

Environmental and Climate Risks in Energy Resilience

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Resilience



resilience

/rɪˈzɪliəns/

noun

1. the capacity to recover quickly from difficulties; toughness.
"the often remarkable resilience of so many British institutions"
2. the ability of a substance or object to spring back into shape; elasticity.
"nylon is excellent in wearability, abrasion resistance and resilience"

Threats

What threats?

Environmental

Hazards of the natural environment

- Geophysical (earthquakes, volcanoes, landslides, tsunamis)
- Hydrological (e.g. floods)
- Climatological risks (extreme temperatures, droughts, wildfires, droughts)

Threats

What threats?

Environmental

Hazards of the natural environment

- Meteorological (extreme weather events, storms/hurricanes, storm surge and inundation)
- biological (diseases, pandemics, epidemics)

Threats

What threats?

Man made

- Technological (industrial accidents, environmental degradation)
- Political (conflicts)

Impact Assessments

Impact *ON* the environment *OF* the project

- Impacts of construction and operation on the environment
 - Water quality, air quality, biodiversity, hydrology etc.
- Issues
 - Project footprint (e.g. land issues, settlement displacement etc.)
 - Socio-economic impact (e.g. socio-economic issues)

Impact Assessments

Impact *OF* the environment *ON* the project

- Impacts of the environment on the operation of the project
 - Geophysical, hydrological, climatological, meteorological etc.
- Issues
 - geophysical siting (e.g seismic zone, floodplain, coastal storm surge)

Climate Issues

Climate variability, climate risks and climate change

Variability

- variations in the mean state and other statistics of the **climate** on all temporal and spatial scales, beyond individual weather events
 - often used to denote deviations of climatic statistics over a given period of time (e.g. a month, season or year) when compared to long-term statistics for the same calendar period.

Climate Issues

Climate variability, climate risks and climate change

Risks

- "Impacts from recent **climate**-related extremes, such as heat waves, droughts, floods, cyclones, and wildfires, reveal significant vulnerability and exposure of some ecosystems and many human systems to current **climate** variability". – (can also apply to infrastructure)

(IPCC 5th AR)

Climate Issues

Climate variability, climate risks and climate change
Change

- **change** in the average conditions — such as temperature and rainfall — in a region over a long period of time – usually thirty years as defined by World Meteorological Organisation (WMO)

Climate Issues

Climate variability, climate risks and climate change

Impacts (arising from)

- Changes in precipitation, temperature, extreme weather events, hydrological regimes etc. – including secondary or indirect impacts within and across sectors
- Slow onset events (long term loss and damage)
- Socio-economic

Existing Circumstances

Peculiar vulnerabilities of SIDs

- Competing interests for limited land resource
- Difficult to separate developmental impacts from climate related impacts
- Limited human and financial resources – lack of economies of scale
- External or exogenous shocks (energy prices)

Climate change – the threat multiplier

- Climate risks, variability and change will exacerbate existing vulnerability
- Competition for limited resources to address climate impacts
 - Changes in priority allocation can lead to socio-economic inequities
 - Social/civil unease or unrest
- National security issues

Energy Security

“Energy drives economies”

- Relationship between energy, economic growth, and socio-economic well being and stability
- Need for resilient energy systems – managing the risks (including environmental and climate change risks)
- Changing paradigms - IRRP