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# OURS

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These factsheets have received financial support from EIT Climate KIC in 2020. To cite this work: Marie, Jussaume, «Climate and biodiversity solutions. Agricultural and natural spaces, keys to resilience» Terre et Cité. 2021.



## CLIMATE AND BIODIVERSITY SOLUTIONS agricultural and natural spaces, keys to resilience

Based on the case studies  
of the urbanizing landscapes  
of Paris-Saclay and the Silicon Valley



# AGRICULTURAL AND NATURAL SPACES KEYS TO RESILIENCE

Ecosystems and biodiversity are particularly sensitive to climate variations and extreme weather conditions. Scientists (IPCC, 2020; IPBES, 2019) therefore increasingly highlight their vulnerability to ongoing climate change:

**Temperature  
+ 8.6 °F**

If the current rate of greenhouse gas emissions continues unchanged by the year 2100, average temperatures at Earth's surface could rise by 8.6°F relative to the period 1986 – 2005. In contrast, average temperature rose by only 1.5°F between 1880 and 2012.

**Sea level  
+ 3ft**

Sea level could rise by close to 3 feet by the year 2100, relative to the period 1986 – 2005. By comparison, sea level rose by 7.5 inches since the end of the 19th century.

**Biodiversity  
- 20 %**

The average abundance of local species in most large terrestrial habitats has declined by at least 20% since 1900. Around one million animal and plant species are threatened with extinction. Specifically, more than 40% of amphibian species, nearly a third of coral reef species and more than a third of all marine mammals are threatened.

**CO<sub>2</sub> emissions  
+ 54 %**

Between 2002 and 2011 annual carbon dioxide emissions of human origin, due mainly to fossil fuel combustion and cement production, were 54 % higher than the 1990 level of anthropogenic emissions.

**Ecosystem services  
per year  
\$75  
trillions**

Global terrestrial ecosystem services have been estimated to amount to the world's annual gross domestic product (\$75 trillion in 2011, based on the value of the 2007 U.S. dollar).

Ecosystems on land play an important role in climate systems because changes in the conditions that affect them may significantly modify the probability, the intensity and the duration of extreme weather events. Sustainable land management can therefore help reduce some of the adverse effects of climate change on land deterioration: curb soil degradation, sustain land productivity, preserve resources, strengthen social resilience, support ecological restoration and so forth. However, ecosystems are currently negatively impacted by anthropogenic pressure which often leads to their degradation and reduces their capacity to provide benefits to people. A range of activities to combat degradation of natural, agricultural and forest areas, together with the implementation of wise land management systems can contribute to climate change adaptation and mitigation, all while reducing loss of biodiversity and fostering direct or long-term benefits at the landscape level.

However, the actions taken against climate change and biodiversity loss are not always associated with one another, despite some progress in integrating these issues. Various successive IPCC reports have pointed out that terrestrial and marine ecosystems absorb nearly half of the carbon dioxide emissions generated by human activities. Therefore, the carbon neutrality objective, that numerous countries support today, can only be achieved provided that it is linked to the protection of ecosystems and habitats. The signing of the 100 Percent Clean Energy Act of 2018," Senate Bill 100 (SB 100, De León) by the governor of California in 2018, was accompanied by the publication of two executive orders (CA EO B-54-18 to safeguard California plants, wildlife and ecosystems from climate change et CA EO N-82-20 to combat the biodiversity and climate change crises in California using nature-based solutions). They call for a more thoughtful and systemic approach that considers the connections between climate change solutions and biodiversity conservation.

This leaflet thus reviews the major issues of climate and biodiversity at different levels (international, governmental, and regional) by following legislative and regulatory trends and by drawing on the experiences of two regions, and specifically on peri-urban landscapes: the Santa Clara Valley in California and the Saclay Plateau in France.

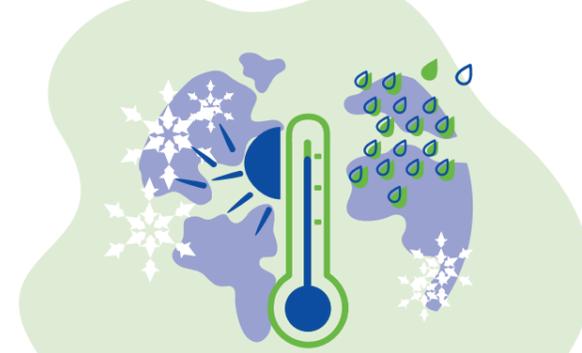
## PERI-URBAN SPACE



This spatial category, which is useful for measuring the phenomenon of urban sprawl on the outskirts of cities, is nevertheless limited because its forms and definitions vary from country to country. In France, the term appeared in the 1960s and became a statistical category in 1996 based on commuting patterns: a municipality is defined as peri-urban when more than 40% of its active residents work in an urban center with at least 1,500 jobs (INSEE French National Institute of Statistics). During the twentieth century, the sprawl of cities in the United States is growing faster and larger than in Europe which raises questions about their boundaries. Since 1983, the Census Bureau has used Metropolitan Statistical Areas (MSA) to distinguish between the central city and the outlying areas based on commuting patterns. Despite their great diversity (isolated suburban housing developments, small apartment buildings, small towns or villages, etc.), peri-urban areas are often discontinuous, sometimes lack comprehensive planning, structured by car use and interdependence with an urban center of reference. They are also areas of proximity between urban, agricultural and natural spaces which brings up the interactions between people with different lifestyles.

# WHAT IS IT ABOUT ?

## CLIMATE CHANGE



Climate refers to average meteorological conditions such as wind, precipitation, temperature, etc., measured over long periods of time and a given geographical area. Climate change is thus the permanent modification of climate systems resulting from human activities in the Anthropocene. It was only in the 1970s that this human impact was recognized as important. It has since been demonstrated by numerous scientific reports that the observed trend is statistically significant and distinct from the natural cyclical variability of climate. Climate change is not to be confused with the term global warming, which refers to the long-term global trend of warming of the atmosphere and the oceans, melting ice sheets, rising sea levels and greenhouse gas concentration in the atmosphere.

## « TERRITOIRE »



The French term 'territoire' appeared at the end of the twentieth century and is defined as an area appropriated by a human community which can have in common characteristics. It has a political dimension, because it is a delimited entity over which an authority is exercised, as well as a symbolic dimension, because its perception is influenced by the sensitivity and experience of individuals. It is a specific French concept that differs from the more objective and descriptive terms of 'espace' or 'milieu'. Its English translation should be treated with caution because it is not obvious in direct translation. The word «territory» is in fact a neutral term for an administrative territory. On the other hand, terms «landscape» or 'open space' are increasingly used in English to encompass social, ecological and geographical aspects. Its use is much broader than the word 'paysage' in French which designates a visible expanse. The words «place» and «space» have a more everyday use. Place is a known, controlled and safe area, associated with a space in close proximity or even intimacy. And Space is a term that designates a more vague and abstract area, which remains to be discovered and which is not always controlled. To designate natural, agricultural and forest spaces, the expressions «open space» and «Natural and Working Lands» are more and more used.

## BIODIVERSITY



Developed by biologists and ecologists, the term biodiversity was coined in 1988 in Washington DC at the National Forum on BioDiversity. It refers to the diversity of all forms of life at various levels: within species through genetic variability, between species but also at the level of the ecosystems in which they live. The emergence of the term is part of the scientific development of descriptive procedures to quantify and classify living organisms. Despite the increasing number of quantitative studies, this concept is the subject of debate as it refers to an elusive reality that does not always provide specific information. Often understood through its components that have disappeared, biodiversity has nevertheless become a cornerstone of modern environmental legislation, particularly in Europe. In the US, the principle of «conservation» has long prevailed and is used to justify the preservation of lands for protection. But the notion of biodiversity is also beginning to develop.

## RÉSILIENCE



Resilience is a concept originally used in physics and psychology to refer to the capacity of an organism to recover or regenerate. Since the 2000s, it has been used in ecology to define the ability of a population or an ecosystem to recover from a disturbance by withstanding and adapting to its effects. This notion, which is present throughout public debate, does not, however, meet with consensus because it questions how well technical innovations can operate to eliminate or reduce climate risks. Regarding the incentive for adaptation, political rationales often focus on strategies that deal with impending consequences and that require less effort than actually solving the root causes of problems, in contrast to mitigation. Implementation of strategies to promote resilience require attention to how operationality can proceed, while invoking practical solutions that are pertinent to areas with different levels of vulnerability.