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RESILIENCE TO COPE WITH CLIMATE CHANGE IN URBAN AREAS.

D5.4 ENHANCED COMMUNICATION SYSTEM FOR STAKEHOLDER PARTICIPATION

Author: Andoni González Gómez

Affiliation: Barcelona City Council

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MAIN AUTHOR:	González Gómez , Andoni
CONTRIBUTOR(S):	Gabàs Masip, Ares (Barcelona City Council); Martínez, Montse (AQUATEC); Martínez-Gomariz, Eduardo (CETAQUA); Pacheco, David (CETAQUA); David, Luís Mesquita (LNEC); João Craveiro (LNEC); Morais, Marco (CML); Monteiro, Maria (CML); Telhado, Maria João (CML); Stevens, John (Bristol City Council); Fourniere, Helene (UN-Habitat); Leon, Esteban (UN-Habitat); Celaya Alvarez, Amaya (UN-Habitat); Williams, Ian (UN-Habitat).
INTERNAL REVIEWER:	Noguera, Gemma (Barcelona City Council)
EXTERNAL REVIEWER:	Pacheco, David (CETAQUA)

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Deliverable 5.4 – “Enhanced communication system for stakeholder participation” provides a review of working methodologies and frameworks developed to create and improve the stakeholders’ engagement in the resilience building process of cities, showing different examples of citizen participatory processes and the case study cities experience about citizen engagement and operational response to emergency. This deliverable gathers different tools, methods and references from resilience based projects approach on stakeholder theory to address the participatory processes, giving the outlines for defining stakeholders’ frameworks and displaying the communication plan among different actors and the ways they should be engaged in the participatory process. Once the methodological framework is developed, the deliverable focuses on the participatory processes for co-design, co-production and implementation of the climate action, supported by good practice examples. This deliverable addresses the communication between emergency teams to establish the operational emergency responses to face shocks and stresses, showing up the performance from the three RESCCUE cities regarding the operational coordination, command structure and communication channels. Thereafter, the three research sites display their governance models for stakeholder engagement and their resilience pathway for climate adaptation. Finally, the deliverable provides lessons learnt and suggests next steps for Barcelona, Lisbon and Bristol to improve and enhance the communication with stakeholders and foster their participation in the framework of urban resilience.

4. Evidence of accomplishment

This report

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1 Introduction

Climate change is a complex challenge that requires a holistic approach to face successfully the hazards that threaten our cities. As climate projections reflect, changes in the frequency and intensity of extreme weather events will lead to unpredictable impacts, crossing boundaries and involving a high diversity of stakeholders with different interests and responsibilities. The inherent uncertainty of climate change effects reveals the duty of a well-planned strategy that enhances the citizen response and preparedness to tackle these impacts. An aware, prepared and trained society is a valuable resource for cities' resilience and should be fostered by institutions. Stakeholder participation in planning and decision-making processes has become essential to give sound evidence and strengthen to the definition, development and implementation of climate adaptation strategies. As different phases of planning process are developed, different roles and contributions from stakeholders will emerge, the active engagement throughout the planning process will ensure the success of the strategy development. Within this context, communication between stakeholders and public dissemination of results becomes a key factor for a successfully implementation process of the adaptation strategies.

Climate change is a global challenge that requires the involvement of all stakeholders present in our society. Local administrations play a central role and must lead climate action but they cannot do it alone, they need the help of all civil society: companies, civil associations, foundations, research centres, universities, unions. In general, all citizens must be involved in participatory processes to create climate actions capable of responding to the challenges posed by climate change for the future of life in cities. The RESCCUE project has different tools to better analyse and learn how to deal with the risks of climate change. This deliverable aims to establish the necessary mechanisms to involve the different stakeholders and define how to carry out citizen participatory processes as well as channels for communication and operation in case of emergency.

The document starts defining the stakeholders' methodological framework, how to identify and categorize stakeholders to involve in the processes giving different tools and methods for cities to create their own participatory processes. It is taken for granted that every process has its own peculiarities and specific issues that make it unique and different, so it is not possible to give a standard solution: each issue has its own tailored solution. This deliverable provides a set of tools and advices for cities to address its participatory processes correctly and how to find the best way out to solve their problems.

This deliverable continues showing how to co-design and co-produce processes, giving examples of how different kinds of stakeholders can contribute and influence in the design of local policies and how co-production of climate actions can be fostered by local administration.

Once the theoretical framework of stakeholder engagement has been developed from the resilience and climate action scope, and it is described how participatory processes must be driven to ensure that no one is left behind in the build-up of climate, this deliverable shows how the three case study cities of the RESCCUE project (Barcelona, Lisbon and Bristol) operate their emergency models. Each city explains how the operative teams are organized to give an effective response to emergency situations and which kind of communication channels are deployed to ensure the correct transmission of relevant information during



critical events between operative teams but also how these emergency situations are communicated to citizenship.

After that, the three cities show how they work out their governance models for stakeholder engagement, becoming a great example that can be replicated by other cities that start their pathway towards climate resilience.

In the last section, it can be found the main lessons learnt by the three RESCCUE cities, as well as some steps to embed stakeholder participation in the city decision making processes.

2 Definition of scope and key sectors

Stakeholder theory has been fully developed in the ambit of business management due to the necessity of firms to know the interests of those who have a role in the business environment and thereby detect threats, identify risks and opportunities, and develop the adequate channels to enlarge their action range and achieve their goals.

From the resilience and climate adaptation scope, the need to successfully implement the climate adaptation strategies results in the incorporation of the stakeholders' participation in the planning methodology and decision-making processes. Adaptation to climate change at the local level is a new challenge that will call for great efforts by municipal authorities. When planning for the next 20, 30 or 50 years, measures to cope with more extreme weather events such as heat waves, intense precipitation, rising sea levels and severe droughts are of special importance as regards securing provision of services such as drinking water, sanitation, energy, care and education¹. Adaptation to climate change involves planning and crisis preparedness work and many of the issues raised by climate change demand a long-term perspective and challenge traditional values and priorities in local planning.

Some approaches have been done with this aim, as an example the *Hyogo Framework for Action* considers the partnering with stakeholders across sectors as an integral part of reducing the risk of disaster. A guide instrument was designed to encourage participation and engagement fostering inclusion and shared responsibilities among governments, private sector and societal networks².

The consensual and conventional conception of what is a stakeholder defines it as "any group or individual that may affect or be affected by the achievement of the organization's objectives"³. However, this traditional conception was further enriched with a new principle, called the *Principle of stakeholder resource*⁴.

This principle further stipulates that stakeholder perspectives and their interdependencies are crucial and should be taken into account in a decision-making process. Although this Principle has been formulated negatively (stakeholders can take legal action if their interests are undermined by a decision or measure they do not control), stakeholder theory can have a positive perspective: the political legitimacy and social acceptability of any decision or impactful measure is favoured by involving the stakeholders and their active participation in decision-making processes that directly or indirectly affect them.

This active involvement and participation is the most pertinent as the critical issues under consideration concern general aspects of environmental quality, population safety and the normal functioning of public services. It is not just about addressing new business opportunities, but the socio-environmental dimension of population security, and especially urban demographic densities requires adapting stakeholder theory beyond those decisions that only involve business management decisions.

More focused on urban resilience, the UN-HABITAT City Resilience Profiling Tool (CRPT) provides in its SET 2 the framework for a cross-cutting analytical approach on several levels focusing on the totality of stakeholders interacting at a local level – public institutions, private actors, civil society organizations, academia and international organizations – and analysing the governance processes. Emphasizing on decision making and decision

implementation processes, the SET 2 considers the key functions of the local governments in developing and consolidating the resilience at the city level⁵.

The involvement of those individuals or groups that play significant roles and affect or are affected by a policy decision or may suffer the effects of the climate change is essential to identify vulnerabilities and risks as well as opportunities to achieve adaptation strategies to uncertain future changes. Citizenship, entities and companies, as well as public institutions have to be active parties in the creation process of urban resilience and climate adaptation.

Stakeholder involvement in the decision making process notably increases the soundness of the agreements accepted in the participatory process. This is due to the acquisition of common responsibilities and the acknowledgment of different points of view from others stakeholders that can diverge on interests and may cause conflicts between them. The solutions to these conflicts strengthen the decisions made and improve the implantation of the planned climatic action and also stimulate the emergence of common values.

The identification and show up of social networks between stakeholders becomes an opportunity for the accomplishment in the dissemination and diffusion of the adaptation strategies to climate change into other stakeholders that may not been involved in the process since the early beginnings, allowing those secondary stakeholders to take part in the decision process. One of the main barriers of stakeholder participation processes is the avoidance of groups or individuals dropout from the process. With this aim, Barcelona approved on 6 October 2017, the Regulations Governing City Participation setting out the rules for promoting and developing participatory democracy in Barcelona, specifically on Article 3.2 defines and identifies the duty of local government in the setting out of channels and tools addressed to maximize the diversity of citizenship involved in the decision making processes⁶.

The participatory process should be open and dynamic. Diverse stakeholders with different interests and capacity to influence are identified during the process, getting engaged at different stages and revealing their preferences over the role they play at each stage. The successful broadcast of the process to the whole society lies on the capacity to establish strong commitments addressed to improve the implementation of win-win strategies and co-benefit generation that matches adequately with the values of an increasingly aware society on the climate change impact.

Therefore, the participatory process should also be guided by objectives discussed among all parties, especially in the early stages of the decision making process. In consequent phases, the resources to be involved in achieving these same objectives must also be specially negotiated, in view of the commitment between the parties and their active engagement to contribute to the collective objectives.

In this broader perspective of commitment, where environmental sustainability and population safety are at stake, public participation processes are of crucial importance for the inclusion of stakeholders and consideration of all interests concerned.

Considering also the collective dimension of what is at stake under environmental sustainability and population safety, it is imperative to clarify the links between territory and environment, and between decisions on urban planning and their mitigating consequences in view of climate change, social and technological challenges.

Public participation is becoming increasingly embedded in the decision-making processes as urban planners recognise the need to understand who is affected by the decisions and actions they take, and who has the power to influence their outcome⁷. Moreover, public participation rises as a social demand of democratic inclusion and the collaborative build-up of common benefit for human communities.

Edmonton The Way we Green - Example of citizen participation in the elaboration of a municipal plan

The Way We Green is the City of Edmonton's 30-year environmental strategic plan with emphasis on resilience and sustainability. The Way We Green sets 12 goals that need to be reached for Edmonton to achieve a sustainable and resilient future. The plan has been developed within the framework of a participative process. At first instance 175 identified stakeholders organizations were engaged into 12 half-day workshops, 6 focus groups were conducted and a representative survey of 1000 Edmontonians. As some results arose, it was developed a website to inform citizens and solicit feedback, developed a database of community Sustainability champions, a 2 days public Forum was held at the City Council, a draft of the plan was widely circulated and finally presented to City Council included a public hearing and finally implemented into the Edmonton's Strategic Plan *The Way Ahead*.



Figure 1. Edmonton The Way We Green Environmental Plan. Source: Edmonton Government (2011)

Example 1. Edmonton (Canada) The Way we Green. Source: Edmonton Government (2011).

3 Mapping the stakeholders

Dealing with complex challenges as adaptation to climate change requires a professional stakeholder analysis. Before start defining the stakeholders to involve it is first necessary to define the aspects of the system, problem or issue under study.

The responsibility in the definition of the issue rests in the setting up of a working team that shapes the action. This core team or steering group should be created from the legitimacy over the issue, the capability to lead the action, the ability to establish linkages, the expert knowledge about the case study, the objectivity and equity, considering a wide range perspective and the broad view to lead the correct identification of those who hold a stake in the issue and with the capability to identify and avoid the potential of marginalising important groups or bias results that could jeopardise long-term viability and support for the process.

The stakeholder analysis process begins with the definition of the social, environmental, economic or technological aspects that will configure the frame of the process. Once the issue is defined, the core team should identify entities, organizations or individuals who are affected by or can affect those parts of the issue, including non-human and non-living entities and future generations⁷. The third step is to prioritise these individuals or groups for involvement in the decision-making process. Issues are typically identified in a top-down manner by the team leading the stakeholder analysis and may therefore reflect their interests and biases⁸. Hence is needed a more iterative approach, where initial scoping interviews and focus groups guide the selection of issues, and these issues get revised as the stakeholder analysis continues. As relevant issues start to emerge, the team can then start identifying, characterizing and prioritizing stakeholders for future involvement in the project⁹.

The composition of stakeholders will likely change over time and the roles they play will differ from one step in the adaptation planning process to a next step. Therefore, stakeholder analysis should be a recurring activity throughout the planning process¹⁰.

Policy analysts have long attempted to understand how information, institutions, decisions and power shape policy agendas for interest groups in social networks. Stakeholder analysis has been seen as a way of generating information on the “relevant actors” to understand their behaviour, interests, agendas, and influence on decision-making processes⁸. Increasingly, the views of civil society groups have also been solicited and there is growing appreciation of the importance of “political will”. The stakeholder research is used to work more effectively with stakeholders, facilitate transparent implementation of decisions or objectives, understand the policy context, and assess the feasibility of future policy options⁷. Focusing on understanding power dynamics and enhancing the transparency and equity of decision-making gives soundness to the results obtained and facilitates the commitments on taking action over the defined issues.

It is important to understand the different perspectives of the actors involved which requires a system, i.e. a space or platform that facilitates the learning among stakeholders by sharing their understanding of the situation in order to reach consensus^{11 12}. Stakeholder analysis itself does not create this platform for negotiation, but can be used as a tool to contribute to this learning between stakeholders⁷. In this way, stakeholder analysis should

facilitate the recognition of multiple perspectives of the ‘truth’, where ‘reality’ is socially constructed.

We know that this **social construction of reality**¹³ is processed by the dynamics of interaction, having to consider that these same dynamics assume flexible models of interaction and beliefs that can be reinforced or exposed in their insufficiencies and contradictions. However, it is necessary to develop interaction mechanisms that do not appeal to the direct confrontation of groups convictions (the risk is the mutually reinforcing of different convictions), but rather to common and tangible goals and actions after problem definition to solve.

Thus, prolonged interaction over time, information exchange and innovation, should produce a new frame of social relationships and institutional commitments. It is only by the historicity and intensity of relations that social reality becomes more consensual and shares a common vision to legitimate the goals and actions to develop¹³. The *reality* and trust built by relationships over time are the most crucial factors. The process of interaction must also avoid spontaneous consensus, which is easily subject to dissent in the future¹⁴. Stakeholder involvement must incorporate trust and the understanding of each other's views.

Involving stakeholders in decision-making processes make them feel some level of ownership of these processes. By doing this, stakeholder analysis may lead to the transformation of relationships and the development of trust and understanding between participants. Although this may not necessarily lead to changes in attitudes and behaviour, it may enable diverse groups of potentially conflicting stakeholders to appreciate the legitimacy of each other's views and see new ways of working together¹⁵.

Involving stakeholders in building resilience in Asunción, Paraguay.

In the city of Asunción, water remains a constant source of emergency and concern, and current city actions around water focus on managing and mitigating emergencies. Through a partnership between the Municipality of Asunción and UN-Habitat, the City Resilience Profiling Programme (CRPP), started to be implemented, with one of its aims being to better understand the relationship between the city and its water. At first, historical data was gathered on flooding (pluvial and fluvial), as one of the main natural hazards faced by the city, and then crosschecked with data on water resource and network management, to assess the vulnerability in the entire water cycle. Data gathered from local to national sources were combined with satellite data to create climate change projections based on the changes witnessed over the previous 40 years. Further on, by combining these projections with the performances of the urban system analyzed through the CRPP tool, key messages regarding climate change and the future of the city were prepared. This extensive analysis not only revealed why the city needed to act but also gave prioritisation to the action areas.

After gathering this data, an in-depth analysis was conducted of the city's performance, stakeholder engagement, current policies, and initiatives in place. However, resilience-building must consider the needs, realities and power to act of everyone, especially those most at risk and traditionally excluded. It should empower urban residents to know what they can do to reduce risk, prepare for shocks and support city-wide recovery efforts. Therefore, beyond the Municipality's departments, the resilience analysis incorporated more than 100 stakeholders from private companies, universities, women's groups and

neighbourhood-level NGOs, to national level ministries and international actors such as the World Bank.

Based on the holistic analysis performed and the inclusion of local knowledge and data gathered, the teams from the Municipality of Asunción and UN-Habitat identified key recommendations for actions to strengthen the resilience capacity of the city. These recommendations were drafted, discussed, and agreed upon through several open dialogues involving the city's main stakeholders. These recommendations aimed at correcting and reorienting public policies around stresses and potential shocks specifically related to water, economy and mobility; and included recommended actions for direct implementation into already approved city planning, measures to be pursued by the city through collaboration with other actors beyond the local level, and resilience priorities for advocacy at the higher institutional level.

The result regarding water cycle management recommendations, is a roadmap of potential actions that recognises the need to re-draw the city from the water perspective and the asset of the abundance of water resources in the city, which allows the city to move away from reactive approaches to proactive ones, and establish sustainable water solutions to be implemented together with local actors.



Dialogue table in the Municipality and preliminary presentation of recommended actions for strengthening resilience in Asunción. Source: CRPP (2019)

Example 2. Involving stakeholders in building resilience in Asunción, Paraguay. Source: CRPP-UNHABITAT (2019).

3.1 Description of stakeholders

Once the steering group has been defined, it is needed a clear understanding of the issue under investigation so the boundaries of the social and environment phenomenon can be established⁷.

The correct identification of the issue addresses the information of who can contribute to make a decision or implement an action, it also provides information about who will affect and be affected by the decisions taken. Stakeholder identification highlights the interdependence between organisations at various levels in society: local, regional, national and international and stresses the need for a systems perspective, where stakeholders at different levels in society are recognised as important but in different ways: some as legislators, some as informants or funders, some as researchers and some as procurement agents or providers of essential services.

Managing this diversity requires a set of methods or tools for generating knowledge about individuals and organizations so as to understand their behaviours, intentions, interrelations and interests, and for assessing the influence and resources they bring to bear on decision making or implementation processes⁸.

Three different methods can be used for stakeholder identification⁷: focus groups, semi-structured interviews and snowball mapping:

- **Focus groups:** main motivation of focus groups is to encourage group discussion to analyse a particular issue in depth trying to understand the perspectives that lie behind the opinions and perspectives expressed by the participants. When addressing a stakeholder identification session, the brainstorming methodology applied to the focus group allows a set of participants, firstly selected by the steering group, to identify freely other groups of stakeholders of interest that should be involved in the process or issue under study. This technique allows participant to build upon the responses of other group members and contribute with alternative ideas enhancing the process itself, opening new visions and exploring the different dimensions of a specific issue.
- **Semi structured interviews:** this kind of interviews are addressed to relevant stakeholders in the process whose perceptions about the issue should be highly considered from the early beginning allowing the analyst to focus attention on specific key areas of interest. This approach provides reliable, comparable and qualitative data on stakeholders' roles, interests, perceptions, their problems, issues they have and challenges they see^{7 16}. This method allows gathering good quality information about stakeholders' interests and prioritizing other groups to be involved and engaged in the process.
- **Snowball mapping:** this method is usually combined with focus groups and semi structured interviews in order to extend the range of stakeholders. The method starts with few firstly involved stakeholders where they are asked to identify new stakeholders' categories and also to provide contacts.

There are also other more traditional techniques that can always be used, using media content analysis (defined temporal, spatial and thematic boundaries), bibliographic research and the consultation of other studies on the concerned issues. Stakeholder identification is a continuous process which happens until the decision process ends.

Therefore, identifying stakeholders is an iterative process. The techniques indicated are only for the initial engagement process, identifying the key actors who in turn should indicate other stakeholders (snowball). The organization of meetings and workshops themselves, although they already require the convening of stakeholders, generally support the selection of other stakeholders, identifying economic sectors or social groups to be involved as well.

It is necessary to emphasize the difficulty of summoning representatives of interests of inorganic social groups or groups generally defined by their vulnerabilities or massive dependencies, experienced in the face of an environmental situation or lack of reaction.

As inorganic social groups or vulnerable groups, we can identify the elderly, the children, the informal economic sectors, illegal labour or illegal immigrants, among other groups. Several decades of social studies carried out in Lisbon, for example, and in clandestine areas of

residence, have helped to define methodologies for identifying informal group representatives. These methodologies support contacts with local ethnic group leaders, neighbourhood association leaders, local sports associations and schools that recruit children from informal groups, or health services or clandestine homes for the older population. The 'snowball' sampling technique is also a valuable resource for identifying stakeholders who due to their special characteristics and informality could be difficult to contact.

However, the involvement of informal groups and vulnerable social groups is crucial for strengthening urban resilience and understanding of the most critical situations and the least protected social exposures to disruptive events or political and necessary measures impacting the normality of everyday life.

In matters related to the adoption of measures to be implemented in a real urban context, the identification of stakeholders will vary depending on the interest of each party involved and also on their decision-making power or influence for the formulation of urban policies. In this sense, sociological literature identifies issues of trust (delegational political trust and trust in technical processes and technological innovation) and expertise issues that are linked to the efficiency and effectiveness of technological processes in general¹⁷.

In addition, a disturbing situation always requires an adaptation of daily behaviors and routines. But it is exactly the usual behaviors and flow of daily routines that socially ensure a relationship of trust in the safe experience of daily interaction contexts¹⁸. Thus, the procedures to be adopted in situations of environmental emergency or in the event of disruptive events have to be negotiated with the stakeholders in order to create bonds of commitment and trust that otherwise cannot develop because they do not fit the usual course of everyday normality.

3.2 Jurisdiction matrix

As there are different kind of stakeholders' roles and interests, there are different views and perspectives about a specifically issue and the way it can be managed. This complex challenge must be handled carefully to ensure the success of the participatory process and avoid barriers that can hinder the decisions taken or the implementation of actions.

Therefore, it emerges the need of the stakeholder categorization and differentiation by their capacity to influence or the support and the opposition they can perform regarding the process. This categorization also helps to find a good representation of all interest at stake when involving parties, and to avoid over-representation of one category or another¹⁰.

Thus, it is necessary to develop empowerment processes of the general stakeholders and their organizations, as well as information mechanisms and warning systems for the general population, but especially for the most vulnerable groups. The ability to influence political decisions varies according to social positions, education, scientific literacy (technical-scientific arguments are more likely to condition a decision-making process), and familiarity with mobilizing legitimate participation resources. Figure 2 seeks to outline the ability to influence a decision process according to the characteristics of social actors and social groups.

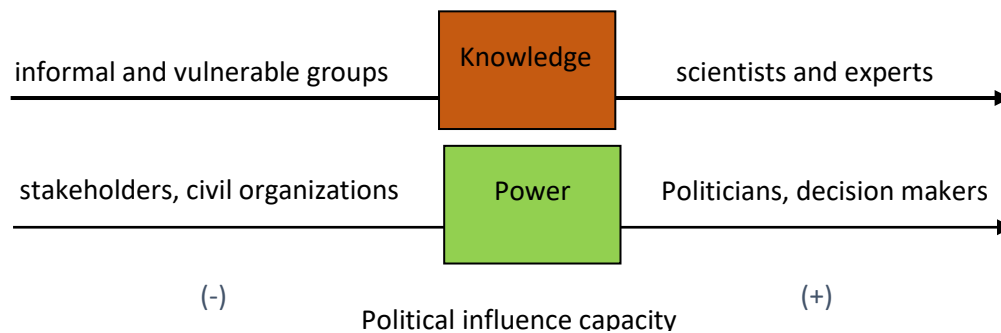


Figure 2. Capacity for political influence by stakeholders and social groups. Source: LNEC (2019).

Empowerment processes need to be considered, not corresponding to a new imbalance of powers, but rather to the inclusion of stakeholders in the decision-making and measures evaluation process. Similarly, public information and alert mechanisms should target particularly vulnerable and perhaps less well-informed groups (lack of information is also a factor of vulnerability).

Populations in urban environments are remarkably mobile throughout the day and under varying climatic conditions. Given this, pedestrian mobility and safety become a major critical aspect in extreme rain events. Thus, it is not only necessary to characterize population flows but also to account the variation of human presence and even its vulnerability throughout the day and night.

In addition to the statistical methods of systematic random survey (pointed ahead), for description of social groups corresponding to the intermittent presence of individuals in various parts of the city, we should consider that the number of people over time can only be estimated using other methods: observation, local counting, or continuous visual recording by cameras or drones (it could be necessary to review legislation on image capture of public places).

So, it is essential to have a typology of social groups and actors in order to anticipate difficulties of participation and to develop in advance adequate mechanisms of involvement that can catch all social groups, especially those most vulnerable and exposed to climate change in urban areas.

Once the stakeholder identification has been carried out, a method for categorizing those stakeholders must be developed, leading to a more understanding and in-deep analysis resulting in the stakeholders that must be actively involved.

Five different methods can be used for stakeholder categorization⁷:

- **Influence matrices:** an easy way to classify stakeholders is the creation of matrices. These can be done based on different categorizations as interest-influence, cooperation-competition, cooperation-threat or urgency-legitimacy. Matrices allow sorting stakeholders into categories that can be later labelled according to their characteristics and show different position and make power dynamics explicit.

As an example, in Figure 3, stakeholders are distinguished into four different categories: “key players” should be actively involved as they show high interest and influence; “context setters” are highly influential but little interest, this may become a risk so they need to be monitored and managed; “subjects” have high interest but low influence, they usually need to be empowered and can become influential by joining with other groups; the “crowd” have little interest or influence therefore the need of engaging them is low.

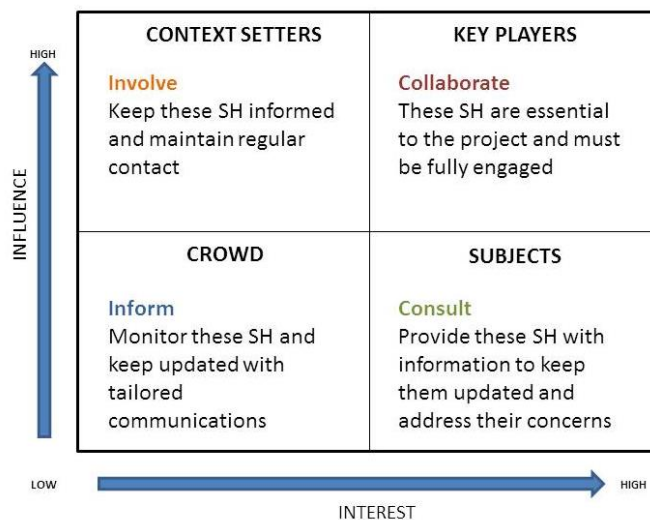


Figure 3. Adaptation of interest-influence matrix. Source: Reed et al (2009).

Once stakeholders are located in the matrix we can give them more attributes like supportive or unsupportive, confident or unconfident, legitimated or illegitimated, etc., which can help the analyst to find clusters and assess possible implications considered within the context of the project.

Influence matrices, as an analytical method, can be done within focus groups settings or semi-structured interviews or by researchers; these can affect negatively the process as analyst biases may be reflected instead of the perception of the stakeholders leading to under-represented groups or vulnerable group concerns being ignored. These aspects can delegitimize the stakeholder categorization done:

- **Radical transactiveness:** this method arises as an open dialogue focused on groups of stakeholders that are usually marginalised from participatory processes. The method looks for the inclusion of weak, poor, non-legitimate or isolated groups. All these also called fringe stakeholders¹⁹, whose views can be disruptive and that may hold knowledge and perspectives that can help to anticipate problems and identify innovative opportunities.
- **Stakeholder led categorization:** by this reconstructive method, the stakeholders involved define the categories and the parameters according to their own criteria. This method reflects closely the main concerns of the stakeholders but may shift the research focus, leading to a novel output but also can be distracting.

- **Q method:** coming from psychology sciences, this method propose a list of statements about some topic, then the participants are asked to sort the statements according to their individual point of view and beliefs, revealing their subjective viewpoints. It is useful to identify different social discourses and allows the analyst to categorize stakeholders according to their consonance with these discourses.
- **Salience method²⁰:** this method categorizes stakeholders by their power, urgency and legitimacy regarding the issue under study. As seen in Figure 4, different categories of stakeholders are identified:

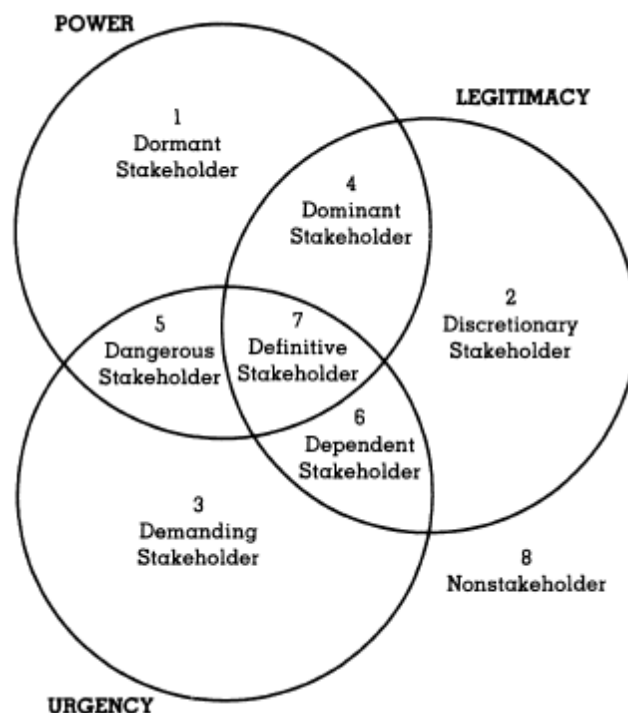


Figure 4. Stakeholder typology. Source: Mitchel et al (1997).

Dormant stakeholders: possess power to impose their will on a process but lack of a legitimate relationship or an urgent claim. They should be closely followed by managers as they are prone to acquire either legitimacy or urgency.

Discretionary Stakeholders: possess the attribute of legitimacy but they have no power or urgent claims. It is optional to managers to engage them actively in the participatory processes.

Demanding stakeholders: those with urgent claims but neither power nor legitimacy, their participation is usually averted by managers as the “noise” of urgency is not enough to be engaged.

Dominant stakeholders: where stakeholders are both powerful and legitimate, their influence is assured. They expect and receive much of managers’ attention but they are by no means the complete set of stakeholders that managers should pay attention to.

Dangerous stakeholders: power and urgency attributes in absence of legitimacy can become coercive and possibly violent. A failure in the identification would result in missed opportunities for mitigating possible dangers and in lower levels of preparedness; therefore managers should pay special attention to this class of stakeholders.

Dependent stakeholders: characterized by the lack of power but who have urgent legitimate claims, therefore these stakeholders depend upon others for the power necessary to carry out their will. Dependent stakeholders are open to establish coalitions with between them to achieve the necessary power.

Definitive stakeholders: by holding the three attributes, these class of stakeholders must be given priority by the managers attending immediately their mandate regarding the action.

3.3 Analysis of stakeholders' expectations

One of the key elements to achieve the goals of the participatory processes is to ensure that the concerns, constraints and expectatives of the stakeholders involved are taken into account and the expected outcomes fit with the needs expressed along the process. It is also important to assume goals adapted to real live experiences and needs from participants and try to avoid utopian goals that can undermine the process.

Asking people about their personal opinion regarding day-life issues make them more comfortable and broad open to collaborate and freely express their concerns about a particular issue that affects their community. As soon as communication barriers are overcome, stakeholders become able to articulate their expected outcomes of the participatory process taking active part in the definition of the common good or become open-minded to other participants' problems and requirements. Thereby, main purposes of the action can be provided, but moreover, the possibility to change these purposes along the process becomes a potential fact.

The core team leading the action needs to know what is important, urgent, necessary, imperative or replaceable for the stakeholders involved in the process. Three methods are described to gather this information: surveys, proposal requests and public consultation:

- **Surveys:** a survey is defined as a research method used to collect data from a defined group of respondents to obtain information and insights on various topics of interest. Surveys have a variety of purposes and can be carried out in many ways depending on the methodology chosen and the objectives to be achieved.

The data is usually obtained through the use of standardized procedures whose purpose is to ensure that each respondent is able to answer the questions at a level playing field to avoid biased opinions that could influence the outcome of the research or study. A survey involves asking people for information through a questionnaire, which can be distributed on paper, although it is more common to distribute them using digital channels/means.

- **Proposal requests:** by using this method, the participants are able to freely express the way a problem can be solved by their own point of view and

make suggestions on how an issue can be tackled. It is important to gather as many proposals as possible in order to give voice to all possibilities (and realities) and therefore start a prioritizing phase where the steering group have to set the criteria of this prioritization based on economic, environmental, social issues...etc. After that, a public debate must be hold with all participants to check their agreement on the results. All proposals need to be responded, even that ones refused, with well-founded arguments.

- **Public consultation:** public consultations have emerged in the late years as a citizen demand to participate in the policy decisions that affect their daily life. Main administrations have adopted this method as an open democracy tool to give soundness to their policy and implementation plans and gather information about what really concerns to people. Public consultations must be transparent, integrative, inclusive, accessible and committed with the results obtained, otherwise they will not be able to represent the community will and therefore loose the legitimacy needed.

However, once again, we must also seek to reach out more vulnerable social groups (isolated older people, ethnic communities or semi-clandestine residential areas, for example). Thus, the above techniques should be combined and not applied by itself excluding other possibilities.

In addition, in special cases of lack of information on the number and characteristics of occupants of a territory or area of residence, some interviewing techniques are more appropriate. In some cases, such as lack of census data or lack of territorial information about the presence of number of persons in transition, the use of systematic random sampling techniques assumes a particular relevance.

These random methods make use of systematic and exploratory sample runs and can be applied using random number tables (in housing areas) or systematic random interviews in certain public places to be defined and according to accorded itineraries.

In any case, all the techniques indicated require qualitative data to be classified, and the content analysis technique is a privileged technique to be considered for the treatment of responses.

The Coaching Territorial approach in Dakar, Senegal.

Starting in 2018, the office of the City of Dakar in charge of the dialogue with the citizens (*Dialogue Citoyen*) began practicing the *Coaching Territorial* approach in the 3 *communes* (sub-local administrative level) of Grand Yoff, Hann Bel Air, and Dieuppeul-Derklé. Working at the neighborhood level and based on a specific topic to address, the office together with volunteers began mapping several networks which led to the development of a social network analysis. Questions emerged such as: which actors? What types of relations (economic, institutional, community, etc.)? What changes can be brought to this specific territory?

Territorial Coaching is a collaboration with the Oriental Region of Morocco and UCLG. It is an approach that relies on local talents and skills in order to contribute to the development of

the territory by complementing the qualities of other stakeholders (elected officials, civil society, entrepreneurs, agencies or national ministries), in the setting of priorities, commitments, and monitoring.

In Dakar, even at the neighbourhood level within a *commune*, there are many actors with different and sometimes competing objectives, talents, and priorities that are difficult to align. This makes communication between them challenging. The territorial coaching approach attempts to position stakeholders to hear one another, create a strong dialogue, and ultimately collaborate towards successful implementation of policies and practices that are built upon a shared vision. It supports local stakeholders to mobilize their potential, problem solve, and promote sustainable development as well as the attractiveness of the *commune*.

With the success of the initial phase within the first 3 *communes*, the *Coaching Territorial* programme expanded in 2019 to 5 *communes*, and now in 2020 to the 19 *communes* that form the City of Dakar. Recent implementations of and demands for the *Coaching Territorial* approach have been for projects such as an action plan for the fishing wharf in Hann Bel Air, the management of the Central Market in Grand-Dakar, as well as the improvement of the living environment and the organization of women's groups in Mermoz Sacré-Cœur.



The Ville de Dakar Coaching Territorial programme in the Hann Bel Air commune together with the actors of the fishing wharf. Source: Coaching Territorial DAKAR (2019).

Example 3. The Coaching Territorial approach in Dakar, Senegal. Source: CRPP-UNHABITAT (2019).

4 Stakeholders Engagement and Communication plan

Based on the previous analysis developed in chapter three, this section will develop the definition of methodologies and plans to keep the stakeholders engaged in the participatory process regarding their particular characteristics and the role they play in the issue. As a result, the communication plan will be designed and developed to ensure the proper progress and the achievement of the goals defined for the development of the participatory processes

4.1 Stakeholders Engagement

We must consider that stakeholders are engaged individually, either formally or informally. Formally, we can make use of personal interview, especially using guidelines about the problem and semi-structured interviews. Informal procedures are more flexible and can include ad-hoc conversations that can allow you to gather additional information from stakeholders.

We should also consider conducting focus groups facilitated by a skilled moderator, these stakeholder focus groups serve the purpose of better understanding how problems are perceived and also how to create more understanding and involvement among stakeholders.

Seminars and conferences, congresses, or even holding local meetings in less-favoured areas are also processes of engaging stakeholders and starting to build links for relationship and mutual engagement. The Delphi method is also quite appropriate as it allows respondents to communicate their opinions anonymously²¹. This method is often used to prioritize issues or topics of a problem using successive questionnaires. It is a technique that deserves better attention, and serves the purpose of progressive engagement, although it cannot dispense later meetings and formal workshops where stakeholders really know each other personally.

Involvement from early stages is crucial just for stakeholders to know each other better and develop mechanisms of interaction and trust. It is also crucial for the clarification of the problem, in later stages, and for the identification of common goals under the commitment of stakeholders for concrete action.

Pla Mobilitat Urbana de Barcelona - Example of a participatory forum and space for consensus around the mobility model in Barcelona

The Urban Mobility Plan (PMU) 2019-2024²² is the planning tool that defines the action lines that set the urban mobility rules in the city of Barcelona moving towards a more secure, healthy, sustainable, equity and intelligent mobility. The PMU process started on 2017 with the definition of the steering group, led by the Barcelona City Council, the monitoring commission and an external supporting team.



Figure 5. Phases and calendar of the PMU participatory process. Source: Barcelona City Council (2017).

In the first phase of the participatory process two internal sessions involving the Mobility Commitment members developed the diagnosis and the validation of goals and main axis of the PMU. Therefore a second phase of information and communication addressed 11 sessions to specific collectives (functional diversity, elderly people, children) and other issues (pollution, noise, health, public space, gender). At the third phase an open debate was open to all citizenship through the online platform Decidim and 4 participative meetings to tackle different aspects of the urban mobility: secure mobility for everyone, public space, technology and quotidian mobility. After these phases, the steering group carried out the assessment of the proposals gathered and gave the feedback to the participants and the whole citizenship. The PMU participative process²³ results showed up 299 proposals (31 from public institutions and 268 from the citizenship) classified into transport models (on foot, bicycle, public transport, private transport and freight transport) and a general category which comprises transversal issues. The participative process lasted one year, where more than 500 people participated in 17 meetings. The PMU is now under review by the monitoring commission.



Figure 6. Urban Mobility Plan participation flyer. Source: Barcelona City Council (2017).

Example 4. Barcelona Urban Mobility Plan. Source: Barcelona City Council (2017).

Creating a Resilience Unit for higher engagement in Maputo, Mozambique.

One of the recommendations for actions for resilience in Maputo coming from the implementation of the UN-Habitat City Resilience Profiling Programme (CRPP) approach in the city was the creation of a Resilience Unit or *Unidade de Resiliência* (UR). The UR will act as a cross-sectorial unit within the municipality and related departments to support resilience mainstreaming. The recommended Resilience Unit will serve as a basis to strengthen the overall capacity of the Municipality of Maputo to ensure that a resilience lens is applied to every sector, project, and planning cycle while still ensuring that the resources are leveraged holistically and inclusive of all stakeholders.

The overall objective of the unit is to build a more inclusive, sustainable and resilient city by strengthening the capacity of local government as well as key public, private and civil society stakeholders; to measure, make decisions, plan and develop actions for building resilience; and to ensure that public and private investments are risk and resilience-informed. Early interventions should be linked to longer-term development goals in line with the Agenda 2030 for Sustainable Development, the New Urban Agenda, the Paris Agreement, and the Sendai Framework for Disaster Risk Reduction.

The recommended unit of the Municipality shall have the following tasks in relation to engaging with its stakeholder:

- Rallying the necessary political and technical support from government departments and related stakeholders.
- Coordinating and leading resilience strategy and urban resilience projects with different kind of partners (institutions, enterprises, and academia) from local to national and international. Positioning of Maputo and companies based in the city that collaborate in the development and implementation of resilience projects as referents in this field, as well as international institutions.
- Bring together a wide array of stakeholders to learn about the city's challenges and help build support for individual initiatives, and for resilience building in general. These stakeholders include government officials, and it is critical that representatives from the private sector, non-profits, and civil society are also included.
- Creation and leadership of urban resilience boards
- Link of communication and coordination with the United Nations agencies and other international institutions oriented to the creation of urban resilience.
- Representation of the city as a reference in this field across Africa.



Figure 7. Technical participatory workshop organised with the Municipality of Maputo in March 2019 to discuss the recommendations for actions for resilience. Source: CRPP (2019).

Example 5. Creating a Resilience Unit for higher engagement in Maputo, Mozambique. Source: CRPP-UNHABITAT (2019).

4.2 Communication plan

The communication plan is understood as a cross-cutting issue involved in different ways and at different phases of this document. It becomes an essential matter to improve the development of the participatory processes defined to increase urban resilience and the implementation of the action plans addressed to cope with climate change and extreme events.

As a main goal of the document, the communication plan leads the different stages of the participatory processes and define who, when and how the stakeholders need to be involved in the process to ensure the proper progress and the achievements defined.

The communication plan will be open and dynamic along the timeline of the process and it will be fed during the different stages.

The communication plan should therefore be based on a simple and straightforward language easily understood by all stakeholders. This communication strategy, stated in the communication plan, responds to the principles of transparency, dispersion and complexity of information (about climate change and urban resilience and adaptive responses), making it necessary to develop an integrated governance that make the public demonstration of the characteristics of the problems and the results of the planned actions.

Thus, the phases of a communication plan should discriminate new mechanisms of interaction between stakeholders and the sources of information to be privileged (at a first stage). Subsequently, communication implies the dissemination of results besides organizational boundaries, building in an ever-changing 'organizational ecosystem', a social structure of inter-organizational networks linked to diverse local and national partners and agendas. This social structure of interorganizational networks is referred even to as «spider-web»²⁴ and reflects the shared collaborative resources based on trust, information, knowledge, innovation and new possibilities for joint action.

A commitment to the people as a number one priority in Teresina, Brazil.

The city of Teresina is an excellent example of what can happen when a group of dedicated civil servants with a clear vision of inclusion, transparency and sustainability take on the task of making their city resilient. As stated in the vision of the Prefecture of Teresina's Secretariat of Planning and Coordination, their number one priority is a commitment to the people. Recognizing that this commitment requires a relationship with its citizens built on trust and openness, one of Teresina's tasks under the guidance of Mayor Firmino Filho and his goal of transparency, is democratizing access to information and ensure that is directly available to interested parties and citizens. In response to this objective, the Municipality has implemented an Open Government Agenda, by training civil servants to promote transparency and to offer best public services using open data.

Along with its partners, Teresina created two major platforms for **information** and **data dissemination**: Observatório da Mobilidade and Colab Teresina.

- **Observatório da Mobilidade** – A new tool to use Blockchain technology to share public transport data. Through this system, the capital of Piauí will store all information related to public transportation in a digital, safe, and efficient way. The data is found in a single place and accessible to the population including information

about fulfillment of service orders, travel reports, etc. The goal is to improve services, reduce carbon gas emissions and bring society closer to decision-making processes in public management, providing reliable and direct communication.

- **Colab Teresina** – Colab is a technology tool with a mission to help public entities become more efficient and responsive to societal demands. It is designed to bring citizens closer to their governments giving the population the power to collaborate with the public sector on issues through urban janitorial publications, participation in decision-making and in public service evaluation consultations. Combined with the work of Teresina Municipality, Colab Teresina works to encourage and promote improvements for more efficient and innovative management in public administration. Colab Teresina strategy recently included a COVID_19 community tracing functionality where people themselves can report no/mild/strong symptoms, suspected and confirmed cases.

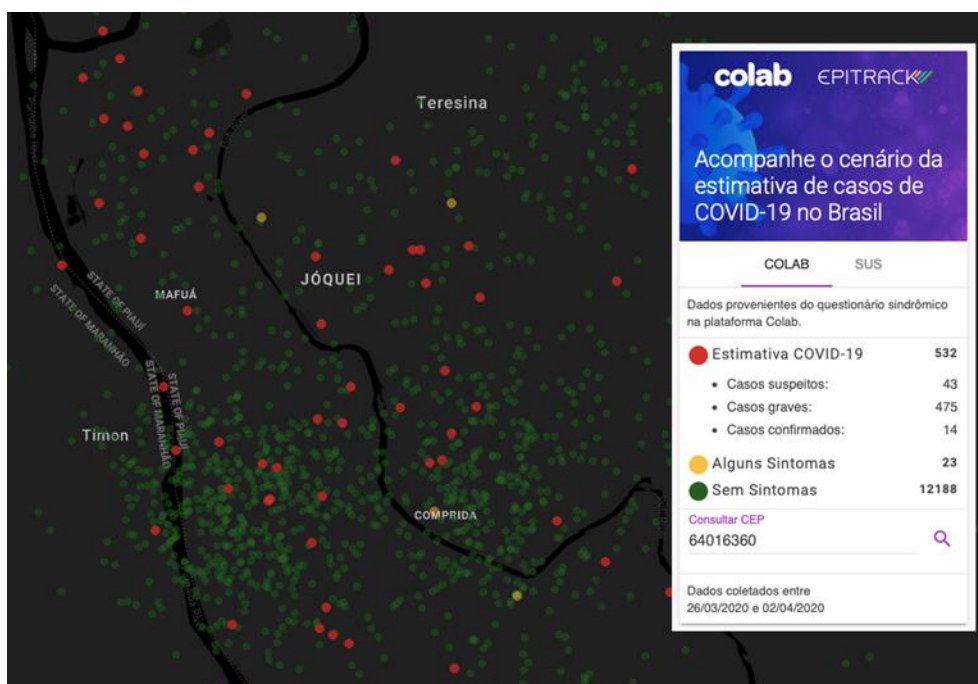


Figure 8. Map from Colab Covid Community Tracing for Teresina. Source: Teresina Municipality (2020).

While Teresina has made strong steps forward, there are still many challenges for the city to overcome. It is situated in one of the regions most exposed to climate change in the Global South. Already, Teresina records 325 hot days (days above 32° C) per year, and average temperatures have increased 2° C in the last century. This extreme heat scenario overlaps social and environmental vulnerabilities with deep economic inequalities. One such vulnerable group identified by the city are women living in poverty. Their subsistence livelihoods will be severely impacted by the continued environmental changes. In pursuit of long-term and comprehensive approaches that can be incorporated into effective urban policy and design, Teresina has proposed gender-based climate adaptation policies in the city. Their goal is to develop strategic, integral, inclusive, feasible, and practical solutions

that are co-created in partnership with affected groups, the government, and civil society.

Example 6. A commitment to the people as a number one priority in Teresina, Brazil. Source: CRPP-UNHABITAT (2019).

Estratègia RESIDU ZERO - Example of communication and dissemination of a specific action

During 2018, the Barcelona City Council developed a pilot project in the Old Sarrià neighbourhood as a response to a citizen demand regarding a waste collection system change. The communication strategy set five tactic goals: inform about the new waste collection system, raise awareness about the importance of correct separation of waste, inform how to separate the waste correctly at home and its disposal at the streets, inform about the zero waste strategy and solve doubts to citizens and shops. To achieve these goals different elements of communication were developed: **personalized service office** with two people working full time to inform the citizenship, **street informants** during six months to give support in the communication process and the distribution of the materials needed to separate correctly the waste at home, **informative leaflets** (flyers, posters and guides), **graphic images** to put on waste bins and waste bags, **stickers** for abandoned waste bags.

The implementation of the *Residu Zero* strategy resulted in the increment from 19% to 60% of selective waste collection in the pilot project neighbourhood.



Figure 9. Sarrià Zero Waste communication flyer. Source: Barcelona City Council (2018).

Example 7. Sarrià Zero Waste. Source: Barcelona City Council (2018).

5 Co-design process

Involving stakeholders in the participatory processes of decision-making increases the soundness of the process itself as shared interests are identified by participants establishing emphatic relationship where everyone's concerns and constraints are taken into account. As all voices are listened, common sense and flexibility emerge facilitating the achievement of defined goals. The steering group in charge of the participatory process must look after the acquisition of these features.

Based on the Governing City Participation Regulations and the Rules of Citizen Participation of the Barcelona City Council, main aspects of co-design processes for decision-making processes have been identified and displayed into four different phases: Information, Discussion and proposals, Consensus process and Feed-back and communication.

In Lisbon, for example, the municipal strategy for adaptation to climate change (EMAAC) was approved in July 2017 with the favourable vote of all the political parties represented. The EMAAC developed a public inquiry, and this research was structured for the reception of free comments, suggestions or criticism attending the category and motivation for participation. These motivations were discriminated by complaint, comment or suggestion (three categories).

It can be stated that the co-design process is variable depending on the timing of people's involvement, the social and individual motivations for involvement and the influence of participants regarding final decisions and political processes. It can be argued that the influence of citizen participation decreases as the level of emergency becomes more critical, and that participation is more proactive and more relevant in strategic planning processes than in emergencies' one. However, emergency preparedness is a crucial process whose plans should be monitored and evaluated according to pre-defined indicators and tested tools and processes. The emergency preparedness should be conducted by authorities, but stakeholder contributions and doubts should enable changes in risk priorities or in the availability of capabilities for response, identifying areas of high human vulnerability and of increased hazards concerning human behaviour²⁵.

On the other hand, the co-design process should play a key role in raising public awareness on risks, best practices for risk reduction and appropriate protective behaviours in emergency situations.

5.1 Information

First aspect of participatory processes is the necessity of an **open information** database where all data, reports, research studies, local knowledge, political and socio-economic aspects, environmental and climate phenomena, etc., must be gathered and fully accessible to participants in the process. It is also needed to explain how the process is going to be developed by the core team and the different phases that are going to be carried out.

The process must be addressed from the **transparency and equity** values so every stakeholder involved have the same rights and obligations respect to others. It is a duty of

local governments to ensure the acquisition and consideration of these values from all the participants.

One of the main aspects for co-design processes is the set of **deliberative democracy** as the primary source of legitimacy of the process. This form of democracy centralizes on authentic deliberation the decision-making processes, where decisions, rules or laws are not merely voted by participants, so as consensus must be reached by participants. To achieve the consensus there must be solid arguments supported by appropriate and reasonable facts; these arguments should be balanced with contrary arguments and should be considered on their merits, not on how they are made or by who is making them. The participants should be willing to talk and listen, with civility and respect so all points of view held by significant portions of the population should receive attention. Deliberative democracy increases sympathy with opposing views, more respect for evidence-based reasons, a greater commitment to the decisions taken by stakeholder involved and a greater chance for widely shared consensus to emerge, thus promoting social cohesion between people from different backgrounds²⁶.

Stakeholder participation is considered as a way not just to reduce conflict, but to reworking the influence capacities of them. The stakeholder involvement should be understood as a process of empowerment.

Empowerment processes need open information, transparency and equity values and formal mechanisms for engagement, consensus and compromise. In addition to the exchange of information and open access to problem data, stakeholders should be encouraged to develop proposals that somehow already contain a definition of the main aspects of the problem and an idea for future actions to be undertaken under commitment.

5.2 Discussion and proposals

The participatory processes are usually a series of meetings delimited in a specific time to promote debate and the contrast of arguments between the citizenship, or between this one and the responsible municipal people. A participatory process can be dealt with on almost any topic, and can affect the whole city, or just a part of it, as examples: how to reform a street or a square, do the diagnosis of a neighbourhood, or give concrete ideas about how to develop a public policy. The purposes of the participatory processes can be: make the diagnosis of a given situation, find creative ideas about an act or evaluate or propose specific actions.

The core team leading the action or issue have to define the stakeholders to involve and organize the **participative meetings**. There are several methods and tools which could be applied in a city context to enhance social innovation, it is essential to review the local circumstances, assets, power dynamics and fitting to the local participative planning process.

Brainstorming sessions, public meetings, local target groups, theme group planning, workshops or process planning groups are all conducted by the core team showing up the main aspects of the action or issue under research and looking for the proper development of the sessions seeking for aspects as equity, legitimacy, responsibility, commitment, respect, understanding, awareness. All voices have to be listened; arguments need to be reasonably exposed and balanced, participants need a comfortable environment to express

their concerns about the process and arrive to the main purpose of the participative meeting: the show up of **proposals**.

Proposals made from participants must be gathered by the core team. This can be done in different ways but all with the same goal: collect as much as possible. Then the next phase is allowed to begin.

Once known all the proposals it is convenient to submit them to a first selection of their suitability and tangibility becomes imperative. Adequacy in function of the action resources mobilized by the stakeholders, and tangibility in the sense that the results will be subject to a system of measurement indicators.

Proposals selected as most appropriate and with tangible objectives should, at a later stage, be exposed to discussion by all stakeholders and (using some of the methodologies explained below) somehow ranked according to their collective relevance and the commitment among stakeholders.

5.3 Consensus process

Once the proposals have been gathered, an open discussion and debate must be hold to analyse and prioritize the proposals done by the participants. Driven by the core team, there are different kinds of tools to lead or guide this strategic phase:

- PEST analysis. It is a simple but important and widely used tool that helps to understand the big picture of the Political, Economic, Socio-Cultural and Technological environment of the local planning site. PEST is used to build the vision of the future, by step by step review of the four factors concerning the local issue.
- SWOT (Strengths, Weakness, Opportunities, Threatens) analysis is based on teamwork. It helps to discover new opportunities, manage and eliminate threats, by analysing certain circumstances of an issue.
- Nominal Group Technique (NGP). Participants severally write down their ideas in a few minute periods about the case in point. Ideas are then collected, discussed, voted on and ranked in order of preference. It combines idea generation and idea evaluation.
- Constructive Controversy. It is a technique improving solutions by arguing for and against your invented options, which can lead to a better understanding of other possible alternatives. At the end of the process participants can draw a conclusion and make well-reasoned decision.
- Analytic Hierarchy Process (AHP)²⁷. Is a simple method of application developed by Thomas Saaty in the seventies, which assumes that there are always possible actions for each problem. The method identifies the highest priority actions using proportion scales from paired comparisons discussed by stakeholders or expert groups. Applications of the AHP method are increasingly relevant in decision-making processes regarding environmental issues²⁸.

There are also other multi-criteria methodologies, such as Measuring Attractiveness by a Categorical based Evaluation Technique – MACBETH, Cluster Analysis (producing data

matrices, which are applied to discriminate social and territorial vulnerabilities by mapping the exposure to climate change impacts), CATWOE, VOTING or SHOPPING. Particularly the last two are easy to apply and understand. Voting requires the discrimination of some previous sentences, with statements about the problem or possible actions and the stakeholders must classify each statement in terms of 'I agree', 'I disagree' or 'I have doubts'. Then, there is a discussion about the classifications obtained at the workshop. It is also interesting to discriminate the same sentences in two time-separated workshops to verify the evolution of the convictions or doubts. The Shopping technique already requires the discrimination of possible actions or some impacts perceived by the stakeholders, and the results of this technique are equivalent to those of the AHP and ANP methodologies.

As many others methods and tools are developed by the social sciences, all of them look for the same purpose: build **consensus**. It is extremely difficult to reach consensus when a great number of stakeholders are involved, some of them will accept the decisions made, others maybe not. The core team need to make a great effort to avoid disenchantment from any of the groups participating and have to win reasons over these groups to keep them engaged in the process; this can be done paying special attention to their constraints and expectatives shown during the process and emphasizing the necessity of them to carry out the action. These kind of matters can be assessed previously at the stakeholder analysis phase as power and influence over the action have been identified and categorized, allowing the core team to prevent any group opposition that can block the action.

5.4 Feed-back and communication

The results obtained from the participative meetings need to be analysed by the core team leading the action. This is an internal work where the viability of the proposals done is studied in depth regarding the main purposes of the co-design process. Aspects like economic viability, social acceptance, environmental protection, adaptation to climate change, resilience increase, risk reduction, climate awareness or vulnerable groups' protection should be first instance features to be considered when co-design processes for climate adaptation results in decisions to political and management spheres. The greater the soundness and robustness of the design actions, the higher are the possibilities to turn them into political will.

The outcomes of this phase have to be broadcasted to the stakeholders involved in the process in a public report of results obtained. This report should reflect the totality of the actions proposed and the state of the actions, which can be expressed in two ways: accepted or rejected, explaining the reasons:

- Accepted and implemented: actions that have been done during the process.
- Accepted and planned: actions that were already planned or included in municipal plans of action.
- Accepted and promoted: actions resulting from the process that can be displayed.
- Rejected and not prioritized: proposals that have not gathered the sufficient supports in the prioritization phase and that it will be necessary to improve with the community.

- Rejected for lack of competence: proposals that are not part of the participatory process or that corresponded to another process.
- Rejected and not concreted: proposals that due to lack of precision have not been possible to evaluate its functional implementation.

In general, the appreciation of contributions by political authorities and decision centres may favour contributions that are expressed in technical terms²⁹, which has been a motive for excluding many contributions from participants sharing a scientific illiteracy or a lower academic ability. These participants often express their beliefs in a non-technical language, making references to negative impact perceived considering their residential areas or economic activities.

Thus, the outcomes of this phase should not exclude contributions expressed in common or non-technical language. Indeed, many of these non-technical contributions can be helpful in identifying the dimensions of the problem.

The results of the co-design process must turn into the acquisition of responsibilities of the stakeholders involved in the process regarding their own characteristics. So that, decision taken must be accepted and facilitated by all groups of interest, putting the necessary resources to achieve the action.

Plataforma DECIDIM Barcelona - Example of a municipal platform for the promotion of citizen participation

Decidim³⁰ Barcelona is the digital platform for participation in the city of Barcelona. It was put into operation on February 2016 and today has more than 32,000 registered participants, 13,000 proposals received, 1,300 face-to-face meetings held, 190,000 supports collected and more than 9,000 citizen proposals accepted. The starting point was given within the process of the Municipal Action Plan (PAM), one of the strategic processes most involved in the digital sphere. Currently, the platform hosts thirty-eight participation processes, a fifteen municipal participation bodies and a dozen civic initiatives.



Figure 10. Screenshot of Decidim Barcelona online platform. Source: Barcelona City Council (2019).

Barcelona has the challenge of placing itself at the forefront in the development of participation policies that generate dynamics of empowerment of citizenship, inclusive participation, direct democracy and co-production of public policies and transformation of the city, based on the needs of people and groups that live in it. At the same time,

Barcelona is already becoming a leader in the development of digital and democratic infrastructures for participation based on open-source software and open knowledge. In this way, Barcelona exports a model of participation and a way of understanding and organizing the participation that is incorporated from the beginning to the free digital technologies and its democratic principles, and also, exports a model of technological development and management of digital data, fully guaranteed, that puts people in the centre and their ability to decide. This opens up the opportunity to develop innovative participation policies that take on the challenge of developing technologies in the digital age to deepen local democracy, facilitating access to participation and capacity to manage, deliberate and jointly decide on all those issues that affect the daily life of the citizens of Barcelona and their social fabric.

In the digital era, of capitalism of surveillance and in global conflict of control of data, issues as fundamental as software licenses, the uses of personal data collected on digital platforms or the governance of digital infrastructures, have become one of the main concerns of governments at different scales, starting with the governments of cities, being all these fundamental issues for the deployment of real democracy in the digital era. To face these challenges, public administrations need to invest in free technology solutions that make an ethical use of data in a guarantee manner and seek formulas for democratic governance. Decidim opens way as a free open-source software project and as a platform of participation in a pioneering way, tackling with many of these challenges.



Figure 11. Decidim digital platform. Source: Decidim digital platform (2019).

Decidim has become a key digital infrastructure at the city level. The project has transcended the local scale and has been extended to public administrations and social organizations. Developed in a generic way in order to articulate any type of democratic process, its design and its flexibility, the fact of being free software, its modular architecture and the open development model, has generated a huge extension, so that, after three years, there are more than 80 local and regional governments who have opted for this platform and more than forty social organizations, both in Catalonia and in the rest of Spain, as in other countries such as France, Mexico, Belgium or Finland.

Example 8. Decidim Barcelona Platform. Source: Barcelona City Council (2019).

6 Co-production process for implementation

Application of the participatory process for the implementation of climate adaptation strategies.

6.1 Stakeholder identification

As a consequence of the co-design process, the stakeholders involved can take part in the next phase as co-producers of the action. Here, those individuals or groups with special characteristic about the issue under development define the role they are going to play such as funders, researchers, implementers, publishers, etc. The core team must attend that all ambits are considered and focus the scope of the co-production process.

An interesting method of self-identification of stakeholders is the social networking, where stakeholder identify the areas where they can contribute at the same time that identify others stakeholders' areas of contribution. Thereafter an identification matrix is built and validated by the stakeholders involved. The result is analysed by the core team that will set the pathway for the co-production process areas of contribution, determining where, when and how each stakeholder is going to partake the action. The roles must be reached by consensus and accepted by everyone, knowing that they can change throughout the process, but preserving the initial scope. Once the groups have been settled, it is necessary to keep them engaged throughout the process.

Other stakeholder identification methods involve media content analysis, public sessions in critical areas, and the content analysis of public participation reports about environmental issues, impacting infrastructures or urban planning processes.

It is also usual to explore primary and secondary sources, i.e. data collected from face-to-face interviews (NGO, political and scientific personalities, and so on), focal groups methodology, questionnaires, collecting documents about organisations or of a critical environmental news and analysing websites.

6.2 Stakeholder engagement

Stakeholders, at different levels and stages, are crucial to the success of an adaptation project through listening to the views of others; stakeholders can build a shared understanding of the issues. Priority areas for action emerge that take account of everyone's perceptions. This process requires time to **build trust** between the groups and individuals involved, and can be empowering, as solutions are worked out collaboratively. If each participant is seen as having a valid view, a stakeholder process can encourage longer-term capacity development by developing pathways for co-ordinated action. Adaptive capacity is developed if people have time to strengthen networks, knowledge, resources and the willingness to find solutions. However, the process must be carefully designed and implemented, as stakeholder participation does not in itself guarantee equity, fairness or eventual buy-in³¹.

The out-finding of **common goals** can became an arduous task since the interests of different stakeholders can be confronted. Many times there can be previous relations

between groups historically opposed where re-building up trust or the simple act of sharing opinions is practically impossible, resulting in the infeasibility of carrying out the action and forcing the creation of new pathways where the mediation of the core team is an essential element. Consensus cannot be understood as a unanimous opinion among group members or among stakeholders. Consensus does not necessarily produce unanimity.

It is also necessary to distinguish what is meant by consensus of opinion among the experts. For example, there is consensus within the scientific community about direct and deferred consequences between human life style and climate change or the frequency and severity of disruptive environmental events. It is also usual for workshops with stakeholders, scientific experts, policy makers and other stakeholders to agree that human lifestyles, industrial production forms and consumption are impacting environmental quality and natural systems as well as social systems.

However, **building trust and common goals** are beyond consensus. It is required compromise (not just consensus) among the parties. It is not just a matter of generally accepted consensus or opinion about the causes and consequences of a complex problem (such as climate change). Commitment requires a schedule for future actions, the sharing of credible data and tangible common goals by an active stakeholder engagement.

We must also consider that climate change translates what the literature calls *wicked problems*. Traditionally formulating a problem is concomitant with our ability to solve it. In the case of climate change, as a *wicked problem*, it is not so.

It takes another form of approach, a new generation of policies and of the own formulation of problems that will lead us to provisional, partial and progressive solutions, and we must be considered that there is no such thing as a complete and effective solution for eradicating the problem of climate change.

One cannot understand the problem without knowing about its context; one cannot meaningfully search for information without the orientation of a solution concept; one cannot first understand, then solve. The systems-approach *of the first generation* is inadequate for dealing with wicked-problems³².

Approaches of the *second generation* should be based on a model of planning as an **argumentative process** in the course of which an image of the problem and of **the solution emerges gradually among the participants**, as a product of incessant judgment, subjected to critical argument and potential **commitments** or disagreements among stakeholders, including politicians and scientists.

Paradoxically, stakeholder involvement cannot be developed with a view to solving a problem, but with a commitment to programmed actions that mean only a progressive escalation of partial outcomes that mitigate the problem of climate change in a city or region (country or continent, even the world!), but which do not (definitively) solve the problem.

Knowing this in advance is crucial to building trust and out-finding common and tangible goals.

the subsidization of projects co-produced by citizens and local administration

Following the success of the Barcelona's 2015-2017 Climate Commitment projects, Barcelona City Council launched a series of grants to promote collaboration projects between the public authority and the city's citizens in order to:

- Boost citizen involvement
- Support collective citizen action
- Promote and support innovative initiatives
- Utilize co-creation processes
- Contribute to the achievement of Barcelona's Climate Commitment objectives.

The Climate Plan³³ provides for €1.2 million until 2030, with a call for projects every two years to contribute to fulfilling the plan's commitments. Over 140 organisations, and a total of 49 projects on diverse themes, participated in the first call for climate grants, published in April 2018 and endowed with a budget of €200,000. The 11 projects selected are driven by a minimum of three bodies who are working together and have received a maximum of €20,000 per project. The process of developing these projects involves on-going advice, monitoring and training for the participating citizens. Four joint sessions and an individual monitoring session with a technical and administrative reference person are planned for each project.



Figure 12. Climate Plan subsidies. Source: Barcelona City Council (2018).

Example 9. Barcelona Climate Plan call for climate projects. Source: Barcelona City Council (2018).

6.3 Setting up of mechanisms for implementation and follow up of the actions

As co-production results are generated a highly commitment of the stakeholders is needed to transform them into real actions to be implemented. Here, local administration develop the lead role developing the frameworks needed like budget allocation, administrative issues, executive tasks or political approval. Municipalities have also to provide spaces to hold the meetings and co-working zones where the action groups created can self-organize and develop the projects. Public fostering of this kind of initiatives is crucial for the implementation of adaptation strategies and to keep the stakeholders strongly involved, as a barrier identified, economic uncertainty undermine the ability to strive the realization of the project. Giving the stakeholders a safe background increases notably the success probability of the actions.

It becomes necessary to propose metrics and measures to evaluate the ongoing process of stakeholders' engagement and follow up the outcomes. There are already indicators of stakeholders' engagement and governance, basically focused on some core areas of measuring outcomes: the process of stakeholder engagement by itself, impact assessment and ex post evaluation³⁴.

Basically, the stakeholder engagement process requires indicator-based monitoring, based on systematic interaction among stakeholders (e.g., number of contacts, number of workshops, presences, organizations and sectors involved, etc.), discussion of applied methodologies, mutual oversight about the information quality and credibility of the of new data produced.

Likewise, it becomes relevant, as already mentioned in this report, the transparency of the whole process, the dimension of trust and of credibility of the data, and the reliability of outcomes as well as the tangibility of the actions to be developed. The development of indicators thus constitutes a critical phase that determines the credibility of the entire stakeholder engagement process. The core team has, indeed, the complex task of building the basis for mutual trust and to facility a system of indicators recognized and co-produced by stakeholders.

It is advisable that the core team creates a follow up committee to address the action groups, setting up a list of indicators that allow them the achievement of the proposed goals. These indicators can be the number of interrelations created during the process, the commitments signed or the responsibilities acquired to build up the action. This committee have to provide technical assistance, analyse the economic viability, address efforts in the right pathway and intermediate and resolve conflicts that may arise, taking advantage of moments of discussion and confrontation as drivers of change and creation of new structures capable of facing new situations merged throughout the project.

La Fàbrica del Sol³⁵ - Example of production space provided to the public by the local administration.

La Fàbrica del Sol is an equipment of environmental education promoted by the Area of Ecology, Urbanism and Mobility of the City council of Barcelona. The rehabilitation of the space has integrated environmental measures and solutions, such as the use of rainwater, an interior vertical garden, a geothermal heat pump, a pergola and a wall with photovoltaic panels, in addition to natural ventilation. The demonstrative building is open to all to publicize and extend the culture of sustainability. The services and resources that are offered are:

- An information and consultation service on issues of urban ecology and sustainability
- A program of activities for adults and families
- The program How does Barcelona work?
- A material loan service

Also found:

- The Ateneu de Fabricació de La Fàbrica del Sol

- The Environmental Education Documentation Service (SDEA)
- Action + Sustainable for shops
- Entities and Companies + Sustainable
- Schools + Sustainable



Figure 13. La Fàbrica del Sol building. Source: Barcelona City Council (2019).

Example 10. The Sun Factory. Source: Barcelona City Council (2019).

Multiple initiatives on engaging with Stakeholders in Yakutsk, Russian Federation.

The city of Yakutsk has recently undertaken multiple initiatives to support the engagement of stakeholders and their inclusion in the design and implementation processes of infrastructure and public space.

In 2016, an initiative budgeting pilot project was launched in Yakutia - the Program to Support Local Initiatives. Development of the project, implementation procedures, and support was carried out with participation of the World Bank experts. The Ministry of Finance of the Republic of Sakha (Yakutia) provided grants from the state budget to local budgets for co-financing of public infrastructure development projects. The Municipality of Yakutsk, through its sub-local administrative divisions, gathered all local initiatives and supported the requests in their submission to the Ministry. The local initiatives were developed in open public meetings of residents to determine project parameters along with citizen questionnaires to identify problems. The results showed a high demand for projects to improve sports sites, develop urban furniture, and liquidation of spontaneous landfills. Since its initiation in 2016, the program has implemented more than 900 projects. Roads have been repaired, parks landscaped, water supply provided, children's and sports grounds built, and monuments restored.

In 2017 the Municipality of Yakutsk launched the project "Formation of the Modern Urban Environment in the City of Yakutsk". This project aims to create a comfortable urban infrastructure for its inhabitants. As part of the program's participatory process, city residents can submit proposals for the inclusion of their yards into the municipal project, including designs for the improvement of the area. This encourages cooperation within the neighbourhoods to discuss ideas and prepare proposals. Moreover, the Municipality

promotes public-private cooperation to implement the project by providing Yakutsk residents with a list of officially recognized organizations that can be contacted to prepare a design for the improvement of the yard area.

In December 2018, the Mayor of Yakutsk approved an initiative from a group of entrepreneurs to jointly improve Vilyuisky Lane. The entrepreneurs decided to contribute 1.5 million rubles to help bear the costs of the project as the city does not have enough funds of its own to finance the reconstruction. Repair of the road from Vilyuisky Lane to Okruzhnoye Highway will take place in two stages. The first stage will be an overhaul of the existing asphalt-covered road that currently has no exterior lighting, sidewalks or drainage trays. The second stage will be to connect it to the main highway (Circle Highway) of the city, which will facilitate the traffic and access to the main road for those living in the area.

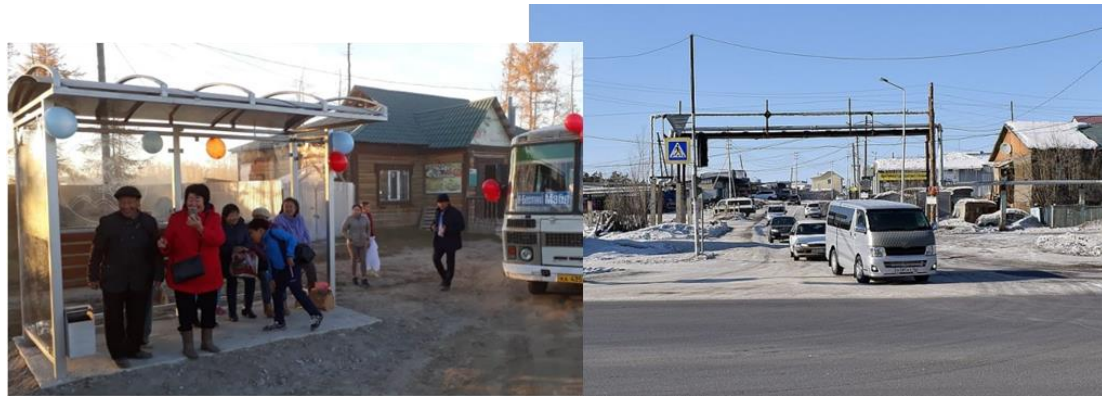


Figure 14. A bus stop financed from the local initiative and the improvement of Vilyuisky Lane.
Source: Якутия.Инфо and ysia.ru (2019).

Example 11. Multiple initiatives on engaging with Stakeholders in Yakutsk, Russian Federation.
Source: CRPP-UNHABITAT (2019).

7 Emergency operational model

Emergency communication between operative teams becomes an essential asset of cities to ensure the correct management of critical situations that can negatively affect a city and harm citizens' livelihood. Until now, the document has analysed how the involvement of stakeholders gives robustness and reliability to citizen participatory processes, and therefore city policies, becoming a key tool in the processes of collective construction of resilience. At the same time, it has been seen how communication plays a transversal role at all levels of citizen participation. But communication plays also a crucial role in cities' management. In this section, the document shows how the three case study cities of the RESCCUE project, Barcelona, Lisbon and Bristol coordinates their operational models, how the operative teams are organized to give an effective response to emergency situations and which kind of communication channels are deployed to ensure the correct transmission of critical information during critical events between operative teams but also how these emergency situations are communicated to citizenship

7.1 Operational coordination

7.1.1 Barcelona operational model

7.1.1.1 Introduction

The Barcelona City Council is responsible, within its jurisdictional framework, of the elaboration approval and implementation of the **Municipal Basic Plan of Civil Protection (PAM)**, defined as the systematic set of actions that all municipal governments and senior administrations must coordinate in all the emergency situations in the city (i.e., is the basic piece in the structure of the whole civil protection planning system). It is necessary to highlight that the participation of the Barcelona City Council in the management of infrastructures owned by the General State and/or the Regional Administration does not prevent the City Council from exercising its own powers in the field of planning, management and urban planning discipline, security and local police, civil protection and fire prevention and extinguishing, public health protection, mobility and traffic management of vehicles and people, environment and any other that also corresponds to the City Council.

The purpose of the PAM is to establish the model of coordination and operating action for the resolution of the different types of threats that have its origin or can affect the Barcelona municipality and that are not contemplated in other emergency plans. Therefore, this plan defines the basic line to be followed in the specific plans and emergency protocols.

The main objectives are:

- rescue, save and attend to victims and / or persons affected by an accident or disaster,
- mitigate the effects of the accident,
- foresee and prevent further damage,
- rehabilitate damaged or disturbed areas, services and infrastructure,
- determine the causes and evaluate the accident,

- provide information to the appropriate authorities and the population.

Civil protection is a public service and the City Council has general capacity for action, planning and coordination in this area, with the main objective of guaranteeing the physical protection of people and property in a situation of great collective risk, public calamity or extraordinary catastrophe, in which the security and life of the people can be massively threatened or succumbed, as well as minimize the natural, anthropological and/or technological risks that may affect the basic services and/or the normal operation of the city and its metropolitan environment. All municipal services, in the face of the different risk situations that may be generated, will act in a coordinated and planned manner to guarantee the efficiency of the security of the population as a whole and the normal functioning of the city. Civil protection is a service based on the collaboration of all those involved in the different emergency situations; therefore, the integration of the citizens in the fulfilment of their duties and their voluntary collaboration are the guarantee of protection for all.

The basic purposes of civil protection actions are:

- The forecasting of serious risks, understood as an objective analysis of these risks and their location in the city.
- Prevention through actions aimed at reducing risks and their immediate detection through appropriate detection mechanisms.
- Planning responses to situations of great collective risk, public calamity or extraordinary catastrophe.
- The intervention in order to eliminate the causes or minimize the effects of the natural, anthropic and/or technological risks that may affect the population and the city as a whole.
- The rehabilitation and/or restoration of essential services and the development of recovery plans.
- The information and training of the people and collectives that can be affected by big collective risks, public calamities or extraordinary catastrophes, as well as of the groups of action.

7.1.1.2 Institutional structure

The **Excellency Mayoresss of the Barcelona City Council** is the highest authority regarding the civil protection within the municipality boundaries and may entrust the management of the plans to the councillors whom she delegates. The Mayoress presides the **Municipal Civil Protection Commission**, a consultative body, deliberating and coordinating for the planning and control of municipal civil protection, attached to the Security and Mobility Commission. This commission can act in plenary sessions or as an executive commission with the following objectives:

- Plan and control municipal civil protection through the Municipal Civil Protection Service.

- Report on Municipal Civil Protection Plans and others of a lower level and, in general, any other civil protection planning instrument in the Barcelona municipal area.
- Report on the review of existing corporate security provisions, activities, industries, schools, hospitals, shows, venues and utilities.
- Report on preventive measures aimed at reducing the risks, catastrophes or public calamities and the detrimental consequences of them.
- Establish relationships with the Municipal Commissions of other municipalities and with the Civil Protection Commission of Catalonia.

The Municipal Civil Protection Commission defines the typologies and scope of municipal emergency plans:

- **Self-protection plans:** a systematic set of actions that the holder of a particular risk must take to guarantee their own security and their environment from prevention and coordination in emergency situations.
- **Internal Emergency Plans:** establishes the systematic set of actions that the holder of a technological risk must take for his own safety and that of his environment in case of an emergency.
- **Action Plans:** It establishes the systematic set of actions that municipal services must take in case of emergencies that are covered by the same service.
- **Specific plans:** It establishes the systematic set of actions that various municipal and other external services must coordinate in situations of specific risks.
- **Basic plan:** it establishes the systematic set of actions that all municipal services and other administrations must carry out in coordination in all emergency situations in the city.

7.1.1.3 Organizational structure

All municipal emergency plans are structured according to the following bodies:

The **Municipal Emergency committee**, formed by:

- **Director of the Municipal Civil Protection Plan.** The Mayoress, as the highest municipal authority or the person she delegates on will be the municipal manager of the emergency and will assume the liability derived from the direction of the Plan.
- **Technical Director of the Plan.** This is the immediate subordinate to the Director of the Plan. This function is carried out by the Deputy Manager of Security and Prevention, or in its replacement, the Director of the Fire Prevention, Extinguishing and Rescue Service.
- **The Advisory Board.** A technical committee that assists the Director of the Plan in the various aspects of the emergency.

- **The Municipal Information Cabinet.** The body responsible for providing the information at the time of the emergency. All information regarding the incident that will be provided to the citizens by the City Council will be coordinated by the Information Cabinet, which is responsible for centralizing, coordinating and preparing the information provided to the different agencies and the media.

The **Action groups**, which are divided into five different areas:

- **Local Intervention Group.** Formed by the Fire Prevention Brigade, Extinguishing and Rescue Service (SPEIS).
- **Local Order Group.** Formed by Local Police (Guardia Urbana - GUB) and regional Police (Mossos d'Esquadra).
- **Local Health Group.** Formed By the Health Emergency Services (SEM).
- **Local Technical and Logistic Group.** Formed by the Urban Ecology Municipal Area.
- **Local Social and Logistic Group.** Formed by the Social Emergency and Urgencies Centre (CUESB).

The **Operational Centres**, which house the different action groups and the several emergency control and management centres, which are distinguished in three types:

- **Municipal Operational Coordination Centre (CECOPAL).** It is the tactical infrastructure that manages the operational control of the emergency, setting the chain of command to transfer the orders from the Director of the Plan or the Technical director to the different teams. It can be placed at different locations depending on the characteristics of the emergency declared.
- The **Advanced Command Centre (CCA)** is a place close to the emergency zone, from where the operative managers coordinate the services' teams and direct the actions to be performed. This centre will be established by the first action group that arrives to the emergency area at the vehicle or place that meets the best conditions, depending on the situation of the accident and its development, and will be placed by the Technical Director. More than one CCA may be constituted according to the characteristics of the emergency.
- The **Alarm Receiving Centres (CRA)** are the places where the infrastructure or service with a response capacity of 24 hours a day is located, especially designed to receive any type of alarm from both accidents and risk warnings, irrespective of their origin or severity. Every Action Group has its own CRA.

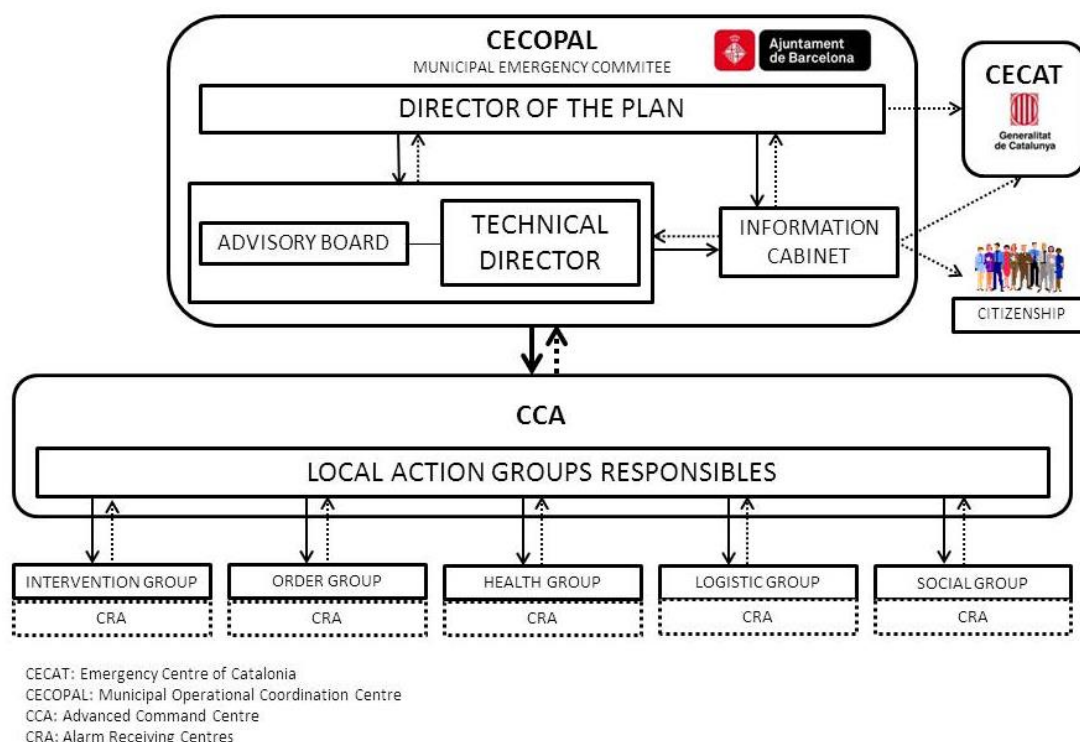


Figure 15. Organizational structure of the emergency planning. Source: Barcelona City Council (2020).

7.1.1.4 Emergency Activation Plan criteria

The activation of the Civil Protection Emergency Plan consists on the declaration of the temporal phases of the plan that correspond to the severity or magnitude of the damage produced or that may be caused by the incident. The activation of the PAM is made by the Director of the Plan, however, the Technical Director will upgrade to the Councillor of the Area of Presidency, Internal Regime, Security and Mobility the operational activation of the Plan in the corresponding phases, when, for operational reasons, is considered necessary due to situations of grave risk, catastrophe or public calamity.

The PAM activation is directly related to the activation of the major plan PROCICAT, the Civil Protection Plan of the Catalan Government; in that case the Interior Councillor of the Catalan Government becomes the manager of the acting groups and establishes the coordination between local and regional teams.

ACTIVATION CRITERIA			
PHASE	ASSUMPTION	OPERATIVE RESPONSIBLE	EVENT
PRE-ALERT	Period of operational prevention actions in the event of the likelihood that an incident may occur. Mostly are informative actions	Technical Director of the Plan	

ALERT	<p>When the PROCICAT Plan is activated in the alert phase in the area where the municipality is located.</p> <p>In the face of a small emergency that can be controlled by the usual means and that does not carry any danger to people, property and environment.</p> <p>At the end of an emergency situation, while performing recovery tasks</p>	<p>Technical Director of the Plan</p>	<p>Accident or emergency situation without affecting the population.</p> <p>Forecasting of significant risk in the short term</p> <p>Panic, citizen disorder due to risk threat</p>
EMERGENCY	<p>When the PROCICAT Plan is activated in emergency phase in the area where the municipality is located.</p> <p>When there is a major emergency in the municipality and carries, or may lead to, a serious risk to the municipality.</p>	<p>Director of the Plan and/or the Technical Director of the Plan</p>	<p>Significant risk situation for the environment.</p> <p>Risk situation affecting the population.</p>

Table 1. Summary of activation criteria of the PAM. Source: Barcelona City Council (2020).

7.1.2 Emergency Municipal Plan of Civil Protection from Lisbon City Council

7.1.2.1 Introduction

The Emergency Municipal Plan of Civil Protection from Lisbon City Council (PMEPCL, 2017) was recently approved (on 13/09/2019) by the National Authority of Emergency and Civil Protection³⁶.

The PMEPL is a general plan that describes the actions of the Municipal Civil Protection System, regarding the responsibilities, organisation and concept of operations, in the event of a response or imminent serious accident and/or disasters within the Municipality of Lisbon. The PMEPL defines the guidelines regarding the action mode of several bodies, services and structures to be engaged in civil protection operations in Lisbon City Council.

It should be noted, as a basic premise of this Plan, that being the competence and responsibility of the Municipality of Lisbon (CML) the political and social management of the municipality under normal conditions, also in crisis and exception situations, these competencies and responsibilities are maintained. This document therefore presents how

the Municipal Civil Protection System mobilises and coordinates all resources in order to manage an emergency situation.

The Director of the PMEPCCL is the Mayor of the Municipality, having as a substitute for this purpose and with delegated powers in this matter, the Councillor in charge of security and civil protection.

This plan does not include the responsibility for emergency management in the area under the jurisdiction of the maritime authority, given that actions in this area are committed to the Captaincy of the Port of Lisbon (CPL), in accordance with the legislation in force. In fact, Decree-Law 43/2002 of March 2 (Maritime Authority System) establishes that "Captains of Ports have Civil Protection powers in the coastal edge and in Public Waterways Domain spaces under the jurisdiction of the Maritime Authority". The PMEPCCL, however, is articulated with the instruments of planning and operational response of the CPL.

The same applies within the perimeter of the Humberto Delgado Airport infrastructure, whose procedures in case of an emergency are those provided for the Airport Emergency and Evacuation Plan, with the Director of the Airport being responsible for all the operations that are carried out under the said Plan.

The present Plan has as main goals:

- Provide, through a concerted response, the conditions and means necessary to minimise the adverse effects of a major accident or disaster;
- Establish guidelines on how the several entities, services and structures to be involved in civil protection operations should operate;
- Set the unit of direction, coordination and command of the actions to be developed;
- Coordinate and systematize support actions, promoting greater effectiveness and speed of intervention by the entities involved;
- Inventory the means and resources available to respond to a major accident or catastrophe;
- Minimising the loss of life and property, mitigating or limiting the effects of major accidents or disasters and restoring minimum conditions of normality as soon as possible;
- Ensure that the favourable conditions are created for the rapid, efficient and coordinated commitment of all available means and resources, where the severity and magnitude of the events justifies the activation of the PMEPCCL;
- Enable the entities involved in the plan to maintain the preparedness and readiness required for the management of major accidents or disasters;
- Promote information to the population through awareness-raising actions, with a view to its preparation, the assumption of a culture of self-protection and collaboration in the emergency response structure.

7.1.2.2 PMEPC Activation Criteria

In accordance with the legislation in force, in case of imminence or occurrence of major accident or catastrophe, the PMEPC is activated by the Municipal Commission of Civil Protection (CMPC).

The activation of the PMEPC is immediately communicated to the Lisbon's District Command of Relief Operations, without prejudice to its confirmation through an immediate Report (RELIM), which includes the type of occurrence, the zones that are involved, the predicted consequences, the duration and circumstances of the phenomenon, as well as other data deemed convenient for the eventual taking of decisions at district level.

When activated, the PMEPC entails the preparation and activation of measures and contingency plans of Civil Protection agents, entities and services, demanding the commitment of means and resources and an inherent management of efforts that are needful to deal with the emergency.

This plan may also be activated by other criteria defined by the CMPC, given the severity of the major accident or catastrophe in question (Table 2).

Impact	Description
Population	In the imminence or occurrence of high numbers of injuries and hospitalizations. High number of people removed for more than 24 hours. Fatalities. Possible need for external resources required to support the supporting staff. Significant damage that may require external resources.
Environment	The imminence or occurrence of some impacts with long-term effects.
Socio-Economic	In the imminence or occurrence of faults or interruptions in the normal operation of some services. Significant loss and necessary financial assistance.
The Alert Status Statement declared by the mayor implies the activation of the PMEPC (all or part of the Plan).	
The Statements of Contingency and Calamity Situation regarding the territorial area of the municipality imply the automatic activation of the PMEPC (all or part of the Plan).	

Table 2. PMEPC Lisbon - Activation criteria. Source: CML (2019).

The advertising of the PMEPC disabling is done by written communication to the Lisbon's District Command of Relief Operations, and published on the municipality's website.

7.1.2.3 Structures

The effectiveness of this plan is supported by the detailed development of specific operational plans of services, entities and bodies which, duly coordinated and articulated within the scope of the defined operational structure, are an integral part of the global response plan to be provided to the situation considered.

The experience and day-to-day operation of the municipal services, as well as of the other bodies and entities, provides in Lisbon the great support, in terms of the philosophy of intervention, for an adaptation of different emergency situations (major accident or catastrophe) that may occur in the city.

The actions will be developed, at different levels, through the structures of political direction, political and institutional coordination and operational command.

7.1.2.4 Policy Steering Structure

The PMEPC Director is the Mayor of the Municipality who is responsible for triggering, on the imminence or occurrence of a serious accident or catastrophe, the civil protection actions of prevention, relief, assistance and recovery appropriate to each case.

As Municipal Responsible for the political Directorate of Civil Protection, it is also the responsibility of the Mayor:

- Declare the Alert Situation at the municipal level
- Convene the CMPC to which it presides, proposing the activation of the
- Comment on the declaration of Contingency Situation affecting the Lisbon Council

The Plan's Director is supported by the Municipal Service of Civil Protection and other Municipal Services, as well as by the several civil protection agents and entities with a duty to cooperate, as set out in this plan, organised into Intervention Areas (IA), in accordance with their responsibilities and characteristics.

The Mayor, as the PMEPC Director, has as a substitute the Councillor in charge of security and civil protection with delegated competences in this matter.

7.1.2.5 Policy and Institutional Coordination Structure

Municipal Commission of Civil Protection (CMPC)

The CMPC is the political and institutional coordination body at municipal level. Therefore, it is within your competence to carry out an assessment of the situation and proceed with the activation of the PMEPC, whenever you consider it necessary.

In general terms, it's responsible for ensuring that all agents, entities and bodies of municipal scope, which are essential to civil protection operations, articulate among themselves, ensuring the means, human and material, appropriate to the management of the occurrence, in the manner defined in PMEPC.

Within the scope of the operations conduction, the CMPC is responsible for the elaboration and diffusion of official announcements.

The Commission may convene a meeting in full or in part, depending on the circumstances of the case, in order to improve the efficiency of its action.

Composition of the Municipal Commission of Civil Protection

The CMPC is composed in accordance with the provisions on the Portuguese Law (Article 41.º of the Law n.º 80/2015 3 August, and republication of the Law 27/2006) and adapted to the municipal structure of Lisbon.

Operational Command Structure

The operational command structure is ensured by a Municipal Operational Command Post responsible for all protection and relief operations, directly resulting from a major accident or disaster in the area of Lisbon's municipality and for the activation and management of resources available in the municipality area or provided by the upper civil protection level.

Installed with the support of the SMPC, it remains activated for the duration of the activation of the PMEPL.

The Lisbon's Fire Brigade Commander or a substitute is in charge of the Municipal Operational Command Post. In general terms, its mission is continuously follow the protection and relief operations, if necessary in the Theatre of Operations (TO) itself, assuming the coordination of these operations and ensuring the operation and coordination on the field of the entities involved.

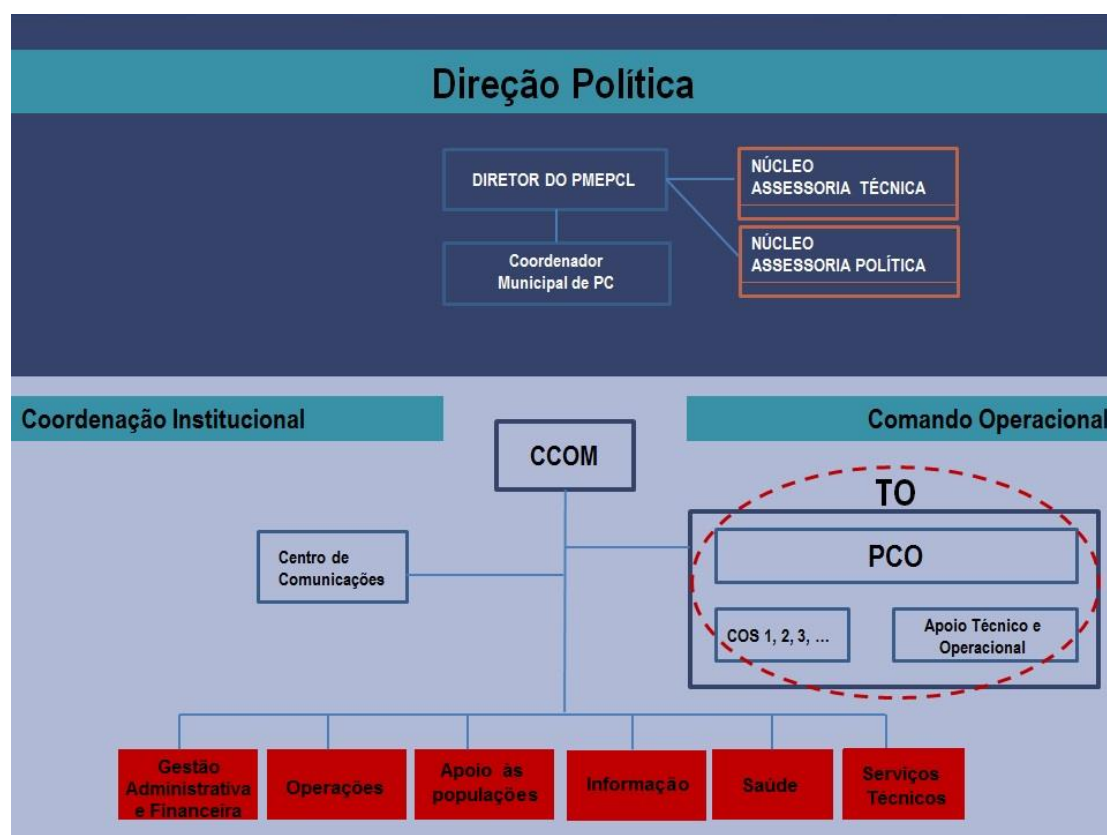


Figure 16. Structure of the Municipal Commission of Civil Protection (CMPC). Source: CML (2019).
Operations Management System (SGO)

In the organization of operations resulting from major accidents or disasters, namely in the case of relief and rescue, the operations management system is used as a command, control and communications instrument for civil protection, the Operations Management System (SGO).

The SGO foreseen in the Integrated System of Relief and Rescue Operations (SIOPS) articulates the services, agents, entities and supporting organizations, under a unique command, without jeopardizing the respective hierarchical and functional dependence.

According to the Portuguese Law (Decree-Law n.º 44/2002, from March 2), the Captains of the Harbours have Civil Protection competencies in the coastal edge and in the hydric public domain spaces under the jurisdiction of the National Maritime Authority (AMN). Thus, the Captaincy of the Lisbon Harbours assumes the role of Commander of Relief Operations (COS) in its area of jurisdiction in straight articulation with the Command of Lisbon Fire Brigade Regiment.

The municipal Integrated Protection and Relief Operations Mechanism (DIOPS) covers the entire territory of Lisbon City and all the organisations and entities that compete and cooperate for protection and relief, carrying out functions to support the political and institutional coordination of response operations.

In this sense, the several entities intervening in the PMEPC (Civil Protection Agents and entities with a duty of cooperation) have responsibilities for prevention, relief, assistance and recovery, both in immediate response and in short-term recovery. The intervention structures of these entities operate and are used under the leadership of the respective hierarchies, provided in the respective organic laws or by-laws, without jeopardizing the necessary operational coordination with the command centres, at their various levels.

This activation does not imply the loss of responsibility for the management and coordination of emergency actions by the municipal level. This responsibility only passes over when local capacities and resources are manifestly exhausted, endangering the response operations, or it is determined by the activation of legal mechanisms through the taking of coordination and operations by the upper levels of civil protection. In this case, the municipal level continues to support the emergency operations.

7.1.3 Bristol Operational Coordination

Operations Centre 100 Temple Street

Emergency situations are coordinated and managed from this central Bristol location. CCTV cameras are positioned at multiple points throughout the city to monitor the situation in real time. Under such conditions the Situation Room is opened and a response is led by BCC Civil Protection Unit (CPU) in conjunction with key responders and emergency services inside and outside of the organisation.

Community places of safety

If residents are evacuated in an emergency then community places of safety are opened to provide temporary shelter in an emergency, like a flood for instance. BCC staff members are sent to the place of safety to support everyone who has been evacuated.

The place of safety will ideally have:

- 24 hour access
- disabled access
- toilets
- heating
- basic kitchen facilities

The place of safety may be open for up to four hours. However if it is still not safe for residents to return home after this time then alternative accommodation will be sought out and provided.

For the community to find their nearest place of safety they must look at a map of the community places of safety in Bristol. An addresses search option is available in order to identify the nearest place of safety.

Community places of safety display the following logo:



Figure 17. Community places of safety in Bristol logo. Source: Bristol CC (2019).

There are still places being added to the scheme and suitable additional suggestions are considered on contact with the CPU via: emergency.planning@bristol.gov.uk.

The Map of community places of safety in Bristol³⁷ is available via the reference provided and this map is also displayed in Figure 18 below.

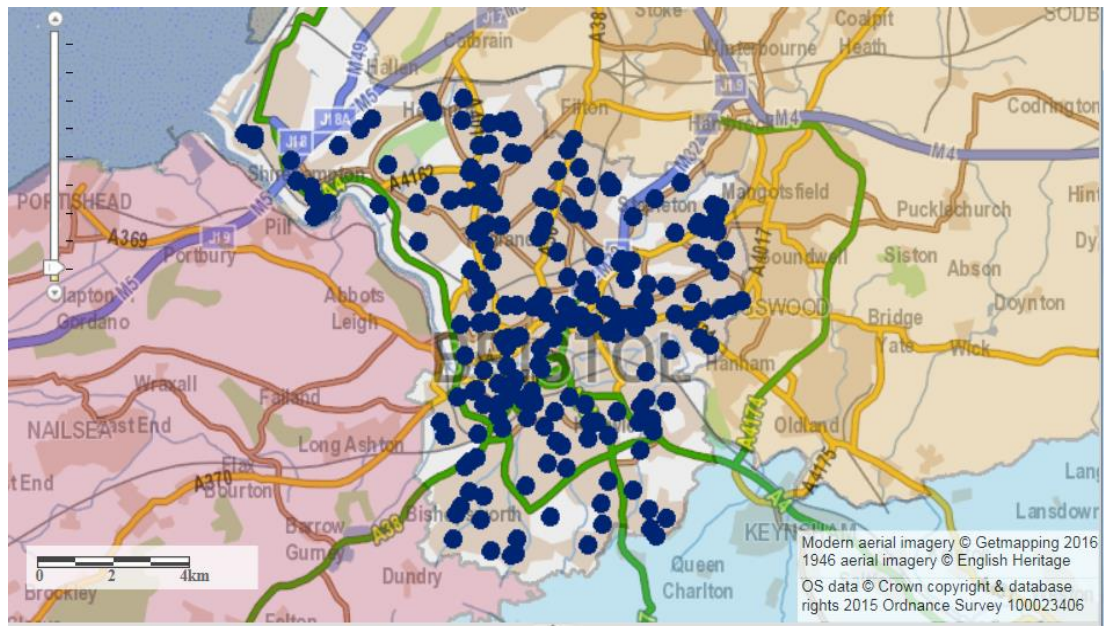


Figure 18. Map of community places of safety in Bristol. Source: Bristol CC (2019).

Municipal emergency plans

The CPU is committed to ensuring the city is prepared for emergencies by:

- Completing risk assessments for the Bristol city area
- Preparing city emergency plans
- Training staff and testing plans
- Providing advice to individuals and businesses on preparing for an emergency
- Ensuring the council can care for the welfare and support of those affected during an incident, can provide expert advice to the emergency services during an incident and can provide support to outside agencies
- Assisting the council in the overall recovery of the community as soon as possible.

Civil contingencies

To reduce the impact of an emergency, the CPU is responsible for the completion of a risk assessment and the development, testing and maintenance of emergency plans that correspond to those risks. Civil contingency duty rotas, emergency plans, policy, business continuity management, severe weather plans, contingencies volunteering, training and learning from events help fulfil the requirements of the Civil Contingencies Act (2004). Ensuring the city is a safe place to live and work in are the main aims and although major emergencies are rare they do none the less occur from time to time. The Council has a duty to be prepared for such emergencies that could cause significant disruption to lives. Many Council employees have a role to play and special staff arrangements come in to play during civil emergencies, headed by the Corporate Resilience Group (CRG) and managed through the Atlas Incident Management System (AIMS). Emergency plans for animal welfare, corporate continuity, evacuation, feeding, flooding, fuel shortage, humanitarian assistance, incident response, recovery snow and severe weather and transport all exist.

Business continuity

A Business continuity framework exists at BCC to account for the effect on staffing arrangements during civil contingencies and an impact analysis for each service captures these effects. The Business Continuity Working Group and Corporate Resilience Group manage this process.

The business continuity framework ensures plans and arrangements are in place so BCC can provide a predetermined level of service during disruptions and return to normal service as soon as possible.

Severe weather

The Severe weather plan contains information and advice regarding weather impacts on critical services. When the plan activation trigger levels are reached, based on weather forecasts, actions such as maintaining key transport links and providing assistance to vulnerable people are undertaken.

Emergency volunteers

The help of community volunteers is often called upon during emergencies such as extreme weather and Snow Wardens would be contacted and their role enacted for heavy snowfall for instance. Those asked to volunteer in an emergency are asked to confirm if they can or cannot respond to aid in the event response planning. Since this is voluntary there is the benefit of being at no cost but it also makes for very varied numbers in the response team.

COMAH and MAHP Plans

Control of Major Accident Hazard (COMAH) and Major Accident Hazard Pipeline (MAHP) emergency response plans are designed to limit the damage caused by an incident involving a chemical site or pipeline transporting hazardous substance.

The CPU works with other agencies in the Avonmouth area (a high risk flood zone) where this is more typical, sharing plans through the Avon & Somerset Local Resilience Forum (LRF) with other Local Authorities and agencies (multi-agency plans).

The Flood Plan

Figure 19 below demonstrates the different RMA (Risk Management Authorities) responsibilities for different sources of flooding.



Figure 19. Flood Risk Management Authorities in Bristol. Source: Bristol CC (2019).

A Flood Warning system exists in Bristol that is provided by the EA (Environment Agency) for anticipated flooding from rivers and the sea. Flood Alerts are usually issued in advance, based on a forecast when flooding is possible, in attempt to give some forewarning of expected conditions. Surface water flooding has no official Flood Warning service or facility, due in part to being extremely difficult to forecast and so sporadic in nature with the short-lived high intensity hit or miss storms. Nor are there any formal flood warning services for any other sources of flooding.

The BCC Flood Plan³⁸ sets out actions and processes for responding to potential flooding which is managed by BCC CPU. The CPU initiates the Flood Plan, in line with certain Flood Warning levels, to respond to potential flood events once activation trigger levels have been reached to orchestrate an organisational response in combination with other key RMA's and services. The Flood Plan identifies specific actions, communication needs, planned recovery processes and links to other emergency plans and multi-agency response plans that could be enacted. A range of Actions could be carried that could include (but are not limited to): recording, investigating flood incidents, clearing gully blockages, placing road diversions, providing notification through networks, deploying flood barriers, lowering Floating Harbour levels, conducting emergency traffic management procedures, maintaining critical services, opening emergency rest centres and places of safety and coordinating waste management processes in flood recovery clear up. The CPU is also the responsible body within the BCC Local Planning Authority for reviewing Flood Evacuation Plans for planning purposes.

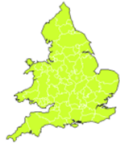
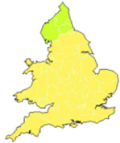
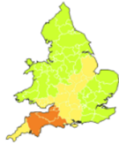
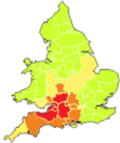



PROACTIVE TRIGGERS	Met Office issue severe weather warning(s)	GREEN No severe weather forecast	YELLOW Be aware	AMBER Be prepared	RED Take action
	Flood Forecast Centre issue Flood Guidance Statement(s) (A Flood Guidance Statement can be issued without a severe weather warning being in force)	Very Low Flood Risk 	Low Flood Risk 	Medium Flood Risk 	High Flood Risk 
	Environment Agency issue Flood Warning(s) (for areas covered by the Flood Warning Service only) (Flood Warnings can be issued without a Flood Guidance Statement being in force)	None	 Flood Alert	 Flood Warning	 Severe Flood Warning
	Reports of Flooding	No reports of flooding	Reports of minor flooding	Reports of property flooding	Reports of significant or catastrophic flooding
REACTIVE TRIGGERS					
RESPONSE LEVEL		LEVEL 0 None	LEVEL 1 Standby / Monitor (Pre-emptive Actions)	LEVEL 2 Monitor / Deploy	LEVEL 3 Deploy / Escalate

Figure 20. BCC Flood Plan triggers. Source: Bristol CC (2019).

Flood Alert Area	Flood Warning Area	Flood Alert	Flood Warning	Severe Flood Warning
Lower Bristol Avon Area	✓			
Bristol Avon (lower) from Twerton to Bristol			✓	✓
Colliters Brook at Ashton Vale			✓	✓
Rapid Response Catchment Area Brislington Brook at Brislington			✓	✓
Bristol Frome Catchment	✓			
Bristol Floating Harbour and the River Avon at Bristol			✓	✓
Bristol Frome from Nibley to Stapleton			✓	✓

Bristol Frome from Stapleton to Bristol Floating Harbour			✓	✓
Severn Estuary at Oldbury-on-Severn, Northwick & Avonmouth	✓			
Severn Estuary at Avonmouth	✓		✓	✓
Tidal River Avon at Bristol, Pill & Shirehampton	✓			
Tidal River Avon at Pill & Shirehampton			✓	✓
Tidal River Avon from Sea Mills to Conham			✓	✓

Table 3. BCC Flood Warning Summary Matrix. Source: Bristol CC (2019).

7.2 Guideline for emergency management

7.2.1 Barcelona response to emergency

7.2.1.1 Operability

The operation of the several **Municipal Emergency Plans (PAM)** is all those procedures and mechanisms defined in accordance with the planned organization so that the functions are carried out with the necessary efficiency. The PAM acts as a framework plan giving a single general action for the procedure definition of the different risks which are contained in their own specific plans and action plans for municipal emergencies. When determining operability, interconnection or interrelation with different level emergency plans must be considered.

In the particular case of special risks, the emergency plans derived from them at the municipal level are the Municipal Action Plans that are developed regarding the special plans drawn up by the Government of Catalonia. The different PAMs established in order to operate the coordination procedures are:

1. BASIC MUNICIPAL EMERGENCY PLAN, which includes the following protocols:
 - Basic Plan Protocol for high winds
 - Basic Plan Protocol for heatwaves
 - Basic Plan Protocol for environmental pollution (in progress)
 - Drought Protocol
2. PAM for forest fires
3. PAM for Insufficient drainage (flooding) and protocol for poor sea conditions
4. PAM for seismic risk

5. PAM for snow and ice
6. PAM for serious accidents in chemical-risk companies
7. PAM for accidents in the transportation of hazardous goods
8. PEM for passenger rail transport emergencies
9. PEM for power outage
10. PEM for gas incident and/or no supply
11. PEM for serious accidents in road tunnels
12. PAM for aeronautical emergencies
13. PAM for radiological emergencies
14. PAM for accidental pollution of marine waters
15. PAM for health risks

These plans establish the systematic set of actions that municipal and other external services must carry out jointly in case of risk, accident or calamity, as a result of an analysis of the consequences of a risk zoning, established by the Commission of Civil Protection of Catalonia. The **General Operation Procedures and Activation of the PAMs** are shown in table 4.

PAM PHASE	ACTIONS
PREVENTION AND PRE-ALERT	<p>Operational prevention actions are understood as the set of tasks carried out by municipal and / or communication emergency groups to plan, adapt resources, act and prepare for a probable crisis situation. Those actions are mainly informative and are carried out through information campaigns. Preventive actions will be taken in the event of knowledge of specific periods of danger or risk that can lead to an emergency state, as well as to a casualty event, usually of minor importance but which should be monitored in its development.</p> <ul style="list-style-type: none"> - Once a CRA (Alarm Receiving Centre) receives an alarm, all data are gathered and communicated to the corresponding CRA action group regarding the typology of the alarm. - The responsible CRA will send, where appropriate, and in accordance with the type of the event, a team to verify the facts, expand the information regarding the event and adopt the first measures, in accordance with the indications of its Action Plan and the corresponding Specific or Municipal Action Plan. - The CRA will carry out the initial assessment of the situation and will require the intervention of the necessary services in order to take the most appropriate preventive measures and alleviate the possible effects of the risk. - The Action Group Responsible will assess the situation and determine, at first instance, and communicate to the Advisory Board the gravity of the situation.
ACTIVATION	<p>The activation of the plan is done by the Plan Director. The Technical Director of the Plan may raise up the operational activation of the Plan in Alert or Emergency to the corresponding Councillor of the Area, when deemed necessary for operational reasons, to be in situations of grave risk, catastrophe or public calamity and by virtue of the speed of decision-making and operational measures to be taken.</p>
ALERT	<ul style="list-style-type: none"> - The Advisory Board will determine the Technical Director of the Plan in charge corresponding to the type of PAM activated. - The Advisory Board will review the PAM phase (if need to be redefined),

	<p>based on the information available.</p> <ul style="list-style-type: none"> - The Technical Director of the Plan will report the situation to the Director of the Plan and to CECAT / 112. - From the CRA will inform the implementation of the PAM to: <ul style="list-style-type: none"> * Heads of the Action Groups, who will communicate it to each of the services that make up their group. * The Technical Director of the Plan, or its representative, will assume the operational direction of the situation and will require the necessary services or groups to act. * The CCA (Advanced Command Centre) will be established by the first group that arrives at the emergency site or indicated in the corresponding specific plan or municipal action plan.
EMERGENCY	<ul style="list-style-type: none"> - The Technical Director of the Plan will inform the Director of the Plan of the need to proceed with the activation of the Plan in crisis phase. - The Technical Director will define the place where the CECOPAL will be established and will summon, through the staff of the CRA, the members of the Municipal Emergency Committee. - The members of the Advisory Committee will go to CECOPAL. - The Municipal Emergency Committee will inform CECAT / 112 of the activation of the Crisis Plan phase.
INTERFACE WITH HIGHER LEVEL PLANS	<p>The integration with Higher Level Plans represents the adaptation of the municipal organization in emergency situations to the structure defined in the major plan PROCICAT, or other higher level. This integration involves:</p> <ul style="list-style-type: none"> - The incorporation of the Director of the Municipal Plan into the Steering Committee of the Higher Plan, if considered by the Director of the latter. - The coordination and permanent contact between the people in charge of the Municipal Plan and the management of the Higher Level Plan. - The allocation of the municipal media in the different Action Groups, under the coordination of the operational heads. - The coordination between CECAT and CECOPAL in real time, while the Higher Level Plan is activated. - The transmission of information to the population, according to the directions and managers provided by the Information Cabinet of the Higher Level Plan.

Table 4. General Operation Procedures and Activation of the PAMs. Source: Barcelona City Council (2020).

7.2.1.2 Recovery Plan

Recovery Plan is activated once the emergency situation is over, depending on the severity of the damage caused. The activation of the recovery plan will be done in the alert phase, while performing the tasks that allow the return to the normal situation.

The recovery plan must state:

- The identification and evaluation of damages.
- The measures to be taken directly by the administration that approves the plan, with a temporary schedule of the rehabilitation actions.
- Proposal for appropriate measures to be taken by other administrations.

If the recovery plan involves the help of other administrations, the plan must have their approval, with the previous report of the **Recovery Commission**. This commission will be composed by the representatives of the Spanish State Administration, the Government of the Generalitat of Catalonia and the local administration. Its mission is to coordinate the measures and grants established by the different administrations and, for this purpose, to establish the procedure for the application for grants and for their materialization.

Identification and evaluation of damages

The person responsible for identifying and evaluating the damage caused, as well as defining the actions of the Recovery Plan will be the Technical Director of the emergency plan that has been activated, or the person whom he delegates. The data of the damages caused will be collected by the Prevention Secretaries. The action groups that have been involved in the risk or calamity must prepare the relevant reports and submit them to the Technical Director. There are several sources of information to identify and evaluate damage:

- Secretary of Prevention,
- Local Intervention Group,
- Local Order Group,
- Local Technical Logistic Group,
- Local Social Logistics Group,
- Local Health Group,
- Regional Police (Mossos d'Esquadra) and Civil Guard bodies,
- Health services,
- Light, gas, water, electricity and telephone companies,
- Transportation companies: railways, metro, city buses, coaches, etc.
- Concessionaires and road holding entities,
- Industries and commerce of the municipality,
- Private people,
- River guards,
- Other.

The basic information to be gathered would be the following:

- **Localization of the affected areas:** identification of the affected geographical areas, establishing the different levels of the affected according to the severity of the damages and, if necessary and operative, drawing up an illustrative mapping.
- **Causes of the damage:** description of the phenomenon or accident that has given rise to the emergency situation. Knowing the causes of the damage is crucial in order to restore normality and, in particular, to predict the evolution of the situation and prevent further damage.
- **Affected strategic elements:** Inventory of strategic elements, affected by the accident. Strategic elements are understood to be those that are or may be vitally important for the recovery and maintenance of normality or their

malfunctioning may cause an increase in damage or make it difficult to return to normalcy (hospitals or medical centres), bridges, communication infrastructures, basic services of electricity, water, gas and telephone, etc. The status of seemingly usable structures must be evaluated.

- **Affected items:** Inventory of items affected by the accident. These include people, property and the environment. Where necessary and viable, a representative mapping of the damage may be made.
- **Population:** quantification of the affected population, considering the resident and itinerant population, according to levels of severity (both for the consequences to the health of people and for the needs of shelter and social care). Also consider the type of population affected and the ages.
- **Goods:** Quantification of the affected assets, in particular with regard to homes that have been destroyed or rendered unusable. The status of seemingly usable structures must be evaluated. Also consider high voltage installations, nuclear and thermal power plants or gas stations and any other type of installation with potential risk that has suffered significant damage.
- **Environment:** quantification of the environmental elements affected by the accident, especially taking into account those that may transcend human health and the recovery of damaged environmental values. Possible elements affected are: surface and groundwater, flora and fauna, forest areas, landscape, relief and air pollution.
- **Elements of historical or cultural interest affected:** inventory of items considered of historical or cultural interest affected, considering the severity of the damages and the recoverability of their values.

Establishment of recovery measures

Recovery measures are actions designed to restore a normal situation to the effects of a disaster. The Recovery Plan must contain the measures to be taken (immediate, medium and long term, if applicable) directly by the administration that approves the Plan, with a temporary schedule of rehabilitation actions. In the case of assistance from other administrations, they must be approved by the Recovery Commission. The Recovery Plan will establish the appropriate measures for the recovery of the situation caused by the emergency. Generally, these measures can be directed towards the following actions:

Immediate actions:

- Carry out the rescue and information tasks to the population. It is usually up to the fire forces to perform this task as well as with police forces, mountaineering groups, scuba diving and others. Dismantling and cleaning.
- Signal all danger zones.
- Research of means and resources.
- Population reception: Provisionally house the victims. Shelters can be hotels, residences, hostels, schools, churches, industrial buildings, sports venues,

among others. Provision should be made for first aid services, food and water, health services, blankets, coats and heating, information and communications service.

- Put into operation the health and hygiene services, as well as ensure the supply of resources to the population. It must ensure the good health of the people; guarantee the supply of medicines, minimum hygiene services and the selection of those highly affected. It must be informed about the use of the water and the measures to be taken if it is contaminated.
- Control contaminated water and prohibit the consumption of uncontrolled water. The competent authorities must guarantee the supply and purification of the water for consumption. If necessary, water tanks will be used to supply drinking water. The necessary warnings must be issued to the population.
- Monitor the state of food and its consumption. Food needs for the population must be mobilized through volunteers or professional staff.
- Restore safely the power supply services: electricity and gas. Generators and any system that allows supplying power, first of all to health centres, rescue teams and shelters.
- Restore the functioning of terrestrial communication infrastructures. Priority should be given to the necessary transport systems for the injured or evacuated, for relief and supplies to the population. An entry and exit path must be chosen to the area of action, as well as a communication between transport and injured vehicles and their reception centres. It may be necessary to determine landing areas for helicopters.

Medium-term actions:

- Economically assess the damages and losses of the disaster and describe the works, repairs, etc., to be performed to recover or repair the damage.
- Clean the affected areas as much as possible, avoiding the proliferation of epidemics.
- Demolish damaged structures and homes, if any, and remove any debris that may be present.
- Ensure order and avoid vandalism and violence.
- Prepare a census of the dead and missing.
- Restore the communication and information services, if they were damaged.
- Carry out the necessary civil and public works to restore normal activity.
- Decontaminate possible areas affected by pollutants, as possible.
- Conditioning the shelter of the victims, whether the affected area or another.
- Carry out the transfer of the injured.

Long-term actions:

- Determine the land suitable and sufficient for the construction of the necessary replacement housing and proceed to its construction.
- Proceed to the established compensation.
- Put into operation all the infrastructures and public services.
- Promote the recovery of economic activity in the area.
- Promote social activity in the area.

7.2.2 Lisbon response to emergency

As a way of minimizing the effects of major accidents or disasters, facilitating an efficient and coordinated response and ensuring the rapid commitment of all available means and resources, the operational response is organized into 2 phases: immediate response and Short-term recovery. In this sense, all civil protection agents, services and entities that are part of this plan should foresee in their respective plans these two phases, but also the prevention and preparation phase.

7.2.2.1 Immediate Response

The immediate response includes decision-making actions taken immediately on the imminence or occurrence of a major accident or catastrophe. The response actions should be:

- Automatic, articulated and coordinated according planned, but with the flexibility necessary to adapt to unexpected situations that may occur;
- Structured on the basis of resources and means not immediately affected and in accordance with the damage assessment;
- Suited to the needs and requirements of the response, decisions should be made in a timely manner, either to increase the level of intervention or to reduce any escalation of the situation.

In this phase, the following actions are privileged:

- Monitoring and coordination of the agent's actions, entities and authorities involved;
- Rescue operations;
- Pre hospital emergency and transport of the victims;
- Evacuation of the population at risk, with particular attention to the sick, bedridden, elderly, children, disabled and others;
- Mortuary operations;
- Maintenance of public order in the affected areas;
- On-going monitoring and evaluation of safety conditions in affected areas;
- Disclosure of warnings and information to the population at risk.
- Immediate intervention in rescuing humans life of the entity itself or in the surrounding neighbouring area and activate the internal emergency plans;
- Activation or recovery of internal and external communication channels;

- Activation of the Emergency Operations Center or an equivalent structure and activating its pre-planned procedures;
- Intervention in potential risk situations to avoid the crisis escalate;
- Assessment of effects produced with reference to human and material damage, means and resources affected and available;
- Reorganization of the internal operational structure to activate emergency response operations;
- Maintaining management and operational coordination until the crisis management effort is declared in the process of returning to normal;
- Continuation of rescue and life-saving actions, including locating victims;
- Intervention and collaboration in ongoing operations through means activation, operational performance, damage assessment and recording, etc.;
- Planning of future actions, including in particular recovery activities.

7.2.2.2 Short-term recovery

- Promote community damage and needs assessment actions;
- Prioritize short-term recovery projects and their respective roles;
- Prepare the processes related to the objectives to be achieved (projects, analysis and costs, etc.) and the execution of recovery actions;
- Coordinate recovery efforts and logistical needs with the entities and bodies supporting the actions to be developed;
- Promote the establishment of support offices for information and assistance to individual and collective recovery projects.

7.2.2.3 Responsibilities

The responsibilities intended to ensure organized intervention and articulation between the various civil protection actors. They may be called upon to intervene (depending on the responsibilities and type of major accident or disaster) not only in the immediate response, which aims to reduce the consequences through a committed structure of forces and means, but also in the short-term recovery period aimed at restoring normality.

The Civil Protection Agents perform relief, assistance and recovery actions according to the direction of the hierarchies recommended in the respective organic laws and / or statutes without prejudice to the proper articulation with the municipal civil protection commission.

Depending on the type and the size of the accident or disaster, other entities may be allocated to intervene which have a special duty to cooperate with civil protection officers. The actions of these entities will complement the responsibilities of the Civil Protection Agents, allowing for more effective operational mobility. In this sequence the municipal civil protection commission may consult scientific and technical research institutions in the different areas of its competence. They are called upon to inform their systems, with a focus on risk detection, to cooperate with the management and coordination bodies.

Although the municipal services do not belong to the civil protection structure prescribed by the Basic Law, the performance of these services is critical to support the performance of the responsibilities of civil protection officers and support agencies and entities. The

municipal services are presented as technical guidance to the structure of political direction and institutional coordination. They intervene operationally in the imminence or occurrence of major accidents or disasters, performing responsibilities for immediate response and short-term recovery.

Identifying resources to support operational response necessarily presupposes the identification of key sectors or vital infrastructures that, not constituting direct emergency response structures, are indispensable for the pursuit of rescue, the ultimate goal of any civil protection system, independent of the territorial area. Indeed, these are sectors without which the prevention and / or mitigation of collective risks and protection and relief to persons and goods, as required by the Civil Protection Bases Act, will be limited or even compromised. Thus, in addition to Civil Protection Agents with key functions to guarantee values such as human life, medical emergency and public health are also identified in the category of operationally relevant infrastructures, a set of key elements and strategic systems to governance, supply infrastructures (water, gas and electricity), transport, justice, and their role in disasters in Lisbon, given the large number of works of art, scientific and technical research institutions.

7.2.2.4 Intervention zones

The operational response takes place in the area of the municipality of Lisbon which is called the Intervention Zone (IZ). In terms of the Integrated Operations and Rescue System, ZI is organized into:

- Sinister Zones (SZ, ZS in Portuguese): These are zones in which the occurrence develops and where mobility is restricted. In these areas, security forces ensure the installation of a security perimeter to prevent outsiders from entering emergency response activities. ZS allow clear definition of command and control responsibilities under the sole responsibility of the Rescue Operations Centre (ROC).
- Support Zones (SZ, ZS in Portuguese): These are areas next to the conditional access SZ, where the support and logistic means and resources strictly necessary to support the intervention means or where intervention means and resources are placed for immediate response.
- Concentration and Reserve Zones (CRZ, ZCR in Portuguese): These are zones where temporarily available means and resources are located, without immediate mission, and where a system of logistical support and pre-hospital assistance to intervention forces is maintained. It is in the CRZ that the concentration of the requested resources will take place.

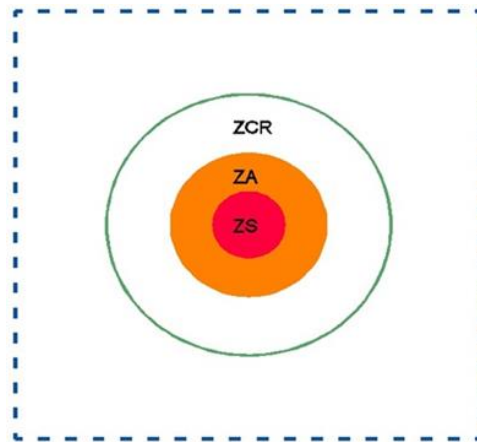


Figure 21. Intervention Zones. Source: CML (2019).

7.2.2.5 Coordination and mobilization of means and resources

In order to deal with situations that may be the result of serious accidents or disasters, the Lisbon Municipal Civil Protection Service has implemented a monitoring, warning and alert system that addresses the following risk situations:

- Transport of dangerous goods by rail;
- Earthquakes and tsunamis;
- Adverse weather conditions (episodes of extremes of maximum and minimum temperature; heavy precipitation, floods and strong wind and gust, strong sea or river agitation and rising tide).

The device implemented is based on prior data collection (in the case of weather forecasting and observation), analysis of satellite and radar images, technical briefings for monitoring extreme situations and evaluation of warnings and announcements issued by the competent entity. This information is received by email, restricted access website and / or by the messaging service.

Given the forecast for the next 48 hours of an adverse weather situation for the district of Lisbon, Portuguese Institute of atmosphere and Sea (IPMA in Portuguese) informs the National Emergency and Civil Protection Authority (ANEPC in Portuguese) about the level of weather warning issued or to be issued. These warnings are issued at district level according to a color chart that reflects the intensity of the phenomenon. In certain situations the Municipal Civil Protection Service of Lisbon is also informed directly.

Level	Description
Green	No risk weather conditions expected.
Yellow	Risk situation for certain weather dependent activities. Track the evolution of weather conditions.
Orange	Moderate to high risk weather situation. Keep aware of changing weather conditions and follow authorities guidelines.
Red	Extreme risk weather situation. Keep update with developing weather conditions and follow the authorities' guidelines.

Table 5. Weather warning system. Source: IPMA (2019).

The implemented system is a platform for dialogue with entities that issue warnings and alerts and monitor these risk situations. It should be noted that, since 2010, the Lisbon municipality has been operating the SALCOM-Communications Room, which establishes an integrated model of security, relief and civil protection. This space brings together the command and control means of Municipal Civil Protection Service, Firefighters Regiment and Municipal Police and is served by a communications and drive system of the respective structures, which ensure a faster and coordinated operational response in order to safeguard life and property.

In order to create an Integrated Monitoring, Warning and Alert Operating System, efforts have been made to create a robust, redundant and compliant, multi-alert network computing platform accessible to different data that can permanently provide information necessary for the coordination and action of all entities involved in emergency management, thus facilitating timely decision-making and optimizing costs and means involved.

In accordance with the current situation and the warning issued, the SMPC promotes preparatory actions by allocating human resources and prevention materials according to the state of special alert declared.

The levels of alert/actuation considered are those described in the following table:

Level of alert	Description
Blue	It includes routine emergency situations, for which bodies and entities are in a position to promote their management through their own resources. The services must ensure that their managers and staff are easily contactable for any activation. They should take into account the mechanisms of communication and activation.
Yellow	Comprises emergency situations (imminence or occurrence) of limited scope and size. However, may enhance to the development of more serious consequences, for which organisations and entities already need to promote concerted actions through a combination of efforts and means. The services must guarantee the minimum operational conditions for foreseeable activations. They should provide for the maintenance of some teams / brigades in the state of prevention.

Orange	Comprises emergency situations (imminence or occurrence) that justify the preparation for the activation of the respective emergency plans, requiring an overall commitment of means and resources and an inherent management of concerted efforts among the bodies and entities contributing to the relief. The services must ensure that the state of operational readiness is strengthened and immediately establish the necessary teams / brigades to deal with the emergency.
Red	Comprises emergency situations (confirmed occurrence) which, because of the scope, characteristics and consequences produced, require the activation of emergency plans and their respective articulation with the PMEPC. It requires the full commitment of the operational structures of civil protection, at its several levels of intervention, leading to the declaration of a state of emergency and inherent activation of the CMPC. The technicians and employees are immediately under the orders of the Director / Coordinator in charge, who must promote the mandatory hierarchical articulation with the CMPC for a concerted action facing the emergency.

Table 6. Alert Levels. Source: PMEPC (2017)

7.2.3 Bristol Emergency Management

Duty rotas involve a Duty Senior Manager and Rota Duty Director, as the senior member of staff. The Duty Senior Manager Rota indicates who is on call at any particular time. On-call officers can be found in the Emergency Contact Directory.

BCC Corporate Resilience Group

The aim of the Corporate Resilience Group (CRG) is to provide corporate-wide oversight of the delivery of BCC statutory duties as a Category 1 Responder to emergencies under the Civil Contingencies Act (2004) and its other statutory emergency duties.

The functions of the group are to ensure that civil contingency and business continuity risks are identified, communicated and appropriately managed, with particular reference to:

- the Avon and Somerset LRF Community Risk Register;
- Current and critical areas of Directorate activity;
- New and emerging risks identified by the LRF Risk Group or the BCC Business Continuity Working Group;
- The likely impact on the communities of Bristol, particularly the most vulnerable.

Further functions include assessing and monitoring BCC's preparedness relating to:

- Undertaking actions in support of a multi-agency response to and recovery from, a major incident.
- Assessing and monitoring BCC's preparedness to manage challenges to business continuity at the Corporate, Directorate and Service levels.

Systems reviews look to identify gaps in preparedness and resilience and make recommendations, commission work, or take other appropriate action to ensure gaps are filled. To also identify corporate-wide plans, risks or other civil protection issues that should be signed off by, or brought to the attention of, the Strategic Leadership Team.

The CRG endorses and promotes an annual training and exercise programme for BCC staff to ensure lessons learned from exercises and incidents are embedded in future policy/plans

and used to improve response and recovery going forward. This proactively promotes a 'resilience culture' within BCC and the city's community.

BCC has additional emergency duties under the Flood and Water Management Act, COMAH, MAHP and REPPiR legislation

Role

The CRG is a central pillar of BCC's Emergency Planning and Business Continuity Management System. The Group provides the corporate vision, legitimacy and 'reach' to ensure pertinent risks are identified and corresponding plans and arrangements are realistic, proportionate and effective. The Group also offers the CPU a valuable, corporate-wide sounding board for achieving the coordination of BCC's emergency planning and business continuity activities.

Civil contingencies and business continuity policy

This policy explains how the council meets the responsibilities imposed on it by the Civil Contingencies Act 2004. It includes:

- legal duties
- key principles
- governance
- anticipation and assessment of a major emergency
- prevention
- preparation
- response
- recovery
- roles and responsibilities

Emergency Services

The strategic–tactical–operational command structure is the operational hierarchy in the UK. This involves strategizing the response and control of resources, tactically identifying more specific actions and then implementing them on site through operations.

7.3 Communication channels

7.3.1 Barcelona Communication tools

Communication becomes a crucial piece of the emergencies' operation. It is entirely necessary to ensure the timely communication between the different actors involved in the emergency management in order to ensure a quick response in case of accident or disruptive event and minimize its possible negative effects. Running on parallel there is the need of an efficient communication to the population of the city that gives the correct instructions to follow and try to avoid panic situations that can harm, even more, the emergency situation. To address these two different channels of communication the PAM differentiates two communication tools: the communication network between the emergency managers and the communication to population set by the Information Cabinet.

7.3.1.1 PAM Communication Network

As every action group has its own alarm receiving centre (CRA), all of them are interconnected with the Joint Command Room, operated by the Security and Prevention Area which is the responsible of the response coordination and the activation of the different phases/levels of the emergency plan. The communication chain operates as follows:

- 1.- The Alarm Receiving Centre receives the warning, collects all the data and communicates to the corresponding Alarm Receiving Centre according to the typology of the situation (in case you it is not the recipient)
- 2.- The Alarm Reception Centre responsible for the Service evaluates and assess the situation determining, in the first instance, the activation phase.
- 3.- The Service Manager communicates the information to the Technical Director of the Plan. This will raise the operational activation (in alert or emergency phase) of the Plan and will submit the declaration and propose the formal (in emergency) activation to the Director of the Plan.
- 4.- Notice plan. The Service Manager will inform the Joint Command Room (which carries out the Warning Plan).
- 5.- Alert Plan activation will be notified to the Technical Director and to the Advisory Board and Information Cabinet.
- 6.- Emergency Plan activation will summon CECOPAL at the location established by the Director of the Plan.
- 7.- The established procedures depending on the PAM specifications and characteristics are followed.

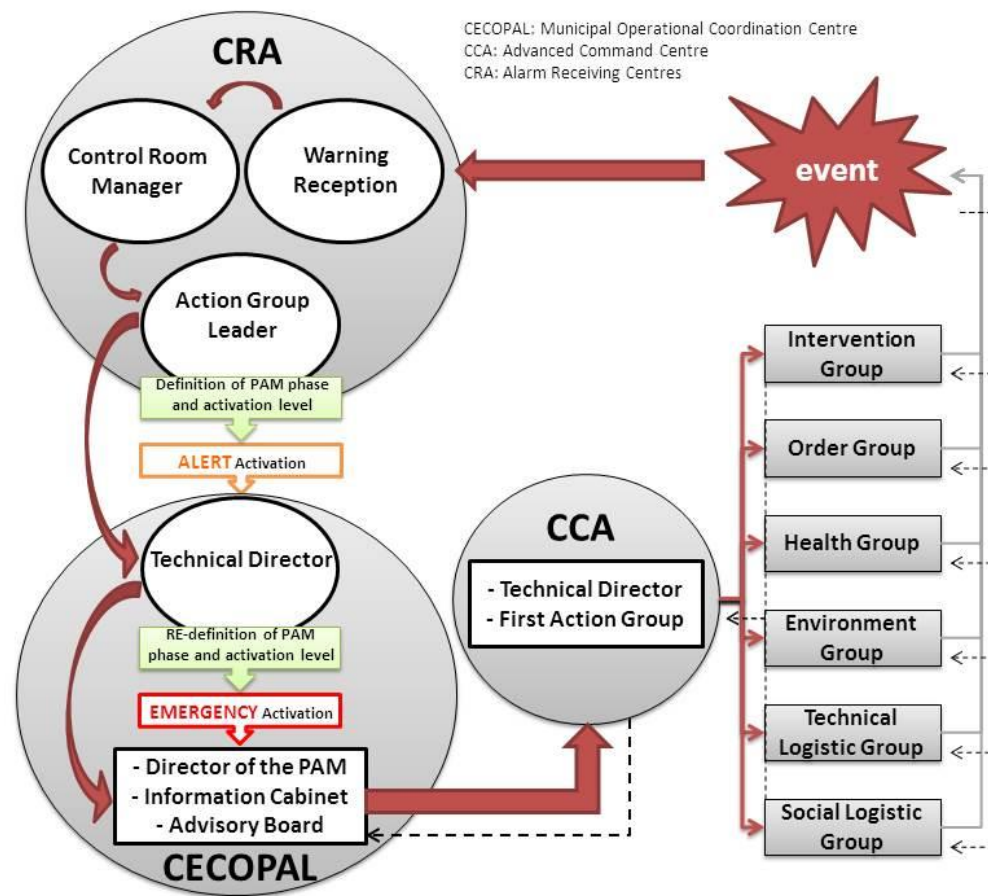


Figure 22. PAM Communication Network. Source: Barcelona City Council (2020).

7.3.1.2 Communication to Population

The PAM sets the communication actions needed to inform the population about any disruptive event that can affect negatively its livelihood depending on the type of the emergency declared and its level of affection. Those actions include the protection measures addressed to avoid further damages.

Communication channels

- **Press announcements:** It is mainly used for prevention actions that citizens can take in forecasting weather alerts like high temperatures or heat waves during the summer or cold/frost days in winter, also used for high winds alerts. The predictions done by the Meteorological Service of Catalonia (SMC) are sent to the Civil Protection Service, which is responsible for disseminating the information to the different affected areas, as well as issuing the consequent notices to the different press media.
- **Radio ads:** Used for prevention actions in case of weather alerts but strongly useful to quickly disseminate information in case of alert or emergency.
- **TV broadcasts:** television advertisements broadcasted with the intention of informing the citizens about a disruptive event that affects the city and the

necessary measures that are required of the population to avoid greater harms. It is important that the messages disseminated through television do not contain images that may cause panic among the population and are limited to providing reliable information as well as the advices to follow in case of being affected by the event.

- **Municipal Websites:** City council websites offer real-time information on the different events that may affect or affect the city and the measures to be taken by the population to minimize their negative effects. The announcements can be both preventive and operative, offering concise information at all times about the situation in the city, affected areas and useful advice for the population to act in case of affection.
- **Mass Media App:** Twitter, Instagram, Municipal Apps. Due to their high impact and speed of diffusion, mass media through smart mobile phone applications have become the main vehicle for communicating alerts to the population.

7.3.1.3 Population Protection measures

The two main measures of protection of the population against an important accident are the Confinement or the Evacuation, in accordance with the instructions provided at the moment through the warning systems and under the responsibility of the Director of the PAM activated.

- **Confinement.** It consists on the population of the affected area being locked in the buildings. In general, confinement requires the following tasks:
 - * The population that is outside will have to enter a building.
 - * To rely on enclosures and spaces that are more protected from the outside.
 - * Close doors and windows.
 - * Do not leave the building until instructed by the authorities.

In some cases, the recommendation to the population of "confinement" in their homes by good information may be more appropriate and give better results than an evacuation order.

- **Evacuation.** It is a measure of prevention and almost always urgent nature, which aims to protect the people affected or potentially affected by any type of accident and that it is carried out through population displacements and subsequent accommodation of the groups under pre-established conditions. It may contemplate the subsequent establishment of permanent assistance of a proper type of care or health care for a more or less extended period of time for all or part of the affected group.
 - * Usually decided by the Plan Director, properly advised.
 - * It can be preceded by a move away.
 - * Its execution can be urgent.
 - * It covers the need for vital assistance to the affected group for a more or less prolonged period.

Sometimes evacuation happens spontaneously being realized by the population in an uncontrolled form facing a risk or accident by diverse circumstances, like poor information or bad knowledge of the reality. When this occurs, the controls responsible for the actions must endeavour to avoid or, in any case, redirect and direct it.

Within the preventive measures of evacuation, the **dispersion** and the **move away** can also be considered. Those two measures respond to the urgency of the event and are mainly addressed to avoid the contact or high risk affection to a group of population close to the affected area of the emergency.

7.3.2 Lisbon communication tools

An organized and coordinated communication system ensuring the necessary timely information flows between players, entities and organizations is a condition for a quick and efficient response to the emergency in case of serious accident or disaster.

Priority actions:

- Ensure that the emergency means of communication are operational;
- Ensure interoperability between all players, entities and bodies that contribute to the operational response, both in the Operations Theatre (TO) and as regards to the Municipal Commission of Civil Protection and also to the upper levels of civil protection;
- Support the different entities and areas of intervention with emergency means of communication, through the use and management of the municipal strategic reserve;
- Mobilize and coordinate the Amateur Radio Service;

Emergency communications network and services:

- Integrated Emergency and Safety Network System of Portugal (SIRESP);
- Strategic Network of Civil Protection;
- Firefighters Operational Network;
- Amateur Alternatives Service Networks;
- Telephonic Fixed Service ;
- Terrestrial Mobile Service;
- Satellite Mobile Service.

Specific Instructions:

- The overall planning and the emergency communications architecture management is responsibility of the SMPCC;
- At the ZI zone (ZS, ZA e ZCR), this competence is the responsibility of Commander of Relief Operations (COS), which is responsible for setting up a communications structure;
- The entities involved, with their own emergency communication facilities, should provide the necessary means depending on the scenario;

- The intervening entities without their own means of emergency communication, will be supported by the SMPC, which rules will be determined depending on the scenario, availabilities and prioritization;
- Operators and providers of public communications services shall cooperate under current legislation;
- In case of activation of the PMEPC, a centralized management of communications to support the entire operational structure should be ensured, ceasing the operations at the current centre designated as Joint Operations Control Room (SALOC);
- The Association of Radio Amateur Broadcasters (Lisbon-ARRLX region) establishes at municipal level a communications system in the Municipal Operational Coordination Center (CCOM) able to establish connections to the parishes, under the coordination of the SMPC;
- The Association of Radio Amateur Broadcasters is articulated with the Portuguese Transmitter Network (REP), which at district level shall ensure the functioning of the mentioned radio network.
- To the SMPC will be assigned a resident callsign for the amateur radio system.

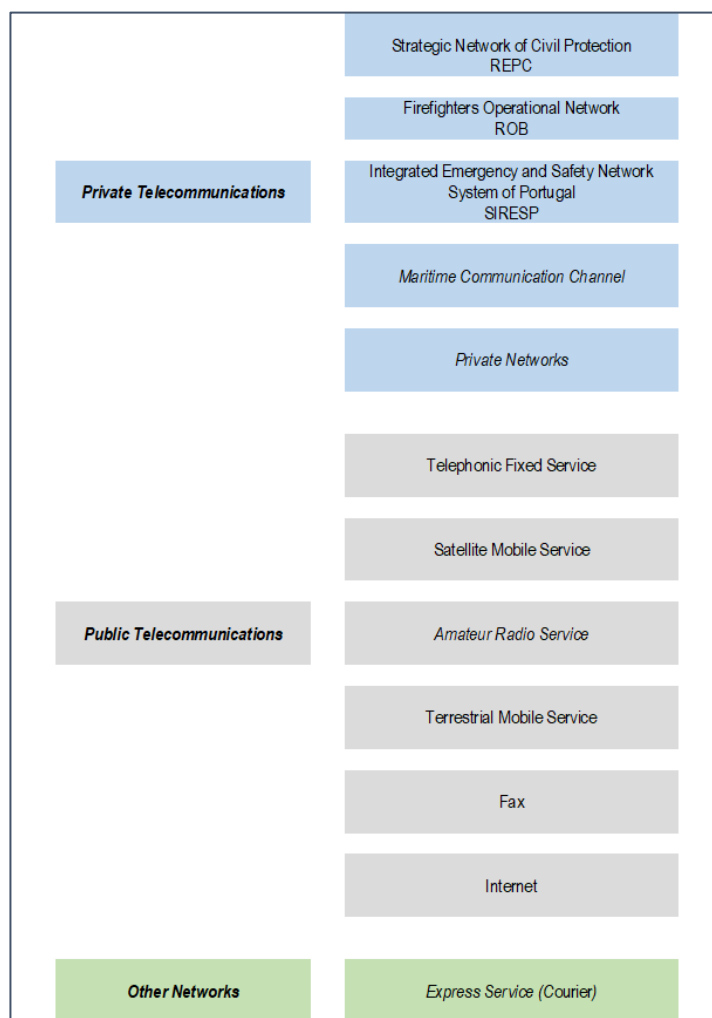


Figure 23. Communications Organization Chart. Source: PMEPC Lisboa (2019).

7.3.3 Bristol communication tools

Inter-organisational phone call meetings for emergency preparations are convened when necessary. Depending on the level of threat the group expands when there is a heightened risk. With regards to flooding these are referred to as:

- FloodCon, internal BCC teleconference with key colleagues and critical departments
- Fast Con, external teleconference with multiple key organisations

For warning the public this can take place through various via social media avenues: BCC website, BCC Facebook, BCC Twitter and Bristol Prepared. Information can be derived from local radio, TV and the internet.

Local radio avenues include

- BBC Radio Bristol, 94.9FM and 104.6FM
- Heart, 96.3FM
- SAM FM, 106.5FM
- Breeze, 107.2FM

TV

- BBC Points West
- ITV West

Internet

Information is posted on the BCC homepage, the newsroom, and on Twitter. Information will also be available from BBC Bristol and Avon and Somerset Police.

Severe weather

Weather warnings are circulated and are available at:

- Met Office - severe weather warnings
- BBC - weather

To find out if a school is closed there is the schools closures page.

For information about gritting and snow clearance there are information provided from roads and pavements in severe winter weather.

Travel

Severe weather travel updates are available from Travel West and Travel West on Twitter. This covers buses, park and ride, trains and roads.

Buses and trains

Bus and train service updates are also available from:

- First Bus, including First bus and park and ride information

- Wessex Bus, includes information about Wessex and BCC services
- Great Western Railway
- National Express

Roads

Information about traffic delays is available from Traffic England website.

Snow and ice

For the public practical guidance for preparing for snow and ice is available:

- Get advice on preparing for winter weather on the Met Office website
- Find your nearest grit bin

Extra support and resource is made available for vulnerable people during severe weather like extreme cold or hot weather. Such as for rough sleepers, somewhere to sleep will be made available if:

- the temperature is likely to be zero degrees or below for three nights in a row
- the Met Office issue an amber warning of rain and wind that is likely to last three nights in a row
- other factors such as wind chill could cause risk to life

This is called the Severe Weather Emergency Protocol (SWEP).

The contact of Street Link is available on 0300 500 0914 for rough sleeping.

For elderly people or vulnerable people at risk there is the contact at: Care Direct on 0117 922 2700, during office hours. At night or weekends, contact the Emergency Duty Team on 01454 615165.

Priority service schemes

Residents can register for a priority service scheme with their utility company if they have particular need because of their:

- age
- ill health
- disability
- mental illness

Priority service schemes allow vulnerable customers to access extra services such as:

- different bill formats like Braille or large print
- advanced warning if they are planning to stop their energy or water supply
- special passwords for when visited and attending the residence

Utility services offering the registration service are available with:

- Bristol Water
- Wessex Water



- Western Power Distribution
- British Gas
- Bristol Energy

8 Summary and conclusions

The following section compile the key lessons learnt from the 3 RESCCUE cities based on the theory behind stakeholder's engagement and communication (presented at the beginning of this deliverable) and on the emergency approaches and operational practices followed by the 3 case studies of RESCCUE project (in the RESCCUE project itself and in other initiatives or practices in the field of urban resilience). Finally, it includes a set of suggestions to enhance communication among stakeholders. This set of suggestions can be also used by other cities which are working to build up urban resilience with the support of local stakeholders.

8.1 Lessons learnt from the RESCCUE cities

Climate change is a global challenge that requires local action. It is also a phenomenon that involves many vectors (urban, environmental, social, technological, etc.). Thus, any process intended to improve cities' resilience needs to be tackled by multisectoral approaches and executed by **multisectoral working groups**. Representatives from public service operators, civil protection agencies, environmental platforms and services, healthcare, local stakeholders or citizens must be involved.

In order to facilitate the co-creation of such multisectoral working groups (including stakeholders), **collaborative environments** are key to facilitate the participation and interaction of multiple individuals to accomplish a common task or objective. One example of collaborative environment is the *Resilience Boards*³⁹ at the Barcelona City Council. Different working groups involving technical staff from the City Council and non-municipal public and private organisations, launch and implement projects to increase city's resilience. The key point here is the implementation of all projects follow a **cyclic procedure** starting with the definition and development of the project and the subsequent closure and communication of the results and measures implemented. This last stage is important given that not all the stakeholders who need to be aware of the action carried out will necessarily have been involved in the project.

Another example of collaborative environment is the *Community-based approach* followed in Bristol. This is a multilevel and cross-sectoral approach involving a range of different stakeholders (including residents) to develop adaptive capacity and build long term resilience. This is an integrated and inclusive way to work with communities and empower them with the knowledge, confidence and resources to take action when affected by local shocks. Another relevant example in Bristol is the *Urban Integrated Diagnostics*, which brings citizens together with researchers, local authorities and partners from business and the voluntary and community sector to explore research and innovation initiatives that help to improve the city's health, well-being and prosperity as they face up to challenges of modern urban living.

On the other hand, the **participation bodies, processes and channels** promoted by the City Councils of Barcelona or Lisbon can also be considered as reference tools and means to promote and facilitate the participation of citizens in the definition and design of public policies and municipal actions. Examples of participatory processes include the *Participatory Budgeting*⁴⁰ in Lisbon, where citizens are endowed with an effective decision power on a fraction of the municipal budget: they submit proposals for the city and vote for the projects

they'd like to be included in the budget of next year. Or the co-production process of the *Climate Plan of Barcelona*³³ where around 100 stakeholders participated through this process and a total of 112 proposals were put forward and incorporated into the action lines of the plan. *The Citizen Council for Sustainability* is another example in Barcelona.

Additionally, regarding participation channels, the *Decidim Barcelona*³⁰ and the Lisboa Participa⁴⁰ platforms are key **digital communication platform** where citizens can directly interact with the city council by different participatory processes.

Finally, the **communication channels** used by the emergency protocols of the 3 cities can be considered as references to efficiently reach stakeholders (and citizens in general) and to communicate them key information and actions to accomplish awareness raising, active collaboration and response. As commented, it is entirely necessary to ensure the timely communication between the different actors involved in the emergency management in order to ensure a quick response in case of accident or disruptive event and minimize its possible negative effects. And, in parallel, to efficiently communicate the population the correct instructions to follow and try to avoid panic situations that can harm, even more, the emergency situation.

The RESCCUE project has been a real opportunity for three research sites to enlarge their experience in the field of stakeholders' co-creation and co-production processes. Aware of the importance of developing projects based on consensus and cooperation, the consortium's partners adopted a collaborative and open attitude from the beginning of the project where communication has been a key element in the success of research, study and development tasks of the different tools generated with the purpose of facilitating cities to improve their knowledge of the resilience of urban services and increase their capacity to anticipate, respond and recover from adverse climatic phenomena that the future holds for urban environments. The internal relationships created by the partners of the RESCCUE project have facilitated an environment of collaboration and mutual recognition of the capabilities of each participant in a wide range of scientific fields that have managed to converge towards a common goal. In this sense, the role played by local governments, exercising their leadership has been able to generate the appropriate means for the conjugation of the holistic approach and the sectorial approach of the project in large part thanks to the experience in conducting participatory processes, both at the local level and in participation in international networks. Good examples of co-creation and co-production within the project can be seen in the generation of the database of adaptation measures and strategies or the development of the resilience assessment framework.

Table 8 summarizes through a set of key questions the main lessons learnt by the three RESCCUE cities, showing examples of good practices reported throughout the deliverable, as well as tips and advices for an efficient involvement of stakeholders in participatory processes related to climate adaptation and increasing urban resilience:

How can a city identify the key stakeholders?

Stakeholder identification is a dynamic process that never ends. A city can use the methods described through the deliverable in sections 3.1 and 3.2 or 6.1 and choose the one that better fits to its resources and the issue to address. It is important to the core team that

leads the action to be open-minded and flexible at the beginning of the stakeholder identification process allowing them to self-identify their role and the collaborative pathway they want to take along the joining process.

Lessons learnt from the RESCCUE cities

Barcelona

Through the Resilience Boards, the Barcelona City Council has developed a soundness methodology to identify key stakeholders regarding specific issues. Project participants are selected based on their influence and action capability, allowing the inclusion of new participants thanks to an iterative identification process.

TIP. When organizing a meeting or a workshop, it is interesting to leave some time to the participants to think about if any other person/entity must be involved.

Lisbon

Lisbon hosted on January 23rd 2020 at Lisbon City Hall the Workshop Lisboa “Urban Resilience as a continuous process”, with 117 participants, representing 28 public and private entities, from central, regional and local administration, including strategic stakeholders from different sectors involved in all phases of RESCCUE project, which have contributed throughout these almost 4 years, to affirm Lisbon as a resilient city to climate change.

TIP. The last session “How to maintain the community Involved in the urban resilience process?” was interactive, using the Mentimeter App, to promote interaction and dialogue with the audience, from which relevant and valuable interventions were provided.

Bristol

In Bristol key stakeholders were derived from critical Risk Management Authorities, service providers and operators that function within the city and surrounding areas. Building on existing ties, as illustrated in 7.1.3, but introducing a range of contacts at different levels and roles aided the appropriate diversity dependant on specific task objectives.

TIP. Keeping sessions open to encourage free flowing dialogue enabled all participants to have involvement. Posing questions related to each organisation to get their interpretation and feedback helped attendees gain benefit from their own perspective and agendas.

Which are the main steps to follow in order to identify critical stakeholders?

Every process has its own pathway. That means that there is not a set of steps to follow since every city face a problem from an unique starting point, represented by their peculiarities, specific issues, human and material resources, citizens will, socioeconomic and environmental situation, etc.. This complex system will tailor the stakeholder composition, in this sense, the influence matrices (and other methods) shown in section 3.2 become a

helpful tool that allows to categorize and classify stakeholders.

Lessons learnt from the RESCCUE cities

Barcelona

The Citizen Council for Sustainability is a sectorial advisory and participatory body in the city, related to sustainability issues. It promotes the Citizen Commitment to Sustainability, the road map to move towards a more sustainable city. The Council seeks to represent different groups and sectors involved in achieving the Commitment objectives and at the same time to promote new strategies for involvement, joint responsibility and participation by citizen organisations

TIP. The creation of social networks addressed to specific issues is crucial to build a basic database of stakeholders categorized by areas such as service operators, emergency teams, entities and business, finance facilitators, social organizations, research sites, etc.

Lisbon

Continuing the investment started in 2010 by joining to the United Nations International Strategy for Disaster Reduction (UNISDR) campaign, following the principles defined by the Sendai Framework, certified in 2017, the Lisbon City Council through Civil Protection Department (CML/SMPC) has strengthened strategic partnerships in the financial, environmental, social, political and research domains that have greatly contributed to prevent potential risk situations and boost the proximity to all those who live, work, study and circulate in the city of Lisbon. All this investment has contributed to the dissemination of a safety culture and to the dynamism of the city's resilience.

A step forward is given with Lisbon participation in the project EU RESILENS Realising European Resilience for Critical Infrastructure.

TIP. The RESILENS project consortium organized (2017) the exercise "Lisbon Pilot Demonstration", for operators of critical infrastructures and by promoting the stakeholders engagement. The audience was challenged to identify concepts and graphic illustrations for the designed Resilience Cycle.

Through the use of infographic frameworks, tasks can be easily driven and facilitates the comprehension from workshops' participants about what is expected from them.



Bristol

Again expanding on what is existing, that 7.2.3 alluded to, was the most useful approach. The Local Resilience Forum in South West England formed this initial steer. Knowledge of the risks and areas prone to vulnerability also assisted in determining what crucial infrastructure or operations are under threat.

TIP. Historic events and past experiences encountered by colleagues in emergency response teams helped develop networking opportunities. Seeking an array of contacts per

organisation enabled alternative persons to become available when restrictions were met.

How can a city best engage stakeholders?

The best way to engage stakeholders goes through the out-finding of common goals and dedicate enough time to build trust between the groups or individuals involved in a project. These two concepts help to reach the consensus, a key piece in the collaboratively working out of solutions. Stakeholders need to give their point of view and feel their concerns are listened and took into account. Cities will success engaging their stakeholders when they feel that the proposals, action or solutions implemented from the public administration are their own ones. Section 6.2 of this deliverable displays the main aspects about stakeholder engagement.

Lessons learnt from the RESCCUE cities

Barcelona

Through the Climate Plan Citizen Projects (6.2) or *la Fàbrica del Sol* (6.3) facilities, public administrations can foster the stakeholder's engagement. Citizens, groups or individuals, can feel that support thanks to the set-up of mechanisms like public facilities with addressed programs to develop climate actions and projects.

TIP. Some groups involved recently in collaborative projects show a need for administrative support to deal with bureaucratic issues that they are not used to. It is important for public administration to support these weaknesses by creating specific attention offices and follow-up committees.

Lisbon

Lisbon celebrates this year the "European Green Capital 2020" award that recognizes the city transformation in the environmental field, in which the combat of climate change and the implementation of a sustainability policy are fundamental pillars. In this framework, the city of Lisbon launches the challenge, to companies, organizations, associations, public and private institutions, to take with us the Lisbon Commitment European Capital 2020 – Lisbon Climate Action 2030 with an ambitious agenda for the next decade, under the motto CHOOSE TO EVOLVE: 2030 measures for 2030. To comply with these environmental targets underlying the established Action Plan, Lisbon invites Your organisation to joint to the more than 200 companies and adhere to the Lisbon Commitment



TIP. The organisations that sign the Commitment will have their logo on the European Green Capital website where all the measures adopted will also appear. They will receive a stamp of adherence to the commitment to the city and will benefit from dissemination on the city's communication networks.

Bristol

Showing the detrimental effects of severe flooding to a stakeholders service or equipment was the most engaging mode of communication. Analyses of transport disruption and power failures for example certainly gained the greatest interest to those managing these systems. This then promoted and stimulated conversation and gave individuals identification of the worth in the investigative research and pre-empted resilience response preparations.

TIP. Figure out the main aims and overarching goals of those partaking with you to ensure they are fully committed since it is in their best of interest and without action there will be greater costs incurred in the long run.

How can a city plan its climate action involving citizenship?

Cities governments have understood that climate adaptation needs the whole society to tackle it. Policy makers have assumed that new policies and regulations need to be consulted to the citizenship to ensure the correct implementation of measures and to achieve the necessarily robustness and consistency of their policies to get enough acceptance from the citizens. Nowadays, climate action cannot be understood without the involvement of entities, civil society, universities, research centres, schools, NGOs, and public administrations, who are called to lead the action and set the necessary mechanisms to active involve citizenship through participatory processes. Sections 5 and 6 describe how to co-design and co-produce the climate action involving citizenship.

Lessons learnt from the RESCCUE cities

Barcelona

The Decidim Barcelona Platform (5.4) allows the whole citizenship to participate in the open projects proposed by the city council. The Climate Plan 2018-2030 is an example of citizen involvement in the climate action planning of Barcelona.

TIP. New technologies have opened a new era for citizen participation. Cities must enhance their deliberative democracy by using and promoting this kind of tools.

Lisbon

The Participatory Budgeting (PB) in Lisbon is just one kind of citizen's participation in the governance of the City of Lisbon. Through PB, citizens are endowed with an effective decision power on a fraction of the municipal budget: they submit proposals for the city and vote for the projects they'd like to be included in the budget of next year.

TIP. Within the scope of the Lisbon European Green Capital 2020 distinction, and in order to raise civil society's awareness of environmental issues, the "2018 Green Seal" was created in the PB 2018/19 edition, which was awarded to all Projects that promoted and valorise some way Environmental Sustainability.

Bristol

Interaction with communities at risk brings the advantages of deriving local knowledge and sharing understanding and best practice. Enrolling people as Flood wardens for instance offers the two way benefit and additional resource.

TIP. Neighbourhood forums and meetings are good entry points as is identifying community groups that exist and targeting those subjected to greater risk as priority. Social media sources are also hugely useful in accessing widespread information in an instant. Also good in emergency monitoring situations.

How can a city communicate the main concerns of climate adaptation?

Communication channels must be tailored to the audience we want to reach and the message should be clear enough to ensure it is not misunderstood. Keeping this in mind and regarding climate adaptation, cities need to develop a whole communication strategy capable to reach every societal sector. Public administrations have duty to keep the population safe, informing at all times of those hazards that can put their lives or goods at risk. Through section 7 can be seen how the case study cities tackle the different faces of communication issues related to climate events, from increasing awareness, foster collaboration, focus on vulnerable population, deployment of emergency teams, or management of emergency situations, among others.

Lessons learnt from the RESCCUE cities

Barcelona

Within the Basic Municipal Emergency Plan of Barcelona is developed the Basic Plan Protocol for heatwaves (7.2.1.1), this protocol sets the communication actions to vulnerable people in the case of a heat wave event. Tele-assistance programmes, specific support for vulnerable groups and communication campaigns are part of the services given to citizens during heat events

TIP. Take advantage of mass media apps and websites. It is an easy and fast way to reach a great amount of people.

Lisbon

1) Lisbon City Council has been developing the Intelligent Management Platform of Lisbon, as a fundamental infrastructure for the modernization and innovation of services provided by the city, supported by four fundamental initiatives: Integrated Operational Center; Open Data Portal – Lisbon Open; Smart Cities projects; Lisbon Urban Data Laboratory.

This last project aims to make available the existing data in the Lisbon Intelligent Management Platform and the Open Data Portal to the scientific and entrepreneurial community with the aim of finding analytical solutions to improve the planning and management of the city. Because this is an area of work that requires specific knowledge

and skills, the creation of partnerships with academia and startups is crucial, because it allows synergies of resources, knowledge and experience.

2) GROWING UP (IN) SAFETY project has been on-going for 23 years, it has been designed by the Civil Protection Department from Lisbon City Council to increase risk awareness among children in Primary and Secondary school. The project has four priority areas of intervention, in which potential risks may be grouped together: 1) safety in the street and public spaces; 2) safety at home; 3) attitudes towards earthquakes; and 4) fire prevention and self-protection.

TIP. 1) Lisboa.24 is a recent app created in order to make available to the citizens all the information about the most important things that happen in the city, the information made available to the public comes from the Lisbon Intelligent Management Platform. Here the citizens could find other informative contents, permanently updated, about Civil Protection, useful contacts and news about the city and the municipality.

2) This initiative may contribute greatly to generate positive social impacts, as it is focused on encouraging a safe behaviour in our youngest generations and it will help to reproduce it in the generations to come. Updating contents, regarding climate risks and climate adaptation issues.

Bristol

Knowing the population demographic is key to ensure the correct modes of communicative tools are utilised. Including diversification of languages spoken, accessibility to modern technology and being able to adapt to all different forms of communication. Using letter drops, braille or interpreters for instance and being adaptive to any form of any different necessary communication means is a start.

TIP. Then making sure what can be very technical scientific information is phrased in a way to communicate to the masses and general public through PR and Comms experts helps branch out the engagement potential and gains more interest.

Table 7. Main lessons learnt by the three RESCCUE research sites.

8.2 Suggestions for the RESCCUE cities

Once the different strategies or practices at the 3 RESCCUE cities have been reviewed, this section compiles a set of suggestions to improve and enhance the communication with stakeholders and thus foster their participation in the framework of urban resilience.

These suggestions could apply to the 3 RESCCUE cities but also, in general, to any city interested in enhancing stakeholders' participation in urban resilience processes:

- Urban resilience is a multidisciplinary field where multiple stakeholders must be involved. It is very important to properly **identify key stakeholders** (diversity is needed both in background and intervention experience levels) and make them involved from the very beginning of the decision-making process. Procedures to map and select stakeholders are described in section 2 of this deliverable.
- Development of urban resilience is also a co-creation process where **engagement and communication procedures** must be followed in **cyclic way** so that stakeholders are involved at the initial stage of the process/project/decision and keep them engaged by a continuous communication plan. Procedures to engage and communicate with stakeholders are described in sections 3 and 4 of this deliverable.
- Communication with stakeholders is therefore a key issue to enhance their participation and engagement. In this sense, it is very important to:
 - Use the appropriate **language** for popular technical communication in order to properly engage stakeholders and make them active during all the co-creation process. According to “communication gaps” often lead to unnecessary misunderstandings, conflicts and deadlocks. Subsequently, these impede the establishment of a shared reference framework that will enable holistic and actionable commitments to address these challenges and build consensus for selected actions.
 - Create a shared **vision** of what is important, set expectations and common outcomes. The interaction and dialogue among different actors seem to improve the decision-making process at the individual, societal and institutional level mostly when there is a strong investment on working in a shared vision of achievements to attend, nightmares to avoid and possible paths to undertake.
 - Design a double-sided communication strategy so that it is a **circular process** involving and benefiting both “recipients” and “senders”.
 - Create **collaborative environments**. These are important in building feelings of belonging, shared visions and committed goals.
 - Celebrate **achievements** and what should be yet possible to develop together in order to give evidence of the co-productions and to keep participants willingness and engagement active to keep going.

References

1. FIELD C, IPCC. *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change.*; 2012.
2. Hyogo Framework for Action. BUILDING RESILIENCE TO DISASTERS THROUGH PARTNERSHIPS, Lessons from the Hyogo framework for Action. Thematic Think Piece. Published online 2013. <http://content.undp.org/go/newsroom/2011/april/supercities-face-high-quake-risk-says-undp-expert.en>
3. Freeman R. *Strategic Management: A Stakeholder Approach.*; 1984.
4. Freeman R. *A Stakeholder Theory of Modern Corporations. In Ethical Theory and Business.* Practice Hall, Upper Saddle River; 2004.
5. UN-HABITAT. City Resilience Profiling Tool. UN-HABITAT, 2018. Published online 2018.
6. Barcelona City Council. Barcelona Regulation Governing City Participation. 2018.
7. Reed MS, Graves A, Dandy N, et al. Who's in and why? A typology of stakeholder analysis methods for natural resource management. *J Environ Manage.* 2009;90(5):1933-1949. doi:10.1016/j.jenvman.2009.01.001
8. Varvasovszky Z, Brugha R. How to do (or not to do) a stakeholder analysis. *Health Policy Plan.* 2000;(15):338–345. doi:10.5604/12303666.1215533
9. Prell C, Reed MS, Hubacek K. Social network analysis and stakeholder analysis for natural resource management. *Soc Nat Resour Press.*
10. Geerdink T, Willems R, Bottema M, Schellekens E, Knapp B, Schwingenschloegl C. *RESIN PROJECT - D6.1 - Actor Analysis for Urban Climate Adaptation.*; 2015.
11. Roling N, Jiggins J. The Ecological Knowledge System. *Facil Sustain Agric Particip Learn Adapt Manag Times Environ Uncertain.* Published online 1998. doi:10.4161/cc.9.13.12145
12. Rist S, Chidambaranathan M, Escobar C, Wiesmann U, Zimmermann A. Moving from sustainable management to sustainable governance of natural resources: The role of social learning processes in rural India, Bolivia and Mali. *J Rural Stud.* Published online 2007. doi:10.1016/j.jrurstud.2006.02.006
13. Berger P, Luckmann T. The Social Construction of Reality: Treatise in the Sociology of Knowledge. In: ; 1966. doi:10.1163/157006812X634872
14. Moscovici S, Doise W. *Dissensions et Consensus – Une Theorie Generale Des Decisions Collectives.* Livros Horizonte; 1991.
15. Forester J. *The Deliberative Practitioner: Encouraging Participatory Planning Processes.*; 1999.
16. Hermans L. *Actor Analysis for Water Resources Management, Putting the Promise into Practice.* Eburon; 2005. doi:<https://doi.org/10.1155/2018/2018601>

17. Giddens A. *As Conseqüências Da Modernidade*. UNESP.; 1991.
18. Giddens A. *A Constituição Da Sociedade*. Editora Martins Fontes; 2003.
19. Hart SL, Sharma S. Engaging fringe stakeholders for competitive imagination. *Acad Manag Exec*. 2004;18(3). doi:10.1109/EMR.2004.25105
20. Mitchell R, Agle B, Wood D. *Toward a Theory of Stakeholder Identification and Salience: Defining the Principle of Who and What Really Counts* Author. Vol 22. Academy of Management Review; 1997.
21. Custer RL, Scarcella JA, Stewart BR. The Modified Delphi Technique - A Rotational Modification. *J Career Tech Educ*. 1999;15(2). doi:10.21061/jcte.v15i2.702
22. Barcelona.cat. Nou Pla de Mobilitat Urbana 2019-2024. <https://www.barcelona.cat/mobilitat/ca/actualitat-i-recursos/nou-pla-de-mobilitat-urbana-2019-2024>
23. Decidim.barcelona. Plan de Movilidad Urbana (PMU) 2019-2024. <https://www.decidim.barcelona/processes/plamobilitatBCN>
24. Mullen CA, Kochan FK. Creating a collaborative leadership network: An organic view of change. *Int J Leadersh Educ*. 2000;3(3):183-200. doi:10.1080/13603120050083891
25. WHO. *A Strategic Framework for Emergency Preparedness*; 2018. doi:10.1017/CBO9781107415324.004
26. Fishkin J. *When the People Speak*. Oxford University Press (OUP); 2011.
27. Saaty RW. The analytic hierarchy process-what it is and how it is used. *Math Model*. Published online 1987. doi:10.1016/0270-0255(87)90473-8
28. Rezaei A, Tahsili S. Urban Vulnerability Assessment Using AHP. *Adv Civ Eng*. 2018;2018:1-20. doi:10.1155/2018/2018601
29. Craveiro JL, Antunes AL. *Territorial Planning and the Influence of Public Participation in Decision-Making (Cases Studies in Portugal)*. Final Report.; 1999.
30. Decidim: free open-source participatory democracy for cities and organizations. <https://decidim.org/>
31. Conde C, Lonsdale K, Nyong A, Aguilar Y. *Technical Paper 2: Engaging Stakeholders in the Adaptation Process*; 2004.
32. Rittel HWJ, Webber MM. Dilemmas in a General Theory of Planning. *Policy Sci*. 1973;4:155-169.
33. Ajuntament de Barcelona. Barcelona Climate Plan 2018-2030. Published online 2018:164. https://www.barcelona.cat/barcelona-pel-clima/sites/default/files/documents/eng_climate_plan_def.pdf
34. OECD. Directorate for Public Governance. Stakeholder engagement: examples by indicator category. *OECD, Better Policies for Better Lives*. Published online 2015.
35. Ecologia Urbana - Ajuntament de Barcelona. *Meet La Fàbrica Del Sol*. <https://youtu.be/jvCQHIV58js>
36. ANEPC. PLANOS DE EMERGÊNCIA.

- <http://planos.prociv.pt/Pages/plano.aspx?con=LISBOA>
37. Map of community places of safety in Bristol.
<https://maps.bristol.gov.uk/pinpoint/?service=localinfo&maptype=js&mapopts=legend&layer=Community+Places+of+Safety>
 38. GOV.UK. Flood warnings for England. <https://flood-warning-information.service.gov.uk/warnings>
 39. López MV, Armesto MF, Masip AG, Fornós JR. Barcelona: building resilience strategies. *Int J Crit Infrastructures*. 2015;11(223).
 40. Lisboa eu patricipo. <https://op.lisboaparticipa.pt/#/home>