



ARUP

Measuring Resilience

A Guide to Tracking Progress





As the global community grapples with the realities of climate change, the need to assess, understand and enhance the resilience of vulnerable populations has emerged as a critical need.

Yet, resilience is complex and not easy to measure. This report, developed in the context of the Race to Resilience (RtR), contributes to deepening this discussion and provides practical and implementable guidance. It reflects the range of approaches that are applicable to measure climate resilience, and the diversity of actors needed to deliver a step change in both assessing and delivering resilience to all.

Since 2021, the Race to Resilience has brought together non-State actors to work towards enhancing ambition on adaptation action and support. Developed in collaboration with initiatives across the world, the Race to Resilience’s metrics framework is a tool designed to guide non-State actors in quantifying and enhancing their contributions to global climate resilience. The framework provides a structured and actionable approach for organisations to measure and report on their climate resilience efforts, supporting RtR’s goal of ensuring 4 billion people are better equipped to handle climate impacts by 2030.

The approaches presented in this report are illustrative of the application to RtR’s metrics framework by different actors and sectors. They are designed to facilitate cooperation across sectors, making the concept of resilience tangible and providing means to track progress, identify needs and lessons, and improve responses. This collective effort is essential in tackling the accelerating effects of climate change and avoiding further losses and damages.

As we look to the future, the value of these methodologies lies in their ability to inform and inspire the implementation of effective and resilient practices globally. The actions we take, informed by the methodologies we implement, will impact through generations. This report is intended as a starting point for a broader conversation and more importantly, action towards a resilient, sustainable future. Through continued refinement and application of these methodologies, we can contribute to better collective learning on how to make a world better equipped to face the challenges of climate change.

As co-chairs of the Methodological Advisory Group of the Race to Resilience, we invite you to delve into the report, to adopt, learn from and help refine these methodologies, and to contribute to enhancing resilience by joining us in the Race to Resilience.

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Disclaimer

The High Level Climate Champions have commissioned Arup to deliver this report as a guide to facilitating partners’ adoption and understanding of the Race to Resilience metrics framework. The work is a collaboration between Arup and Climate Champions Team, with the contributions of select Race to Resilience partners, and is based on the research and assessments from Arup. While the guidance therein is not mandatory it is highly recommended that third parties embrace this approach for consistency and transparency in reporting. Neither the High Level Climate Champions nor Arup accepts any responsibility for any actions taken or not taken on the basis of this publication. The content in the publication is not reviewed and endorsed by the UNFCCC and none of the UN Climate Change High-Level Champions, the RtR campaign team, the RtR Partners and their respective teams, agents, data or other third-party content providers make any representation or warranty, express or implied, in respect to the report’s contents (including its completeness or accuracy) and shall not be responsible or liable for any actions taken or not taken on the basis of this report, nor any consequences of the use of, or reliance on, the report and its content.



The UN High Level Climate Champions Race to Resilience campaign is a global non-State actors platform that brings together businesses, cities, regions, the finance sector, civil society organisations and local communities working to improve the resilience of people to climate change.

The campaign goal is to **increase the resilience of four billion people living in vulnerable communities by 2030**. Understanding progress towards the goal requires a robust metrics framework, which the Climate Champions team published in 2021 and are committed to continuously improving. This paper is intended to provide supplementary guidance to support clear and consistent reporting of diverse initiatives against this overall goal.

Climate change resilience is not easy to measure - it is multi-faceted, dynamic, systemic, and responding to a range of climatic risks. Nonetheless, significant progress has been made in defining and measuring resilience over the past ten years, across academic and practitioner spheres. The challenge for the Race to Resilience however is in bringing together a variety of existing measurement methodologies into a single reporting framework that provides a consistent metric - that of the number of people living in vulnerable communities whose resilience has been enhanced. A review of existing reporting and measurement approaches confirmed that they do not all allow outputs to be converted into this single metric.

The approach taken in this paper is therefore to provide practical guidance through a combination of real case studies from different organisations operative in different sectors and geographies, as well as a number of 'scenarios' - developed to provide broader illustration of how different organisations could report their outputs and outcomes in a way that contributes towards the overall goal and aligns with the Race to Resilience metrics framework.

These case studies and scenarios are presented for **businesses, non-governmental organisations, and sub-national government bodies**.



What is this paper about?

The Race to Resilience campaign has publicly committed to mobilise non-State actors to increase the resilience of four billion people living in vulnerable communities by 2030. Members of the Race to Resilience need to be able to monitor and measure their progress and to provide an evidence-based link between their actions and the ultimate campaign goal in terms of number of people whose resilience is increased.

The existing RtR metrics framework provides a methodological approach to tracking and assessing progress towards achieving the campaign's flagship goal. This paper provides supplementary guidance to support organisations seeking to measure the impact of their activities on the resilience of people living in vulnerable communities.

How can this paper help?

This paper showcases practical scenarios and real life case studies to assist a range of organisation types in understanding whether their activities are relevant to the Race to Resilience goal, and if so, how they can report against it in a simple, consistent and evidence-based way.

Definition

What is resilience?

Resilience is the capacity of social, economic, and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure while also maintaining the capacity for adaptation, learning and transformation.

IPCC Definition of Resilience, used by RtR

Campaign

Pledge, Plan, Proceed, Publish

RtR campaign asks their partners to:

- **Pledge** to commit to the goal
- **Plan**: develop and share a clear strategy
- **Proceed**: take immediate action
- **Publish**: publicly report progress

Taking this guidance on board ahead of making a **pledge**, creating a **plan** and deciding to **proceed** will facilitate the **publish** stage.



I am interested in becoming a member of the Race to Resilience - do my activities align with its goal?

To align with Race to Resilience, you must consider if the work you do contributes to the overall goal of making people more resilient to climate change. To assess this, you can review the resilience attributes from the Race to Resilience framework. The resilience attributes give a comprehensive review of the ways in which resilience and transformational change can be fostered. Does the work you are doing fit into these attributes? If so, you can align with the Race to Resilience. Read more about resilience attributes on page 12.

Will I be able to meet the reporting requirements for the 'publish' stage of the Race to Resilience?

To report on this work to Race to Resilience, your organisation must demonstrate that:

1. Your activities are chosen through a robust assessment and are responding to the needs identified.
2. There is a direct and measurable link between your actions and the resilience of vulnerable communities. You have a theory of change that articulates 'how' your actions increase resilience, and 'whose' resilience is increased.
3. Your actions are based on robust evidence of current and future climate risk, to build resilience and avoid maladaptation.

What are the practical steps I should take to be able to report on the outcomes and impact of our activities?

You must simply be able to define the direct link between your activities, their outcomes and the number of people living in vulnerable communities who will benefit as a result.

Resilience building activities will differ significantly between different organisation types and sectors, therefore the approaches to measurement may also differ, but the clarity on their direct contribution to the overall goal will not.

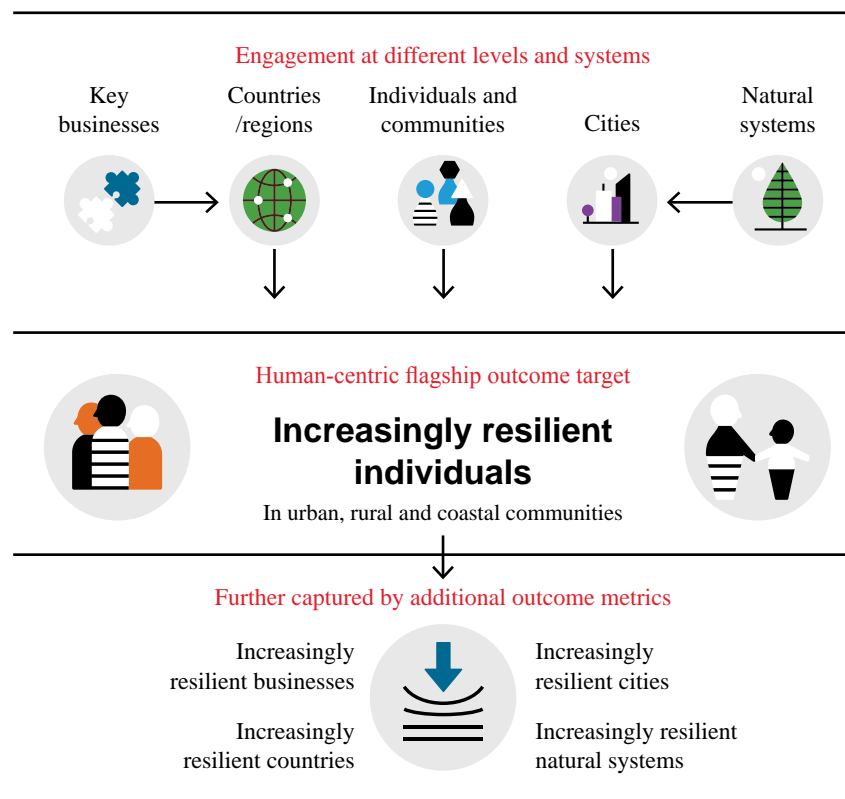
Therefore this paper presents a range of both hypothetical scenarios (grounded in anonymised but real examples) and real life case studies to 'show by doing' and generate actual numbers that could be reported.

RtR Metrics Framework



Overview

This section gives an overview of the Race to Resilience metrics framework, (as laid out in the 2022 paper from Billi, M. & Bórquez, R.) that is used to track and assess the progress of RtR partner initiatives towards the campaign's flagship goal of increasing the resilience of four billion people living in vulnerable communities¹.



After Billi & Bórquez (2022)

The RtR framework considers beneficiaries of resilience building activities in six categories: Individuals, Companies, Cities, Regions, Countries and Natural Systems. Individuals are the target beneficiaries of the campaign. However, RtR recognises that actions that target other beneficiary categories can be reported on provided they can demonstrate that they indirectly benefit individuals. This is expected of partners when reporting activities for all types of beneficiaries other than individuals. The relationship between the flagship goal and the beneficiary categories is demonstrated in the figure to the left.



The campaign collects this information through surveys of the partner and its members, a pledge statement on the number and type of beneficiaries they are targeting, and a plan statement on the actions they are putting in place to achieve the pledge. The purpose behind the metrics framework is to monitor the progress toward achieving the pledge.

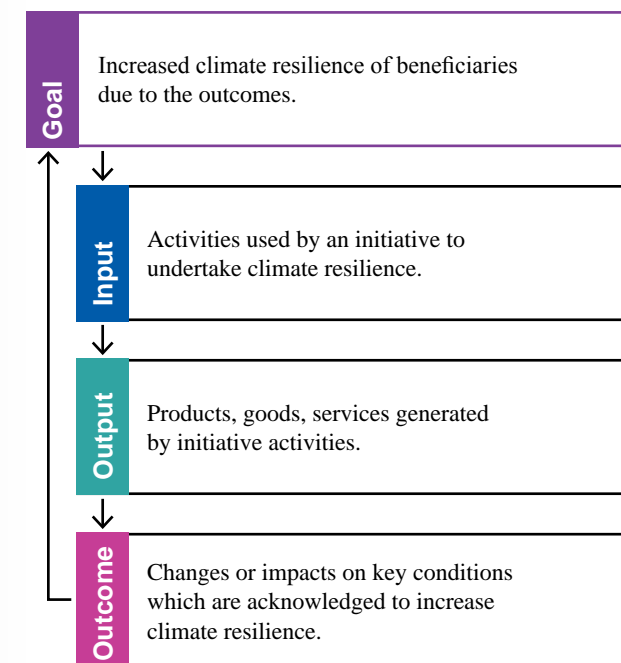
The campaign seeks to understand the inputs, outputs, outcomes and goals of RtR partners to track the progress of actions in delivering resilience to people.

Inputs are considered to be activities, projects, and resources mobilised by partner initiatives to promote climate resilience.

Outputs are considered products, goods, services, capacities, knowledge, and other tangible impacts generated by those (input) activities. Evidence is requested on the effective provision of outputs, which must be validated in the existing literature as effective strategies to pursue resilience.

Outcomes are considered to be changes or impacts on key conditions acknowledged to increase resilience (through resilience attributes). This needs to be backed by a robust causal understanding of how the change is expected to happen.

Goals are considered to be the impacts of the action with respect to increased resilience of beneficiaries, through delivery of the outcomes. In essence, this is the ultimate purpose of the action, and should align with the pledge made by each partner on entering the campaign. This is demonstrated in the figure to the left.



The Race to Resilience metrics framework builds upon a large body of work on measurement of resilience across academic and practitioner spheres. Significant progress has been made on ways to measure resilience over the past ten years. Two key wide-ranging reviews of resilience and adaptation measurement which provide useful guidance in the formulation of metrics to measure resilience and adaptation to climate change include the Overseas Development Institute's Resilience Measurement Frameworks and Approaches: A Bird's Eye View (2016)² and the National Academies of Science's Building and Measuring Community Resilience, Actions for Communities and the Gulf Research Program (2019)³. A brief summary of these is presented in the additional information at the end of the document.

Resilience attributes

The RtR campaign must work in a dynamic environment where measurement is challenging. Therefore, the framework allows resilience to be measured by proxy, through resilience attributes, and sub-categories, laid out in the figure below. Using these allows an action's impact to be qualitatively assessed.

As noted in the framework, if an action “can be demonstrated to: a) have an outcome on the resilience attributes of a beneficiary and b) this attribute operates in a domain in which a beneficiary is vulnerable to climate change, then it can be assumed that the action is increasing the resilience of the beneficiary to climate change” and reducing the risk the beneficiary faces.



Resilience Attributes
After Billi, M. and Bórquez, R. (2022)

Social collaboration

Collective organisation and action. The methods and means through which people, communities and social systems organise, partner and network to enable (or inhibit) cooperation, collaborative and collective action, knowledge sharing, including social and human capital, building relationships and governance systems.

Collective participation

Focuses on actions that promote sociability, comprehensive social relationships (intergenerational, between men and women, between different professions or trades), a sense of belonging, attachment and community identity.

Connectivity

Focuses on actions that contribute to the creation, improvement or promotion of collective encounters between individuals and social groups by facilitating the opportunities to meet (improving public transport, roads, internet, etc).

Coordination

Focuses on actions that contribute to the creation or promotion of social networks, groups or associations of individuals or social groups.

Learning

The capacity to generate, absorb and process new information and knowledge, including of how to respond and adapt to climate change and uncertainty (educational learning), and through personal and collective reflection on lived experiences and past failure to modify and adapt behaviours for future decision-making (experiential learning).

Educational learning

Focuses on actions that contribute to the people's capacity to generate, absorb, and process new information and knowledge about climate change adaptation options and ways to live-with and manage uncertainty.

Experiential learning

Focuses on actions that contribute to the ability to learn from and internalize past experiences and failures and to modify actions in the face of changes in order to avoid the repetition of past mistakes and exercise caution in future decisions.

Assets

The natural, financial, technological, infrastructure and service resources that exist as public or private goods and are accessible to people when needed.

Basic Services

Covers actions that contribute to creating and/or promoting emergency and social services.

Infrastructure

Covers actions that contribute to the construction, improvement and/or maintenance of sustainable or critical infrastructure in the face of climate risks and/or adaptation.

Technologies

Covers actions that contribute to creating or promoting technological mechanisms and tools for climate risk reduction and/or adaptation.

Natural Resources

Covers actions that contribute to promote the conservation and/or restoration of ecosystems and ecological services.

Finance

Covers actions that contribute to the creation and promotion of the use of financial tools for climate risk reduction and/or adaptation.

Agency

The individual or collective ability of people, communities, organisations, or other social systems, to exercise choice freely, modify procedures and plans, implement new ideas, and to self-organise in response to environmental changes, disturbances, or other changes.

Autonomy

Covers actions that contribute to developing ownership and free disposal of individual and collective resources of targeted beneficiaries.

Leadership

Covers actions that contribute to creating and promoting different types of social leadership and focuses on coordination and collaboration functions

Decision making

Covers actions that contribute to better individual and collective decision-making, promoting social participation in the process and definition of decisions.

Equity and Inclusivity

The just and equitable distribution of, and access to, resources; the respect of equal and basic rights in decision-making; and the inclusive integration of all variety of affected actors and discourses in decision-making processes.

Distributive Equity

Covers actions that contribute to social equity through effective economic distribution and/or access to fundamental rights such as education, health, energy and water.

Equity of Access

Covers actions that contribute to the social integration of historically marginalized groups and vulnerable groups in the face of climate change.

Preparedness and Planning

Ability to anticipate, prepare and plan for, and respond to, change and uncertainty.

Planning

Identifies actions that contribute to the ability to plan for change and uncertainty by developing strategic short, medium and long-term planning in order to prevent and minimize climate risks and increase adaptation capacity.

Preparedness

Identifies actions that contribute to the ability to anticipate and prepare for change and uncertainty by shaping responses, preventing actions, and monitoring hazards and climate risks

Flexibility

The capacity to switch between coping mechanisms and adaptation strategies, actions, and management structures based on change and new knowledge. It captures the diversity, robustness and redundancy of different strategies.

Redundancy

Focuses on actions that contribute to creating or promoting services that overlap others to be alternative means in the face of sudden and uncertain changes, disturbances or degradation.

Diversity

Focuses on actions that contribute to increasing and/or preserving the diversity of strategies available for the production of social and ecological services, products and processes and/or incorporating a variety of actors and experiences in the activities that the partners and their members develop.



Read this if...

..you are a private sector organisation who wants to report on how your product, goods or services are increasing the resilience of people living in vulnerable communities.

Businesses have a big part to play in increasing people's resilience to climate change. As outlined in the Sharm-El-Sheikh Adaptation Agenda⁴, for sufficient progress towards adapting to climate change to be made, businesses must accelerate action and collaborate with regions, cities, investors and civil society.

This collaboration means a common vision and common metrics, whereas often businesses report to their own particular vision and objectives, and whilst societal benefits are often part of a businesses environmental, social, and corporate governance strategy for example, there are not always direct links made between the products, goods or services that a business provides, and the number of people whose resilience is enhanced through their provision.

There are two well-known methodologies that many private sector organisations are already reporting against. These are the [Task Force on Climate-Related Financial Disclosures \(TCFD\)](#), and the [Taskforce on Nature-related Financial Disclosures \(TNFD\)](#).

TCFD is designed to “promote more informed investment, credit, and insurance underwriting decisions”, in turn enabling stakeholders to “understand better the concentrations of carbon-related assets in the financial sector and the financial system's exposure to climate related risks”⁵. This exposure to climate risks gives an insight into the resilience of the business but does not measure resilience (or improved resilience) directly. Businesses reporting to TCFD disclose governance, strategy and risk management information, along with the metrics used to assess and manage climate related risks⁶. There is a degree of flexibility within the metrics suggested under the categories. Under the Capital Deployment metric category, the current suggested metrics include “Investment in climate

adaptation measures (e.g., soil health, irrigation, technology)”⁷. The outcomes of such investments could be linked to the overall goal of the Race to Resilience although doing so is beyond the TCFD requirements.

TNFD, a newer reporting methodology gaining traction with businesses across the world was established to address the need to factor nature into financial and business decisions⁸. It does not directly measure number of people made more resilient to climate change, but contained within the suggested assessment metrics are a small number of indicators that could align with reporting to the RtR framework. These sit under ‘Ecosystem service assessment metrics’⁹.

Case Study

Electrical grid infrastructure owner, National Grid, trials new technology

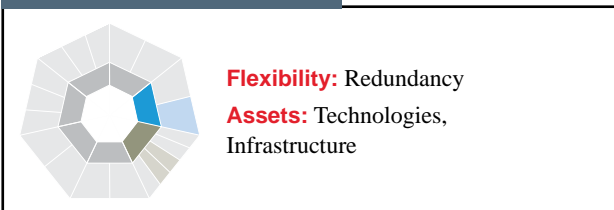
National Grid¹⁰ is one of the world's largest energy providers with a vision to be at the heart of a clean, fair and affordable energy future.

There are over 29,000 employees across the UK and US working on a wide portfolio of energy networks and assets. In addition to their own commitment to reduce greenhouse gas emissions to net zero by 2050, they are working with governments and regulators to assist them in meeting their carbon reduction targets. At the heart of these commitments to achieve clean, affordable, and reliable energy are the National Grid customers. Every year National Grid invests and tests innovative technologies to address complex challenges facing the industry such as extreme weather events driven by a changing climate.

An example currently being deployed onto National Grid's electricity distribution networks in New York and Massachusetts is called Fault Location, Isolation and Service Restoration (FLISR). The leading cause of outages for most electric utilities is caused when vegetation, such as fallen trees or branches encounter a live conductor, causing a fault in the circuit. These faults typically impact all the customers on the entire circuit, but with FLISR installed, the circuit can self-identify the exact location of the fault and automatically restore service to unaffected remaining customers. In a recent incident in upstate New York, a metallic balloon drifted into a substation causing a widespread outage. The circuit with FLISR installed was able to automatically restore all customers in under 5 minutes, while the remaining circuits required manual inspection and restoration procedures.

National Grid's goal is to have FLISR installed on most of the distribution network in the US by 2030, although they are currently in the early stages of testing. FLISR technology will provide greater reliability for their customers. For the most vulnerable customers reliable energy provision is absolutely essential during severe weather events.

Race to Resilience attributes



The authors would like to acknowledge the contribution of Resilience First, a RtR partner, in sourcing this case study.



Key information

Organisation type: Infrastructure provider.

Action cluster: Climate-proofing infrastructure and services.

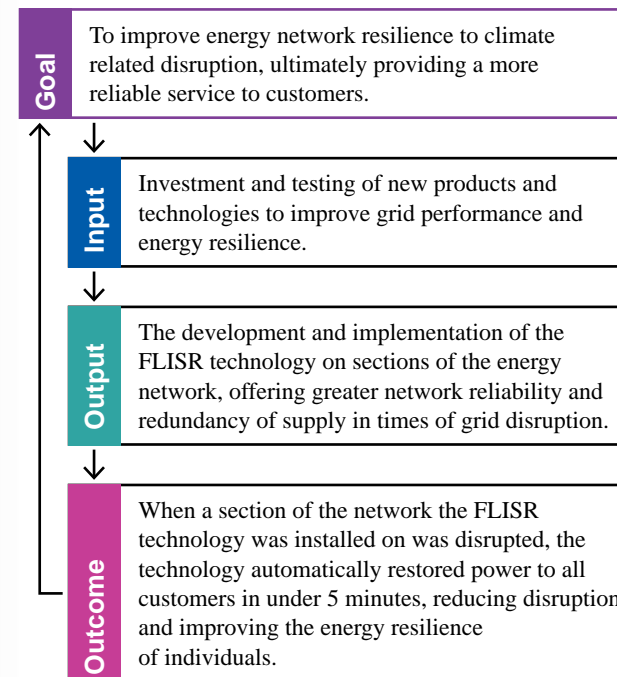
Contribution to flagship goal: *Direct.* National Grid is investing in and trialling new technologies to improve the resilience of the energy network to climate related disruption. The continued testing, trialling and planned roll out of this technology will enable National Grid to improve its continuity of service to its large customer base in the face of climate disruption.

Indicator: Total customer base served by network sections with Fault Location, Isolation and Service Restoration (FLISR) technology installed, who only experience short-term disruption when a fault occurs.

Indicator purpose: To track the effectiveness of the technology in delivering energy resilience to end users.

How does it connect to RtR? Energy infrastructure is critical to resilience at the household level, particularly for vulnerable people. Through investing in technologies to reduce the impact and expedite the recovery and reconnection of service when disrupted by climate related events, National Grid is providing energy network climate resilience as a proxy for the individual resilience of its customers.

Sharm-EI-Sheikh Adaptation Impact Systems: Infrastructure systems.





Hypothetical Scenario

Social Enterprise makes products from reclaimed waste

A social enterprise company offers both employment and training to the informal work sector, through waste capture and technical training in the repurposing of waste materials into goods, and in the setting up microbusinesses to sell and market the goods produced. The social enterprise markets their ecosystem restoration, or waste capture services to the public and private sector to provide a primary avenue of employment. Subsequently, as waste materials are captured and employees are trained in repurposing them into goods, employees can diversify their livelihoods through the creation of microbusinesses.

Organisation type: Social Enterprise.

RtR Action cluster: Diversification of livelihoods and social economy.

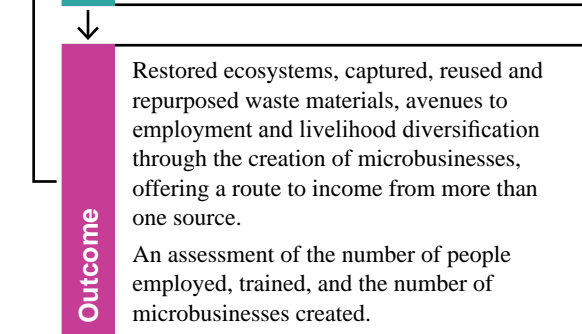
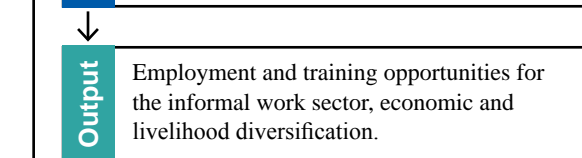
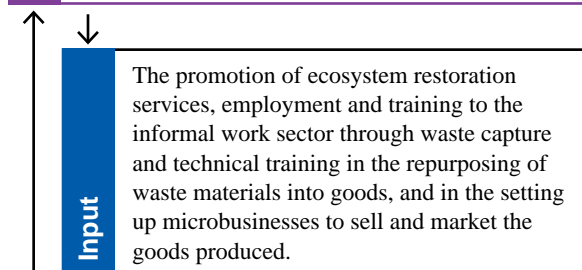
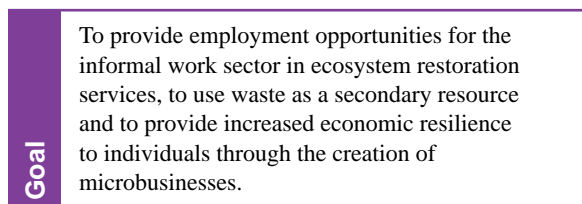
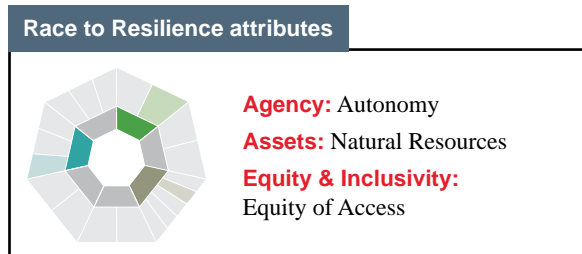
Contribution to flagship goal: *Direct.* Through providing an avenue to employment and training, workers livelihoods are diversified and their economic resilience is improved.

Indicator: Number of people employed, trained and number of micro-businesses created.

Indicator purpose: To measure the number of people whose livelihoods have improved and diversified.

How does it connect to RtR? Providing increased opportunities for workers in the informal sector to be employed and trained in the use of waste as a secondary resource means that their resilience is improved through diversified livelihoods and increased economic resilience.

Sharm-El-Sheikh Adaptation Agenda Impact System: Human Settlement Systems.



Hypothetical Scenario

Telecommunications operator upgrades network

A telecommunications company has invested in system upgrades to adapt their network to climate change and respond to climate risk after experiencing disruption to their communications infrastructure, which serves rural coastal communities, from a storm weather event and freezing temperatures.

Organisation type: Infrastructure provider.

RtR Action cluster: Critical infrastructure and protective systems.

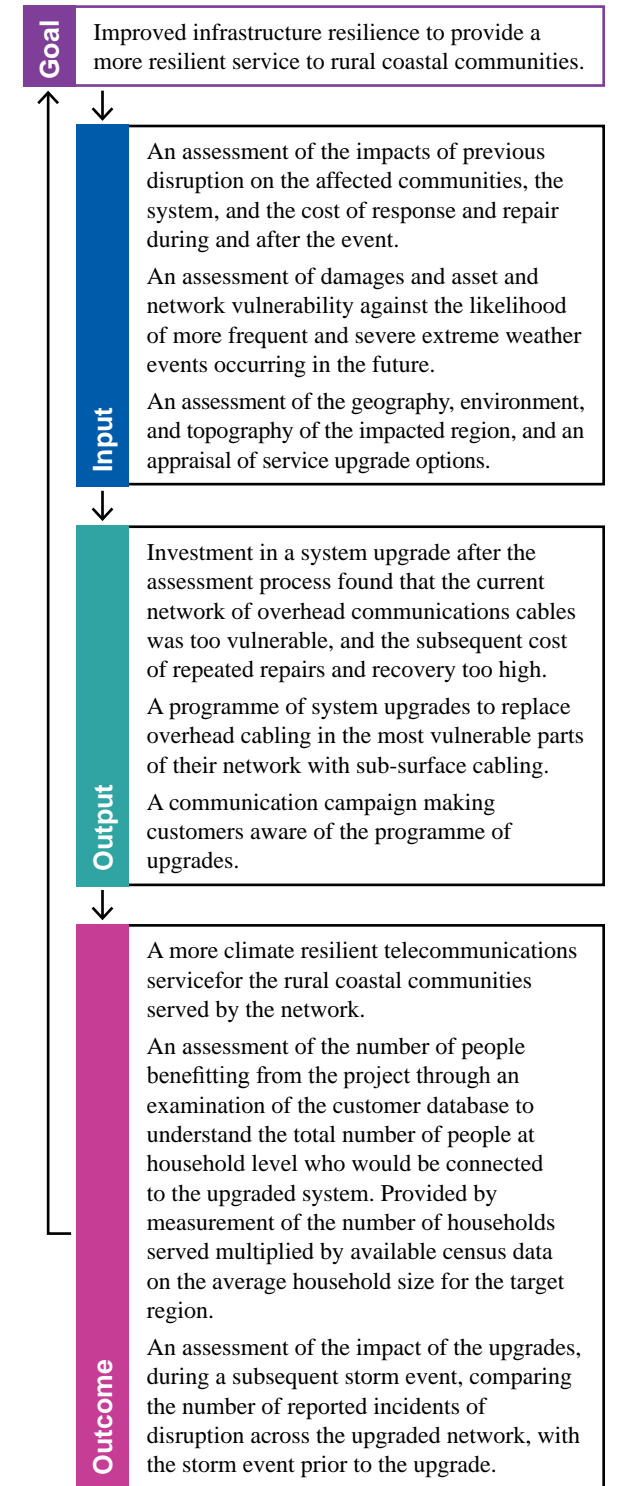
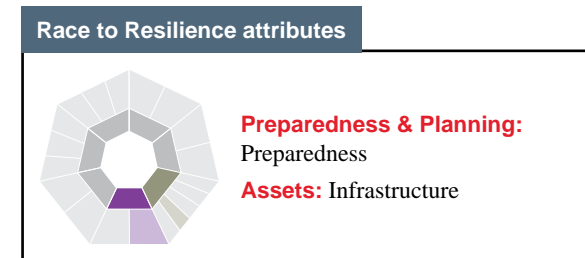
Contribution to flagship goal: *Direct.* Delivered through planning and preparedness activities to upgrade and adapt a telecommunications system to increased climate risk, reducing the risk of disruption to end users located in rural coastal communities.

Indicator: Number of households connected to upgraded system. To avoid double counting properties owned by more than one individual, or that fell under the same name, are only accounted for once.

Indicator purpose: To track the number of people in rural coastal communities who are connected to an upgraded, climate proofed telecommunications system.

How does it connect to RtR: Household level resilience provided by increased resilience of an infrastructure provided system to climate risk, minimising disruption to end users.

Sharm-El-Sheikh Adaptation Agenda Impact System: Infrastructure systems.





Read this if...

...you are non-governmental organisation who wants to report on how many people you are making more resilient.

Non-governmental organisations (NGOs) encompass a huge range of organisations and the beneficiaries of their resilience-building activities include individuals, communities natural systems, cities and countries.

One relevant reporting framework for NGOs focused on individuals is that from the UK Government's International Climate Finance Key Performance Indicators, particularly Key Performance Indicator (KPI) 1 (Number of people supported to better adapt to the effects of climate change as a result of International Climate Finance (ICF)¹¹) and KPI 4 (Number of people whose resilience has been improved as a result of ICF¹²). Depending on the organisation, and type of project, these indicators could also be used by regional governments or other non-State actors.

KPI 1 measures the reach of programmes, counting the number of people who have been supported to “prepare for and deal with the effects of climate change, including long-term changes in weather patterns and the increasing frequency and severity of extreme weather events”¹³. KPI 1 is designed as an output indicator, not an outcome indicator, i.e. it does not measure the success, effectiveness, or impact of the support.

The indicator has steps that can guide any approach for reporting on number of people made more resilient. These include:

- Consider whether all or part of a programme constitutes climate change adaptation,
- Collect direct beneficiary data from partner management information systems and collect data on indirect beneficiaries through surveys,
- Categorise beneficiaries in terms of whether they are targeted (i.e., receiving direct support they are aware of),
- Categorise beneficiaries in terms of the intensity of support they receive (i.e., low being e.g., people within a catchment area subject to a water resources management plan, medium being e.g., people receiving extreme weather forecasts by text, and high being e.g., people whose housing that has been raised on plinths or cash transfers)
- Count the number of direct beneficiaries (targeted with high intensity)
- Count the number of indirect beneficiaries (targeted with medium or low intensity)
- Convert household data into total number of people if necessary, and
- Report disaggregated data (e.g., on gender).

KPI 4, which is an outcome type indicator, is designed to measure the number of people with improved climate resilience as a result of support. It is not a measure of absolute resilience¹⁴. When used with KPI 1, KPI 4 assesses the total number of people with improved climate resilience. KPI 4 does not measure climate resilience directly, rather, it measures the number of people with improved capacity to adapt, anticipate and/or absorb climate-related shocks and stresses¹⁵. This aligns directly with the Race to Resilience metrics framework.

A key part of the KPI 4 process is data collection through survey questionnaires. Programmes are required to construct the questionnaire, set a sampling frame, and survey the beneficiary population to ascertain the change in resilience. As part of the process a baseline survey needs to be taken which reflects pre-intervention data, and at least one follow-up survey to measure progress which can be built into the programmes' monitoring and evaluation activities¹⁶. An extra step is taken to account for counterfactual analysis. This is based on subtracting the projected level of number of people made more climate resilient without intervention from the total¹⁷, to determine impact.

Case Study

Ocean Risk and Resilience Action Alliance and their partners deliver resilience-building activities

Launched at the UN Secretary General’s Climate Action Summit in September 2019, the Ocean Risk and Resilience Action Alliance (ORRAA) is the only multi-stakeholder alliance that brings together insurers, banks, governments, multilateral organisations, academia, and civil society to drive investment into finance and insurance products that deliver resilient coastal communities and regenerate nature.

ORRAA’s mission is to drive USD\$500 million of investment into coastal and ocean natural capital by 2030, positively impacting the resilience of at least 250 million climate vulnerable people in coastal areas around the world. ORRAA joined the RtR campaign in 2021. ORRAA’s mission is delivered through their three priority pathways: financial innovation, science and research and, policy and governance. ORRAA’s existing Monitoring, Evaluation and Learning (MEL) framework¹⁸ enables reporting to the RtR campaign’s flagship goal of making 4 billion people more resilient to climate change. Within the framework there are two indicators which speak directly to accounting for number of people made more resilient. These are (1) a mandatory indicator of the people supported by ORRAA, and (2) a non-mandatory indicator of the number of people made more resilient.



The first indicator is designed to measure the total number of people who have received support as a proxy for building resilience, distinguished from the second which measures where that support that explicitly improves resilience of a reported population. The rest of this scenario focuses on the second indicator. Two examples are presented of the work of ORRAA’s partners the Mesoamerican Reef Fund and Rare where they have measured this indicator.

The authors would like to acknowledge the contribution of the Ocean Risk and Resilience Action Alliance, a RtR partner, for these case studies.

Race to Resilience attributes



- Preparedness & Planning:** Preparedness, Planning
- Equity & Inclusivity:** Equity of Access
- Flexibility:** Redundancy
- Assets:** Finance, Natural Resources

Key information

Organisation type: A multi-stakeholder convener.

Action cluster: Establishment of effective governance to manage climate risks accompanied by human and institutional capacity-building.

Contribution to flagship goal: *Direct.* Details differ in each project - see overleaf for two examples.

Indicator: Number of people more resilient.

Indicator purpose: To measure whether ORRAA support improved the resilience of people to ocean related risks.

How is it reported and how often? This indicator is reported as an outcome through a final report of an activity or project.

How does it work? ORRAA does not prescribe a particular methodology to this indicator to measure improvements in resilience, but they do require that certain mandatory and preferred reporting conditions are met. It is considered mandatory that; shocks and stresses are monitored and measured, resilience is operationalised as capacities and or well-being variables are measured in relation to shocks and stresses, base and end line data is collected, and counterfactual analysis is performed¹⁹. It is considered preferred that; a randomised control trial is carried out; external or independent, peer reviewed evaluation is carried out; environmental, ecological aspects are captured, and; mixed methods identify and explain causal mechanisms²⁰.

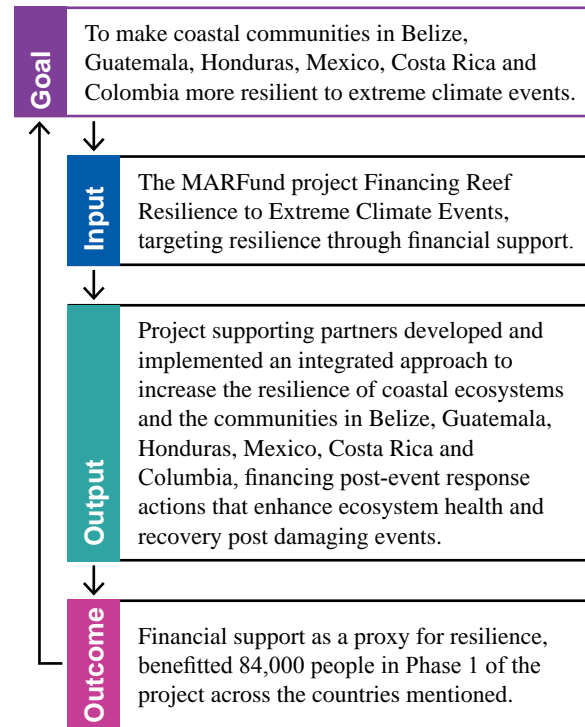
These requirements combined with the instructions on data source and collection work to give integrity to the level of built resilience, and to the number of people who have benefited from it.

Where does the data come from? Under this indicator, data is collected either by external or independent researchers or evaluators, or by implementing organisations with their own MEL capabilities. Data can be collected through surveys or direct observations of a representative end user group. Household, individual, or other data can feed into reporting to this indicator. As per the overall indicator above, data on household size should be determined from the most recent census data or representative household survey and if collected at household level, the number of households should be multiplied by the average household size. Disaggregation by male, female or other is also required under this indicator, and may be estimated based on the best available composition data concerning the relevant populations.

Sharm-El-Sheikh Adaptation Agenda Impact System: Human Settlement Systems; Coastal & Ocean Systems; Cross-cutting enablers: Planning and Finance.

Mesoamerican Reef Fund

Mesoamerican Reef Fund (MARFund)²¹, a current ORRAA and RtR campaign member evidenced through their project titled: Financing Reef Resilience to Extreme Climate Events that they had been providing support, as a proxy for building resilience to over 84,000 people (in Phase 1) living in Belize, Guatemala, Honduras, Mexico, Costa Rica and Colombia. The level of support the Government of Canada and UK Department for Environment, Food & Rural Affairs (Defra) provided was considered (High/Medium) and it was targeting resilience through financial support. The impacted population were aware of the support they had received because the project's supporting partners namely WTW²², Caribbean Biodiversity Fund²³, Forever Costa Rica Association²⁴, Fondo Acción²⁵, InsuResilience Solution Fund²⁶, KfW²⁷ UNDP/ISGAP²⁸ and AXA Climate²⁹ had developed and implemented an integrated approach to increase the resilience of coastal ecosystems and the communities (in the countries listed above) through financing post-event response actions that enhance ecosystem health and recovery after damaging events.

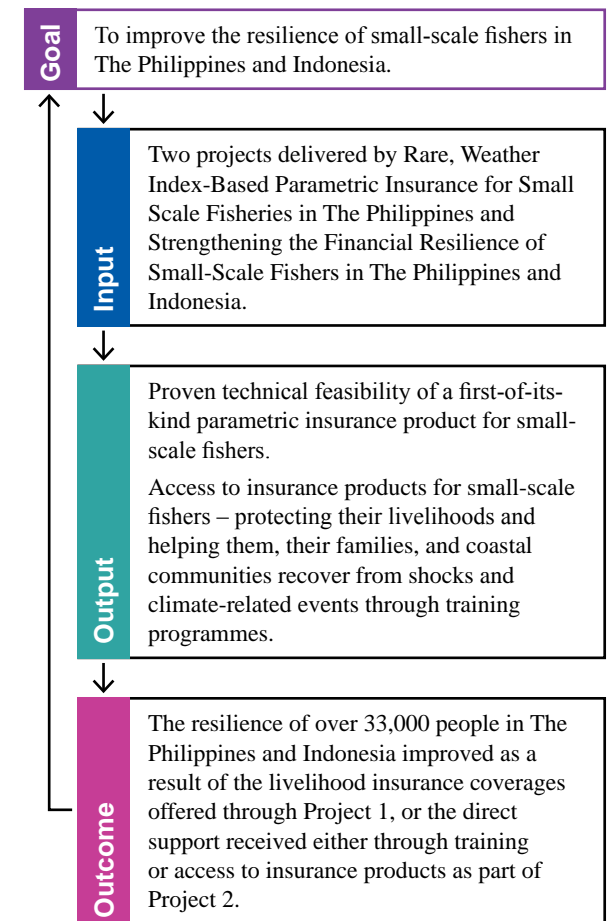


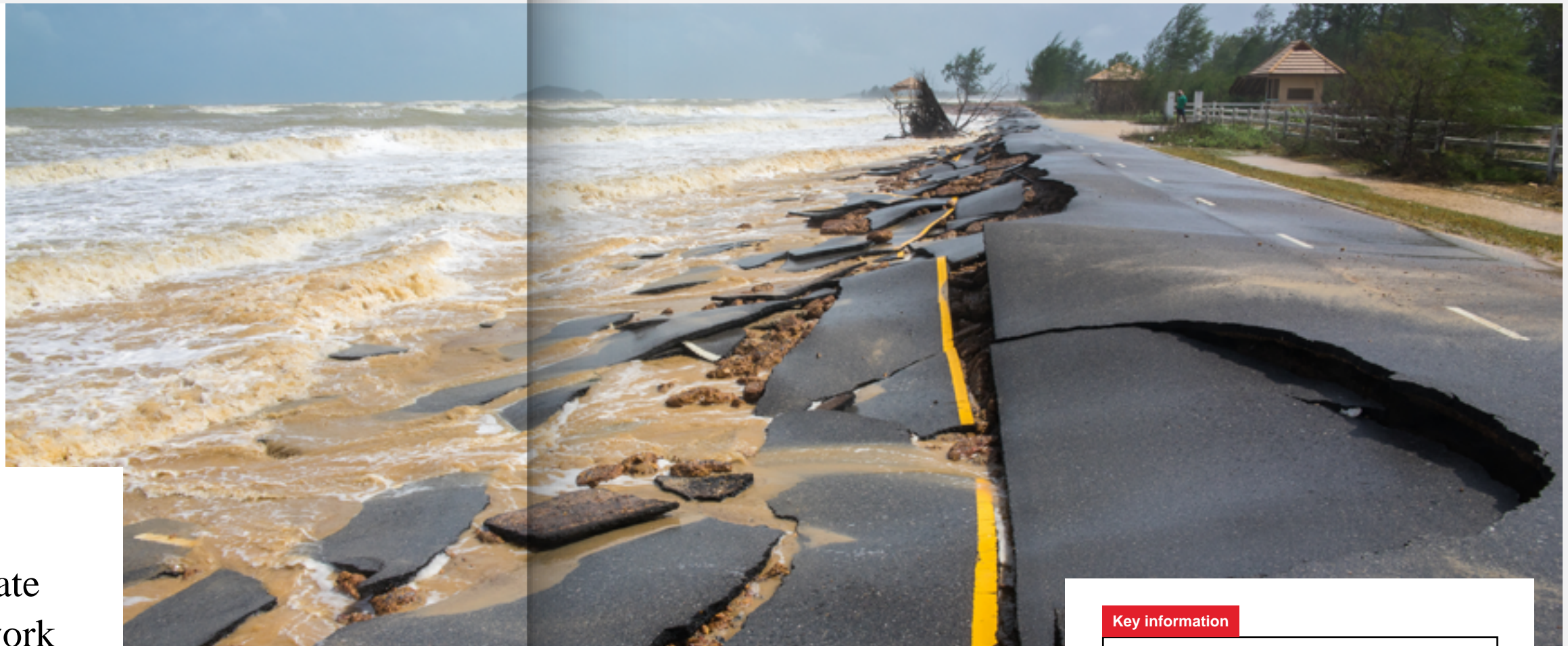
Rare

Rare³⁰, a current ORRAA and RtR campaign member delivering projects titled Weather Index-Based Parametric Insurance for Small Scale Fisheries in The Philippines and Strengthening the Financial Resilience of Small-Scale Fishers in The Philippines and Indonesia were able to report that they had improved the resilience of over 33,000 people in The Philippines and Indonesia. The Government of Canada, UK Defra and WTW could justify that they were operationalising resilience through two projects. Project 1, Weather Index-Based Parametric Insurance for Small Scale Fisheries, demonstrated the technical feasibility of a parametric insurance product indexed to bad weather conditions. This prevents unsafe fishing using actuarial analysis of independent weather data which combines three identified weather parameters into the insurance product which will then provide payments to the fishers in local currency when the policy is triggered. Project 2, Strengthening the Financial Resilience of Small Scale Fishers, gives small-scale fishers access to insurance products. It protects their livelihoods and helps them, their families, and coastal communities recover from shocks and climate-related events. This was done through training programmes where data was collected through feedback mechanisms and recording participation and enrolments. Both projects were concerned with addressing the shocks and stresses associated with severe weather and climate change, by improving the livelihoods of small-scale fishers.

During Project 1 a total of 4079 people were directly enrolled in one of the livelihood insurance coverages offered and in the case of Project 2, a total of 4065 were directly supported either through training or access to insurance products. Both figures were multiplied by the average number in a family which is 4.1.

By reporting according to the ORRAA guidelines Rare were able to successfully showcase that they had made a tangible difference to the resilience of individuals, and report with confidence into the RtR campaign.





Case Study

PIARC, the World Road Association publishes Climate Change Adaptation Framework

PIARC, also known as the World Road Association, is a non-profit organisation established in 1909 to improve international co-operation and to foster progress in the field of roads and road transport.

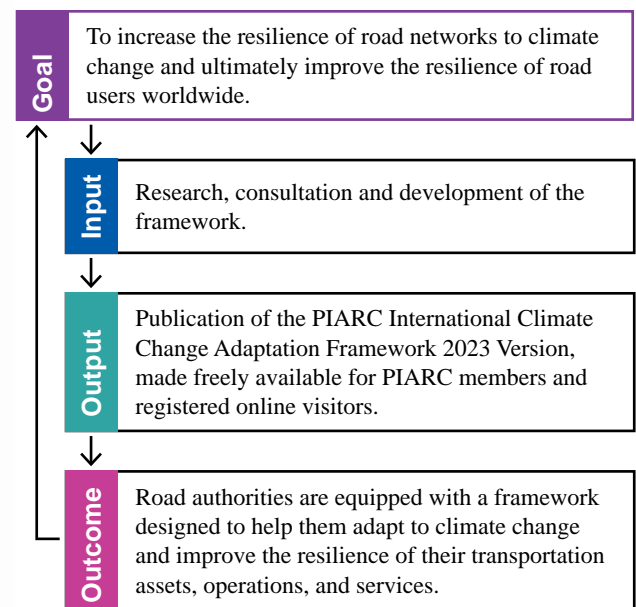
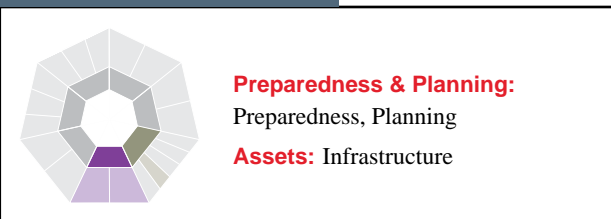
An example of PIARC’s work supportive of resilience is the ‘PIARC International Climate Change Adaptation Framework 2023 Version’³¹. This report is intended for use by institutions such as road authorities who are responsible for providing resilient road networks, including ‘assessing needs and possibilities, assessing vulnerability and risk, possible adaptation measures and their implementation in a sustainable working process’³².

The framework has been designed to be applicable for all PIARC member countries, regardless of the level of maturity of the road authority using the framework. The document provides practical examples, case studies, and allows users to tailor their assessments according to the specific needs of the road organisation³³. The framework supports organisations to understand their needs, identify resources, find data and put forward an action plan³⁴.

The framework was presented at the PIARC World Road Congress, Prague, Czech Republic in October 2023 which was attended by over 4,000 delegates and 2,000 students. Guidance such as this is designed to assist decision makers in High- and Low-Middle Income countries, to influence and encourage the implementation of adaptation. It has the potential to have a resilience impact on a large scale, although it is difficult to measure the number of people made more resilient as a result.

The authors would like to acknowledge the contribution of the International Coalition for Sustainable Infrastructure, a RtR partner, in sourcing this case study.

Race to Resilience attributes



Key information

Organisation type: Non-profit international member organisation.

Action cluster: Critical infrastructure and protective systems.

Contribution to flagship goal: *Indirect.* Through promoting resilience and adaptation to climate change through an implementation framework, PIARC are helping road authorities take steps to improve their road infrastructure resilience, and ultimately improve the resilience of the services they provide to end users. Road users are made more resilient indirectly through the availability of a more climate resilient road network.

Indicator: Number of downloads and citations per year, and category of reader (if possible).

Indicator purpose: To track the number and type of organisations accessing the knowledge and hence develop a proxy understanding of the reach of the implementation framework.

How does it connect to RtR? The PIARC framework enables road authorities to identify, assess and implement adaptation measures to adapt sections of the road network to climate change. They can *indirectly* benefit a great number of people through providing best practice on adapting road infrastructure to climate change, ensuring that road networks remain operational in the face of climate change, benefitting the resilience of road users.

Sharm-El-Sheikh Adaptation Impact Systems: Infrastructure Systems.



Hypothetical Scenario

Charitable organisation trains farmers to adapt to climate change

A charitable organisation carried out a programme working with farmers to adapt seasonal farming practices to climate change, enabling them to be productive despite greater seasonal variability. To assess the impact of the training and grant funding on individual resilience to climate change, a representative sample of beneficiaries was surveyed to understand whether they perceived that their climate resilience had improved because of the programme. The work also indirectly benefited people employed in the supply chain including agricultural workers and people employed in freight and food processing. A representative sample of people employed within two nodes of the farm value chain was surveyed to assess who benefitted from the programme.

Organisation type: Charity.

RtR Action cluster: Actions in agricultural, livestock, forestry, and aquaculture practices.

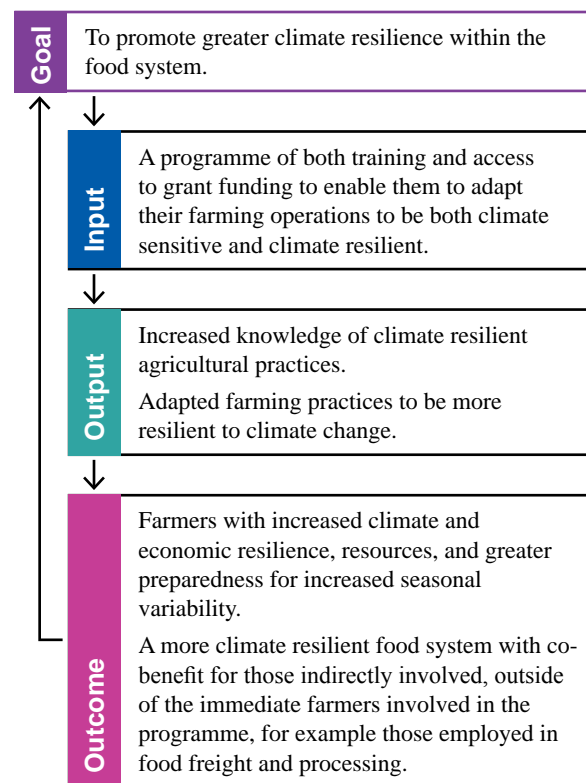
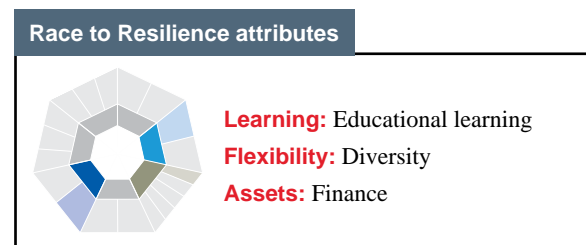
Contribution to flagship goal: *Direct:* Through training and funding farmers to adapt agricultural practices to climate change. *Indirect:* A more resilient agricultural system can indirectly benefit many people who are involved in the agricultural value chain beyond farming, and in society as whole.

Indicator: *Direct:* the number of farmers trained and funded as part of the programme. *Indirect:* the number of people supported by a more resilient agricultural system within two nodes of the supply chain.

Indicator purpose: *Direct:* to report the number of farmers who have received training and funding as part of the programme. *Indirect* – to track the number of indirect beneficiaries of the programme.

How does it connect to RtR?: Adaptation of agricultural practices to climate change, promoting a more resilient food system, increasing economic resilience of farmers and resilience within the wider food system.

The Sharm-El-Sheikh Adaptation Agenda Impact System: Food and Agriculture Systems.



Hypothetical Scenario

Research Institute pilots tools on climate change impact on fish stocks

A research institute researched and developed a tool to assess and map the impact of current and future global sea level and temperature rise on fish stocks in five locations. As part of the project, the research team worked with commercial inshore fishers to record and monitor their catch levels over a five-year period. Catch volume and species were recorded. The research team analysed the data to assess changes in the type and quantity of species caught. They mapped the changes, including the number of migratory fish species caught in locations out of season and increases in non-native species not normally caught in that location. The trends observed over the five-year period were analysed against predicted changes in sea level and temperature rise over time. The output of the tool was then brought to government ministries responsible for managing fisheries policy and to industry. The tool was subsequently made available as a free web platform for inshore fishers, enabling them to both continue to report their catches and to better understand predicted changes in fish stocks.

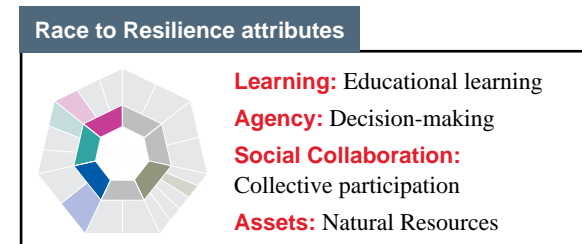
Organisation type: Research institute.

RtR Action cluster: Research and collaboration actions.

Contribution to flagship goal: *Direct:* The web-based tool enabled inshore fishers to both capture and access information to inform their decisions and adapt practices.

Indirect: Through influencing policy and regulation within the fishing industry the outputs of the research programme enabled better long-term sustainable management of fish stocks and subsequently increased the resilience of the people who work in the inshore fishing industry and rely on healthy fish stocks for their livelihoods.

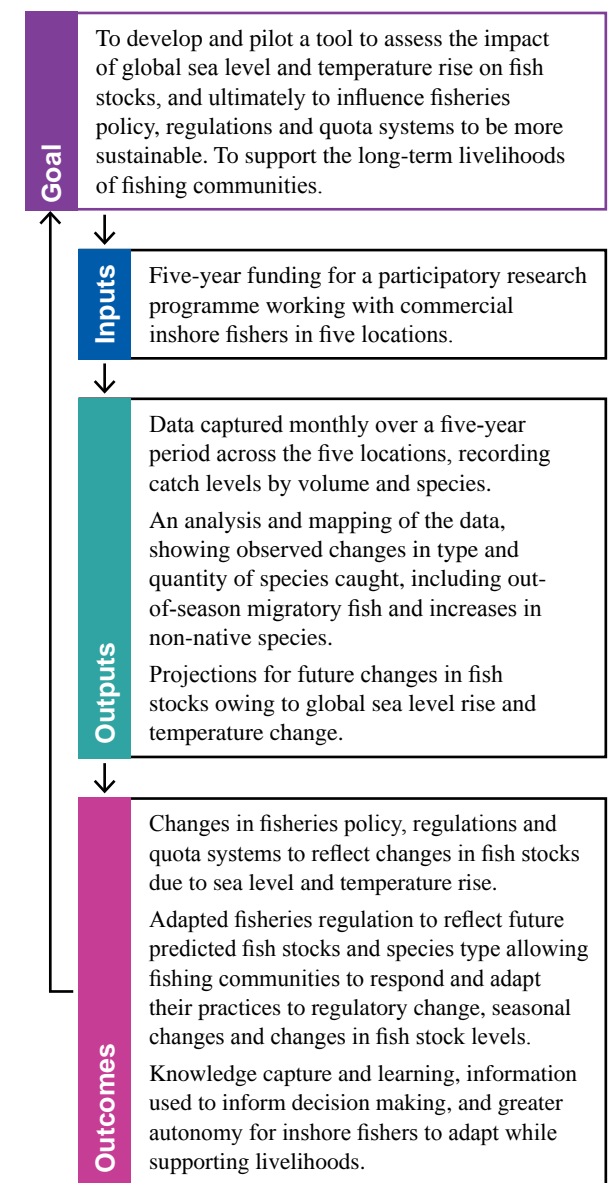
Indicator: Number of registered active users of the web-based platform, by occupation, gender, age and location.



Indicator purpose: To track the reach of the platform and understand the type of user accessing or inputting information.

How does it connect to RtR?: By influencing change at the policy and regulation levels and providing open access to information, this research impacts at national, regional and local levels. Through developing understanding which enabled more sustainable fisheries management, the project indirectly benefits the resilience of the communities that rely on sustainable and healthy fish stocks.

Sharm-El-Sheikh Adaptation Agenda Impact System: Coastal & Ocean Systems.



Sub-national governmental organisations



Read this if...

...you are a government organisation, working at sub-national level (e.g. cities or regions) seeking to report the impacts of your resilience building activities on people living in vulnerable communities.

This section explores methodologies relevant to reporting on people's resilience and how they may be of assistance to reporting to the RtR campaign. It showcases real-life and hypothetical scenarios that bring this reporting to life.

The reporting methodology attached to the [Sustainable Development Goals](#) (SDGs), encompasses 231 indicators around the 17 Goals and 169 targets. It makes reference to individual-level data, but is not focused on resilience, or to numbers of people made more resilient to climate change³⁵. There are indicators, however, that could be used to guide some aspects of reporting on individuals made more resilient. These indicators work to track progress against the SDGs, by measuring increases or decreases in the number of people.

For example, if a non-State actor such as a rural local or regional authority commissioned a roads improvement project due to changes in seasonal weather patterns, indicator 9.1.1 'Proportion of the rural population who live within 2km of an all-season road', which supports goal 9 'Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation'³⁶, could be used as guidance in reporting numbers of people made more resilient to climate change through that project. Regional population data overlayed on the new or upgraded road networks could be used to support this indicator.

The [City Resilience Index](#) (CRI), which evaluates cities' relative resilience performance over time, includes 156 qualitative metrics and 156 quantitative metrics on which a city can score itself. The quantitative metrics are designed to allow a baseline to be established as a measure of their performance³⁷. As such, the measurement tools attached to the CRI process³⁸ can assist reporting on individuals made more resilient, identifying relevant measurements and data sources within the metrics.

The [Global Urban Monitoring Framework](#)³⁹ is another indicator-based methodology, which draws indicators from the SDGs, New Urban Agenda, City Prosperity Index and others. It could assist in reporting on individuals made more resilient. The framework is divided across domains and city objectives. The domains consist of society, economy, environment, culture, and governance and implementation, and the city objectives include: safe and peaceful, inclusive, resilient, and sustainable⁴⁰. The Framework also provides the applicable data sources per indicator to assist in reporting. This could be a useful resource in reporting to the RtR campaign, particularly when developing a measurement strategy for projects and identifying data sources to report from.

Other helpful methodologies exist, such as the [Global Adaptation Progress Tracker](#) (GAP-Track)⁴¹, although this is focused on other aspects of climate change resilience and not on quantifying numbers of people made more resilient through adaptation related activities.

Case Study

Infrastructure Victoria advise regional government on adaptation



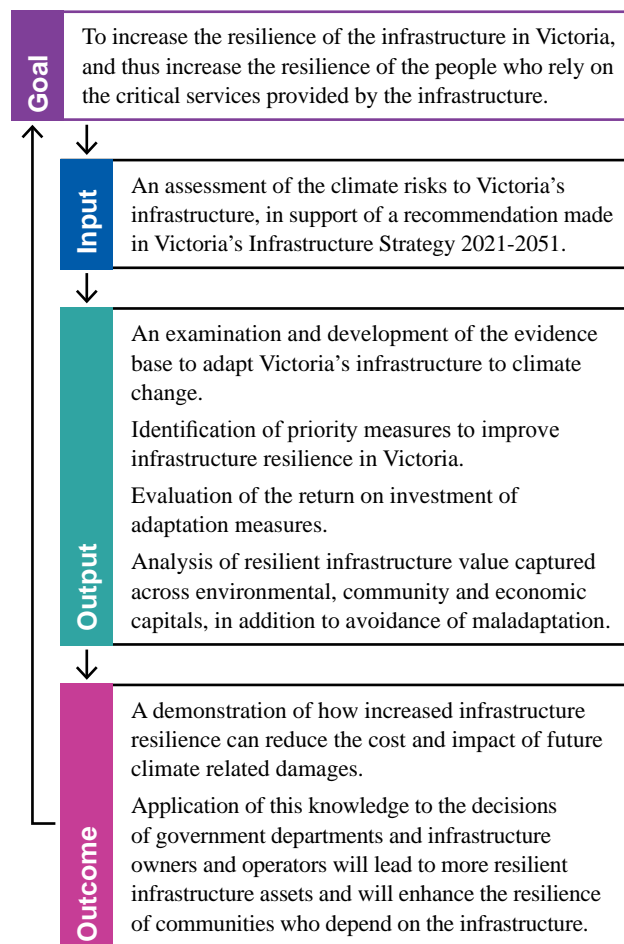
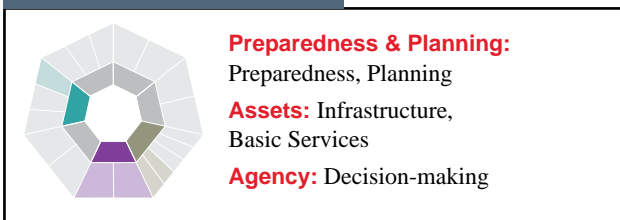
Infrastructure Victoria is an independent advisory body that prepares a 30-year infrastructure strategy for the state of Victoria, Australia.

It also provides written advice to government on specific infrastructure matters, and it publishes original research on infrastructure related issues and supports government departments and agencies in the development of sectoral infrastructure plans⁴².

Infrastructure Victoria's work covers topics which concern both climate adaptation and resilience in relation to infrastructure. Their independent voice works to influence change at the policy level, and their research informs strategy. An example of an Infrastructure Victoria activity is on the right.

The authors would like to acknowledge the contribution of the International Coalition for Sustainable Infrastructure, a RtR partner, in sourcing this case study.

Race to Resilience attributes



Key information

Organisation type: Advisor to regional government.

Action cluster: Climate-proofing of infrastructure and services.

Contribution to flagship goal: *Indirect.* Through enabling better decisions, it has the potential to enhance the resilience of many people that depend on climate resilient infrastructure, application of this guidance will enhance the climate resilience of infrastructure.

Indicator: Number of downloads and citations per year, and category of reader (if possible).

Indicator purpose: To track the number and type of organisations accessing the knowledge and hence develop a proxy understanding of the decisions.

How does it connect to RtR? Economic assessment carried out by Infrastructure Victoria assesses the direct, indirect tangible and intangible costs and benefits of adaptation to the community. Therefore the contribution of this example is classified as indirect.

Sharm-EI-Sheikh Adaptation Impact Systems: Infrastructure systems.





Hypothetical Scenario

Regional Government trains partners to prepare for disasters

A regional government has worked with local authority, emergency response and infrastructure partners, businesses, community, grassroots, and voluntary organisations, to establish and run participatory community resilience training and exercising programmes as part of a regional climate adaptation plan. They engaged a wide and diverse representative base of the community in the programme, empowering and engaging communities across the region in activities and actions to improve their own resilience, and ultimately, to enable the regional government to concentrate resources and services delivered in crises to those most in need.

The programme delivered community resilience plans, resource mapping, training, and exercising, and provided additional layers of social infrastructure to be enacted in response to climate risk events. The forums created through the programme increased collective participation, connectivity and coordination among community members, local authority, infrastructure and emergency response partners, and businesses.

An assessment of the number of direct beneficiaries actively engaged in the community resilience programme and the direct beneficiaries extending beyond the representative members engaged, was taken through an assessment of the number of wider community members who attended training and workshops facilitated by the community resilience forums.

Indirect resilience beneficiaries were assessed based on population data which covered the region in which the community resilience programme operated.

To avoid double counting, the regional government subtracted the number of direct beneficiaries from the total number of indirect beneficiaries to provide an accurate number for both.

To understand the level of resilience provided by the community resilience programme, the regional government surveyed the participating community members at the start of the programme and two years into the programme lifetime to understand if across the resilience activities, there had been an increase in perception and confidence across the resilience attributes identified.

Organisation type: Regional Government.

RtR Action cluster: Emergency preparedness; Community-based, inclusive, and participatory risk reduction; Building knowledge for resilience.

Contribution to flagship goal: *Direct:* Through providing participatory community resilience training and exercising programmes directly to community members, and through the creation of resilience forums, as part of a climate adaptation plan, it is enhancing the capacity of those individuals to prepare for and respond to crises.

Indirect: Through providing training, exercising and forums across the region it enhances the collective preparedness and resilience of communities within the region.

Indicator: *Direct:* the number of community members directly engaged in the community resilience programme, and the number attending workshops facilitated by community resilience forums.

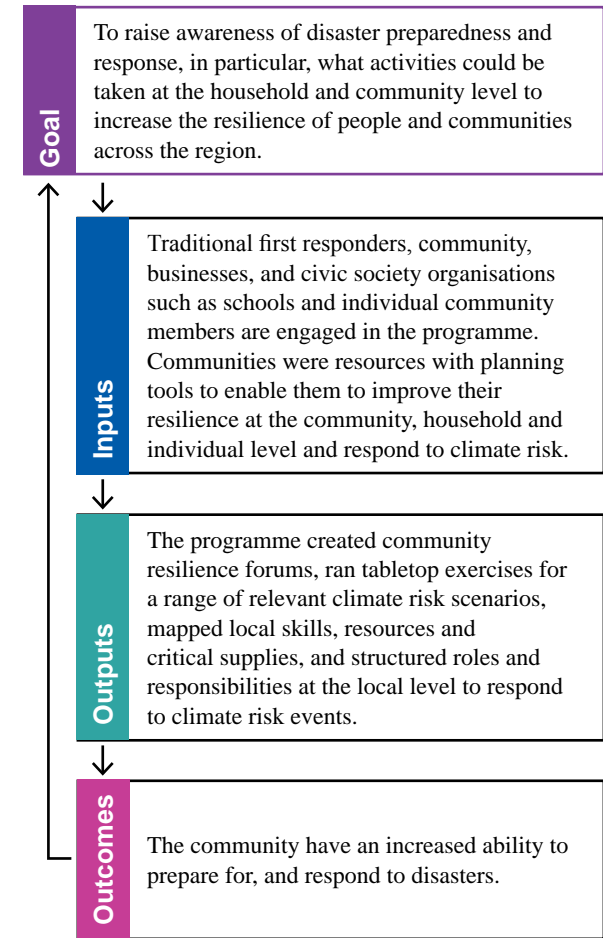
Indirect: regional population data for the number of people living within the region that the community resilience programme operated in.

Indicator purpose: *Direct:* to understand the number of people accessing community resilience training, exercising and forums.

Indirect: to understand the number of people within the region that are likely to benefit from increased collective community resilience.

How does it connect to RtR? As a regional initiative focussed on training and exercising for increased community resilience it supports the RtR by providing an enabling environment for individuals to learn, connect and increase their levels of resilience directly, and indirectly through the provision of a regional programme to improve collective resilience.

Sharm-EI-Sheikh Adaptation Agenda Impact System: Human Settlement Systems.





Hypothetical Scenario

Local Authority implements early warning systems

A local authority identified its vulnerability to climate risk and acted on improving the resilience of its community through investing in an early warning system. The local authority identified that they were at increased risk of flooding from extreme weather events, and while they had measures in place to protect their community from flooding, in some extreme weather conditions these mitigation measures did not protect all. To give community members greater opportunity to secure their belongings and property, limit damages and allow for expedited recovery, the local authority invested in an early warning alert system. The local authority chose to invest in a text alert system which was advertised to community members where they were able to register for free to receive early warning information, sent directly to them.

To assess the impact and level of resilience delivered by the early warning system, the local authority conducted a stress test of the system with a representative survey group from the community, to understand if the system gave the community sufficient time to prepare in the event of a flood.

Organisation type: Local Authority.

RtR Action cluster: Early warning systems.

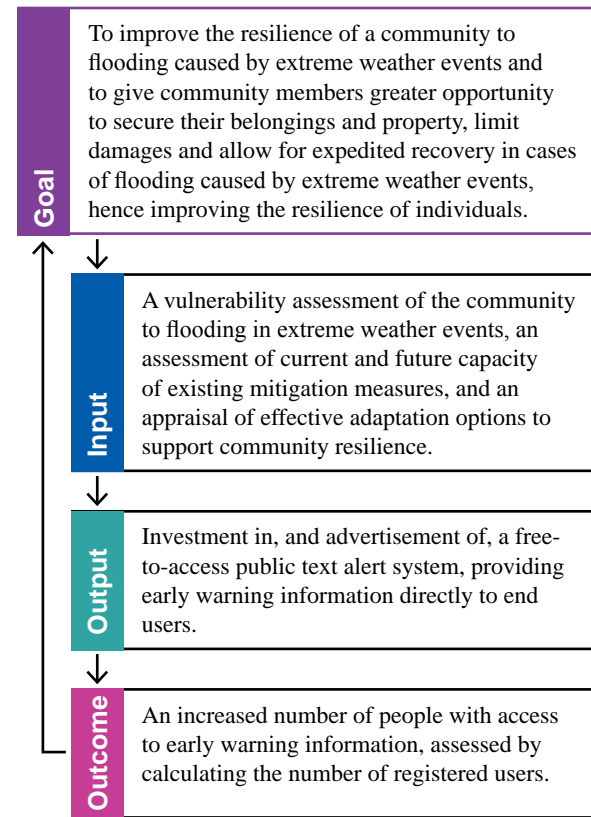
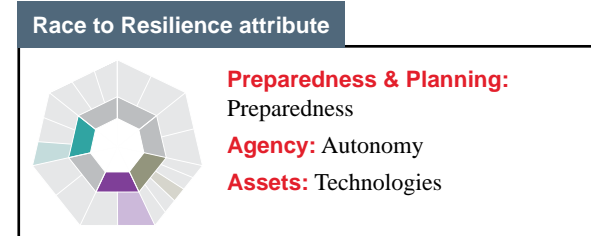
Contribution to flagship goal: *Direct.* Through providing early warning flood risk information at the individual and household level, this action seeks to equip people with timely information to make preparedness and response decisions.

Indicator: The number of people accessing the early warning system service.

Indicator purpose: To track the number of people who receive early warning information.

How does it connect to RtR? A direct measure of the number of people who are made more resilient through early warning system technology, enabling increased preparedness and autonomy in responding to climate risk events.

Sharm-El-Sheikh Adaptation Agenda Impact System: Human Settlement Systems.





There are many routes for non-State actors to monitor and measure increases in people’s resilience to climate change. This paper shows how this can be achieved across a diversity of organisation types through many different activities.

They can use existing methodologies, tailor approaches outlined in existing methodologies to their own organisation, or develop a new methodology, specifically for their own situation. All are valid, but to report to Race to Resilience, there are minimum criteria that must be met.

Minimum criteria that must be met

| | |
|---|---|
| <p>Assessment</p> <p>The activities are chosen through a robust assessment of the selected beneficiaries and are responding to the needs identified.</p> | <p>Actions</p> <p>The actions are based on robust evidence on what is effective to build resilience and avoid maladaptation.</p> |
| <p>Understanding</p> <p>There is a causal understanding of how the actions delivered make the beneficiaries more resilient to climate change (a theory of change).</p> | <p>Align</p> <p>Actions and activities must align with the Race to Resilience Attributes, through these it is possible to understand how an activity is building resilience in people.</p> |



For businesses, resilience has important implications for their bottom line – use of methodologies such as that outlined by the Task Force on Climate-Related Financial Disclosures highlight the impact of climate change on the business and therefore impact on shareholders and employees. In addition to this, many businesses provide critical services to society. Assessing what critical service a business provides is key to understanding how that business can improve people’s resilience.

For non-governmental organisations, the UK Government’s International Climate Finance Key Performance Indicators 1 and 4 provide a particularly robust and appropriate methodology for measuring individuals made more resilient. The maturity of the non-government organisation sector is arguably greater than other sectors, and reviews such as the Overseas Development Institute’s Resilience Measurement Frameworks and Approaches: A Bird’s Eye View, underline this.

Existing metrics and methodologies that non-national governmental organisations can use include the Sustainable Development Goals, the City Resilience Index and the Global Urban Monitoring Framework. These are just some of the most well-recognised tools, but by no means the only ones

available. Many governmental organisations will be mandated to report on resilience but may find their existing processes and data are not set up to focus on individual beneficiaries. This report will support them to “convert” reporting to focus on individuals.

Non-State actors of all kinds must be transparent about when it is not possible to directly measure the number of people made more resilient. Otherwise there is a risk of double counting - for example the same communities could be counted as having benefited from a published guidance note as well as the implementation of adaptation measures described in this guidance note. This does not diminish the importance of such projects, but it strengthens the overall aim to make more people resilient in a meaningful way. In all cases it is important that Resilience Attributes are considered. In doing so, we ensure that both the Magnitude and Depth of resilience are adequately addressed.

No matter the reporting route chosen by a non-State actor, reporting must be robust and transparent. By openly documenting the impact they make, they not only help others by sharing their learnings, but they also increase alignment across sectors and encourage others’ ambition to adapt to climate change.

Additional information

Definitions of scenario tags

Within this document the real-life case studies and hypothetical scenarios are tagged against existing frameworks and outputs from initiatives including:

Race to Resilience Action Clusters – these are used to identify and address specific challenges and opportunities in climate resilience. The action clusters consist of 9 groups and 29 categories of action. They contain a mix of adaptation and response measures, capacity building and awareness raising measures. The RtR Action Clusters were developed with reference to the Marrakech Partnership⁴³, Carbon Disclosure Project⁴⁴, and the Intergovernmental Panel on Climate Change’s Action List⁴⁵ and validated by the RtR Methodological Advisory Group (MAG). Within this document the scenarios are tagged to a respective action cluster, or a specific action.

Sharm-El-Sheikh Adaptation Agenda Impact Systems – The Marrakech Partnership defined five key impact systems to structure resilience actions globally as part of Climate Action Pathways, and two actions as cross-cutting enablers⁴⁶, as featured in the Sharm-El-Sheikh Adaptation Agenda with Global 2030 Adaptation Outcome Targets.

Background on resilience measurement reviews

Two key reviews in this area are

1. Overseas Development Institute’s Resilience Measurement Frameworks and Approaches: A Bird’s Eye View (2016)⁴⁷ and
2. National Academies of Science’s Building and Measuring Community Resilience, Actions for Communities and the Gulf Research Program (2019)⁴⁸.

The first of these presented an overview of common approaches to resilience measurement, monitoring and evaluation used in international development, humanitarian interventions, disaster risk reduction, and urban planning. It analysed the approaches to determine what definition of resilience was used, at what scale, and how resilience was conceptualised in terms of capacities (these are similar to attributes in the RtR framework).

The second review presented options for measuring resilience at the community level and summarised an existing portfolio of resilient measurement efforts used by organisations including Z Zurich Foundation, 100 Resilient Cities, The Nature Conservancy, National Oceanic and Atmospheric Administration, National Institute of Standards and Technology, Federal Emergency Management Agency and others⁴⁹.

Another useful resource in this context is the Adaptation Metrics Mapping Evaluation produced by the International Platform on Adaptation Metrics in 2021⁵⁰. This framework collates interventions focussed on adaptation metrics evaluation. The framework is designed to provide “practical guidance for mapping and evaluating available metrics and identifying the opportunities for developing new metrics”⁵¹.

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