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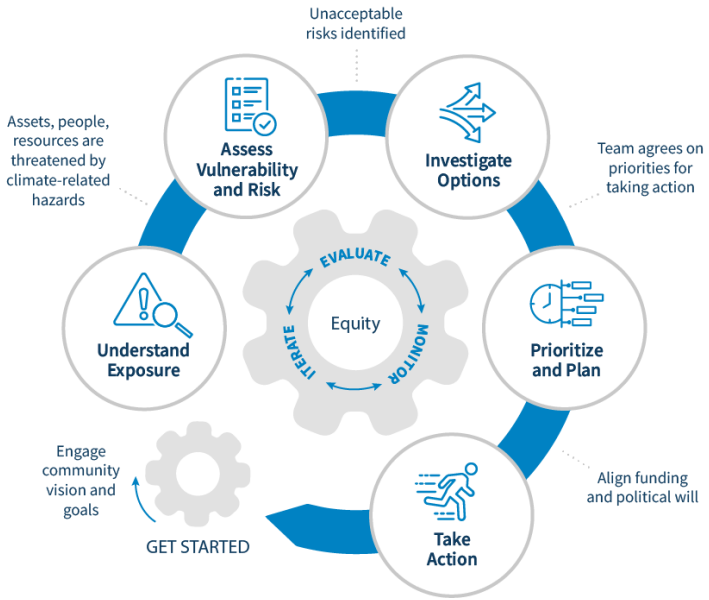
Comparable Risk Frameworks to the Steps To Resilience

OVERVIEW



The Steps to Resilience framework[1] encompasses the team building, data gathering, and decision making it takes for a local climate champion and a team of engaged community members to enhance their resilience to climate-related impacts. The framework is aligned with and inclusive of other efforts to reduce risk through adaptation.

The Steps to Resilience framework describes a process to help communities learn about their local climate hazards, identify their most pressing climate-related issues, and work together to develop an equitable climate resilience plan. The framework can also help people recognize potential opportunities presented by changing climate conditions.

The framework is compatible with other climate adaptation processes in use by various sectors and across different regions. These steps were codified as part of the U.S. Climate Resilience Toolkit to help systematize, compare, and promote resilience-building efforts across the nation.

Whichever process you follow, effective resilience-building requires you to evaluate *exposure*, *vulnerability*, and *risk* from climate-related impacts, and integrate the results with other considerations before setting priorities, developing plans, and implementing projects.

[1] https://toolkit.climate.gov/steps-to-resilience/steps-resilience-overview

Comparable Frameworks

The Steps to Resilience were inspired by and or adapted from the following sources. All of the frameworks deal with risk and resilience, and the iterative approach is foundational. Most include the same "substeps" as the Steps to Resilience, but group them differently.

FEMA Pre-Disaster Recovery Planning Guide for Local Governments

[Pre-Disaster Recovery Planning Guide for Local Governments | FEMA]

The Federal Emergency Management Agency (FEMA) Pre-Disaster Recovery Planning Framework is a six-step process to help communities become better prepared before a disaster strikes. By following the standardized framework, the decision-makers can make informed choices and verify they have the necessary tools. In addition, once created, it will help streamline the recovery process when an extreme weather event occurs.

The six-step process is

1. Form a collaborative planning team (Steps to Resilience: Get Started)
    a. The decision-makers first step is to form a collaborative planning team by identifying critical stakeholders from the entire community, making sure varying sectors are represented. The team's first primary role is to establish the scope of the community hazard plan. Next, the group needs to understand the geographic area being served. Finally, while the team is still in the "forming" stage of group development, they need to implement a stakeholder and partner engagement strategy. The engagement strategy allows for relationships and trust to be built throughout the planning and post-disaster process. If a new partner comes on later in the process, there's a clear entry point for them.

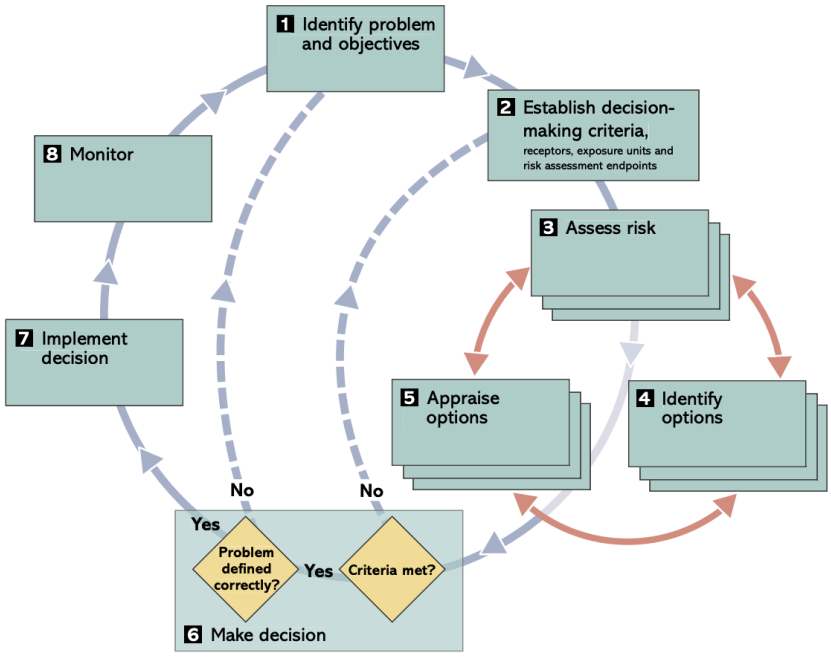
2. Understand the situation (Steps to Resilience: Understand Exposure, Assess Vulnerability and Risk)
    a. The decision-maker must understand the situation by identifying the community's risks, impacts, and consequences. For example, decision-makers might consult hazard-mitigation plans, climate action plans, tribal hazard mitigation plans, or local or regional economic development strategies. After the decision-makers analyze the available data, they should hold a community meeting to discuss the risks and impacts.
3. Determine goals and objectives (Steps to Resilience: Investigate Options)
    a. In step three, the decision-makers need to determine the goals, mission, objectives, and priorities for the project based on the community's hazards, risks, and threats. In addition, the decision-makers will need to consider assessing the community's general capabilities by answering the questionnaire and identifying capability targets via a similarly formatted questionnaire.
4. Develop the plan (Steps to Resilience: Investigate Options, Prioritize and Plan)
    a. In step four, the decision-makers need to develop the pre-disaster plan outlining strategies for leadership, resources, organizational roles, and responsibilities. The team of decision-makers needs to appoint one leader who will be the champion for the group. From there, the team should develop a clear organizational structure. Then, the team can review and create policies, procedures, and guidelines for all necessary information. Finally, the decision-makers will need to create a process for post-disaster decision-making.
5. Prepare, Review, and Approve the Plan (Steps to Resilience: Prioritize and Plan)
    a. The decision-makers will need to write the pre-disaster plan clearly and concisely in an accessible format for all stakeholders. Once the pre-disaster plan is drafted, it should be shared with the community via social media, among other mediums, and open for edits and comments at community hearings. After an appropriate time for comment, the decision-makers need to hold a meeting to decide if they want to adopt the plan.
6. Implement and Maintain the Plan (Steps to Resilience: Take Action, Central Cog in the Figure - Iterate, Evaluate, Monitor)
    a. If the plan is approved, the decision-makers schedule time for ongoing events like training and document revisions for stakeholders. It's essential to keep the document updated and continuously evaluate for new vulnerabilities.

Kresge Foundation, Georgetown Climate Center, Preparing for Climate Impacts: Lessons from the Front Lines

A very high level discussion that matches well with the Steps to Resilience. They break the process into two main steps, 1) Planning and 2) Implementation. Then they talk about continual measurement and evaluations that lead to iterating these two main steps.

- Planning is
    - identifying the climate-change impacts (Steps to Resilience: Understand Exposure) and
    - assessing vulnerabilities (Steps to Resilience: Assess Vulnerability and Risk).
- Once those are identified, actions are recommended to prepare for and respond to projected impacts (Steps to Resilience: Investigate Options, Prioritize and Plan).
    - Plans must be translated into action by anticipating and responding to challenges that may be encountered during implementation.
- Implementation: Implementing the recommendations in adaptation plans (Steps to Resilience: Take Action)
- Post-Implementation monitoring and revisions: To be truly effective, adaptation must be an iterative process. Communities must monitor the efficacy of implemented activities and then refine plans, laws, and policies based upon the best scientific information about climate change and the effectiveness of different measures. Doing so will require policymakers to develop metrics for assessing the effectiveness of adaptation measures while providing funds and instituting requirements for monitoring their implementation. (Steps to Resilience: Central Cog in the Figure - Iterate, Evaluate, Monitor)

University of Oxford [United Kingdom Climate Impacts Programme]



The U.K. Climate Impacts Program (U.K. CIP) has released a climate risk adaptation framework that is an eight-step iterative framework. This framework allows organizations to assess their vulnerability to climate hazards and mitigate against the risk to become more resilient. The steps are as follows.

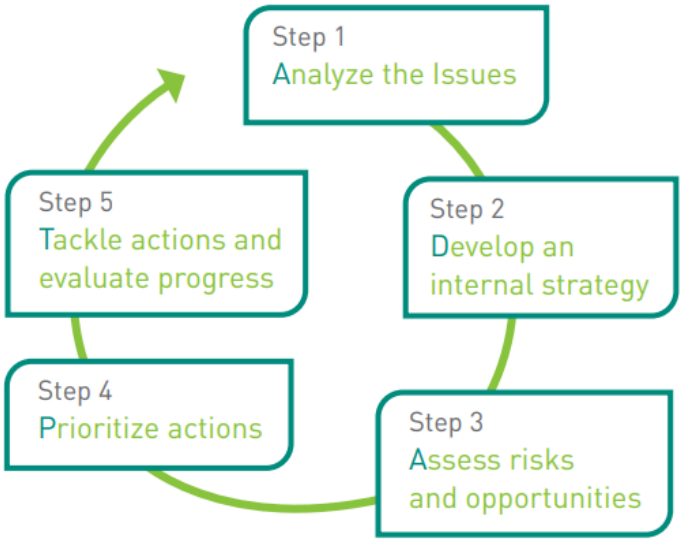
1. Identify problem and objective (Steps to Resilience: Get Started): the decision-maker needs to understand why they are undertaking the project and the broad objectives.
2. Establish decision making criteria (Steps to Resilience: Get Started):There will be many constraints the decision-maker has to face, specifically climate adaptation decisions and climate-influenced decisions. The decision-maker will also need to account for risk in the decision-making process.
3. Assess risk (tiered): Assess risk by characterizing the nature of the threat, providing qualitative and quantitative estimates of the risk, assess the consequences and uncertainty or the decision options, and coping sources of the risk. The key to this step is utilizing the tiered risk assessment: tier 1-risk screening, tier 2 qualitative and generic quantitative risk assessment, and tier-3 specific quantitative risk assessment.
    a. Preliminary climate change risk assessment (Steps to Resilience: Understand Exposure)
    b. Qualitative and quantitative climate change risk assessment (Steps to Resilience: Assess Vulnerability and Risk)
4. Identify options (Steps to Resilience: Investigate Options): The decision-maker will identify the options through an in-depth adaptive management decision-making process. A series of factors may be considered, climate and non-climate impacts of concern, the decision maker's attitude towards risk, the degree of risk and

uncertainty surrounding the project, and whether the decision operates at the policy, program, or project level.

5. Appraise options (Steps to Resilience: Prioritize and Plan): The decision-maker will appraise their options by discerning how much adaptation and when such measures are needed. These choices are dependent on the climate variables identified in the "Assess risk (tiered)" step and often involve necessary tradeoffs between environmental, economic, and social options. As in the "Assess risk (tiered)" step, a three-tiered approach is proven valuable. Tier 1 is a systematic qualitative analysis approach that ranks the choices in terms of costs and benefits. Tier 2 is a semi-quantitative analysis by studying the risk assessment of a project associated with preset boundaries. Tier 3 is a fully quantitative analysis of costs and benefits and in monetary terms when possible.
6. Make a decision (Steps to Resilience: Take Action): The practitioner will make the decision by bringing the information together and evaluating it against the objects and defined decision criteria. When making the decision, there are many moving variables, including uncertainty and risk, the consequences of the uncertainty, the analysis findings stating key assumptions, and data sources.
7. Implement the decision (Steps to Resilience: Take Action): by putting the plan into action.
8. Monitor, evaluate, and review (Steps to Resilience: Central Cog in the Figure - Iterate, Evaluate, Monitor) the project by keeping activity recording the findings, reviewing the results against the predicted outcomes, and determining if any iterations need to be made.

Oxfam America and Acclimatise Value Chain Climate Resilience: A Guide to Managing Climate Impacts in Companies and Communities

This framework takes a "value chain" and systems thinking approach. The approach focuses on local communities and the natural environment and how they interact with business value chains. Risks are viewed through local values and assets. This guide introduces the Business ADAPT (analyze, develop, assess, prioritize, and tackle) tool. The framework follows a step-by-step climate resilience framework inspired by existing good practice risk management models.



1. Analyze the issues (Steps to Resilience: Get Started)
2. Develop an internal strategy (Steps to Resilience: Get Started)
3. Assess risks and opportunities (Steps to Resilience: Understand Exposure, Assess Vulnerability and Risk, and Investigate Options)
4. Prioritize actions (Steps to Resilience: Prioritize and Plan)
5. Tackle actions and evaluate progress (Steps to Resilience: Take Action, the Central Cog in the Figure - Iterate, Evaluate, Monitor)

FEMA and California Agencies [California Adaptation Planning Guide: Planning for Adaptive Communities]

The State of California worked with FEMA to provide guidance for local governments to plan for a changing climate and its impacts. It recognizes the planning framework can vary from a short, qualitative process to a more detailed quantitative analysis (depending upon scope, size of community, and available resources).

However, the basic steps are the same:
Vulnerability Assessment (Steps to Resilience: Understand Exposure, Assess Vulnerability and Risk)

1. Exposure: Identify the climate change effects a community will experience.
2. Sensitivity: Identify the key community structures, functions, and populations that are potentially susceptible to each climate change exposure.
3. Potential Impacts: Analyze how the climate change exposure will affect the community structures, functions, and populations (impacts).
4. Adaptive Capacity: Evaluate the community's current ability to address the projected impacts.
5. Risk and Onset: Adjust the impact assessment to account for uncertainty, timing, and adaptive capacity.

Adaptation Strategy Development

6. Prioritize Adaptive Needs: Based on the vulnerability assessment, prioritize the adaptive needs. (Steps to Resilience: Assess Vulnerability and Risk)

7. Identify Strategies: Identify strategies to address the highest priority adaptation needs. (Steps to Resilience: Investigate Options)
8. Evaluate and Prioritize: Prioritize strategies based on the projected onset of the impact, projected cost, co-benefits, and other feasibility factors. (Steps to Resilience: Prioritize and Plan)
9. Phase and Implement: Develop an implementation plan that includes phasing of strategies and a monitoring system to assess effectiveness. (Steps to Resilience: Take Action, Central Cog in the Figure - Iterate, Evaluate, Monitor)

ICLEI Preparing for Climate Change: A Guidebook for Local, Regional, and State Governments

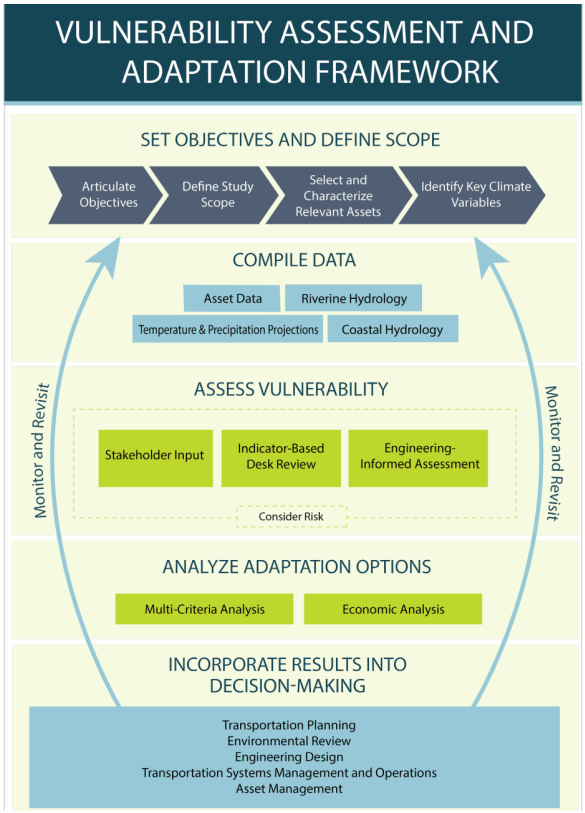
The ICLEI's Five Milestones for Climate Adaptation is a sequenced methodology allowing the actor to build upon the previous steps while continually reviewing what they have already done.

The five steps are:

1. Initiate (Steps to Resilience: Get Started, Understand Exposure)
    a. Initiate the process by evaluating their climate change plan by assessing the project's stakeholders. The actors will need to gather an adaptation team and assign a project champion. The actors will then review historical climatic events for the region and predict future ones. During this process, they will need to build political support for the project to keep the momentum going.
2. Research (Steps to Resilience: Assess Vulnerability and Risk)
    a. Research the climate impacts in the region more accurately through risk and vulnerability assessments.
3. Plan (Steps to Resilience: Investigate Options, Prioritize and Plan)
    a. Establish an adaptation plan based on the findings in the Research step. The project will include the vision, goals, constraints, and objectives. Then the Adaptation Action Plan is created from the initial plan. The Adaptation Action Plan involves the timeline, budget, how the project implementation will be evaluated and measured, the actual implementation process, and who is doing what, and more.
4. Implement (Steps to Resilience: Take Action)
    a. Implement the project by ensuring they have the right tools and proper approval to complete the project successfully.
5. Monitor/ Review (Steps to Resilience: Central Cog in the Figure - Iterate, Evaluate, Monitor)
    a. Monitor and review their progress to ensure their original goals have been achieved, identity and problems, solve them and communicate progress with the general public.

USDOT Federal Highway Administration [Vulnerability Assessment and Adaptation Framework, 3rd Edition]

The U.S. Department of Transportation's (ToD) Vulnerability Assessment and Adaptation Framework, 3rd Edition, is a cyclical model that provides state-level Transportation Departments and other transportation agencies to carry out climate vulnerability assessments. This model is created by and geared toward the transportation sector.



It is an iterative five-step process.

1. Set Objectives and Defining Study of Scope (Steps to Resilience: Get Started)
    a. Begin by setting the objectives for their risk assessment to determine the scope and associated boundaries.
2. Compile Data (Steps to Resilience: Understand Exposure)
    a. The user will select assets that the agency will include and evaluate the asset criticality by combining quantitative and qualitative data. Different asset types, sources, and characteristics need to be considered. Some asset types include roadways, airports, ports, rail. A few examples of best practices for collecting asset data are implementing specialized monitoring at high-risk sites, Geo-code asset data reporting, and adding vulnerability-specific data fields to regular asset management reporting.
    b. Identifying key climate variables such as temperature, precipitation, drought, and streamflow, among others.
3. Assess vulnerability (Steps to Resilience: Assess Vulnerability and Risk)

    a. Assess the vulnerability by one of three approaches laid out below. With these different types of vulnerability approaches, users also need to consider risk in their assessments.
        i. The Stakeholder Input approach relies on the knowledge and buy-in from the local stakeholders rather than traditional analysis. For example, practitioners may conduct group activities, interviews, or engage with stakeholders in other ways to gather their data.
        ii. In the Indicator-Based Desk Review approach, a team studies quantitative transportation asset data and compares it to projected regional climate stressors. The data provides an approximant measurement of an asset's overall exposure, sensitivity, and adaptive capacity.
        iii. The Engineering Informal Assessment approach goes more in-depth on the risk and vulnerability of a single specific asset in response to its climate stressor(s).
4. Analyze Adaptation Options (Steps to Resilience: Investigate Options, Prioritize and Plan)
    a. Identify, analyze, and prioritize adaptation options. Again, the list of assets may be long, so it's essential to focus on the most high-risk investments. After potential adaptation options are created, there are two methods of implementation.
        i. A multi-criteria analysis compares adaptation options across a range of qualitative and quantitative criteria, including but not limited to, environmental impacts, capital and life-cycle costs, and scale or impact response.
        ii. An economic analysis is a transparent tool for evaluating public investment and prioritizing adaptation options by completing a long-term cost and benefit analysis. This model is not as granular as the multi-criteria analysis.
5. Incorporate Assessment Results in Decision-making (Steps to Resilience: Take Action, Central Cog in the Figure - Iterate, Evaluate, Monitor)
    a. Incorporate the results in decision-making by implementing the findings into current and future projects and looking for ways to promote resilience at a systems level. Again, practitioners should incorporate their results early on in the project development process. The assessment findings can significantly impact their engineering and design. Finally, users will have to monitor and evaluate their vulnerability assessment and their implemented plans to ensure nothing needs to be improved or altered slightly for better results.

EcoAdapt Adaptation Ladder of Engagement

http://ecoadapt.org/programs/awareness-to-action/climate-savvy-quick-course/ladder-of-engagement

The EcoAdapt Adaptation Ladder of Engagement assists practitioners in the assessment process to determine what efforts need to be taken to be more resilient towards climate change. The Adaptation Ladder consists of seven steps.

1. Awareness (Steps to Resilience: Get Started)
    a. Climbing a ladder requires you know the ladder exists and that you take the first step: in adaptation, this first step is awareness of climate change affects a community or organization's ability to achieve their goals. The investments made by a community, be it time, money, or political capital, are vulnerable and can be compromised if you are not aware of and considering climate change..
2. Assessment (Steps to Resilience: Understand Exposure, Assess Vulnerability and Risk)
    a. The practitioner gets a better feel for the scope of the problem: this could be a general review, or a formal vulnerability or risk assessment. The essential focus should be to assess how climate change might affect your investments and goals..
3. Planning (Steps to Resilience: Investigate Options, Prioritize and Plan)
    a. Planning is the step where you move from assessing the problem to identifying the solution. Based on the risks and opportunities identified in step 2, what can be done to reduce vulnerability and increase the likelihood of better outcomes?.
4. Implementation (Steps to Resilience: Take Action)

    a. Implementation is putting the the plan into action. This might mean new policies, laws or regulations, or it might be adjusting existing activities by changing when or how they are done.
5. Integration (Steps to Resilience: Take Action)
    a. Adapting to climate change is not a one-time action. Integrating climate-savvy thinking into your approach is an ongoing process, be it informally through awareness of climate or formalizing monitoring and adaptive management.
6. Evaluation (Steps to Resilience: Central Cog in the Figure - Iterate, Evaluate, Monitor)
    a. It is essential to see what is working, what is not, and iterate to improve it rapidly. Project monitoring and evaluation should be integrated throughout adaptation efforts to ensure investments made are not wasted.
7. Sharing (Steps to Resilience: Central Cog in the Figure - Iterate, Evaluate, Monitor)
    a. Internal and external capacity-building increases opportunities for success as we share and learn from each other. Capacity is built through collective learning, and long-term success is increased by learning from others.

Adaptations to Climate Change NCA3 [Adaptation | National Climate Assessment]

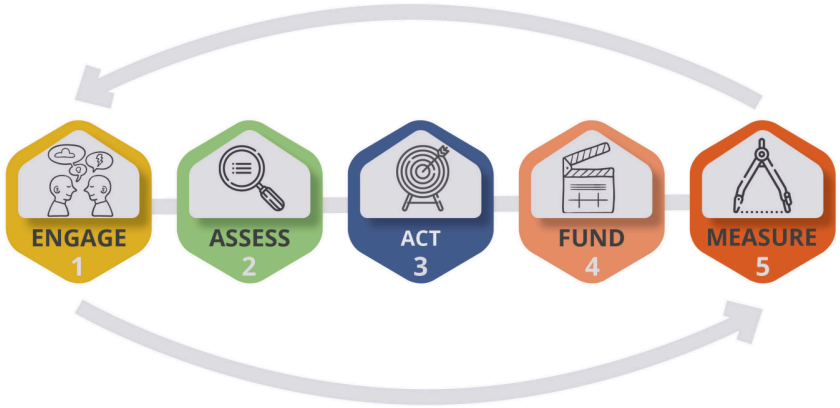
The NCA3 Adaptation reviews the depth and breadth that adaptation covers. From the built environment to human health and legal arrangements, ranging from local governments to international governments and crossing over to public-private partnerships, adaptation has no bounds. However, while it may seem like adaptation is everywhere, it is important to note there are still many barriers to entry, and it is not easily scalable. Nevertheless, including climate change adaptation planning in the risk assessment and planning process can improve the quality of life for many because it exacerbates existing issues like poverty, pollution, and environmental degradation. When a decision-maker is trying to assess their community's adaptive capacity, they can use the Adataipion Process, a five-step model that evaluates adaptation patterns emerging through stakeholder engagement.

1. Identifying and understanding risk, vulnerabilities, and opportunities (Steps to Resilience: Get Started, Understand Exposure, Assess Vulnerability and Risk)
    a. The first step is to identify and understand risk, vulnerabilities, and opportunities. The decision-maker can accomplish this through vulnerability risk assessments, case studies, analog analysis, scenario analysis, and peer information.
2. Planning, assessing, and selecting options (Steps to Resilience: Investigate Options, Prioritize and Plan)
    a. Planning, assessing, and selecting options to control future risks as much as possible. Again, the decision-maker can accomplish this through participatory approaches, integrating climate adaptation into existing management plans, or creating independent adaptation plans.
3. Implementation (Steps to Resilience: Take Action)
    a. The decision-maker must implement their plan by doing since there is very little peer-reviewed work to reference.
4. Monitoring and evaluation, (Steps to Resilience: Central Cog in the Figure - Iterate, Evaluate, Monitor)

    a. After their project has been implemented, the decision-maker moves on to monitoring and evaluating their project. It's essential to monitor and assess the project, as there's limited data thus far, and the primary focus has been on process-based indicators rather than outcome-based indicators. It's also essential to keep a close eye on the project budget, as the cost of adaptation projects hasn't been appropriately captured either.
5. Revising strategies and processes and information sharing (Steps to Resilience: Central Cog in the Figure - Iterate, Evaluate, Monitor)
    a. Finally, iterating on the process as new knowledge becomes available and sharing best practices with other communities.

EPA Smart Growth Regional Resilience Toolkit: 5 Steps to Build Large-Scale Resilience to Natural Disasters

The EPA's Smart Growth Toolkit is a scalable engagement with an intentional focus on actionable steps.



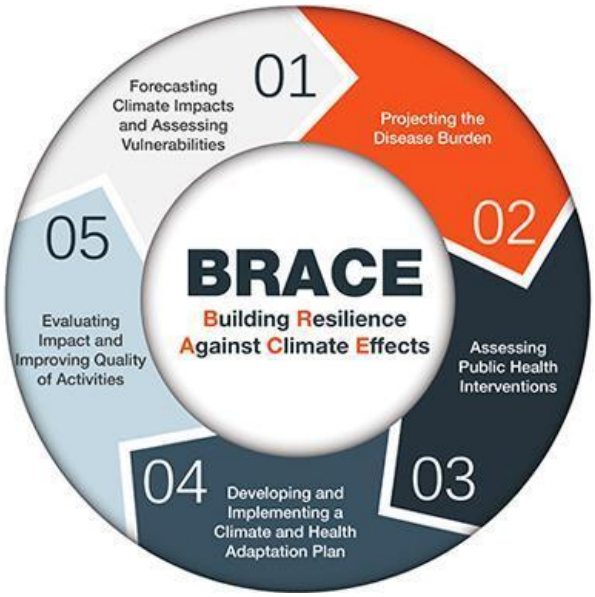
The five-step process includes

1. Engage (Steps to Resilience: Get Started)
    a. The first step is to engage in resilience by understanding how to build trust and community so that all voices can be heard. Then start stakeholder mapping. Once the community's priorities are mapped, the decision-makers will develop an engagement and outreach plan to share the idea with community members and keep engaging with the district.
2. Assess (Steps to Resilience: Get Started, Understand Exposure)
    a. The decision-makers will access the project's scope and determine the goals while incorporating the existing hazards. After identifying the assets, the decision-makers will conduct the assessment.
3. Act (Steps to Resilience: Assess Vulnerability and Risk, Investigate Options, Prioritize and Plan)
    a. The decision-maker will need to summarize the vulnerabilities by creating problem statements that need to be solved. From the answered statements, the decision-maker can develop strategies and plans. Finally, from the list, prioritize the different methods, build a unified consensus among all team members, and create and implement a plan.
4. Fund (Steps to Resilience: Take Action)
    a. The decision-makers will fund the project by being financially literate regarding resilience funding options and training like-minded individuals to grow the project's capacity and gain additional funding options. One way decision-makers can do this is by creating and selling a business case for the resilience project to stakeholders and investors (public or private).
5. Measure (Steps to Resilience: Central Cog in the Figure - Iterate, Evaluate, Monitor)
    a. Finally, the decision-maker will measure the outcomes by evaluating and refining them. The decision-maker will first create their metrics and targets based on their tracking and the preset goals. The decision-maker would then

assess the outcome from the data collected and, if needed, iterate or make any necessary changes to the project for better results.

CDC's BRACE [CDC's Building Resilience Against Climate Effects (BRACE) Framework | CDC]

The CDC's Building Resilience Against Climate Effects (BRACE) Framework is a five-step sequential process that looks at the intersection of atmospheric science, specifically climate projections and epidemiological analysis in public health. Overlaying the two fields allows health practitioners to better prepare for and respond to climate-sensitive health impacts.



The five steps are laid out below:

1. Anticipate Climate Impacts and Assessing Vulnerabilities (Steps to Resilience: Get Started, Understand Exposure, Assess Vulnerability and Risk)
    a. The first step practitioners prepare for is anticipating climate impacts and accessing the potential vulnerabilities. This is accomplished by identifying a community's climate vulnerabilities and the associated health risks. Then, practitioners can see where the burden lies by assessing the community's adaptive capacity and creating a vulnerability assessment.
2. Project the Disease Burden (Steps to Resilience: Assess Vulnerability and Risk)
    a. In step two, practitioners project the disease burden to develop a causal pathway by linking exposure or environmental hazards to health outcomes and assembling the data elements. Some of the data include climate data, baseline disease prevalence, exposure-outcome response function, and source population. Then, they have to project the disease burden, essentially based on the data and the preset parameters of the vulnerability assessment to quantify linkages between climate hazards and human health indicators. Next, they perform an uncertainty analysis, and finally, if needed, iterate the process through adaptive management.

3. Assess Public Health Interventions (Steps to Resilience: Investigate Options, Prioritize and Plan)
    a. Then, in step three, practitioners will assess public health interventions in a changing climate. There is a lack of data on two subgroups. The effectiveness of public health interventions and overall efficacy and implementation of public health measures within a community.
4. Develop and Implement a Climate and Health Adaptation Plan (Steps to Resilience: Prioritize and Plan, Take Action)
    a. Develop and oversee a climate and health adaptation plan.
5. Evaluate Impact and Improve Quality of Activities (Steps to Resilience: Central Cog in the Figure - Iterate, Evaluate, Monitor)
    a. Evaluate the overall impact of the project and controls for quality improvement.

Adapting to Rising Tides (ART) Model, San Francisco Bay Conservation and Development Commission [Getting Started « Adapting to Rising Tides]

The ART approach is an eight-step customizable and systematic approach to adaptation planning that allows the practitioner and government champion to create a plan geared towards their community's needs.

The eight steps include

1. Scope and Organize (Steps to Resilience: Get Started): Scope and organize the project by deciding the team and the project's resilience goals and desired outcomes.
2. Choose an Approach (Steps to Resilience: Understand Exposure, Assess Vulnerability and Risk): Choose an approach by utilizing the ART assessment questions to help collect the current information ranging from vulnerabilities to a project's scope.
3. Do the Assessment (Steps to Resilience: Understand Exposure, Assess Vulnerability and Risk): Complete the vulnerability assessment by understanding an asset's current conditions, the potential risks and outcomes it faces in a changing climate, and its overall adaptable capacity.
4. Summarize Findings (Steps to Resilience: Assess Vulnerability and Risk): Once the analysis is conducted, summarize the findings and synthesize the information for the working group in ranked vulnerability and consequence statements.
5. Identity Issues (Steps to Resilience: Assess Vulnerability and Risk): The planning team identifies issues using the vulnerability assessment findings and the project

resilience goals for relevance. Specifically, the two outcomes are, creating issue statements for each asset-specific issue and a clear understanding of the resilience goals based on the vulnerability assessment.

6. Develop Responses (Steps to Resilience Investigate Options): Develop responses with a direct focus on actionable steps. The choices are three-pronged, with each putting the actor closer to implementation: response to a vulnerability, one or more actions, implementation options. The approach works because it connects action directly to the assessment outcome.
7. Evaluate Responses (Steps to Resilience: Prioritize and Plan): Evaluate the response against the initial resilience goals and four sustainability frames: society and equity, governance, economy, and environment. The planning team will continue to refine their own criteria and are encouraged to include the sustainable frame for a more holistic perspective.
8. Advance Options (Steps to Resilience: Take Action, Central Cog in the Figure - Iterate, Evaluate, Monitor): Advance the options by implementing a project or recommending a further collaboration or iteration on a project.

Geos Institute Whole Community Resilience Framework Climate Ready Communities [Climate Ready Communities – Geos Institute]

The Geos Institute's Whole Community Framework is designed to support cross-sector coordination and collaboration throughout the planning and implementation process, with a strong emphasis on broad and active community engagement. The framework is the foundation for the Institute's Climate Ready Communities program, a do-it-yourself approach for small and under-resourced communities who want to get started building resilience. The framework and the Climate Ready Communities program follows these 7 steps:

1. Launch the Project (Steps to Resilience: Get Started): The community establishes a project Task Force and defines the scope and breadth of the project.
2. Assess Past and Future Trends (Steps to Resilience: Understand Exposure): Explore the historical trends in climate and community conditions, and understand the future projected trends.
3. Identify and Prioritize Vulnerabilities (Steps to Resilience: Assess Vulnerability and Risk): Community leaders work together to identify and prioritize climate vulnerabilities across the 5 primary community systems (built, natural, economic, human, and cultural)
4. Develop and Prioritize Resilience Strategies (Steps to Resilience: Investigate Options, Prioritize and Plan): Community leaders work across sectors to identify strategies

and actions to reduce the community's vulnerabilities, prioritizing those that create co-benefits, enhance social equity, and support ecological sustainability.

5. Finalize and Share the Plan (Steps to Resilience: Prioritize and Plan): Actively seek community feedback and input on the plan and use that momentum to help implementation.
6. Implement the Plan (Steps to Resilience: Prioritize and Plan): The project Task Force transitions into an Implementation Team focused on turning the strategies into action.
7. Monitor and Reassess (Steps to Resilience: Take Action, Central Cog in the Figure - Iterate, Evaluate, Monitor): Each strategy will be monitored to track progress, and the whole plan will need regular updates as advancements in climate science and understanding changing conditions improves.

Community Resilience Planning Guide (NIST) [Community Resilience Planning Guide | NIST]

This guide focuses on the built environment and recognizes that communities have limited resources and their resilience planning and implementation will take many years. This framework focuses primarily on planning, with limited guidance on implementation.

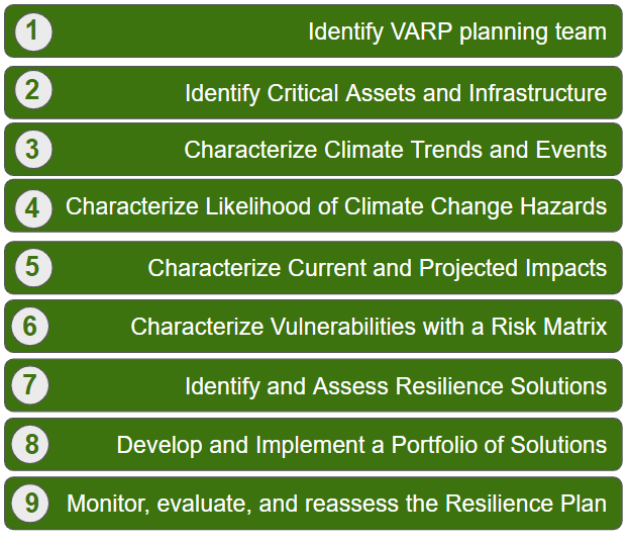
The guide follows these steps.

1. Form a collaborative planning team (Steps to Resilience: Get Started): The community determines the Government Champion and recruits the planning team.
2. Understand the situation (Steps to Resilience: Understand Exposure): Look at social dimensions and the built environment and the interaction between the two. This includes identifying key assets that the community values.
3. Determine Goals and Objectives (Steps to Resilience: Understand Exposure, Assess Vulnerability and Risk): Establish goals for resilience linked to key hazards and the performance of the assets during and after a hazard event.
4. Plan Development (Steps to Resilience: Assess Vulnerability and Risk, Investigate Options, Prioritize and Plan): Look at the shortfalls between the actual performance and the desired outcomes. This includes looking at vulnerability and risk, identifying possible solutions, and then prioritizing the solutions to develop an implementation strategy.

5. Plan Preparation, Review, and Approval (Steps to Resilience: Prioritize and Plan): Prepare the plan and socialize it with the planning team. Then complete community outreach. Once feedback is received, update and finalize the plan.
6. Plan Implementation and Maintenance (Steps to Resilience: Take Action, Central Cog in the Figure - Iterate, Evaluate, Monitor): Put the plan in place, and then monitor its success through time. Modify the strategy to better accomplish the set goals.

DOE VARP

https://www.ornl.gov/file/doe-varp-guidancefeb2022-v12/display



The Department of Energy established its Vulnerability Assessment and Resilience Plans (VARP) framework to enable DOE sites to identify, prepare for, and meet the challenges posed to DOE Sites and Assets by climate change. It builds on existing DOE risk assessment processes including the Federal Management Program's (FEMP) Technical Resilience Navigator (TRN) and Threat and Hazard Identification and Risk Assessment (THIRA). VARP recommends using both the National Climate Assessment and the US Climate Resilience Toolkit as key resources.

The VARP steps are

1. Identify VARP planning team (Steps to Resilience: Get Started)
2. Identify Critical Assets and Infrastructure (Steps to Resilience: Understand Exposure)
3. Characterize Climate Trends and Events (Steps to Resilience: Understand Exposure)
4. Characterize Likelihood of Climate Change Hazards (Steps to Resilience: Understand Exposure)
5. Characterize Current and Projected Impacts (Steps to Resilience: Assess Vulnerability and Risk)
6. Characterize Vulnerabilities with a Risk Matrix (Steps to Resilience: Assess Vulnerability and Risk)
7. Identify and Assess Resilience Solutions (Steps to Resilience: Investigate Options, Prioritize and Plan)
8. Develop and Implement a Portfolio of Solutions (Steps to Resilience: Take Action)
9. Monitor, evaluate, and reassess the Resilience Plan (Steps to Resilience: Central Cog in the Figure - Iterate, Evaluate, Monitor)

Center for Climate Strategies Adaptation Guidebook

www.climatestrategies.us

This framework focuses on how to identify options linked to a community's greatest risks and primary goals, then prioritizing, planning, and starting implementation.

1. Initiate Executive Order or Legislation (Steps to Resilience: Get Started): Set the goals and scope of the project. Determine the Government Champion and planning team and provide resources.
2. Organize Process (Steps to Resilience: Get Started): Set up the work process and recruit technical work groups.
3. Organize Adaptation Action by Major Sector Areas (Steps to Resilience: Understand Exposure): Determine which key assets (sectors) and their related hazards.
4. Set Initial Priority Actions (Steps to Resilience: Investigate Options): Note that this process DOES NOT involve a detailed vulnerability assessment or a study of potential impacts of climate change on key assets. It recommends using what is currently available and then identifying adaptation actions.
5. Execute Systematic Process of Adaptation Options (Steps to Resilience: Prioritize and Plan): This framework recommends only examining 50 adaptation options in depth in order to meet the goals of the project in a reasonable timeframe.
6. Complete Deeper Evaluation of Adaptation Options (Steps to Resilience: Prioritize and Plan): Set decision criteria and prioritize.
7. Consider Related Consequences and Impacts of Adaptation Actions (Steps to Resilience: Prioritize and Plan): Look at cross sector implications when determining the costs and benefits of prioritized options.
8. Report including Analysis of Aggregate Economic, Environmental and Social Impacts of Adaptation Actions Selected (Steps to Resilience: Prioritize and Plan): The analysis should be holistic and not just driven by cost/ benefits related to engineering solutions. The value equation should include environmental and social considerations.