

TERRA. Revista de Desarrollo Local

e-ISSN: 2386-9968

Number 8 (2021), 253-279

DOI 10.7203/terra.8.19017

IIDL – Instituto Interuniversitario de Desarrollo Local

**Adaptation to climate change, an opportunity for
sustainable spatial planning at regional,
subregional and local scales: examples in
Valencian region**

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ARTICLE SECTION

Adaptation to climate change, an opportunity for sustainable spatial planning at regional, subregional and local scales: examples in Valencian region

Abstract: Actions to adapt to climate change will shape the political agenda in the coming years and decades. In fact, concrete actions are already being developed at the regional and local levels in Spain. Valencian Community has launched, in recent years, various actions, both planning and regulatory, that are having an impact on local scale. Municipalities do not always understand the benefits of sustainable territorial planning, because there has been no tradition in our country of territorial sustainability actions. This question is studied by mentioning the examples of international good practices and three initiatives that imply a change in the territorial culture in the Valencian territory, promoted by the regional government and that will have concrete effects on the local scale in the framework of the current process of adaptation to the global warming process.

Key words: sustainable spatial planning; climate change; adaptation; regional, subregional and local scales.

Reception: November 09, 2020

Review: April 23, 2021

Acceptance: April 29, 2021

Citation:

Olcina, J. (2021). Adaptation to climate change, an opportunity for sustainable spatial planning at regional, subregional and local scales: examples in Valencian region. *TERRA. Revista de Desarrollo Local*, (8), 253-279. DOI 10.7203/terra.8.20364

IDEAS CLAVE / HIGHLIGHTS / IDEES CLAU

1. La ordenación del territorio debe considerar los recursos y los riesgos del medio como principios rectores de las actuaciones de planificación territorial.
2. Las escalas regional, subregional y local deben incorporar el cambio climático como elemento de la infraestructura verde a la hora de asignar nuevos usos del suelo.
3. Los aspectos que debe incorporar la infraestructura verde en la planificación territorial y urbana para reducir los efectos del calentamiento climático son: a) el aumento de temperaturas y pérdida del confort térmico, b) la subida del nivel del mar en áreas litorales, y c) los cambios en las precipitaciones.
4. En la Comunidad Valenciana se han desarrollado algunas acciones, planes y normas, que tienen el cambio climático como principio rector para la consecución de un desarrollo territorial sostenible: el PATIVEL, el Plan Vega Renhace y la Ley Valenciana de Cambio Climático.

1. Spatial planning must consider the resources and risks of the environment as guiding principles for spatial planning actions.
2. Regional, sub-regional and local scales should incorporate climate change as an element of green infrastructure when allocating new land uses.
3. The aspects that green infrastructure must incorporate into territorial and urban planning to reduce the effects of global warming are: a) the increase in temperatures and loss of thermal comfort, b) the rise in sea level in coastal areas, and c) changes in precipitation.
4. In the Valencian Community, some actions, plans and regulations have been developed that take climate change as a guiding principle for the achievement of sustainable territorial development: the PATIVEL, the Vega Renhace Plan and the Valencian Law on Climate Change.

1. L'ordenació del territori ha de considerar els recursos i els riscos del mitjà com a principis rectors de les actuacions de planificació territorial.
2. Les escales regional, subregional i local han d'incorporar el canvi climàtic com a element de la infraestructura verda a l'hora d'assignar nous usos del sòl
3. Els aspectes que ha d'incorporar la infraestructura verda en la planificació territorial i urbana per a reduir els efectes del calfament climàtic són: a) l'augment de temperatures i pèrdua del confort tèrmic, b) la pujada del nivell de la mar en àrees litorals, i c) els canvis en les precipitacions.
4. A la Comunitat Valenciana s'han desenvolupat algunes accions, plans i normes, que tenen el canvi climàtic com a principi rector per a la consecució d'un desenvolupament territorial sostenible: el PATIVEL, el Pla Vega Renhace i la Llei Valenciana de Canvi Climàtic.

EXTENDED ABSTRACT¹

Current climate change process is scientific evidence with direct effects on atmospheric elements (temperature, rainfall, etc.), but with repercussions also on uses and economic activities implemented in geographical areas. Hence, the consideration of the global warming process that has been recorded in recent decades must be comprehensive, addressing policies and practices that affect the causes and effects expected in the modeling. Regional, subregional and local scales are decisive in the actions to be developed, as it is the area closest to the public and the one with greatest capacity to carry out actions with greatest impact on adaptation to climate change. This is so both due to the implementation of its own actions, as well as the application of actions derived from the application, at the municipal level, of the determinations of plans and higher-scale standards.

At present, the planning of the territory has challenges in the framework of sustainability and climate change, as a guiding principle of the actions to be planned in the environment: a) it must consider the resources and risks of the physical environment; b) it must incorporate the environmental regulations issued by the competent administrations; c) it must comply with the hierarchy of work scales that are fundamental in legal practice; and d) it must incorporate a continuous diagnosis phase based on the design of monitoring indicators for the continuous evaluation of the plans. And all this, under the principle of transparency and open information to society by competent administrations.

The incorporation of landscape, as a fundamental spatial planning criterion, and of green infrastructure, as a tool for territorial management, allow incorporating, among other aspects, climate change into the planning of the territory. To this finality, cartographies and models that can be used when defining the green infrastructure layers that establish the first delimitation between the geographical area to be protected and the geographical area that will be actionable.

The aspects that green infrastructure must specifically incorporate into urban and regional spatial planning to reduce the effects of climate change, are the following: a) increase in temperatures and loss of thermal comfort, the effects of which can be mitigated through urban design measures such as the increase in public parks, green spaces in homes (terraces and green facades); b) rise in sea level in coastal areas, the effects of which must be reduced with structural actions, in some cases, and with territorial planning (regulation of uses along the coastline, vacant coastlines). And c) changes in rainfall, with an increase in its intensity and irregularity, which makes it necessary to design large-capacity water drainage spaces, as well as water storage tanks of greater capacity than existing ones to guarantee supply of urban demands. All this must be based on the elaboration of rigorous behavior models of climatic or environmental elements (sea level) and that allow the periodic updating of the projections with a view to their application in territorial planning.

In Valencian Community (Spain), some actions, plans and regulations have been developed, which have climate change as the guiding principle for the achievement of sustainable territorial development. These are PATIVEL (Territorial Action Plan for Green Coastal Infrastructure), the Vega Renhace Plan and the Valencian Climate Change Law.

Along with the rest of the green infrastructure parameters contemplated in the Valencian Territorial Strategy (2011), Pativel has included in the definition of the green

¹ Traducción exclusiva de los autores / Authors' exclusive translation.

infrastructure at the littoral areas, the influence of climate change in the coastal strip (sea level rise, flooding areas due to increased episodes of river flooding). In this last aspect, PATIVEL is novel at the state level. For this, it has considered the “Effects of climate change on the Spanish coast Report”, of the Ministry of Ecological Transition, as well as other works on the Valencian littoral to estimate the evolution of the Valencian coast in a double sense: erosion due to littoral drift and the effects of surge storms.

For its part, the purpose of the Vega Renhace Plan is to turn the catastrophe into an occasion to promote a resilient environment that favors the economic and social regeneration of the Vega Baja. And, at the same time, promote a territorial development, respectful with the environment, that prepares for future episodes of storms, and that allows a greater structuring of the territory of the Vega Baja with the rest of the Valencian Community. The Vega Renhace Plan has been organized into four fundamental pillars: coordination, consensus, evidence and resilience. These pillars have acted as the backbone of the need to join efforts of various actors, public and private, to achieve great common objectives.

Finally, the Law on Climate Change and Ecological Transition, presented as a normative proposal in the spring of 2020, represents an advance in the political consideration of current climate warming in the territory of the Valencian Community. It is a text that comprehensively addresses policies and administrative actions to reduce the effects of climate change, that is, both mitigation actions (energy) and adaptation (territorial planning, urban design, education). The proposed law indicates that in all territorial planning instruments that are developed after its approval, the climate perspective must be incorporated. In short, numerous articles of the bill are a necessary bet to adapt urban planning to the principles of mitigation and adaptation to climate change.

In short, climate change is, and will continue to be, a priority axis for public policies and private actions in territories with high exposure to its effects, such as the regions of the Spanish Mediterranean coast. Of the set of actions that can be developed to reduce its effects (loss of thermal comfort, greater irregularity in rainfall, high frequency of extreme weather events), spatial planning is a particularly effective procedure for mitigating and adapting to climate change.

The application and management of its determinations and planned actions is presented as a challenge for the consolidation of a necessary commitment to territorial sustainability that should be the guiding principle of territorial plans and programs in the coming decades, within the framework of the fulfillment of the Sustainable Development Goals (SDG) and European Strategy of economy decarbonization (2050 horizon).