

ENVIRONMENT

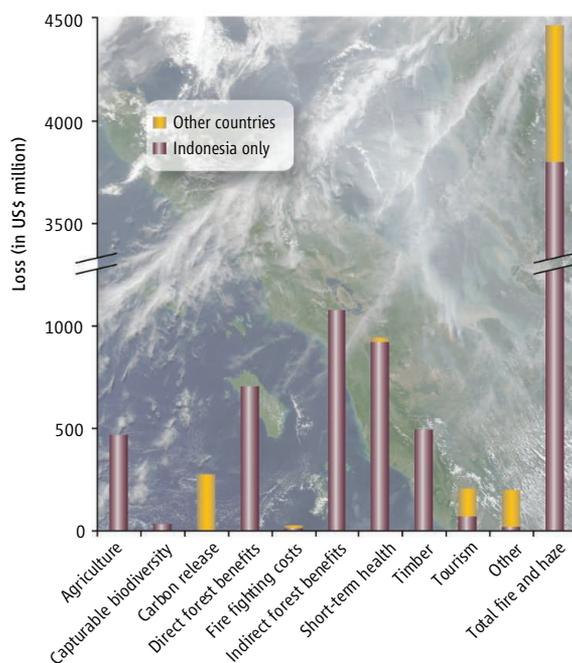
The Burning Issue

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The international community has failed repeatedly to prevent large-scale environmental catastrophes driven by perverse land-use practices in the tropics. Haze pollution in Southeast Asia is an example that has immediate and long-term negative consequences.

The use of fire to clear land is entrenched in many Southeast Asian cultures (1), and large commercial tree plantations—particularly in Indonesia and East Malaysia—have begun burning on an enormous scale (2). The resulting smoke, or “haze,” from hundreds of simultaneous fires spreads across the region in the intermonsoonal dry season, lingering for weeks. Fires set to clear land may burn out of control, particularly during El Niño years, and consume large swaths of forest damaged by logging. These exact a high toll on this hotspot’s biodiversity (2, 3). During the last El Niño in 1997–98, fires consumed over 8 million hectares on Borneo and Sumatra, blanketing more than 3 million km² and 70 million people in haze (2, 4, 5). Material damage estimates ranged from US\$4.4 to \$9.7 billion (2, 4) (see figure, above right); CO₂ and soot liberated from burning peat and biomass released an estimated 0.81 to 2.57 gigatons of carbon into the atmosphere (6). In addition to increasing hospital admissions throughout the region, unhealthy haze conditions increased mortality in Malaysia and lowered infant and fetal survival in Indonesia (7, 8).

Using fire to clear land has been illegal in Indonesia since 1995, and a zero-burning policy was ratified by the Association of Southeast Asian Nations (ASEAN) in 1999 (4, 9). Although many Malaysian plantations have stopped using fire (4), reappearing haze over Southeast Asia every year, including 2006, indicates that farmers throughout the region and plantations in Indonesia ignore the ban. Given the social and economic complexity of the annual haze problem, there will be no easy solution, but we



Effects of smoky haze. Estimated damage in Indonesia and other countries resulting from the haze episode exacerbated by the 1997–98 El Niño (13). The shroud of haze from July 2001 fires can be seen in the background satellite image.

highlight several priorities below.

Concentrate on “dirty fires.” To minimize the greenhouse gases and pollution associated with fires, preventing and extinguishing “dirty fires” from peat and green vegetation, which release more CO₂ and soot than dried biomass, should get highest priority (10).

Coordinate fire-fighting efforts. The 1998 ASEAN Agreement on Transboundary Haze Pollution calls for establishing a coordinating center for battling haze, which has not been formally constituted because Indonesia has not yet ratified the agreement. Streamlining governmental procedures for handling fires may speed response.

Provide incentives to stop burning. Financial incentives could be provided to districts or villages that have policed themselves and have avoided burning during hazardous conditions. Stronger incentives for corporations that clear land for plantations, might include payment of up-front deposits or mandatory “no-fire insurance” (10).

Provide alternatives to burning. Fire will always be the cheapest method to clear land in the tropics. International aid agencies should focus on providing infrastructure and hardware

Neither governments nor civil society have been able to mitigate the annual shroud of haze that blankets Southeast Asia.

needed to clear land without fire.

Teach environmental management. Efforts should be made to educate local farmers on the medical, environmental, and political ramifications of burning, along with alternate methods of land clearing. Volunteer organizations such as the U.S. Peace Corps could help stop fires on the ground and teach rural communities about alternatives to fire.

Neither the Indonesian government nor regional ASEAN pressure have been able to stop the haze (10, 11). Ongoing efforts by the Forest and Agriculture Organization of the United Nations (9), including a recent meeting on sustainable forest management and a workshop in Indonesia to train community-based fire managers, can address the problems at both governmental and community levels. In addition, the United Nations or the World Bank could help generate needed funds through debt-for-nature swap or carbon credit–offset funds.

Solutions to the haze problem are needed before the onset of the dry season in June, as 2007 may be another El Niño year (12). Lessons learned from this catastrophe may help ameliorate similar smoke-haze episodes in Amazonia, Africa, and other parts of Asia.

References and Notes

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