CLIMATE PROOF PLANNING:
INNOVATIVE POLICIES AND TOOLS FOR COASTAL WATER MANAGEMENT IN NEW JERSEY

workshop internazionale di progettazione e pianificazione urbanistica e ambientale
The debate on climate change, supported by empirical evidence brought by the Stern Review (Carraro 2009), followed by regular reports from the IPCC (2007, 2013), the EU report on temperature increases and the EEA’s (2012) report on “Urban adaptation to climate change” in Europe, has become increasingly important within the urban issues. Climate protection can be generally defined as a set of indirect policies for adaptation and mitigation aimed at reducing the impact of climate change on natural and anthropized systems to the reduction of environmental degradation that may favour the climate changes in the medium and long term (Musco 2009). This combined approach of policies to mitigate and adapt acquires a strategic value, since it allows different management levels, multiple policy areas and a number of actors to be held together, both in terms of top-down and bottom-up. Although a growing part of the scientific community (Betsill and Bulkeley 2005; Biersbroek et al. 2009; Musco 2012), together with international institutions’ research and policies (IPCC, EEA, EU White Paper, ECI), recognizes the role that territorial planning can play in addressing both the causes and consequences of climate change, the explicit translation of CC-problems into territorial policy measures and actual management is far from being reached. It seems evident that adaptation, although by its nature being developed locally, needs to be supported by processes to integrate the different project and planning scales closely related to mitigation policies and efficiency of the urban scale.

The international workshop

The international intensive workshop was part of the university’s activities in the forming cluster/lab cities and climate change and promoted from Planning Climate Change Lab of the IUAV Department of Design and Planning in Complex Environments involving all the Master Programs in Architecture, Design and Urban Planning activated at IUAV.

The workshop strengthens the collaboration between the University IUAV of Venice and the Drexel University of Philadelphia with which there is an active Erasmus+ program, aiming to open a new agreement with the Department of City and Spatial Planning of the Penn University of Philadelphia, an internationally-known university involved in urban and environmental studies, design and architecture. Drexel and Penn universities have developed, during the last years, numerous studies and projects fostering the concepts of resilience, including knowledge fields such as planning, engineering and architecture with specific studies on climate change adaptation.

The international workshop developed was an opportunity to shape knowledge and methods, together with partner universities, to counteract climate change impacts on coastal areas. The workshop aims to enhance adaptation and mitigation strategies to CC, fostering coastal adaptation techniques and policies with the opportunity for replication across borders, insuring positive impacts for both the built environment and the propagation of successful methods in academic fields.

This week workshop was to target coastal climate risks and climate adaptation policies, focusing an estuarine coastal area of the Delaware river. As everybody know, 2012 Hurricane Sandy was the most recent severe example of a coastal storm that devastated coastal communities up and down the American eastern seaboard. New Jersey and part of Pennsylvania states were ground zero for Sandy, and five years later many communities are continuing to suffer economic hardship as a result of the storm.

The workshop was structured with a solid initial analysis that involved several institutions (IUAV, Drexel and UPenn), so that students’ work started with a good preliminary identification of opportunities and threats, that have the greatest resilience potential. This part was carried on with deep field visit, GIS analysis, floodplains and risk area, vulnerability assessment, physical and data sets on the NJ coastal area to recognize where best to focus resources and future action. The second part was oriented to a creative approach in order to elaborate proposals to successfully target risks and enhancing adaptation. Students were elaborate scenarios that will highlight the results of their design proposals on the resilient growth of communities showing the effects of the proposed solutions. In doing so, students were followed and supported by tutors, international professors and experts during direct comparison moments and step-by-step reviews.

Immersed in an international environment, in a country where climate-proof approach is at an advanced experimental stage, the students were enrich their knowledge and build their method through an experimental learning process.

Meeting the community

The first day of activity ended with the meeting of Eastwick community (Eastwick is a neighborhood of Philadelphia). This was a fundamental moment for the next stages of the workshop, because the community expressed his desire and also his concerns. The meeting was opened by an introductory presentation held by Prof. Franco Montalto) on the Eastwick community and on the objectives to be achieved during the workshop week. Then each of us (tutors, students, professors, and members of the community) presented herself in order to create a more confidential situation and thus to facilitate the discussion.

During the meeting, four thematic tables were created, one for each of the four study sub-area identified. On this occasion, students had questions about the study sub-area’s issues, curiosity, but also to hear the wishes and ideas of the area’s inhabitants, in that way students had the opportunity to improve their knowledge of the area and community perceptions. Each participant was free to move from table to table to express their opinion on the other areas as well.

Community residents have been prepared on faced topics and were eager to collaborate with students, offering interesting tips and suggestions for project ideas. It is important to underline that this community has been working on such kind of issues for 2 years, in a bigger town project. Thus, they were really prepared and available. Moreover, having not to much time to carry out in-depth analysis, the meeting with the community was important, because it allowed us to know immediately some criticalities of the place, but above all the desires and necessities of inhabitants.

In fact, our task was to find solutions that were functional but at the same time accepted by the community.

Prior to the 1950s, Eastwick residents called it many names, including “Elmwood,” “Clearview,” and “the Meadows.” In the words of former resident Mary Martin, Eastwick was a “knitted in community” built among natural marshlands. Specifically, students were have the opportunity to approach and work on:

- Coastal urban resilience to CC;
- Coastal hydraulic vulnerability;
- Shaping adaptation strategies to CC;
- Understanding mid and long-term impacts of extreme weather events;
- Elaborating an integrated design proposal;
- Building scenarios to test their solutions;
- Public space renovations and regeneration.

EASTWICK TERRITORIAL DYNAMICS

SAFETY

Adapting to Climate Change

Water management

Resilience actions

USABILITY

Multi-use

Re-appropriation

User friendly

Accessibility

Connections

Enhancement

URBAN + LANDSCAPE

ELEMENTS

THREAT

OPPORTUNITY

CORE AREA

SMART GROWTH

EASTWICK

meadows

20 McKee, supra note 1, at 547, 549, 555, 575 n.40.
Group 1 analysis and project

The group 1 has examined the surrounding sub-area of a Delaware’s tributary in which was detected the need of a levee. This decision was made consequent to the large amount of floods that affected the nearest houses and other public and private areas: indeed, this part of the Eastwick neighborhood has a public park, two schools, many playgrounds and a superfund site, which required the greatest care to avoid further diffusion of carcinogenic pollutants.

The meeting with the community and the analysis of this sub-area have suggested that the future design of the area should have improved what actually exist (the recreational and naturalistic value) and defend the citizens from floods and soil pollution, integrating the project paths with security solutions.

The final project it’s been completed integrating all the different goals of protection and development. The main solutions chosen was the construction of a soil levee that with is “green” design doesn’t affect the landscape. This issue has given the idea to work with different levels of soil, in order to create elevated routes, and pools of water containment.

Moreover, to solve the soil pollution issue, has been designed a phytoremediation system, this choice was conditioned by the composition of pollutants, which are polycyclic aromatic hydrocarbons and organic compounds derived from incomplete combustion of petroleum. The phytoremediation solution has been judged appropriate in this case because it consists in the use of plants that oxygenate the soil and degrade the organic compounds. These plants are located at the bottom of the water reservoirs, where there is a greater accumulation of liquids.

Along with these measures, a cycle-pedestrian pathways have been integrated, operating on three different heights: one on the levee, another series of paths is at the road level, which partly reproduce existing ones valorized by the presence of sculptures, which have been preserved in the project and increased by number. Finally, there are paths crossing the water reservoirs, which can be used in the absence of torrential rains and/or floods.
The group 2 has worked on the regeneration of the residential sub-area between the 84th street and Heinz national Wild Life Refuge. The main issues to rethink and improve were: lack of accessibility, poorness of public space and adaptation to hydrological risks since the area was affected in the past by the flooding events.

During the meeting with the community some representatives from the neighborhood explained us what they expect to be improved in the area, with this information we defined the framework for our project based on the hydrologic risk and the community’s priorities.

We tried to deal the community’s needs rethink completely the sub-area. The project was structured in two main objectives: the first one focused to adapt the area for flooding events, and the second one which focused on the community needs about leisure, use of the open and public space and accessibility. The main challenge was matching this two objectives using the same solutions.

Considering this challenge we decided to develop artificial levee with a bicycle and pedestrian lane on its top and some urban gardens in the vacant area between Heinz Reserve and the residential area. In that way the levee would be used as a green disposal both for leisure activities, and protection from inundation events. It’s also fits with the idea of expanding the natural reserve, in fact the levee would make a separation between the residential area and the vacant green one, which could be turned into a wet land through the inclusion of autochthon plants. With such solution this new wet land will be useful to collect the excess water during extreme events.

The project aimed to create four different spaces. The first one located behind the residential area, is a wild natural space, connected to the Heinz Reserve by some raised paths, between this area and the residential one, there is the second one, that is the levee space. That represent a technical solution to protect people but it could be also used for leisure.

The third one is located in the middle of the residential area, where we rethink a vacant space as a community square, connected to all the pedestrian paths surrounding the houses. Moreover, this space that is characterized by a natural depression of the soil, in case of flooding events, could be used as natural collection tank.

Finally, the last area is at the beginning of the neighborhood, where we observed that the first line of houses have some problems related to traffic (noise, pollution, unsafety, etc.). Thus, in such space we designed some “soft-green” intervention.
The group 3, worked on the sub-area around Eastwick Railway Station. The aims of the project was based on adaptation solutions able to increase the resilience of the building in that sub-area and also about socio-economic interventions to regenerate this Neighborhood.

The analysis was divided into two main phases. The first part was focused on the analysis of the site from the morphological and urban quality point of view. In fact, through a field visit was clear which type of constructive building typologies were present and consequently with which urban spatial structure we were dealing.

The second part of the analysis, was addressed to understand the concerns of the Eastwick community. This phase allowed a comparison about the criticalities and allowed us to assess the importance of appropriate design alternatives.

The results of the analysis permitted us to defined a design vision, that should address three main themes: resource exploitation, security and accessibility.

Furthermore, since Eastwick Station is included in the route that connects Washington with New York, and also it is the closest town stop to Philadelphia Airport, the project took into account the future perspective of the railway station's transformation into a high-speed station. Four interventions were proposed with the aim to solve the main problems related to low accessibility of the area, lack of public spaces, urban degradation, lack of parking near the station and poor flooding problems:

- the transformation of the railway station into a structure able to assimilate the great flow of people who use it daily;
- a new resilient parking near the station that can act as a “rolling tub” for floods;
- an “over-the-counter waterway system” for the disposal of floods;
- requalification of few car path infrastructure.
Group 4
analysis and project

The group 4 worked on the Pepper School sub-area. Thanks to a first field visit and the support of prof. Michael Nairn (UPenn University) we have obtained a complete overview of the state of art of the project sub-area. The main problem is the school location, the area is three meter lower than the road level. This position is critical in extreme weather conditions like strong rainfall, because produce flooding effect in the Pepper School. For this reason the school has been abandoned from some years.

The analysis was enriched from the participatory meeting with the community, whereby the necessities and needs of the inhabitants came out during the discussion. In fact, they imagine a new use of the Pepper School area, including the establishment of a meeting center for the community, a common desire shared from all participants present at the meeting.

At the same time, however, the area should maintain the same conformity with the existing difference in level, because is a "natural basin" already existing an able to contain a certain quantity of water during flooding events. In this way the water during the floods, does not reach the dwellings across the road border.

Taking all these aspects into account, the group’s design a proposal aims to give a new life to the sub-area. The first action envisaged by the project is the demolition of the school, too obsolete to be recovery.

The second step is to create a structure dedicated entirely to the inhabitants, through the insertion of a meeting point for the community, small enterprises, shops and services. These will be placed on raised structures linked together by pedestrian walkways. Below you will find a park equipped with basketball and baseball courts, pedestrian and bicycle paths that cross the whole area and thicker groves where people can walk and keep the cooler the area. The park will, therefore, have a dual functionality, on the one side recreational area, meeting and sport, on the other hand a water collector tank, in extraordinary weather conditions. To make the area accessible as possible, the area’s mobility system has also been revised, thanks to the realization of cycle paths that allow access to both the north and south of the area.
Conclusion

The four projects produced during the workshop have in common the ambition to find solutions to three main themes: to protect the Eastwick residents and their properties from floods and pollution, improving accessibility with particular regard both to slow mobility and the connection with the Philadelphia City Center, and the regeneration of public spaces.

The first theme was addressed through the use of barriers and detention basins to restrain floods and retain rainwater with as little impact as possible on the landscape; in some cases a phytoremediation system has been used through native plants to purify rainwater and soil.

The topic of accessibility, as mentioned above, has been developed in two different ways: in the case of slow mobility, all groups have included different cycling and walking paths in their project to create a network of trails efficiently connected to each other. The connection between Eastwick and Philadelphia was dealt with exclusively by group 3, which worked on the railway station, located between the airport and the city center.

The issue of public spaces has been addressed in different ways:
- group 1 has worked on an existing recreational area, so it had to keep that peculiarity in a project that also includes climate adaptation solutions;
- group 2 designed both green areas and community gardens in order to give to the community high quality recreational areas;
- group 3 worked on a facilities of the train station that could increase the livability of the users;
- group 4 has designed a community meeting center where the inhabitants can have a public space to discuss about the town issues.

If we match together all single projects in one big project, the Eastwick project, we can say that was made possible by fundamental experiences and conditions: primarily the meeting with the community was one of the key factor in the whole workshop and was a brilliant example of participation, where individuals experiences and needs have taken shape in a coherent project that follows the vision and the initial goals. Also with the limited time of the workshop we arrived in the end with a vibrant proposal for Eastwick neighborhood, that tried to shape the needs of the community, who had the opportunity to examine the output and to express doubts and advices at the day of the final presentation.