



# ADAPTATION ACTION PLAN (AAP)

## Executive Summary

University of Catania



Catania, May 2011

In the coming decades Sicily will cope with an average increase in temperature more than 3 degrees. The impact will be particularly heavy on the population considered that the current temperatures are significantly high. Adaptation strategic actions are extremely urgent and crucial especially in urban areas planning issues.

The University of Catania is responsible for the planning and management of several university sites and the campuses. They include several buildings and facilities, green areas and road networks with a relevant impact on the urban fabric of Catania. The largest one is the Main Campus (*Città Universitaria*), located in the northern periphery of the main city. However, the University spreads its activities, infrastructure and facilities all over South-Eastern Sicily. It directly manages a variety of rural and protected areas. In addition it acts as scientific advisor for various public administrations (municipalities, provincial and regional governments, parks and other natural areas management agencies). Indirectly, it can affect regional and local planning policy, with the involvement of a network of communities.

University involvement in the GRaBS project has produced an Adaptation Action Plan (AAP) aimed at coping with climate change effects mainly in its local context.

Considering its major expertise in the field of urban and regional planning, sustainable mobility and transport management and environmental and energy management, the University has produced a set of policy guidelines (Internal Action Plan) on its own university facilities, addressing climate change adaptation and mitigation actions. On a more strategic level, the University has developed a set of policy guidelines (External Actions Program) as a set of proposals for current planning activities of at regional level that can be useful for public administrations in Sicily beyond the administrative borders of the city also for Catania and its metropolitan area.

## **Existing expertise of university of Catania for the construction of the AAP**

University of Catania may provide experiences and skills in bridging scientific knowledge to political stakeholders and decision makers, in the urban and regional planning processes. Some of these aspects have been already investigated in the recent years in researches projects, consulting activities and management practices in the field of urban and regional land use and planning. Research experiences and innovative management and planning include the following:

- Catania Municipality, Master Plan revision, based on Adaptation and Transit Oriented Development principles; the general principles have been discussed by the City Council in June 2010.
- Catania Municipality; Sustainable Mobility Policy Guidelines, discussed by the City Council in November 2010.
- Paternò Municipality (a town in Catania Metropolitan area), program called “Greening the city refreshing the climate” on micro actions (pergolas and street trees aimed at improving the amount of green mass within the compact city.
- Mascalucia Municipality (a town in Catania Metropolitan area), Document for the Master Plan general directives, includes proposals based on Transit Oriented Development principles and strategies for planning of Non Urbanized Areas (NUA).

- Siracusa, Provincial Regional Plan (PTP) comprises a complete range of adaptation and mitigation policies at regional scale including a set of Transit Oriented Development proposal, the definition of a sustainable mobility network and a non prescriptive Appendix on Climate Change adoption actions , currently for no for
- Sustainable Energy Management of University of Catania subcontracted to a private partner (Energy Saving Company). It includes energy saving actions and a large program of PV panels mainly located in the Campus “Città Universitaria”. The program has been awarded by two prizes in September 2010 (Cofely prize - Gdf Suez) and more recently (May 2011) the “*Best Practice Patrimoni Pubblici*” awarded by “Forum PA” a yearly meeting of Italian Public administrations.
- Assistance to Green Space Department of the University administrative staff in defining the green area management policy, including the design of a new pedestrian path in the Main >Campus; currently (May 2011) under construction.
- Draft plan for an automated people mover (APM), connecting, University Main Campus and the new underground station “Milo”.

## Scope and format

*Spatial scale:* Adaptation Action Plan mainly addresses strategies and actions at neighborhood scale of the Main University Campus and other University facilities. AAP also deal with Adaptation issues at a broader regional scale, proposing general principles to public administrations involved in planning activities, in order to help them in taking into account climate change issues and adaptation and mitigation actions.

*Temporal validity of the Plan:* validity of the AAP will be 5 years.

*Actions priority:* involvement and participation of various administrative departments inside the University and, at a general level other public agencies and non-governmental bodies involved in the process of planning and implementing adaptation measures.

*Plan design responsibility:* AAP has been jointly designed by three scientific departments of University of Catania: Department of Environmental and Civil Engineering (DICA), Department of Architecture (DARC), Department of Mechanical and Industrial Engineering (DIIM).

*AAP format.* A Set of Guidelines for orienting in-house design of buildings, green areas and outdoor infrastructures a. In addition the plan proposes general principles to inform local government about potential climatic strategies to be included in local and regional planning instruments.

*Plan Management:* the responsibility in managing AAP will be taken by the relevant Administrative Offices of the Universities (Technical Areas) with a support team composed of representatives of the three departments who designed the plan.

*Monitoring and review mechanisms.* AAP will be monitored annually and will be reviewed every five years.

## **Climate change adaptation and mitigation strategies**

University of Catania deals with adaptation strategies, even if it will provide mitigation actions too, especially regarding energy and mobility. AAP provides adaptation strategies in the following strategic areas.

- Bio-architecture, eco-planning;
- Eco-friendly materials;
- Indoor environmental quality;
- Use and energy management efficiency;
- Green area and open space;
- Water management and conservation;
- Mobility;
- Information and awareness about the relevance of climate change challenges.

AAP also provides a list of expected results for each strategic area.

## **Internal actions plan**

Internal Actions Plan is composed by two main parts:

- University Facilities Adaptation Action Strategies;
- Main Campus Adaptation Action Plan.

University Facilities Adaptation Action Strategies are based on the classification into four categories: of the university facilities:

- Historical facilities located in the urban center;
- New facilities located historical urban center;
- Facilities in recent development areas;
- S. Sofia University Campus facilities (Città Universitaria).

For each category different actions are outlined in order to ensure both the aimed result and the safeguard of the historical and architectural quality of the most valuable buildings.

Adaptation Action Strategies are:

- Sound design of outdoor green spaces;
- water management and water saving;
- energy management and energy saving;
- eco-sustainable building materials and interiors quality.

Strategies can be achieved by the following groups of Actions:

- New green technologies for outdoor areas: Green walls, living walls, green curtains, green coats, green roofs, pergolas, hanging gardens, tree rows, rain gardens, new tree planting, allotment gardens, water permeable paving materials and green maintenance waste recycling;
- water management and saving: water collection system, retarding and balancing basins ;
- energy saving, management and sustainable energy production, definition of general rules for the installation of Photovoltaic systems,;
- Eco-sustainable building materials and interiors quality.

Actions on different facility components (facades, roofs, interiors, pedestrian spaces, green spaces, outdoor waste spaces and parking lots) may be able to contrast overheating and flooding effects and to manage and save energy.

Main Campus Adaptation Action Plan represents the more detailed part of the Plan and it is based on Land Cover Analysis, Critical Climate Change Effects Analysis and Pedestrian paths Climate Analysis. The analyses performed have been used for localizing and prioritizing the following recommendations:

- Actions on buildings;
- Rainwater management;
- Pedestrian paths network;
- Actions on pedestrian paths;
- External pedestrian paths network;
- Pedestrian path in progress.

The APP includes design examples intended as a suggestion for increasing the capacity of building and green area to respond to climate change challenges.

The plan include a proposal for extending the pedestrian and cycling network outside the borders of the campus connecting with the planned city network that will be proposed for the City of Catania as part of the Master Plan Revision.

## **External actions program**

An external actions program, referred not only to Catania and his metropolitan area, may be able to suggest adaptation strategies principles for urban and regional master plans, urban mobility action plans or other green strategies in order to deal with urban development at local and neighbourhood scale.

The program is focused on the following issues:

- Eco-sustainable Urban Planning;
- Bio-climate building adaptation;

- New urban green technologies;
- Transit Oriented Development strategies;
- Innovative and easy-to-implement public transportation approaches and technologies (BRT, automated people movers hectometric transport systems);
- Pedestrian and cycling paths networks;
- New forms of urban and peri-urban agriculture (agricultural parks, community supported agriculture, allotment gardens);
- Farmland protection strategies (Transfer of Development Rights (TDR) measures.
- Sustainable Energy production.

The plan devises a set of future actions to communicate these strategies to public administrations and agencies.

## **Conclusions**

The role of Catania University in implementing Adaptation Strategies in South eastern Sicily can be relevant and is already becoming part of the University policy (See Annex Decision of University Administration Board).

Main Campus may represents a place in which explore, at a local scale, adaptation strategic actions, which can be limited in size, but that can give significant information on a broader scale.

In this perspective, AAP suggested proposals may have a strong value and acting as guidelines for the next generation dealing with even heavier climate change effects.

## **Annex**

### **Summary in English of the Approval of the detailed design of a new pedestrian and cycling path in the University Campus S. Sofia by the University Administration Board, 25<sup>th</sup> February 2011 meeting.**

(See pdf file attached containing the original document in Italian)

The project approval was prefaced by a comprehensive introduction of the Administrative Director of the University

He describes summarily the climate change risks in Sicily characterized by a higher probability of heat waves and increases in storm water runoff, due to the massive urbanization in Catania Metropolitan Area. The presence of a large green area, like the university campus, represents a relevant resource, not only for the academic community but also for the city. Then, he describes briefly the Grabs Project pointing out that the University took part in the exchange of good practices. After, he describes briefly the critical issues of the Main Campus where outdoor areas need improvements and pedestrian mobility is discouraged by lack of adequate sidewalks, steepness of the site and absence of shade along the pedestrian paths, indispensable during the long hot season.

The area of the proposed project appears to be particularly suitable for a new pathway, considering that it is still in its pristine conditions of olive grove. This part of the campus has a considerable scenic value and can play an important role as far as mitigation is concerned. The proposed pathway will connect the sport complex and the open air theatre with the students' dormitory compound that hosts also one of the Campus Libraries and one of the canteens. A secondary lane will reach a new parking lot. The new pedestrian pathway will make this area useable for students, faculty and visitors increasing the availability of good quality outdoor spaces within the campus.

The project is briefly described to the board members: the path width is 1,5 meters, paved with macadam. It is sided by low retaining basalt stone walls. All the materials used are natural and highly permeable. Some shaded rest areas with wooden tables and seats are included. The total cost of the project is 56.000.

The director lists the technical documents of the project and details the legal terms for the tender, conforming to the laws in force.

The Director points out that the project was prepared by Eng. Fulvio La Pergola and the Agronomist Fulvio Uchino of Technical Department in charge of outdoor areas in collaboration with Professors Matteo Ignaccolo of the Department of Civil and Environmental Engineering, Paolo La Greca and Francesco Martinico of the Department of Architecture and Alberto Fichera of the Department of Mechanical and Industrial Engineering.

He concludes that the project can be considered a first step in establishing the good practices devised by the Grabs project.

The board approves unanimously.