

# Introduction

The UNEP Year Book 2009 presents work in progress on scientific understanding of global environmental change, as well as foresight about possible issues on the horizon. The aim is to raise awareness of the interlinkages among environmental issues that can accelerate the rates of change and threaten human wellbeing.

The chapters of this Year Book track the same trajectory as our awareness of environmental change. Transformations are inherent to this trajectory and are taking place on many fronts: from industrial agriculture to eco-agriculture; from a wasteful society towards a resource efficient one; and from a triad of competing interests among civil society, the private sector, and governments to a more cooperative model based on mutual benefits.

The first chapter, **ecosystem management**, presents ecosystems responding at accelerated rates to climatic, anthropogenic, and ecological changes and the critical thresholds that are advancing. It examines the call for an eco-agricultural approach to food production and the potential that sustainability principles offer to ensure that ecosystem management addresses poverty reduction.

The chapter on **harmful substances and hazardous waste** follows the discovery of synthesizing nitrogen to its application for chemical fertilizers that spurred unprecedented population growth and accelerated an era of large-scale industrial chemistry. Many of these chemicals are adversely affecting our environment and our health.

The **climate change** chapter draws attention to the latest research on increased concentrations of greenhouse

gases in the atmosphere and new findings on the rates and distribution patterns of melting ice and rising sea levels. Potential consequences are considered for specific Earth systems such as ocean circulation, tropical monsoons, and familiar atmospheric oscillations. The concept of tipping elements and tipping points in Earth systems is introduced.

The **disasters and conflicts** chapter documents civil unrest, earthquakes, storms, and droughts that continue to stress human populations and the ecosystems they depend upon. In particular, vulnerable populations are at risk. Evidence is mounting, however, that disaster prevention and preparedness programmes are working. The chapter also contains a map of significant environmental events of 2008.

Alternative industrial approaches are explored in the chapter on **resource efficiency**. A significant transformation is underway through new patterns of production and consumption and improved resource-use efficiencies. Developing and up-scaling existing solutions from the private sector such as industrial symbiosis and dematerialization may help turn around the growing resource deficit.

The final chapter, **environmental governance**, gives a brief summary of key findings of the preceding chapters and discusses the cumulative effects expected from degradation of ecosystems, the release of substances harmful to those ecosystems and to human health, the consequences of our changing climate, the continued human and economic loss resulting from disasters and conflicts, and the overexploitation of resources. It

calls for an intensified sense of urgency for responsible governance in the face of approaching critical thresholds and tipping points. A calendar of selected events in 2008 is also included in this chapter.

More in-depth, the chapter identifies some of the drivers that create challenges, such as increasing populations, their material aspirations, and a flawed economic model that does not assign appropriate values to many of the resources being exploited. These drivers have cumulative effects and require decisions to be made, often making the practice of environmental governance both challenging and complex. For example, pressures from population growth and material aspirations draw workers to settle near national parks where they may be forced to destroy the protected ecosystem to survive, or these pressures motivate people to build livelihoods in coastal urban areas where they are exposed to threats from increased intensity and frequency of storms.

This Year Book also explores some of the many solutions such as effective disaster preparedness programmes that can establish foundations for community cooperation that could resonate through future development projects. As well, resource efficient industrial symbiosis applications can feed sustainable economic growth, forestall pollution, and provide goods for the green economy. Re-tooled assessment processes and the establishment of innovative schemes with multiple social and environmental benefits are only samples of solutions that can be devised through institutional mechanisms and good governance.