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DERRIS

Il clima cambia.
Riduciamo i rischi.

(LIFE14 CCA/IT/000650)

GUIDELINES FOR PA: ASSESSMENT AND MANAGEMENT OF RISKS LINKED TO CLIMATE CHANGE.

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EXECUTIVE SUMMARRY

Catastrophic events linked to climate change have increased rapidly both in intensity and frequency, at European and world level. Italy is one of the European countries most vulnerable to climate change, indeed, of the 28 EU member States, it is the one that has suffered the greatest economic damage caused by natural events[1]. Within this context, urban areas are the ones most exposed to the impact of climate change as this is where there is the highest concentration of population and economic activity: according to the latest data available[2], 91% of all Italian Municipalities would appear to have at least one area classified as a high hydro-geological risk area. Moreover, according to AIBA (Associazione Italiana Broker di assicurazione e riassicurazione) data, 90% of SMEs obliged to interrupt production for more than a week due to a catastrophic event go bankrupt within a year. The exponential increase on climate-related events affects heavily SMEs since they do not have adequate tools to assess and to manage these phenomena.

This leads to an increase in direct and indirect damage-related costs, which has an impact on the financial burden of public administration, insurers and businesses.

It is on the basis of this knowledge that the DERRIS project developed a public-private partnership model focused on PA and SME resilience.

The DERRIS project public-private partnership (PPP) model is based on the assumption that the resilience of an area increases when the risk culture of those who operate there grows and it has developed along three lines:

- *transfer of knowledge* to increase risk culture,
- *drafting adaptation plans* and climate change tools,
- *collaboration and links between the various partners* at local level.

The DERRIS project was developed in the municipality of Turin as a pilot project that led to the definition of the "CRAM TOOL", a risk self-assessment instrument. Then, the project was replicated in other ten Italian cities, thanks to a pervasive process of stakeholder involvement.

On the basis of the experience gained with this project, a number of weaknesses have been identified, in particular the difficulty to get SMEs involved, which also highlighted a lack of risk awareness due to structural factors; as well as strong points, like Municipalities' proactivity and the transfer of special knowledge that supplied cognitive tools useful to PA and SMEs. In the Guidelines, there are also comments and proposals to be brought to the attention of public decision-makers in order to improve legislation concerning climate change adaptation policies.

1 FEEM, *Cambiamento climatico in Italia. Impatti e adattamento*, Equilibri 2/2017, 2017

2 ISPRA, (http://www.isprambiente.gov.it/it/pubblicazioni/rapporti/dissesto-idrogeologico-in-italia-pericolosita-e-indicatori-di-rischio-edizione-2018)

INTRODUZIONE

These guidelines were developed on the basis of experience gained in the context of the European DERRIS project aimed at creating a public-private partnership model for the resilience of PA and SMEs, with a specific focus on the assessment and the management of climate change-related risk. The objective of the document is twofold: on the one hand to describe the "DERRIS model" and offer public and private partners the most important operational indications and necessary instruments to replicate it in other cities, other businesses and other organizational contexts; on the other, to offer comments and proposals aimed at completing and improving the legislative and organizational context of climate change adaptation policies implemented at national, regional and local level, also by promoting awareness of the risk of climate change-related catastrophic events in businesses, all thanks to a reasoned analysis of the model's strong points and weaknesses.

Objectives of the project. Why Derris.

At European level, Italy is one of the Countries most vulnerable to climate change. Floods, extreme rainfall, landslides, heat waves, frost and other extreme meteorological conditions are increasing, and they in turn, increase the consequences of these risks for the population and the territory. The damage caused by these disasters has serious repercussions on the growth and the economic stability of the affected areas. Of the 28 EU member States, **Italy** is the one that **has suffered the greatest economic damage caused by natural events**[3]. From 2013 to 2016, damage caused by floods and landslides amounted to ca € 7,6 billion, however, the State responded by allocating ca 10% of the amount needed[4]. 90% of SMEs obliged to interrupt production for more than a week due to a catastrophic event go bankrupt within a year. (Source: AIBA). In this context, there are two main weaknesses:

- Italian SMEs do not have the necessary tools to assess and manage these phenomena;
- Italy is one of the countries where businesses underestimate the impact of this type of risk most. In fact, a recent study showed that 37% of businesses interviewed did not fear any climate change-related negative effects on their activities[5].

Since September **2015**, **Gruppo Unipol** has been the **leader**, along with its partners **ANCI, CINEAS, City of Turin, Coordinamento Agende 21 Locali Italiane** and **UnipolSai**, of the **DERRIS** project (**DisastEr Risk Reduction InSurance**), **co-financed by the European Commission** within the context of the financial instrument **LIFE**. Derris is the first European project that brings together Public administration, businesses and the insurance sector in order to reduce risks caused by extraordinary weather events.

3 FEEM, Cambiamento climatico in Italia. Impatti e adattamento, Equilibri 2/2017, 2017

4 Ibidem

5 Zurich, Effetto potenziale sulle attività delle piccole e medie imprese (PMI) a causa dei cambiamenti climatici nel 2016, Rapporto di indagine globale, Novembre 2016.

The main objectives of Derris are:

1. To implement **innovative forms of public-private partnerships** between insurers, public administration (PA) and businesses, which will trigger virtuous behaviour in the field of prevention and **climate risk management,** and also increase the **resilience of local communities**, thus reducing the cost of extreme climate events, which is covered by public spending;
2. To foster a **greater risk culture**, by transferring knowledge and **know-how** from **insurers** to **SMEs** and **public administration**;
3. To put **adequate tools for climate risk prevention and management** at the disposal of SMEs;
4. To analyse potential innovative financial instruments that make it possible to transfer capital dedicated to risk reduction, climate change adaptation and local community resilience.

After pilot testing in Turin between October 2016 and April 2017, the DERRIS project replicated this experience in **10 more cities** throughout Italy. The objective was to enable the highest number of Italian SMEs to identify the main climate risks they are exposed to and choose which actions to undertake to manage risks and emergencies. The Cities that have joined DERRIS have committed themselves to work with SMEs to reduce the consequences of weather and climate phenomena and to increase the safety of their city and their citizens.

In view of the central role of local administrations in the fight against climate change and in the involvement of local stakeholders, the DERRIS project decided to activate a process whereby Cities are called upon to manifest their interest in taking part in the project. In April 2017, the "***Il Comune che protegge"*** call was launched to gather manifestations of interest from Cities/local public bodies engaged in implementing climate change adaptation and committed to taking part in the experience as pilot Cities. Three criteria were used to assess the manifestations of interest:

- Type of risk present in the area (considering the various risks included in the DERRIS project), so as to create a panel of cities with different risks;
- Degree of activation of adaptation policies
- Presence of production sectors in order to foster the direct involvement of businesses, within a public private collaboration framework.

Following the Turin experience, the cities of **Genoa**, **Padua**, **Bologna**, **Rovereto**, **Udine**, **Varese**, **Molfetta**, Alghero, **Pescara** and the **Unione dei Comuni del circondario empolese Valdelsa** manifested their interest in participating in the project and signed a memorandum of interest that defined roles and commitments. These **11 Cities** have created a community of cities that shared experiences, good practices and instruments to increase the resilience of their areas.

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1. THE CURRENT REFERENCE FRAMEWORK

1.1 ADAPTATION TO CLIMATE CHANGE

The European scenario

With its **"Strategy on adaptation to climate change"**[6], approved in April **2013,** the European Union aims at improving the capacity of all operators to respond to the effects of climate change, encouraging and offering strong support to all member States adopting national strategies and helping all adaptation actions undertaken at national level. The Strategy refers precisely to the fundamental role of cities in promoting and implementing strategies, objectives and adaptation measures at local level and to the role of the insurance and financial sectors in creating investments for resilience and for managing climate change related risks. As for the subject of insurance and financial products, the European Union has published a special Green Paper[7] that goes hand in hand with the European Strategy on adaptation to climate change.
To date, 21 of the 28 European Union member States have developed national adaptation strategies: of the 28 European Union countries, only Slovenia, Croatia, Luxembourg, Bulgaria, Cyprus, Estonia and Latvia still have to adopt a strategic framework. The first countries to adopt a national adaptation strategy, in the absence of a European strategy before 2013 were: Finland (2005), Spain (2006), France (2007), Hungary (2008), Denmark (2008), the Netherlands (2008), United Kingdom (2008), Germany (2008), Sweden (2009), Belgium (2010), Portugal (2010), Switzerland (2012), Malta (2012), Ireland (2012), Austria (2012), Lithuania (2012), Norway (2013) and Poland (2013).

Italy on the other hand, is among the group of countries (along with Bulgaria, Cyprus, Czech Republic, Greece, Latvia, Romania and Slovakia) that completed their adoption of a national strategy only after 2013, based on a national assessment of impact, vulnerability and adaptation measures.

Measures planned at national level are often part of a package of sectoral policies ranging from environmental protection to sustainable management of resources and prevention of natural disasters, but the creation of dedicated adaptation strategies is considered the most effective way of preparing member States to assess impact, vulnerability and adaptation options.

The multiplicity of policies and strategies devised by the European countries highlights the impossibility of defining a single climate change adaptation model applicable in a uniform manner to all European countries, due to the environmental, social and economic diversity from one country to another: the many ways in which adaptation action is designed and implemented also depend the different institutional setups and the way in which competences in the environment sector are managed.

The main national adaptation policies are focused on measures aimed at creating an institutional and organizational setup for climate adaptation, climate change risk and vulnerability assessment,

6 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions An EU Strategy on adaptation to climate change /* COM/2013/0216 final */ https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52013DC0216

7 GREEN PAPER on the insurance of natural and man-made disasters /* COM/2013/0213 final */ https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:52013DC0213

identification of the various adaptation options, adaptation measures cost/benefit assessment, definition of sectoral action plans able to assign precise long-term roles and responsibilities, strategy monitoring and assessment based on well-defined instruments and indicators. These measures are typically multi-sectoral. The drop in available natural resources like water, or climate change that may reduce windiness in specific areas, can create problems linked to the availability of resources and the supply of plants, thus obliging individual countries to redefine their energy production and supply systems.

Most European countries that adopted an Adaptation Strategy have begun offering strategic support to local authorities, such as setting up research programmes on adaptation. Only some member States have created dedicated instruments to support local bodies, such as national adaptation web portals, aimed at informing political decision-makers at the various levels or other public information and communication tools to promote these themes in the country's public debate in an inclusive manner.

Recently, the European Commission has concentrated on a series of policies and actions to promote climate adaptation, offering substantial support – also from the operational point of view – to States defining adaptation strategies. It was with this objective in mind that the **Climate ADAPT** platform was launched to support the various levels of governance (national, regional, local) engaged in implementing integrated adaptation policies, objectives and measures, starting with sharing analyses, data, practices, initiatives, tools and information on climate change, possible responses and experiences developed at international and European level.

Another significant European initiative in the field of investments relating to resilience is the **"European Structural and Investment Fund"**, which offers funding for territorial cooperation projects within the objective on climate change adaptation, prevention and risk management.

As for the commitment of individual countries, the implementation of national adaptation strategies in line with national plans for natural disaster risk management is the priority intervention according to the European Commission. And linked to this, is the EU financial support granted to implement national and local-level adaptation measures, by strengthening instruments such as the LIFE programme, to foster the exchange of good practices, concrete risk reduction measures and the promotion of environmental sustainability at various levels.

Adaptation to climate change themes are also part of the voluntary commitment of thousands of local administrations all over Europe, which have joined the **"Covenant of Mayors for Climate and Energy**" initiative and therefore committed themselves to tackle in an integrated manner the challenges of mitigation and adaptation at local level (from the reduction of climate-changing gas emissions, to energy efficiency, risk reduction and adaptation to climate change measures). Among the thematic networks created by cities, in the **Resilient Europe** network, co-funded by the Urbact programme, the cities of Antwerp, Rotterdam, Potenza, Bristol, Thessaloniki and Malmö are engaged in exchanging experiences on how to improve the resilience of cities and local communities by fostering active collaboration between stakeholders and local administrations, a cross-sectoral approach, and mainstreaming among the various sectors and planning departments, at local level and with the various levels of territorial governance.

In this context, there is an initiative worthy of mention: the **New Urban Agenda** that recognises culture and cultural diversity as a source of enrichment for humanity, which can offer an important contribution to the sustainable development of cities, human settlements and citizens, thus strengthening them and giving them an active and unique role in development initiatives. In this context, cultures should be taken into consideration when promoting and applying new sustainable

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consumption and production models that will contribute to a responsible use of resources and will tackle the adverse impact of climate change. HABITAT III, Quito, 17-20 October 2016.

The Italian scenario

In a global and European scenario of attention to themes of climate change related to disaster risk management, Italy is undoubtedly among the countries that due to its geographical characteristics requires a greater effort to define integrated strategies and plans to reduce the impact of possible natural disasters. To tackle and manage these risks, in 2014, Italy drew up a **"National Strategy for sustainable adaptation to climate change and environmental security" (SNAC)**, implementing the European Strategy and stemming from the commitment undertaken by the Ministry of the Environment, as of the 2007 National Conference on Climate Change.

This Strategy is the fruit of an effort to involve political decision-makers, scientific communities, institutional and non-institutional stakeholders and was the focus of a series of public consultations. The approaches and actions resulting from analyses of data and scenarios at European and national level and contained in the national Strategy will be implemented within the **"National Plan for Adaptation to Climate Change" (PNAC)**, in the process of being adopted, which, along with the Strategy, indicates how to proceed with concrete action at national, district, regional and local level.

The National Plan is intended to be an open instrument to be updated continuously to help national institutions, Regions and Municipalities to identify the most effective measures to adopt in the different climatic areas according to their different risk and weakness profiles.

Regional Plans

In the framework of collaboration between the various levels of governance as promoted by SNAC, the Regions play a significant role in identifying geographical and sectoral intervention priorities.

Numerous preliminary initiatives for the implementation of regional plans and strategies have been under way in various Italian Regions since 2015, with the aim of defining effective planning guidelines based on local needs and characteristics, to tackle the effects of climate change and create a homogeneous and shared reference framework for local bodies with adaptation objectives, policies and measures at local level (at municipal level, in a metropolitan area or in a Union of Cities).

In order to define regional strategies, different climate scenarios and action priorities, climate change effects and vulnerability, measurements, indicators and adaptation options, assessment and monitoring systems have been drawn up at regional level. To promote true adaptation culture at regional level along with commitments and precise actions is the objective of the Regional Plans, in line with the contents of the European Strategy and the SNAC and the regular plans and programmes, such as the 2014-2020 POR, Regional Operational Programmes.

The regional administrations that have already undertaken the job to plan climate change adaptation interventions include Lombardy, Valle d'Aosta, Piedmont, Friuli Venezia Giulia, Emilia Romagna, Tuscany, Abruzzi, Sardinia and Calabria, as well as the Autonomous Province of Trento, all engaged in drawing up strategy documents on the regional impact of climate change.

In 2012 already, the **Lombardy Region** was the first to draft Guidelines for an Adaptation to Climate Change Plan followed in 2014 by the "Regional Strategy on Adaptation to Climate Change". In 2015, Lombardy drew up the Regional Action on Adaptation to Climate Change Document, which identifies priority areas and adaptation interventions to minimize risks and effects on the population and increase the resilience of society, the economy and the territory.

In 2015, the **Emilia Romagna Region** began the process of defining a single Strategy for mitigation and adaptation, which includes defining a strategy document to guide sectoral planning in line with emission reduction objectives and resilience policies. The Regional Strategy sets out to offer a reference framework for the various regional departments, administrations and organizations in the areas involved in order to carry out a complete analysis of the effects of climate change on various sectors. The Strategy drawn up by Emilia Romagna enhances actions, plans and programmes already in place in the fields of mitigation and adaptation to climate change, it defines the creation of a regional and local policy implementation Observatory, and it identifies new measures and actions to be introduced at regional level thus harmonizing the various forms of programming in the area.

The **Sardinia Region**, which coordinates the activities of the national Strategy for adaptation to climate change Interregional Coordination Table, has begun drawing up a Regional Strategy. In the Regional Adaptation Plan, which is being drafted, Sardinia is defining the links between interventions carried out under the various thematic strategies, starting with the Energy Plan.

In 2015, the **Abruzzi Region** began drafting the Regional Plan for adaptation to climate change, which includes creating a regional climate profile that will be used as the basis for a specific adaptation plan, thanks to a process that involves the various levels of local governance, starting with the Municipalities, and the actors operating in the area (citizens, businesses, etc.). Creating knowledge-sharing networks to foster protection and prevention is one of the main objectives of the process that leads to the drafting of a Regional Adaptation Plan able to define the fundamental points of the climate change related risk management strategy.

The role of cities

In the context of adaptation to climate change, cities are the governance level that is in direct contact with the territory and is in charge of town planning and territorial programming at local level. Cities are the suitable place to apply and experiment with concrete adaptation to climate change measures able to improve local resilience.

Cities can act concretely through integration and inter-sectoral action when planning urban climate strategies that have a direct impact on the way in which an entire territory functions and is managed. Cities are therefore the place to test solutions and verify their effects, and to build models that can be replicated and adapted to different types of contexts, in terms of long-term strategies as well as short and medium-term interventions and measures. The idea is to increase the resilience of the area and reduce the risks and effects of climate change with medium and long-term precise territorial planning and town planning strategies as well as urban planning and regeneration, thus improving the liveability of environments and the quality of life of citizens in terms of protection and conservation of biodiversity, food security and health particularly of the more vulnerable sections of population.

Recently, for example, green infrastructures have acquired a significant role in promoting urban resilience and regeneration. In many European cities, **green urban infrastructure** is created and managed for a number of functions: grounds and structures like parks, gardens, green roofs and walls, urban and suburban orchards, urban woods and tree-lined avenues contribute to various degrees to absorb CO_2 and atmospheric pollutants, to reduce heat islands, to foster sustainable mobility, to improve the liveability and air quality in urban contexts. For example, in Great Britain, the creation of ***"Green Belts"*** is proving to be an important instrument to control urban expansion and protect landscapes: indeed the creation of green belts contributes both to curb urbanisation and to protect and promote forestation and urban agriculture.

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In **Spain** too, many cities have chosen similar solutions to promote urban centre re-planning in an environmentally friendly manner. This is the case of **Vitoria Gasteiz** that has turned its green belt into the distinguishing feature of its commitment to the environment, rewarded by the title of European Green Capital in 2012, and of Barcelona whose **"Anella Verda"** created a network linking twelve protected green belts around the city with ecological corridors.

In order to increase the resilience of the territory, in Countries like Italy, the strategy must be to intervene to limit hydro-geological instability: Municipalities have undertaken to collaborate with the various levels of governance (Regions and district Authorities in charge of infrastructure interventions to reduce risks in the most vulnerable areas. The strong connection between **climate change and hydro-geological instability,** proved also by science in recent years, requires constant and detailed monitoring of the conditions of the territory to be able to contrast the effects of natural calamities (increase in the intensity of rainfall, floods, landslides, etc.).

As already mentioned, commitment to resilience and combatting disaster-linked risks is decisive also to protect, not only the population but also the production sector, against phenomena that may have an impact on the future of entire production chains as well as having an impact in terms of the economy and jobs.

At local level, Municipalities are the ones able to monitor the territory, also taking into account preparation and updating of emergency plans that include risk-preparedness measures. Cities can therefore launch integrated adaptation to climate change strategies, involving a number of stakeholders who operate in the area in defining interventions to be carried out in a collaborative manner in the medium and long-term. Here too support through national, regional and European Union programmes, such as LIFE, is fundamental to secure the necessary resources and facilitate exchange of information with other similar experiences at European level.

There are many cities, even in Italy, that have projects and adaptation interventions under way, also thanks to European funding and which can act as reference points for cities that intend to undertake this process.

The City of Turin is one of the cities that has focused most on involving stakeholders and local businesses in implementing Action Plans for adaptation to climate change, within a pilot experiment undertaken precisely thanks to the DERRIS project. Twenty-eight small and medium-sized undertakings were able to receive technical support, as well as training and on-the-spot support to assess their climate risk. This support generated plans based on the needs of individual businesses containing on average twenty actions to carry out, ranging from risk management and management of emergencies due to floods to improving water efficiency, prevention in case of excessive temperature increase and staff training.

The **City of Bologna** thanks to two LIFE projects focused on the issue of adaptation to climate change called BlueAp (Bologna local urban environment Adaptation plan for a resilient city) and RainBO (RainBO Life Reduction of grenhouse gases from agricultural systems of Emilia-Romagna) has approved one of the first integrated plans in Italy with the inclusion of actions that combine resilience and urban redevelopment, such as the creation of urban gardens in abandoned green areas through a participatory approach for the construction of the plan. In addition, thanks to the RainBO project, the Municipality has started the implementation of territorial measures like the creation of a system for collecting and monitoring data and information in order to assess the impact of the actions and the effectiveness of the proposed methods and tools.

The project is one of the first integrated plans in Italy, which includes actions that link resilience and

urban regeneration, such as the creation of city orchards in abandoned green areas.

In the case of Bologna, an area expected to experience a significant increase in average temperature (ca 2 degrees), a potential drop in rainfall along with an increase in drought, water shortage and heat waves, the adaptation plan includes creating infrastructure that retains water and enhances natural ecosystems, containing consumption and water leakage by using alternative water resources, increasing green urban areas (from large parks to planting trees along avenues) to limit temperature increase, and public site regeneration. The plan also includes precise intervention to reduce waterproof surfaces and improve local areas for example by making car park and courtyard floorings permeable to water or by fostering the accumulation of volumes of rain water also through the creation of green roofs.

Ancona, in the context of the LIFE ACT project, tested a model centred on participation to define the Local Plan for adaptation to climate change, which was defined in close collaboration with the City authorities, local agencies and public and private stakeholders. The model developed by Ancona in collaboration with the cities of Bullas (Spain) and Patras (Greece), led to the creation of a method that cities can apply easily to analyse the vulnerability of their territory and identify the critical and priority areas in which to intervene. During the implementation of this project, Ancona analysed information on existing forecast models and scenarios based on a comparison of adaptation plans already drawn up at international level. This phase was followed by an assessment of the local impact of climate change on specific fields of action (biodiversity, agriculture, tourism, cultural assets), thus defining a promotion model for environmental, social and economic dimensions of urban sustainability with actions that can be replicated in other urban contexts interested in testing the various phases that lead to the creation and implementation of local adaptation plans.

On the other hand, other cities started with interventions in specific urban context areas and then went on to define broader adaptation plans with effects on the entire urban territory. **Padua** concentrated on its southerly basin currently subject to flooding of built up areas and other areas characterized by strong urbanisation in the last century, a fact that limited greatly the amount of permeable areas and reduced the capacity of the soil to absorb rain water. Padua therefore included in its adaptation plan a series of actions to repair the existing network, restore permeability, create temporary accumulation basins on public green land to be enhanced and made into equipped city parks and contour roads to allow surface-water channelling.

In the context of activities for the URBACT Resilient Europe network, the city of **Potenza** drew up a local action plan that details the action to be implemented in cities to promote urban resilience starting with better governance of processes inside local administration, and to create synergies with a variety of local actors and stakeholders. Potenza has undertaken a process based on participation, which will lead to the creation and implementation of an integrated plan for urban resilience aimed at improving the city's response capacity in case of natural disasters by defining a participation-based civil protection plan and improving the quality of urban spaces, starting with the historical centre and creating a network of green areas.

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1.2 RISK PREVENTION AND REDUCTION.

The prevention of risks linked to natural disasters is a priority at global level in order to increase the safety of living areas that are likely to be struck by climate change-related disasters ever more, as these events are likely to increase in frequency, intensity and duration, as forecast by the fourth Assessment Report of the IPCC (International Panel on Climate Change). If the recent trends are confirmed, natural disaster-related economic losses are estimated to increase five-fold compared to today[8], in Europe alone.

The impact of natural disasters is visible in economic terms not only because of a net reduction in the production capacity of small and medium-sized undertakings due to interruptions in activity, but also total destruction of their capacity in case of cessation of activities, because of damage to critical infrastructure and entire areas that often pay an extremely high price for poor design and poor management of land and housing stock. All this has a serious impact on the repetition of catastrophic events. The severity of extreme climate events depends very much on the level of vulnerability of the territory exposed to such events: for example, only 30 per cent of the risk of violent floods can be attributed to climate change and the increase in rainfall, whereas human behaviour and lack of quality planning have a substantially greater impact by favouring the harmfulness of such events.[9]

An analysis of the main international and European reference frameworks indicates clearly the actions and instruments that can be adopted to prevent these risks, starting with strategies and interventions linked to adaptation to climate change, which can be implemented on different and interconnected scales.[10]

The action of all levels of government involved in adaptation interventions and action to mitigate risks caused by natural disasters is not limited to simply reacting to disasters caused by climate change or other forms of natural calamities, it extends to continuous awareness campaigns aimed at the population and to a closer link with policies fostering sustainable development.

It is precisely in this context, that the link with other international strategies is achieved, like the **Sustainable Development Goals and the New Urban Agenda of the UN**, which define a clear commitment in favour of sustainability at all levels of governance. As well as this, there is the global commitment to reduce CO_2 emissions and contain the increase in global temperature defined by COP21, which commits all States and all levels of governance to collaborate to improve the environment and combat climate change.

The reduction of disaster-related risks thus becomes a cross-cutting action covering various contexts, able to involve various levels of governance (public sector), the world of business and the economy (private sector), stakeholders and citizens (civil society) and to be implemented at various levels, from global to national, regional and local. In particular, the local level is identified as the most suitable to define in an accurate manner the type of interventions needed for prevention and an effective management of disaster risk, with special attention placed on medium and large cities where the highest number of inhabitants live.

The global scenario

The first form of global planning of **policies and interventions for natural disaster risk reduction is the 1989 reference Framework for action for the International Decade for Natural Disaster Reduction**, which was the first to define policies and interventions to turn into

8 Forzieri, Giovanni et al., "Increasing risk over time of weather-related hazards to the European population" 2017.

9 EEA Report No1/2017, Climate Change, impacts and vulnerability in Europe 2016.

10 From the commitments defined at UN level, starting with the action of the office dedicated to disaster risk reduction (UNISDR), to the strategies promoted by the European Commission and the European Union Member States, as well as, more directly, by the Cities engaged in disaster-related risk reduction.

practice the duty of mutual assistance in cases of natural disasters assigned to the United Nations member states by the general Assembly in the sixties already, with Resolution 2034 of 1965 and strengthened by the creation of the United Nations Disaster Relief Office in 1971.

The international community's renewed attention materialized in the 1990-1999 decade dedicated by the UN to natural disaster reduction with the adoption of two important strategy frameworks respectively in 1994 with the "Yokohama Strategy for a Safer World: Guidelines for Natural Disaster Prevention, Preparedness and Mitigation" an in 1999 with the "International Strategy for Disaster Reduction".

Hyogo Framework for Action 2005 - 2015

The first document that re-launched in a powerful and complete manner the international community's commitment to reducing natural disaster-related risks is the **"Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters"**, a ten-year plan presented during the 2005 World Disaster Reduction Conference and adopted officially by the UN General Assembly with Resolution A/RES/60/195, which is linked to the post-2015 Global Development Agenda, also known as Agenda 2030. The plan describes in detail the actions and strategies needed in a multiplicity of sectors to reduce natural disaster-related consequences and is the fruit of concerted efforts with all possible actors involved in the various phases of natural risk management: including national governments, international agencies, disaster experts and non-governmental organizations, and it provides for one single coordination point to be set up at global level.

Reduction of the social, economic and environmental impact of natural disasters follows the Framework with **five priority actions**:

1. To make disaster-related risk reduction a local priority with a strong institutional basis to implement the actions adopted at national and local level through well-defined policies and institutional frameworks.
2. To identify and monitor risks in order to improve alert systems for the population.
3. To use knowledge, innovation and education in schools to promote a culture of security and resilience at all levels.
4. To reduce risk factors by intervening strongly on a series of elements and fields of action, from economic, social and environmental conditions to land consumption, climate change and the use of water resources.
5. To improve disaster response capacity at all levels.

Sendai Framework for Disaster Risk Reduction 2015-2030

The process of consultation of global stakeholders and intergovernmental negotiations undertaken between 2012 and 2014, led to the **"Sendai Framework for Disaster Risk Reduction 2015-2030"**, adopted during the third UN World Conference in Sendai.

The new global reference framework focuses strongly on the management of disaster-related risks and considerably increases the number of types of risk considered, no longer limiting them to natural factors but extending them to factors caused by man or even biological, technological and environmental causes.

The agreement sets strategies and objectives for an overall 15-year period and recognises the decisive role of States in reducing the risk of disasters but for the first time, it establishes

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the need to share actions and responsibilities with society as a whole, and therefore with the active involvement of local governments and economic actors.

The agreement sets seven objectives and four action priorities to reduce the risks of disasters. The objectives are the following:

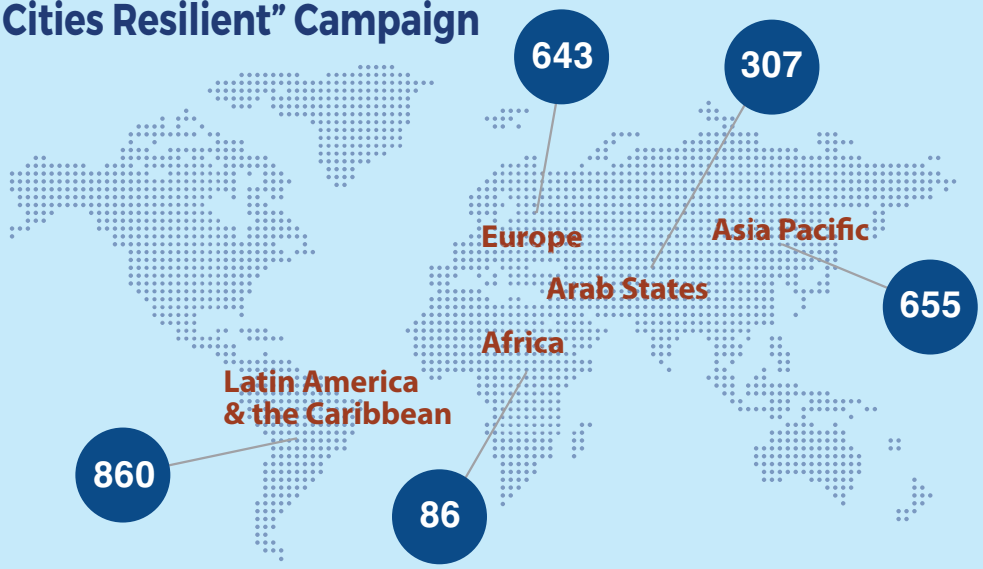
1. considerably reduce global disaster-related mortality by 2030,
2. reduce the number of persons struck at global level,
3. reduce disaster-related economic losses in relation to the gross domestic product;
4. reduce damage to critical infrastructure and basic services
5. increase the number of countries with national and local strategies to reduce the risk of disasters by 2020;
6. improve international cooperation with developing countries;
7. increase the availability and access to rapid danger alert systems and to information in order to assess the risk of disasters for people by 2030.

Understanding the risk of disasters, strengthening governance to manage disaster-related risks, investing in disaster risk reduction for resilience and improving disaster preparedness for an effective response and "to reconstruct better" during recovery, rehabilitation and reconstruction are the priority actions identified by the Framework, which indicates a series of actions that the various levels of government must carry out, in a context of global interdependence and reinforced cooperation in particular with the Southern hemisphere.

The Sendai Framework also entrusts the UNISDR (United Nations Office for disaster reduction) with supporting the implementation, the follow-up and the revision of the Framework while committing itself to increasing the awareness of world public opinion about the importance of disaster-related risk reduction and to allowing communities to manage disaster-related risks, by informing all parties involved in risk management and supplying services and practical instruments to tackle them. In this context, the action of **UNISDR** in favour of local contexts is also important with the **"Making Cities Resilient"** campaign that supports mayors and local officials to develop policies that put into practice the guidelines of the Sendai Framework and concretely involve over two thousand cities in regions all over the world (over 600 in Europe alone).

Cities Participating "Per Region"

UNISDR "Making Cities Resilient" Campaign



Fonte: UNISDR: In support of the Sendai Framework for Disaster Risk Reduction 2015 - 2030

"Ten Essentials" for local resilience

Essential 1
Organise for disaster resilience

Essential 2
Identify understand and use currente and future risk scenarios

Essential 3
Strengthen financial capacity for resilience

Essential 4
Pursue resilient urban development and design

Essential 5
Safe guard natural buffers to enhance the protective functions offered by natural

Essential 6
Strengthen institutional capacity for resilience

Essential 7
Understand and strengthen societ at capacity for resilience

Essential 8
Increase infrastructure resilience

Essential 9
Ensure effective disaster response

Essential 10
Expedite recovery and build back better

- Operational framework built on Sendai Framework for local level;
- Developed for Mayors, city managers, planners to develop and implement local resilience strategies;
- Plan future investments and identify progress;
- Possibile basis for insurers to assess level of risk;

Fonte: UNISDR: In support of the Sendai Framework for Disaster Risk Reduction 2015 - 2030

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UNISDR pilot survey 2016: 104 SMEs in 14 cities

- 72% identify natural and man-made hazards as having an impact on the business
- 64% of respondents are either not aware of city-level activity on DRM or aware but not actively participating and 80% not aware of city-level incentives to invest in disaster resilience
- Less than 25% of respondents have developed plans and invested in concrete actions to recover from disasters
- 67% of respondents plan to change their DRM approach in the next 5 years
- Possibile basis for insurers to assess level of risk;

Fonte: UNISDR: In support of the Sendai Framework for Disaster Risk Reduction 2015 - 2030

The European scenario

The considerable increase in number and intensity of natural disasters has led the European Union to activate policies and interventions that make up the reference framework within which the member states act.

Natural disasters have struck Europe in a completely different manner compared to other areas around the world because of obvious differences in management systems for phenomena such as urbanization, population increase and environmental degradation. However, Europe has suffered the effects of climate change all the same, with an increase of phenomena such as heat waves, intense rainfall and forest fires, which have caused considerable damage in various areas of the continent: in fact, between 1980 and 2015, extreme events have caused ca 90,000 incidents and catastrophic events, according to 2017 European Environment Agency data[11].

European Commission Action Plan for effective implementation of the Sendai Framework

Reducing the number of victims and losses in economic terms and promoting effective action in case of emergencies are the guiding principles for Europe's commitment to apply the Sendai Framework that the European Union intends to implement as of June 2016 with a specific Action Plan that includes disaster risk reduction issues in many dedicated European policies.

Fostering knowledge of the risks within the context of European policies, promoting the active involvement of society as a whole in risk management, promoting investments that are aware of disaster-related risks and supporting the development of a holistic approach in the management of disaster-related risks are the four intervention areas identified by the European Commission Action Plan for the effective implementation of the Sendai Framework through a series of concrete actions and interventions. The most worthy of mention among these are:

- collation and sharing of data linked to losses caused by disasters,

11 NATCATService MunichRe Database for European Environmental Agency 2017, IND-182 also known as CSI042, CLIM 039.

- use of risk forecasting and management scenarios,
- greater collaboration with the scientific community and the private sector and,
- development support from effective national and local policies.

Risk assessment and management activities

In general, the European Union aims at taking existing policies and actions that are already promoting the implementation of the principles of the Sendai Framework in a fragmented manner and making them more systemic. For example, risk assessment is one of the fields in which the European Union is most active starting with the inclusion of the risk assessments made by individual countries, which offer data and up-to-date mappings, in a series of directives such as the Floods Directive (2007/60/EC), the Directive on major-accident hazards involving dangerous substances (Seveso III, 2012/18/EU) and the Directive on European Critical Infrastructures (2008/114/EC).

The collaboration with the scientific community for risk reduction and management is visible in a series of actions, amongst which the Disaster Risk Management Knowledge Centre, which is the European Commission's reference point. Since 2014, the European Commission has also been promoting and coordinating work on developing a Community of Users for Crisis Management and Disaster Risk Management and fostering the inclusion of these matters in funding allocation procedures for projects submitted within the Seventh Framework Programme and the 2020 Horizon Programme.

It is not only as part of external action, as will be detailed later, that disaster risk management guides the operational capacity of the European Union, but also in a series of policies such as cohesion, transport and energy, research and innovation, green infrastructure, integrated management of coastal areas, agriculture, environmental protection, biodiversity, flood risk management and prevention of the worst industrial accidents. Even the development of new policies has been influenced by the European Union's ever growing attention to disaster-related risk reduction: such as the Environmental Impact Assessment Directive (Directive 2014/52/EU), on the subject of the environmental impact of projects carried out by public and private operators.

At the same time, the European Commission is investing heavily in the creation of ecological and sustainable infrastructure as a possible intervention area to promote disaster resilience: there are clear indications on this in the Green **Infrastructure Strategy**[12]**,** which illustrates instruments able to sustain the effort to design sustainable infrastructure in urban and rural areas.

Coordinated disaster response action

In Europe however, the implementation of the Sendai Framework requires also a coordinated disaster response action. Over the years, the creation in 2013 of the **EU Civil Protection Mechanism** has favoured a rapid and effective response in case of disasters, starting with the action of a group of volunteer countries that pooled resources and intervention capacity in case of urgent intervention. Within the framework of this mechanism, the European Union is defining standard and interoperable procedures coordinated by an Emergency Response Coordination Centre that coordinates the European response to the main international crises.

How to strengthen the European Union's capacity to manage disasters through a joint system of solidarity and responsibility is the main focus of the last official document produced by the European Commission on this subject (COM2017-773), which identifies the worst catastrophic events that have occurred over the last few years in Europe (from the forest fires in Portugal to the earthquakes that

12 http://ec.europa.eu/environment/nature/ecosystems/strategy/index_en.htm

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have struck Italy and Greece) and therefore defines an ambitious and all-encompassing approach the European Union can adopt to prevent, prepare for and respond to disasters. Increased cooperation among member States to offer responses to the disasters that occurred over the last few years is definitely a more significant element in terms of impact than what is laid down in the EU Civil Protection Mechanism that does not fund operational costs directly but only transport costs. The document recommends investing heavily in prevention as the only field of intervention able to reduce in a significant manner the economic impact of disasters such as floods, which are ever more frequent in various areas in Europe. Moreover, improving disaster management and response is a fundamental prerequisite to offer better protection to communities and to Europe's social and economic interests.

Offering not only new rapid response systems but also a series of mechanisms to favour risk reduction in the long term is another requirement re-launched by the European Commission's document to improve the cross-cutting approach in various European policies by fostering a more coherent and coordinated use of the European funds dedicated to this and allocated in the European Fund for Regional Development, the European Fund for Agriculture and Rural Development and the European Solidarity Fund. In November 2017, in its Communication to Council and to the Committee of the Regions, the European Commission proposed the creation of a new system to guarantee a stronger European response in case of disasters. As well as creating the RESCEU system, the European Commission offers incentives to member States to improve their capacity to adapt and repair damage and operational costs related to these operations. Improving disaster response capacity goes hand in hand with prevention and preparedness action aimed at guaranteeing greater collaboration between countries and coordination among national strategies, especially by simplifying administrative procedures in order to reduce response times further.

The Italian scenario

In a global and European scenario of attention to the subject of climate change-related disaster risk management, Italy is undoubtedly among the countries that due to its geographical characteristics requires a greater effort to define integrated strategies and plans that can reduce the impact of possible natural disasters.

In order to tackle these risks, Italy has included specific actions in the National Strategy for Sustainable Adaptation to Climate Change and Environmental Security and has introduced dedicated measures such as Italia Sicura, which are proof of the Government's attention to disaster prevention issues.

The work carried out since 2008 by the National Platform for Risk Reduction created in Italy to implement the Hyogo Framework made it possible to create a link and constant coordination between the various levels, scientific, political, social and cultural, all involved in risk management as well as a link with the Global Plan to create awareness of the issue of disaster-related risks and a culture of prevention and awareness.

The shortage of funds for the implementation of actions promoted by these policies over the last few years has not prevented the creation of forms of coordination among those analysing types of risk and an effective support for prevention policies. While at local level, monitoring the adoption of legislation, which obliges cities to set up Emergency Plans, makes it possible to constantly verify the evolution of local disaster risk management policies, at national level, it is the assessment of hydro-geological risk prevention policies that offers a precise indicator of Italy's commitment to climate change mitigation and adaptation.

The monitoring carried out by the Department of Civil Protection of the Presidency of the Council of

Minsters indicates that, out of a total of 7935 Municipalities, 88 per cent have an emergency plan[13].

The Municipalities that have adopted a Plan for the Management of Emergencies due to Natural Disasters. Source of data: Department of Civil Protection

Autonomous Regions/ Provinces	Total municipalities	Municipalities with plan	% Municipalities with plan/total
Abruzzi	305	301	99%
Basilicata	131	123	94%
Calabria	409	317	78%
Campania	550	486	88%
Emilia-Romagna	334	322	96%
Friuli Venezia Giulia	216	216	100%
Latium	378	366	97%
Liguria	235	220	94%
Lombardy	1.544	1.209	78%
Marche	239	239	100%
Molise	136	136	100%
Piedmont	1.206	1.119	93%
Autonomous Province of Trento	210	210	100%
Puglia	258	256	99%
Sardinia	377	297	79%
Sicily	390	190	49%
Tuscany	276	250	91%
Umbria	92	91	99%
Valle d'Aosta	74	74	100%
Veneto	575	527	92%
Total	**7.935**	**6.949**	**88%**

As for hydro-geological risk prevention, a better governance system, better coordination and management of interventions has gone hand in hand in recent years with the creation of a National Inventory of Soil Protection Interventions[14], which has systematized the requests for intervention and the financial requirements that have emerged from the various areas. Constantly updating the National Plan against Hydro-geological instability with the Plan of project-feasible interventions against floods in metropolitan cities and in urban areas is a very important element to optimize resource utilization in the context of a clearer governance system. From the point of view of the hydro-graphic basin, surveys monitoring the adoption and the implementation of Hydro-geological Structure Plans have shown that the legislation that required the definition of plans on the various types of national, interregional and regional interventions has been fully implemented at all administrative levels.

In Italy, collaboration with local administrations to reduce disaster risk, in line with the Sendai Framework indications, is evident also in the process that led to the adoption of the Flood Risk

13 http://www.protezionecivile.gov.it/jcms/it/dati_di_dettaglio.wp

14 http://www.rendis.isprambiente.it/rendisweb/

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Management Plans (PRGA) in 2015 and of the PGRAs of all hydro-graphic districts except Sicily in October 2016, thus creating a tool that can effectively define which elements are exposed to flood and can improve coordination and increase the efficacy of prevention policies.

New national legislation on civil protection

One of the main novelties introduced recently in the field of combatting natural disasters is the reform of the governance system laid out by the Civil Service Code (January 2nd, 2018 legislative Decree n.1,).

This legislative decree extends the definition of the National Civil Protection Service, defined as "a utility", in particular "a system that fulfils the function of civil protection, made up of all the competencies and actions aimed at protecting life, physical integrity, assets, settlements, animals and the environment from damage or hazards caused by catastrophic events of natural origin or due to human activity".

Moreover, the new legislation lays special attention on planning, which is defined for the different administrative levels as "a non-structural prevention activity, based on prevention and risk scenarios" and which must guarantee active citizen participation during the preparatory phase. Plans and programmes for land management, protection and requalification must be coordinated with civil protection plans in order to guarantee consistency with risk scenarios and operational strategies.

For a comprehensive description of the new legislation see Annex II.

2. THE DERRIS PUBLIC-PRIVATE PARTNESHIP MODEL FOR RISK REDUCTION AND LOCAL COMMUNITY RESILIENCE - HOW TO REPLICATE IN OTHER LOCAL BODIES

Since extreme meteorological events have increased in frequency and intensity, there has been a development of an ever more widespread awareness of the need to devise natural disaster prevention and management models concerted with public and private operators, and which must **adopt insurance mechanisms to manage uncertainty** and the substantial damages.
As early as 2010, the OECD stressed how "risk funding and transfer instruments such as insurance products, can play a fundamental role in reducing the economic impact of catastrophic risks" (OECD, 2010). The European Union, in its Action 8 of the 2013 EU Strategy for adaptation to climate change coherently set itself the objective to spread insurance and financial products that are instruments able to increase resilience to climate change. **The green paper on insurance of natural and man-made calamities** (European Commission, 2013)[15] recognizes the need to **increase the penetration on the market of natural disaster insurance** and to fully exploit the potential of insurance and other financial product premiums to increase awareness of risk mitigation and prevention and for the long-term resilience of investments and commercial decisions".

15 https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=CELEX:52013DC0213&from=IT

2.1 PUBBLIC-PRIVATE PARTNERSHIP TO INCREASE THE RESILIENCE OF LOCAL COMMUNITIES

As already said, **extreme meteorological events** carry with them also an **increase** in the **cost of direct and indirect damage**, which increase the financial burden for public administration, insurers and businesses. This increases the need to devise natural disaster prevention and management models that include public and private operators. However, it is also necessary to adopt insurance mechanisms to manage uncertainty and cover the growing costs of damage. In fact, a **model of governance that includes adopting public-private insurance mechanisms** may be a strategic choice in so far as it makes natural disaster-related expenditure more sustainable for the State.

The role of insurance becomes important to forecast the characteristics of the risks, in close collaboration with the public institutions. This collaboration is necessary to identify prevention and intervention policies in order to increase the resilience, the spread and the increase in capacity and knowledge of risks among entrepreneurs and citizens.

In this context, the adoption of public-private insurance mechanisms is not only responsible for a more effective and sustainable risk distribution; it can also contribute greatly to the process of adaptation to climate change and to spread a culture of risk prevention and management, to encourage virtuous behaviour and introduce effective damage and loss management instruments. An increase in the resilience of an area and therefore a reduction in its risk exposure is an element of considerable interest to the *risk carriers* (insurance and reinsurance companies) as well as to Public Administration that must manage the territory.

Collaboration between Public Administration and the insurance sector could become one of the fundamental pillars to increase the resilience of local communities facing extreme and catastrophic climate events in Countries that have a low rate of insurance penetration (like Italy).

The transfer of knowledge and instruments, risk sharing and redistribution, the promotion of prevention and protection behaviour are all incentives to ensure sustainable development and greater competition.

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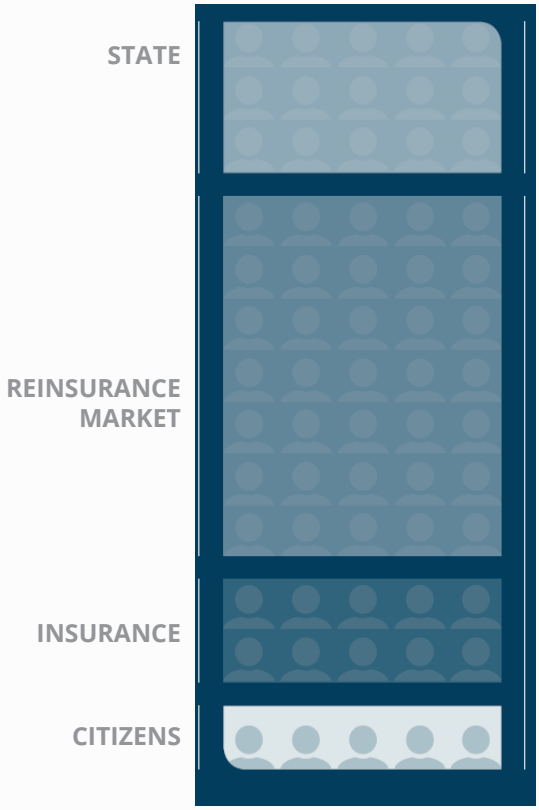
Partnership multistakeholder



Public Role vs. Private Role:

contribute to the construction of the baseline (data, maps, information); to act as a reinsurer of last resort; ensure compliance with the rules and the functioning of the mutualist mechanism; to guard the territory

transfer the risk that individuals can not (and can not) endure (protection, universality, mutualism), create incentives, transfer knowledge and tools.

Source: Unipol Gruppo, Unipol per il clima, 2015, p30

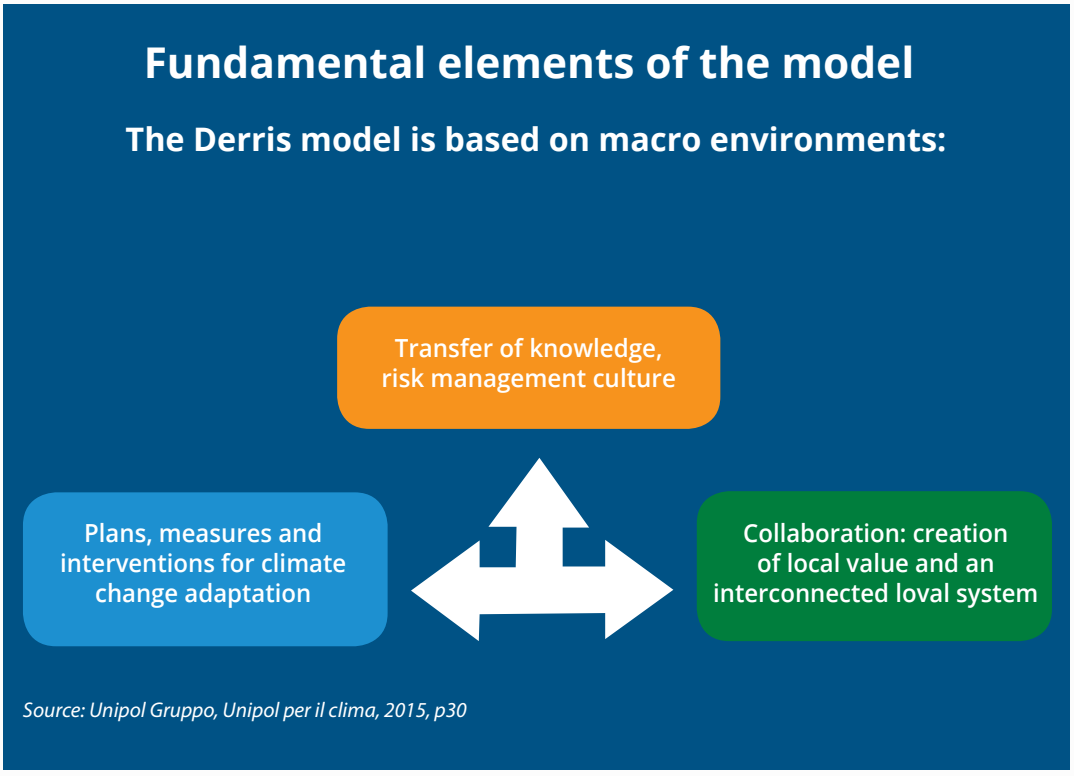
2.2 THE PUBLIC-PRIVATE PARTNERSHIP BETWEEN THE DERRIS PROJECT PAS AND SMES

The DERRIS project **public-private partnership** (PPP) model is therefore based on an assumption: the resilience of an area grows when there is an increase in the risk culture of those operating in it, in particular thanks to a transfer of competencies and knowledge of risk prevention and management, consistent with the adoption and implementation of integrated public measures within a local system that is interconnected and collaborative.

The DERRIS PPP model considered three axes:

- **Knowledge transfer to increase risk culture**: as said before, the DERRIS project contributed to the **transfer of knowledge and competencies in the field of risk and adaptation to climate change**, both **to local administrations** and to **SMEs**, by activating parallel processes aimed at completing public administration (PA) plans with measures aimed at adapting to climate change, while taking into account also the management needs of SMEs. Businesses followed ad hoc training that also gave them guidance on using the climate risk self-assessment and management tool (CRAM tool) for better risk defence and for proactive adaptation action that is useful to guarantee business continuity in case of damage caused by the 7 hazards considered by DERRIS.

- **Drawing up plans and tools for adaptation to climate change**: For the local DERRIS participants, account was taken of the prior presence of tools to plan adaptation to climate change (like for example their degree of PAESC implementation), whereas for businesses, the presence of risk management systems was taken into account. The objective of the project was to facilitate the inclusion of adaptation to climate change measures in local public administration development plans and the adoption of action plans for SME adaptation to climate change;
- **Collaboration and connections between local operators at local level**: As for the collaboration system, the initial decision was to create opportunities to involve local stakeholders (PA, professional associations, Chambers of Commerce, universities and research centres) to increase their awareness of climate change issues and the impact they can have on SMEs, and to transfer to them a framework containing the main national and international adaptation to climate change measures. As for PA, an effort was made to involve various sectors of the local administration in a across-cutting manner (environment, town planning, civil protection, public works...). During the pilot phase in the city of Turin, collaboration and connections between the various operators at local level materialized in the form of a joint PA/SME training workshop and 3 more workshops to co-design the adaptation plan for the district of the city of Turin.



These axes are adapted in an ad hoc manner to the specific territorial characteristics while still maintaining a homogeneous model structure.

Variances in the DERRIS model

From the planning point of view, DERRIS cities have reached different degrees of maturity in climate change adaptation planning. In some cases, the adaptation is linked (mainly) to managing emergencies and hazard mitigation interventions in certain specific areas but without any true integration among plans and without a complete analysis of local vulnerable points. In other cases however, DERRIS

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cities have implemented PAESC[16] with the objective of including in local development strategies, not only mitigation policies (CO_2 emission mitigation to limit the increase in the average temperature of the Earth), but above all adaptation policies (to increase the resilience of areas and communities to already active climate change), completing the Covenant of Mayors with Mayors Adapt.

Also from the point of view of the degree of connection with the local economic fabric, there are considerable differences between DERRIS participant cities: on the one hand, continuing experiences such as local agenda 21 and PAES working groups contribute to greater interaction with professional associations and local stakeholders; on the other however, in almost all cities, getting businesses involved required a greater effort with a different, more direct approach than the "vertical" chain of representation approach.

This has shown that it is difficult to achieve effective direct involvement of businesses, especially if it is done through actions that are not integrated or that are perceived as mandatory. Local administrations and businesses participating in DERRIS have drawn up a series of adaptation-related measures. As for local administrations, in particular during training workshops, stress was placed on the advantages of an approach that requires the inclusion of climate change adaptation measures in existing planning instruments, for example:

- General Emergency Plan of Civil Protection
- Operational Security Plans (POS): may refer to specific risks
- Urban Plan for Sustainable Mobility (PUMS)
- Municipal Town Planning Plan
- Operational Municipal Plan (POC)[17], which may identify specific interventions (water saving, hydro-geological structure or road layout, etc.). Businesses too can introduce many actions to reduce their vulnerability to more or less dangerous climate events. Some interventions concern protecting physical company assets such as plants and machinery. Others concern company management and organization. Finally, some fundamental measures concern emergency management, green infrastructure or interventions for the efficient use of water resources.

As for SMEs, the interventions that they have been asked to reflect on and include in their climate change adaptation action plans concern:

- PREVENTION: By **risk prevention** we mean all the measures, at times very simple (such as regular checks on certain infrastructure aspects), at times more comprehensive (in particular when the undertaking intends to do restructuring work), that reduce the likelihood of being damaged;
- MANAGEMENT: when using the term **risk prevention** we refer to all the organizational and management measures that generate procedures suitable to manage risks and interventions in case of emergencies. This includes infrastructure interventions aimed at protecting company assets in case of a potentially damaging event;
- EMERGENCY: if an **emergency** occurs it is necessary to adopt, as quickly as possible, all existing measures to secure persons and goods, and to implement all the procedures defined in the plans to guarantee operational continuity and speed up resumption of activities. For this reason, it is important that the undertaking have specific plans for emergency management and a reference person able to coordinate the operations.

16 As of October 2015, on the occasion of the Signature Ceremony in Brussels, the Covenant of Mayors set itself new more ambitious objectives and extended its range of action thus becoming the Covenant of Mayors for Climate & Energy. The changes introduced are extremely interesting and not only do they offer the possibility for non-European countries to take join, they also add contents to the old Sustainable Energy Action Plan (SEAP) that will now be replaced by the Sustainable Energy and Climate Action Plan (SECAP).

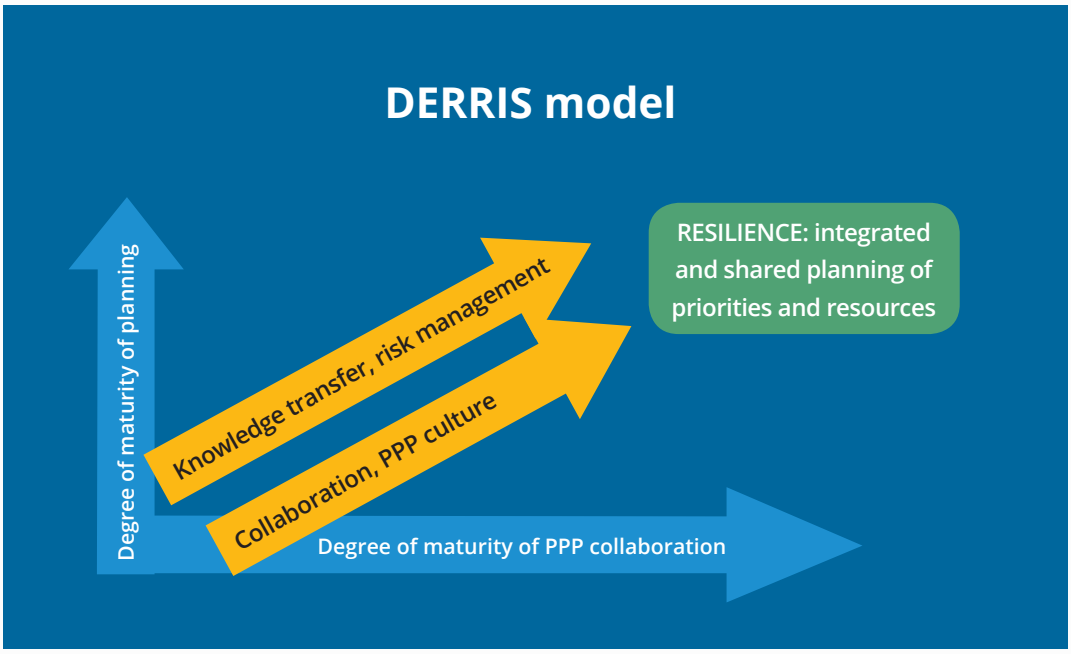
17 The Operational Plan is an executive and prescriptive plan with a time limit (the same as that of the Local Council). It is a plan that provides a time schedule for the Structural Plan, it must select the priority interventions to be activated first during the period of the Local Council and identify also the economic resources needed to carry them out.

Risk prevention and management, and climate change adaptation require effective integration between public (PA) and private action (SMEs) since undertakings, especially the smaller ones, do not have the instruments to tackle extreme climate events or to plan resilience interventions alone. For this reason, the DERRIS project started with involving the local administrations in order to activate a parallel process of adoption of climate change adaptation measures by the public sector (PA) and the private sector (SMEs).

The DERRIS model: integration, collaboration, resilience

The DERRIS model implements a mechanism that leads PAs to undertake more in-depth strategic planning and other actors to develop a greater capacity to work together and identify priorities and instruments. Through the transfer of knowledge that fosters a stronger risk culture and through participation and collaboration-based processes, DERRIS facilitates a higher degree of resilience of areas and of the economic system.

This is the structure:



The DERRIS model: from "vertical" PPP to "collaborative" PPP

The cities that took part in the DERRIS project have activated a process of pervasive involvement of internal (cross-cutting involvement of various sectors within local administrations) and external stakeholders (from the business world to the research world) for example by organizing local workshops. The idea was that PPP be based on a less hierarchical and institutional collaboration between these various operators and more on shared planning, aimed at management and efficacy.

The creation of a **local community on adaptation themes** requires a model in which every actor that is involved and participating contributes their specificity and in which a process of good practice sharing must develop in order to achieve greater resilience.

The DERRIS model highlighted how while remaining in compliance with MOU definitions, role flexibility ensured a greater awareness in all the actors and a greater efficacy in the processes. By way of example, professional associations were involved both by the Municipalities and the Unipol

Regional Councils (CRU), whereas undertakings were involved through a broad and diversified network of actors (professional associations, chambers of commerce, Municipalities, UnipolSai and Unipol Banca branches and also by other undertakings that bear witness to the project and act as ambassadors of the project). The circularity of the inclusive processes has contributed to consolidating a community made up of a broad range of different actors.

The DERRIS model: the role of insurers

In the fight against climate change, insurers have a very big part to play in so far as they have expertise and specific knowledge, which allows them to supply support and instruments to:

- **know and assess the risk**, thus increasing public awareness of disaster risks and understanding of the most vulnerable elements for citizens and businesses;
- **manage risks and emergencies**, thus contributing towards improving resilience to extreme climate events;
- **manage the residual risk**, by proposing insurance solutions.

In the DERRIS project, insurers have played the support part by transferring knowledge and know-how on risk prevention and management, with the aim of developing risk culture and the adoption of virtuous behaviour.

2.3. THE DERRIS MODEL: ACTORS, PHASES, ACTIVITIES AND INSTRUMENTS

Premise

The objective of this chapter is to describe in detail the actors, the phases, the activities and the instruments of the PPP model developed by the DERRIS project based on an analysis of the pilot case developed in the City of Turin and in the other local administrations that then replicated the project.

The ultimate goal is to produce information that will be useful to other public bodies and/or private organizations interested in replicating the model:

- by mapping out the actors to be involved immediately;
- by listing the sequence of activities to carry out in order to facilitate the success of the process both within the local administration and outside (to foster SNE participation);
- by highlighting all the instruments made available to the DERRIS project, which other local administrations interested in replicating the experience can use.

2.3.1 ACTORS INVOLVED

The DERRIS model was developed thanks to a multistakeholder partnership based on the collaboration of six different categories of actors:

Local administrations (Municipalities or Unions of Municipalities): played a fundamental role, by promoting the start of a process that is both internal (by activating an intersectoral process), and external (by involving a broad network of local actors: professional associations, multiutilities, SMEs, universities and research centres). Municipalities have specific knowledge of the local vulnerabilities, of the characteristics of the entrepreneur fabric and of the stakeholders to involve. Municipalities' ability to work in a crosscutting manner, by involving the various sectors (environment, town planning, civil protection, public works...), proved to be key to the success of the project and achieving its objectives. A further success factor was the strong political leadership that contributed to the strong involvement of all the interested parties.

Professional associations - The Chambers of Commerce: have an important part to play in connecting the SMEs and can become "ambassadors" of the project, speeding up its dissemination. For this reason, the decision was taken to involve them in the project right from the initial moments

of the process (preliminary phase) and also in the training stages (implementation phase), to increase their awareness and to guarantee the transfer of knowledge needed to involve their members. The professional associations and Chambers of Commerce can supply useful indications on the most effective way to involve businesses and on the criteria to select the undertakings to contact in a targeted manner (undertakings already struck by catastrophic events, undertakings sensitive to environmental issues, undertakings in high risk areas...). Despite this, the poor level of awareness of SMEs about these matters required increased efforts on the part of the professional associations. The direct involvement of PA and the creation of a collaborative system tend to improve the efficacy of this process.

Businesses (in particular SMEs): are the central actors of the project in so far as (very often) because of their limited budget and their small size, they do not have the instruments or staff dedicated to risk prevention and management, and tend to underestimate the consequences of a lack of checks and balances. Precisely for this reason, they were included in ad hoc training sessions, and they were provided with an instrument, the CRAM tool, that allows them to discover the risks to which their undertaking is exposed and the interventions they can undertake to prevent and manage those risks. Many of these are interventions related to integrating and improving the management and operational procedures already in place (e.g. D.lgs 81/2008 and 9001 and 14001 ISO standards).

Insurers: have played a prime part in activating, facilitating and involving stakeholders (undertakings, professional associations) at local level, transferring technical knowledge (for example to draft the contents of the CRAM tool) and offering technical support to draft company climate change adaptation action plans (thanks to on-the-spot visits to the undertakings).

Universities: have played a fundamental role in transferring knowledge and developing specific instruments, elements that were the result of the training activities organized for PA and SMEs. At local level, they can supply further useful data on the vulnerabilities of an area and they can offer support to public actions.

2.3.2 PHASES OF THE PROCESS

DERRIS project experimentation involving PA and SMEs was developed mainly in two phases.

Preliminary analysis phase

The preliminary analysis that was carried out both in the City of Turin and in the 10 local administrations that replicated the project was aimed at:

- **looking into the types of risk present in the area:** the objective is also to assess the specific vulnerability of production areas to weather and climate events (based on catastrophic events that possibly occurred in the past);
- **mapping the existing plans that contain or could be completed with climate change adaptation measures:** the objective is to map out plans that already exist or are being put into place by describing the measures undertaken to combat climate change, in particular adaptation (e.g. Plan to Combat Hydro-Geological Instability, General Civil Protection Plan, Operational Plans on specific risks; Mobility Plan; Town Planning Plan, POC;
- **selecting the production areas and industrial estates with a high concentration of SMEs in which to activate the project:** the objective is to acquire a good knowledge of the types of undertaking to involve, by taking into account also the specific risks of the area in which the undertakings are operating. In the City of Turin, the first action was to identify on the maps which areas and undertakings were to be involved in the experiment. Selection was carried out by considering on the one hand intended use of the areas with commercial and production activity propensity and on the other by assessing their risk exposure to the 7 hazards considered in the DERRIS project;
- **involving local partners and undertakings:** the objective was to identify possible partners able to help in the phases focused on involving the SMEs, actors interested in following the

project process (e.g. professional associations). This activity is crucial to the success of the project. Experience developed with these cities has shown that the involvement process must absolutely be crosscutting and pervasive (not vertical or hierarchical). Thus, on the one hand, it is necessary to create a dialogue between the undertakings and PA not only by sending out communications, but also through the Municipality's willingness to enter into a dialogue with the undertakings in a proactive manner both in the preliminary phase (to explain the project and the benefits undertakings can draw from it) and in the implementation phase (by having Municipal reference staff present during the training courses and the on-the-spot visits to the undertakings). On the other, it is now clear that it is particularly useful to involve professional associations in the initial phase of the process in order to map out the types of undertakings to be involved (per sector and per area) and to avoid setting overly restrictive criteria.

Experience with this project has shown there are some characteristics that can help to identify the undertakings best equipped to be involved. Elements mentioned are for example: certification (ISO 9001, ISO 14001), past weather or climate event damage experience (direct or indirect), proximity with external risks (river...), undertakings that supply large companies / multinationals (that are tending ever more to require climate risk assessment of their suppliers), the existence of projects and working groups that can facilitate the involvement of undertakings.

In Turin, the preliminary phase lasted from September 2015 to September 2016. In the other 10 cities that took part in the project, the preliminary phase took place during the drafting of their expression of interest and during the organization of meetings with the reference staff from the various sectors of the Municipality during the organization of local workshops.

In Turin, the selection of the undertakings began with selecting the ATECO codes of the undertakings present within the city perimeter[18]. To get the SMEs[19] involved, three workshops were organized in collaboration with the professional associations. The Municipality sent out 760 letters signed by the Mayor and the Environment Councillor with an invitation to take part in the workshop dedicated to presenting this project and the "Torino che protegge" pilot project. After an initially poor response rate (3 participants in the first workshop), the officials of the City of Turin contacted the undertakings directly in collaboration with the professional associations (CNA, Chamber of Commerce, Consorzio ambientale Castello di Lucento, API, Compagnia delle Opere, Lega Coop and UNI) by visiting their operational headquarters. At the end of this effort, 32 expressions of interest were collected.

Considering the difficulties encountered by the City of Turin to involve businesses in the project, cities are advised:

- Not to restrict the panel of undertakings to be involved (dimensions, type of production,location...)
- Not to base the involvement process on a vertical and formal/bureaucratic process (sending e-mails, organizing meetings): one-to-one contacts with the undertakings to explain the project and increase awareness have proved to be fundamental;
- To ensure that the Administration is willing to listen to the needs of the SMEs.

18 These data were collated through a query to the Chamber of Commerce data bank and the remap service applied to GIS.

19 The invitation was sent out to undertakings with operational headquarters in one of the areas identified for this experimentation project, between 5 and 250 employees and which comply with City administrative and tax rules.

USEFUL DOCUMENTS AND INSTRUMENTS

- DERRIS project leaflet;
- Brochure for undertakings;
- Video of the project;
- CRAM tool tutorial.
- Video with the testimony of Turin undertakings

Implementation phase of the project

The implementation phase of the project includes the following activities:

- **Activating an internal process to involve areas/functions**: To encourage the inclusion of climate change adaptation measures in existing plans and instruments it is necessary to involve all Municipality sectors involved in the issue (environment, civil protection, town planning, public works, green areas, mobility...). In Turin, this process of involvement led to the setting up of an inter-departmental working group (cf box below). This aspect proved to be important also in the 10 cities, given that the objective was to encourage including adaptation aspects in their plans.

Within the City of Turin, a technical group was set up to follow the preparation of the District Adaptation Plan. The technical group covered a number of areas and services and took part in the training activities and the meetings required by the project, which showed that it was necessary to create an inter-departmental group formalized by a City Council decision. The creation of this group does not end once the DERRIS project is completed, it becomes the body that follows the activities of the city action plan and the commitments entered into voluntarily by the Administration in the field of mitigation and adaptation.

ADVICE FOR OTHER CITIES

- include training courses on climate change-related risks in the City training plan and involve various services;
- set up a group involving all City Councils to coordinate the actions, including actions undertaken on a voluntary basis, undertaken by the City in the context of climate change, risk management and civil protection;
- recognise the need for crosscutting political and technical coordination.

The transfer of knowledge and competencies on risk prevention and management:

- The objective of **Public Administration training** was to increase the **awareness** of the various sections of local government of the expected impact of climate change on their specific territory, to **develop knowledge** about the adaptation processes that could be adopted in the various fields of action of the Municipality and those that can be implemented in undertakings.
- The aim of the **SME training courses** was to offer them **technical support free-of-charge**, in order to transfer more knowledge of risk prevention and management to them and this was

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necessary to teach them how to make a more precise assessment of their vulnerability to weather and climate events. In this case, the training proved to be useful preparation for filling in the instrument for risk self-assessment defined by the project, the **CRAM tool,** that offered guidance to entrepreneurs in the form of details and suggestions, thus helping them select the actions to include in their climate change adaptation action plan (CAAP). The possibility for undertakings to benefit from an **on-the-spot visit** by project experts, who helped them understand on which points to concentrate their adaptation actions also proved extremely important.

Both types of training showed how necessary it is for these operators to collaborate in order to reduce risks and minimize the consequences of weather and climate phenomena thus increasing the security of the city and its citizens.

USEFUL DOCUMENTS AND INSTRUMENTS

- Web training sessions and e-books produced by Cineas
- Toolkit for PA: contains all the training material used by the trainers during the training sessions with the local administrations;
- Toolkit for businesses: contains all the training material used by the trainers during thetraining sessions with the SMEs;
- Report on training activities: it illustrates all the contents, the objectives, the recipients and the instruments used during the training carried out within the DERRIS project

- **Inclusion of adaptation measures and in the case of the City of Turin, adoption of an integrated District Adaptation Plan (IDAP) --**

  The city adaptation plan, IDAP, was developed following these phases:

  - The training programme described in the previous paragraph that was horizontal and intersectoral and widely followed by many in the Municipality; it led to uniform staff knowledge. At the end of the training programme an interdisciplinary working group was set up;
  - Involvement of the stakeholders: this process was activated and strengthened thanks to co-design workshops, and it consisted of 8 information days that involved 57 external operators amongst whom GTT – IREN - AMIAT (IREN) – SMAT - ARPA PIEMONTE and various departments of the Municipality. What proved to be fundamental for the activation of this process was the proactivity and the commitment of the Municipality to involve and develop relations with external actors (undertakings and professional associations);

During the process of drafting its district adaptation plan (IDAP), the City of Turin undertook a process of active stakeholder co-involvement that led to the organization of three co-design workshops:

- The first meeting set out to share concepts of resilience and shock stress as well as draw up an inventory of the measures already in place and those to be adopted. The exchange of experiences with stakeholders is structured in two working groups: public sector and undertakings/associations;

- The second meeting focused on the undertakings taking part in the pilot experiment: information on the expressed needs concerning the main requirements in terms of interventions deemed necessary for the contributions of the DERRIS experience to turn into action;

- The third workshop was aimed at PA, public service businesses and professional associations. Its objective was to present and discuss the contents of IDAP, in particular to share the action plan.[20]

USEFUL DOCUMENTS AND INSTRUMENTS

- Report on the co-design workshops;
- IDAP
- http://www.comune.Torino.it/ambiente/bm~doc/idap_28maggio2018-c1b1207-c.pdf

2.4.3 INSTRUMENTS

As already mentioned, the DERRIS project created a series of instruments that were developed during the Torino pilot experiment and later tested when the project was extended to the 10 cities. The objective of this paragraph is to describe them in greater detail. These instruments are at the disposal of anyone wanting to replicate the project.

The main instruments are:

- The climate risk self-assessment instrument (CRAM tool)
- The climate change adaptation action plan for undertakings (CAAP)
- The district adaptation plan for cities (IDAP)
- Web training
- Other material needed for training

The CRAM tool

This project has developed a simple immediate instrument that offers SMEs the opportunity to understand to which risks they are exposed in case of extreme weather and climate events, and which solutions could be applied to their undertaking to prevent damage. This instrument, called the "CRAM tool" (Climate Risk Assessment Tool) supplies the undertaking with a series of information about the level of hazardousness of the area in which the premises to be analysed are located. Subsequently, the undertaking is asked to fill in a questionnaire aimed at investigating the degree of vulnerability from the point of view of the 7 weather and climate hazards analysed by DERRIS (floods, rain, wind, hail, lightning, temperature and landslides). The tool analyses 2 further matters: water efficiency and resilience. Based on the answers supplied by the undertaking, the tool selects a series of suggestions for interventions to prevent the risk, manage the risk and manage the emergencies that the undertaking can select and include in its climate change **adaptation action plan** generated automatically by the tool. Therefore, the self-assessment carried out using the tool supplies three main pieces of information to the undertaking:

20 http://www.comune.Torino.it/ambiente/cambiamenti_climatici/life_derris/primo-workshop-di-co-design.shtml
http://www.comune.Torino.it/ambiente/cambiamenti_climatici/life_derris/2-workshop-di-co-design.shtml
http://www.comune.Torino.it/ambiente/cambiamenti_climatici/life_derris/3-workshop-di-co-design.shtml

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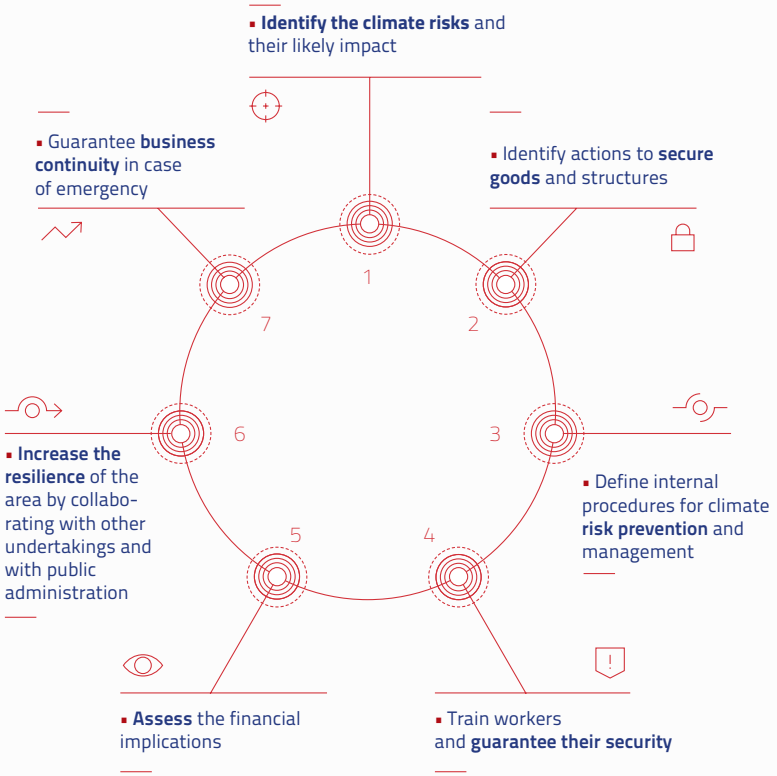
- **The degree of hazardousness** of the area in which the undertaking is located from the point of view the 7 hazards analysed by DERRIS;
- **The risk level** of the undertaking prom the point of view of these 7 hazards;

The index of resilience of the undertaking: the tool gives indications as to the current and the prospective index (if the undertaking carries out the interventions in its action plan).

All undertakings, from the largest to the smallest, must protect all the tangible and intangible production factors they have. In other words, they must safeguard the fundamental elements upon which their value creation process is based. Climate change-related risks may undermine the ability of an undertaking to exist and to resist on the market, from its very roots. **Safeguarding company assets, managing emergencies and ensuring continuity of operations** after a disaster, are the 3 fundamental passages that make an undertaking resilient.

To do so, the DERRIS project has identified a process based on 7 steps that have been summarized in an **index of resilience**, which allows the undertaking to verify (regularly) which steps they must carry out. The index developed by DERRIS draws inspiration partly from the model used by UNISDR in the context of the "Making Cities resilient - My city is getting ready" campaign, which is made up of 10 key aspects that define the degree of resilience of an area, and partly from the model developed by the European U-Score project. The DERRIS resilience index is based on a re-processing of both models thus adapting them to the field of application of the SMEs and the dimension of the public-private partnership.



The climate change adaptation action plan for undertakings (CAAP)

The DERRIS project climate change adaptation action plan is a document that is generated automatically by the risk self-assessment tool. The CAAP is a summary document containing the result obtained by completing the CRAM tool, and it lists all the actions already under way or that the undertaking has decided to undertake to improve its resilience to climate change. It is a voluntary document aimed at offering guidance to undertakings in order to increase their resilience.

The district adaptation plan for cities (IDAP)

The DERRIS project provided that the City of Turin, the pilot city of the project, draft a District Adaptation Plan (IDAP). The IDAP is the result of a public-private partnership process that is the first important step for a City to build an adaptation strategy and then draw up a climate change adaptation Plan. The objective of this document is to define the actions the City commits itself to adopt in order to reduce the risks for Small and Medium Enterprises (SMEs) and trigger the process to increase the resilience of the Turin area to climate change. IDAP contains a series of actions:

- Pursuing relations with the "Torino che protegge" pilot project undertakings or CAAP and experiment monitoring
- Replicability in other undertakings
- Integration with other European projects and the experimentation undertaken by the City
- Concrete launching of the inter-departmental WG activities offering help to create a strategy and a city climate change adaptation Plan (knowledge sharing, definition of new standards and updating existing plans and regulations)
- Verification of inclusion of mitigation and adaptation aspects into urban transformation processes through the VAS (Strategic Environmental Assessment)
- Proposal to include the DUP (single programming document) mitigation and adaptation guidance
- Strengthening adaptation capacity thanks to action to communicate and increase awareness of available information regarding climate change

When pursuing activities beyond the end of the project, the implementation of these actions will depend to a large extent on the City's internal coordination through the involvement of its various Services, and externally through its relations with other Bodies and Authorities in the area. The City's capacity to trigger the participation of civil society and business circles will also be essential.

Web training

The DERRIS project has produced two videos that last respectively 10 and 13 minutes as a training tool, and also to facilitate the use of the Cram Tool on the part of SMEs that have not taken part in training courses directly. The videos can be consulted on the project website and can be seen on YouTube. The first video is about climate change and related risks whereas the second one is about risk assessment and management and related risks. For those who would like to replicate and study these matters further, the DERRIS project has produced two "e-books" as training instruments on the subject of impact and management of climate change risks and emergencies.[21] Cineas who also organized all the training activities within the project produced the videos and e-books.

Other materials

As well as web training, all the presentations used by trainers during the training sessions have also been made available on the project's website. Finally, other materials have been published such as brochures and leaflets, in order to disseminate initiatives, share the results and create a national community of businesses and Public Administration.

21 The videos can be found at this address: http://www.derris.eu/valuta-il-rischio/toolkit-per-le-imprese/

3. LESSONS LEARNT

Premise.

Adaptation policies are to be included in a long-term vision context that goes well beyond the limited time period of a City Council's mandate, and implies a complete 360° review of the development and the structure of the area for its future development (not only up to 2020, but beyond that, until 2050 at least, in line with European strategies)**.**

3.1 STRONG POINTS AND WEAKNESSES OF THE MODEL

The DERRIS project development process identified a number of characteristic elements that contributed to achieve its objectives. For the sake of project replicability, the following elements are worthy of mention.

STRONG POINT	WEAKNESSES
➜ Crosscutting ➜ Sustainability of the project. ➜ Proactivity. ➜ Dedicated training ➜ Commitment.	➜ The economic resources needed to implement the actions. ➜ Difficulties creating a PAM/SME dialogue. ➜ Difficulty PA encounter in involving the entire Municipal Administration. ➜ Paradoxical business involvement dynamics. ➜ SMEs difficulty in perceiving the experimentation as an opportunity. ➜ Misalignment between owners and user of builkdings. ➜ Dimension of undertakings.
OPPORTUNITIES	**THREATS**
➜ Collaboration between the various municipalities in a Metropolitan City.	➜ Difficult interaction between the various levels of public administration.

Strong points

Crosscutting. It is essential that the local structure be involved in its entirety in order to predict and develop adaptation actions. One of the peculiarities of the "Torino che protegge" pilot project case was the creation of an inter-departmental group, made up of ca 30 persons, managers and officials, which stemmed from training sessions promoted by the DERRIS project and further discussion meetings, and was set up formally by a Council decision. The group is active and its objective is to offer support in drawing up an adaptation strategy and an adaptation Plan that include the other local government instruments in order to help generate a new climate adaptation culture in the various local government departments and draw up a climate change adaptation action plan that responds to the voluntary mitigation and adaptation policies to which the city has subscribed.

Sustainability of the project. Thanks to the creation of the working group and to the definition of the IDAP Action Plan, the objectives pursued by DERRIS will be developed and strengthened further even after the project has ended and will be transformed into new involvement actions.

Proactivity. The proactive role of the City proved to be fundamental in the process of involving undertakings. There has been a shift from a unilateral type approach whereby the City provides information, to a circular approach whereby the City enters into a dialogue with undertakings thus also receiving suggestions, at times very practical suggestions, from them.

Targeted training. The **transfer of knowledge** operated by the project was extremely useful to align the climate change adaptation knowledge of municipal staff belonging to **different departments and sectors**. The training sessions are considered as a trigger for the across-the-board involvement of municipal staff with a view to include adaptation measures in existing local-level plans.

Commitment. A motivated municipal body will take part in and develop the project in a more effective manner. To this effect, what proved to be essential is the political commitment promoted by institutional City figures (Mayor and/or Councillors) and this was made evident by the signing of the Memorandum of Understanding and also by the capacity to promote and implement concrete adaptation measures. However, as well as the commitment, what proved to be equally important is the competence and the motivation of the managers and officials in charge of operational planning and implementing the interventions and the projects. Therefore, in order to enhance and strengthen knowledge and competence, it is fundamental to offer training in climate change adaptation themes to all levels of technical reference figures in administration (managers, officials, technical experts). To achieve effective internal commitment, it is of strategic importance to create and then formalize an internal inter-departmental group thus appointing participants from the various departments (environment, town planning, infrastructure, construction, mobility, green areas, treasury, etc.).

Weaknesses

Economic resources needed to implement the actions. The absence of a specific budget available to the Municipalities that took part in DERRIS in the experimental phase created difficulties with working hours to dedicate to the project in addition to routine activities.

Difficulty creating a PA/SME dialogue. The experimental phase of the DERRIS project highlighted the difficulty of creating a dialogue between Public Administration and SMEs: Cities often do not have communication channels and instruments that are adequate and effective in the dialogue with SMEs, as those available to them tended to be the usual rigid tools. However, many businesses appreciated the dialogue with the local authorities in the cases where "out-of-the-ordinary" dynamics were generated, such as on-the-spot visits to the undertakings. When disseminating the DERRIS project, communication between undertakings, with the undertakings that took part in the experimentation describing their experience, proved to be generally more effective.

Difficulty PAs encounter in involving the entire Municipal Administration. With no formal obligations and no allocation of specific economic resources, when the City is not an official partner because it joined at a later stage, the obligation to collaborate is not felt as strongly and the degree of collaboration becomes a variable of political and managerial commitment. This phenomenon makes it even more complex to get the entire municipal structure involved, as this process requires identifying clear and widely shared objectives.

Paradoxical business involvement dynamics. In most cases, the undertakings that took part in the project are the ones that were already aware of basic environmental issues and had adopted/undertaken adaptation measures thus reducing the impact of the risks to which they are exposed. These dynamics tend to generate a paradox whereby the undertakings that would benefit most from training to undertake risk self-assessment are the ones most difficult to involve; on the other hand, the most active undertakings are the ones that are already the most aware of the problem. To this

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effect, it is important to exploit the most proactive business cases and offer more visibility to the positive results of the activities they undertook, through concrete examples and by recording and showing how, in the case of disasters, the more aware businesses proved to be more resilient, thus reducing the level of impact.

SMEs' difficulty in perceiving the experimentation as an opportunity. SMEs consider commitment to environmental and climate-related risks an element not directly linked to business objectives and therefore potentially an increased cost and a burden to business. The difficulty of transferring a general and global concept such as climate change adaptation into the operations and the management of individual businesses has now become very evident. Greater awareness of the risk and of how intervening on damage after the event and not adopting prevention measures to reduce the risk before the event may impact the finances of a business can only be achieved through targeted training and by following the process undertaken by DERRIS. However, it is fundamental to be able to quantify the effects and the benefits of interventions in economic terms. It is therefore necessary to study risk prevention-related economic benefits in greater detail to promote the project using a more business-like language. In particular, the project highlighted the difficulty in involving businesses actively in an issue of global dimensions such as climate change adaptation.

Misalignment between owners and users of buildings. In small business, the user who occupies the premises is often not the owner: many businesses operate in premises they have rented. From the point of view of adaptation measures, these situations are even more difficult, since it is the owner who has to pay for the interventions whilst it is the user who benefits from them. Introducing specific parameters in the property condition assessments of commercial buildings can solve this problem.

Micro-businesses. The dimension of the businesses involved, often less than 5 employees, has highlighted the already known difficulty of identifying company staff dedicated to assessing and managing climate adaptation-related risks.

Future challenges

Difficult interaction between the different levels of government (State, Regions, Municipalities). In order to be tackled effectively, climate change has to be mainstreamed, through the alignment and the multi-level integration, both from the point of view of the need for consistent political choices and regarding operational and instrumental cooperation (for example sharing data and information). The Turin case is a positive example of collaboration between the City, the Region and ARPA, which contributed to the success of the "Torino che protegge" experimentation and to drafting the IDAP. However, this issue is still a challenge for many territories where this kind of cooperation appears to be more difficult.

Collaboration between the various municipalities within a Metropolitan City. One aspect not tackled, or only marginally, by the "Torino che protegge" experiment is the metropolitan dimension. In particular, it is important to develop cooperation between the various Municipalities within the Metropolitan City in order to produce a climate change adaptation Plan for the metropolitan area, which could be drafted following the strategic plan model.

3.2 GOOD PRACTICES OF THE PILOT: "TORINO CHE PROTEGGE"

In the experimentation led by the City of Turin, the DERRIS project developed two business case good practices achieved in different contexts, which introduced innovative elements.

1) The first case regards hospitality structures and EU Ecolabel certification.

Open 011, the House of interculture and youth mobility is a tourist hospitality structure owned by the City of Turin, run by a social cooperative. Thanks to the "Torino che protegge" DERRIS experimentation, Open 011 adopted mitigation and adaptation measures, in collaboration with Area Ambiente.

- An ARPA weather station has been installed to collect precise weather data as well as two internal temperature and humidity detectors. The experimentation includes the creation of a green infrastructure (green roof/walls) and the sharing of pre and post- intervention data aimed at verifying its beneficial impact in terms of micro-climate (adaptation) and energy saving (mitigation).
- The innovative element of these experiments is that they have an impact not only on positive actions within the structure, but also on cooperation with other projects Interreg IVC Alcoltra APP. VER., and the EU Ecolabel intends to disseminate these good practices not only on special occasions but routinely.

a) Internal and external temperature monitoring with data loggers;
   1) and weather station;
   2);
b) creating green walls and roof on the multipurpose hall;
c) comparison of energy consumption before and after the intervention;
d) publication of the monitoring and the results obtained on the institutional website;

2) The second case is that of the **Consorzio Ambientale Castello di Lucento** that is one of the six pilot areas of "Torino che protegge". Approximately one third of the pilot project businesses participate in it.
This case shows that the DERRIS project can offer valid help to businesses also regarding voluntary certification processes and can therefore become a further incentive. For example: the Consorzio adapted the UNI ENI ISO 14001 standard to the 2015 standard. In this phase, thanks to the collaboration stemming from the DERRIS Public Private Partnership, the Consorzio included in its environmental policy also aspects linked to social issues, to mitigation and to climate change adaptation, all of which generated a new approach and new procedures, for example procedures regarding water recovery, the creation of green walls and roofs, and the dissemination of Green Public Procurement.

3.3 RECOMMENDATIONS AND PROPOSED LEGISLATION.

Premise.

The data stemming from the fourth Cineas-Mediobanca Observatory , of September 2016, regarding the dissemination of risk management in Italian medium-sized enterprises show that 27,5% of enterprises declare they do not have a risk management system and as for the perception of extreme climate event risk, only 30% of businesses fear its impact on sales, 31,7% on supplies and just over 27% on production, whereas ca 62% of businesses protect themselves with a dedicated insurance policy against climate risks.
The above data examined medium-sized enterprises, however, since according to the most recent ISTAT data, 88% of Italian enterprises are "micro businesses" with less than five employees, the data should be corrected drastically downwards thus painting an alarming picture of Italian businesses' perception of extreme climate change-related risks.

The experience developed with the DERRIS project also showed that businesses do not have sufficient staff to dedicate to further studies on risk assessment and to planning actions to define a company plan to combat the potential effects of a catastrophic event determined by climate events. Moreover, the economic figures, in other words the availability of resources, is another discriminating factor for the initiation of activities needed to define a company plan and to undertake the necessary interventions.

Proposals and recommendations to involve SMEs

How to involve businesses

Based on the experience gained with this project, the most effective way to involve businesses is word-of-mouth among short networks based on experience-related elements and data. The trust element plays an essential part.

Macro-categories of intervention considered able to modify the behaviour of businesses positively follow below.

Recommendation 1: *Introduce Voluntary Instruments*

When disseminating practices aimed at sustainability, there is a clear trend now shifting more and more from the "command and control" approach to practices based on environment management planning, which include involving all levels of PA, businesses and citizens.
Therefore, over the years, instruments of a "voluntary" nature have taken over for the dissemination of policies aimed at sustainability and reducing the impact of business activities on the environment, (e.g. Ecolabel/EMAS) and all this has also had a positive effect on the marketing of products and services already offered on the market.

1.1 *Proposal.* It is therefore deemed desirable to introduce a ***reward system*** in ***public tenders*** by adding reward criteria in the procedures for the selection of suppliers, to favour businesses/organizations that have already adopted/implemented adaptation measures. The reward system could take the form of incentives and tax rebates by including special provisions in municipal regulations, for example in building rules or rules governing public land use, or in the application of municipal tax on buildings, etc. for example with volume/surface area-based incentives.

1.2 *Proposal*. Adopt incentive mechanisms for businesses undertaking mitigation and adaptation action, even at district level, as well as a possible review of Green Public Procurement rules thus adding a reference to risk mitigation action to the procedure whereby the PA entrusts the supply of services to businesses (if a company reduces its risk exposure it is more reliable from the

point of view of continuity in its supply of goods/services).

1.3 *Proposal*. One possibility worthy of consideration is the introduction at regional level (with a provision linked to land use plans) or at municipal level (with a provision linked to PGT (land management plan)/PU) of **territorial brands** intended as similar mechanisms of a voluntary nature but relating to climate risk - e.g. "area protected against climate risk" district mark. Certified businesses would have privileged relations with financial operators (banks / insurers) for access to credit.

1.4 *Proposal*. Another possibility is to use **Programme Agreements** to be promoted at national level and adapted to regional conditions, with the involvement of the businesses' professional associations, be they productive or commercial, and also banking and insurance associations to promote financial instruments useful to facilitate access to credit for investments aimed at reducing company exposure to risks caused by climate change-related catastrophic events. Programme Agreements could be considered as "pilot" interventions in preparation for the introduction of mainstream rules in for example information systems, see below.

Recommendation 2. ***Tax exemptions***

A study carried out by the Chamber of Deputies in collaboration with CRESME[22], has observed that between 1998 and 2017, tax incentives for housing regeneration and energy renovation were granted to 16 million households, which represents 62% of the Italian total as estimated by ISTAT, amounting to 25.9 million Euros. These measures activated investments worth 264 billion Euros, 229.4 billion for housing regeneration and 34.6 billion for energy renovation.

In this context, following the example of incentive measures for energy renovation in the 2018 budget, and given the success achieved[23], the intention is to introduce ***tax exemption measures*** linked to adaptation interventions, with less funds than those granted to energy efficiency for example (a special **Climate Adaptation Bonus** could be created or a else a special dedicated item could be added in the Housing Regeneration Bonus).

Recommendation 3 ***Legislative instruments***

Another effective measure could be a set of provisions implemented in the sectors linked to the activities of the undertakings, such as:

3.1 SAFETY AT WORK PROVISIONS.

Consider climate risk in the context of Legislative Decree (D.Lgs.) 81/08 for the drafting of the risk assessment document (DVR). Even though this is already possible according to a broad interpretation of the legislation, in practice, climate risk is not taken into account in the analysis, therefore it would be advisable to inform and train all persons in charge of risk analysis;

3.2 CIVIL PROTECTION LEGISLATION

Envisage civil protection drills that include businesses, in compliance with the provisions (see the case of the II Seveso Directive (Directive 96/82/EC);

3.3 INFORMATION SYSTEM LEGISLATION

Enhance the SMEs able to identify the environmental, social and governance risks (ESG) to which they are exposed – including climate change-related risks – possibly also by introducing them as selection criteria for acceptance into Individual Saving Plans (PIR), so as to facilitate their access to the capital market.

22 http://documenti.camera.it/leg17/dossier/pdf/Am0051d.pdf

23 Example: the 2018 Budget establishes a chapter in the National Energy Efficiency Fund about the issuing of guarantees for transactions that finance energy requalification interventions. The government report estimates that the 50 million Euros made available every year for these guarantees will generate investments amounting to over 600 million Euros.

3.4 NATURAL DISASTER PREVENTION AND MANAGEMENT MODELS SHARED WITH AND ACCEPTED BY THE PUBLIC AND PRIVATE ACTORS

Extreme weather events entail higher direct and indirect damage costs that increase the financial burden of public administration, insurers and businesses. This increases the need to come up with natural disaster prevention and management models shared by public and private operators. Of course, it would also be necessary to implement insurance mechanisms to manage the uncertainty and cover the growing costs of the damage. A governance model that includes adopting public-private insurance mechanisms could be a strategic choice in so far as it makes disaster event expenditure more bearable for the State.

The role of insurers is important to forecast the characteristics of the risks, so long as it is done in close collaboration with the public institutions. This collaboration is needed to identify prevention and intervention policies in order to increase the resilience, the spread, the increase in capacity and the knowledge of risks among entrepreneurs and citizens.

In this context, adopting insurance mechanisms of a public-private nature is not only responsible for a more effective and sustainable risk distribution but it can also make an essential contribution to the climate change adaptation process and help spread risk prevention and management as well as encouraging virtuous behaviour and introducing effective damage and loss management tools. Increased resilience and therefore reduced risk exposure are elements of great interest both to the risk carriers (insurance and re-insurance companies) and to the Public Administration that has to manage the area.

Collaboration between Public Administration and the insurance sector can become one of the fundamental pillars in the Countries that have a low rate of insurance penetration (like Italy), to increase the resilience of their local communities facing extreme and catastrophic climate events. Transferring knowledge and instruments, sharing and redistributing the risk, promoting prevention and protection behaviour are all incentives to ensure sustainable development and greater competitiveness.

This model works if the risk is widely distributed. Building a governance model that includes the adoption of insurance mechanisms of a public-private nature not only makes disaster event-related expenditure more sustainable for the State coffers and saves society from having to pay the overall costs, but also promotes a higher level of attention and knowledge of climate change-related risks thus triggering virtuous protection, prevention and adaptation behaviour. It is worth stressing that costs borne by the State are passed onto all taxpayers in a uniform manner even when the damages are of an individual nature and in many cases they could be avoided by implementing risk prevention actions.

The premium for a risk is in fact determined by weighing the level of exposure of the single ensured party: the lower the exposure the lower the cost of the policy. Moreover, insurance works thanks to a mutuality mechanism that distributes the risk between the most vulnerable (families and SMEs) or the most exposed and the best equipped technically (national insurance companies and the international insurance market) or less vulnerable. In a scenario such as that of Italy, characterized by an extremely low propensity to insurance, the insurance model alone cannot work. The risk of anti-selection (the phenomenon whereby only the most exposed to risks take out insurance) and the high risk of moral hazard (the phenomenon whereby virtuous behaviour is not chosen because the right incentives to do so are not in place), do not make the model economically sustainable. The role of the legislator is to define the rules of the system and lay down the conditions so it can work, thus generating a reference market that aligns demand and supply in an efficient manner, and it is his duty to intervene when there are needs that are not met by the market. Trying to publicise the mutuality principle of risk coverage thus making insurance coverage more widespread can do this. Another

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alternative could be to apply economic incentives to insurance premiums and to the adaptation plan interventions in order to generate virtuous behaviour. For example what could be done is extend the insurance policy tax exemption that was introduced for private residences to SMEs, and link these incentives to a climate change adaptation plan with risk mitigation and prevention measures.

4. SUPPLEMENTING EU LEGISLATION ON ENVIRONMENT MANAGEMENT/ CERTIFICATION SYSTEMS WITH DISASTER RISK PREVENTION ACTIONS.

It would be necessary to add references to natural disaster risk actions to the two main environmental certification instruments that include an Environmental Management System (EMS) for businesses and production plants, as per the ISO 14000 rules and to the EMAS regulation. This also in order to put the above-mentioned instruments in line with the actions undertaken by businesses and PA to mitigate (and partially adapt to) the effects of climate change (e.g. green roofs, treews).

5. SURVEY ON COST – BENEFITS IN THE FIELD OF PREVENTION

It is suggested that the Parliamentary Environment Committee carry out a survey to estimate the cost-benefits of prevention actions in order to identify precisely the costs linked to damages paid by the State (Regions) for damage caused to businesses by climate change-related disaster events. As for the benefits, the investigation could assess the impact of a possible measure to facilitate the implementation of risk prevention interventions (e.g. tax exemption) as compared to activating the total volume of investments and jobs, with the aim of calculating the overall balance of potential tax incentive measures.

LOGICAL SUMMARY OF THE PROPOSALS

Type of intervention	Action	Level of government/legislation
Voluntary instruments	Disseminate low risk territorial marks also thanks to territorial planning instruments.	Government/Regions Local administrations (Mountain Communities, Unions – Networks – Aggregations of municipalities, Metropolitan cities and networks) and Local bodies (Cities)
Voluntary instruments	Introduce reward criteria in public tenders.	Government, Regions, Local administrations
Voluntary instruments	Programme agreements	Government/Regions Banking and insurance system Business representatives
Economic instruments	Tax exemption measures.	Central government, Regions
Legislative instruments	Review work place safety rules to introduce references to climate event risk prevention plans	European Union Central government, Regions
Legislative instruments	Dedicated EU/national/regional funds	European Union
Legislative instruments	Operational civil service indications concerning company drills	Central government, Regions
Legislative instruments	Integrating EU environmental management/certification systems with disaster-related risk prevention actions	EU Commission/Parliament
Studies and Research	Survey on cost-benefits in the field of prevention.	Commission/Parliament.

Proposals and recommendations for Public Administration

Our Country has only started tackling the issue of climate adaptation in a systematic manner in very recently. The Ministry of the Environment has completed the National Climate Change Adaptation Strategy and it was adopted on 16 June 2015.
This Strategy was followed by the National Climate Change Adaptation Plan, which describes actions, including financial measures that are indispensable to implement adaptation actions. The Plan also contains an analysis and a proposal regarding possible participatory tools and indicators for monitoring and assessing the effectiveness of adaptation measures. It is a working basis for all levels of government and parliament to plan secure financial resources to facilitate the adaptation process at all levels.

As highlighted by the Plan, the implementation of adaptation action must be closely focused on the local scale, as it is mainly at this level that the climate-related impact and therefore the benefits of adaptation action are felt directly. However, to date, only a limited number of regional and local administrations have drawn up regional and local adaptation plans. This is due to the lack of dedicated resources and the complexity of the actions to be implemented, which require in-depth studies that in turn require a considerable administrative and participatory effort internally and more effort externally to create a dialogue with the many stakeholders.

The National Strategy has highlighted the following fundamental elements that are necessary to undertake adaptation strategies and plans:

- Create right from the start a broad participatory process in which all documents are shared in the various phases of the work
- Consider a mix of options (measurers, strategies and policies) for sectoral and intersectoral adaptation.
- Plan at different time scales: 2020 – 2030 – 2050
- Link the short-term measures with the long-term options.

It is the role of the Regions to offer guidance to local government and to define regional strategies and objectives aimed at guaranteeing:

- the creation of a reference framework from which shall stem the strategies, policies, objectives and measures of the lower-level of administration, for the entire area and for local territories,
- the provision of measures that offer guidance and support to the local adaptation measures when planning the various European and regional structural funds,
- support the dialogue between local administraions and productive sector to define specific sustainable and coordinated actions;
- foster, support and carry out pilot actions.

In the light of this, adaptation can only be defined by identifying multi-level governance models able to ensure that the cross-cutting interventions and actions defined and implemented transpose the guidelines of the National Climate Change Adaptation Strategy (SNAC) and the related Plan (PNACC), without which these instruments will not produce the set results.[24]

Proposals

Recommendation 1. ***Uniform terminology in legislation***

As is known, territorial governance is up to the Regions. This means that there is a very diversified situation from Region to Region both in terms of legislation and guidelines.
Proposal: Update legislation on land governance and planning (up to the Regions) by adopting

24 http://forumpa2017.eventifpa.it/it/2017/04/13/ruolo-della-pubblica-amministrazione-nelladattamento-ai-cambiamenti-climatici-un-approfondimento-forum-pa-2017/

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homogeneous guidelines for climate adaptation planning at the various levels and mainstreaming the subject of adaptation in regional sectoral plans / legislation.

Recommendation 2. ***Introduce interventions that cover vast areas***

To be truly effective, the dimension and the complexity of the climate change phenomenon and its impact require supra-municipal interventions that are integrated into the various levels of government. Proposal: in order to create a coherent legal framework, the Ministry of the Environment is advised to adopt guidelines that impose mandatory specific climate change adaptation measures and actions in routine planning.

Recommendation 3. ***PA staff training***

Experience gained with the DERRIS project has highlighted the need for specific training in climate change adaptation dynamics, relating to the legal framework and climate change-related risk assessment and management.

Proposal: draw up a national training programme focused on subjects relating to climate change, which public administrations are obliged to promote at all levels (managers, officials, technical experts).

Recommendation 4. ***Awareness Campaign.***

Proposal: the Ministry of the Environment is advised to promote a national awareness campaign on adaptation measures and climate event-related risks, involving public administration, professional categories, universities and research centres. This awareness action could be carried out in collaboration with programmes already in place such as the Civil Protection "Io non rischio" campaign[25]

LOCAL SUMMARY OF THE PROPOSALS

What	How	Who
National adaptation plan	Publish and finance actions	Central government
Uniform terminology in legislation	Update territorial governance rules (drawn up by the regions) using a common language and clear guidelines for adaptation planning at all levels with uniform terminology.	Central government and regions
Vast area legislation	Need to work as a chain (of enterprises through the professional associations and of PA), bearing in mind that climate change requires supply chain/ district dimension to be tackled.	Central government
PA staff training	National programme focusing on the training process (also through service orders). Creation of a common and shared language.	Presidency of the Council, Ministries.
Communication	Increase awareness of risks thanks to ad hoc information campaigns at the various levels (local, regional and national).	Presidency of the Council of Ministers/Ministries Public television / regions

25 http://iononrischio.protezionecivile.it/

ANNEX

ANALYSIS OF EXISTING LEGISLATION

The analysis of European and national legislation on climate change impact, vulnerability and adaptation is an integral part of the Italian National Adaptation Strategy and it focuses on certain sectors considered vulnerable to climate change and of greater legal interest. The sectors included in the study are: water, agriculture, environment and biodiversity, building and infrastructure, energy, prevention of major industrial risks, responsibility and insurability, human health, soil and transport. The chapter summarizes the main legislation and regulations regarding climate change taken from the national reference document (available at http://www.minambiente.it/sites/default/files/archivio/allegati/clima/snacc_2014_rapporto_analisi_normativa.pdf) and the main critical elements of Italian legislation.

WATER

Directive 91/271/EC

This Directive concerns the collection, treatment, and discharge of urban wastewater, as well as the treatment and discharge of wastewater from certain industrial sectors. The aim of the Directive is to protect the environment against the negative repercussions caused by the discharge of the above-mentioned wastewater. **Critical elements of Italian legislation**: in Italy, 475 small/large urban centres were found to be non-compliant with the directive when the procedure was started in 1998. However, only 110 of them were still found to be non-compliant when the Court ruling was issued. The Directive was deemed to be the suitable tool to start a "pilot initiative" in favour of a "new approach" for the promotion of compliance and implementation.

Directive 98/83/EC

This Directive is aimed at protecting the health of persons, by laying down wholesomeness and cleanliness requirements with which drinking water must comply at European level. **Implementation in Italy**: the current decree governs the quality of water intended for human consumption in order to protect human health against the negative effects of water contamination, thus ensuring wholesomeness and cleanliness.

Directive 2000/60/EC

This Directive pursues multiple objectives, such as prevention and pollution reduction, promotion of sustainable use of water, environmental protection, improving the conditions of aquatic ecosystems and mitigation of the effects of floods and drought. Its ultimate objective is to achieve a good ecological and chemical state in all EU waters by 2015. **Critical elements of Italian legislation**: to date, in Italy, the provisions of Directive 2000/60/EC have not yet been fully implemented and its application in the Italian legal system has led to infringement proceedings and conviction.

Directive 2006/7/EC

This Directive establishes the provisions for monitoring and classifying the quality of bathing water. **Critical elements of Italian legislation:** on 10 April 2006, the Commission sent a letter of formal

notice to Italy for having violated the obligations laid down by articles 4, paragraphs 1, 6, paragraphs 1 and 13 of Directive 76/160/EEC concerning bathing water quality of (infringement procedure n.2006/2017).

Directive 2006/118/EC

This Directive establishes special measures to prevent and control groundwater pollution. **Implementation in Italy**: D.Lgs. n. 30 of 16 March 2009 triggered the "Implementation of Directive 2006/118/CE, on the protection of groundwater against pollution and deterioration". This decree applies to underwater bodies identified on the basis of technical criteria.

Directive 2007/60/EC

This Directive establishes a joint framework for the assessment and management of the risks that floods produce for human health, the environment, economic goods and activities linked to floods. **Critical elements of Italian legislation**: the Commission initiated EU Pilot 2225/11/ENVI procedure against Italy, in so far as the Italian authorities maintained that the definition of flood, challenged by the European Commission, excluded floods caused by sewage systems and not directly attributable to meteorological phenomena. According to the Commission's opinion, the definition adopted by Italian legislation results in the exclusion not only of floods caused by sewage systems but also, contrary to what is laid down in the Directive, floods caused by non-meteorological phenomena, such as seaquakes or the collapse of a dam.

Directive 2008/105/EC

This Directive establishes environmental quality standards for priority substances and certain other pollutants, as provided for with the aim of achieving good surface water chemical status in accordance with the provisions and objectives of the Directive. **Implementation in Italy:** D.Lgs. n. 219 of 10 December 2010 updated certain articles and annexes of D.Lgs. 152/2006 and, in particular, those concerning the protection of water against pollution.

Directive 2009/90/EC

This Directive lays down technical specifications for chemical analysis and monitoring of water status. **Implementation in Italy:** D.Lgs. n.219 of 10 December 2010 lays down technical specifications for chemical analysis and monitoring of water status. This decree also sets minimum efficiency criteria for the analysis methods used by Member States to monitor water status, sediment and biota, as well as rules for demonstrating the quality of analytical results.

ENVIRONMENT AND BIODIVERSITY

Regulation (CE) 2152/2003 of the European Parliament and of the Council

This Regulation established a Community scheme for broad-based, harmonised and comprehensive, long-term monitoring of the condition of forests to continue to further develop the monitoring of air pollution and air pollution effects and of other agents and factors that have an impact on forests, such as biotic and abiotic factors and factors of anthropogenic origin.

Directive 2008/56/EC of the European Parliament and of the Council

This Directive establishes a framework within which the Member States shall adopt the necessary measures to achieve and maintain a good environmental status in the marine environments by 2010. Marine strategies for the marine environment intended to protect and preserve the marine

environment are prepared and implemented. **Implementation in Italy:** D.Lgs. n. 190 of 13 October 2010 establishes a framework aimed at establishing strategies for the marine environment and adopting the necessary measures to achieve and maintain a good environmental status by 2020.

Directive 2009/29/EC of the European Parliament and of the Council

This Directive establishes the greenhouse gas emission allowance-trading scheme in the Community in order to promote reductions of said emissions according to validity criteria in terms of cost and economic efficiency. **Implementation in Italy:** D.Lgs. n. 30 of 13 March 2013 lays down the provisions for participation in the greenhouse gas emission allowance-trading scheme in the Community.

Directive 2009/147/EC of the European Parliament and of the Council

This Directive relates to the conservation of all species of naturally occurring birds in the wild state in the European territory of the Member States**. Implementation in Italy**: law n. 157, of 11 February 1992, lays down that all wild fauna is inalienable heritage of the State and is protected in the interest of the national and the international Community. **Critical elements of Italian legislation**: many Regions have not complied precisely with these legal provisions that reflect the EU text.

Regulation (EU) n. 1293/2013 of the European Parliament and of the Council

This Regulation establishes the LIFE programme. This financial tool advances funding for actions aimed at adapting biodiversity to climate change.

CONSTRUCTION AND INFRASTRUCTURE

Directive 92/57/EEC of the Council

This Directive concentrates on protecting the health and safety of workers, with a special focus on the effect climate change will have on construction sites and occupational safety therein.

Directive 2010/31/EU of the European Parliament and of the Council

This Directive promotes the energy performance of buildings, parts of buildings and building units at national or regional level by establishing a methodology for calculating the energy performance of buildings, which takes into account certain specific variables, including the thermal characteristics of the building. **Critical elements of Italian legislation**: there are some issues with the role of the EPC in the contractual context. However, the EPC cannot be prepared before the adoption of the planned inter-ministerial decree that will adapt the previous provision on energy documents and set the mandatory criteria and contents of the new APC. Therefore, until the new certificate is available, the rule on nullity of contracts cannot be respected.

Regulation (EU) n. 305/2011 of the European Parliament and of the Council

This Regulation lays down conditions for the placing or making available on the market of construction products by establishing harmonised provisions to express the performance of construction products in relation to their essential characteristics and on the use of CE marking on those products.

PREVENTION OF MAJOR INDUSTRIAL RISKS

Directive 2012/18/EU of the European Parliament and of the Council

This Directive lays down rules for the prevention and the management of risks considered major hazards for the health of workers, citizens and the environment. **Implementation in Italy**: this Directive has not been implemented yet in Italy.

LIABILITY AND INSURABILITY

Directive 2004/35/EC of the European Parliament and of the Council

This Directive establishes a legal framework of environmental liability, based on the "polluter pays" principle to prevent and remedy environmental damage. **Critical elements of Italian legislation**: adaptation of national legislation to EU dictates led to some misunderstandings that complicated the application of this legislation for public bodies, businesses and insurers.

Directive 85/374/EEC of the Council

This Directive establishes the principle of liability without fault to be applied to European producers. If a defective product causes damage to a consumer, the producer may be deemed liable. **Implementation in Italy**: D.P.R. n. 224 of 24 May 1988 implementing Directive 85/374/CEE, on the approximation of laws, regulations and administrative provisions of the Member States concerning liability for defective products, in accordance with art. 15 of law n. 183 of 16 April 1987, that now governs liability for damage caused by defective products at the moment in our legislation.

SOIL AND RELATED USES

Directive 86/278/EC of the Council

This Directive is aimed at regulating the use of sewage sludge in agriculture in such a way as to prevent harmful effects on soil, vegetation, animals and man, thereby encouraging the correct use of sewage sludge. **Implementation in Italy**: D.Lgs. n. 99 of 27 January 1992 is aimed at regulating the use of sewage sludge in agriculture in such a way as to prevent harmful effects on soil, vegetation, animals and man, thereby encouraging their correct use.

Directive 1999/31/EC of the Council

The aim of this Directive is, by way of stringent operational and technical requirements on waste and landfills, to provide measures, procedures and guidance to prevent or reduce as far as possible negative effects on the environment. **Implementation in Italy**: D.Lgs. n. 36 of 13 January 2003 provides stringent operational and technical requirements on the waste and landfills, measures, procedures and guidance to prevent or reduce as far as possible negative effects on the environment. **Critical elements of Italian legislation**: the implementation of the directive on landfills is still very unsatisfactory and requires considerable further efforts to improve it.

Directive 2008/1/EC of the European Parliament and of the Council

This Directive accords priority to integrated pollution control as an important part of the move towards a more sustainable balance between human activity and socioeconomic development, on the one hand, and the resources and regenerative capacity of nature, on the other. **Critical elements of Italian legislation**: it must be stressed that national legislation makes no reference

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to measures the State could adopt concerning the impact of climate change.

Directive 2010/75/EU of the European Parliament and the Council

This Directive regulates integrated prevention and control of pollution, as of 1st January 2016. **Implementation in Italy**: Directive 2010/75/EU has not yet been transposed in Italy.

TRANSPORT

Directive 2005/44/EC of the European Parliament and of the Council

This Directive establishes the rules on the introduction and the use in the EU of harmonised river information services (RIS) to support inland waterway transport in order to increase their safety, efficiency and environmental friendliness and to foster its coordination with other forms of transport. **Implementation in Italy**: as for the implementation of the above mentioned directive in Italy, initially, our Country chose the derogation solution, allowed by the Directive itself, according to which for national inland waterways not connected to the waterways network of another Member State it is not mandatory to establish the technical requirements and specifications indicated in the Directive.

Directive 2008/57/EC of the European Parliament and of the Council

This Directive sets out to establish the conditions to be met to achieve interoperability within the Community rail system in a compatible manner. **Implementation in Italy**: D.Lgs. n. 191 of 8 October 2010 defines the conditions to be met to achieve the interoperability of the national rail system with the corresponding trans-European rail system, laid down by the Directive. These conditions concern the design, construction, placing in service, upgrading, renewal, operation and maintenance of the parts of this system as well as the professional qualifications and health and safety conditions of the staff who contribute to its operation and maintenance.

DERRIS PROJECT PARTNERS

The Derris project partners are:

UNIPOL GRUPPO

A limited liability company listed on the Italian Stock Exchange, it is the holding company of a Group that operates in the insurance and the banking sectors.
Website: **http://www.unipol.it/CSR/Pagine/CSRHome.aspx**

ANCI

National Association of Italian Municipalities for the protection and the assertion of the principle of municipal autonomy that is recognised by our Constitution.
Website: **www.anci.it**

UNIPOLSAI

A multi-line insurance company belonging to the Unipol group, leader in the Italian non-life sector, in particular Third-Party Motor insurance.
Website: **http://www.unipolsai.it/Pagine/home.aspx**

CITTÀ DI TORINO

Capital of the metropolitan city bearing the same name and of the Piedmont Region.
Website: **http://www.comune.Torino.it/**

COORDINAMENTO AGENDE 21 LOCALI

Association of Regions and local authorities aimed at improving environmental management and turning Sustainable Development into a step towards a more fair future.
Website: **http://www.a21italy.it/chi-siamo/lassociazione/**

CINEAS

A non-profit university consortium, set up by the Polytechnic of Milan, to offer risk and claims management training to management personnel.
Website: **http://www.cineas.it/**

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