



Table of Contents

Section I.	Introduction – why this work?.....	4
Section II.	Linking Ecosystems, Energy and Livelihoods	5
Section III.	Effects of Climate Change on Energy Security and Supporting Ecosystem Services	13
Section IV.	Way Forward	18
Section V.	Conclusion.....	20
Annex 1:	Energy Sources and Impacts.....	22

Summary

Section I. Introduction – why this work?

Energy is a fundamental part of our lives. It is needed for heating, cooking, cooling and lighting in our homes. Modern life is also reliant on the provision of energy for communication, transport and industrial processes.

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. How these forms of energy are harnessed and employed makes energy use a critical environmental issue as often its sourcing, production, transmission and consumption—particularly conventional fossil fuel-based sources, and even renewable energy options—impact ecosystems. Ecosystems are also key to helping meet the growing energy demand. Thus to sustainably increase future energy supplies, the quality and integrity of ecosystems need to be well-managed and enhanced.

Energy is also a critical development issue, underpinning each of the UN Millennium Development Goals (MDGs). Currently, 1.6 billion people in the world lack access to electricity and over 2.5 billion people depend on biomass fuels for cooking and heating (WEO 2006). These people have a legitimate right to, and need for increased energy services which are affordable,

Section II. Linking Ecosystems, Energy and Livelihoods

Box 1: Biomass for Energy Production

by energy developments such as oil and gas exploration and energy installations such

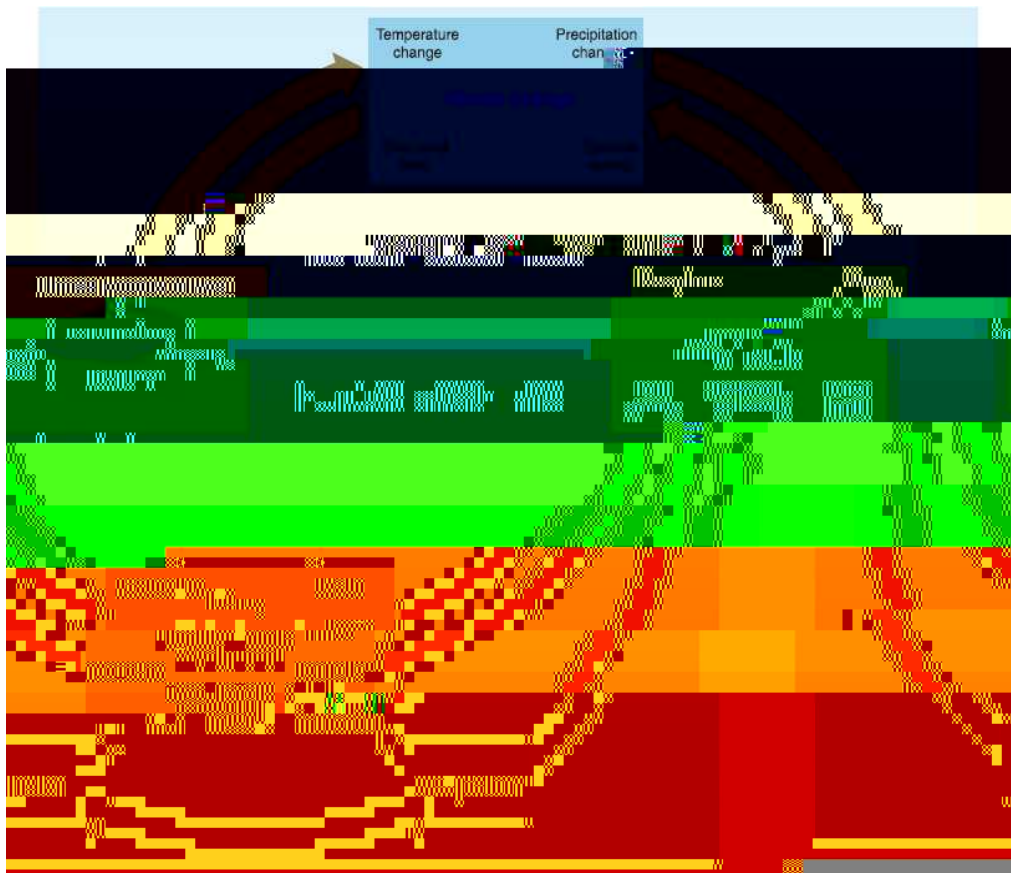
Challenges

The 2005 Millennium Ecosystem Assessment reports that 60% of the world's ecosystem services are degraded to the point where they no longer provide sufficient benefits to people. Moreover, the ongoing degradation of ecosystem services is increasing the likelihood of serious damage to human well-being.⁴ As rural and urban low-income households do not have access to alternative energy sources, degradation of local, energy-providing, ecosystem services—such as biomass—makes these populations more vulnerable to poverty and disease.

Section III. Effects of Climate Change on Energy Security and Supporting Ecosystem Services

The challenge of meeting energy needs while protecting the ecosystem services that underpin the energy source is further compounded by the effects of climate change as is illustrated in Figure 4 below.

Figure 4: Interactions between anthropomorphic drivers and the impacts and responses of climate change



Source: IPCC (2008)

Climate change is a major global challenge; its impacts are already evident, and changes in water availability, food security and sea-level rise are projected to

Figure 5: Climate Change Impacts on Well-being

increases resilience and adaptive capacity to climate change by providing a resource base as well as a physical buffer against flooding.

- , e.g. fuel efficient cookstoves and access to alternative energy sources to reduce pressure on local resources.
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An integrated approach can

- Work with other programmes to prepare an informational manual that looks at:
 - key ecosystem services and the energy services each one provides
 - how climate change may impact the quality and quantity of each service
 - how ecosystem goods and services can be used to adapt to changes in land and water availability due to climate change impacts
 - proposed policies and measures to support identified actions

- Cooperate with efforts that are working to improve opportunities for the most vulnerable (particularly women) to have a voice in energy issues, e.g., in designing new energy systems, to ensure that ecosystem issues are incorporated into the process.

- Support gender-sensitive, sustainable energy technology innovation and production in cooperation with vulnerable communities, as a way to create jobs, increase coping capacity, provide energy security and manage ecosystem services.

Section V. Conclusion

Energy affects everything that we do and many forms of energy are the result of ecosystem services. Ironically our growing requirement for

Section VI. References

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<p>Hydroelectricity ~2.2% of energy use</p>	<ul style="list-style-type: none"> • Building large dams leads to disruption of natural river cycles and the degradation of upstream catchment areas due to inundation of the reservoir area (WCD, 2000). • Dam reservoirs also emit greenhouse gases due to the rotting of vegetation and carbon inflows from the basin. • Some dam reservoirs provide recreational opportunities with fish and waterfowl habitat opportunities. 	<ul style="list-style-type: none"> • Alterations in availability of freshwater resources (both improved and declining depending on situation) for human use. • Population displacement.
<p>Nuclear energy ~ 6.3 %</p>	<ul style="list-style-type: none"> • A nuclear accident would affect the environment generally and not just humans. • Water used to cool reactors is released to environment at significantly above ambient temperatures and accentuates the effects of climatic accidents such as heat waves. • Produces relatively small amounts of greenhouse gases. 	