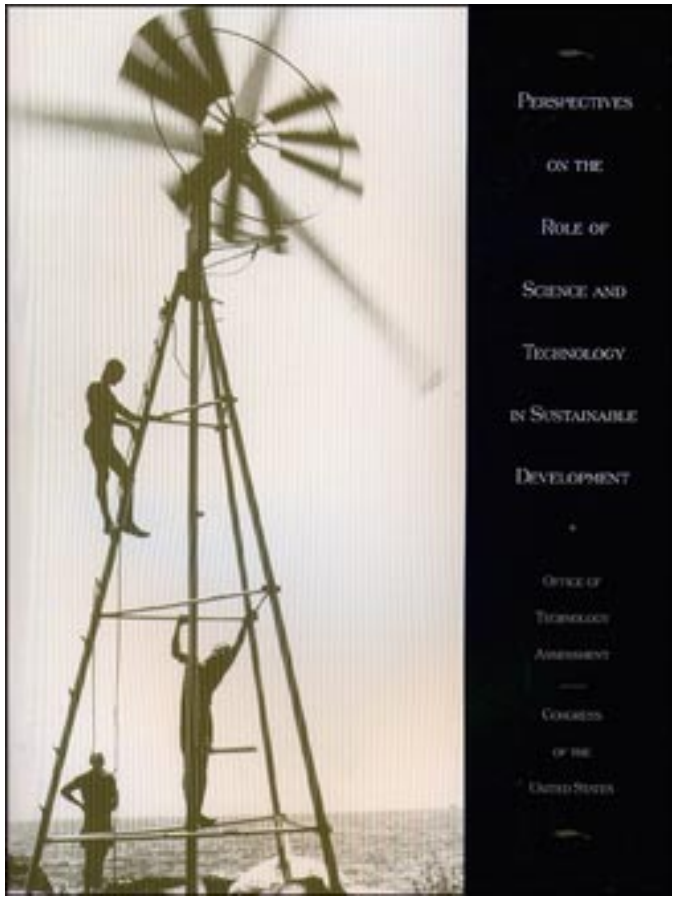
Perspectives on the Role of Science and Technology in Sustainable Development

September 1994

OTA-ENV-609
NTIS order #PB95-109674
GPO stock #052-003-01396-7



Recommended Citation: U.S. Congress, Office of Technology Assessment, Perspectives *on the Role of Science and Technology in Sustainable Development, OTA-ENV-609* (Washington, DC: U.S. Government Printing Office, September 1994).

For sale by the U.S. Government Printing Office
Superintendent of Documents, Mail Stop: SSOP, Washington, DC 20402-9328
ISBN 0-16-045318-6

Foreword

Resource degradation and depletion, exponential population growth, widening econoimc gaps between and within industrial and developing countries, and resource-driven conflicts all have contributed to the growing concern about sustainability of our societies, nations, and the Earth. Discussions about integrating environment and developrnent now include issues of intergenerational equity, resource substitution, and irreversibility of impacts. In this setting, sustainability has emerged as a central goal for international development. Yet, many development models exist, each with slightly different imperatives and underlying assumptions about the meaning of the term sustainable *development.*

This report examines an array of *sustainublc development* definitions and discusses their common elements. Current agriculture, energy, and industry technologies are described as well as the strides being made in education, communication, and information technologies that could support sustainable development. Access to these technologies, however, remains a challenge for many in developing and industrial countries alike. Several central issues are discussed that have clear policy implications. First, sustainable international development involves multiple themes that cross U.S. foreign and domestic policy boundaries (e.g., energy efficiency, sustainable agriculture, and resource conservation); thus, coordinating these policies will be fundamental. Second, eliminating institutional, social, economic, and political barriers to sustainable development is 1 likely to be a key challenge. Finally, developing and disseminating technologies that can advance sustainability will require significant collaboration and investment on the parts of industrial and developing countries.

The following congressional committees requested the Office of Technology Assessment (OTA) to review its technology assessments of the past 20 years and distill the key science and technology areas underpinning sustainable development: the House Committee on Foreign Affairs, the Senate Committee on Foreign Relations, and the House Committee on Natural Resources.

OTA greatly appreciates the contributions of the working group participants and contractors. We are especially grateful for the time and effort donated by numerous contributors who seined as reviewers and as liaisons with the many groups and organizations involved in these issues. The information and assistance provided by those individuals proved invaluable to the completion of this assessment. As with all OTA studies, the content of this report is the sole responsibility of OTA.

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