

Notes

1. *Extent and Growth.* To determine the extent of agroecosystems, the International Geosphere-Biosphere Programme (IGBP) defined agroecosystems on the basis of remote sensing imagery and defined agricultural regions as areas where more than 40 percent of the land is used for cropland or highly managed pasture. Using this definition, agroecosystems account for 21 percent of total land area (USGS EDC 1998). However, this excludes significant areas where there is overlap with forest and grassland ecosystems, since, in fact, land use is often fragmented spatially. Where agriculture mixes with other land uses—forests or grasslands—a mosaic of land cover is formed.

For the PAGE study, satellite data were reinterpreted to incorporate mosaic areas that have a 30 percent or more intensity of cropland or managed pasture. Using this approach, approximately 6 percent of areas classified as forest and 14 percent classified as grasslands by IGBP fall within the global extent of agroecosystems as defined by PAGE. Thus the percentage of agricultural land area totals 28 percent (Wood et al. [PAGE] 2000).

2. *Economic Importance.* The total value of agricultural production output was calculated by weighting 134 primary crop and 23 pri-

mary livestock commodity quantities by their respective average international agricultural prices (calculated by the Gary-Khamis method) during 1989-91.

3. *Soil Degradation.* It is difficult to reconcile these results with observed growth in food production in Asia, even allowing for past increases in fertilizer application rates. But this apparent incompatibility highlights the basic challenge of using existing data sets in making credible assessments of the state and changing capacity of ecosystems.

4. *Deforestation and Forest Loss.* See for example: Holmes, Derek (2000, draft of 25 February), *Deforestation in Indonesia: A Review of the Situation in Sumatra, Kalimantan, and Sulawesi*. (Draft report in preparation for the World Bank, based on mapping carried out by the Indonesian Ministry of Forestry and Estate Crops; data are subject to final revision, but are not expected to change significantly.)

5. *Supply and Demand.* PAGE researchers used a slightly lower estimate of global runoff than previous analyses and discounted the use of fossil water sources, since such use is unsustainable in the long term.

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Chapter 2

Introduction

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