. Climate Action Act (Cap. 643)

National climate legislation is one of the prerequisites for enabling good governance. In this regard, the Climate Action Act of 2015 (CAP. 543) was recently repealed through the enactment of the new Climate Action Act No. XVI of 2024. The scope of this Act is to establish a framework for climate action and to provide for the establishment of the Climate Action Authority (CAA).

ii. Malta Low Carbon Development Strategy up to 2050 (LCDS)

The LCDS, also referred to as the National long-term strategy, incorporates the National Adaptation Strategy. It includes the latest national adaptation priorities in terms of the sectors most vulnerable to the impacts of climate change and the respective adaptation measures.

⁴⁰ Jagers, S.C. and Stripple, J., 2003. Climate Governance Beyond the State. *Global Governance*, 9, pp.385–399. doi:10.2307/27800489.

iii. National Energy and Climate Plan for 2021-2030 (NECP)

The NECP was introduced through the Regulation (EU) 2018/1999⁴¹ on the governance of the energy union and climate action. The NECP serves as a strategic planning, framework and policy document that will guide Malta's contribution to achieving the Union's 2030 energy and climate objectives and targets, whilst identifying the measures necessary for their achievement during the period until 2030.

iv. Flood Risk Management Plan (FRMP)

The FRMP is part of a broader approach under the European Floods Directive (2007/60/EC), which is mainly intended to assess and manage flood risk. The aim of this Plan is to reduce the adverse consequences of flooding events to human health, the environment, cultural heritage and economic activity.

3.1.4 Against this background, this Chapter assesses the:

- i. comprehensiveness of the climate change regulatory framework in place;
- ii. robustness of the main national CCA related strategy;
- iii. quality of adaptation measures in the national climate plan; and,
- iv. relevance of the flood risk management plan *in vigore*.

3.2 The recently enacted Climate Action Act has brought about various positive developments

3.2.1 Until recently, climate change matters were mainly regulated through the Climate Action Act of 2015 (CAP. 543). This national legislation has recently been repealed through the enactment of ACT No. XVI of 2024 as published in Government Gazette No. 21,240 of 10 May 2024. Such development was primarily intended to enable the setting up of a Climate Action Authority, which is *"responsible for the exercise of climate action, to co-ordinate and oversee mitigation and adaptation policy and measures and any matters ancillary thereto or connected therewith and to provide for the reporting of such climate action, as required"*⁴².

3.2.2 The existence of national climate legislation is only one of the prerequisites for enabling good governance. To this end, it is critically important that such legislation includes clear legal definitions of responsibilities and mandates of relevant actors and national entities, together with accountability mechanisms and the political will to enforce the law.

3.2.3 For the purpose of this Report, the NAO has carried out a comparative analysis of the 2015 and 2024 Acts to assess the inputs to this policy as well as its comprehensiveness in terms of the aspects covered, the stakeholders involved as well as the respective roles and responsibilities. Table 1 provides an indication of whether such developments are considered as being positive or otherwise.

⁴¹ European Union, 2023. Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action. [online] Consolidated text available at: <http://data.europa.eu/eli/reg/2018/1999/2023-11-20>

⁴² Government of Malta, 2024. Act No. XVI of 2024. [online] Available at: <https://legislation.mt/eli/act/2024/16/eng>

Table 1: Comparative analysis of key elements of the former Climate Action Act – Cap. 543 and the present Climate Action Act – Cap. 643

Key elements	Overall development
	● positive ● improvement opportunity ● negative
Assignment of responsibilities to bodies	●
Climate Action Board	●
Frequency of Board Meetings	●
Intra-Ministerial Coordination	●
Ministerial Climate Action Coordinator	●
National Climate Action Council	●
Reporting	●
Climate Action Fund	●

3.2.4 This exercise clearly shows that from a performance audit perspective, most of the changes to the key elements of the Climate Action Act, were deemed to be positive. The following observations shed more light on the overall ratings presented in Table 1:

i. Assignment of responsibilities to bodies

The 2015 Climate Action Act failed to identify the responsible parties within Government for fulfilling all duties and obligations emanating from the same Act, including Articles 5 and 6. Responsibilities were mainly linked with the Minister responsible for Climate Change policy. On the other hand, the 2024 Act allocates most of the responsibilities to the newly established Climate Action Authority (Article 10). Government is now responsible for ensuring that this Authority has the adequate human and financial resources to fulfil its functions as assigned to it under this new Act (Article 5(2)(i)). Furthermore, the newly established Authority is supported through the contribution of a National Climate Action Council (NCAC) as well as an official Climate Action Coordinator within each Ministry.

ii. Climate Action Board

Article 10 of the former Climate Action Act set out the Climate Action Board (CAB) with the primary responsibility of overseeing the implementation of the 2015 Act. Under the 2024 Act, Article 9(2) establishes the Authority's Board which is to be composed of a Chairperson and between 4 to 6 other members (one of whom may be designated as

a Deputy Chairperson). Thus, the CAA together with the NCAC, shall be better equipped to ensure that CCA action is effectively and efficiently designed, implemented as well as monitored across Government.

iii. Frequency of Climate Action Board meetings

The former CAB was unable to meet on a frequent basis. Through the 2024 Act, the frequency of Board meetings increased and a compulsory minimum threshold of once a month was set in legislation.

iv. Inter-Ministerial Coordination

Under the 2015 Act, the CAB, together with the Ministry responsible for climate change, were responsible for coordination across Ministries. The 2024 Act (Art.10(1)(b)) also enables the setting up of a specific committee, in addition to the Authority's established setup, to ensure that any policy or legislation having a direct impact on climate change is duly discussed with the relevant stakeholders. Moreover, the new Act has introduced the concept of a climate action coordinator within each Ministry, with various obligations including reporting on climate change matters to the Authority within established timeframes.

v. Ministerial Climate Action Coordinator

Article 9(17) of the new Act designates the Permanent Secretary within each Ministry as the Climate Action Coordinator responsible for providing the CAA with any input it may require in fulfilment of its functions listed in Article 10. To this end, it is to be noted that a similar approach had already been adopted by the 2012 Sustainable Development Act (Cap. 521)⁴³. Furthermore, the 2024 Act also refers to specific obligations pertaining to 'relevant' Ministries (Article 9 (17)(d)).

It is to be noted that the new Act does not specify the key Ministries or sectors relevant to climate action. However, MEEC contended that the broad term "relevant ministries" as referred to in the Act, is intended to provide flexibility to the CAA in implementing its functions and the Minister in identifying responsible entities at different points in time without the need to specifically amend the Act.

vi. National Climate Action Council

The new Act establishes the NCAC, an independent statutory body, composed of experts in the field of climate change, supporting Malta's strategic aims relating to climate action, through the provision of advice to Government on climate action in Malta. Moreover, the NCAC may also appoint any other expert or group of experts to assist it in the performance of its functions.

⁴³ Government of Malta, 2012. Sustainable Development Act (Cap. 521). [online] Available at: <https://legislation.mt/eli/cap/521/eng>

vii. Reporting

The 2024 Act (Article 23) requires the CAA to compile an annual report on its proceedings and policy. Furthermore, the 2024 Act provides deadlines in this respect, not only by when such report shall be presented to the Minister responsible for climate action policy and the Minister responsible for finance (not later than 6 weeks after the end of each financial year), but also a deadline for the former Minister to present such report to the House of Representatives (two weeks after receiving a copy of such report if the House is in session). Additionally, through Article 23(3) of the new Act, the House is also committed to discuss on a yearly basis the progress registered in climate action in a dedicated sitting.

viii. Climate Action Fund

Article 16 of the former 2015 Act established the Climate Action Fund, including obligations related to publishing of the annual audited balance sheet together with a report of related activities. On the other hand, under Part V, Article 24 of the 2024 Act, establishing and maintaining a Climate Action Fund does not seem to be compulsory. To this end, the amended wording from “shall...” to “may ... by order establish and maintain...” may weaken the importance of setting up such a source of funding. Such an approach may have been adopted as the recently established Authority shall duly consider the different options available for funding climate action.

3.3 Adaptation measures incorporated in the Malta Low Carbon Development Strategy lack ownership as well as clear timeframes and KPIs

- 3.3.1 This Review noted the current National Adaptation Strategy as incorporated in the 2021 LCDS, does not identify the Governmental entities responsible for each measure, as well as any other stakeholders that may be involved in their implementation. Moreover, the adaptation measures included therein, generally lack clear timeframes and Key Performance Indicators (KPIs). Such situation does not contribute towards the effective monitoring of expected deliverables, including the need to improve the resilience to climate change hazards like flooding and sea level rise.
- 3.3.2 In May 2012, Malta’s Ministry for Resources and Rural Affairs (MRRA) published the National Strategy for Climate Change and Adaptation. This document was intended to complement the second communication (2010) to the United Nations Framework Convention on Climate Change (UNFCCC) and, to guide local discussions on CCA management, including flooding.⁴⁴
- 3.3.3 In view of its importance, the development and publication of an adaptation strategy was included as an obligation in the 2015 Climate Action Act. In line with Article 8 of this Act, such Strategy is to be reviewed and updated at least every five years. To this end, the responsible Ministry at the time, that is the Ministry for the Environment, Climate Change and Planning

⁴⁴ Food and Agriculture Organization (FAO), 2012. National Climate Change Adaptation Strategy. [online] Available at: <https://faolex.fao.org/docs/pdf/mlt165082.pdf>

(MECP), opted to include the revised adaptation strategy in Chapter 3 of the LCDS that was published in October 2021. The LCDS is also referred to as the National long-term strategy.

- 3.3.4 Chapter 3 of the LCDS identifies the main climate change threats and high-risk areas as well as lists 41 measures across six main categories. These categories namely relate to water resources; infrastructure and transport; land use and buildings; natural ecosystems, agriculture, and fisheries; health and civil protection; and tourism. Moreover, the LCDS presents an additional nine cross-sectoral measures. Such measures are all intended to address the vulnerabilities to the climate change hazards as identified across the different sectors, including sea level rise as well as the changing precipitation patterns that may result in flooding events.⁴⁵
- 3.3.5 This Office acknowledges the benefits of incorporating the national adaptation strategy within the LCDS. However, as the 2021 LCDS is due for revision in 2026, having a stand-alone document addressing CCA may be a more effective solution. This approach would enable the competent authorities to enhance their monitoring function. In this regard, the NAO was recently informed that the CAA is in the process of commissioning the development of a more detailed and updated National Adaptation Plan.
- 3.3.6 For the purpose of this Review, the NAO has analysed the 50 adaptation measures within Malta's LCDS Chapter 3, that is, the National Adaptation Strategy. Forty-one of these measures relate to six different sectors, namely: water resources; infrastructure and transport; land use and buildings; natural ecosystems, agriculture and fisheries; health issues and civil protection; and tourism. Government deemed these sectors as requiring the most attention when devising adaptation measures due to their vulnerability and climate change impact. The sector with the highest number of measures is land use and buildings, followed by infrastructure and transport.
- 3.3.7 The National Adaptation Strategy also includes nine cross-sectoral measures covering more horizontal aspects. These measures include incorporating climate change considerations in different policies as well as, increasing awareness and knowledge through an online community. Moreover, these measures extend to ensure that different maintenance regimes in different sectors consider climate change.
- 3.3.8 The NAO has also classified the 50 adaptation initiatives according to the type of measure. The seven categories adopted for this analysis included: education and awareness; study, assessment or survey; policy (i.e. statement of intent); standard (i.e. rules to achieve an intent); plan (i.e. actions intended to attain policy); implementation (i.e. operational initiatives); and monitoring and reporting. The main objective of this exercise was to get an indication of the distribution of these measures, that is, whether the focus is more on awareness raising and studies, or the implementation of actual projects that are intended to directly address specific climate change related concerns. Table 2 refers.

⁴⁵ Ministry for Environment, Climate Change and Planning, 2021. Malta Low Carbon Development Strategy. [online] Available at: https://unfccc.int/sites/default/files/resource/MLT_LTS_Nov2021.pdf

Table 2: LCDS (2021) climate change adaptation related measures by sector, type and relationship to flooding and/or sea level rise

Sector as defined in the National Adaptation Strategy	Number of Measures per sector (by type)							Total number of measures per sector	Measures relatable to flooding and/or sea level rise*	
	<i>Education and Awareness</i>	<i>Study, Assessment or Survey</i>	<i>Policy</i>	<i>Standard</i>	<i>Plan</i>	<i>Implementation</i>	<i>Monitoring and Reporting</i>		No.	%
Water resources	0	2	0	0	0	4	1	7	6	85.7
Infrastructure and transport	0	3	0	3	1	1	1	9	8	88.9
Land use and buildings	1	2	1	2	0	4	0	10	9	90
Natural ecosystems, agriculture and fisheries	0	1	0	0	1	4	0	6	6	100
Health and civil protection	1	0	0	0	1	4	2	8	4	50
Tourism	1	0	0	0	0	0	0	1	1	100
Cross-sectoral	3	2	1	0	0	2	1	9	9	100
Total	6	10	2	5	3	19	5	50	43	86
	(12%)	(20%)	(4%)	(10%)	(6%)	(38%)	(10%)	(100%)		(avg.)

*Such measures may address issues related to these climate change hazards directly or indirectly as well as enhancing climate resilience.

3.3.9 Table 2 shows that the highest-ranking type of measure was '*Implementation*' (38 per cent). This category relates to operational initiatives such as fiscal incentives to promote green roofs, controlled ventilation, grey water usage and rainwater catchment, which is an adaptation measure under the '*Land use and buildings*' sector. This was followed by '*Study, Assessment or Survey*' (20 per cent) including, *inter alia* initiatives such as a comprehensive study of the current hydrological cycle monitoring capacity and new hydrological data modelling and management, under the '*Water resources*' sector.

3.3.10 Furthermore, a relatively good number of measures were evenly distributed across three of the remaining five types of measures chosen for the purpose of this exercise. To this end, the categories '*Education and awareness*', '*Standards*' and '*Monitoring and Reporting*' scored six (12 per cent), five (10 per cent) and five (10 per cent) respectively. Hence, this Office considers the extent of variation of the type of measures chosen for addressing CCA issues, as being adequate, both in terms of the options available for addressing such concerns as well as the utilisation of available resources.

- 3.3.11 This Review also noted that 86 per cent of these adaptation measures are directly or indirectly linked with flooding and sea level rise, either in terms of addressing the resulting concerns or by enhancing resilience to climate change impacts. For instance, direct adaptation measures include studies to identify where new reservoirs and retention systems can be developed to increase the local water storage capacity, collect water run-off and decrease flooding, whilst creating an additional water supply. On the other hand, indirect adaptation measures include the strengthening of the entire public health infrastructure to prevent illnesses and health issues derived from climate change impacts like climate anxiety. While these measures do not directly address the hazards of flooding and sea level rise, they nonetheless play an important role by indirectly enhancing resilience to the climate change hazards under review. For instance, directing resources to strengthen the public health infrastructure, would ensure that Government is better prepared to address the challenges posed by these climate change hazards.
- 3.3.12 The significantly high number of adaptation measures related to flooding and sea level rise (86 per cent), either directly or indirectly, is consistent with the Government's recent position as expressed in multiple fora including at the United Nations General Assembly summit in September 2024. Climate change hazards and in particular sea level rise, has been classified as a real threat even to the Mediterranean region and consequently also for Malta in view of its geographical specificities.^{46 47}

3.4 In December 2023 the European Commission identified multiple improvement opportunities regarding Malta's draft NECP

- 3.4.1 Desk research carried out for the purpose of this audit revealed that the European Commission (EC) issued several recommendations on the draft updated integrated National Energy and Climate Plan (NECP) of Malta covering the period 2021-2030 and on the consistency of Malta's measures with the Union's climate neutrality objective and with ensuring progress on adaptation. The salient recommendations are being reproduced below in italics, followed by NAO observations:

- i. Recommendations on Malta's draft updated integrated NECP under Regulation (EU) 2018/1999⁴⁸:

"3. Provide additional analysis on the relevant climate vulnerabilities and risks regarding the achievement of the national objectives, targets and contributions and the policies and measures

⁴⁶ Times of Malta, 2023. Robert Abela Warns UN Summit on Rising Sea Levels. [online]

Available at: <https://timesofmalta.com/article/robert-abela-warns-un-summit-rising-sea-levels.1098616>

⁴⁷ It is to be noted that implementation of the adaptation measures at the sectoral level shall be discussed in the ensuing Chapter of this Report.

⁴⁸ European Commission, 2023. Commission Recommendation on the draft updated integrated national energy and climate plan of Malta covering the period 2021-2030 and on the consistency of Malta's measures with the Union's climate neutrality objective and with ensuring progress on adaptation, SWD(2023) 920 final, C(2023) 9610 final, p. 6. [online]
Available at: https://commission.europa.eu/document/download/cf47a01d-e1db-4868-918d-edc0639b295e_en?filename=Recommendation_draft_updated_NECP_Malta_2023.pdf

in the different dimensions of the Energy Union. Better outline and quantify the link to the specific Energy Union objectives and policies, that adaptation policies and measures should support. Set out additional adaptation policies and measures in sufficient detail to support Malta's achievement of national objectives, targets and contributions under the Energy Union. Pay particular attention to water management in changing climatic conditions due to risks of electricity disruption as floods, heat and drought impact the energy production".

NAO's observation: As informed by MEEC and already discussed in Chapter 2, the Maltese-economy-wide climate Vulnerability and Risk Assessment was referred to Government in early 2025. Such study is expected to contribute positively towards the identification and better understanding of existing vulnerabilities, thereby enabling improved prioritisation and allocation of sufficient resources for addressing existing risks to climate change hazards like flooding.

- ii. Recommendations on the consistency with the Union's climate-neutrality objective and with ensuring progress on adaptation under Regulation (EU) 2021/1119⁴⁹:

"3. Establish an appropriate mandatory framework for climate change adaptation policy and action. Reinforce and clearly mandate a governance and coordination structure able to support strong planning, deployment of solutions and investment for adaptation across all sectors, population groups and administrative levels. Update the national adaptation strategy so that climate adaptation considerations are integrated in key vulnerable sectors, and that gaps and barriers to adaptation are addressed. Ensure that adaptation policies are monitored and evaluated systemically. Put climate resilience considerations more to the forefront in the use of support from Union funding programmes, such as the common agricultural policy, cohesion policy funding and other relevant Union funds. Union funds should be spent in such a way that they increase climate resilience and do not increase vulnerabilities (i.e., do no significant harm to adaptation). Ensure that public and private financing mechanisms for adaptation actions are in place and that the budgets are commensurate with the investment needs, in particular in the priority vulnerable sectors".

"4. Engage stakeholder groups that are particularly vulnerable to the impact of climate change in Malta's adaptation policy design and implementation. Document the processes and outcomes of relevant consultations. Improve coordination between different levels of governance (national/regional/local) to align planning tools and to help coordinated interventions aimed at systemic transformation".

"5. Promote nature-based solutions and ecosystem-based adaptation in national strategies, policies and plans and provide investments for their deployment".

⁴⁹ European Commission, 2023. Commission Recommendation on the draft updated integrated national energy and climate plan of Malta covering the period 2021-2030 and on the consistency of Malta's measures with the Union's climate neutrality objective and with ensuring progress on adaptation, SWD(2023) 920 final, C(2023) 9610 final, p. 10. [online] Available at: https://commission.europa.eu/document/download/cf47a01d-e1db-4868-918d-edc0639b295e_en?filename=Recommendation_draft_updated_NECP_Malta_2023.pdf

NAO's observation: The legal framework for national climate policy has been strengthened through the recent enactment of the Climate Action Act (Cap. 643). As noted in Table 1, the 2015 Climate Action Act has been repealed and replaced by a new Act to incorporate not only the setting up of a new Climate Action Authority but also the introduction of a Climate Action Coordinator within each Ministry as well as a National Climate Action Council composed of experts in climate-related fields. This approach is expected to strengthen both the monitoring as well as the reporting functions of climate change matters, particularly if the EC's recommendations are taken on board, including the active involvement of representatives from vulnerable groups and across the different levels of governance.

3.4.2 In November 2024, Malta, together with 12 other Member States received a letter of formal notice in view of the delay in submitting the updated NECP. The Commission considered Member States to be in breach of their obligation under the Governance Regulation (EU) 2018/1999.⁵⁰ However, in January 2025, MEEC managed to submit an updated version of the NECP to the EC⁵¹ and the respective infringement was resolved in March 2025. According to the EC's recent assessment of Malta's final updated NECP, dated 27 May 2025⁵², Malta has not yet fully addressed the recommendations communicated in December 2023 regarding climate change adaptation policy and action. To some extent, similar observations have also been noted by the NAO throughout this performance audit.

3.5 Malta's Second Flood Risk Management Plan has improved significantly in line with the European Commission's recommendations

3.5.1 The Energy and Water Agency (EWA) has generally addressed the EC's recommendations with respect to the First Flood Risk Management Plan, published in February 2019.⁵³ These recommendations were intended to enhance Malta's flood risk management in view of preparations for the second FRMP. Table 3 refers.

⁵⁰ European Commission, 2024. November Infringement Package – Key Decisions on Energy. [Online] Available at: https://energy.ec.europa.eu/news/november-infringement-package-key-decisions-energy-2024-11-14_en

⁵¹ Government of Malta, 2024. Malta's National Energy and Climate Plan 2021–2030. [online] Available at: https://commission.europa.eu/publications/malta-final-updated-necp-2021-2030-submitted-2025_en

⁵² European Commission, Commission Staff Working Document of 27 May 2025 on the EU-wide assessment of the final updated national energy and climate plans Delivering the Union's 2030 energy and climate objectives, SWD(2025) 140 final, COM(2025) 274 final

⁵³ European Commission, 2019. Commission Staff Working Document- First Flood Risk Management Plans- Member State: Malta. SWD(2019) 72 final. [online] Available at: <https://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=SWD:2019:0072:FIN:EN:PDF>

Table 3: EC's recommendations on Malta's first FRMP and Government's actions to address such issues through the second FRMP

EC's recommendations on Malta's first FRMP	Government's actions to address the issues raised by the EC through the second FRMP	Overall development
		 positive  improvement  opportunity  negative
Objectives should have an explicit timeframe to be able to assess progress	Timeframes for each measure has been included in the second FRMP (p. 93 – p. 106)	
Links between measures and objectives should become explicit	All measures that Malta has committed to the FRMP have clear objectives	
Objectives should explicitly include reducing the adverse consequences of floods	PoM initiatives generally include details of how the specific objectives therein shall be addressing flooding issues	
To provide information on the estimated cost of all flood risk mitigation measures	The prioritisation of PoM initiatives included a scoring criteria ranging from a score of 1, that was attributed to a very high-cost, up to a score of 5, that was attributed to a very low-cost initiative. Nevertheless, the estimated cost per measure was not included.	
Include information on the prioritisation of mitigation measures and the methods used for prioritisation	The prioritisation of measures was determined using flood risk maps and a multi-criteria analysis based on six weighted factors namely volumetric impact, cost, climate change readiness, effectiveness on risk areas, impact on SDGs and public engagement.	
Information on the mechanisms and indicators for monitoring the implementation of mitigation measures	Two major monitoring mechanisms are in place, namely the National Table Monitoring Stakeholder Platform and the Inter-Ministerial Committee on the implementation of the Water Framework Directive and the Floods Directive. However, the level of detail with respect to the indicators is limited.	

To include the methodology for assessing the flood risk mitigation measures in terms of costs and benefits	The prioritisation of PoM initiatives included a scoring criteria ranging from a score of 1, that was attributed to a very high-cost, up to a score of 5, that was attributed to a very low-cost initiative	
Provide more detailed information on the active involvement of stakeholders	Section 7 of the Second FRMP outlines the mechanisms in place to engage stakeholders. These relate to: • the public consultation on the FRMP; • the National Water Table multi-stakeholder Platform, • the Inter-Ministerial Committee on Water.	
FRMPs, PFRAs/APSFRs and FHRMs should refer to each other as appropriate and be continuously available to all concerned and the public in an accessible format, including digitally	Various cross references were noted in Malta’s Second FRMP.	

Source: Adapted from European Commission, 2019. Commission Staff Working Document- First Flood Risk Management Plans- Member State: Malta. SWD(2019) 72 final.

3.5.2 Table 3 shows that, EWA as the Governmental Agency responsible for developing the FRMP, has taken various initiatives in order to improve flood management. These include the established timeframes relating to the initiatives listed in the Programme of Measures of Malta’s second FRMP, as well as information regarding the methodology adopted for the prioritisation of measures.

3.5.3 However, some of the recommendations have not yet been fully addressed. An example in this regard includes the estimated costing of all flood mitigation measures. This issue of concern, common amongst various Member State, shall be further discussed in Chapter 4 of this Report. Nevertheless, MEEC contended that the costings of measures as part of the FRMP is dependent on the input of various governmental entities. However, such information might not be available at the initial planning stages and consequently these are set through discussions at Inter-Ministerial level.

3.6 Conclusions

3.6.1 Malta’s commitment to better manage climate change matters is evidenced through the introduction of the Climate Action Act back in 2015, the Parliamentary climate change emergency declaration in 2019 and the recently enacted Climate Action Act of 2024. The latter has brought about a number of positive developments, including the establishment of the Climate Action Authority.

- 3.6.2 Moreover, this Office observed that the major components of the climate governance framework under review are generally in place. These mechanisms, mainly emanating from international and EU obligations, include the LCDS, the NECP covering the period 2021 to 2030, and the Second FRMP for the Malta River Basin District. The latter acknowledges the increasing intensity as well as the frequency of extreme weather events and incorporates different types of measures to address flooding-related challenges. The multi-faceted approach adopted by EWA includes an array of measures spanning up to 2027 that cover initiatives related to adaptation, mitigation, monitoring, public information as well as research, studies and investigations.
- 3.6.3 However, this Review raised concerns that could hinder the effective and efficient implementation of adaptation action. These concerns, in instances, include the lack of assignment of responsibilities with respect to specific initiatives, and the non-identification of implementation timeframes. Consequently, the monitoring function is hampered by these issues. Chapter 4 will discuss in more detail the timely implementation and systematic monitoring of measures with a perspective to enhance climate resilience as well as optimise the use of the limited resource allocated for CCA.

Chapter 4

Adaptation action and monitoring

4.1 Introduction

- 4.1.1 Effective climate change initiatives rely on both implementation to turn strategies into actions, as well as monitoring to track progress and impacts. However, assessing the level of implementation of Climate Change Adaptation (CCA) measures through the monitoring mechanisms in place, proved to be a challenging endeavour for various reasons. These concerns ranged from the lack of ownership, timeframes and Key Performance Indicators (KPIs) to projects with multiple objectives. The latter issue of concern relates to projects having a combination of objectives including public health, infrastructure development, as well as CCA, with the latter often not being considered as the primary objective. This results in a situation whereby it is difficult to apportion the required resources as well as the resulting financial, socio-economic and environmental benefits. Non-climate-related projects can offer significant indirect benefits to climate change adaptation, particularly when they address underlying vulnerabilities, enhance resilience, or improve sustainability in ways that help communities cope with climate impacts.
- 4.1.2 This Review opted to focus on the planned CCA measures included in the Malta Low Carbon Development Strategy (LCDS), as well as the Programme of Measures (PoM) under the Flood Risk Management Plan for the Malta River Basin District (FRMP). Such an approach was adopted since as noted in Chapter 3 of this Report, most of the LCDS Adaptation measures (86 per cent) are expected to have direct or indirect benefits in terms of addressing flooding and/or sea level rise issues. Similarly, whilst noting that Malta's second FRMP includes different types of measures, namely adaptation, mitigation, monitoring, public information, as well as research, studies and investigations, all these measures are highly interlinked and, ultimately are intended to reduce and manage the risks posed by floods. It is to be acknowledged that adaptation and mitigation measures are extremely interconnected, with the common primary objective of containing the impact of climate change and flooding at catchment level. To this end, some of the planned measures include greening projects, support schemes for the restoration of rainwater harvesting facilities, as well as rehabilitation works in valley systems.

4.1.3 Various stakeholders are involved in the overall monitoring of Adaptation measures. These namely include the Ministry for the Environment, Energy and Public Cleanliness (MEEC) including the Directorate for Climate and Carbon Neutrality, the Energy and Water Agency (EWA), the Inter-Ministerial Committee (IMC) on Water and, the National Water Table (NWT) multi-stakeholder platform. The recently set up Climate Action Authority (CAA) is also expected to contribute towards the monitoring of Adaptation action in line with the reporting obligations emanating from the Climate Action Act (Cap. 643). This performance audit also noted that other stakeholders contributed to the monitoring function although not in a systematic manner. These included the former Climate Action Board (CAB) that was originally established through the 2015 Climate Action Act, the Climate Action Platform (CCP) at the University of Malta (UM), as well as the IMC responsible for the development of the LCDS and the National Energy and Climate Plan for 2021 to 2030 (NECP).

4.1.4 In view of the foregoing, as well as the overall objectives of this performance audit, this Chapter discusses the extent to which the planned Adaptation measures are being prioritised, implemented and systematically monitored through the following:

- i. The Malta Low Carbon Development Strategy that includes a stock take of the 2012 National Adaptation Plan;
- ii. The second Flood Risk Management Plan for the Malta River Basin District; and
- iii. interlinked sectoral contribution.

4.2 Effective implementation and monitoring of Adaptation measures included in the Malta LCDS is significantly hindered by the lack of prioritisation of measures, clear timeframes and KPIs

4.2.1 For this Performance Audit, the NAO has attempted to gauge the level of implementation of the 50 CCA measures included in Malta's LCDS. This approach was adopted since as noted in Chapter 3 of this Report, most of the LCDS Adaptation measures (86 per cent) are expected to have direct or indirect benefits in terms of addressing flooding and/or sea level rise issues.

4.2.2 Several stakeholders are responsible for the implementation of these Adaptation measures that span across six different sectors, coupled with other measures that are of a cross-sectoral nature. Hence, apart from the leading Inter-Ministerial Committee that was set up for the development of Malta's LCDS, the Office of the Prime Minister (OPM) is also responsible for monitoring implementation. Table 4 presents the level of implementation of these measures.

Table 4: Climate Change Adaptation measures presented in the Malta Low Carbon Development Strategy

Sectors (LCDS Adaptation measures)	Implementation Status*			Total measures
	Pending	Ongoing	Implemented	
Water resources	0	6	1	7
Infrastructure and transport	0	9	0	9
Land use and buildings	1	9	0	10
Natural ecosystems, agriculture and fisheries	0	6	0	6
Health and civil protection	0	8	0	8
Tourism	0	1	0	1
Cross-sectoral	1	7	1	9
Total	2	46	2	50
%	4	92	4	100

*Source: Office of the Prime Minister as at February 2024.

4.2.3 As shown in Table 4, most of the Adaptation measures were classified as '*Ongoing*' (92 per cent), with only four per cent, that is two of the measures being '*Implemented*'. These namely relate to the following:

i. Water resources

A comprehensive study of the current hydrological cycle (including rainfall, run-off and evaporation), which led to the enhancement of monitoring capacity and development of a new hydrological data modelling and management system. This project was partly funded through the EU Cohesion Fund and was concluded in December 2023.

ii. Cross-sectoral

A survey to gauge⁵⁴ the level of knowledge and awareness of climate change matters amongst the local population, including the willingness to accept adaptation measures. Around 600 individuals were involved in this telephone survey that was carried out in 2021 and 2022.

4.2.4 The significantly high number of adaptation measures that were classified as '*Ongoing*' in terms of their level of implementation, may in part be attributable to the timeframe covered by the LCDS, that is, up to year 2050. Furthermore, MEEC contended that some of these measures are of an 'ongoing nature', meaning they are being extended, such as incentive schemes, due to their benefits and positive uptake.

⁵⁴ Climate Action Authority. (2024). Malta's First Biennial Transparency Report, p.148. Ministry for the Environment, Energy and Public Cleanliness, Government of Malta.
[online] Available at: https://unfccc.int/sites/default/files/resource/Malta%27s%20First%20BTR_2024.pdf

- 4.2.5 However, within the context of this Performance Audit, Government has neither managed to clearly highlight those instances that are deemed to be of an ‘ongoing nature’, nor provided additional quantitative information regarding the successful implementation or otherwise of these measures. Despite numerous reminders, the last qualitative update was forwarded to the NAO in February 2024.
- 4.2.6 Moreover, efforts by this Office to assess any potential contribution of the LCDS’s IMC towards monitoring the measures listed in the LCDS, showed that such function was missing. This situation is also evidenced by the recently updated and published NECP, which includes an update regarding the level of implementation of some of the CCA measures included in the LCDS. Clearly, such an update is characterised by a lack of quantitative information regarding the outputs and outcomes emanating from these measures.
- 4.2.7 The main monitoring-related challenges emanate from the fact that most of these CCA measures do not include specific timeframes and other KPIs. Such a situation is not conducive to systematic monitoring mechanisms, an issue that has also been highlighted by the European Commission in 2023 within the context of the NECP.⁵⁵ MEEC noted that the recently established CAA has been entrusted with such monitoring function, supported by other legislative amendments that put obligations on all the relevant Ministries both to consult on and report any climate-related efforts.

4.3 Measures emanating from the second Flood Risk Management Plan are being implemented and monitored in line with pre-established timeframes

- 4.3.1 In view of the clear link with flooding, this Office has also reviewed the Programme of Measures (PoM) under the second Flood Risk Management Plan for the Malta River Basin District (FRMP). These measures are primarily intended to limit the impact of climate change including flooding at catchment level. As noted in Chapter 3 of this Report, the proposed measures were grouped under five main clusters, all intended to address flooding issues from different perspectives. Such categories namely include adaptation (ADP), mitigation (MIT), monitoring (MON), public information (PI), as well as research, studies and investigations (RSI). Table 5 presents all the 14 measures included in Malta’s second FRMP, including some high-level information regarding the planned implementation timeframes as well as the implementation status as at end 2024.

⁵⁵ European Commission, 2023. Commission Recommendation on the draft updated integrated national energy and climate plan of Malta covering the period 2021-2030 and on the consistency of Malta’s measures with the Union’s climate neutrality objective and with ensuring progress on adaptation, SWD(2023) 920 final, C(2023) 9610 final. [online] Available at: https://commission.europa.eu/document/download/cf47a01d-e1db-4868-918d-edc0639b295e_en?filename=Recommendation_draft_updated_NECP_Malta_2023.pdf

Table 5: Malta's second Flood Risk Management Plan, Programme of Measures (as at end 2024)

Measure Code (as per 2 nd FRMP)	Measure Name	Implementation timeframe	Implementation Status (Pending / Ongoing / Completed)
ADP1	Local Council Urban Greening Scheme	2025	Ongoing
ADP2	Support scheme for the restoration of rainwater harvesting facilities in the domestic sector	2022 – 2027	Ongoing
ADP3	Revision of the existing regulatory framework for the construction of rainwater harvesting cisterns in new developments	2023 – 2027	Ongoing
ADP4	Rehabilitation works in two valley systems in Malta and Gozo	2020 – 2027	Ongoing
ADP5	Support schemes for the promotion of Green Urban Infrastructure	2023 – 2027	Ongoing
MIT1	Green stormwater infrastructure on public land	2025 – 2027	Ongoing
MON1	Upgrading of the hydrological monitoring framework for improved water resources management for the Maltese Islands	2023 – 2024	Completed
MON2	Storm Water Quality Monitoring and Sediment Characterisation for the National Flood Relief Project Infrastructure in connection with Environmental Permit (EP 0030/13/B)	2023 – 2027	Ongoing
PUI1	Campaign on Green Urban Infrastructures	2023 – 2026	Ongoing
RSI1	Re-assessment of water catchments boundaries in the Malta River Basin District	2023 – 2024	Ongoing
RSI2	Modelling tool for the assessment of GUI impact on highly urbanised areas	2023 – 2024	Completed
RSI3	Valley Management Masterplan for Malta and Gozo	2023 – 2026	Completed
RSI4	Stormwater Management Masterplan	2027	Ongoing
RSI5	Green Infrastructures to mitigate flood risks in Urban and sub-urban areas and to improve the quality of rainwater discharges	2023 – 2024	Completed

Source: EWA.

4.3.2 The NAO observed that, in this case, the FRMP related measures are all accompanied by overall implementation timeframes, which enables a better assessment of the related deliverables. As noted in Table 5, most of these measures (71 per cent) were in the process of being implemented and hence classified as 'Ongoing'. Such situation is mainly attributable to the fact that these measures are to be completed by end 2027, and consequently their implementation status reflects the situation as at end 2024.

4.3.3 On the other hand, the remaining four measures (29 per cent) have already been implemented by the responsible Government Entities in line with the planned implementation timeframes, that is, by end 2024. These namely included the:

i. *Upgrading of the hydrological monitoring framework for improved water resources management for the Maltese Islands*

This system, which was co-financed by the EU Cohesion Fund and implemented by EWA, enhanced flood risk monitoring and hydrological understanding, supporting long-term water resource protection and management. Key benefits include improved assessments of surface water runoff, identification of risks to water resources and people, and support for developing flood protection policies and measures. The network includes:

- a. *Catchment Monitoring*: Radar sensors and measurements of streamflow depth and velocity across diverse catchment types (agricultural, urban, blue clay outcrops, garigue).
- b. *Flood Monitoring*: Surface water level and flow measurements in high-risk areas identified in the previous Floods Directive cycle.
- c. *New Weather Stations*: These stations provide real-time data on rainfall, wind speed, solar radiation, and more, improving data accuracy and representation of Malta's hydrological cycles.

ii. *Modelling tool for the assessment of Green Urban Infrastructure (GUI) impact on highly urbanised areas*

This modelling tool for assessing the impact of different GUI on highly urbanised areas was developed under the GiFLUID project⁵⁶ as will be discussed in paragraph 4.3.6 of this Report. It included several key components, namely:

- a. Assessment and identification of flood hazard and risk maps.
- b. Implementation of a model integrating green stormwater infrastructures.
- c. Remodelling of the area to evaluate effects based on critical indicators such as flood risk reduction, runoff quality improvement, peak flow reduction, and volume runoff reduction.
- d. A Cost-Benefit Analysis to select the most effective scenario, ensuring that the most efficient and sustainable flood mitigation solutions are prioritised based on budget and fiscal incentives.

⁵⁶ GiFluid Project, 2025. Green Infrastructures to mitigate flood risks in Urban and sub-urban areas and to improve the quality of rainwater discharges. [online] Available at: <https://www.gifluid.eu/>

iii. *Valley Management Masterplan for Malta and Gozo*⁵⁷

The Valley Management Masterplan for Malta and Gozo, which formed part of the LIFE Integrated Project (IP), was launched in 2020 and included different types of interventions that are being implemented across valleys to ensure more sustainable action that conserves the ecosystems therein. Such works included valley cleanups, construction of gabion dams, control of invasive species, maintenance of water infrastructure, afforestation, reinstatement of rubble walls, as well as community engagement activities in conservation efforts. Thus, this document is a key input to valley management. Moreover, valley management plans were developed for the major valley systems in Malta and Gozo. Subsequently two valleys were chosen as part of the pilot project site selection to implement the actions which have been identified and set out in such plans. The valleys where pilot projects are being carried out are Il-Wied tal-Isperanza, which is situated in the Għasel Catchment in Malta, and Il-Wied tal-Grixti, situated in Xlendi Catchment, in Gozo.

iv. *Green Infrastructures to mitigate flood risks in urban and sub-urban areas and to improve the quality of rainwater discharges*

This Policy Paper was also developed under the GiFLUID project discussed in paragraph 4.3.6 of this Report. It contributes to Malta's efforts to enhance its resilience to climate change impacts through the development of a policy framework promoting the use of GUI. This sustainable infrastructure is deemed as being highly beneficial in terms of mitigating flood risks, improving disaster preparedness, enhancing urban environments, and restoring biodiversity. Moreover, the GiFLUID Project, which was concluded in February 2023 and financed under the INTERREG Italia-Malta Programme, also included the installation of an experimental Green Roof at the Għajn National Water Conservation Awareness Centre in Rabat.

4.3.4 In this case, EWA prioritised flooding related measures using Flood Risk Maps as well as a Multi-Criteria Analysis (MCA)⁵⁸. As noted in Chapter 3 of this Report, six weighted criteria were used to assess and rank the proposed measures, including volumetric impact, cost, climate change readiness, effectiveness on risk areas, impact on Sustainable Development Goals (SDGs), and public engagement. Such an approach ensures that measures are evaluated holistically, duly considering environmental, social, as well as economic factors.

4.3.5 As opposed to the LCDS Adaptation measures, more systematic monitoring of the second FRMP measures is being ensured through the involvement of multiple stakeholders in different fora. These namely include the:

⁵⁷ RBMP Life Malta, 2025. Valley Management Plan. [online] Available at: <https://www.rbmplife.org.mt/content/valley-management-plan>

⁵⁸ Ministry for the Environment, Energy and Enterprise, 2023. 2nd Flood Risk Management Plan for the Malta River Basin District, September 2023, p. 102 [online] Available at: <https://energywateragency.gov.mt/wp-content/uploads/2023/10/2nd-Flood-Risk-Management-Plan-Final-1.pdf>

i. Inter-ministerial Committee (IMC) on Water

This Committee was established to provide a high-level consultation framework to oversee the effective and timely implementation of the Water Framework Directive 2000/60/EC (WFD) and the Floods Directive 2007/60/EC (FD). The involved public bodies and implementing agencies record and communicate their progress during these IMC meetings, to integrate the relevant measures into each entity's business plan.

ii. National Water Table meetings (NWT)

This regular consultation with public and private stakeholders is mainly intended to support the joint implementation of the WFD and FD. The scope of these meetings is to identify any necessary corrective actions for ensuring that both the River Basin Management Plan (RBMP) and the Flood Risk Management Plan (FRMP) meet their objectives.

4.3.6 In addition to these monitoring mechanisms, the NAO observed that there is another layer overseeing the implementation of flooding related measures, that is, the Energy and Water Agency (EWA). To this end, the EWA coordinates the implementation of the FRMP through the organisation of the IMC and NWT meetings every six months. Moreover, this Office could also confirm that in addition to such monitoring role, the Agency is also involved in the implementation of some of these measures, particularly those related to the development of plans or even the testing of potential solutions for limiting climate change impacts including from flooding events. A case in point relates to the following four flooding related projects carried out in collaboration with neighbouring countries in view of the transboundary nature of climate change impacts:

i. GiFLUID

This 30-month project with a budget of around €2 million was funded through the programme Interreg Italia – Malta programming period 2014–2020.⁵⁹ The aim of this project was the development of green infrastructure to mitigate flood risks in urban and sub-urban areas and to improve the quality of rainwater discharges. The project recognised the increased risk of flood events in coastal catchment areas in Sicily and Malta, resulting from the impacts of climate change. This risk has been exacerbated by anthropogenic activities, including the increased urbanization of the low-lying areas of these catchments, resulting in increased hazards to human life, as well as to economic and cultural activities. Therefore, the project focused on the mitigation of these risks, through the increased integration of Nature-Based Solutions (NBS) in the urbanised sections of these catchments, reducing the flow of rainwater runoff while returning water to nature such as through increased percolation.

ii. CARDIMED (Climate Adaptation and Resilience Demonstrated In the MEDiterranean region)

This project, with a total duration of 54 months and a budget of around €20 million between the 51 partners, is funded by the European Union under the Horizon Europe 2021-2027 programme. Malta's portion of EU funds for the period 2023 to 2027 amounts

⁵⁹ Energy and Water Agency, Malta, 2025. GiFluid. [online] Available at: <https://energywateragency.gov.mt/gifluid/>

to €131,500.⁶⁰ This project shall introduce a framework to build climate resilience in the Mediterranean biogeographic region by efficiently unifying the individual efforts of regions and communities in different countries and continents. This will be achieved by deploying the digital infrastructure to harmonise data collection and assessment processes, providing open data to all stakeholders involved in the NBS value chain and integrating functions crucial for climate resilience. The consolidation of regions and communities joining the initiative will establish the CARDIMED Regional Alliance, which will act as a vehicle to expand the network.

iii. LocAll4flood

The LocAll4flood project under the INTERREG EURO-MED is an €2.3 million EU co-funded project.⁶¹ It proposes an Integrated Multi-stakeholder Governance Model, combining prevention, adaptation and mitigation actions, which will be tested in small catchments, particularly vulnerable to flash floods. The EWA, the Civil Protection Department as well as the Coastal and Stormwater Unit within the Public Works Department (PWD) are the national partners participating in this project. From a local perspective, the outcomes of this project will inform the optimisation of flood management in Malta, contributing to the process of the Third Flood Risk Management Plan.

iv. Green Shield

This project led by EWA spans between January 2024 to December 2026. Malta's unique geographical and climatic conditions, coupled with increasing urbanisation and vulnerability to climate change impacts, necessitate a systematic approach to implementing Green Stormwater Infrastructure (GSI). This initiative aims to optimise flood management through upstream water strategies while delivering additional benefits such as biodiversity restoration, improved air quality, and enhanced community resilience.⁶²

4.4 Despite various CCA beneficial projects across different sectors, climate-related systematic monitoring and evaluation of such action was limited

4.4.1 For this performance audit, the NAO has also attempted to gather information from key Ministries regarding CCA related projects that may have resulted in direct as well as indirect benefits in terms of enhancing the resilience to flooding and sea level rise. These mainly included the Ministry for the Environment, Energy and Public Cleanliness (MEEC), the Ministry for Transport, Infrastructure and Public Works (MTIP) and the Ministry for Agriculture, Fisheries and Animal Rights (MAFA).

4.4.2 A common finding across all Government Entities involved in this exercise was the limited systematic monitoring mechanisms that are geared towards quantifying the CCA related benefits

⁶⁰ Energy and Water Agency, Malta, 2025. CARDIMED Project. [online] Available at: <https://energywateragency.gov.mt/cardimed/>

⁶¹ LocAll4Flood Project, 2025. Interreg Euro-MED – LocAll4Flood. [online] Available at: <https://locall4flood.interreg-euro-med.eu/>

⁶² RBMP Life Malta, 2025. Transforming Malta into a Green and Flood-Resilient Community. [online] Available at: <https://www.rbmplife.org.mt/content/transforming-malta-green-flood-resilient-community>

or otherwise regarding the measures and projects under their responsibility. Such a situation was particularly evident in projects whose major objective is more of a socio-economic nature but nevertheless may result in CCA related benefits.

4.4.3 The major flooding-related infrastructural project implemented to-date is the National Flood Relief Project (NFRP). This comprehensive storm-water drainage infrastructure is primarily composed of intercept culverts and underground tunnels leading to outflows on the coastline. It covers an area of around 65 km² and was mainly implemented over the period 2013 to 2015. The localities that directly benefited from this infrastructural project include H'Attard, Hal Lija, Hal Balzan, Birkirkara, Iklin, Msida, Marsa, Hal Qormi, Haż-Żebbuġ, Gżira, Haż-Żabbar and Marsascale. The total cost of this project amounted to around €54 million.

4.4.4 The Government intends to upgrade the existing NFRP network to further improve the flood protection infrastructure in place. Such plans include the following measures:

- i. Tunnel branch from the existing tunnel serving San Ġwann Industrial Estate to Triq Sir Anthony Mamo, with approximate length of 500 metres and three metres wide, to be dug at a depth of around 40 metres.
- ii. New surface water tunnel below Triq Sant Andrija between Swieqi and Pembroke.
- iii. Pipe network systems at Żurrieq, Mosta and Hal Kirkop.
- iv. Other projects at Hal Balzan, Marsa, Mosta and Birżebbuġa.

4.4.5 In addition to the NFRP related infrastructure, Government has undertaken other type of projects aimed at better understanding the coastal vulnerabilities particularly in view of Malta's geographical specificities. The Coastal–Climate Overall Vulnerability and Exposure Risk (C-COVER) project aimed to provide an assessment of the coastal risks and put forward recommendations for adaptation. The European Commission's (EC) Technical Support Instrument funded this project, with a total cost of around €600,000. The main Government Entity behind this project was the PWD under the Ministry for Transport, Infrastructure and Public Works (MTIP) and the Malta Tourism Authority (MTA)⁶³. It is to be noted that the assessment was entrusted to the Coastal & Marine Union (EUCC) and its core team of experts namely, the Environmental Hydraulics Institute of the University of Cantabria (IHCantabria), AKTIS Hydraulics and, the University of Malta. The main objectives of this project were to assess coastal risks and identify sustainable protective solutions that consider the impacts of climate change, the integrated management of resources and, which lead to a holistic and consistent strategic framework at national level.⁶⁴

⁶³ In addition, MTA is contributing towards the development of a platform which uses Copernicus Satellite data to monitor a wide number of environmental indicators including climate, air, land and sea.

⁶⁴ European Commission, n.d. C-COVER: Coastal Climate Overall Vulnerability and Exposure Risk- protection strategy for the Maltese Islands. [online] Available at: <https://maritime-spatial-planning.ec.europa.eu/projects/coastal-cover-coastal-climate-overall-vulnerability-and-exposure-risk-protection>

- 4.4.6 Similarly, projects managed by Project Green are generally deemed as having direct benefits in terms of Adaptation to flooding risks. The seven-year plan with a total budget of €700 million⁶⁵ for the maintenance and creation of green infrastructure including parks and gardens, is expected to contribute significantly towards the minimisation of rainwater run-off and the ensuing risks associated with flooding events, such as through the improved percolation and/or rainwater harvesting. Project Green contended that projects are generally selected based on several criteria including climate change resilience, enhanced biodiversity, accessibility and connectivity, community engagement, social sustainability, environmental sustainability, as well as innovation and impact. However, this Office noted that during its first year of operation, such projects were not accompanied by formal climate risk assessments in accordance with the European Commission's Technical guidance on the climate proofing of infrastructure in the period 2021-2027 (2021/C 373/01)⁶⁶ or equivalent standards. To this end, it is to be noted that such a situation was common across most of the Government Entities involved in this performance audit. However, entities such as the Water Services Corporation and the InterConnect Malta Ltd undertook project-specific climate change vulnerability assessments such as the ones relating to the Hondoq Reverse Osmosis and the Malta's Second Interconnector with Sicily respectively. As discussed in Chapter 2 of this Report, investment in climate risk assessments would ensure that potential threats are identified and duly considered, not only to ensure compliance with environmental standards but also to prevent maladaptation and maximise the CCA potential. Project Green has confirmed its intention to adopt this sustainable practice to better manage its projects even at monitoring stage.
- 4.4.7 MAFA indicated that it is implementing a number of initiatives that contribute indirectly to CCA. These mainly focus on the provision of financial aid under the Agri-Environment Climate Commitments or Eco-Schemes to eligible farmers for the maintenance of newly planted trees, mechanical weed control in orchards and vineyards, implementation of Soil Management Plans by farmers, as well as the maintenance and management of fallow land. Promotion and support for the restoration of rubble walls utilising traditional methods is also provided. These contribute towards improved soil percolation and consequently reduces rainwater surface run-off and flooding.
- 4.4.8 The NAO acknowledges that the monitoring function has recently been strengthened through various initiatives. These mainly include the setting up of a new Climate Action Authority as well as the recently enacted Climate Action Act that has put obligations on all the relevant Ministries to report any climate-related efforts. Such obligations also include the frequency of reporting and the need to discuss climate developments in Parliament. However, the allocation of sufficient funding remains key for strengthening the monitoring function, as also contended by representatives of the Climate Change Platform at the University of Malta.

⁶⁵ Government of Malta- Ministry for Finance, 2022. Budget Speech 2023, p. 84. [online] Available at: https://finance.gov.mt/wp-content/uploads/2023/04/Budget_Speech_2023.pdf

⁶⁶ European Commission, 2021. Union Civil Protection Mechanism – EU Resilience Report. [online] Available at: <https://op.europa.eu/en/publication-detail/-/publication/23a24b21-16d0-11ec-b4fe-01aa75ed71a1/language-en>

4.5 Conclusions

- 4.5.1 This Chapter has revealed that in comparison with the other climate change hazards, flooding issues are being addressed in an organised manner through the Programme of Measures (PoM) established under the second Flood Risk Management Plan for the Malta River Basin District (FRMP) in accordance with the Floods Directive 2007/60/EC. Measures therein were prioritised and are being systematically implemented and monitored under EWA's supervision.
- 4.5.2 Adaptation action that maximises the involvement of all relevant stakeholders, not only on a national level but also on a wider scale such as with neighbouring countries experiencing similar climate change impacts, is commendable. These include projects like GiFLUID and CARDIMED. In view of the transboundary nature of climate change, issues of concern such as those resulting in flooding events, are best addressed collectively through the sharing of available resources including the acquired knowledge and experience.
- 4.5.3 On the other hand, the CCA measures included in the LCDS, which are supposedly intended to address all sorts of climate change hazards including extreme temperatures as well as slow-onset events like sea level rise, were characterised by various deficiencies. These included the lack of prioritisation of measures as well as non-established timeframes and KPIs.
- 4.5.4 This Review observed that projects with Adaptation related benefits, do not duly consider the resulting impact of climate action in terms of quantifying the hazards' containment, as well as the resilience of the project itself to future extreme weather events. Hence the importance of integrating climate risk assessments at planning stage, leading to projects that are more resilient, sustainable, and effective in combating climate change while providing the anticipated environmental and socio-economic benefits. In parallel, the Government is also undertaking other types of projects aimed at better understanding coastal vulnerabilities, particularly in view of Malta's geographical specificities. To this end, the C-COVER project shall lead to the development of an assessment on coastal protection for the Maltese Islands as one of its deliverables.
- 4.5.5 Timely and strategic financing of adaptation actions is essential, especially given the limited resources typically allocated to climate change matters. This includes the implementation of Nature-Based Solutions that address flooding events and account for potential future vulnerabilities associated with slow-onset phenomena, such as sea level rise. The value for money considerations is included in the next Chapter of this Report.

Chapter 5

Cost-effectiveness of Adaptation measures

5.1 Introduction

- 5.1.1 The Malta Low Carbon Development Strategy (LCDS) notes that the cost of inaction on climate change is far greater than the cost of adaptation.⁶⁷ The significant difference between the costs of inaction and adaptation to climate change was also noted in a recent special report by the European Court of Auditors (ECA) on climate adaptation in the European Union (EU). The same ECA report outlined that exposing today's EU economy to global warming of 1.5 to 3°C above pre-industrial levels, would result in a conservative estimated annual economic loss of between €42 and €175 billion.⁶⁸
- 5.1.2 The European Environment Agency (EEA) estimated the cost of adaptation to climate change for the EU-27 and the UK, in the scenario of limiting the global temperature increase to 1.5°C, at around €40 billion per year.⁶⁹ Thus, the current climate adaptation investment needs are estimated to be significantly lower than the cost of inaction on climate change at EU level.
- 5.1.3 The foregoing implies that adopting a more proactive or anticipatory approach to climate change, does not only save human lives and ecosystems, but also results in more cost-effective solutions. Implementing preventive measures like building resilient infrastructure and restoring natural floodplains, will significantly reduce the economic costs of climate change. A climate change perception survey carried out by the European Investment Bank (EIB) in August 2024, shows that the Maltese respondents perceive CCA as an urgent matter and are aware that adaptation investments are more cost-effective and significantly reduce the economic costs associated with climate change impacts.⁷⁰
- 5.1.4 Against this backdrop, this Chapter discusses the:
- higher cost of inaction as opposed to the cost of adapting to climate change hazards;
 - efforts to quantify the cost of inaction as well as the cost of adaptation to climate change, particularly for flooding and sea level rise; and

⁶⁷ Ministry for Environment, Climate Change and Planning, 2021. Malta Low Carbon Development Strategy, p. 81. [online] Available at: https://unfccc.int/sites/default/files/resource/MLT_LTS_Nov2021.pdf

⁶⁸ European Court of Auditors, 2024. Climate Adaptation in the EU – Action Not Keeping Up with Ambition: Special Report, p. 9. [online] Available at: <https://www.eca.europa.eu/en/publications?ref=SR-2024-15>

⁶⁹ European Environment Agency (EEA), n.d. Assessing the Costs and Benefits of Climate Change Adaptation. [online] Available at: <https://www.eea.europa.eu/publications/assessing-the-costs-and-benefits-of>

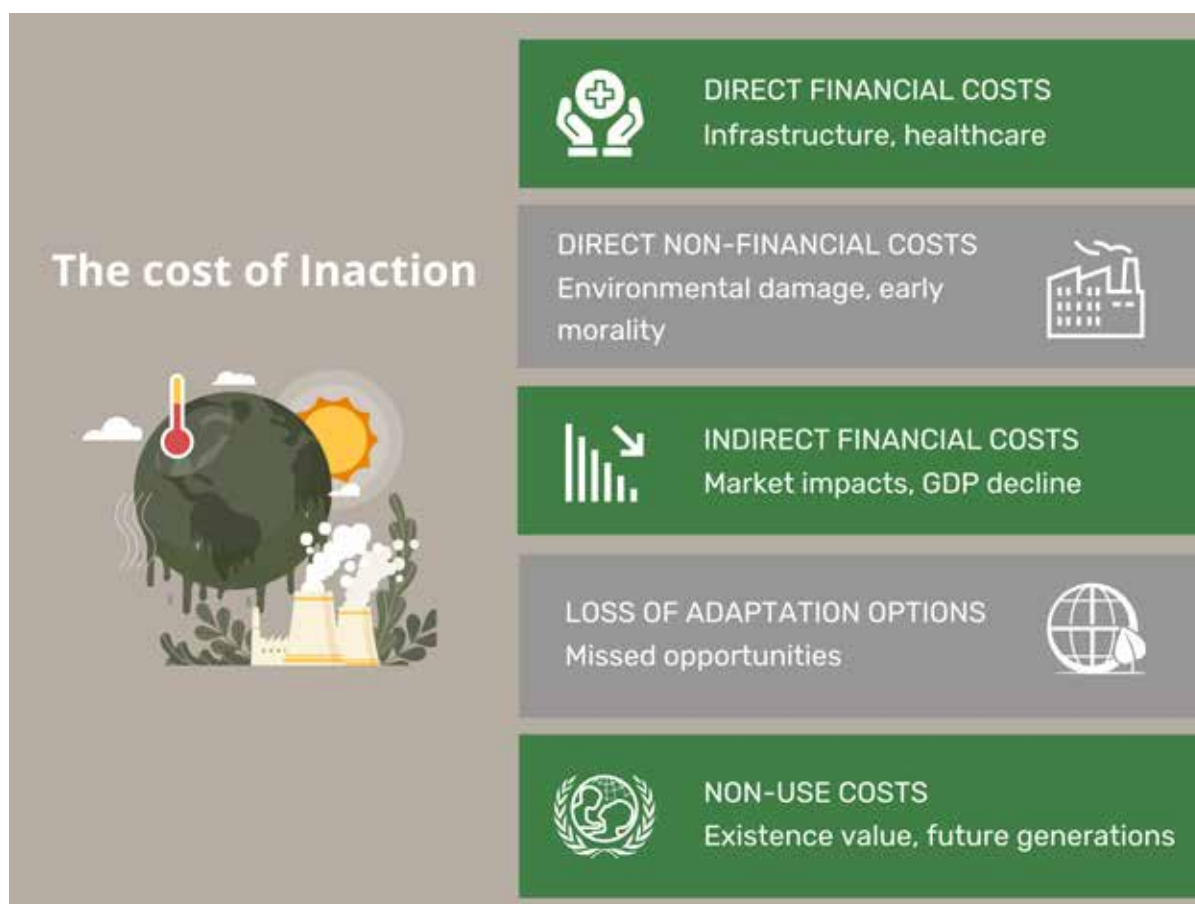
⁷⁰ European Investment Bank. (2024). Over three-quarters of Maltese respondents view climate adaptation as a national priority, EIB survey shows. [Press release- Online] 11 November. Available at: <https://www.eib.org/en/press/all/2024-423-over-three-quarters-of-maltese-respondents-view-climate-adaptation-as-a-national-priority-eib-survey-shows>

- iii. national funds that were directly allocated to address climate change issues over the last decade.

5.2 Scientific literature increasingly supports the assertion that the cost of inaction on climate change already exceeds the cost of adaptation

- 5.2.1 Quantifying the cost of inaction as well as the cost of adaptation to flooding events and sea level rise, is a critical step for enabling sufficient and more effective adaptation action, thereby strengthening the resilience to these climate change hazards. Whilst acknowledging the challenges associated with identifying, quantifying and monetising the impacts of climate change, failing to address these concerns could result in adaptation gaps in terms of knowledge, technology as well as funding.
- 5.2.2 The cost of inaction may be defined as the damages that will result when allowing climate change to continue unabated. This cost to society should not be limited to direct and monetary assessments. The economic costs of climate change to be considered when evaluating the cost of inaction are illustrated in Figure 6, with further details included in Appendix V.⁷¹

Figure 6: The economic costs when evaluating the cost of inaction on climate change



⁷¹ European Environment Agency (EEA), 2022. Costs of Adaptation vs Costs of Inaction: EEA Preparatory Study, p. 16, 18. [online] Available at: <https://climate-adapt.eea.europa.eu/en/metadata/publications/costs-of-adaptation-vs-costs-of-inaction>

- 5.2.3 The United Nations Framework Convention on Climate Change (UNFCCC) defines the cost of adaptation as the cost of any additional investment needed to adapt to or exploit future climate change. The cost of adaptation, which is equally complex to quantify, should include the financial, social and environmental resources necessary to reduce vulnerability to climate change impacts like flooding whilst building resilience in infrastructure, ecosystems and societies. The four main types of adaptation costs to be considered are illustrated in Figure 7, with an in-depth description provided in Appendix V.⁷²

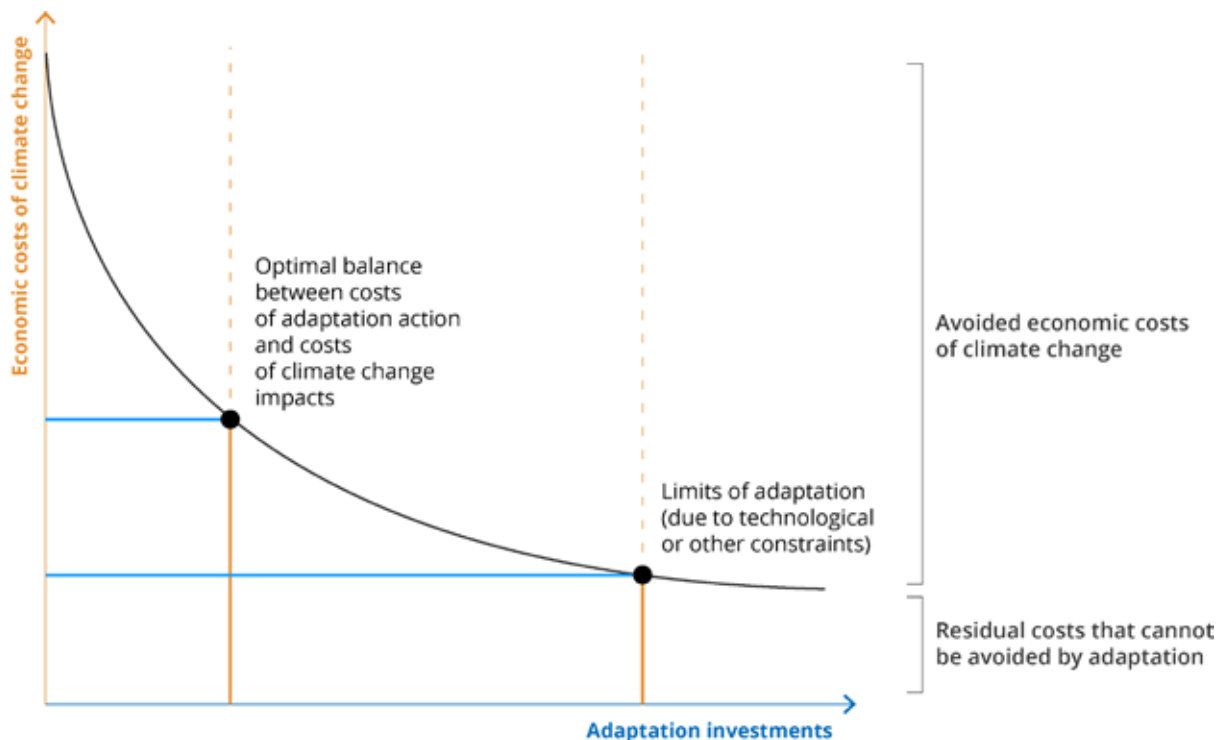
Figure 7: The four main types of Adaptation costs



⁷² European Environment Agency (EEA), 2022. Costs of Adaptation vs Costs of Inaction: EEA Preparatory Study, p. 31. [online] Available at: <https://climate-adapt.eea.europa.eu/en/metadata/publications/costs-of-adaptation-vs-costs-of-inaction>

5.2.4 Efficient and effective adaptation investments result in multiple social as well as environmental benefits and, reduce significantly the economic costs of climate change. Figure 8 refers.

Figure 8: Economic costs of climate change and Adaptation investments



Source: <https://www.eea.europa.eu/publications/assessing-the-costs-and-benefits-of>

5.2.5 As shown in Figure 8, due to technological or other constraints, it is likely that there will be some residual costs that cannot be avoided by adaptation. Nonetheless, it is possible to find an optimal balance between the costs of adaptation action and the costs of climate change impacts, thereby avoiding both under-adaptation as well as over-adaptation. The cost of adaptation occurs when adaptation actions are insufficient, resulting in climate change impacts like flooding causing large economic, social, and environmental costs. On the other hand, spending excessively on adaptation can result in inefficiencies and wasted resources, especially when the likelihood or severity of climate risks could be based on trends and projections that remain subject to assumptions and inherent limitations.

5.2.6 While there are economic methodologies for attempting to estimate the value of non-market goods and services including intangible benefits, as well as for calculating indirect impacts, these are often complex cost estimates. In addition to the issue of the monetisation of costs, other challenges when quantifying the cost of inaction materialise. These relate to the irreversibility of climate impacts, discounting of future costs and uncertainty.⁷³

⁷³ European Environment Agency (EEA), 2022. Costs of Adaptation vs Costs of Inaction: EEA Preparatory Study, p. 19. [online] Available at: <https://climate-adapt.eea.europa.eu/en/metadata/publications/costs-of-adaptation-vs-costs-of-inaction>

- 5.2.7 Desk research undertaken for the purpose of this Performance Audit revealed that other countries, for instance the United Kingdom, has managed to quantify cost of adaptation to flooding, also at household level. Another scenario indicates that the cost of inaction is expected to increase significantly. Focus 1 and 2 refer.

Focus 1

In 2015, the UK managed to estimate the cost of adaptation, in terms of putting the necessary flooding defences in place, by locality and type of premises based on 2008 prices. Such costs varied across different levels of climate proofing as well as by type of property and other variables, including:

- i. *Flood Protection* – costs ranged from £1,500 to £2,380 for Residential property, and between £2,300 and £3,570 for Offices (standard resistance).
- ii. *Flood Resilience* – costs ranged from £6,210 to £9,450 for Residential property, and between £11,490 and £16,600 for Offices (standard resilience).
- iii. *Flood Resilient Reinstatement* – costs range from £39,500 for buildings constructed before 1919, to £32,400 for buildings constructed after 1939 (concrete floor and brick with cavity walls).

Moreover, the UK has also managed to identify the cost of inaction. The UK Government estimated the economic losses from flooding between November 2019 and March 2020 at about £333 million, although it would have cost an extra £2.1 billion without flood defences.

Sources:

UK Government, 2015. Cost Estimation for Household Flood Resistance and Resilience Measures. [online] Available at: https://assets.publishing.service.gov.uk/media/6034eec5e90e076607c1bf3b/Cost_estimation_for_household_flood_resistance_and_resilience_measures.pdf

UK Government, 2021. Counting the Costs of Flooding. [online] Available at: <https://www.gov.uk/government/news/counting-the-costs-of-flooding>

Focus 2

Recent flooding events across Mediterranean countries resulted in estimated billions of Euro in claims for damages. The rating agency Moody estimated the loss caused by the 2024 fatal flash floods in Spain, at more than €3.5 billion based on an analysis of the first 72,000 claims. About 4,500 businesses in the Valencia region were directly affected by the floods, with half facing potential closure. Moreover, it estimated crop losses at about €150 million. Considering that this cost excludes damage to public infrastructure as well as outstanding claims, the cost of inaction is expected to increase significantly.

Source: Commercial Risk Online, 2023. Insured Loss Estimates Rise for Spanish Floods. [online] Available at: <https://www.commercialriskonline.com/insured-loss-estimates-rise-for-spanish-floods/>

5.3 Government is still in the process of better quantifying the cost of inaction on climate change and the cost of adaptation

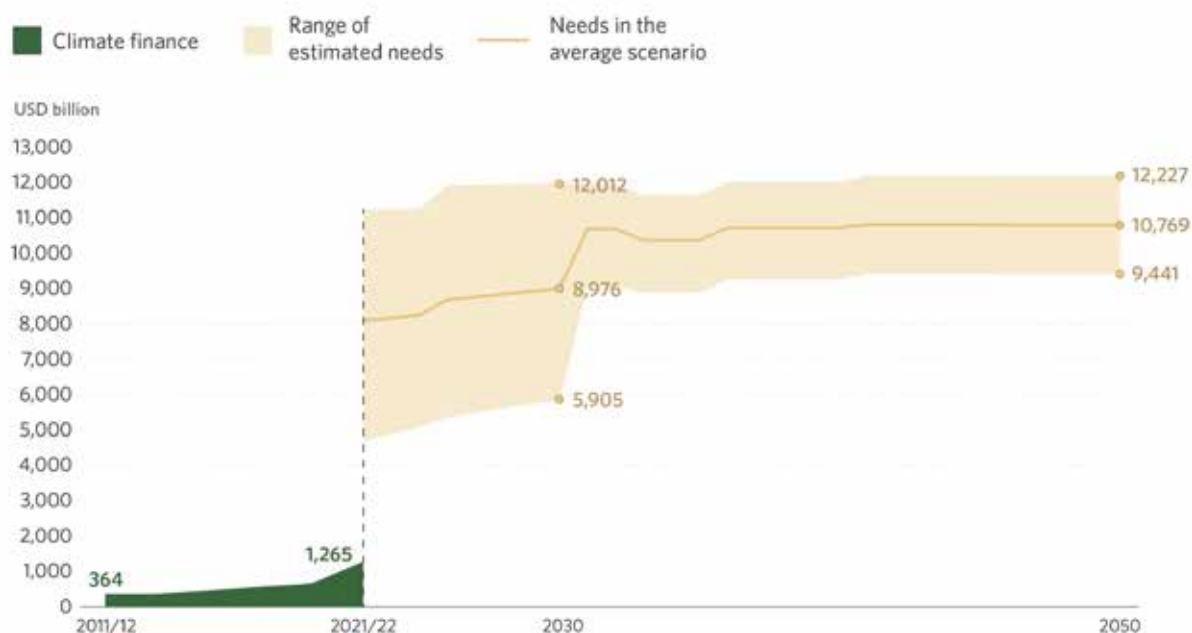
5.3.1 The Ministry for the Environment, Energy and Public Cleanliness (MEEC) contended the economy-wide climate VRA identifies which economic sectors are most vulnerable to climate change impacts and highlights areas for more in-depth assessments. In addition, MEEC stated that while this VRA primarily focused on risk characterisation, it also provides high-level cost assessments based on scenarios that may or may not occur, offering valuable insight into potential economic implications of inaction or adaptation. These outcomes will support the prioritisation of resources and the development of robust adaptation strategies. The NAO acknowledges the importance of the VRA's estimates related to the cost of inaction on climate change hazards, as paramount to any CCA projections, initiatives and evaluations. The non-availability of such documentation constitutes a limitation on this performance audit. In this light, the NAO looks forward to receiving this documentation as it will serve as an important input to any future evaluation on this topic undertaken by this Office.

5.3.2 MEEC contended that the 50 CCA measures presented in the LCDS were costed in line with standard practice when developing strategies and plans. However, such costs were not included in the final version of the LCDS policy document as submitted to the UNFCCC. Similar circumstances prevail in conjunction with the Second Flood Risk Management Plan for the Malta River Basin District (Second FRMP). Following its review of the First FRMP, the European Commission has voiced its concerns regarding the lack of information on the cost of measures as noted in Chapter 3 of this Report.

5.4 Similar to global trends, national climate change budgets are on the increase but likely not commensurate with the investment needs

5.4.1 Although CCA issues may be addressed indirectly through sectoral measures, such contributions are not easily quantifiable. An example in this regard is the agricultural sector, which could in part contribute to minimise floodwater surface runoff. Hence, CCA needs to be sustained with more direct Adaptation action, particularly in view of the increase in the frequency and intensity of these climate change events. The Climate Policy Initiative (CPI), an organisation providing analysis and advisory services with deep expertise in finance and policy, supported by the German and Norwegian Governments, estimated the total amounts invested worldwide to combat climate change in 2021-2022, at around USD 1.26 trillion. Figure 9 refers.

Figure 9: Global tracked climate finance and average estimated annual needs through 2050



Source: Climate Policy Initiative, 2023. Global Landscape of Climate Finance 2023.

5.4.2 Figure 9 depicts the significant gap that exists between the global tracked climate finance for the period 2021 to 2022 and, the average estimated annual needs up to year 2050. Moreover, the CPI outlined that *“In the average scenario, the annual climate finance needed through 2030 increases steadily from \$8.1 to \$9 trillion. Then, estimated needs jump to over \$10 trillion each year from 2031 to 2050. This means that climate finance must increase by at least five-fold annually, as quickly as possible, to avoid the worst impacts of climate change.”*⁷⁴

5.4.3 In November 2024, during the 29th Conference of the Parties (COP29) to the UNFCCC that was held in Azerbaijan, parties agreed on the New Collective Quantified Goal on Climate Finance (NCQG). The new finance goal is composed of the following two main elements⁷⁵:

- i. triple finance to developing countries, from the previous goal of USD 100 billion annually, to USD 300 billion annually by 2035; and,
- ii. secure efforts of all actors to work together to scale up finance to developing countries, from public and private sources to the amount of USD 1.3 trillion per year by 2035.

5.4.4 Similarly, the European Court of Auditors (ECA) noted an increasing trend in the funds allocated for climate change, and specifically for adaptation. The ECA acknowledges the difficulties associated with estimating the relevant EU funding due to the cross-cutting nature of actions related to climate adaptation. However, the ECA estimated that the EU has increased its allocation for

⁷⁴ Climate Policy Initiative, 2023. Global Landscape of Climate Finance 2023. [online] Available at: <https://www.climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2023/>

⁷⁵ UNFCCC (2024) COP29 UN Climate Conference agrees to triple finance to developing countries, protecting lives and livelihoods. Available at: <https://unfccc.int/news/cop29-un-climate-conference-agrees-to-triple-finance-to-developing-countries-protecting-lives-and>

climate adaptation from around €8 billion for the programming period 2014-2020, up to €26 billion for the current programming period 2021-2027.⁷⁶

- 5.4.5 At the national level, the funds allocated directly for managing climate change matters have also been on the increase over the last decade. This Office has reviewed the allocation to climate change based on the recurrent budget estimates for the period 2015 to 2023⁷⁷. This period was chosen in conjunction with the introduction of the Climate Action Act in 2015 and the 2023 being the last year where data pertaining to the actual expenditure was available. Table 6 refers.

Table 6: Climate Change budget line item and actual expenditure (2015-2023)

Year	Climate Change	
	Budget (€)	Actual expenditure (€)
2015	50,000	82,695
2016	150,000	133,801
2017	150,000	226,010
2018	150,000	214,638
2019	150,000	33,656
2020	300,000	280,475
2021	400,000	890,248
2022	600,000	622,156
2023	600,000	181,639
Total	2,550,000	2,665,318

- 5.4.6 Table 6 shows that the Climate Change budget has increased by 12 times, that is, from €50,000 in 2015 to €600,000 in 2023, amounting to a total of €2.55million over these nine years. Furthermore, the total expenditure for this period amounted to around €2.67million. This situation implies that the Ministry responsible for climate change has overall utilised the allocated funds.

- 5.4.7 This Office also reviewed other direct climate change budget votes. These included the financial resources allocated to the Climate Action Board, the Climate Action Fund, as well as for International Climate Finance. Table 7 shows the budgeted and actual expenditure directly allocated to climate change through these three budget lines. These line items address both mitigation and adaptation measures, over the period 2015 to 2023.

⁷⁶ European Court of Auditors, 2024. Climate Adaptation in the EU – Action Not Keeping Up with Ambition: Special Report, p. 4. [online] Available at: <https://www.eca.europa.eu/en/publications?ref=SR-2024-15>

⁷⁷ Government of Malta- Ministry for Finance, 2025. The Budget Archive. [online] Available at: https://finance.gov.mt/the_budget_archive/

Table 7: Recurrent budget and expenditure directly related to climate change (2015-2023)

Year	Climate Action Board		Climate Action Fund		International Climate Finance		Total	Total
	Budget	Actual expenditure	Budget	Actual expenditure	Budget	Actual expenditure	Budget	Expenditure
	(€)	(€)	(€)	(€)	(€)	(€)	(€)	(€)
2015	N/A	N/A	N/A	N/A	50,000	50,000	50,000	50,000
2016	74,000	1,945	N/A	N/A	100,000	100,000	174,000	101,945
2017	74,000	12,605	100,000	0	100,000	98,402	274,000	111,007
2018	74,000	1,644	100,000	0	100,000	100,000	274,000	101,644
2019	74,000	12,987	250,000	52,563	100,000	100,000	424,000	165,550
2020	40,000	13,552	250,000	241,114	100,000	100,000	390,000	354,666
2021	70,000	33,095	250,000	80,016	100,000	100,945	420,000	214,056
2022	70,000	25,677	250,000	0	200,000	200,000	520,000	225,677
2023	50,000	10,482	100,000	54,868	400,000	400,000	550,000	465,350
Total	526,000	111,987	1,300,000	428,561	1,250,000	1,249,347	3,076,000	1,789,895

5.4.8 Based on semi-structured interviews with key climate change representatives, the examination of relevant documentation, as well as, a review of the numbers presented in Table 7, this Office has raised the following observations:

i. Climate Action Board⁷⁸

A yearly allocation of around €70,000 was considered as insufficient to fulfil the CAB's broad mandate and incentivise a more proactive approach. In accordance with the former Climate Action Act of 2015, the Board's mandate included the following main functions, that is:

- a. consulting with key stakeholders,
- b. monitoring and advising the Minister on the implementation of the Act as well as international and EU obligations,
- c. facilitating Government's adherence to the national climate related strategies and policies, and
- d. reporting annually to the Minister on the progress being registered in the field of climate change.

In addition, this Office observed that the former Board only utilised around one fifth of these funds. It is to be noted that the former CAB in their 2020 report noted that it did not have an executive role and did not run its own budget. The former Board contended that this situation materialised to avoid duplicating a function of the line Ministry.

⁷⁸ Following the enactment of the new Climate Action Act, the former Climate Action Board ceased to exist.

ii. *Climate Action Fund*

The numbers presented in Table 7 clearly show that the Climate Action Fund has not been utilised effectively since its inception. Out of the total budget of €1.3 million covering the period 2017 to 2023, only around one third of these funds were utilised. Nonetheless, MEEC noted that during the same period, Government invested in various climate-friendly initiatives including renewable energy and energy efficiency related projects, as well as grants for electric vehicles.

iii. *International Climate Finance*

Malta's contribution to International Climate Finance, also registered a very positive increase over the years. Such contribution has rose significantly from €50,000 in 2015 to €400,000 in 2023. In addition to the relatively modest financial contribution, Malta offered technical support through scholarship programmes to nationals from states vulnerable to climate change. The main objective of these programmes is to enhance specific skill sets required to address climate change impacts.⁷⁹

5.4.9 In addition to the above-mentioned financial resources that were allocated directly for climate change matters, more public funds are budgeted and utilised for CCA related projects. These include the €700 million⁸⁰ being managed by Project Green for the maintenance and creation of green infrastructure including parks and gardens. Such projects often have multiple objectives including social, economic, environmental such as for safeguarding biodiversity and, are also expected to contribute significantly towards the minimisation of rainwater runoff and the ensuing risks associated with flooding events, as noted in paragraph 4.4.5 of this Performance Audit Report. However, due to the inherent limitations in apportioning both the costs and benefits of projects with multiple objectives, it was not possible to accurately quantify the adaptation investments attributable to different sectoral projects. This is mainly because most initiatives do not identify the additional costs, if any, incurred specifically to address climate change risk projections. Additionally, the accurate determination of CCA expenditure remains elusive since the mechanisms for the classification of budget lines are still being developed. The fragmentation of financial information with respect to Adaptation related investments should be addressed, in part, through the recently enacted Climate Action Act that have put obligations on all the relevant Ministries to report any climate-related efforts.

5.4.10 Government's more recent efforts to rope in the private sector on climate change matters are also to be acknowledged. In 2023, the Water Services Corporation listed green bonds on the Malta Stock Exchange for the very first time. Green bonds are fixed-income instruments intended to fund projects with a positive climate, societal or environmental impact. It is to be noted that the €25 million bonds were immediately oversubscribed, showing the willingness of the private sector to participate in sustainable projects.

⁷⁹ Government of Malta, 2024. Malta's National Energy and Climate Plan 2021–2030, p. 70. [online] Available at: https://commission.europa.eu/publications/malta-final-updated-necp-2021-2030-submitted-2025_en

⁸⁰ Government of Malta- Ministry for Finance, 2022. Budget Speech 2023, p. 84. [online] Available at: https://finance.gov.mt/wp-content/uploads/2023/04/Budget_Speech_2023.pdf

5.4.11 In August 2023, KPMG Malta conducted a global survey to measure Governmental tax incentives for the issuance of green bonds across EU and non-EU countries. Such survey revealed that out of the 20 EU Member States that replied to the survey, only Luxembourg and The Netherlands had some tax advantages related to the issuance of green bonds. Similarly, out of the 18 non-EU countries that completed the survey, only three had similar incentives in place, that is, Brazil, Malaysia and Tunisia. KPMG Malta concluded that *“Despite the urgency of climate change, it is clear that most governments are still lagging behind in offering tax advantages in this particular field.”*⁸¹

5.5 Conclusions

5.5.1 Similar to global trends, despite the substantial increase in the funding allocated for climate change matters, the total budgets are likely not commensurate with the investment needs. Even when considering the more recent efforts to strengthen climate finance at the local, EU as well as the international level, these efforts may not be sufficient to timely address the prevailing climate change hazards. In view of the transboundary nature of climate change impacts, the contribution of all stakeholders is of key importance for ensuring more effective and timely adaptation action. The final agreement at COP 29 recognised the substantial gap in funding to address climate adaptation and through its new pledges aims to improve climate financing on a global level.

5.5.2 This performance audit has also revealed that Government is still in the process of better quantifying the cost of inaction as well as the cost of adaptation to climate change in socio-economic as well as environmental terms. Quantifying the cost of inaction as well as the cost of adaptation to flooding events and sea level rise, is key for enabling sufficient and more effective adaptation action.

5.5.3 The challenges associated with identifying, quantifying as well as monetising the impacts of climate change are to be acknowledged. Nonetheless, failing to do so could result in adaptation gaps in terms of knowledge, technology as well as funding, thereby forfeiting the opportunity to strengthen the resilience to the climate change hazards under review. Recent flooding events across other Mediterranean countries clearly show that the current cost of inaction is significantly higher than the cost of adaptation. Consequently, doing nothing is not an option.

5.5.4 National CCA measures as included in the Malta LCDS were costed in line with standard practice when developing strategies and plans as contended by MEEC. However, such costs were not included in the final version of these policy documents. Moreover, the NAO acknowledges efforts by the Energy and Water Agency (EWA) to incorporate the forecasted costs as a criterion for prioritising the measures included in the second FRMP.

⁸¹ KPMG Malta, 2023. Green Bonds Survey Results. [online] Available at: <https://kpmg.com/mt/en/home/insights/2023/11/green-bonds-survey-results.html>

5.5.5 This Review also noted that since the enactment of the 2015 Climate Action Act, Government has not managed to make optimal use of the supporting mechanisms in place. These namely related to the former Climate Action Board and its broad mandate, which nevertheless did not manage to fully utilise its budget allocation, as well as the Climate Action Fund that was also underutilised. The Ministry for the Environment, Energy and Public Cleanliness (MEEC) contended that under the recently adopted Climate Action Act the newly established Climate Action Authority is expected to effectively manage the Climate Action Fund through its role.

Chapter 6

Concluding Remarks

- 6.1 This Performance Audit sought to verify the extent to which Government is effectively managing the Climate Change Adaptation (CCA) risks. In view of the socio-economic and environmental impacts, this Review focused on the risks emanating from flooding incidents and slow onset events like sea level rise.
- 6.2 The Maltese-economy-wide climate Vulnerability and Risk Assessment (VRA) commissioned by the Ministry for the Environment, Energy and Public Cleanliness is the first in-depth consideration of the interplay between the climate change impacts and the socio-economic realities of the Maltese Islands. The climate VRA aimed to establish priority areas within different economic sectors, in terms of the vulnerability to the impacts of climate change. This VRA also intended to provide an indication about the cost of inaction as well as better guidance for directing the resources made available for climate action including Adaptation.
- 6.3 With respect to flooding, the relevant hazard and risk assessments were utilised to develop the second Flood Risk Management Plan (FRMP) in line with the EU Floods Directive. Nevertheless, this Review noted that the flood risk assessment considered the 2011 Census of Population and Housing, which was the only comprehensive study that was readily available. Consequently, Adaptation action may not have been directed towards the areas at highest risk. MEEC contended that the Energy and Water Agency shall avail of information pertaining to the 2021 Census of the Population and Housing for the next update of the Flood Hazard and Risk Maps (FHRMs) that is due by December 2025.
- 6.4 The climate governance framework has recently been strengthened through the recently enacted Climate Action Act. The latter has not only established a new Climate Action Authority but has also put obligations on all the relevant Ministries to report and consult on any climate-related efforts. Nonetheless, as observed by the European Commission in its review of the draft National Energy and Climate Plan (NECP) in December 2023, Malta is to set out additional Adaptation policies and measures in sufficient detail, with a special focus on water management in changing climatic conditions. A similar situation was reported in the EC feedback on Malta's final NECP, dated May 2025.
- 6.5 Although this Review was intended to focus mainly on flooding and sea level rise, when assessing the CCA regulatory framework in place, the NAO could easily observe the significant difference in the approach adopted between flooding and other hazards like extreme temperatures. Flooding related measures are being prioritised, implemented and monitored in a more structured manner in line with the Programme of Measures emanating from Malta's second FRMP. On

the other hand, Adaptation measures intended to address other climate change hazards, are being managed mainly through the Malta Low Carbon Development Strategy, whereby CCA measures are characterised by insufficient prioritisation as well as the need for more detailed timeframes and Key Performance Indicators (KPIs).

6.6 As highlighted in the 8th National Communication of Malta under the United Nations Framework Convention on Climate Change (UNFCCC) dated June 2023, more investment is required to further reduce the risks associated with flooding and sea level rise. Although climate change budgets are on the increase, these are likely not commensurate with the investment needs, particularly in view of the increase in the frequency and intensity of climate change events. Quantifying the funding gap through further studies is key to enable sufficient and more effective Adaptation action.

6.7 When considering the existing environmental and socio-economic challenges, coupled with the transboundary nature of climate change impacts, the contribution of all stakeholders both public as well as private, is of key importance for ensuring more effective Adaptation action. This Office acknowledges the challenges associated with identifying and monetising the impacts of climate change. However, the absence of such metrics may result in adaptation gaps in terms of knowledge, technology and funding. Finally, timely Adaptation action is of critical importance to strengthen the resilience to flooding and sea level rise, as well as to contain the relative costs that are expected to increase by time.

6.8 In view of the foregoing, the NAO proposes the following five recommendations:

i. Addressing data and knowledge gaps impacting the quality of risk assessments

The relevant Ministries and Government Entities are encouraged to continue to actively participate in initiatives similar to the CARDIMED, LocAll4Flood and MedSeaRise projects. In this regard, the opportunity exists for institutional arrangements to be further aligned to foster the timely exchange of climate intelligence, the development of data warehouses, and to maximise prospects for capacity building, research, innovation, and data-sharing; potentially also through partnerships with the private sector. Through such an approach, Malta would acquire knowledge, address data gaps and ensure the harmonisation of data collection methods.

ii. Timely completion of future climate VRAs for more effective policy shaping

Government is encouraged to identify and undertake any complementary sectoral VRAs particularly those relating to the priority areas identified through the Maltese-economy wide climate VRA. This approach will facilitate the development of more climate-proof policies and projects.

iii. More detailed Adaptation plans that include SMART performance measures

Ministries are to develop more detailed sector-specific CCA plans. These Adaptation plans should ideally include hazard-specific measures with clearly assigned responsibilities, costings, timeframes and KPIs. Such an approach will lead to enhanced accountability

and coordination, efficient resource allocation, as well as attract more private investment and public participation, leading to a more climate resilient society. This will also enable the Climate Action Authority and responsible Ministries to strengthen their monitoring functions.

iv. Adopt and implement the national strategic framework for coastal protection and adaptation

In view of Malta's geographical specificities, coupled with climate change hazards like sea level rise, the Government is encouraged to sustain the ongoing initiatives in relation to adopting and implementing a national strategic framework for coastal protection and adaptation, building on the outputs and outcomes of the C-Cover project as well as other relevant inputs.⁸²

v. Quantify the Adaptation funding gap and ensure that budgets are commensurate with investment needs

The Government is to step-up efforts to quantify the Adaptation funding gap. A clear financial roadmap, implemented in line with the EU Taxonomy Regulation, will ensure that Adaptation funding is sufficient, used efficiently and tracked effectively. Early identification of financial shortfalls allows for more proactive Adaptation, reducing future economic losses caused by extreme weather events.

6.9 For ease of reference, Table 8 links the NAO's recommendations with the audit conclusions as presented in this Report.

Table 8: Links between the NAO's recommendations and audit conclusions

Recommendation reference (paragraph number)	Recommendation	Audit conclusion reference(s) (paragraph number)
6.8 (i)	Addressing data and knowledge gaps impacting the quality of risk assessments	2.4.4
6.8 (ii)	Timely completion of future climate VRAs for more effective policy shaping	2.4.1 2.4.2
6.8 (iii)	More detailed Adaptation plans that include SMART performance measures	3.6.3
6.8 (iv)	Adopt and implement the national strategic framework for coastal protection and adaptation	4.5.4
6.8 (v)	Quantify the Adaptation funding gap and ensure that budgets are commensurate with investment needs	5.4.1 5.4.2

⁸² European Commission, n.d. C-COVER: Coastal Climate Overall Vulnerability and Exposure Risk- protection strategy for the Maltese Islands. [online] Available at: <https://maritime-spatial-planning.ec.europa.eu/projects/coastal-cover-coastal-climate-overall-vulnerability-and-exposure-risk-protection>

6.10 By focusing on these five strategic recommendations, the Government should be in a position to better manage the increase in frequency and intensity of extreme weather events, whilst limiting the resulting socio-economic and environmental damages. In view of the dynamic and competing national priorities, it is of utmost importance to make optimal use of the limited resources that may be allocated for Adaptation action. Thus, it is critical to avoid maladaptation whilst employing a risk-based approach that makes optimal use of nature-based solutions to maximise climate resilience for the benefit of current and future generations in line with the Sustainable Development Goals.

Appendix I

Maltese-economy-wide climate Vulnerability and Risk Assessment

Part A: The main objectives, outputs and outcomes

Specific Objectives, as extracted from paragraph 2.2 of Section 3 – *Specifications/Terms of Reference* of Tender Document SPD8/2021/004⁸³:

- *Identify the scientific and academic basis of the climate change impacts of the Maltese Islands, in geophysical and economic terms, in the form of Impact Chains.*
- *Model and analyse this information, in conjunction with climate scenarios, providing outputs on impacts' distribution, magnitude, certainty, and economic cost.*
- *Consult with stakeholders for the evaluation of these outputs, in terms of impacts, adaptive capacity and Climate vulnerability.*
- *Collate a comprehensive report including the outputs of the model and the evaluation by stakeholders.*
- *Disseminate the findings of the project to the relevant stakeholders.*

Expected Outputs of the model (for each climate impact as identified through the impact chains and indicators), as extracted from paragraph 4.2 of Section 3 – *Specifications/Terms of Reference* of Tender Document SPD8/2021/004:

- *Distribution in terms of geographical location, represented in an interactive mapped format, given in relation to the spatial distribution of total population, vulnerable populations, economic activities and economic value.*
- *Magnitude of the impact, in a standardised format comparable across all impact.*
- *Certainty classified according to systems used by the IPCC.*
- *Timescale distribution: present (2018-2021), the near future (2022-2060) and the distant future (2061-2100).*
- *Economic cost expected per sector under each scenario in each timescale. Outputs on the following types of costs will be obtained (along with information on the distribution, timing and specific type of asset or service):*
 - *Losses by economic sector based on the Nomenclature of Economic Activities (NACE) codes, and their multiplier effect. The NACE codes for which output is provided, and the level of detail, will be subject to the amendment and approval of the Contracting Authority.*

⁸³ Department of Contracts, Government of Malta, 2025. Call for Tender SPD8/2021/004. [online] Available at: <https://www.etenders.gov.mt/epps/cft/prepareViewCfTWS.do?resourceId=7474877>

- o *Cost to Government.*
- o *Loss of space (in the form of land mass) due to sea level rise.*
- o *Increased household consumption costs.*
- o *Damages to agriculture and infrastructures.*
- o *Impacts on tourism.*
- o *Public health impacts.*
- o *Financial impacts and Investment losses*
- o *This will include inputs from previous impacts of climate change, along with their associated costs.*

Part B: VRA major reporting deliverables

The Table presents the main deliverables related to this project, the official target dates for each deliverable as set out in the Tender Document (SPD8/2021/004), as well as, the actual dates when the deliverables were completed.

Table: VRA main deliverables and status

Phase	Deliverable	Deliverable due date (duration of deliverable)	Date delivered (Month & Year)
Phase I: Preparatory work	Impact Chain Report	January 2022 (5 months)	April 2022
Phase II: Assessment	Stakeholder list for data collection	January 2022 (5 months)	October 2021
	Policy Review Report	May 2022 (9 months)	December 2021
	Assessment Report of Climate Impacts in the Maltese Islands	August 2022 (12 months)	December 2023
Phase III: Evaluation	Stakeholder list for Evaluation	August 2022 (12 months)	October 2021
	Evaluation Framework Report	December 2022 (16 months)	December 2023
	Evaluation Report of Climate Vulnerability in the Maltese Island	April 2023 (20 months)	February 2024
	Draft VRA Report	June 2023 (22 months)	May 2024
	VRA final report*	July 2023 (23 months)	May 2024
Phase IV: Dissemination	Dissemination material for specific stakeholders	July 2023 (23 months)	February 2024
	Conclusion of dissemination of findings	August 2023 (24 months)	January 2025

Source: MEEC

*Main components of the Final VRA Report, as extracted from paragraph 4.2 of Section 3 – Specifications/Terms of Reference of Tender Document SPD8/2021/004:

- *The purpose of development of the VRA, along with the identification of the target audience.*
- *Description of the methodology, data, scenarios and models used.*
- *Listing of all stakeholders involved.*
- *NACE-by-NACE consideration of the following (each differentiated clearly from the other), with an overview and rated on qualitative scales of high/medium/low/not applicable:*
 - *Different impacts, magnitude, certainty, likely impact and economic cost*
 - *Evaluation of the impacts, adaptive capacity, Climate vulnerability and risk in the local context*
- *Cross-sectoral combinations across specific themes, taking a systems approach.*
- *An overview, providing National Prioritization of Impacts and Actions, combining the data outputs and the evaluation outputs. This should also feature the identification of adaptation goals for Malta, to aid in future policymaking.*
- *Information of the quality assurance/review processes carried out in the formulation of the VRA.*
- *Recommendations for how to fill knowledge gaps.*
- *A summary of the report, with the most salient points and a heavier reliance on visual transmission of information.*

Appendix II

Flood hazard areas and potential impact resulting from a low-probability 200-year extreme weather event (second FRMP)

The Table presents a summary of the main types of flood hazard areas as well as the expected type of impact for all the seven Areas of Potentially Significant Flood Risk (APSFR) catchments.

Table: A 200-year extreme flood event and potential socio-economic impact

Catchment	Flood hazard areas	Potential impact
Birkirkara	Mainly dedicated to economic activity, with limited residential property	- Economic activity may be disrupted particularly at Valley Road in Birkirkara and Triq Dun Gaetano Mannarino in Msida - Significant transport disruptions
Burmarrad	Primarily rural areas with no inhabitants potentially affected	Agricultural economic activity
Gżira	Residential as well as non-residential property obstructing the natural flow of stormwater runoff	- Urbanised areas along Triq tas-Sliema and Triq il-Gżira - Range of economic activity - Significant transport disruptions
Marsascalea	Residential property located near the basin outlet as well as non-residential property	- Urbanised areas particularly along Triq La Sengle and Triq San Ġwakkin - Various economic activity - Significant transport disruptions
Qormi	Residential property located along natural valleys and stormwater runoff retaining structures in the upper portions of the catchment	- Residential property located along Triq il-Wied in Ħal Qormi as well as Wied is-Sewda due to water retaining structures - Various economic activity along Triq il-Wied in Ħal Qormi - Significant transport disruptions
Marsalforn	Natural valleys and urbanised lower portion of catchment	- Small number of residential properties particularly along Triq il-Wied - Limited number of non-residential properties utilised for various economic activities - Some traffic disruptions at the lower end of the catchment
Xlendi	Natural valleys and urbanised lower portion of catchment	- Small number of residential as well as non-residential properties utilised for various economic activities particularly along Triq ir-Rabat and Triq tal-Għajn - Residential areas in Fontana, Ta' Kerċem and Victoria shall be investigated further due to the proximity to the flood risk areas - Traffic disruptions at the lower end of the catchment

Source: Adapted from the 2nd FRMP for the Malta River Basin District, pages 53 to 55.

Appendix III

Summary of the methodology adopted for the second Flood Risk Management Plan for the Malta River Basin District

The risk matrix adopted by the Energy and Water Agency (EWA) for the location of risk areas within the Areas of Potentially Significant Flood Risk (APSFR), is mainly based on an analysis of the Hazard factor (H) and the Potential Damage (PD). The former represents the level of hazard within an analysed area associated to a certain probability of occurrence of a flood event, whilst the latter defines the expected damage to the exposed receptor at risk.

The PD is dependent on the exposed elements (E) in terms of the receptors at risk for different areas and activities, as well as the (V). This factor considers the degree of ability or inability of an area or an element to hold up against a flood event, ranging from '0' that implies no damage, to '1' implying the complete loss of the receptor at risk. In this case, due to insufficient data about the order of magnitude, typology and frequency of flood events as well as the behaviour of the elements exposed to flooding, EWA adopted a more conservative approach by setting the value of 'V' to 1, resulting in a broader safety margin. The resultant Risk Factor (R) has been classified into four classes, namely:

- i. Significant Risk (**R4**) = Human loss together with significant risk to natural, economic, historical, and cultural interest assets, possibly leading to major ecological and environmental disasters.
- ii. High Risk (**R3**) = Areas where safety for people may be endangered and potentially disruption of the normal functionality of the economic system and services.
- iii. Moderate Risk (**R2**) = Limited damage for people with minor damages to the socio-economic fabric.
- iv. Low Risk (**R1**) = Areas subject to a low risk in term of negative impacts on the receptors.

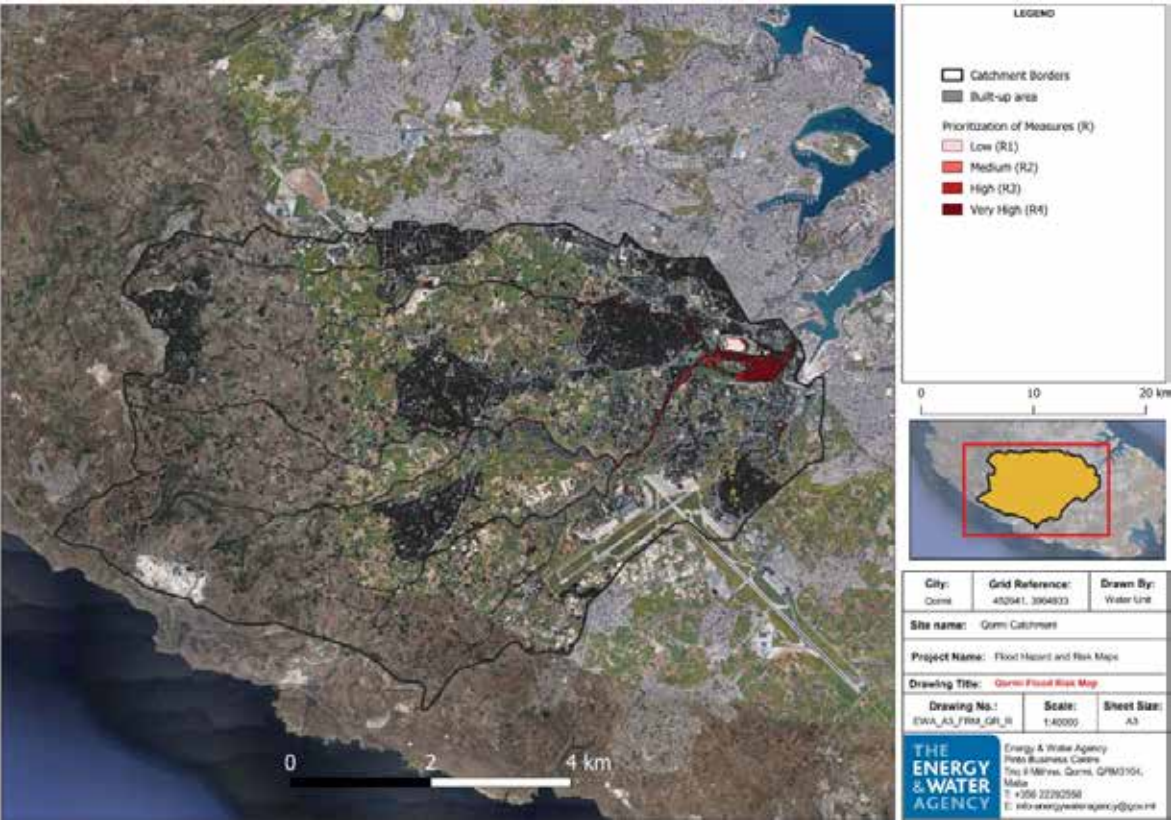
Table: Risk Matrix

		Hazard		
		H3 (5-year RPT i.e. areas associated with rainfall events with high probability of occurrence resulting in a flood event)	H2 (50-year RPT)	H1 (200-year RPT)
Potential Damage	D4 (Significant)	R4	R3	R2
	D3 (High)	R4	R3	R1
	D2 (Moderate)	R3	R2	R1
	D1 (Low)	R1	R1	R1

Source: Adapted from the 2nd FRMP for the Malta River Basin District, page 63.

The areas classified as R4 are those with a high number of receptors at risk even when considering a rainfall event with a probability of occurrence of five years, that is, with a 20 per cent chance to occur in any given year. Thus, the R4 areas should be prioritised when implementing flood mitigation measures to attain the best results possible. EWA developed flood risk maps for the seven APSFR catchments identified. Figure refers.

Figure: Flood Risk Map for the Qormi Catchment



Source: 2nd FRMP for the Malta River Basin District, Annex V, page 102.

Appendix IV

Residents at risk of flooding across the seven APSFR catchments (second FRMP)

The localities of Ħal Qormi, Birkirkara and Msida have the highest number of residents at a significant risk of flooding (R4), with 563, 491 and 300 residents respectively. These numbers were derived from Malta's second PFRA which considers the 2011 Census of Population and Housing. Table refers.

Table: Residents at risk across the seven APSFR catchments

Catchment	Population of Localities at Risk	Residents at Risk (R1, R2, R3 and R4)		Residents at a Significant Risk (R4)	
		No.	% (out of population of localities at risk)	No.	% (out of total Residents at risk)
Birkirkara <i>(Msida, Ħ'Attard, Ħal Lija, Ħal Balzan and Birkirkara are the urban settlements at risk of flooding that are entirely or partially located within this catchment)</i>	53961	4345	8.1	791 <i>(Msida = 300, Birkirkara = 491)</i>	18.2
Marsascula <i>(Marsascula and Ħaż-Żabbar are the only two settlements within this catchment that are at risk of flooding)</i>	2918	798	27.3	257 <i>(Marsascula)</i>	32.2
Gżira <i>(This is the only urban settlement at risk of flooding within this catchment)</i>	13692	521	3.8	0	0.0

Qormi (<i>Ħ'Attard, Ħal Qormi, Ħaż-Żebbuġ, Siġġiewi and Rabat are the urban settlements at risk of flooding within this catchment</i>)	59694	1717	2.9	786 (<i>Ħal Qormi = 563, Ħ'Attard = 203, Ħaż-Żebbuġ = 20</i>)	45.8
Burmarrad (<i>Dingli, Naxxar, San Pawl il-Baħar and Rabat are the urban settlements located entirely or partially within this catchment that are at risk of flooding</i>)	33322	548	1.6	194 (<i>San Pawl il-Baħar</i>)	35.4
Marsalforn (<i>Iż-Żebbuġ and Rabat both in Gozo are the urban settlements at risk of flooding which are entirely or partially located within this catchment</i>)	8705	85	1.0	85 (<i>Iż-Żebbuġ = 76, Rabat = 9</i>)	100.0
Xlendi (<i>Fontana, Ta' Kerċem and Munxar are the urban settlements at risk of flooding within this catchment</i>)	7157	408	5.7	209 (<i>Munxar = 23, Fontana = 176, Ta' Kerċem = 10</i>)	51.2

Source: Adapted from section 3.4.2. *Assessment of the receptors at risk in the Flood Risk Areas* of the 2nd FRMP for the Malta River Basin District, page 64.

Appendix V

Cost of inaction on climate change and cost of adaptation

Part A – Cost of Inaction on climate change

The Table presents the economic costs of climate change to be considered when evaluating the cost of inaction.⁸⁴

Table – The type of economic costs when evaluating the cost of inaction

Type of cost	Description
Direct financial costs	Example the costs to replace infrastructure like roads as well as increased healthcare costs, that are relatively simple to identify and monetise
Direct non-financial costs	The costs society must bear due to the failure to adapt like the direct environmental costs of damaged ecosystems, as well as intangible costs such as the pain and suffering associated with the increased early mortality, which may be challenging to monetise.
Indirect financial costs	This cost is associated with the flow-on impacts of climate change due to a failure to adapt, resulting in indirect market and societal impacts. These include the impact on specific markets such as real estate as well as the impact on GDP growth and political instability, that may be challenging to identify and monetise.
Costs related to the loss of adaptation options	This cost will materialise in the future due to the current inaction, including missed learning or innovation opportunities. This is challenging to conceptualise, identify or quantify due to limited data availability.
Non-use costs	This is the value given by individuals to the existence of a healthy planet and the inability to pass this on to future generations (challenging to quantify and define in detail).

⁸⁴ European Environment Agency (EEA), 2022. Costs of Adaptation vs Costs of Inaction: EEA Preparatory Study, p. 16, 18. [online] Available at: <https://climate-adapt.eea.europa.eu/en/metadata/publications/costs-of-adaptation-vs-costs-of-inaction>

Part B – Adaptation costs

The Table describes the four main types of Adaptation costs to be considered.⁸⁵

Table – The four main types of Adaptation costs

Type of cost	Description
Initial costs	Represent the expenditure incurred from project design to completion and commissioning of the adaptation option, including land, studies, construction and equipment costs
Recurring costs	These include operation and maintenance costs.
Indirect costs	These costs are difficult to measure and are attributable to the, often hidden, unintended side effects of adaptation activities, or secondary consequences that occur because of implementing adaptation measures. These costs can emerge across various domains including the: <i>Environmental</i>, for example biodiversity loss due to the installation of dikes for flood protection but which disrupt local ecosystems. <i>Economic</i>, such as the opportunity cost associated with the funds being diverted away from other critical sectors like healthcare or mitigation. <i>Social</i>, that may be attributable to the relocation of persons from high-risk areas such as flood-prone regions. Such situation could lead to social and cultural disruptions as well as increased mental health issues.
Transition costs	These costs are consequential to the investment and correspond to adjustments or additional expenses triggered by adaptive responses like monitoring, maintenance and management costs.

⁸⁵ European Environment Agency (EEA), 2022. Costs of Adaptation vs Costs of Inaction: EEA Preparatory Study, p. 31. [online] Available at: <https://climate-adapt.eea.europa.eu/en/metadata/publications/costs-of-adaptation-vs-costs-of-inaction>

2024-2025 (to date) Reports issued by NAO

NAO Annual Report and Financial Statements

July 2024	National Audit Office Annual Report and Financial Statements 2023
-----------	---

NAO Audit Reports

January 2024	An audit of the contract for the provision of food and beverage services at the Malta Life Sciences Park
January 2024	Performance Audit on the Operations of Jobsplus' Law Compliance Unit
February 2024	Performance Audit Preliminary Review: Leasing of Private Property by Government
June 2024	Follow-up Audits Report by the National Audit Office Volume I 2024
July 2024	High-Level Review on Enemalta's Planning and Investment in the Local Distribution Network
October 2024	Information Technology Audit: Document Management Systems across Government
November 2024	Evaluating the role of the Malta Film Commission in promoting the Maltese film industry
November 2024	Follow-up Audits Report by the National Audit Office Volume II 2024
December 2024	Report by the Auditor General on the Public Accounts for the year 2023
December 2024	Report by the Auditor General on the Workings of Local Government for the year 2023

