

Interconnections

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Exploring the role of state, non-state and subnational actors

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The experience of mainstreaming climate change adaptation at sub-national level in Lombardy, Italy: lessons learnt, instruments and possible pathways for the implementation of the SDGs agenda at the local level.

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The process of mainstreaming of topics such as climate change adaptation and sustainable development has been an issue of interest in the field of political sciences in the last years. Apparently yet, there are many understandings of the concept of mainstreaming and how it should be developed in practice. The paper aims to report and elaborate on the experience developed in the design of the Strategy (2014) and the Action Plan (2016) for Adaptation to Climate Change of Lombardy Region, for which the Lombardy Foundation for the Environment (FLA) has been the leading scientific advisor. Mainstreaming required in this case a manifold action, as the process identified different “streams” in which to integrate the concepts related to adaptation. On one hand, a mainstreaming of the topic into the political agenda required to set up a years-long exchange between the scientific and the administrative counterparts. On a more practical level, the process required an attentive survey and investigation of the administrative procedures and instruments of the local government for the integration with sectoral policy plans and programmes. Finally, the key role of individuals within the administrative bureaus and the continuity of their roles in time will be discussed, as a considerable part of the mainstreaming effort involves the meticulous setup of a network of people. With regards to the implementation of the sustainable development agenda, the experience of mainstreaming adaptation in Lombardy could provide interesting elements for consideration, supporting similar processes in identifying opportunities, success factors and possible barriers.

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The experience of mainstreaming climate change adaptation at sub-national level in Lombardy, Italy: lessons learnt, instruments and possible pathways for the implementation of the SDGs agenda at the local level.

Summary.

Adaptation is intrinsically a cross-sectoral issue, which has been tackled by both government and bottom-up initiatives at sub-national level, often anticipating the national institutions. Our case study deals with Lombardy, a region in northern Italy, the most populous and industrialized, which developed a Regional Strategy and an Action Plan autonomously.

Lombardy Foundation for the Environment (FLA) is the research institution that advised the local public administration all along a process that dates back to 2008 with the Kyoto-Lombardia project (providing the first knowledge base about climate change and its impacts considered at the regional scale), followed by the Guidelines for the development of a Regional Adaptation Strategy (2012), the Strategy itself (2014) and the Action Document (2016).

This years-long process, that, together with the mitigation efforts, we could refer to as the local “climate action”, required of course a strong component of *mainstreaming*. Mainstreaming is yet a complex concept that has different definitions and no established “blueprint” on how to be carried out. We took the move from a set of given definitions of mainstreaming, some of which originally developed in completely different areas, such as gender equality and education. On the contrary, we argue that adaptation to climate change and sustainable development can be seen to some extent as twin issues and can benefit from synergies and common efforts in mainstreaming.

We describe therefore the steps and milestones in the development of the “climate action” in Lombardy region and particularly within the scope of its Regional Public Administration. If the Kyoto-Lombardia project can be seen as the first base of knowledge and the foundation stone in the networking action between the scientific advisors and the policy-making community, then the Guidelines and especially the Regional Strategy served for the indispensable mapping of the governance system into which the adaptation logic had to be mainstreamed. Once the picture was clear, three key conceptual focuses gave the direction of the process: raising the saliency of climate change and climate change adaptation in the political and administrative agendas of the regional institutions; climate-proofing the main plans and programmes in use or planned by the institution, that is checking the coherency with adaptation goals and temporal scopes; creating and improving the individual awareness on the topic of all the people involved in the governance system of reference.

In said system, we have engaged different “entry points”, as they are suggested in the OECD methodology for mainstreaming. The inclusion of adaptation as a concept in the framework regional policy documents, the coherency in sectoral plans and programmes, the integration into decision-, policy-making and planning

processes, and finally the integration into non-institutional, community based initiatives for development consistent to adaptation perspectives.

Then we propose a brief analysis of strength points and challenges characterizing the process in our case study and we try and highlight some useful comparison elements for the implementation of SDGs.

Introduction.

Adaptation to climate change is a complex topic, that involves multiple processes across multiple policy sectors, geographical scales and administrative levels. Global and international bodies that deal with climate change (UNFCCC, IPCC, etc.) have recognized and fostered the necessity of an effort towards adaptation, and so did the European Commission and the European Environmental Agency in Europe. Going down the geographical scale, the governance of adaptation gets yet less ordinary: unlike mitigation, which usually followed the classic path “national, down to local (regional), down to municipal”, there is a range of sub-national initiatives that have been and are pushing on the theme of adaptation (although in some cases not exclusively): we could hereby mention MayorsAdapt (later merged into the Covenant of Mayors), RegionsAdapt, ENCORE, the Four motors of Europe.

In a not obvious way sub-regional governments and administrations (subjects that could be framed into the so called Non-State Actors) have even anticipated the respective national levels on the theme and the implementation of adaptation measures.

In this regard, the case of Lombardy is exemplary. The regional government developed and approved a Strategy for Adaptation in 2014 and a Plan (yet called Action Document) in 2016, in both cases before the release of the respective national documents. Within the region, hundreds of municipalities are signatories of the Covenant of Mayors, and the regional government is a member of RegionsAdapt, the Compact of States and Regions (thus of the Under-2 Memorandum of Understanding), the Climate Group, ENCORE and of the Four Motors of Europe.

The Lombardy Foundation of the Environment played a key role in the setup of the climate change policy of the regional government, since the very beginning, bringing in fact to the local attention the themes of the Kyoto protocol and then providing the necessary scientific support to the administration for the development of both the Strategy and the Action Plan for Adaptation.

Lombardy Foundation for the Environment, (FLA: Fondazione Lombardia per l’Ambiente, in Italian) is a non-profit scientific organization established in 1986 by the Lombardy Regional Administration and five major universities of Lombardy to provide technical and scientific support to the regional policy-making in the environmental sector. On the policy side, FLA provides technical expertise and scientific advice to national, regional and local policy-makers, as the Italian Ministry of Environment, the Lombardy Government, the

Municipality of Milan. On the side of the scientific community, FLA cooperates with the EU Joint Research Centre (JRC), the National Research Council (CNR), as well as several national and European universities and research institutions.

Concisely, the themes on which FLA is active are Climate Change mitigation and adaptation, Biodiversity and Nature Conservation, Air quality & human health, Ground and Surface Waters, Integrated Risk Assessment, Land and space planning, Sustainable Development Economics, Environmental law and policies, Education and training. The internal structure of the Foundation reflects these sectors and each of them is supervised by a senior scientific advisor. The research activities are reviewed by a scientific Committee appointed by the five universities associated to the Foundation. Since 2000 the Foundation is accredited as an NGO by UN Convention on Climate Change (UNFCCC). At European level, FLA cooperates with several entities, among which the Alpine Convention, the UN-ECE Convention on Transboundary Air Pollution (CLRTAP), the Carpathian Convention.

As regional advisory, FLA is operating directly within the Institutional Regional Administration System; particularly, FLA is supporting DG Environment, DG Land planning, DG Agriculture, DG Risk prevention & management of the regional administration, as well as the satellite agencies Regional Agency for Environment Protection of Lombardy (ARPA), Regional Agency for the Services to Agriculture and Forests (ERSAF), Regional Institute for Research, Statistics and Training (EUPOLIS), Regional Company for Infrastructures (ILSPA), Regional Park Authorities.

As suggested before, FLA was the main scientific consultant for the development of the Guidelines (2012), the Strategy (2014) and the Action Plan (2016) for Adaptation in Lombardy. The construction of the climate change policy documents for the local public administration required of course the implementation of a systematic mainstreaming process, aimed at integrating knowledge and methodologies in the current regional plans and programs. Thanks to the experience gained during the developing of the climate change adaptation policies, we aim at pointing out some useful elements and considerations about the process.

We believe that this discussion paper could be significant for this conference for two main reasons:

- It emphasizes the essential and peculiar role of sub-national actors in developing policies of global interest, such as climate change adaptation and the SDGs agenda;
- It presents a complex experience of mainstreaming a highly cross-sectoral issue, such as SDGs and climate change adaptation are, into current policies and processes.

On the concept of mainstreaming.

The concept of *mainstreaming* raised to an important role in the international political agenda in the last years and in different application fields. Also, there are different interpretations of this topic, according to the area of implementation, from environmental concerns to gender issues. It is worth mentioning, for

instance, a guideline for “gender equality” mainstreaming developed by the European Commission. This document tries to give a more precise definition to some ambiguous terminology:

- a) *“Mainstream: the principal, dominant ideas, attitudes, practices or trends. It is where choices are considered and decisions are made that effect economic, social and political options. It is where things happen. The mainstream determines who gets what and provides a rationale for the allocation of resources and opportunities;*
- b) *Gender mainstreaming: to make gender equality part of this dominant (mainstream) trend in society so that women and men benefit equally. It means looking at every step of policy – design, implementation, monitoring and evaluation – with the aim of promoting equality between women and men.”³*

The above definitions are useful to understand the meaning of the term *mainstream*, as the framework where decisions are usually taken, and tell us also about the sense of action (“to make something mainstream”) attached to the term. Other propositions, more directly focusing on the mainstreaming of adaptation, are helpful to connect this terminology to climate change issues:

- c) *Mainstreaming adaptation is here defined as the integration of adaptation in policy and decision-making processes, outputs and outcomes, across different levels of governance and entry points (national, sectoral, local).⁴*
- d) *The idea of mainstreaming adaptation is to systematically include climate risk and adaptation considerations in decision making and planning processes instead of only implementing “stand alone” adaptation measures.⁵*

This second set of definitions outlines some significant elements of the mainstreaming process, that we are going to discuss further on in the document:

- the integration of concepts of both climate risk and adaptation into current programs, avoiding the implementation of separated “ad hoc” adaptation measures;
- the inclusion of adaptation perspectives into both the decision-making processes and the outputs (policy documents) produced;
- the importance to engage different vertical levels of governance (from national to local);

³ EU Commission, *EQUAL Guide on Gender Mainstreaming*, 2005

⁴ J. Casado-Asensio, A. Drutschinin, J. Corfee-Morlot, G. Campillo, OECD, *Mainstreaming Adaptation in National Development Planning*, 2016

⁵ Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), *A closer look at mainstreaming adaptation*, 2013.

- the presence of different possible entry points, that is: critical interfaces where to start the mainstreaming process in terms of the levels and steps of the planning and decision-making activity of a given institution.

The “climate action” in Lombardy region.

Steps and milestones.

The mainstreaming process that the researchers of the Lombardy Foundation for the Environment have carried on in the last years was a long process deeply intertwined with the construction of the adaptation strategy and the climate action of the region.

- In 2008, FLA finalized a project called Kyoto-Lombardia that aimed at elaborating and scaling down the climate knowledge made available in the scope of the Kyoto protocol and the decisions of the protocol itself to Lombardy and its socio-economic conditions. The territory of Lombardy had been analysed, with regards to the aspects of climatology, GHG emissions, carbon stocking capacity of soils and forests, but also anticipating some potential impacts of climate change in Lombardy on the population, the fauna, and on agriculture and tourism activities. The project could present already some emissions scenarios at local scale and some first indication on emission reduction policies.
- In 2012, FLA developed the Guidelines for the development of a Regional Adaptation Strategy, in which the theoretical bases for the process of a climate action in Lombardy were set. The guidelines provided the first key elements for an impact assessment of climate change in Lombardy and an integrated evaluation of the socio-economic and natural systems.
- In 2013-2014, Lombardy developed the Regional Adaptation Strategy (RAS) in line with the recommendations of the European institutions (Green Book on Adaptation, 2007; White Book “Adapting to climate change: towards a European framework for action”, 2009; adoption of the European Strategy for Climate Change Adaptation, 2013). Compared to the Guidelines (2012), the RAS introduced many new elements: the methodology for mainstreaming into sectoral policies; the participation of institutional stakeholders through consultation; an update of climate knowledge base (trends and scenarios) at local scale; an impact and vulnerability assessment for all the considered sectors. Finally, for each sector, the Strategy set the scheme of impacts, adaptation goals and options, within the general framework of the current plans and programmes of the regional Administration.
- In 2016, the regional Action Plan was developed. This document updated the knowledge base of the Strategy, identified a number of priority policies for the regional administration, pointing out the implicit “adaptation effort” of current plans and programmes, and designed about 30 actions

for adaptation to be implemented in the next years. The Plan is part of a broader Climate Plan for Lombardy that also includes elements of mitigation.

Summarizing, the Strategy served for:

- ✓ mapping of competencies, structures and sectors
- ✓ setting up a network of subjects
- ✓ sharing knowledge about impacts of climate change
- ✓ acquiring knowledge about the decision and policy-making process
- ✓ defining goals

whereas the Plan provided:

- ✓ updating of the mapping
- ✓ activating the network again and redefining it
- ✓ sharing knowledge about the strategic objectives
- ✓ acquiring knowledge about specific targets of plans and programmes
- ✓ defining actions (who, when, at what cost)

Samples of the mapping phase.

As we can see, a particular matter of interest was the “mapping” phase, which appears a necessary step in every case a cross-, multi- or inter-sectoral conceptual set of principles and practices, such as adaptation, has to be mainstreamed into existing structures, policies, governance processes. In these regards, the same process could be useful for the integration of SDGs, as many of them qualify as cross-, multi- or inter-sectoral issues. Just to give an example of the outcome of the mapping done and then updated in the Strategy and the Plan from Lombardy, the tables below show:

- the sectors for adaptation as defined for the Strategy and the Plan (Table 1)
- the Departments in the regional administration, the designated satellite agencies competent for the sector and the main policy documents (plans or programmes) ruling over the sectors at this level (Table 2).

Sectors in the Strategy	Sectors in the Action Plan
Water Resources	Water Resources* + Anthropic Environment, Soil protection and spatial planning
Anthropic Environment, Soil protection, transportation and spatial planning	* (hydro-geological risk)
Air Quality	Human Health + Air Quality
Human Health	

Ecosystems, Biodiversity and Protected Areas	Agriculture and Animal Farming + Ecosystems, Biodiversity and Protected Areas
Agriculture and Animal Farming	Agriculture and Animal Farming + Ecosystems, Biodiversity and Protected Areas
Tourism	Tourism
Energy	-

Table 1 - Sectors for adaptation

Conceptual elements for the implementation phase.

- i. Three dimensions of mainstreaming can be identified in the reference case study.
 - a) The first has to do with *saliency*, a terminology particularly used in *agenda setting* theories. By saliency, we mean here the relevance and importance of climate change and adaptation as issues in the political agenda of the regional government and in the operational agenda of the administration. The presence in framework or reference documents of concepts and wordings related to climate change adaptation can be assumed as a first rough indicator of the saliency of those topics and the level of political commitment of the institution.
 - b) *Coherency* is the dimension more directly related to the *integration* and *inclusion* as defined in the description of *mainstreaming* we have quoted above. Similarly to saliency, the explicit mention of adaptation in the different sectoral plans and programmes can be a sign of coherency. Yet, a complete mainstreaming process would require a more systematic proofing of the coherency of each new sectoral (or inter-sectoral) policy documents (particularly of their explicit goals) with the strategic documents of reference for climate change adaptation, thus to the adaptation goals (the check is often referred to as “climate-proofing”).
 - c) *Awareness*. This dimension could be interpreted as the saliency at an individual level. Even before having the knowledge and the capacity to include adaptation perspectives into their activities, policy- and decision-makers should have a full conviction about the issue. In this sense, civil servants, officers, administrators can greatly profit of evidences showing the relevance and the interactions of climate change and of adaptation with their own priority topics (e.g. how climate change is going to affect, for example, biodiversity; but also how the integration of adaptation logics is going to affect their policy/decision-making processes in everyday work).
- ii. we mean to stress the fact that in our case study the mainstreaming process was in fact a **years-long process of «soft» steps and dialogue** on the institutional level as well as on the **individual** one, the importance of which should not be underestimated. Also, we argue that a form of **co-production** of knowledge and pathways in decision-making processes should be regarded as more effective than a classic “knowledge transfer” approach, especially as a co-produced knowledge is more likely to be trusted than an imposed one.

Going again through the steps of the climate action in Lombardy as we have seen them before, we could say that: the **Kyoto-Lombardia project** served as the primitive knowledge base for the climate action in Lombardy and at the same time the first attempt to bring the issue of climate change to the attention of the political level and the administration, to promote the “saliency” of the topic in their agendas.

Consequently, the **Guidelines** from 2012 were a first concrete step in the cooperation between the scientific advisors and the public administration, incorporating knowledge and producing first recommendation for a legislative framework (and in this sense an example of co-production).

The **Regional Strategy** continued both the two courses, on one hand completing and updating the knowledge base (impact & vulnerability assessment, governance mapping), on the other one setting adaptation goals and proposing options. Finally, the **Action Plan** completed the first iteration of the process by defining actions, characterized by the respective roles and responsibilities.

Engaged entry points.

Regarding the entry points, as suggested by OECD’s “Integrating Climate Change Adaptation into Development Co-operation”, we have utilized at least the following ones:

- i. Integration of adaptation into national/overall plans, investments, programmes and policies: climate change and adaptation are explicitly mentioned in the *Framework development programme* of Lombardy Region, the document translating the political agenda of the elected board into operational indications for the ruled period (five years).
- ii. Integration of adaptation into a specific sector programme/plan: both the Strategy and the Plan checked on the coherence of current policies to adaptation goals and highlighted them and pinpointed the gaps to be filled.
- iii. Integration of adaptation into project planning and implementation: particularly the Plan define a set of actions which would include adaptation logic into future planning (territory-specific adaptation planning, inclusion into higher level spatial planning, inclusion into Strategic Environmental Assessment tools).
- iv. Integration of adaptation into community level development, community level projects: just for instance, a strong cooperation has been installed with the administrative unit responsible for water management and with some River Contracts (community, bottom-up initiatives for river basin management) in order to support and steer local projects, especially on urban water-related risks.

Main Departments in the PA	Agencies, Facilities, Tech. Bodies	Plans, programmes, policy documents	Objectives, priorities, axes, measures, actions already implemented (climate-relevant)	Anticipated objectives, priorities, axes, measures (not yet implemented)
<p>Ambiente Energia e Reti</p> <p>Ambiente</p> <p>Agricoltura</p>	<p>ERSAF</p> <p>ARPA</p> <p>URBIM Lombardia (Unione Regionale Bonifiche Irrigazioni Miglioramenti fondiari per la Lombardia)</p>	<p>1. Programma Sviluppo Rurale 2007 2013</p> <p>2. Codici di Buone Pratiche Agricole (Decreto del 1999)</p> <p>3. Sistema Informativo Agricolo Della Regione Lombardia (SIARL)</p> <p>4. Progetto AgriCO2tura (ERSAF e FLA – finanziato dalle DG regione e ambiente) 2010 - 2013</p> <p>5. Programma Sviluppo Rurale 2014-2020 (non ancora pubblico)</p> <p>6. Progetto HELPsoil (Life+/ERSAF kick-off luglio 2013)</p>	<p>1. <u>già attuate</u>: nell’ambito dell’asse I per fare fronte alle sfide climatiche (misura 122 e 121) Mis. 121: contributi per: ristrutturazione degli impianti irrigui e trasformazione della tecnica irrigua finalizzati alla riduzione dei consumi idrici aziendali; introduzione in azienda dell’impiego di fonti energetiche rinnovabili; realizzazione di interventi finalizzati al risparmio energetico; realizzazione di coperture delle vasche di stoccaggio degli effluenti di allevamento, finalizzate al contenimento di emissioni azotate e di carbonio e alla prevenzione della formazione e dispersione in atmosfera di particolati fini.. Mis. 125A: contributi per sistemi e tecnologie innovative per la gestione della rete dei canali; interventi per l’aumento dell’efficienza della rete e dei metodi di distribuzione. Ciò finalizzato al risparmio idrico. Nell’asse II attraverso gli effetti compensativi da tutte le misure forestali ed altre (216-221-223 protezione dell'ambiente e prevenzione delle avversità; miglioramento del paesaggi, Mis.213 mantenere le strutture vegetali per fitodepurazione e corridoi ecologici, Mis.214 aumentare la biodiversità attraverso l'utilizzo dei principi della produzione integrata e la naturalizzazione di terreni agricoli, Mis.216 salvaguardare e incrementare la biodiversità , Mis.216-214 tutelare le risorse idriche superficiali e profonde , Mis.223 tutela e conservazione dell'ambiente tramite la diversificazione delle produzioni legnose ecologicamente sostenibili.) - Mis. 223: contributi per: costituzione di boschi permanenti, a scopo ambientale, paesaggistico o protettivo. Mis. 226: contributi per la ricostituzione del potenziale forestale e interventi preventivi", in particolare: Ripristino e ricostituzione di boschi danneggiati da disastri naturali e da incendi. Mis. 221: contributi per l’imboschimento dei terreni agricoli, con la costituzione di boschi permanenti e di arboricoltura da legno. Mis. 216: contributi per: Realizzazione strutture vegetali lineari e fasce tampone boscate; Recupero dei fontanili.</p>	<p><u>1.previste:</u></p> <p><u>1.potenziali:</u></p> <p><u>2.previste:</u> Obiettivo principale è quello di contribuire anche a livello generale a realizzare la maggior protezione di tutte le acque dall'inquinamento da nitrati riducendo l'impatto ambientale dell'attività agricola attraverso una più attenta gestione del bilancio dell'azoto.</p> <p><u>2.potenziali:</u></p> <p><u>3.previste:</u></p> <p><u>3.potenziali:</u></p> <p><u>4.previste:</u></p> <p><u>4.potenziali:</u></p> <p><u>5.previste:</u></p> <p><u>5.potenziali:</u></p> <p><u>6.previste:</u> individuazione minacce per i suoli e problematiche ambientali verso la stesura di linee guida dove racchiudere le esperienze fatte nel progetto. Nel complesso testare e dimostrare tecniche di agricoltura conservativa abbinate a pratiche innovative di gestione dei terreni agricoli. Potenziare le funzioni ecologiche dei suoli (sequestro di carbonio, aumento di fertilità e biodiversità edafica, protezione dall’erosione).</p>

Table 2 - Mapping of regional policies and structure

Strength points and challenges in the mainstreaming process for adaptation in Lombardy.

As a result of this protracted and deep institutional engagement, we have identified an interesting set of considerations about positive aspects and limits of the reference process. We concisely describe them as follows:

Strenght points.

- i. The mainstreaming pathway that we, as researchers, have developed required an intense cooperation with the administrative staff of Lombardy Region as an institution. This relation was certainly set in 2011-12 during the Guidelines project, but started as early as 2008, and brought a reciprocal familiarity between the scientific side (Lombardy Foundation for the Environment) and the administrative one. The entry point in this mainstreaming process was the Air and Climate Unit, under the Environmental Department. This Unit managed also the coordination with other Departments and the various regional technical agencies.

The cooperation between FLA and the Lombardy Region was dynamic and intense, with several opportunities for discussions. Also by the means of questionnaires, regular briefings with the regional contact point, a number of workshops with institutional staff and meetings with the most relevant stakeholders, the connection between the research and the political institutions was uninterrupted and regularly checked.

- ii. The process was developed through both plenary meetings, usually arranged for different thematic areas, and bilateral meetings with specific regional officers. Plenary meetings presented the elements of knowledge, climate scenario, strategic views and goals, whereas bilateral ones were the occasion for more in-depth analysis of current regional policies and single related adaptation measures. The balance of the two formats (plenary and bilateral) granted a cooperative and a multi-disciplinary approach and an effective workflow. Also, it helped in keeping the “mainstreaming fatigue” as low as possible, by optimizing the requirements in terms of time and number of individuals involved.
- iii. both regional institutional staff and technical agencies were engaged (e.g. ARPA, Environmental Protection Agency and ERSAF, Rural and Forestry Development Agency). Due to this wide involvement, FLA took advantage of different competencies and functions. While departments staff is responsible for the developing of the regional programs and plans (policy making), the agencies’ officers usually hold the policies monitoring and the scientific data. The same broad network of different regional actors gave the opportunity to spread effectively information about climate change scenarios, temperature trends and related impacts.

- iv. Working with many different departments within the institution and the deputed officers was extremely helpful in the screening of the sectoral policies and their “climate-proofing”, aimed at pointing out the existing (although often implicit) adaptation effort (and consequently the gap to be filled) avoiding the imposition of redundant ad hoc policies. In some case, the measures were disposed in the previous legislative framework, like for instance several interventions in the agriculture sector (e.g. measures on conservation agriculture), which have been part of the development logic of the Regions for years before and independently from climate change adaptation perspectives.
- v. The mainstreaming process gave the opportunity to screen and identify potential and actual overlapping and doubling of regional instruments. As an example, we could mention the case of the monitoring of water resources use. Lombardy Region has an optimal availability of water resources, nevertheless matched by a very high demand, due to the sprawl of urban settlements, the widely-developed agriculture sector and the strong industrial settlement. The meetings and workshops arranged for the development of the Regional Strategy turned out to be the occasion for the deputed staff to share the knowledge of the existence of different monitoring networks that can be combined without producing further instruments.
- vi. FLA is a multi-sectoral research organization, which tries to develop an interdisciplinary approach. Its scholars come from different research fields and bring in different competencies and sights. Five universities are involved in this organization, specialized both on economics and social issues and natural and biological themes. These diverse competencies were fundamental for the mainstreaming process.

Challenges.

As mentioned above the work of FLA was both complex and innovative, because of the early start of this climate change adaptation project (2008), with no initial links with the Italian adaptation strategy (2015) and no lessons learned from other Italian regional experiences. Due to these topics, FLA faced several challenges during its activity with the Lombardy Region:

- i. The cooperation between FLA and Lombardy Region for the planning of the climate change adaptation policies was carried out for almost a decade, resulting in three official and approved documents: the Guidelines for the Adaptation Strategy, the Adaptation Strategy and the Action Document. This challenging pathway was carried on especially thanks to the human relations between FLA researchers and the institutional staff. Nevertheless, according to political contingencies and bureaucratic habits, regional officers frequently change their work positions. Notwithstanding the Unit for Air and Climate which remained practically unchanged over the last

years, other units and departments faced several reorganizations. In some cases, these significant changes interfered with the mainstreaming process. For instance, the employees involved during the process of the Adaptation Strategy changed roles before the beginning of the development of the Document for Action, and the new officers were again not aware of climate change topics and unfortunately not of the previous work done in their new department on the Strategy. Looking at this issue from another perspective, it is also true that interacting with diverse people allowed FLA to spread out the knowledge and the information about climate change adaptation to a broader audience. However, because of this specific situation some information was lost during the process and various positive relationships were interrupted.

- ii. As mentioned previously, this mainstreaming process was promoted without any coherent and robust examples of adaptation interventions in local governments. FLA developed its activities trying to take advantage of the available information and the indications coming from the most important international institutions (European Union, OECD, UNFCCC, etc.). Nevertheless, the most significant policy documents and toolboxes on this topic have been developed in the last few years. For instance, European Adaptation Strategy was developed in 2013, whereas the Lombardy Region mainstreaming process started in 2008 with the Kyoto-Lombardia project and then in 2011 with Guidelines for the Adaptation Strategy (which in turn started in 2013). According to these elements, FLA activities followed ongoing policy guidance but at the same time, had no conclusive or concrete outcomes to observe. Therefore, FLA developed its commitment without defined adaptation interventions framework, adjusting the approach during the process, thanks to the lessons learned and the emerging guidelines.
- iii. The mainstreaming process developed by FLA focused so far on the strategic framework and there is no monitoring over the actual implementation, at this stage. The Document for Action pointed out diverse measures already implemented by regional programmes and plans coherent with a logic of adaptation, but at the same time, no specific measure proposed in the Adaptation Strategy have been established now. Possible hindering factors are: a. in the resistance to changes and to external considerations (that may be felt as undesirable interferences) that sometimes officers in the public administration show, b. in the different temporal scopes and pacing of regional plans and programmes compared to those of adaptation actions. Dealing with these uncertainties, a clear and planned monitoring scheme is essential, attempting to evaluate progresses within the institution over time.
- iv. Vertical multilevel governance is a fundamental issue of the mainstreaming process: the coordination of national, regional and municipal views is surely a critical interface, especially when trying to integrate different competencies. In fact, we argue that it can be seen as a negative

aspect the fact that the Lombardy Region Strategy (2014) and the Document for Action (2016) anticipated the Italian Adaptation Strategy (2015) and municipal experiences, and therefore there was no official dialogue between these different institutional levels during the two almost parallel processes.

- v. Research and politics have different timeframes and perspectives. A political agenda has the pace of the legislature and usually is set on the base of short term goals and rapidly visible achievements. Whereas on these topics, research institutions need a long term and clear framework, trying to define a planned pathway, although flexible. In the present case study, we observed criticalities due to the different temporal paces and reorganization in the structures.

Conclusions.

Climate change adaptation has a wide field of applications. Trying to develop an effective and complete intervention, adaptation must be integrated in different regional department programs. The holistic approach is a key element of this process, both at the horizontal level (sectors) and vertical (national, regional and municipal). The mainstreaming process developed by FLA for the climate change adaptation policies of the Lombardy Region is an interesting example of a local institution picking up a global-level challenge and of the integration of such a perspective into a governance context.

Similarly to adaptation, SDGs agenda has a broad range of objectives that would require an active commitment by local authorities and to engage a number of different deputed administrative departments. We argue that the goals of adaptation and sustainable development could often match; well the same solutions for adaptation could be often effective in the field of SDGs. Even more importantly, the effort put into adaptation planning at local level can prepare the field for an effective integration of the sustainability agenda, as some of the entry points in a complex regional administrative structure already engaged could be exploited in synergy. Linkages between SDGs needs and adaptation measures could be strengthened, boosting shared actions.

We believe that the experience of the adaptation action in Lombardy points out lessons learnt and possible challenges in the integration of a widespread political agenda in a local context. This mainstreaming pathway shows some key elements, particularly useful also for SDGs objectives integration:

- a) where a mainstreaming process of climate change adaptation has **already been implemented**, this could be in turn a **launch pad** for the integration of the SDGs objectives, taking advantage of a consolidated network and habit of work from the operational point of view, as well as of the conceptual proximity of some adaptation and sustainability goals.
- b) The **coordination between different government bodies**, also at different level, is essential. Regional and local levels could be frontrunners, according to subsidiary principle, nevertheless

there should be a stringent coordination with the national and transregional levels. A well-organized and planned cooperation between these political levels can foster the efficient implementation of measures, exploiting different roles and resources. The cooperation between these levels should be planned on an early stage and carefully.

- c) When setting up a mainstreaming process, it is indispensable to **map** the structure of the governance subject of reference: its main programmes and plans or, generalizing, its policy documents, and to identify the temporal scopes of said documents and processes. This mapping is the necessary base on which every step of the mainstreaming is going to take place and allows to define where to operate the inclusion and integration in terms of saliency, coherency and awareness of adaptation and sustainability perspectives.
- d) The **engagement of higher levels** within an administration should be able to provide a stronger **commitment**. Moreover, it should facilitate the deployment of financial and human resources for the process.
- e) The engagement of institutional officers should be continuous and personal: it is important to acknowledge the process of building trust between public policy- and decision-makers and experts from the scientific and practitioners' community, as well as the value of co-production of knowledge and practices. In these regards, dialogue praxes with an enlarged community of stakeholders should be encouraged. also for a fruitful exchange of views and competencies.
- f) we deem worth to remark the importance of **trust** and **trustable knowledge**. If we consider the proposition about the importance of adaptation (as well as sustainability) being "science-based" and "informed", we should see that a very early step of a mainstreaming process in a broad sense lies in the process of building trust between the scientific community and the policy/decision-making community. The political and administrative side needs a strong and consistent knowledge base on which to build their decisions, yet consistency alone does not guarantee a complete trust in the source and the contents of the information delivered.
- g) A **multi-disciplinary approach** is particularly useful for tackling complex issues such as adaptation as well as SDGs. In these terms, a **multi-sectoral research institution** has the unique capacity of deploying a range of competences, especially when integrating natural, economic and social science approaches.