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Adapting to Climate Change

Key Terminology and Context

Written by the EGU Climate Hazard and Risk Task Force

What is adaptation?

Adaptation is the process of adjusting to actual or expected climate and its effects, to moderate harm or where possible, benefit from favourable changes. Adaptation covers a wide range of reactive and proactive actions that can reduce exposure and vulnerability to climate hazards while also identifying effective ways to increase adaptive capacity [1]. It can also be seen as the counterpart to mitigation: where mitigation reduces the scale of future climate change, adaptation manages its consequences.

Key adaptation terminology

Reactive adaptation: responds to impacts after they occur and is often cheaper in the short term but tends to track behind the climate rather than get ahead of it, leaving societies repeatedly exposed to each new extreme and with little time to build capacity before the next one.

Precautionary (also called anticipatory): Adaptation can happen in advance of expected impacts [2]. The scope of precautionary adaptation measures depends on the scenarios considered to inform strategy and may be implemented using incremental or transformational approaches (see below).

Incremental adaptation: maintains the essence and integrity of an existing system**.** Incremental measures are often a sensible first step, and can accumulate into transformational change, but where risks approach adaptation limits, incremental adjustment alone may no longer be sufficient.

Transformational adaptation: changes the fundamental attributes of a social-ecological system in anticipation of climate change and its impacts [1].

Why do we have to adapt now?

Global mean temperatures averaged over 2015-2025 were 1.24 to 1.32°C warmer than pre-industrial temperatures (1850-1900 average) while European temperatures have increased by 2.20 to 2.29°C over the same period [3]. Climate model projections show that, even if we strongly reduce greenhouse gas emissions starting now, warming won't be halted until at least the 2050s [4] reaching a global average of at least 1.8°C above pre-industrial. This is because the human activities that cause greenhouse gas emissions cannot stop immediately; it takes time to implement actions to reduce greenhouse gas emissions, even if done with the highest possible ambition and carbon removals are

utilised for hard-to-abate emissions. Adaptation needs to be strengthened to reduce the impacts of climate change that are already occurring and to prepare for their intensification as temperatures continue to rise towards a peak. The level of that peak depends on how quickly emissions are reduced [5]. Delaying mitigation and adaptation also makes adaptation harder: it raises costs, reduces feasibility and locks in high-emissions infrastructure, and once hard limits to adaptation are reached, some losses can no longer be avoided [6].

Reasons for potential resistance to adaptation

Despite the evidence, it can be challenging to maintain political will to plan and implement adaptation measures as their impact generally is not measured within a political or economic cycle. Subsequently, visible, near-term policies and measures may be favoured over more effective long-term investment, increasing the risk of maladaptation [7]. Furthermore, while global projections have been shown to be very accurate, local and regional climate projections (particularly for precipitation) carry wide uncertainty ranges, making it difficult to design to a single future-proof standard. This means that policymakers are increasingly required to plan with uncertainty rather than calculable risk. Lastly, public pressure for adaptation can waiver. A study of over two billion social media posts found that temperatures once considered remarkable quickly become unremarkable with repeated exposure [8] - a phenomenon related to “ecological amnesia” [9]. Conditions can become increasingly hard to bear without prompting commensurate action.

A whole of society approach for adaptation

Effective climate adaptation requires sustained cooperation, knowledge exchange and shared responsibility among public authorities, scientific institutions, civil society, local communities and the private sector. Clear roles and responsibilities, effective coordination mechanisms, and opportunities for co-design and collective action are essential to translate adaptation priorities into concrete, locally owned and sustainable measures [1; 10].

A whole-of-society approach should promote a shift from reactive responses to proactive and shared adaptation efforts, encouraging all societal actors to take appropriate measures according to their respective roles, capacities and resources, rather than relying exclusively on public authorities when climate-related hazards materialise. In this context, the EGU Climate Hazard and Risk Task Force was pleased to see ownership of climate risk across all levels.

References

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