The experience of Italy in the design and implementation of adaptation to climate change

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OVERVIEW

- Key drivers for policy action in Italy
- Alignment to the EU guidance
- The National Adaptation Strategy project
- Adoption process
- Conclusions

KEY QUESTIONS

- Overview of process/steps of how the national Strategy on climate change adaptation has been developed,
- Which sectors were taken into consideration (vulnerable sectors) and how they were integrated into a specific answer to climate change?
- How to arrive from outputs of climate models for the future climate to adaptation measures?
- What was the timeframe used for the Strategy preparation (i.e., 2030, 2040, 2050,…) and how used timeframes were reflected towards suggested adaptation measures? How the priority measures were defined – having in mind Action plan (for example, were there only one category of measures, e.g. short term measures with obligation for re-assessment of measures every 5 years, or, Action Plan immediately have defined short term, medium and long term measures?)
- What kind of consideration was given to Strategy policies from other sectors? How they were integrated into Strategy for CC adaptation? How difficult was to establish connection among different Strategies in case they have different time horizons and measures?

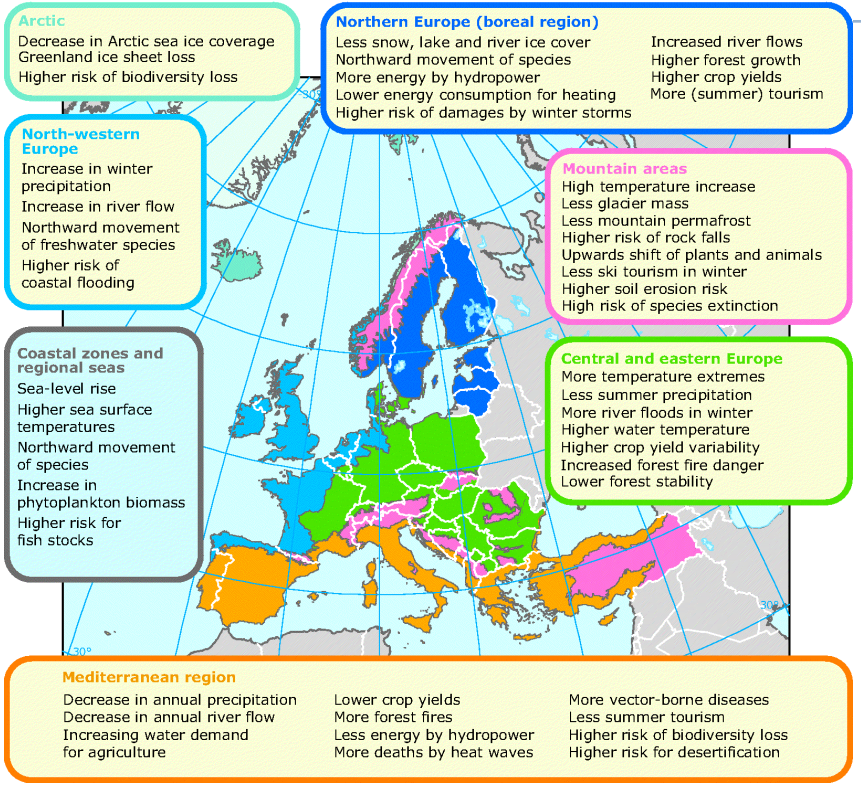
KEY DRIVERS FOR POLICY ACTION IN ITALY

- **Increasing concern by national institutions** (**2002 CIPE "National strategy for sustainable development"** highlights the need to adapt; **2007 National Conference on Climate Change and "Manifesto for Climate"** - identified top priority sectors and 13 priority actions for sustainable adaptation by the government)

- **Emerging scientific knowledge** (**IPCC Fifth Assessment Report** - WGI, **EEA thematic reports** on CCIVA, **EU projects and national project outcomes** published in 2012)

- **EU Adaptation Strategy package** (**Strategy document**; **Guidelines on developing adaptation policies** 2013)

KEY DRIVERS FOR POLICY ACTION IN ITALY: SCIENTIFIC EVIDENCE



Source: Climate change, impacts and vulnerability in Europe, An indicator-based report EEA (2012)

The Mediterranean Region is a hot spot for climate change

- **Southern Europe and Mediterranean Basin:** combined effect of high temperature increases and reduced precipitation in areas already coping with water scarcity
- **Mountain areas (in particular the Alps):** temperatures increase rapidly leading to widespread melting of snow and ice changing river flows
- **Coastal zones:** sea level rise combined with increased risks for storms.

Source: The European environment — state and outlook 2010 (EEA 2010)

EU Guidelines on developing adaptation policies

- **Step 1.** Preparing the ground for adaptation
- **Step 2.** Assessing risks and vulnerabilities to climate change
- **Step 3**. Identifying adaptation options
- **Step 4.** Assessing adaptation option
  *Prepare a **strategy document** and get political approval*
- **Step 5**- Implementation
  *Develop an **action plan***
- **Step 6.** Monitoring and evaluation

EU Climate-ADAPT: Adaptation Support Tool

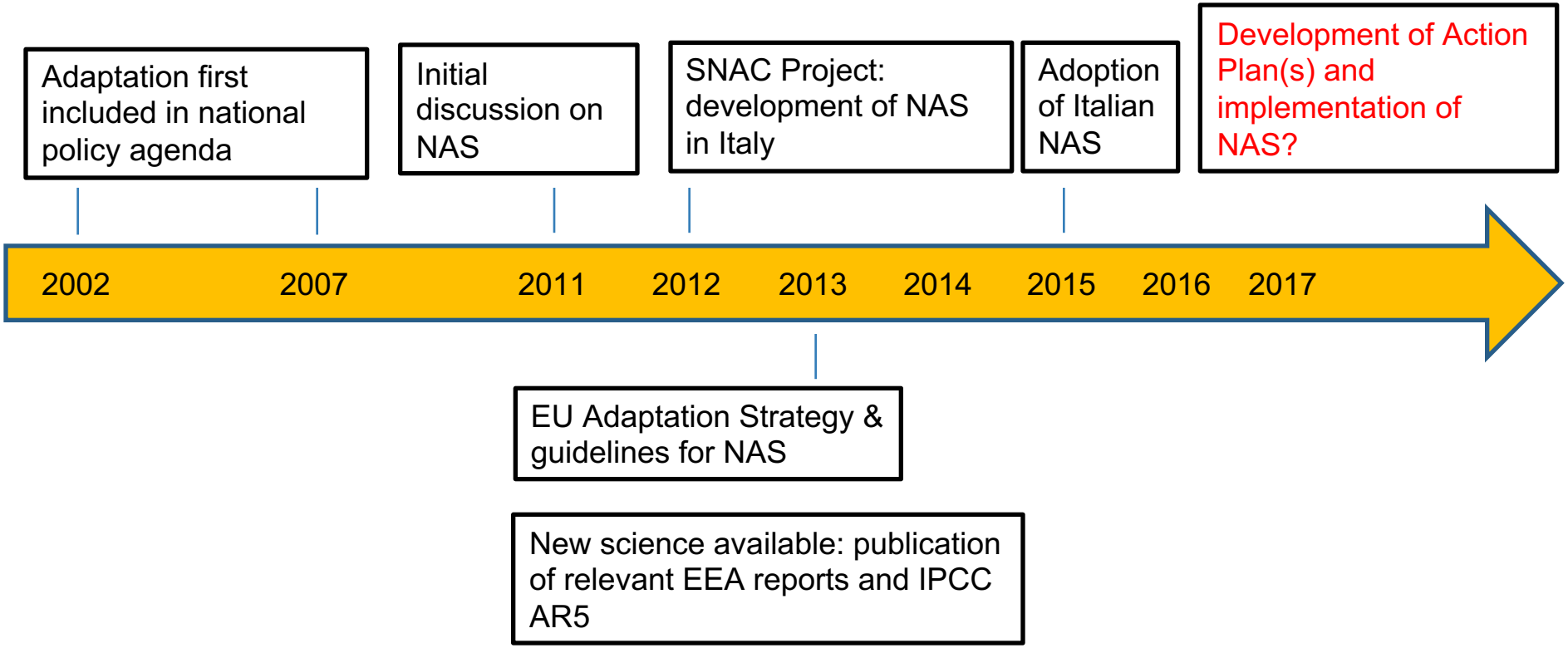
Policy cycle for users (6 steps)

Based on UKCIP Adaptation Wizard

- **National Adaptation Strategy (NAS):**
  - Involvement of **stakeholders** and **decision-makers**
  - Analysis of possible mainstreaming of adaptation in the different sectoral policies
  - **Recommendations and guidelines** to build up adaptive capacity in different sectors and at different spatial scales (national, regional and local) and to reduce societal costs
  - Review after n years
  - A National Adaptation platform

- **National Adaptation Plan (NAP):**
  - **Implementation** of NAS with **governance provisions** and **funding** allocation
  - **Evaluation** of implementation **(indicators)**

TIMELINE


Adaptation first included in national policy agenda
Initial discussion on NAS
SNAC Project: development of NAS in Italy
Adoption of Italian NAS
Development of Action Plan(s) and implementation of NAS?
2002
2007
2011
2012
2013
2014
2015
2016
2017
EU Adaptation Strategy & guidelines for NAS
New science available: publication of relevant EEA reports and IPCC AR5

- Nationally-funded project:
"*Elements for the elaboration of a National Adaptation Strategy to climate change*"

- Institutional Coordination: **Italian Ministry for Environment Land and Sea**

- Technical Coordination: **CMCC**

- Duration: **2 years (July 2012 - July 2014)**

MINISTERO DELL'AMBIENTE
E DELLA TUTELA DEL TERRITORIO E DEL MARE

cmcc
Centro Euro-Mediterraneo sui Cambiamenti Climatici

- Key project aims:

1. **Involvement of all national stakeholders**
2. **Assessment of CCIVA at national level**
3. **Provision of recommendations and guidelines to build adaptive capacity in different sectors and scales in order to implement cost-effective adaptation measures**

TOP DOWN

Technical Panel – about 100 national scientists and sectoral experts

Interministerial Panel – line Ministries and institutional stakeholders (Dept. of Civil Protection, Union of Italian Provinces, National Association of Italian Municipalities, Italian Committee of the Regions)

BOTTOM-UP

Participatory process – involvement of national stakeholders at all levels (civil society, scientific community, private sector…)

Participatory process

Stakeholders participation is key when developing and implementing adaptation to guarantee efficiency, commitment as well as social justice
(Bauer et al., 2012; Preston et al., 2011; Smith et al., 2009; Paavola, 2008; Beierle & Cayford, 2002; Reed, 2008)

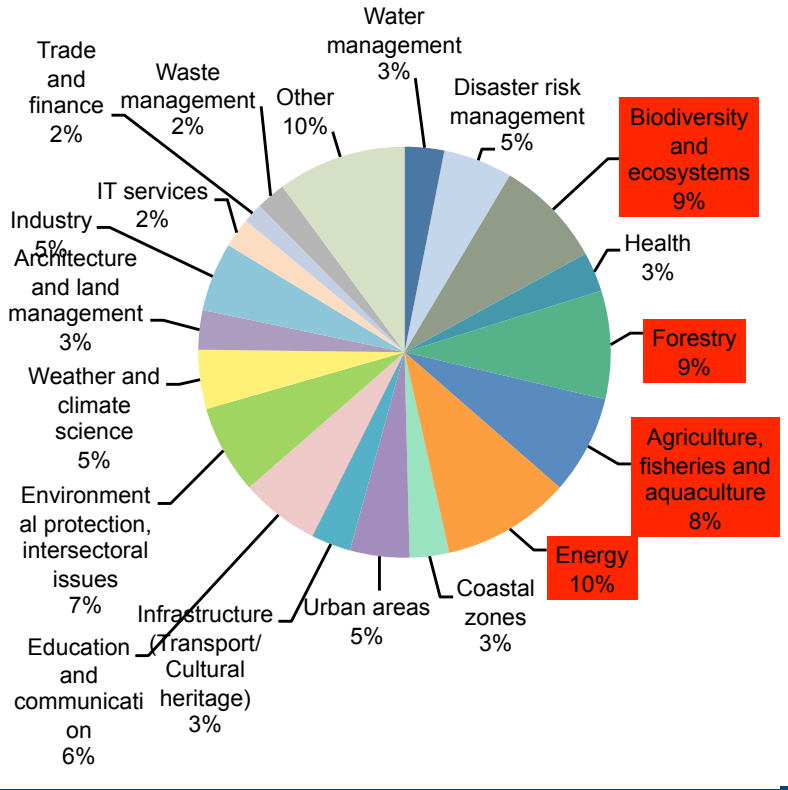
Involvement of scientific community, and non-governmental stakeholders at all levels through:

- **On-line preparatory survey for public** (October – November 2012); followed by further analysis with selected sample
- **Ad hoc Public Consultations for civil society, and sub-national administrations** (Rome, 9-10 December 2013)
- **Public on-line review of the Strategy Document draft** (30 October 2013 – 20 January 2014)

Preparatory survey

- **Open questionnaire: 154 respondents, mostly from non-governmental areas** (private sector 22%, scientific community 22%, NGOs etc 14%) **all responding on personal behalf** (73%)

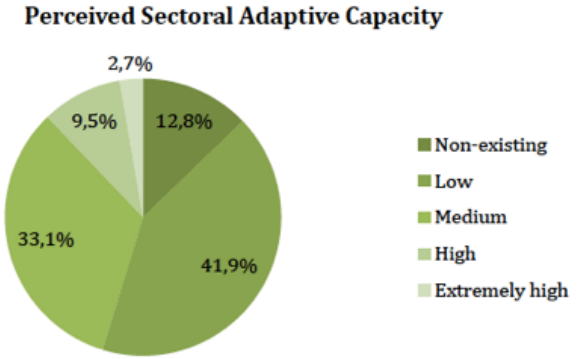
- **Respondents mostly distributed along 4 sectors: Energy, Biodiversity, Forestry, Agriculture** → these were contacted for further interview

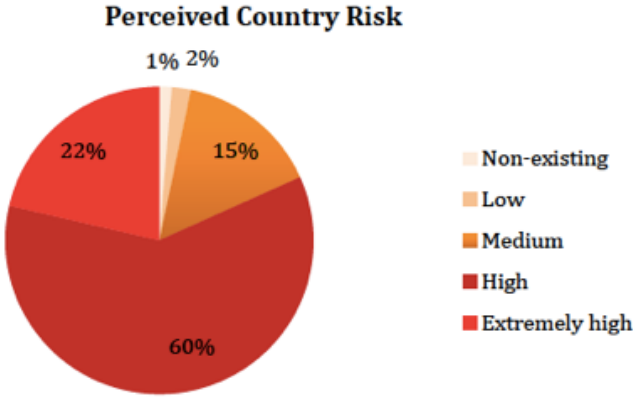


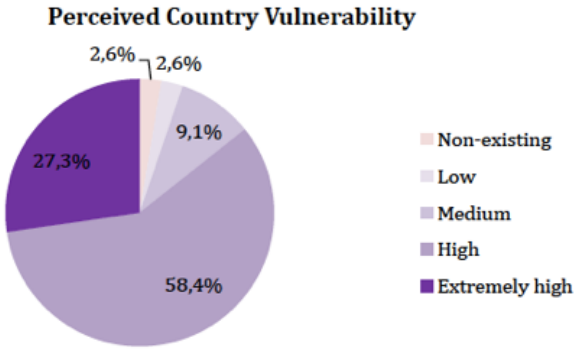
Preparatory survey

Results: citizens' current perception of climate change

- High or extremely high degree of risk related to impacts of climate change
- Great vulnerability
- Low sectoral adaptive capacity
- No action (45%) or if so, fragmented







Preparatory survey

Results: characteristics that the NAS should have and actions to take by the government

- **Objective: protection of territory** including monitoring and safeguarding areas at risk of floods and landslide

- **Priorities:** limiting land-use change, sustainable management of water and use of resources, reducing hydro-geological risk, improving energy efficiency
- **Focus on actions related to mitigation** (increase renewable energy, efficiency of public transportation, car-pooling) **and adaptation-mitigation synergies** (improve energy efficiency in buildings, expand green areas...)

- **Legal nature of the adaptation policy: binding** (82%)

The Italian NAS package

In order to elaborate the NAS **three main background documents** have been published:

1. **A national CCIVA assessment concerning the national sectors;**
2. **An analysis of European and national policy framework for adaptation;**
3. **Elements for a strategy document.**

National CCIVA Assessment

Methodology: systmatic and coherent review of existing literature and experts appraisal, no new research

- Definition and identification of vulnerable **sectors**
- Assessment of **past, present and future climate variability and change** (regional projections from CIRCE project)
- Assessment of **present and expected impacts** of climate change for each sector
- Assessment of **vulnerability/risk** of each sector to the present and future climate
- Assessment of **adaptive capacity** of each sector
- Evaluation of **already implemented adaptation measures** in sectors
- Tentative **estimate of sectoral costs of inaction and adaptation** - only for few sectors and not comparable

Analysis of EU and national policy framework

- Analysis of the **EU Adaptation Strategy** (*launched on April 29th, 2013*)
- Overview of **EU legislation for mainstreaming adaptation** in EU sectoral policies (directives and regulations): water, agriculture, environment and biodiversity….
- Asessement of the degree of **national implementation of *Acquis communautaire*** for the different sectors of Italian NAS and remaining gap areas
- Analysis of **NAS adopted in Europe** with focus on governance settings and sectoral approaches (18 European countries with a NAS in 2014)

Elements of an Italian NAS

- **General principles** and **objectives** based on international guidance and lessons learnt from other EU countries. NAS provides a vision, reference framework for adaptation, as a basis for further action.

- **A set of guidelines and measures** to reduce risks, build resilience and take advantage of opportunities in various sectors, across multiple sectors and at different geographical (also transnational) scales and time horizons.

Italian National Adaptation Strategy

Contains and summarises the 3 background documents:

- General objectives and principles for adaptation
- European context on adaptation
- **Sectoral issues: key messages on existing impacts and vulnerability, and adaptation actions, (cost-benefit analysis)**
- **Cross-sectoral issues**
- **Conclusions and outlook**
- Glossary
- Attachments:
  - List of relevant EU legislation (directives, regulations)
  - Summary of analysis of EU Adaptation Strategy and lessons learnt from other countries
  - **Long list of proposed adaptation actions**

Available online (in IT only)

Sectors

*Sectors where cost estimates are available are marked with **

1. **WATER RESOURCES** (quantity and quality)
2. **DESERTIFICATION, SOIL DEGRADATION and DROUGHT**
3. **HYDRO-GEOLOGICAL RISK***
4. **BIODIVERSITY and ECOSYSTEMS**:
   - *Terrestrial ecosystems*
   - *Marine ecosystems*
   - *Inland water ecosystems and transition ecosystems*
5. **HEALTH**
6. **FORESTRY**
7. **AGRICULTURE*, AQUACULTURE, FISHERIES*:**
   - *Agriculture and Food Production*
   - *Marine Fisheries*
   - *Aquaculture*
8. **ENERGY** (production and consumption)
9. **COASTAL ZONES***
10. **TOURISM***
11. **URBAN SETTLEMENTS**
12. **CRITICAL INFRASTRUCTURE:**
    - *Cultural Heritage*
    - *Infrastructure for Transport*
    - *Hazardous Industries and Infrastructure*
13. **SPECIAL CASE STUDIES:**
    - *Mountain Areas (Alps and Apennines)*
    - *Po River basin*

Sectors

Despite the lack of a NAS, adaptation was being implemented countrywide in relevant sectors through legislation, non-binding frameworks, monitoring and early-warning systems as well as practical measures.

Most relevant existing initiatives for adaptation **were taken into consideration** in the sectoral analysis, for example:

- National Biodiversity Strategy, National and Local Action Programmes to combat drought and desertification, White Paper on Rural Development and Climate Change
- Monitoring and surveillance systems for heat-waves (Civil Protection), vector-borne diseases and other infections (various regions)
- Integrated coastal zone management (various regions, Emilia-Romagna, Venice)
- Local adaptation plans (Ancona ACT, Genova province GRaBS, Padova, Alba), vulnerability assessment (Bologna BlueAP), regional adaptation strategy (Lombardy)

Long list of proposed adaptation actions

- **NO PRIORITISATION OF ADAPTATION ACTIONS IN THE NAS**
- **LONG LIST BASED ON: existing good practice national and sub-national initiatives, EU guiding principles** (e.g. measures that perform well in the face of uncertainty to be favoured), **cost-estimates when available**
- **SECTORAL AND CROSS-SECTORAL ACTIONS:** measures are presented for all sectors considered in the vulnerability assessment, and across multiple sectors
- **3 TYPOLOGIES OF ACTIONS:** measures are categorised as **soft, green, grey actions**
- **TIMESCALE:** NAS does not set an overall timeframe, but envisages **short/medium (by 2020) and long term (beyond 2020)** adaptation measures

Azioni di tipo non strutturale o "soft"

Settore d'azione	*Azioni settoriali proposte*
Risorse idriche	Normativa e pianificazione • Pianificazione degli schemi complessi (sforzo di coordinamento) per stabilizzare l'aspettativa sulle disponibilità; • Sviluppare la capacità di una gestione pluriannuale delle risorse idriche nelle a minacciate dalla scarsità e dalla siccità; • Riconsiderare fabbisogni e concessioni idriche storiche in accordo con i piani e programmi vigenti (PdB, PdA, PTA); • Sviluppare programmi integrati per migliorare l'efficienza degli usi irrigui, potabi industriali per ottimizzare i consumi e ridurre contestualmente il prelievo dai co idrici naturali;

Azioni basate su un approccio ecosistemico o "verdi"

Settore d'azione	*Azioni settoriali proposte*
Risorse idriche	• Riqualificazione dei corsi d'acqua in considerazione del mantenimento dei deflussi vitali e/o flussi ecologici e della qualità ecologica in situazioni di variazioni dei regimi termo-pluviometrici futuri; • Introduzione sistematica del minimo deflusso vitale (MDV), ovvero portata ecologica o flusso ecologico, nei piani e nelle pratiche di gestione considerando anche le variazioni attese per condizioni climatiche e deflussi; • Creazione di zone tampone fra aree coltivate e corsi d'acqua; • Protezione e conservazione delle fasce boscate e della vegetazione costiera; • Protezione e valorizzazione degli acquiferi, inclusi gli interventi di ricarica artificiale; • Miglioramento della capacità di ritenzione idrica dei suoli; • Mantenimento/Ripristino di condizioni favorevoli alla naturale ricarica delle falde (deflussi ecologici e connettività laterale).
Desertificazione, degrado del territorio e siccità	• Adozione di lavorazioni del terreno "più semplificate" rispetto all'aratura profonda tradizionale; • Limitazione di sbancamenti e livellamenti; • Promozione dell'uso di siepi per dividere le diverse aree coltivate e nello stesso tempo fungere da barriere di assorbimento delle sostanze chimiche utilizzate in agricoltura (prodotti fitosanitari, concimi) la cui diffusione all'esterno dell'area stessa viene così limitata;

Azioni di tipo infrastrutturale e tecnologico o "grigie"

Settore d'azione	*Azioni settoriali proposte*
Risorse idriche	• Riciclo e riuso dell'acqua; • Interventi strutturali per l'efficientamento e ammodernamento delle reti per la riduzione delle perdite e la contestuale riduzione dei prelievi dai corpi idrici naturali; • Gestione dei deflussi di pioggia in aree urbane e loro utilizzo; • Adattare la gestione degli impianti di trattamento delle acque reflue e dei relativi sedimenti per una maggiore frequenza degli eventi estremi (alluvioni, siccità, etc.); • Adeguamento tecnologico (strumenti di misurazione di prelievi, usi e restrizioni, telecontrollo, separazione acque nere e grigie, etc.); • Dissalazione tramite sistemi alimentati con impianti fotovoltaici; • Incremento delle capacità dei bacini e serbatoi artificiali che permettono di pianificare la gestione pluriannuale della risorsa; • Introduzione di sistemi più efficienti di raffreddamento industriale; • Incremento della connettività delle infrastrutture idriche; • Riconversione delle reti ad esclusivo uso irriguo; • Manutenzione della rete idrica a funzione multipla; • Incremento delle potenzialità di accumulo nelle zone rurali privilegiando interventi diffusi, a basso impatto ambientale e ad uso plurimo; • Interventi per il riutilizzo irriguo dei reflui;

Azioni di tipo trasversale tra settori (soft, verdi o grigie)

Settori d'azione	*Azioni trasversali proposte*
Risorse idriche - Dissesto idrogeologico – Ecosistemi di acque interne e di transizione – Agricoltura - Zone costiere - Turismo – Salute - Insediamenti urbani – Industrie pericolose – Area alpina e appenninica – Distretto idrografico del fiume Po	• Sviluppare (potenziare, o aggiornare) gli esistenti sistemi di allerta preventiva (*early warning*) contro i rischi legati ai cambiamenti climatici; • Introdurre le considerazioni sulla verifica di coerenza con i principi della Strategia nazionale di adattamento ai cambiamenti climatici in atto e futuri nei processi di Valutazione d'Impatto Ambientale (VIA) e Valutazione Ambientale Strategica (VAS) attraverso l'incorporazione di nuovi criteri e prescrizioni.

Azioni a breve e lungo termine

Settore d'azione	*Azioni a breve termine (da attuare entro il 2020)*	*Azioni a lungo termine (da attuare oltre il 2020)*
Risorse idriche	Soft • Pianificazione degli schemi complessi (sforzo di coordinamento) per stabilizzare l'aspettativa sulle disponibilità; • Sviluppare la capacità di una gestione pluriannuale delle risorse idriche; • Riconsiderare fabbisogni e concessioni idriche storiche in accordo con i piani ed i programmi vigenti (PdB, PdA, PTA); • Sviluppare programmi integrati per migliorare l'efficienza degli usi irrigui, potabili e industriali per ottimizzare i consumi; • Favorire forme partecipative per la gestione delle risorse, includendo anche i "Contratti	Soft • Includere le variabili indice connesse con i cambiamenti climatici nella valutazione ambientale strategica; • Nuovi codici per il risparmio idrico nel settore delle costruzioni; • Definire misure per il recupero dell'acqua piovana all'interno dei requisiti per il rilascio dei titoli edilizi; • Stabilire regole minime e certe per i finanziamenti delle strutture e delle infrastrutture; • Favorire forme partecipative per la

Principles for effective adaptation – Adaptive management

Name	Definition/scope	Examples
No regret	Measures that are **worthwhile now**, delivering net **socio-economic benefits which exceed their costs**, and that continue to be worthwhile **irrespective of the nature of future climate** Includes **'soft' measures** that **build adaptive capacity** through supporting better understanding of risks, and governance on adaptation	Increase public awareness about social and economical consequences of climate change Improve understanding of the vulnerability of the coastal zone to sea level rise
Low regret	Measures for which the associated **costs are relatively low** and for which the **benefits** under future climate change may **potentially be large** Includes **operational measures** – i.e. changes in processes and procedures	Establish early warning systems for floods

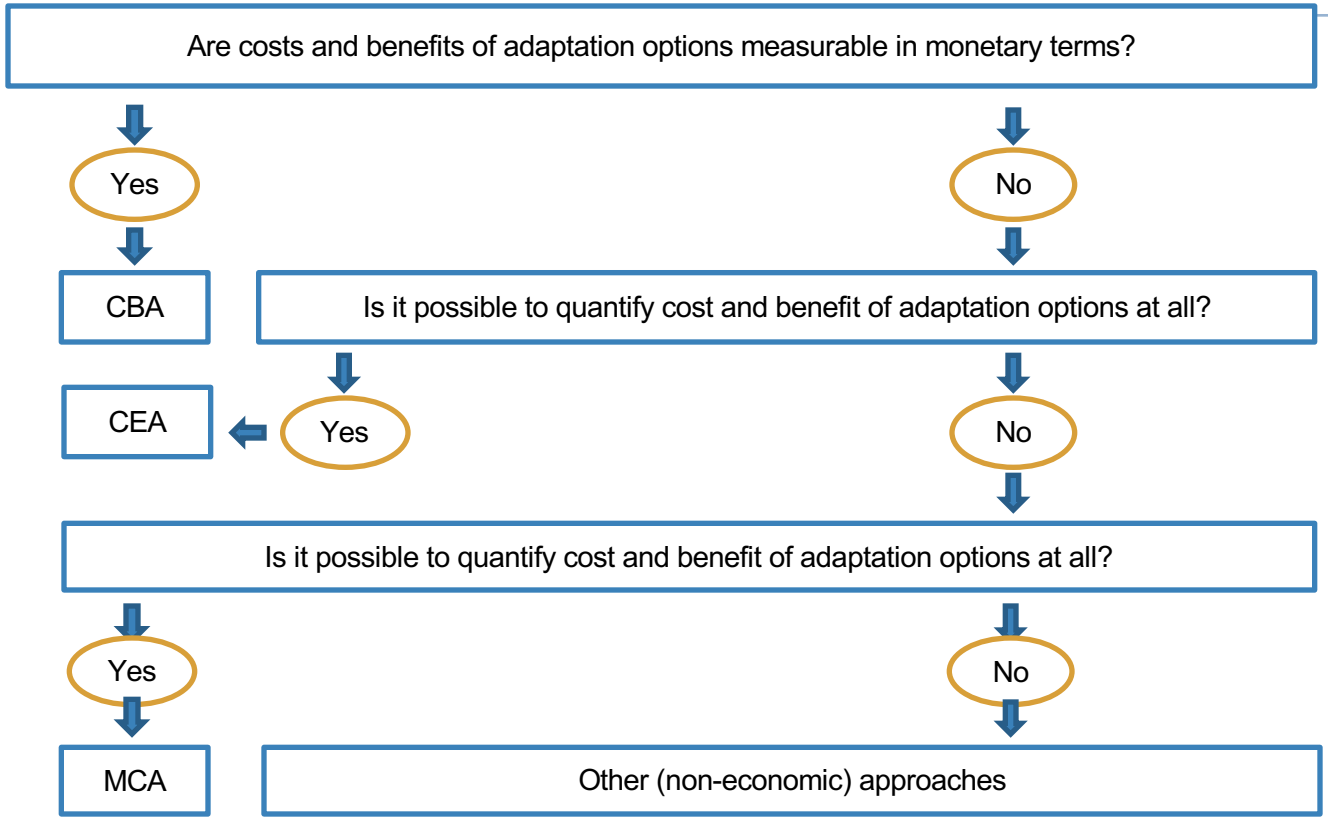
Principles for effective adaptation – Adaptive management

Name	Definition / scope	Examples
'Win-win'	Measures which have **other environmental, social or economic benefits** as well as managing climate change	Improve building energy efficiency to reduce GHG emissions and better manage high temperatures
Flexible or adaptive	Measures that can be **implemented incrementally**, rather than through the adoption of 'one-off' costly adaptation solutions	Design coastal flood risk management strategies which can be easily modified / upgraded over time

TOOL FOR APPRAISING ADAPTATION MEASURES

- **Cost-Benefit Analysis (CBA):**
  - Comparison of the costs and benefits of a project expressed **in monetary values**, with one main objective, e.g. economic efficiency
  - **Example where CBA can be applied:** Comparison of engineering options for rehabilitation of existing and construction of new water resource management facilities
- **Cost-Effectiveness Analysis (CEA)**
  - Analysis of costs of alternative adaptation options
  - Compared with CBA, CEA is suitable where benefits cannot be defined in monetary terms
  - **Example where CEA can be applied:** Preservation of fauna and flora species diversity → Measurable objective: the number of animals preserved and hectares of wetland or forest protected per invested monetary unit
- **Multi-criteria Analysis (MCA)**
  - Tool that is able to rank and prioritise multiple adaptation options.
  - Ranks resulting from an MCA are not based purely on economic calculations, but on a broader range of criteria to capture wider objectives
  - **Example where MCA can be applied:** Dealing with increased flood risk:
    - **Four adaptation options could be analysed:** 1) installing pumps, 2) improving drainage infrastructure, 3) organising manual labour, and 4) bearing the losses (doing nothing)
    - **According to four criteria**: 1) costs, 2) effectiveness in safeguarding agricultural production, 3) health benefits and 4) environmental effects

TOOL FOR APPRAISING ADAPTATION MEASURES



Source: https://gc21.giz.de/ibt/var/app/wp342deP/1443/wp-content/uploads/filebase/ms/mainstreaming-guides-manuals-reports/Economic_assessment_of_CC_adaptation_options_-_GIZ_2013.pdf

Cross-sectoral issues

- **Monitoring and observation** systems for adaptation
- **Research needs** for adaptation
- Synergies between **adaptation, mitigation and sustainable development**
- **Disaster risk reduction and adaptation**, including the role of insurance sector
- **Treatment of scientific uncertainties** in the decisional process of adaptation

Conclusions and outlook

The NAS document foresees a number of next steps:

- Establishment of a **permanent national platform on adaptation** for stakeholder engagement and communication
- Development of comprehensive **assessment of costs of climate impacts, as well as analysis of costs-benefits of adaptation measures** in all the identified sectors
- Development and implementation of a **Plan of action for adaptation** **and/or sectoral plans that will identify adaptation actions**, and a **scheme for systematic monitoring and evaluation of progress**
- Review of technical content of NAS on a 5-year cycle

Steps for adoption of the NAS

NAS document finalised in September 2014:

- In a session of the **"Conferenza Unificata" on the 30th of October 2014 at the Council of Ministers Presidency level** (Committee of Ministers, Regions and Municipalities that delivers advices on area of its jurisdiction) the Ministry of Environment presented the document named "Strategia Nazionale di Adattamento ai Cambiamenti climatici" (NAS) for final approval. Hence, the **positive advice by the Conferenza Unificata was issued.**

- The NAS was finally **adopted on June 2015** with a **Directorial Decree of the Ministry of Environment, establishing specific objectives to be reached by 31st December 2016.**

Directorial Decree by Ministry of Environment – June 2015

Specific objectives to be reached by 31st December 2016:

- **Update NAS document** every 5 years
- Establishment within Ministry of Environment of **"Permanent Forum"** for awareness raising and communication, and **"National Observatory"** for identification and monitoring of priorities of action by local and regional administrations representatives
- **Plan of action to be agreed by *Conferenza Stato-Regioni*** including:
  - Roles and responsibilities for implementation, and coordination mechanisms within the government
  - Criteria for developing regional/local-scale climate scenarios
  - Short-list of adaptation options
  - Estimation of financial and human resources for implementation of adaptation options
  - Indicators to measure success of adaptation measures
  - Modalities for monitoring and evaluating impacts of adaptation measures

- The Italian NAS is an example **of satisfactory policy process achieved in a sensible timeframe, with relatively low financial resources available** for the policy planning process itself

- It has provided a **coherent framework** for ongoing action, but is **lacking real implementation** without an action plan and/or sectoral action plans in place with precise allocation of roles, budget and timeframes

- There is need for **new climate research at the regional and local scale** to be able to **correctly prioritise sectoral action** on adaptation

- There is need for **comprehensive national and sectoral economic assessments** to be able to **appraise and prioritise adaptation actions from the long list** contained in the NAS

Thank you for your attention.

Hvala!

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