

Training handout – RESILIENCE ANALYSIS FRAMEWORK

IPCC (2014) defines resilience as,

“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.”

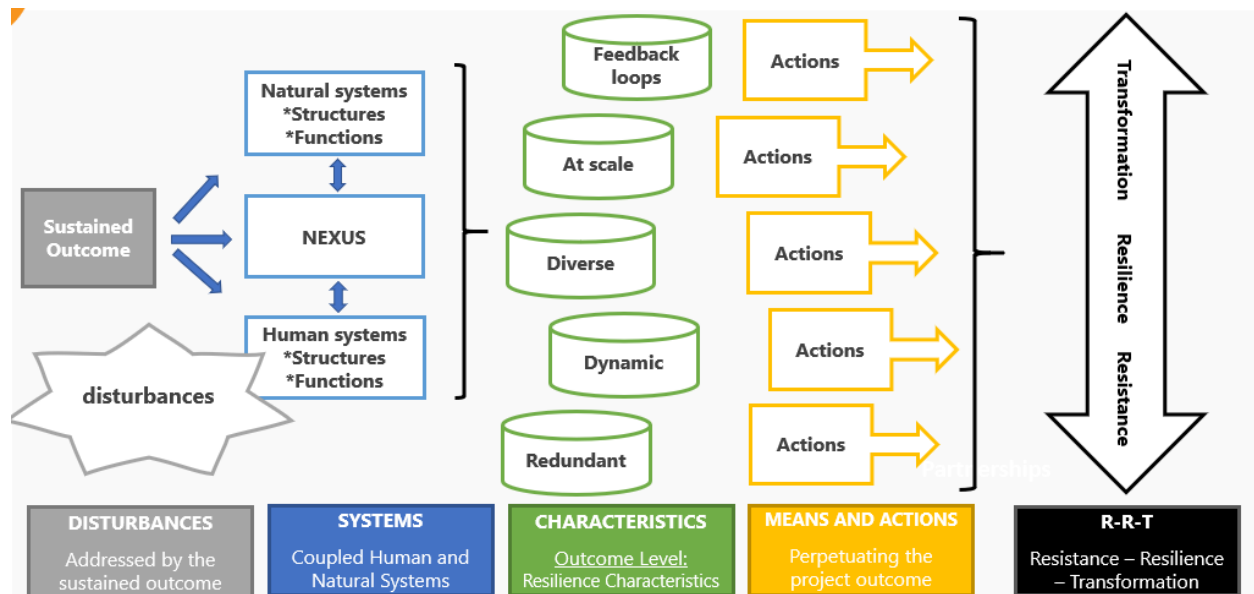
One of the ultimate goals of climate change adaptation can be described as “resilience” to the effects of climate change and related extreme weather events (floods, storms, droughts, etc.) and climate variability (seasonal timing changes, shifts in weather patterns, etc.).

In other words, through adaptation, the structures and functions critical to life would be less affected by climate-related disturbances and/or these disturbances would be less impactful.

- Disturbances can be acute shocks (e.g. a cyclone, flood event) or chronic stresses (e.g. gradual crop loss from temperature rise, sea level rise).
- A structure could be a literal, physical asset (forest, storm wall, evacuation shelter, etc.), or could be figurative like an institution or set of practices (local government, economy, early warning system).
- A function is the ability to serve a particular need or purpose (generate income, attend school, be safe and secure).

A resilience analysis tool was developed, made of five core different components for analysis, including two main frameworks to assess resilience in Fund projects ex post. The resilience analysis tool is an innovative tool that will be piloted during Phase two. The core components of the resilience analysis of Fund projects in ex post are:

- **Component 1:** the climate disturbances.
- **Component 2:** the systems that outcomes affect and are affected by.
- **Component 3** (framework 1): the characteristics of resilience used by the outcomes.
- **Component 4:** the actions and resources devoted to supporting those outcomes.
- **Component 5** (framework 2): the resistance-resilience-transformational (R-R-T) typology for determining where the project sits in terms of strategies employed and how/whether actions are designed to maintain or change existing structures (or “what” the project influences or uses to implement actions) and functions (or what “purposes” or “roles” those structures fulfil). This framing moves beyond individual sustained outcomes to explore how and whether actions as a collective whole are being taken that translate to improved climate resilience.



How to use the resilience tool:

- **Component 1:** Identify **climate disturbances (shocks, stresses)** addressed by the selected outcomes
 - **Component 2:** Characterize the **human and natural systems and their nexus** influencing/influenced by the outcomes
 - **Component 3:** Consider the **characteristics of resilience** that may describe the selected outcomes
 - **Component 4:** Examine evidence of **the means and actions** sustaining the resilience characteristics of those outcomes
 - **Component 5:** Weigh where on the **RRT typology** the ex post outcome(s) could fall, both individually and collectively
- ✓ Vet and verify desk review findings with country counterparts prior to fieldwork:
- Adjust desk review analysis and priorities based on new inputs
 - Acknowledge possible limitations (for example on the systems that will be considered/part of the ex post analysis)

Project example: PARSACC PROJECT – Enhancing Resilience of Communities to the Adverse Effects of Climate Change on Food Security in Mauritania

Country: Mauritania

Years implemented: 2014 - 2019 (5 years)

Component 1: Government technical services; Adaptation plans; Risk monitoring system

Component 2: Dune fixations; Reforestation; Water retention structures

Component 3: Training; Cereal banks; Fuel efficient stoves

COMPONENT 1: climate disturbances

WHAT? The stresses and shocks that the sustained outcomes address:

- **Shocks:** sudden expected or unexpected climatic events – or disasters - such as drought, flood, hurricanes, wildfire, etc.
- **Stresses:** slower onset climatic changes such as sea-level rise, change in habitable area, loss of soil or plant matter, etc.

HOW?

Disturbances	Description and impacts relative to project
Stress: Increasing temperature by 0.9 °C since 1960 (1.3-3.8 by 2060)	<ul style="list-style-type: none"> • desertification of agropastoral lands; • half of population depends on livestock livelihoods and agriculture
Stress: 20% reduced rainfall; isohyet moving south	<ul style="list-style-type: none"> • desertification
Shock: Periodic drought	<ul style="list-style-type: none"> • loss of livestock, food insecurity

COMPONENT 2: HUMAN/ NATURAL SYSTEMS AND NEXUS

WHAT? The structures and functions within human and natural systems – and their nexus – that affect and are affected by the project outcomes

- **Natural Systems** (watershed, biome, ecosystem, coastal zone) etc.), either:
 - Structures (forest, valley, biome, population, ecosystem, etc.)
 - Functions (hydrological cycle, generation of soil, air filtration, etc.)
- **Human systems** (institutions, communities, households, etc.), either:
 - Structures (physical assets, institutions, policies, etc.)
 - Functions (safety, economic well-being, food security, etc.)
- **Nexus:** practices, skills, interface between humans and nature etc.

HOW?

Systems Context and trends	Structures	Functions
Human systems: Context: project focuses on pastoral, agro-pastoral and rainfed agriculture production	C1 & C3 Decentralized and participatory adaptation planning C3 Diversified livelihoods	C1 Better understanding of climate risks/impacts by targeted communities
Nexus: Context: fragmentation of agricultural plots, unequal	C2 & C3 Concrete adaptation actions	C1 Food security

access to land (especially vulnerable groups, women)	C1 (Inadequate) agricultural practices (poor processing and conservation)	
Natural systems: Trend: isohyet (@250mm) moving farther south	C2 Land/soil and arable land – re: desertification, land degradation	C2 Soil and hydrological cycle

COMPONENT 3: CHARACTERISTICS

WHAT? The characteristics are the types of resilience strategies used by the project outcomes. There are five types of characteristics:

- *Feedback Loops:* Ensuring active systems are in place for continual communications and that pertinent information reaches users who can act on it
> **having ways to generate and communicate information that can be used to take or adjust actions / decisions**
- *At Scale:* Providing the temporal or spatial scale needed for natural and/or human systems to maintain or change their functions and/or structures in the face of climate disturbances
> **of sufficient size or timeliness in order to generate desired benefits**
- *Diverse:* Reflecting a wide and deep variety of actors and inputs working toward common goals in complexity and climate resilience
> **different things/entities serving different functions but part of a larger common system or set of purposes**
- *Dynamic:* Demonstrating flexibility – around an equilibrium – in approach and strategy towards reaching common objectives
> **flexibility and changes that are centered around a common set of purposes (or equilibrium)**
- *Redundant:* Creating a duplicate or back-up system to support resilience to climate disturbances if/when one option fails
> **having back-up; two or more things serving the same/similar function or role**

HOW?

Outcomes	Characteristics and reason
Human systems: Livelihood diversification – The survey for the final evaluation shows that vegetable production has increased significantly compared to the past.	Diversity – of income options given losses (and lack of access for landless) in pastoral and agriculture
Nexus: Fixing of dunes – In 36 sites, 995 ha have been mechanically and biologically fixed as part of sand	Redundancy – protects homes, water infrastructure and farmland from drifting sands/clean up; possibly at scale in locations where halted or reversed.

dune fixation activity, increasing the vegetation cover in the targeted project communities	
Natural systems: Conservation water and soil – improve degraded land, rehabilitate approximately 440 ha of land, of which 370 ha were secured with fences and cultivated by the beneficiary communities from the 2018 crop year	Biodiversity based on habitat restoration, redundant since new land was secured, at scale (does it cover a sufficient percentage of land to result in continued generation of benefits?); intended to recover new land and increasing crop yields.

COMPONENT 4: MEANS AND ACTION

WHAT? The activities, resources, and systems in place that perpetuate the continuation of project outcomes

HOW?

Outcomes/ impacts	Actions and Means sustaining them
Capacity building – technical & institutional, EWS – social capital ; partnership commitment	Final Evaluation: development of community social capital that results in (i) the constitution and training of the 85 local committees (adaptation action plans), and (ii) the strong involvement of the populations.
Livelihood diversification - reinvestment in the community because of profits made	Final Evaluation: Most IGAs supported by the project contribute both to reducing poverty and to reducing the vulnerability of small producers to climatic and economic shocks.
Pastoral defenses, village reforestation, fix sand dunes - 2,415 ha fixed dunes; 100ha protected	Final Evaluation: The reforestation and environmental protection actions should allow the reconstitution of woody formations limiting wind erosion. This leads to the loss of soil and its nutrients, other consequences of climate change. Most practices and activities supported by PARSACC tend to reduce ecological constraints but also have a positive impact on the environment.
Soil and water conservation - improved access to water	Final Evaluation: digging and rehabilitating wells, building water reservoirs, supplying motor pumps is certainly one of the interventions with high health, nutritional, and economic impact.


Component 5: RRT typology

WHAT? The position along the resilience scale based on the cumulative effect of the sustained actions and mean.

The R-R-T typology is an action-based scale or spectrum. It focuses on whether actors are passively or actively maintaining existing structures and functions (resistance), or whether they are seeking to

fundamentally overhaul structures and functions in light of climate disturbances (accelerated transformation). Resilience, the third of six states, is noted as “Actions designed to improve the capacity of a system to return to desired past of current structures and functions following a disturbance to the extent possible while recognizing some new elements are inevitable.”

HOW?

TRANSFORMATION	Position on RRT	Outcomes and explanation
 <p>6 ACCELERATED TRANSFORMATION Actions designed to more rapidly advance transition towards new structures and functions.</p>	6 Accelerated Transformation:	
<p>5 DIRECTED TRANSFORMATION Actions designed to drive transition towards new structures and functions.</p>	5 Directed Transformation:	
<p>4 AUTONOMOUS TRANSFORMATION Actions designed to facilitate the autonomous transition to new structures and functions.</p>	4 Autonomous Transformation:	
<p>3 RESILIENCE Actions designed to improve the capacity of a system to return to desired past or current structures and functions following a disturbance to the extent possible while recognizing some new elements are inevitable.</p>	3 Resilience:	<p>Human systems – social capital and partnership building Nexus – livelihoods diversification</p>
<p>2 PASSIVE RESISTANCE Actions designed to passively maintain current/ historical structures and functions.</p>	2 Passive Resistance:	<p>Human systems – EWS Human systems – soil and water conservation</p>
<p>1 ACTIVE RESISTANCE Actions designed to actively maintain current/ historical structures and functions.</p> <p>RESISTANCE</p>	1 Active Resistance:	<p>Natural systems – protected lands</p>

Examples (details):

Resilience:

- Human systems – social capital and partnership building – overall capacity of the human systems to manage climate risk improved, new structures (coordination among actors who were not previously) and functions (partnering and working towards common interests, understanding climate risk).
- Livelihood diversification – IGAs and reinvestment into the community, increased economic autonomy of women; designed to return to current or past structures and functions by restoring income opportunities lost from drought, land degradation.

Passive Resistance:

- Human systems – EWS – incomplete and in draft form, not fully executed.
- Human systems – soil and water conservation; structures and functions put in place to passively maintain past/current structures and functions.

Active Resistance:

- Natural systems – protected lands, fixing dunes, agriculture lands, watershed, forests, vegetation cover; all designed to actively maintain current and historical structures and functions; some use for humans but also some to allow for recovery of ecosystems.