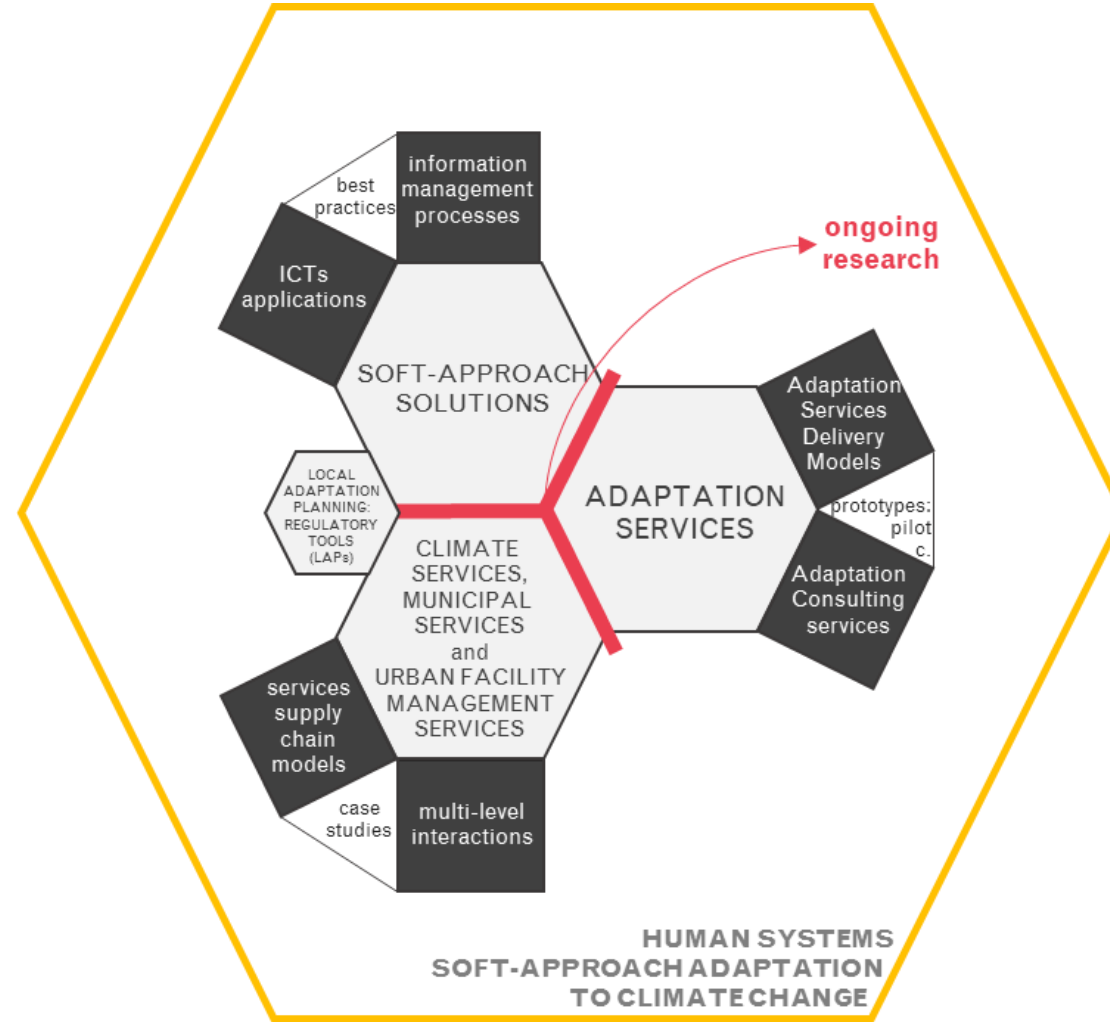


URBAN SERVICES AND CLIMATE CHANGE ADAPTATION. APPLYING A NOVEL METHODOLOGICAL FRAMEWORK.

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Politecnico di Milano

The **urban services** sector in the perspective of **soft-approach adaptation** to climate change



RESEARCH FIELD

The **urban services** sector in the perspective of **soft-approach adaptation** to climate change

OBJECTIVES

- Development of **interpretative** and **analytical frameworks and instruments** for the application of soft-approach in climate change adaptation processes
- **Redesign** of **Urban services Delivery Models** in the perspective of climate adaptation

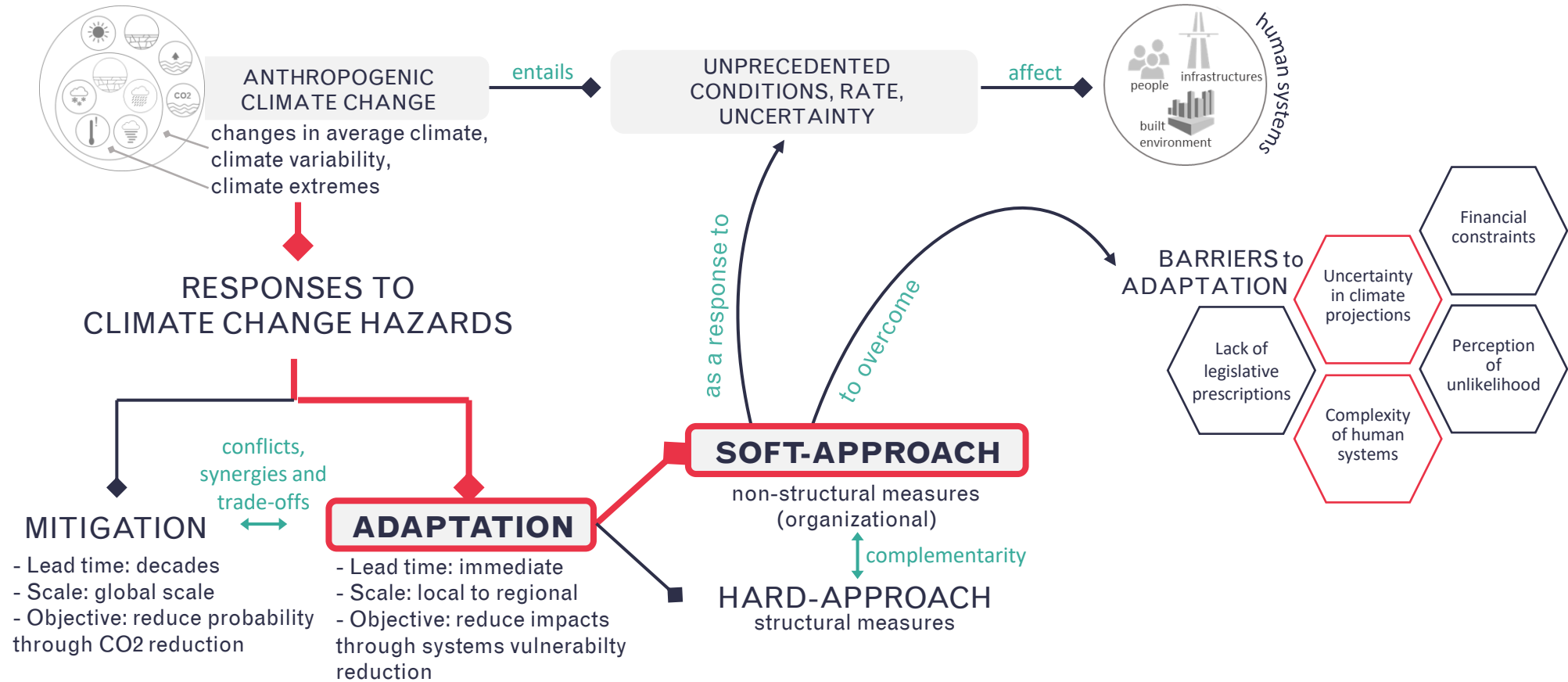
METHODOLOGY

- **Literature analysis** on soft-approach in urban climate change adaptation processes
- Local Adaptation Plans **in-deep analysis**
- **Review** of support entities and instruments to climate adaptation (agencies, networks, knowledge platforms)
- **Proposal** of a **new taxonomy** for Urban services in the perspective of climate adaptation
- **Stakeholder mapping** and **consultation** (continuous collaboration)
- **Analysis** of urban services practices and operations in **case cities**
- **Proposal** of new Adaptation services **Delivery Models**
- **Application** of new models on a **pilot case** (San Donato Milanese)

RESULTS

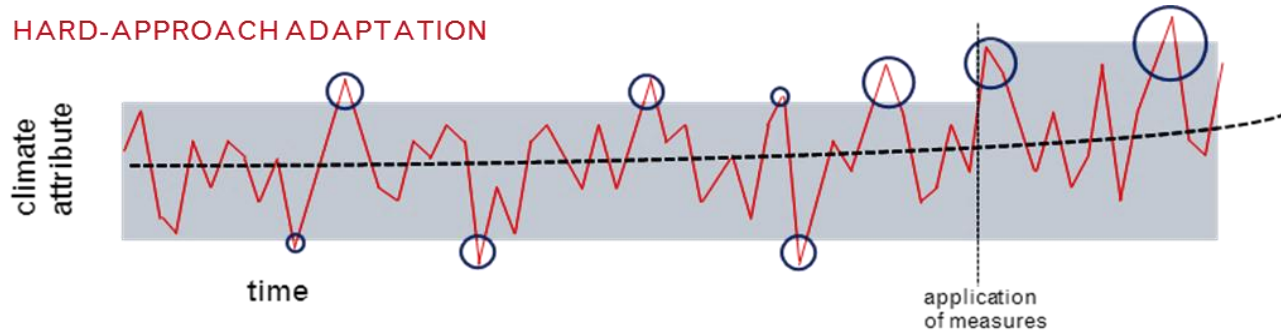
- **Analytical framework** for mapping Urban services systems potential transitions towards integrated Adaptation services systems
- **Redesign** of Adaptation services **Delivery meta-Models** (prototypes) in a pilot case

Conceptual structure

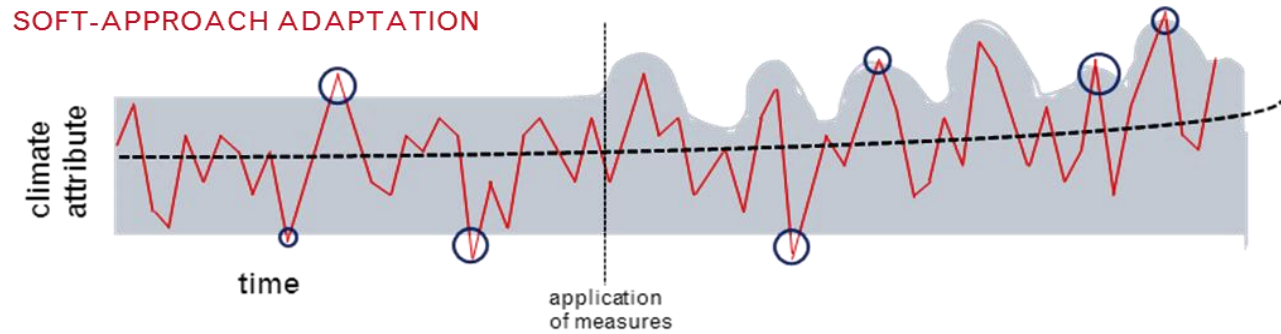


Hard and soft approach to climate change adaptation

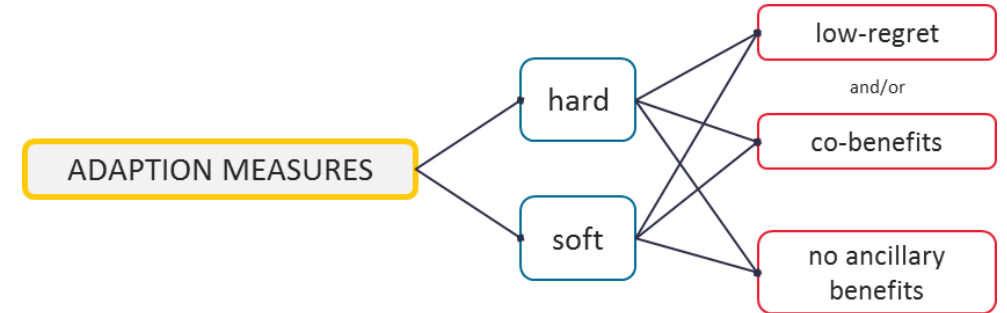
HARD-APPROACH ADAPTATION



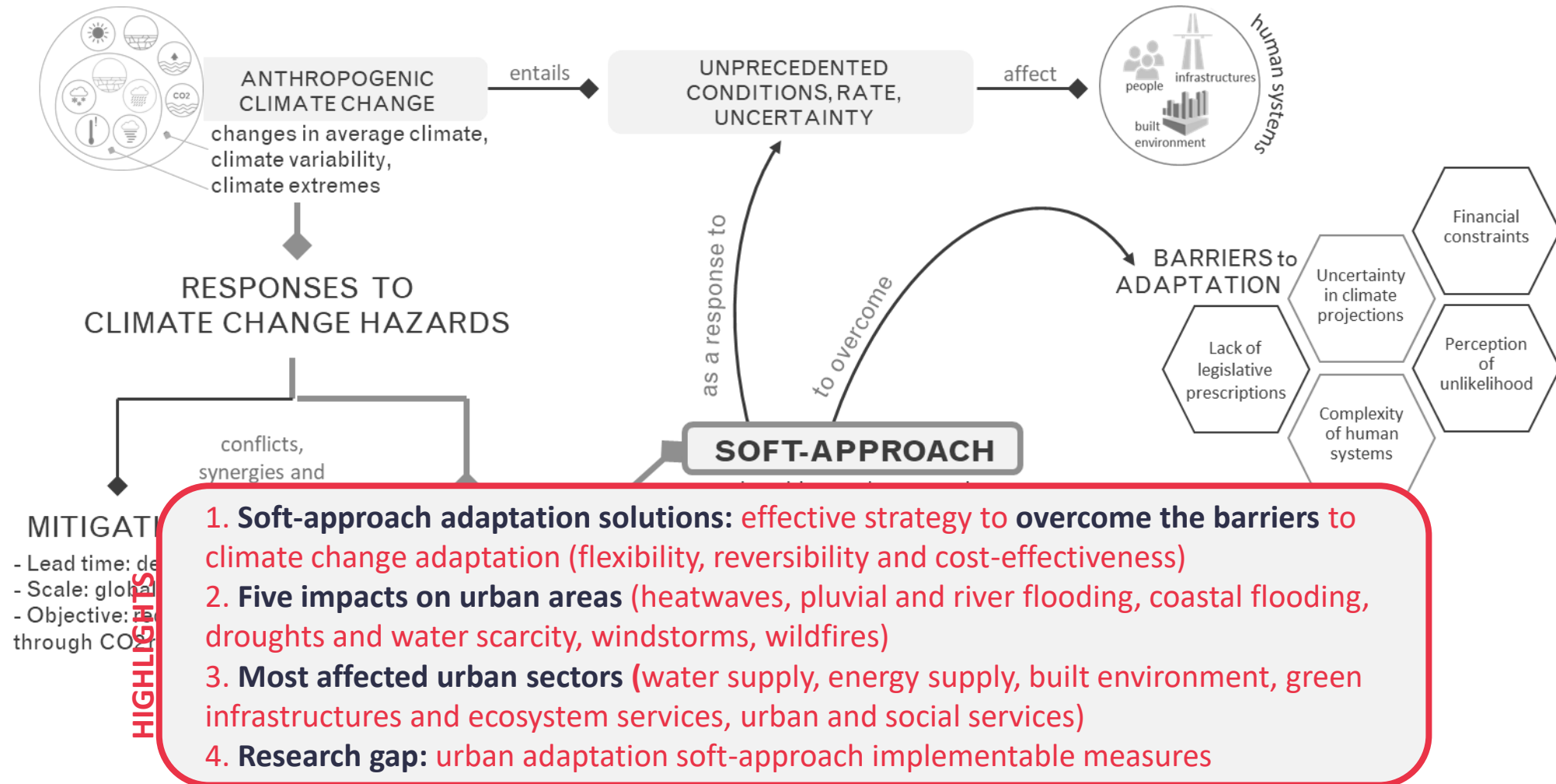
SOFT-APPROACH ADAPTATION



- Time series of climate attribute
- Trend in mean value of climate attribute
- Coping range before/after adaptation measures
- Exceedance of coping range (vulnerability)

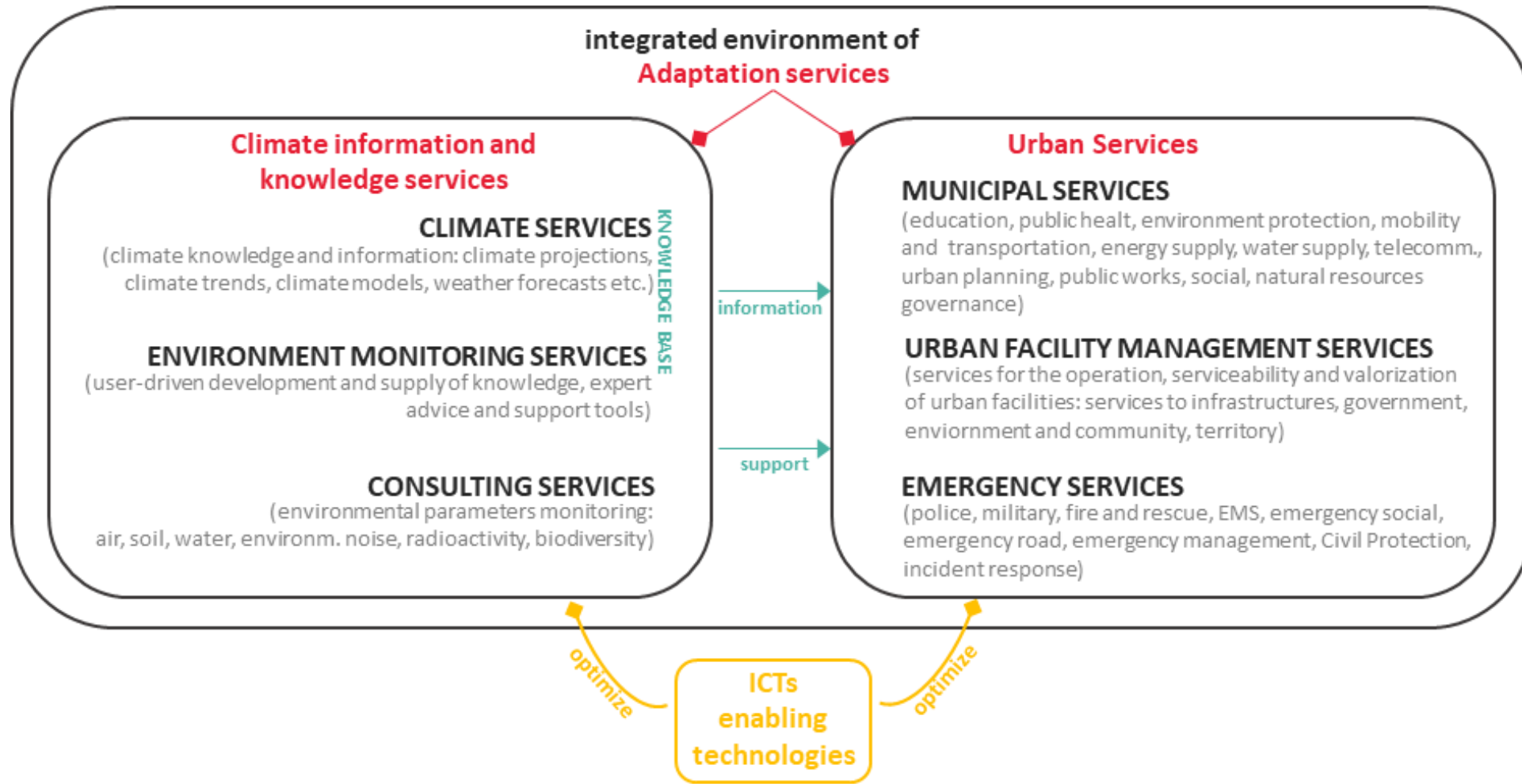


Hard and soft approach to climate change adaptation

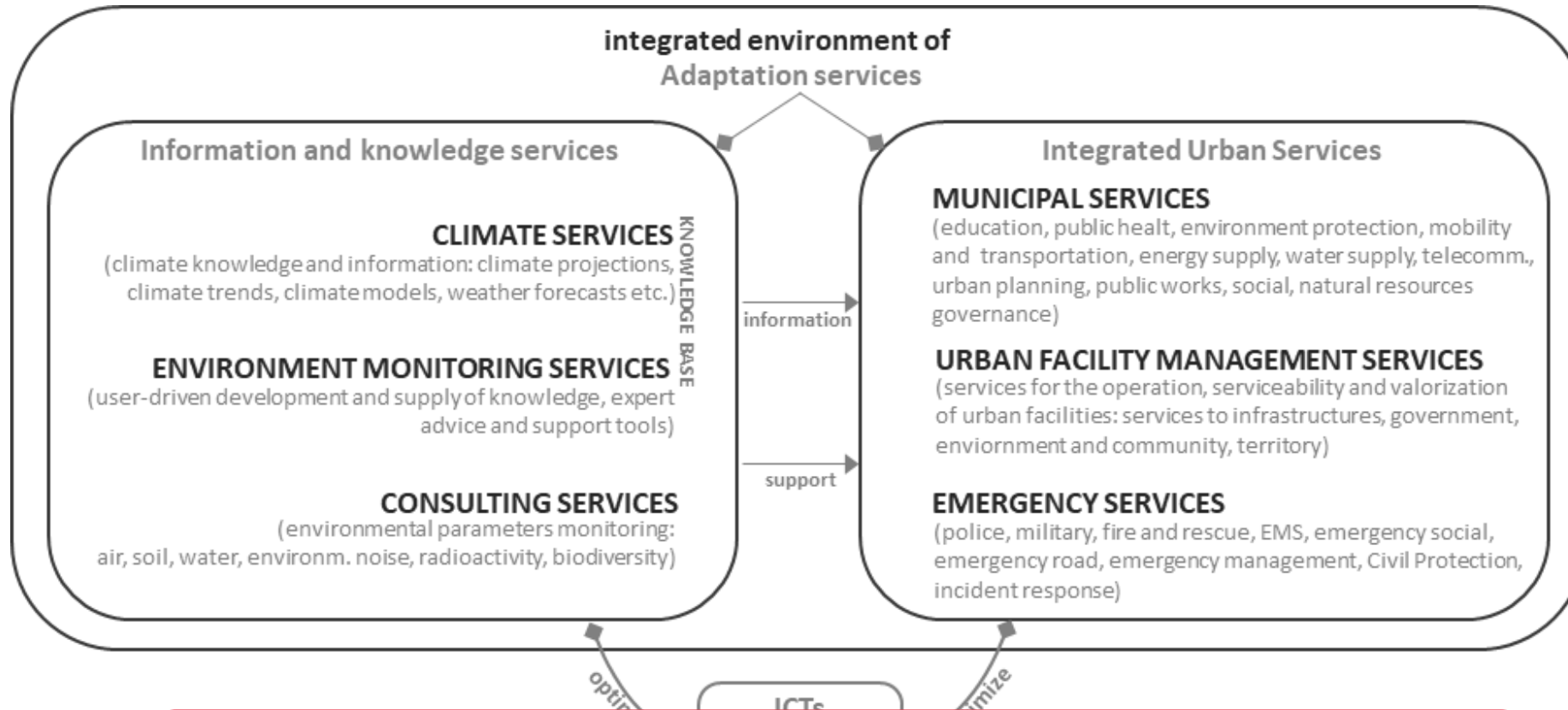


The view of Adaptation services as an integrated environment connecting macro classes of urban services

Adaptation services: services increasing the capacity of society, cities and infrastructures to adapt to climate change
(International Panel on Climate Change; European Environment Agency; Climate-KIC)



The view of Adaptation services as an integrated environment connecting macro classes of urban services




PROPOSAL

Proposals for achieving Adaptation services integrated systems:

1. Shared taxonomy of services
2. Adaptation services stakeholders mapping
3. Analytical framework to analyze processes in services delivery


Analytical framework application on a pilot case: San Donato Milanese

Taxonomy

INTEGRATED ENVIRONMENT of ADAPTATION SERVICES			EXTREME EVENT: WINDSTORM			
MACRO CLASS OF SERVICES	CLASS OF SERVICES	SERVICES	PRE	DURING	POST	
	CLIMATE SERVICES	Medium and long-term forecasts: climate predictions and projections; global, national, regional, and local climate models; future climate scenarios; climate trends	●			
		Short-term weather forecasts	●	●		
		Impacts, vulnerability and risk assessments	●		●	
	ENVIRONMENT MONITORING SERVICES	Air quality monitoring services				●
		Soil quality monitoring services				
		Water quality monitoring services				
		Biodiversity monitoring services				
		Radioactivity monitoring services				
		Environmental noise monitoring services				
	CONSULTING SERVICES	Professional consulting services		●	●	●
		Consulting toolkits		●	●	
		Web-based knowledge platforms		●		●
		Training programmes		●		
	URBAN PUBLIC SERVICES	Education services		●		
		Public health and healthcare services		●	●	●
Public safety services			●	●	●	
Environment protection services						
Mobility and transportation services				●	●	
Energy supply services				●	●	
Water supply services				●	●	
EMERGENCY SERVICES						

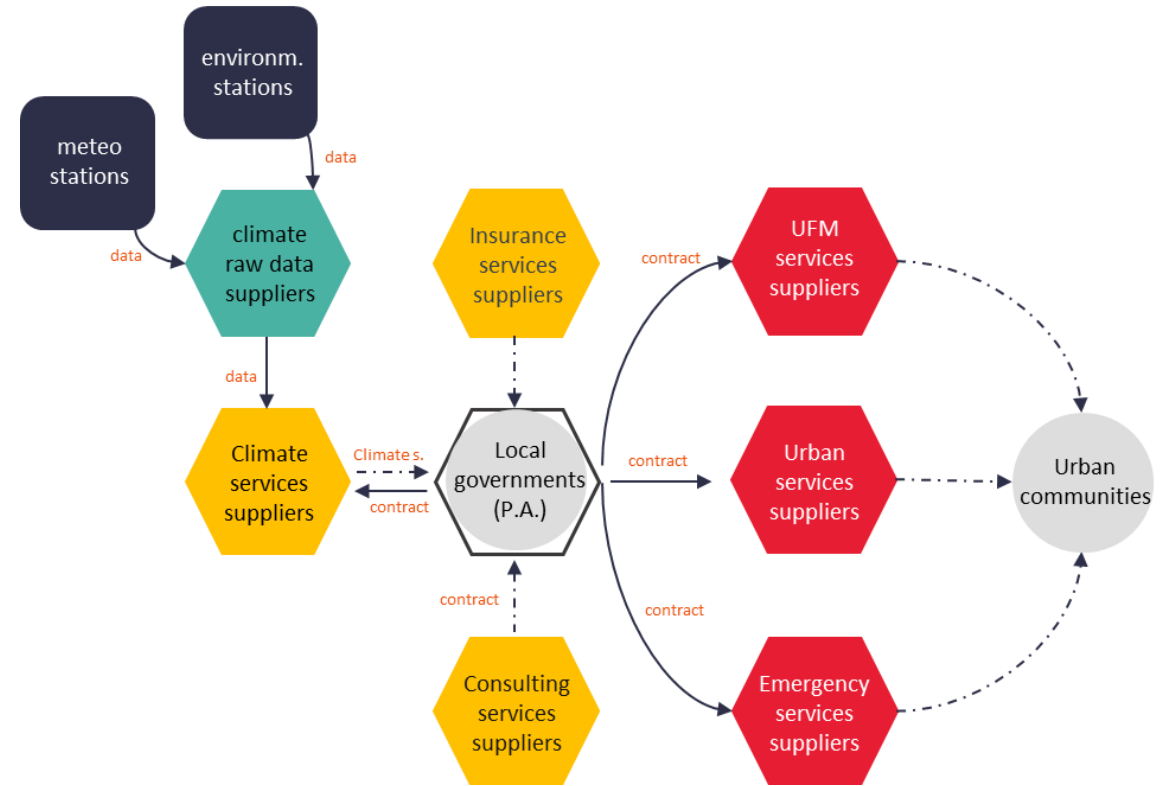
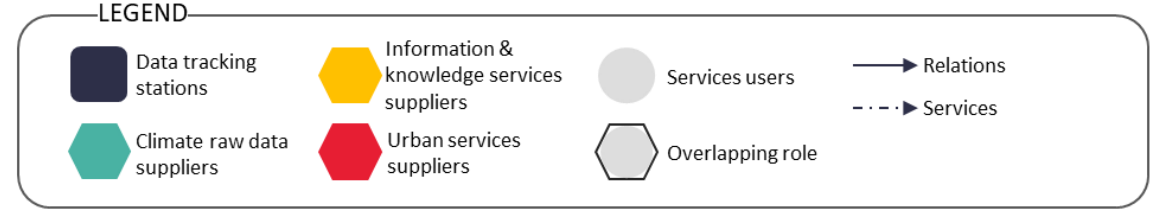
ISSUES

1. Undefined and/or overlapping responsibilities among services suppliers
2. Informal tasks performed by emergency services to compensate gaps in Urban Facility Management services contracts
2. Lack of insurance services for the PRE-event phase
3. Insufficient consulting services in the PRE-event phase

INTEGRATED ENVIRONMENT of ADAPTATION SERVICES			EXTREME EVENT: WINDSTORM		
MACRO CLASS OF SERVICES	CLASS OF SERVICES	SERVICES	PRE	DURING	POST
	URBAN FACILITY MANAGEMENT SERVICES	Services to the territory			
		Maintenance, verification and monitoring of urban furniture services	●		●
		Maintenance, care and monitoring of urban greenery services	●		●
		Maintenance and care services of land and equipment			
		Maintenance and monitoring services of horizontal, vertical and light signs			
		Technical engineering services for drafting of road land registers			
		Road network verification, monitoring and control services			
		Road surface maintenance and first-aid holes services			
		Snow clearing services, shedding salt and anti-fog treatment			
		Parking management service			
	Services to buildings, plants and infrastructures	Building and plants maintenance services			
		Management, operation and maintenance of power plants and thermal plants services			
		Management, operation and maintenance of air treatment plants services			
		Management, operation and maintenance of water plants, sewer services	●		●
		Management, operation and maintenance of electrical and lighting systems services	●		●
		Management, operation and maintenance of technological safety systems services	●		●
		Management, operation and maintenance of technological control systems services	●		●
		Operation and maintenance of telephone and data transmission networks services	●		●

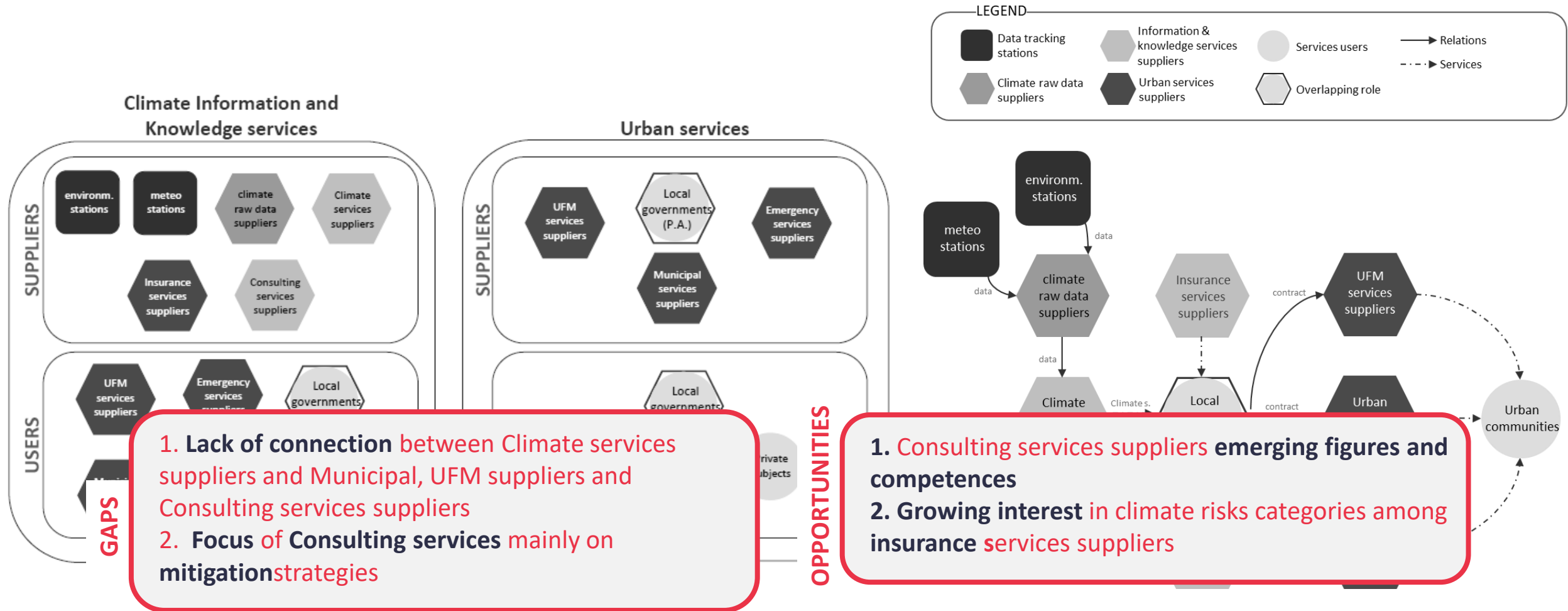
Analytical framework application on a pilot case: San Donato Milanese

Stakeholder mapping



Analytical framework application on a pilot case: San Donato Milanese

Stakeholder mapping

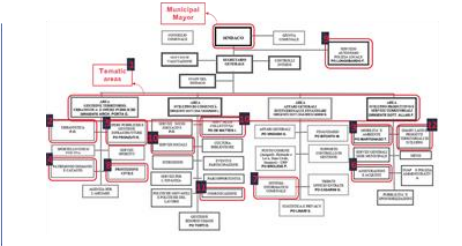
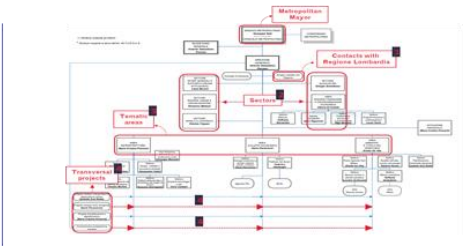


The proposal of an analytical framework to analyze processes in services delivery

De-structuring services to identify areas for Climate Information and Knowledge services integration

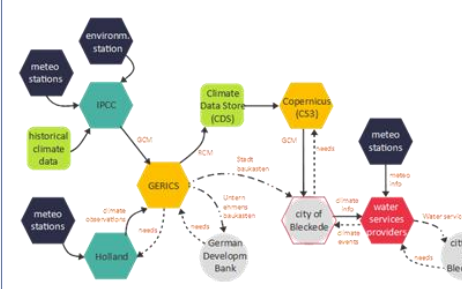
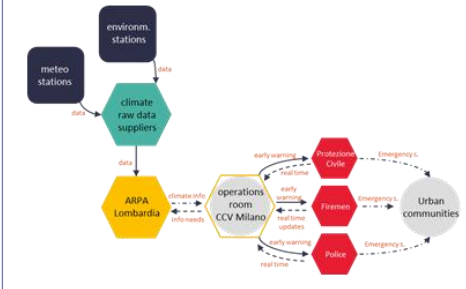
a)

ORGANIZATIONAL STRUCTURE OF INVOLVED SUBJECTS (local governments, private companies, etc.)



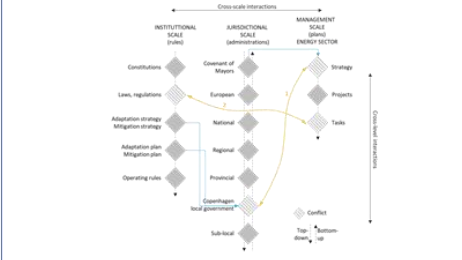
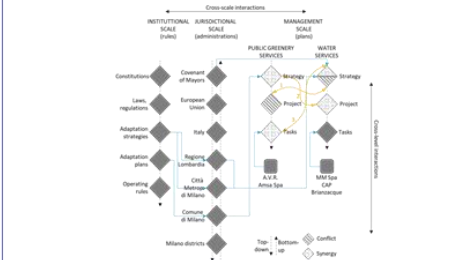
b)

RELEVANT SERVICES SUPPLY CHAIN



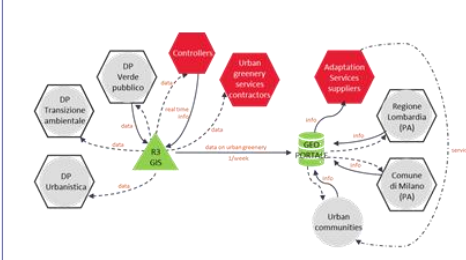
c)

MULTI-SCALE and MULTI-LEVEL INTERACTIONS BETWEEN SERVICES



d)

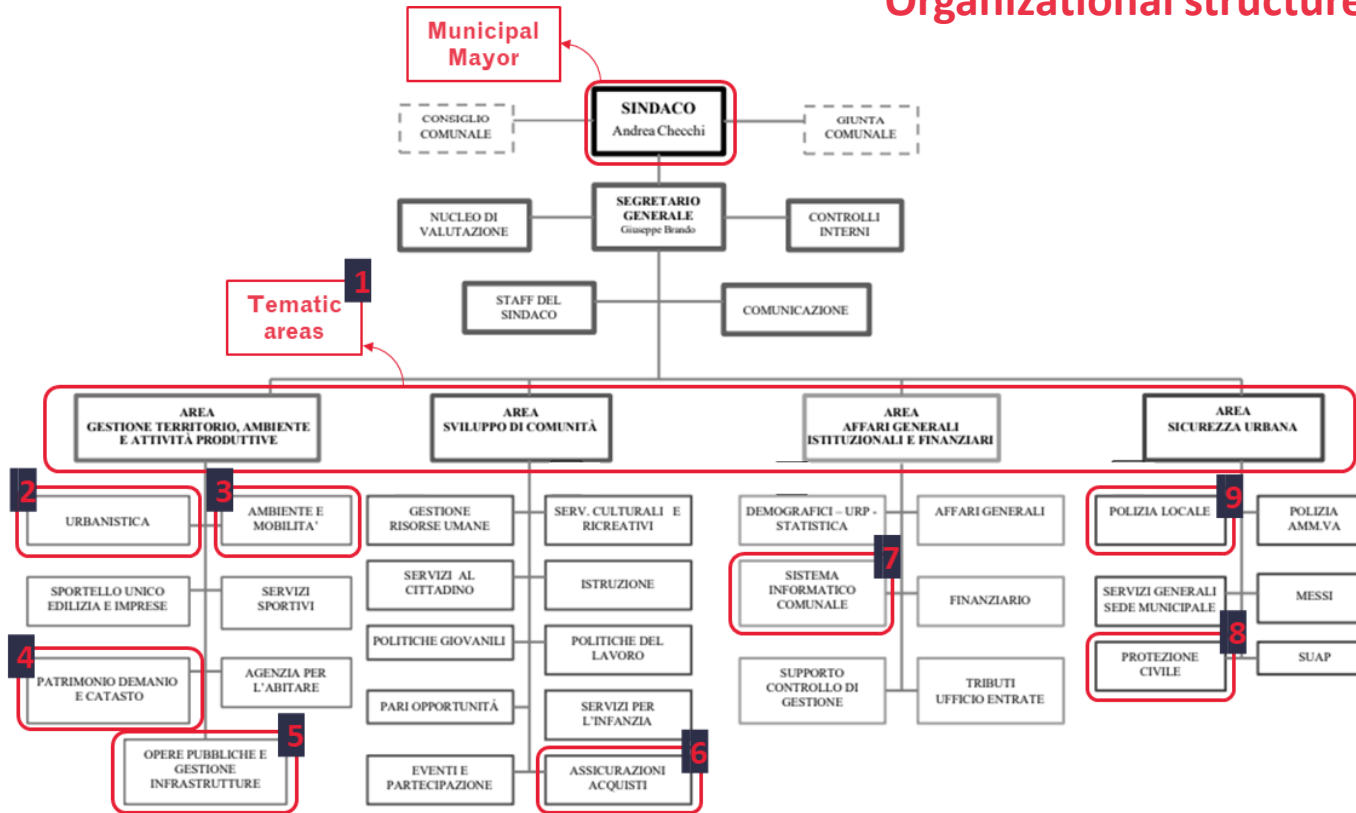
INFORMATION MANAGEMENT FOR SERVICES MANAGEMENT



CONSISTENCY ACROSS LEVELS

Analytical framework application on a pilot case: San Donato Milanese

Organizational structure



INTEGRATED ENVIRONMENT of ADAPTATION SERVICES			EXTREME EVENT: WINDSTORM				
MACRO CLASS OF SERVICES	CLASS OF SERVICES	SERVICES	PRE	DURING	POST		
CLIMATE SERVICES	ENVIRONMENT MONITORING SERVICES	Medium and long-term forecasts: climate predictions and projections; global, national, regional, and local climate models; future climate scenarios; climate trends	●				
		Short-term weather forecasts	●	●			
		Impacts, vulnerability and risk assessments	●		●		
		Air quality monitoring services			●		
		Soil quality monitoring services					
		Water quality monitoring services					
		Biodiversity monitoring services					
		Radioactivity monitoring services					
		Environmental noise monitoring services					
		Environmental certification processes (Ecolabel, Emas...)					
CONSULTING SERVICES	CONSULTING SERVICES	Professional consulting services	●	●	●		
		Consulting toolkits	●	●			
		Web-based knowledge platforms	●		●		
		Training programmes	●				
URBAN PUBLIC SERVICES	URBAN PUBLIC SERVICES	Education services	●				
		Public health and healthcare services	●	●	●		
		Public safety services	●	●	●		
		Environment protection services					
		Mobility and transportation services		●	●		
		Energy supply services		●	●		
		Water supply services		●	●		
		Telecommunication services	●	●	●		
		Urban planning	●		●		
		Public works	●		●		
		Social services		●	●		
		Natural resources governance services					
		EMERGENCY SERVICES	EMERGENCY SERVICES	Primary emergency services		●	
				Secondary emergency services	●	●	●

ISSUES

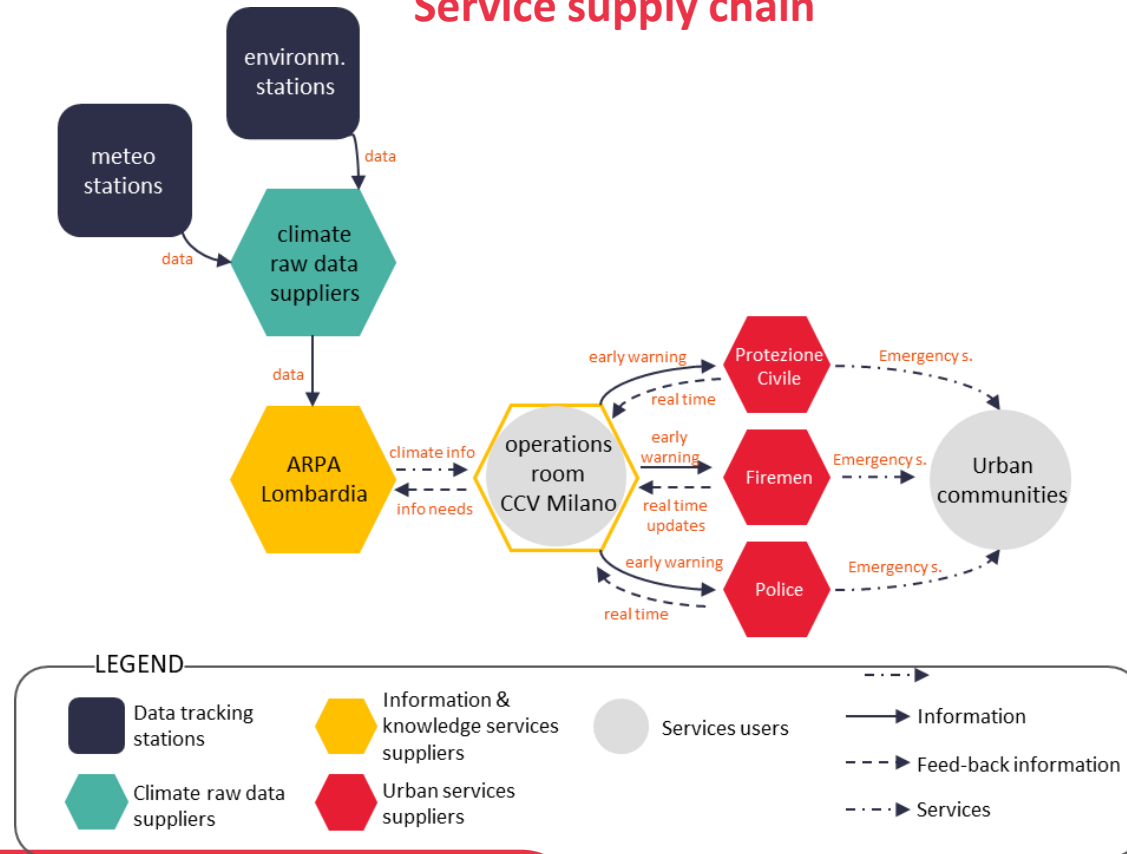
1. Lack of specific **competences** and dedicated **figures** for adaptation to climate change
2. “**Silos**” structure
3. Need for Consulting services

PROPOSALS

1. Adoption of a **new figures** (ex: Resilience officer, eco-managers, etc.)
2. **Links** between different departments through responsible figures
3. **Extension of the role of private Consulting services** suppliers (Decisio e Cisaenergy)

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Service supply chain



ISSUES

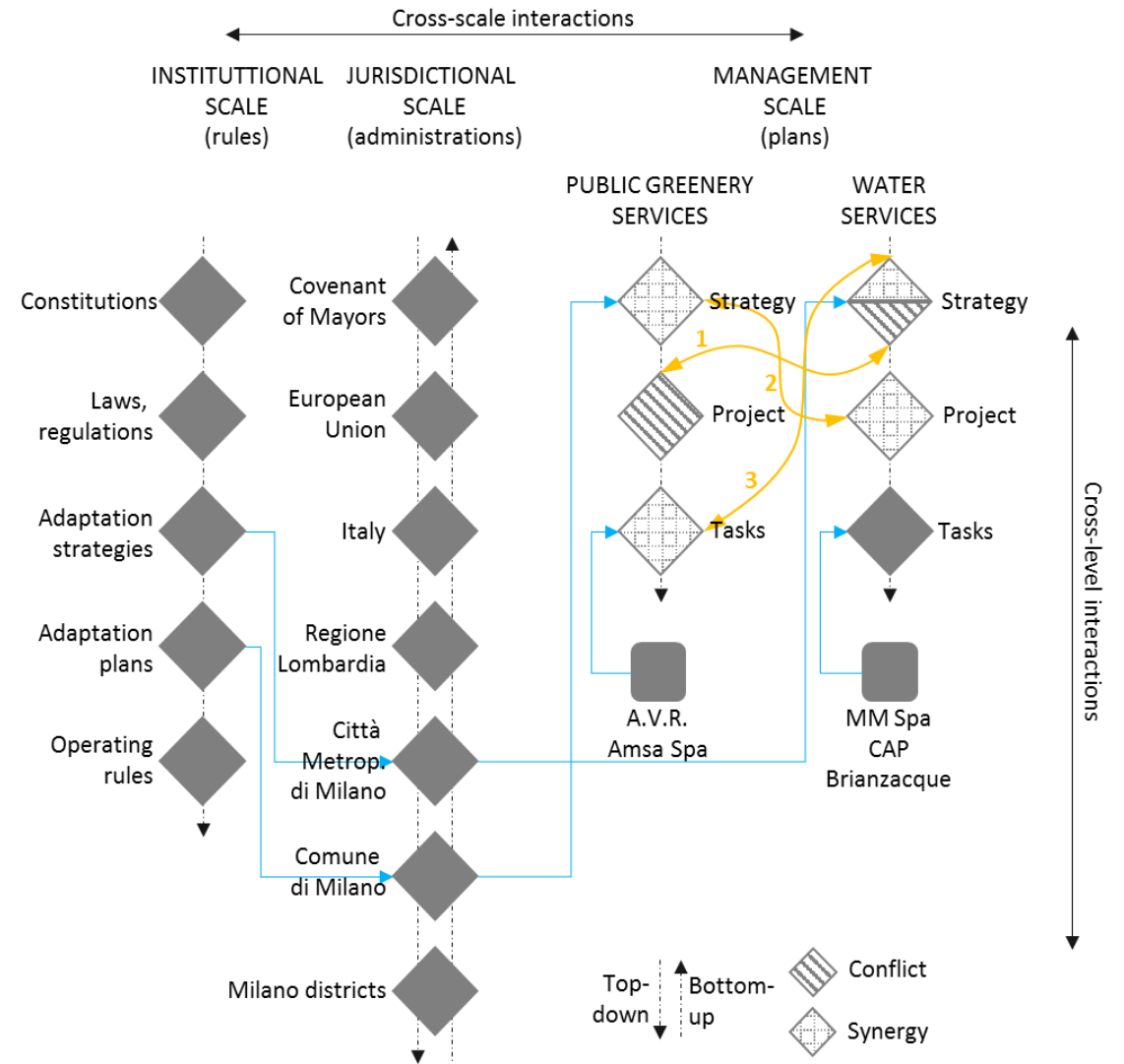
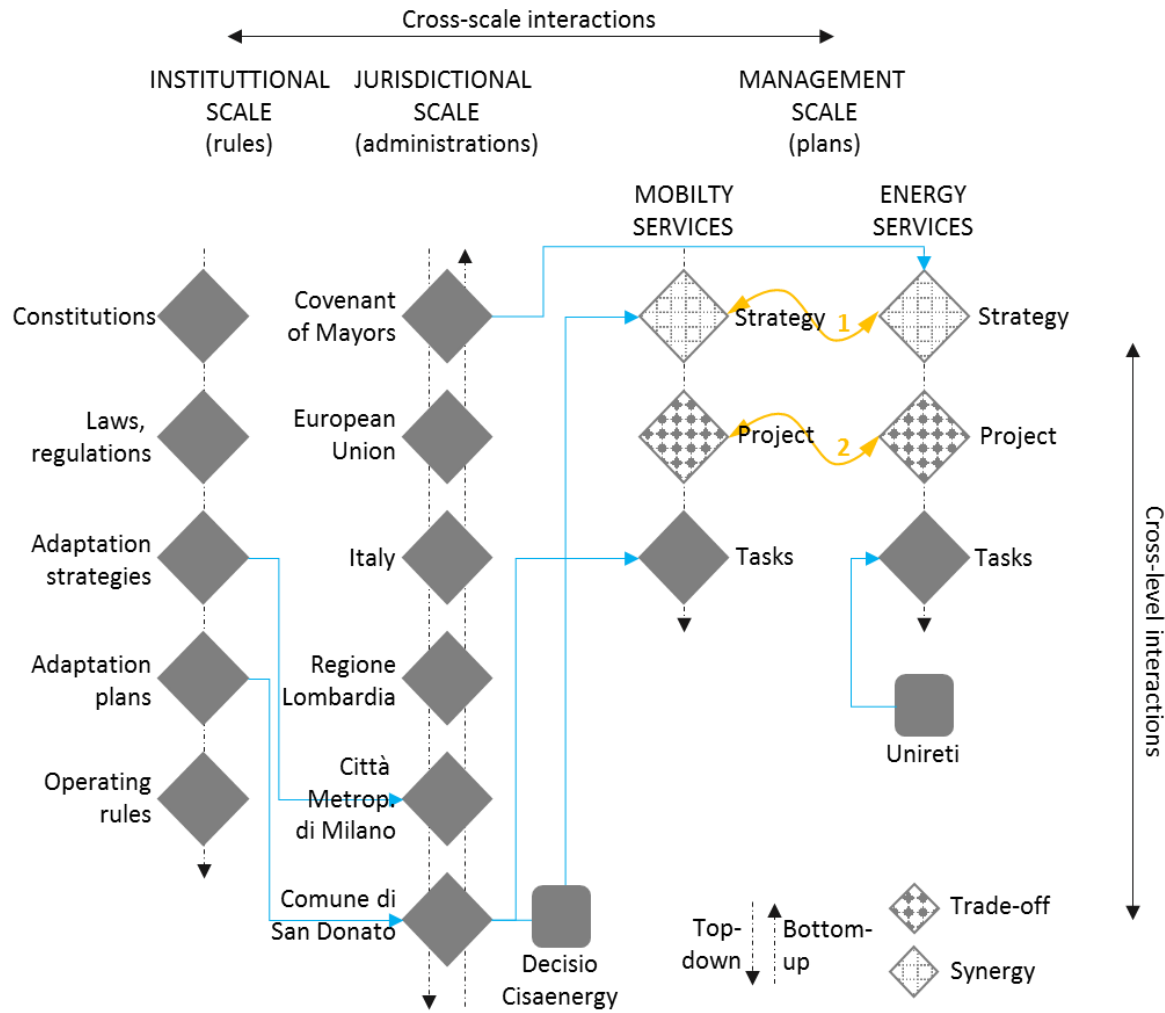
1. Inadequate **contracts** with Urban Facility Management services suppliers
2. **Informal tasks** and undefined **responsibilities**
3. **Lack of coordination** between different services suppliers (emergency and Urban Facility Management)

PROPOSALS

1. Urban Facility Management services supply **contracts re-writing**
2. Re-assignment of **responsibilities** of emergency services suppliers
3. **Multi-services** suppliers

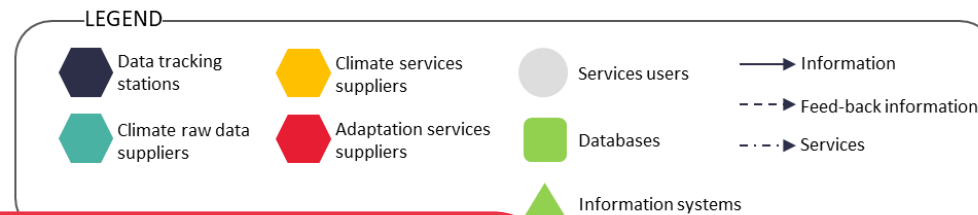
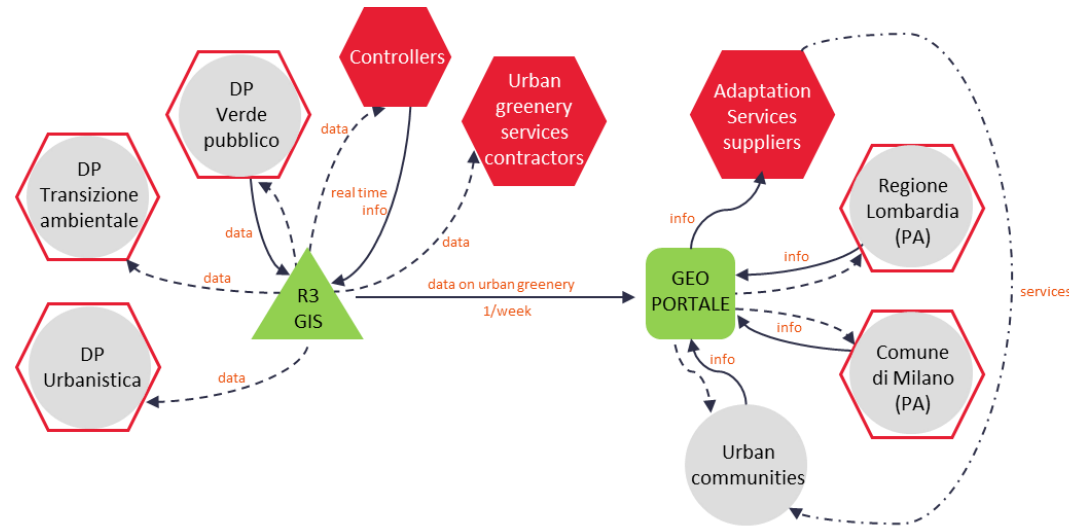
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Multi-scale and multi-level interactions between services



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Information management



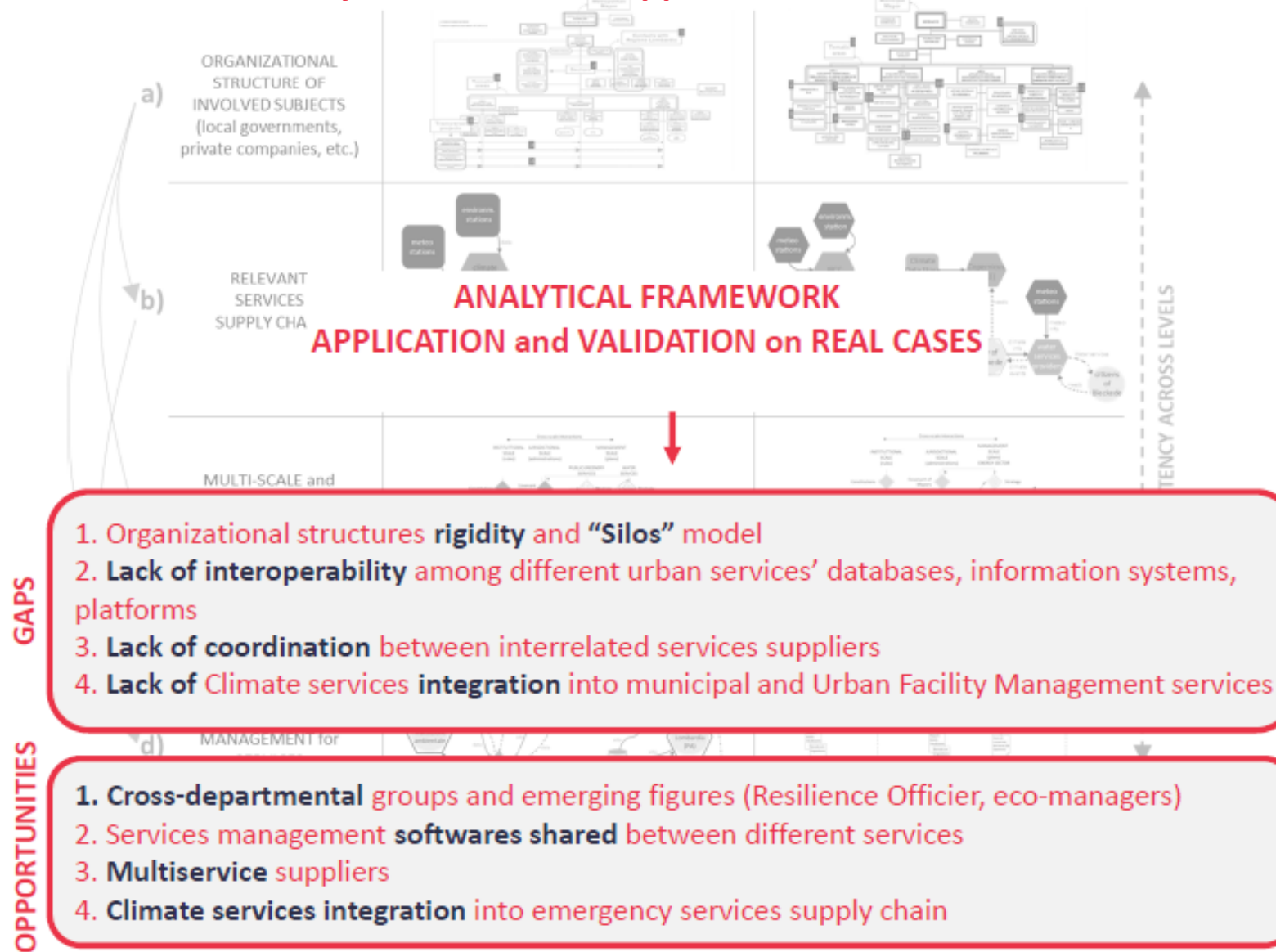
ISSUES

1. **Fragmented information** among services suppliers
2. Lack of **interoperability** between different services information systems and **databases**
3. Lack of **protocols** for **data and information collection** (ex: informal tasks performed by emergency services suppliers)

PROPOSALS

1. **Unified databases**
2. Links between departments through **interoperable platforms**
3. **Standardized protocols** for data and information collection

Analytical framework application: feedbacks



Conclusions

1. Need for multi-level **complementarities**

Soft-approach adaptation strategies must be considered as **complementary** with **hard** adaptation strategies and seeking for **synergies with mitigation** policies. This integration should be pursued by **climate plans** at the different scales, which at present do not address this integrated vision.

2. **Emerging figures and new partnerships models**

Adaptation measures relying on Adaptation services call for new figures (**consulting, insurance**) and new relations within built environment management involving public and private **partnerships**;

3. **New services Delivery Models**

New models for **Urban Facility Management** services delivery should be developed in order to achieve integration with **Climate Information and Knowledge services**;

4. **Meeting European Adaptation Strategy requirements**

Adaptation measures relying on **Adaptation services** are: implementable in the **short-term, co-benefits** (urban comfort and cities attractiveness), **low-regret** (relatively small investments and non-structural).

Further developments

Integration into Local Adaptation Plans of:

1. Strategies to achieve **complementarity** and **synergies** with mitigation plans
2. Guidelines for Urban Facility Management services **contract writing**
3. **Responsibilities** re-assignment among services suppliers
4. Data and information **collection protocols**
5. **Training programs** for new figures (consulting services, insurance services, Resilience Officer)
6. Requirements for adaptation support tools (**ICTs**): information systems, databases, platforms
7. Requirements for **insurance** services

