



Exploring energy and climate change linkages from an ecosystem perspective

Excellent Hachileka- Regional Coordinator

IUCN Climate Change Programme for
Eastern and Southern Africa

Energy and climate change

- Energy is a fundamental part of our lives
- Most energy sources at some stage are dependent on ecosystem services, e.g. water flows used to power turbines to generate electricity or biomass which can be used for heating, cooking and electricity generation
- Ecosystems are key to meeting the growing energy demand. Thus to sustainably increase future energy supplies, the quality and integrity of ecosystems need to be well-managed and enhanced
- The combination of climate-related threats to existing energy systems, coupled with the low efficiency of existing energy technologies and reliance on expensive, decentralised energy supply systems, further compounds the problem of ensuring local energy access and meeting demand in the region

The impacts of climate change on energy

In terms of energy generation and supply, the impacts of climate change on the energy sector primarily include:

- storm damage to equipment;
- agricultural disruption;
- changes in the growth rates of biomass for fuel use;
- increased runoff and siltation from land degradation (affecting hydro-generation);
- losses or fluctuations in hydropower production due to increased stresses on water supply systems and changing rainfall patterns

The impacts of climate change on the energy

- The effects of climate change already threaten the strained relationship between energy security and functioning ecosystems. The poor are particularly affected as they rely primarily on biomass, wood, waste, animal dung, and other natural resources whose quality and quantity is affected by climate change.
- With limited or no access to alternative energy sources the poor are the most vulnerable to climate-induced impacts and are the least able to adopt adaptation measures.
- Energy scarcity and increased threats due to climate change also hinder the provision of basic services such as water, health and education and thus a community's well-being (HELIO 2007).

Climate change and hydro-power

- In terms of energy generation and supply linked to water,
 - Climate change increases the risk of disruption as well as reduced output.
 - Climate related impacts on the hydrological cycle often affect growth rates of biomass and cause fluctuations in hydropower, with reduced efficiencies caused by increased run-off and land degradation leading to storage challenges due to siltation.

Main areas of vulnerability of energy systems in sub-Saharan Africa

- Lack of rational territorial distribution of energy resources across this region
- Inaccessibility of reliable and affordable energy for households, local SMEs, public sector and commercial sector
- Lack of a reliable, affordable energy supply
- Increased environmental degradation associated with traditional biomass use
- Unexplored and underdeveloped hydropower potential of river basins

A call for a sustainable energy future

There is need to pursue energy options that:

- Have a radically-reduced carbon footprint
- Are more equitable
- Do not threaten biodiversity
- Ensure continued supply of ecosystem goods and services
- Emphasize renewable energy policies and strategies that incorporate ecosystem services, thus harnessing energy demand for the good of long-term environmental and natural resource protection

Possible Solutions

Solutions to these interlinked problems lie in parallel, mutually-reinforcing approaches:

- Restoring and sustainably managing ecosystems;
- Ensuring a diversified and distributed sustainable energy mix combined with increased energy efficiency and conservation
- Implementing integrated water management that assesses river basin resources from a broad perspective and includes planning and multiple stakeholder involvement
- Ensuring that activities centring on adaptation to climate change and sustainable energy development are increased and maintained so as to generate sustainable livelihoods

Conclusion

- No one energy source is completely ecosystem-neutral and energy choices will need to be made with a full understanding of the trade-offs involved in any specific situation
- Addressing the future challenges of meeting increasing energy demands, while supporting biodiversity conservation, will require an integrated multi-sector approach for managing ecosystems for ensuring sustainable future energy strategies
- IUCN advocates for the use of Ecosystem-Based Adaptation (EbA) in recognition of the role that well-managed ecosystems can play in supporting adaptation – by increasing resilience and maintaining essential ecosystem services and goods, and thereby reducing the vulnerability of people and nature in the face of climate change
- The increased threat of climate change on natural energy resources reinforces the need for urgent action to provide alternative and sustainable energy generation and supply