ADAPTING TO CLIMATE CHANGE: BOLOGNA AS A RESILIENT CITY

Extended abstract

Piero Pelizzaro1*, Chiara Caranti2

1International Cooperation Unit at Kyoto Club, LIFE + BLUE AP Communication Manager and Adaptation Policy Expert at AzzeroCO2,
2Comune di Bologna, Italy

Background

In the last decade, the international community has taken the knowledge that our planet will face serious consequences due to climate change, whether attributable to natural causes, and the action of man. While there is a broad consensus on how fast and how our climate is changing, there is an increasing perception of the impact and this can be seen by the shift of the debate about how society should adapt. Growing awareness promoted by the political and economic institutions for adaptation is controversial in some areas of environmentalism, in fact for some senior figures is interpreted as a tacit admission that efforts to mitigate greenhouse gas emissions are no longer sufficient. However it should be remembered how, less efficient mitigation measures will require more pronounced adaptation actions to be undertaken. Therefore this suggests that policies for mitigation and adaptation must be addressed in concert, by exploiting all possible synergies.

The integration of the two policies was confirmed recently by the Global Risk Report 2013, published by the World Economic Forum (WEF), a reference document for global investors on the main risks that may afflict their investment portfolio. In the 2013s report, one of the main risks identified is the "failure of the system to adapt to climate change." More then this, if you combine the Global Risk Report with the WEF report "The Green Investment Report. The ways and means to unlock private finance for green growth", which indicates an increase in public investment world of 36 billion dollars / year to trigger private investment by enough to contain the critical threshold of 2 °C global warming, we understand how mitigation and adaptation goes together. Both WEF reports reflect what suggested in 2012 by the EU Climate Change Expert Group, which indicates an increase in the costs of climate change impacts, equivalent to 5% up to 20% of the GDP (or higher) in the long run, parallel with the current trend of increase in global temperature.

The European Environment Agency (EEA) has recently published the "Climate change, impacts and vulnerability in Europe 2012" reports, where the evidence of the impacts is well identified. In all European regions have been observed an increase in average temperatures combined with a decrease in rainfall in the southern regions and increased precipitation in Northern Europe. The Greenland ice sheet, sea ice and many glaciers are melting all over Europe, the snowpack has decreased and most of the permafrost soils have warmed. These extreme weather events have generated local urban phenomena such as heat waves, floods and droughts causing a consequent increase in costs in terms of human lives and infrastructure.

While these scenarios show that more elements are needed to understand the role of climate change, the growth of human activity in areas at risk could be a key factor. The Agency predicts that extreme weather events will become more intense and frequent, helping to accentuate the vulnerability of such a situation. The recent weather and climate events have shown clearly and unequivocally the high economic and social costs of such disasters, that are expecting to be even worst in the near future. Estimated losses in 2011 alone, for the floods in Thailand amounted to U.S. $ 30 billion, Hurricane Katrina resulted in damage to the U.S. economy $ 125 billion. It should be remembered that in 2003 the heat wave that struck Europe caused 35 thousand victims, while the 2011 drought that hit the Horn of Africa has resulted in tens of thousands of victims and threatened the survival of 9.5 million people.

* Author to whom all correspondence should be addressed: piero.pelizzaro@gmail.com
As stated by Jacqueline McGlade, Executive Director of the European Environment Agency: "Climate change is a reality all over the world, and the extent and speed of change is becoming more evident. This means that every part of the economy, including households, needs to adapt and reduce emissions". However, it should be pointed out that some regions of the world will be less capable of adapting to climate change than others because of economic disparities and the effects of these changes could deepen these inequalities.

The consequences, however, has to be considered not only at the global level, in fact in the report of the EEA is emphasized that a different adaptive capacity because of economic inequalities, there might be even within the EU borders. In order to reconcile the challenge of building climate resilience in a situation of great economic stress, it is therefore necessary to re-evaluate current policies and national strategies. For example, in many countries, national insurance systems and housing policies continue to encourage urbanization of coastal areas prone to flooding or high landslide risk, rather than avoid the risks.

Decide to continue with these policies may be the cause of the creation of pockets of vulnerability to climate risks. A 2007 OECD report analyzes 136 port cities around the world, and highlights how the population exposed to coastal flooding could triple by 2070 and this was due to the combined effects of climate change and urbanization. Another interesting fact that comes from the EU project Corinne tells us that between 1990 and 2006 the area of artificial soil of the European Union has grown from 176,000 to 192,000 km² (1), this is an area like half Germany. In the past sixteen years the consumption of fertile soil was then equal to 970 km² per year, or 265 acres per day. That is to say, it is an area as large as the historical center of Milan (2). If you were to continue business as usual by 2050 would add other 43,000 km² of ground cemented, an extension equivalent to the entire Denmark.

**Objectives**

Looking at the increasing awareness that global temperatures will raise, a mentality "Climate-smart" must be adopted by all levels of decision-making. "Climate-smart" is a term that originated in agriculture, to describe those interventions in the agricultural sector that are able to increase the resilience of adaptive capacity to climate change and at the same time reduce emissions of greenhouse gases.

A mentality "Climate-smart" incorporates the analysis of climate change taking place in the definition of strategies and operational decision-making processes. This approach involves the search for synergies between climate change mitigation and adaptation, wherever is possible.

**Outline of the work**

As for the energy, this approach has been well described in the position paper of the Alliance to Save Energy "Energy Efficiency: A Tool for Climate Change Adaptation. An Alliance to Save Energy White Paper" (February 2012), according to American scholars energy efficiency is the first tool to mitigate the changes taking place, through the reduction of fossil fuel consumption, but at the same time measures for energy demand management are also able to address some of the vulnerabilities of the energy sector in relation to the impacts of changing climate.

For example, we should consider as win-win solution:

1. The distribution of energy efficient technologies in end-use efficiency and production services, transmission and distribution can help to counteract the increase in demand and at the same time reduce the production of power in a context of higher temperatures;
2. Demand response programs and efficiency programs aimed at the management of energy peak load, that can help to counteract the increase in peak demand due to increased use of air conditioning and to address the uncertainties in the production and consumption of electricity and heating, due to extreme weather conditions, and so far, avoiding the need for construction of new energy facilities;
3. The manufacturers can design buildings "future proof", ensuring long life characteristics such as orientation and insulation and installing fixtures appropriate for the climate conditions;
4. Cities can reduce the environment temperature, and make buildings more energy efficient, with cool roofs or green,
5. The construction of distributed generation, particularly efficient combined production of heat and electricity (CHP), able to ensure the supply of electricity to large consumers or micro grid because they are less prone to outages due to extreme weather conditions, (6) efficiency programs in water management can address climate impacts on water resources and reduce the consumption of energy for pumping and water treatment. Energy efficiency, energy savings and demand reduction programs offer consumers and relatively inexpensive technologies to utilities and programs that allow a reduction in demand and the amount of climate-altering gases emitted.

**Methods**

The importance to look at adaptation has become fundamental to tackling climate change with an integrated approach, as repeatedly stressed by the Working Group II of the IPCC, which since long time stressed the concept that mitigation and adaptation should be complementary components of a strategy to response to global warming.
Develop an adequate adaptive capacity has become therefore a priority for European policy on climate. The European Commission White Paper "Adapting to climate change: Towards a European framework for action", has traced the path to the definition of the European Strategy for Adaptation which was published last April.

The Strategy will provide a leading role of governments but calls for a strong commitment of the local government and companies, since the impact of the changes are highly local. While some national governments are struggling to make binding commitments, many cities have taken the first steps, creating networks such as the ICLEI Initiative Resilient Cities and the EU Adaptation Strategies for Cities Climate (CITIES ADAPT), to share best practices and to promote bottom-up initiatives. The impacts of climate change will be different in every urban context, and therefore new approaches to local urban planning should include these factors in an appropriate manner.

**Results and discussion**

A "local tailor made" global response and a mix of real politics it is now necessary for the city to quickly adapt to climate change. The first step of the project BlueAP Bologna Resilient City - led by the Municipality of Bologna - is heading in this direction and proposes the definition of the adaptation plan by 2015. The Plan will be based on an analysis of vulnerability and territorial adaptive capacity - Local Climate Profile - made by ARPA Emilia Romagna. The measures to be implemented will then be identified and shared with the citizens and businesses through a participatory process - implemented by Kyoto Club and Ambiente Italia - which aims to engage the community and to improve the existing resilient capacity, starting the collection of memories and the ancient tradition of Bologna.

For responding to the complex future risks a link with what has already been implemented by Bologna Municipality in the definition of its Sustainable Energy Action Plan - Covenant of Mayors and the Metropolitan Strategic Plan will be take in consideration. This integrated approach shows how the Administration is adopting a "Climate-Smart" strategy in future planning.

**Concluding remarks**

But the fact remains that today we are facing enormous socio-economic challenges that require immediate attention, with the availability of limited public resources - in particular to finance efforts to prevent the long-term effects of climate change, which, in turn, could seriously affect the global economy. We find ourselves in front of a negative feedback loop daunting.

The logic of risk management tells us that countries should invest today for the protection of critical infrastructures and centers of economic activity for two main reasons: (1) estimates of future climate-related losses and damage are on the increase and these annual measures may (2) create new jobs to boost economic growth in the shortest possible time. The real problem is that investment in strategic infrastructure is easier to list than to do, in spite of the benefits you can have both in the short and long term.

Thus, a new approach, which is based on a meeting of minds in various professions, sectors and geographical areas, and the ability to act decisively in the face of considerable uncertainty about what the best plan of action, could tell. Continuing to hesitate to act today, we will continue to add burdens to the future generations.

**Keywords:** adaptation, climate change, memory, mitigation, resilience