Cerema

THE RESILIENCE COMPASS

Benchmarks for territorial resilience

CONTENTS

FOREWORD

The Covid-19 pandemic, unprecedented by its global nature, reminds us that shocks and crises often take unpredictable forms. Communities, on the front line of this health crisis, are experiencing their great vulnerability, but at the same time reveal their coping and adaptation capacity, in the hope of being better prepared for future crises.

The disruption of planetary balances, however, which mark our time, from climate change to the decline of the living world, constitutes an even more serious threat than the current crisis. While the probability of more frequent and more violent shocks increases, and whose systemic effects generate cumulative crises (health, economic, climatic, social, etc.), communities are continuing their efforts to improve the quality of life of residents, preserve the environment, while now learning to "live with" uncertainty. Resilience is thus included in the ecological transition agenda, the requirement for anticipation and preparation supporting that for transformation.

These Cerema notebooks support these dynamics through the resilience compass, which is intended to help the stakeholders in the territories who are constantly aware of the challenges to be met.

A resilience compass

WHY? WHO'S IT FOR?

The **Cerema resilience compass** presented in this guide constitutes, in this context, a framework for reflection and action. It is intended to help the stakeholders of the community and, more broadly, of the territory (companies, local stakeholders, inhabitants, etc.), **strengthen their resilience to better anticipate, act, bounce back, transform over time and, ultimately, to reduce their vulnerabilities.**

The compass is thus suitable for any type of territory (city, inter-municipality, district, department, region, catchment, natural park, coastal strip, etc.) or organisation (community, company, public establishment, association, etc.). It aims for example to feed the reflections of the territory by shedding light on its degree of maturity on the subject.

It allows any public policies; approaches, project or existing or planned actions to be **considered from a resilience standpoint**. It reveals their contribution to the overall resilience of the territory and helps identify avenues for improvement. More generally, it can support the **implementation and monitoring** of sustainable territorial projects, by making it possible to integrate all the components of resilience into these projects.

Finally, the resilience **qualities** described in the annex can also serve as a reading grid to strengthen the resilience of projects, public policies or processes. The methods for using the resilience compass are therefore not set in stone at this stage and will be the subject of exploration and capitalisation.

WHERE DOES IT COME FROM?

Through its work for communities and its methodological know-how, Cerema has built a recognised expertise around this notion of resilience for many years. The design of the resilience compass proposes an **original vision** of resilience. This latter derives from the diversity and complementary nature of Cerema's

competences, reflected by its spheres of action (sustainable city, territorial strategies, ecological transition, climate, risks, standardisation, etc.).

It is, moreover, the result of a **twofold analytical and practical** approach. Substantial analytical work on repositories, methodologies, standards and models, which have helped stabilise the concept of territorial resilience over the past decade[1], has made it possible to outline the contours of the compass. This theoretical version of the tool has greatly evolved, faced with the practice of stakeholders in the field, which today allows its operational translation into approaches and projects in the territories.

The use of this initial prototype by a variety of territorial scales and a diversity of organisations will enrich it and make it more robust by confronting the practice and the realities of various fields. Cerema integrates this **principle of capitalisation of experiences and development** into the life of the compass, and will regularly publish updated versions.

TOWARDS RESILIENT AND SUSTAINABLE TERRITORIES

While the resilience compass includes the conventional levers of risk mitigation and resilience, it also asserts the importance of **transformation** as a key principle of a necessarily global and transversal approach. In this, the notion of resilience is strongly interwoven with those of ecological transition and sustainability. **An unsustainable territory cannot be resilient, just as a non-resilient territory cannot be sustainable.**

1 - All the methodologies that inspired the compass are listed in the bibliography.

Indeed, the actions implemented in the immediate post-shock period, then in the post-crisis reconstruction period, are rarely of a nature to question, or even to dispute, the deep vulnerabilities of the system which resulted in the disruption. A **profound transformation** of the social, economic and physical structures of territorial systems, however, is **inherent to resilience** as developed within this framework.

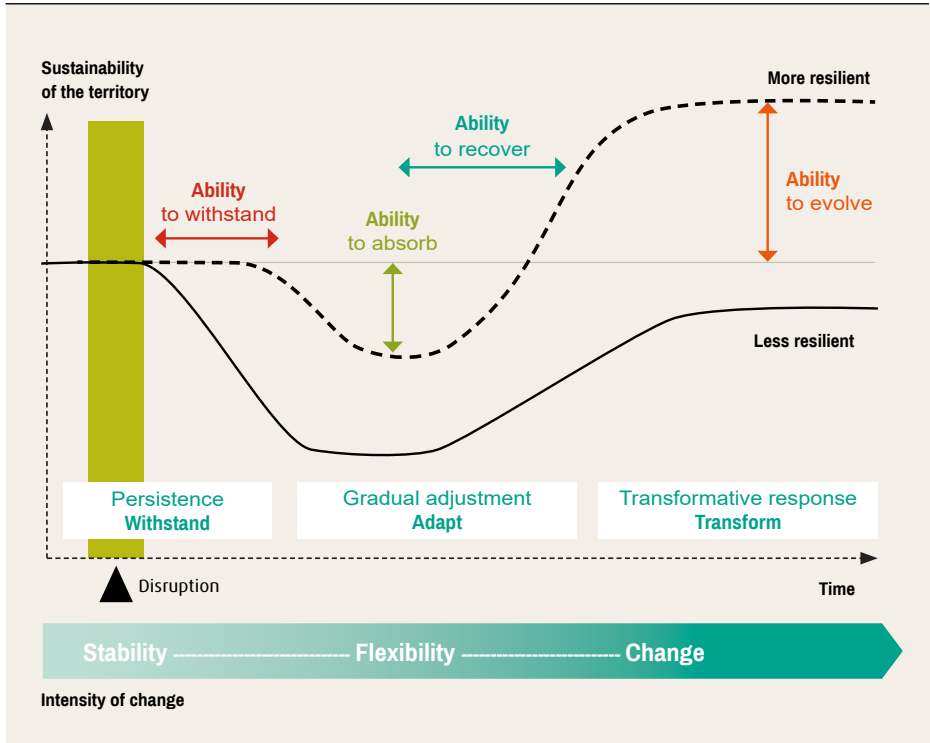Thus, a resilient territory can be defined as having the capacity to:
► **anticipate** any type of disruption;
► **act** to reduce the effects or prevent their appearance;
► **bounce back**, recover;
► **adapt** and **transform**.

The choices should ideally be collective and fit into ecological transition trajectories that guarantee basic needs and ensure that planetary limits are not exceeded.

The diagram opposite, adapted from Tendall et al (2015), allows this definition to be expanded and illustrated by introducing the founding concepts of resilience, which underpin the compass. This diagram represents changes in the sustainability of a territory, subjected to an initial disruption (flood, epidemic, factory closure, etc.). It highlights three main phases, which may sometimes not follow one another, but be concomitant:

► the first phase corresponds to the period immediately following the shock: the way in which the system reacts shows its sensitivity to the shock, determined by its **ability to withstand** the impact and its physical fragility (vulnerability);

► the second phase begins when the system experiences the effects of the disruption and attempts to deal with it. It refers to the ability **to absorb the disruption.** The system then reacts to the shock and gradually re-establishes its trajectory: the **ability to recover** then comes into play. This second absorption-recovery phase constitutes a phase of gradual adjustment or **incremental adaptation;**

► Finally, the third phase is that of the transformative response and corresponds to the **territory's ability to evolve and transform** in order to orient its trajectory towards a new equilibrium characterised by greater sustainability.

Resilience of a territory subjected to an initial disruption

Learning ability, which is part of the post-crisis period, thus appears to be essential to a territory's resilience: the aim is to learn, through feedback and successive disturbances, in order to increase the ability to withstand, absorb, recover evolve and transform. The choices should ideally be collective and fit into ecological transition trajectories that guarantee basic needs and ensure that planetary limits are not exceeded[2].

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2 - In "The Donut Theory", the economist Kate Raworth seeks to reconcile the issues of social justice with environmental issues, to orient the economy in favour of sustainable and fair development. Between the outer (environmental ceiling) and inner (social floor) limits lies the safe and just space for humanity.

The resilience compass

6 PRINCIPLES AND 18 LEVERS

The resilience compass constitutes a first attempt to synthesise and formalise the theoretical and practical lessons learnt and a first draft towards a **"repository" of resilience.** The compass offers an action framework for communities, organised into **six principles, themselves broken down into eighteen levers.**

These Cerema notebooks aim to describe their content **by explaining and illustrating them.** The order in which the principles and levers are presented does not reflect the priority of one over the other, the six principles and eighteen levers forming a system.

The eighteen levers are then broken down into a few **example actions**, which are simply illustrative and from which communities, or any other compass users, can take inspiration. The aim is to locally build actions that promote their territory's resilience dynamic, whatever the type of shocks or disruptions: hazards, shocks, chronic stress, slow pressures ("low-noise" economic, demographic or environmental changes), as yet unknown threats, etc.

Resilience compass: consolidated version

Cohesion - Solidarity
- Culture and know-how
- Solidarity
- Ability to act

Strategies - Governance
- Shared governance
- Territorial cooperation
- Integration of vulnerabilities

Anticipation - Watch
- Knowledge of threats
- Information - education
- Preparation for the crisis

Robustness and continuity
- Reduced exposure
- Strength and reliability
- Continuity of service

Adaptation, learning and innovation
- Monitor and alert
- Feedback and benchmarks
- Innovation, experimentation

Sobriety and basic needs
- Vital and essential needs
- resilient economy
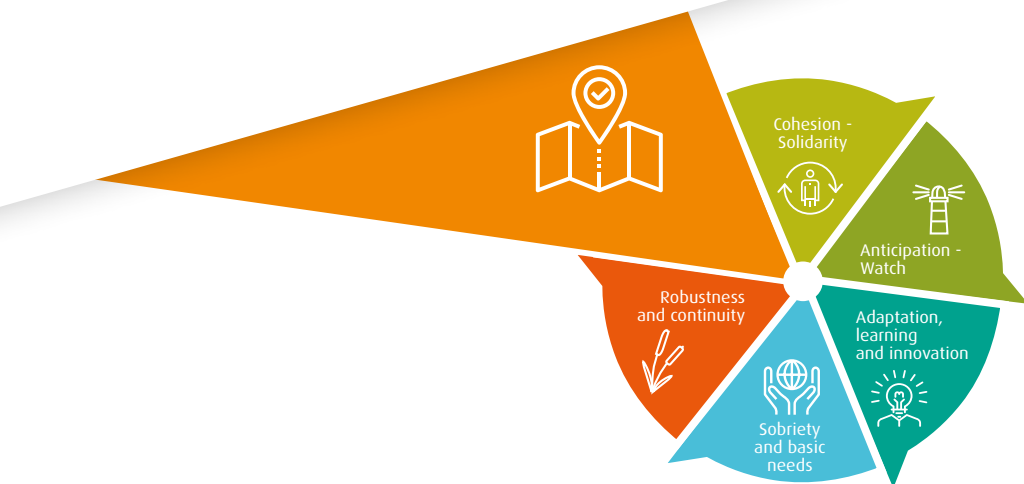- Planetary limits and resources

PRINCIPLE 1

INTEGRATED AND ADAPTIVE STRATEGIES AND GOVERNANCE

Ensuring
shared
governance
and citizen
participation

Ensuring
multi-scale
cooperation
between territories

Integrating
vulnerabilities and their
evolutions
in all projects

What is it all about?

A major lever for transformation concerns the governance and management of public action. On the one hand, it is about moving from institutional governance, prioritised to more horizontal governance and giving pride of place to emergence, intuition, experimentation and co-responsibilities.

The involvement of all local stakeholders, whether citizens, elected officials, technicians or entrepreneurs, is an essential principle, as is the establishment of the conditions for dialogue, collective learning and co-development of the responses best suited to local realities. The diversity of views and experiences is a source of richness, creativity and innovation in projects.

This lever also covers work on a large scale, relevant and consistent with the problem addressed. This will require combining sectoral topics, time scales (e.g.: integration of climate change) and territories (e.g.: upstream-downstream solidarity for floods, or metropolitan and rural areas for food). This systemic logic also makes it possible to better anticipate the domino effects and invites renewed modes of governance. Finally, the effectiveness and the scope of resilience strategies are all the stronger when all the actions of the territory are coherently directed towards this balance. This implies a systematic consideration of resilience both in projects and in planning and programming exercises, from design to implementation.

Lever for action

ENSURING SHARED GOVERNANCE AND CITIZEN PARTICIPATION

The construction of a resilient territory invites us to widely share the diagnosis, objectives and action plan, which in turn implies innovative modes of governance, better sharing of resources and responsibilities, along with going beyond "silos" or limitations of traditional administrative procedures. A territory's resilience is necessarily co-constructed and thought out with and for all stakeholders, in their diversity (social, hierarchical, cultural, thematic, professional). The effective participation of all proponents allows everyone to be informed and made aware, but also to be the guarantor of the commitments made (see compass of Cerema's participation). The implementation of collective intelligence processes reinforces the acceptability, adaptability, creativity and robustness of the project.

Action examples

• **Create and strengthen a climate of trust** and communicate by guaranteeing the transparency of information (traceability, visibility and readability).

• **Encourage and collect the voice of citizens**, by setting up consultation, stakeholder involvement of, co-construction and co-decision mechanisms, with dedicated actions for the most disadvantaged groups, sometimes excluded from stakeholder involvement mechanisms.

• Ensure **political support** for the vision of a resilient territory. Set up a **dedicated and inter-sectoral organisation**, that rises to this ambition, through a team representative of the diversity of issues, fields, populations, professions and a dedicated action plan, also providing for actions aimed at transforming current ways of "doing".

• Appoint a **manager** in charge of participatory democracy and dialogue with stakeholders, develop a culture of listening, transparency and participation, train or be supported on collective intelligence and collaborative production practices. Devote the necessary resources to these actions.

Example

Co-construction workshop

In 2019, Cerema supported the Nièvre department in developing a strategy for adapting to climate change. At the heart of the proposed methodology, Cerema asserts the ambition to co-construct, with a diversity of stakeholders, a sustainable approach compatible with planetary limits. The collective development of such an approach constitutes one of the conditions for the success of the project, in that it facilitates the acceptability and support of the populations, the co-responsibility of measures between stakeholders and the construction of a shared vision of the territory.

Lever for action

ENSURING MULTI-SCALE COOPERATION BETWEEN TERRITORIES

A territory's resilience depends on its ability to forge intelligent cooperation with other territories, at several scales. Thus, the effectiveness and consistency of actions often depends on the relevance of the scale of implementation. Both in times of crisis and in the long term, a resilient territory seeks to strengthen its relations with other territories, to promote mutual aid which reduces the impact and allows better recovery, but also to build partnerships of joint interests to appropriate scales: agreements on a catchment for floods, water quality or water stress, exchange of sensitive site monitoring data, for example, etc.

Action examples

• **Understand the context and challenges of each territory** in order to articulate the purpose of their projects.

• **Ensure action consistency** and concerted management of flows at different scales, according to the principle of subsidiarity, by stimulating synergies and complementarities between stakeholders through meetings, dialogue, co-construction and cooperation over time.

• **Pool the resources** deployed in the service of resilience.

• **exchange: participate in networks** of territories working on resilience.

• **Build "inter-territorial" partnerships and cooperations**, between several levels of territorial governance (e.g.: between the city centre and its periphery) and initiate reciprocal actions.

• Establish, at a supra-municipal level, a **network of "resilience" referents** present at each level, like the "ambassadors of sustainable development" networks.

INTEGRATE VULNERABILITIES AND THEIR DEVELOPMENTS IN ALL PROJECTS

The transformation of management methods, towards better consideration of vulnerabilities, very early in the process of projects, constitutes a principle of action for resilience. It is a question of designing any project, any public policy by integrating from their conception, their planning, even their financing, all the questions relating to the various forms of potential disruptions, to the fragilities and to the sensitivities of the systems concerned, etc. Thus, it now seems essential to take into account the effects of climate change and to anticipate the increased frequency of extreme phenomena, heat waves, drought, epidemics, etc.

Besides this logic of anticipation, close attention is paid to the effects of the project, such that it does not worsen, or even reduce, the vulnerabilities, and consequently, the short- or long-term threats to the territory. It is truly a question of entering into a logic of resilience, engaged in a systematic way, which notably mobilises the resilience qualities defined in this document. This systematic attention to resilience ultimately appears as an opportunity to invent ways of doing things differently by working with all the stakeholders concerned, based on systemic approaches and leading to unusual technical responses such as innovative urban forms, functionality-oriented uses, etc.

Action examples

• **Integrate adaptation, particularly with regard to poorly or unknown threats, into public policy planning** and projects (e.g.: project reversibility) with regard to changes, in particular climate change.

• **Check upstream** of each project its **compatibility** with the resilience policy (**ex ante** evaluation).

• **Favour multi-benefit actions** (nature-based solutions have this characteristic).

• **Favour so-called no-regret measures** (beneficial whatever the future situation).

• **Check downstream** the consistency and non-antagonism of the planned actions and their compatibility with the resilience of the territory (**ex post** evaluation).

PRINCIPLE 2

SOCIAL COHESION AND SOLIDARITY OF STAKEHOLDERS

Relying on a shared culture and local know-how

Supporting solidarity and consideration for the most vulnerable

Guaranteeing trust and the ability to act

Strategies - Governance

Anticipation - Watch

Robustness and continuity

Adaptation, learning and innovation

Sobriety and basic needs

What is it all about?

While a territory's resilience is based on the community's ability to prepare and anticipate, it also relies on the ability of its inhabitants and stakeholders, in the face of a shock or crisis, to self-organise, to show solidarity, to create local mutual aid webs. This self-organisation faculty, both horizontal and collective, depends heavily on social cohesion.

A territory, in order to strengthen its resilience, will therefore seek to consolidate social cohesion, by promoting local culture and know-how, by supporting solidarity, by reducing inequalities and by taking into account the most vulnerable people. Social cohesion and stakeholder solidarity help reduce the sideration time associated with a shock, promote the ability to act and to set in motion, thereby limiting the psychosocial consequences.

Social cohesion and solidarity, which meet a fundamental need for consideration and esteem, constitute pillars that are all the more fundamental as they are relatively independent of the type of shock or crisis affecting the territory. Moreover, they constitute the basis for rich and sustainable local living conditions.

Lever for action

RELYING ON A SHARED CULTURE AND LOCAL KNOW-HOW

Social cohesion and the ability of citizens to show solidarity are all the stronger when a feeling of belonging (to the territory) is present or cultivated. A territory, to become more resilient, will therefore seek to enhance and bring to life its culture, knowledge and local dynamics. While self-sufficiency is neither realistic nor desirable, a territory's resilience is nourished by its local resources, by its strengths to reinforce its identity and its relative autonomy. Paradoxically, this "localist" attention is a fertile ground for inventiveness, innovation and "sustainable" local development.

Action examples

• **Identify the resources**, potentials, know-how and active forces involved in the territory. Look for diversity of perspectives to identify **synergies** and dynamics around these strengths (mapping of stakeholders and interrelationships).

• **Support local creation and distribution dynamics. Reveal and enhance** the territory's cultural, social and geographical history: ancestral knowledge (agriculture, industry, etc.), knowledge of the land, knowledge of the context and of the social development of the territory. Cultivate the memory or the spirit of the place.

• Share: **support associative dynamics, promote local relationships** (neighbourhood level) and moments of collective exchange and sharing (neighbours' parties, village celebrations, festivals, etc.).

Examples

Mining area heritage

The Hauts-de-France Region, which has suffered greatly from deindustrialisation, relies on its history and this industrial heritage to make it a lever for transformation and resilience. The classification of the mining basin as a UNESCO world heritage site is one of its most symbolic manifestations, a source of local pride and social cohesion.

The covid mutual aid website

Following the general lock-down of the French population in March 2020 due to the covid 19 epidemic, initiatives have multiplied: local mutual aid groups, help to the most vulnerable, solidarity with caregivers, etc. The covid mutual aid website, put online during this period, aims to identify, map and contribute to the sustainability of these initiatives, by increasing their visibility and facilitating synergies.

https://covidentraide.gogocarto.fr/annuaire#/carte/@5.79,-47.11,2z?cat=all

Lever for action

SUPPORTING SOLIDARITY AND CONSIDERATION FOR THE MOST VULNERABLE

Territorial dialogue, which promotes the logic of cooperation and solidarity, makes it possible to strengthen the match between actions in terms of resilience and the benefits expected by stakeholders, thereby facilitating their support. A territory's ability to cope with and absorb a shock, in particular when it is sudden, depends largely on the cohesion and social links formed between the inhabitants, the institutions, and all the other types of stakeholders. By supporting the solidarity webs that are woven into a territory, public action strengthens the citizens' ability to act collectively, in a logic of mutual aid or care for others. The fight against inequalities and the special attention paid to the most vulnerable constitute principles of action inherent to the creation of a resilient territory.

Action examples

• **Identify upstream the most vulnerable**, co-construct and implement dedicated actions, in a logic of collective empowerment and emancipation.

• **Take into consideration**, for each project, the **inequality** situations and their induced effects.

• **Develop and promote places and initiatives of solidarity and cohesion.** Support local mutual aid networks, reciprocal knowledge exchange networks (RERS), and local exchange systems (SEL), third places and collective learning spaces (fablabs, DIY, etc.).

Lever for action

GUARANTEEING TRUST AND THE ABILITY TO ACT

Strengthening the ability of stakeholders to act is a major avenue of territorial resilience. The community serves to link and federate the ecosystem of stakeholders over the territory. This serves to produce the conditions allowing the population and the stakeholders to be able to mobilise the resources to understand the situation and the means to act. By stimulating citizen initiatives, by supporting the emergence of social innovations, by claiming transparency, communication and a culture of dialogue, the community promotes the trust of stakeholders, a rich and dynamic local life, conditions required for self-organisation and collective movement in the event of a shock.

Action examples

• **Train** stakeholders in **shared governance**, transparency and clarity of decisions and communications. Identify everyone's potential to build a project where everyone has a role to play.

• **Support citizen initiatives**, associations and social innovations aimed at increasing sustainability and resilience, even local autonomy. Create spaces for collective action and facilitate the involvement of all in these dynamics of co-construction in the service

of the general interest through financial and technical support.

• **Develop** training, resource, sharing, exchange and experimentation locations, aimed at strengthening the empowerment of stakeholders and their means of acting.

Principle 3

ANTICIPATION, KNOWLEDGE, WATCH

Knowing the hazards, vulnerabilities and dependencies

Informing, educating, developing a common culture of resilience

Preparing for crisis and post-crisis management

What is it all about?

A territory's resilience depends in part on the anticipation of disruptions that may affect it. This forward-looking vision provides an understanding of the major changes to come, in order to be able to determine the optimum trajectory to adopt and, ultimately, to get through periods of turbulence as well as possible.

While resilience rhymes with anticipation of risks and vulnerabilities, whether social, economic or environmental, intrinsic to the system or dependent on external conditions, it also rhymes with recognition and collective awareness of vulnerability.

Thus, failing the ability to predict with certainty what could happen, the aim is to prepare for any eventuality, aware of this vulnerability, but also of a great ability to act, to adapt and to transform.

Lever for action

KNOWING THE HAZARDS, VULNERABILITIES AND DEPENDENCIES

In-depth knowledge of the territory, coupled with a better understanding of hazards and their changes over time, allows vulnerabilities and dependencies to be identified and appropriate solutions to be developed. This knowledge, derived from multiple sources (field data, modelling, archives, testimonies, etc.), is intended to be understandable by all, shared and made available to as many people as possible.

Action examples

• Diagnose: carry out a shared **diagnosis of hazards** (elements external to the system: shocks, chronic stress).

• Diagnose: carry out **diagnostics of the vulnerabilities** (intrinsic elements) of the various system components, regularly, as vulnerabilities evolve. Take into account and deepen knowledge of the concomitance of phenomena to which the territory may be subject.

• Diagnose: **identify interdependencies, supply circuits and feedback loops** within the system and outside, in particular economic, food, climate.

• Observe: **set up partnership observatories, organised in webs, and integrate systems for evaluating the** mechanisms in order to drive their evolution.

Example

Regional climate, air, energy observatory

In the Auvergne-Rhône-Alpes region, the need for an integrated approach to climate, air and energy data led to the creation of the Regional Climate, Air and Energy Observatory (ORCAE) in 2018. ORCAE is the result of the grouping of 3 existing observatories in Auvergne-Rhône-Alpes, including ORECC (Regional Observatory of the Effects of Climate Change), created in 2013, led and supported by Cerema, and AURA-EE since its creation, joined in 2017 by Météo France. The role of ORCAE is to provide the territories with reliable data and analyses at the regional and territorial levels, suitable for fuelling the energy-climate initiatives, which are numerous in the region. It is also intended to be a place of exchanges between territorial stakeholders and experts, on climate, air and energy themes.

Lever for action

INFORMING, EDUCATING, DEVELOPING A COMMON CULTURE OF RESILIENCE

The development of a form of "culture of resilience" among all the territory's stakeholders facilitates shared decision-making in the face of hazards, vulnerabilities and dependencies, and promotes behaviour adapted, where necessary to periods of crisis or emergency situations. The multiplication of unprecedented phenomena, in their intensity or their geography, will require the involvement of a large part of the population through several vectors, including original ones such as the mobilisation of the arts.

Action examples

• **Inform, raise awareness and educate** the entire population about risks and vulnerabilities, taking into account the risk ratio and the sociology of the population: functioning and interdependence of the system, planetary limits, territorial vulnerabilities, but also cohesion and solidarity. The organisation of collective general interest projects can be a good way achieve do this.

• Promote **popular education in risk management and resilience** to be included in school and university programmes, in initial and continuing training, and appoint resilience referents in organisations.

• Create a **network of volunteers** and resilience ambassadors able to respond to shocks.

• Raise awareness: **mobilise the arts and culture** as a vector of awareness.

• Mobilise the existing collective memory to learn from past disasters (local initiatives and heroes) and **develop a memory** of disasters.

Lever for action

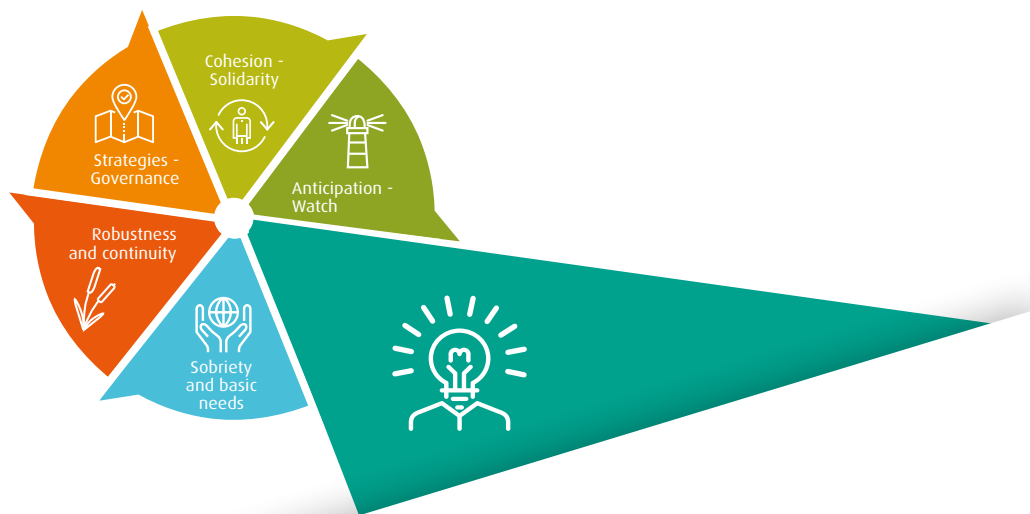# PREPARE FOR CRISIS AND POST-CRISIS MANAGEMENT

While not limited to it, resilience includes crisis and post-crisis management. The implementation of a policy of preparation and planning for crisis and post-crisis management, or more generally exceptional situations, is an essential line of action. These plans must be known by those who have to put them in place (but also by the population), achievable and realistic (both materially and financially). Upstream consideration of the post-crisis is also essential to envisage a rapid recovery of the territory and an appropriate adaptation to reduce vulnerability compared to the initial state.

Action examples

• Plan: set up consultative, decompartmentalised **planning procedures,** involving stakeholders and **ensuring the consistency and synergy** of the various plans in place.

• Anticipate**: generalise post-shock recovery approaches** ("Build Back Better" principle, etc.).

• Prepare: **perform fictitious** emergency exercises with rescue teams and infrastructure managers and **test** their effectiveness. Develop warning exercises and simulations involving the population. **Develop participatory foresight exercises** to anticipate and co-build responses to crises.

Cohesion - Solidarity

Strategies - Governance

Anticipation - Watch

Robustness and continuity

Sobriety and basic needs

Principle 4

ADAPTATION, LEARNING AND INNOVATION

Monitoring and alerting

Implement regular experience feedback and benchmarks

Innovating, experimenting, building new images

What is it all about?

Faced with ill-defined or undefined, complex, extreme or changing threats, a system is all the more resilient if it is able to adapt its behaviour, to invent adequate, adaptable and flexible responses that incorporate these uncertainties. Similarly, a territory, by strengthening its adaptive capabilities, will be better able to absorb the less predictable shocks, but also to change in the face of chronic stress.

Collective questioning approaches, which draw on lessons from history to learn from the present and the future, or which draw from the analysis of disorders and failures of knowledge to inform decisions, are part of the dynamic learning process at the heart of resilience.

Observation thus shows that the same causes do not necessarily produce the same effects, on sometimes close time scales. This ability to continually renew and deepen the understanding of causes and effects, combined with a form of intuition and a perpetual search for new solutions, sometimes out of step with or contrary to conventional responses, is an driver of innovation. It is sometimes out of step with or contrary to conventional responses and requires a patient transformation of the territory.

Lever for action

MONITORING AND ALERTING

An adequate monitoring system is essential to identify and track vulnerabilities and threats. It aims to enable the territory to alert populations of a hazard, by effective means of dissemination adapted to each type of phenomenon (flood, storm, etc.).

Action examples

· Implement vulnerability **monitoring systems** (hazards and sensitivity).

· Implement **warning systems and thresholds linked to safeguarding bodies.**

· Identify **effective, accessible** and well-known warning channels for the general public.

Lever for action

PROVIDING REGULAR FEEDBACK AND BENCHMARKS

Thinking from past events or those having occurred recently in other territories, including internationally, allows projects and other territorial dynamics to be based on feedback, sources of inspiration.

Action examples

· **Implement systematic feedback** and assess the operationality and effectiveness of the measures put in place. Change practices in relation to this feedback.

· **Identify and learn** from best practices.
· **Exchange experiences.**

Lever for action

INNOVATING, EXPERIMENTING, BUILDING NEW IMAGES

Unprecedented situations often call for innovative and astute responses. Experiments and the creation of demonstrators are ways to test solutions and act in a context of uncertainty. Resilience thus rhymes with adaptability and flexibility in the short term (reorganisation of services, tactical urban planning, etc.) and in the long term (reversibility of developments, etc.). The detection of weak signals, foresight approaches and the production of narratives feed the production of new imaginations and, by shifting attention, provide a better understanding of complex and systemic phenomena, such as climate change. These phenomena are difficult to apprehend by the mere experience of the present and its immediate environment. The idea is to start from today's field issues and the challenges ahead to imagine adapted and desirable futures and to construct inspiring and emancipatory narratives.

Action examples

• Prefer the implementation of **low-tech[3]** responses (sober, agile and resilient technologies), that are both **transient and reversible** (e.g. tactical urban planning).

• Promote multidisciplinary approaches, integrating varied and complementary skills (architects, landscapers, humanities, etc.).

• Encourage the implementation of nature-based solutions.

• Support and finance the experiments and innovations that go in the direction of the territory's transition: frugal, socially useful and ecologically sustainable innovations.

• Develop resilience-focused participatory equity research and participatory science programmes.

• Create new stories that inspire and mobilise, drawing on, among other things, foresight techniques and workshops.

3 -   https://www.lafabriqueecologique.fr/vers-des-technologies-sobres-et-resilientes-pourquoi-et-comment-developper-linnovation-low-tech/

Example

School yard in Paris

The "resilient school yards" approach aims to make school yards, both in primary and secondary schools, greener and more enjoyable. The aim is to allow rainwater to seep in where it falls, to make nature accessible to children. It is also about taking action to improve summer comfort and to adapt to the neighbourhood's climate change.

Cohesion -
Solidarity

Strategies -
Governance

Anticipation -
Watch

Robustness
and continuity

Adaptation,
learning
and innovation

Principle 5

SOBRIETY AND MEETING BASIC NEEDS

Identifying
and guaranteeing
basic and vital needs
for all

Supporting the
transition towards a
diversified, inclusive
and sustainable
economy

Respecting planetary
limits, natural and
common resources

What is it all about?

A shock or disaster exacerbates, sometimes brutally, the question of a territory's ability to meet the basic needs of the population (health, food, housing, energy, etc.). The construction of a territorial resilience approach therefore necessarily requires the commitment of collective, participatory and inclusive reflection on these basic needs (health, food, housing) and the means to guarantee them at all times, including outside the crisis period. This work on basic needs is a major lever for reducing long-term social vulnerabilities and allows everyone to flourish in a spirit of social justice. It is also part of a commitment by France to achieve the UN's 17 SDGs by 2030. Finally, it raises the question: what desirable and just future do we want to build? What really matters here and now?

By asking the question in these terms, it is understandable that this discussion of basic needs must be coupled with a reflection on the impact of lifestyles and societal choices. Indeed, a territory's resilience necessarily depends on the non-aggravation of chronic stresses to which it is already subjected (climate change, the collapse of biodiversity, social inequalities, etc.). Basic needs must be met in a logic of sobriety (consumption of resources, emission of GHGs or pollutants, etc.), informed by the latest scientific knowledge, social justice and adaptation to climate change. It is necessary to limit long-term vulnerabilities. Indeed, uncontrolled consumption of natural resources will inevitably lead to shortages and associated tensions.

Lever for action

IDENTIFYING AND GUARANTEEING BASIC AND VITAL NEEDS FOR ALL

Meeting basic and vital needs allows us to consider a level of well-being and quality of life, while promoting greater social justice. The Donut Theory, developed by Kate Raworth, or the Maslow Pyramid, help define basic and vital needs. Vital needs include water, food, health, energy, housing, networks and income. The basic needs that complement them are: gender equality, social equity, employment, voice in the city, education. Each territory can open a collective reflection to define locally and complete the list of these needs (culture, mobility, security, etc.) by integrating the question of sustainability.

Action examples

• **Ensure, in a redundant manner, vital needs:** safe housing, clean and affordable energy, food security, health, etc.

• **Collectively define essential needs and services and ensure that they are met at all times**: access to health facilities, waste management, education and culture, security, mobility, social assistance continuity plan, and all actions that contribute to strengthening people's dignity and social cohesion.

Lever for action

SUPPORTING THE TRANSITION TOWARDS A DIVERSIFIED, INCLUSIVE AND SUSTAINABLE ECONOMY

Taking planetary limits into account means moving from a productive and extractive economy, based on the principle of "extraction-transformation-rejection" to an economy of sobriety, reducing the consumption of resources, energy and materials and waste production, compatible with the idea of a world with finite resources.

The transition to a more resilient economy also requires a diversification of the local economic fabric, better suited to overcome crises.

Finally, this economy must also be at the service of all and of well-being (care society).

Action examples

• **Support the transition to a new, sober and resilient economic model (social and solidarity economy, territorial industrial ecology) and the emergence of new professions** (recycling, agroecology, etc.).

• Create the conditions for **inter-knowledge between economic stakeholders** to facilitate interdependencies (dedicated workshop, platform, club).

• **Promote and develop a local economy** (relocation of strategic activities, setting up short supply circuits, local currency, etc.).

• Produce dynamic, scalable, partnership-based and regularly updated analyses of **interdependencies and flows between territories**, trade in goods and services, in order to better understand the issues and to control the consequences as far as possible.

• **Make investments conditional** on their contribution to long-term sustainability.

Lever for action

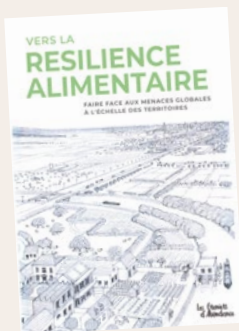# RESPECTING PLANETARY LIMITS, NATURAL AND COMMON RESOURCES

Understanding and taking into account the idea of a "finite world" is essential to ensuring long-term resilience. This notion of fragility of the planet's biophysical balance was modelled through the identification of 9 planetary boundaries[4] defined by an international team of 26 researchers and published in 2009. Moreover, the depletion of certain non-renewable or over-exploited natural resources, which are now essential to our lifestyles, invites us to rethink the use of these resources and the possibilities for substitution. The notion of common resources is a way of rethinking our relationship with the world, applying this concept to several elements: natural (climate, air, water, soil, nature, etc.), heritage (historical monuments, public parks, gastronomy, etc.) or socio-economic services such as public services (health, solidarity, education, security, etc.). The reasons are numerous: these assets are often essential for the proper functioning, cohesion and even survival of a territory, and are therefore a major lever of resilience.

Action examples

• **Translate locally the issues of the 9 planetary boundaries**, as defined in the 2009 Rockstrom et al. report, and identify community-wide levers to contribute to overall compliance with these limits.

• **Limit the use of non-renewable natural resources** (fossil fuels, rare earths and materials, sand, etc.).

• **Identify and develop the governance of common resources** (natural, urban, public services) based on consideration of the uses, common management and responsibilities of all.

4- *The 9 planetary limits, as defined in the Rockström et al. report of 2009, are as follows: climate change, erosion of biodiversity, disruption of the geochemical cycles of nitrogen and phosphorus, land use change, ocean acidification, water use, stratospheric ozone depletion, increased aerosols in the atmosphere and introduction of new entities into the biosphere. See the report and infographic produced by the Lyon Metropolitan Area, which outline courses of action for communities: Millénaire 3: https://www.millenaire3.com/publications/11-infographies-Limites-planetaires*

Food resilience guide

The issue of food resilience is a subject increasingly addressed by communities. Food is a particularly critical area since, as a vital need of the population, it governs social stability. The association "les greniers d'abondance" recently published a report entitled "Towards food resilience" which exposes the vulnerabilities of the contemporary food system in the face of various systemic crises: climate change, resource depletion, collapse of biodiversity, etc. and offers communities a coherent set of actions and levers. to be implemented at their level.

© Collectif etc

Place Dormoy in Bordeaux

In terms of development, the highlighting of tactical urban planning made an impression during the management of the Covid crisis. Reflections around sober developments, however, do not date from this crisis. The development of frugal and high-quality public spaces aims to give back meaning to spaces, via inexpensive but quality redevelopments.

These developments may involve streets, plots or small local parks and gardens. This is an opportunity to quickly improve a location and make users want to re-appropriate the everyday public space. The aim is also to facilitate the use and appropriation of these spaces over the long term. For this, users are often asked directly about the transformation of these spaces through, in particular: open construction sites, use tests, events, etc.

Cohesion - Solidarity

Strategies - Governance

Anticipation - Watch

Adaptation, learning and innovation

Sobriety and basic needs

Principle 6

ROBUSTNESS AND CONTINUITY OF SYSTEMS

Limiting exposure to hazards

Reinforcing system strength and reliability

Guaranteeing the continuity of critical networks, services and essential activities

What is it all about?

Resilience includes in its definition the notion of resistance to disruptions and shocks. The robustness of a territory's various components and the ability to ensure the continuity of their function hold a key place in the resilience strategy. To strengthen its robustness, a territory can mobilise several lines of action: first, limit its exposure to hazards (avoidance logic), strengthen the solidity and reliability of systems (resistance logic) and finally negotiate an acceptable level of degradation, which must however guarantee the continuity of vital services and the safety of goods and people. The acceptability criteria will differ from one stakeholder to another but also over time. They must be determined collectively, with a view to democratising the issue of risk.

Lever for action

LIMITING EXPOSURE TO HAZARDS

The logic of avoiding potential impacts should prevail whenever possible. To limit exposure to hazards, it is possible either to act on the threat itself (e.g.: logic of protection or mitigation for the climate), or on exposure to them (e.g.: by limiting constructions in risk areas).

Action examples

• **Reduce** the intensity of the hazard at the source, **by continuing efforts to mitigate climate change.**

• **Avoid constructions in areas exposed** to hazards and, in general, apply the **precautionary principle**, in particular to threats that are still poorly understood, so as not to increase the vulnerability of the territory.

• Limit the exposure of the most vulnerable populations to risks and hazards by developing **"global environmental solidarity** (macro-social) and the fight against **environmental inequalities** (micro-social)".

• **Rethink the organisation of the territory** and anticipate the relocation of goods and services already subject to hazards or which will be in the short, medium or long term. Integrate reflections on spatial recomposition into the urban planning strategy.

Lever for action

REINFORCING SYSTEM STRENGTH AND RELIABILITY

Not all impacts can be avoided and, as such, a system's strength is a key point of its resilience. The potential impacts must be understood upstream in order to consider an appropriate design and sizing.

Action examples

• Integrate risk into the **sizing of systems.**

• **Manage the existing heritage in an integrated manner**: maintenance of equipment, hotline, periodically monitored, **maintained infrastructure** and compliance with field data and vulnerabilities.

Lever for action

GUARANTEEING THE CONTINUITY OF CRITICAL NETWORKS, SERVICES AND ESSENTIAL ACTIVITIES

In the event of major disruptions, a system's resistance, even a particularly robust one, can be severely tested, and its integrity compromised. The inevitable deformations and impacts on the system must therefore be thought out upstream in order to ensure the continuity of vital and essential activities and services (food, medical care, water, energy, communication, etc.). These functions must be identified upstream and collectively in order to implement service continuity plans through various strategies (redundancy, autonomy, diversification, etc.).

Action examples

• **Anticipate system adaptability**, reversibility and flexibility.

• **Ensure reserve capabilities and** system redundancy.

• **Diversify resource pools** (human, material, etc.) to limit the impacts and improve the ability to bounce back.

Example

Carriageway collapse

The robustness of structuring transport infrastructures largely determines a territory's ability to ensure the continuity of certain activities and essential services. Climate change contributes to increasing the vulnerability of these infrastructures, making the resilience of infrastructures an issue in itself.
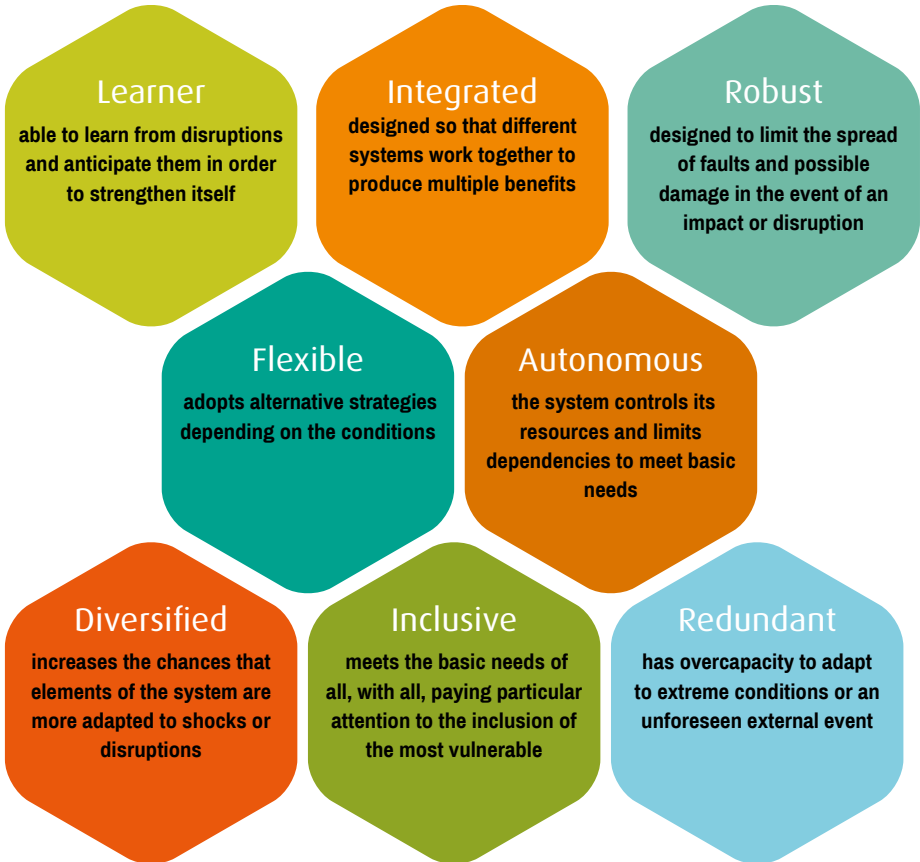

Carriageway collapse - © Cerema

THE EIGHT QUALITIES OF TERRITORIAL RESILIENCE

A **resilient territory** can be qualified through its short and medium-term response/adaptation capabilities, but also its long-term learning and reorganisation capabilities. Some "qualities", however, tend precisely to favour or even increase these latter. A complementary way of qualifying a resilient territory therefore consists in specifying how the territory seeks to reinforce these qualities. A consensus is emerging in recent work around these "resilience qualities" (see bibliography). Cerema retains the following **8 resilience qualities**:

Learner

able to learn from disruptions and anticipate them in order to strengthen itself

Integrated

designed so that different systems work together to produce multiple benefits

Robust

designed to limit the spread of faults and possible damage in the event of an impact or disruption

Flexible

adopts alternative strategies depending on the conditions

Autonomous

the system controls its resources and limits dependencies to meet basic needs

Diversified

increases the chances that elements of the system are more adapted to shocks or disruptions

Inclusive

meets the basic needs of all, with all, paying particular attention to the inclusion of the most vulnerable

Redundant

has overcapacity to adapt to extreme conditions or an unforeseen external event

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Find all our publications online   **Online store**

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Cohesion - Solidarity

Anticipation - Watch

Strategies - Governance

Adaptation, learning and innovation

Robustness and continuity

Sobriety and basic needs

CEREMA
SUPPORTS YOU

You wish to engage your territory's services, inhabitants and stakeholders around an awareness of local vulnerabilities. You want to collectively anticipate any form of disruption to avoid critical and complex situations. You want to co-construct an action plan with them to act and adapt accordingly.

Cerema offers an integrated offer of tailor-made support for your resilience initiatives by favouring collective approaches (participatory diagnosis, development of resilience action plans with the resilience compass tool). Using its expertise, it offers assessments of your resilience dynamics, enhancement of your action plans and monitoring methods. It provides resilience training (discovery or in-depth format for project managers).

Our service offering

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Cerema is a public establishment, a centre of interdisciplinary scientific and technical resources and expertise.

Carrying out its activity at the national and territorial level, it supports communities in the realisation of their projects, in particular in the fields of development, urban planning, mobility, transport, energy, climate, environment and risk prevention.

The **Cerema** **notebooks**

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