

# SCIENCE NEWS of the week

## Technology for the Tropics

In the shade of rubber trees, Brazilian cattle graze on a ground cover crop of tropical kudzu. Wild crocodiles are fed in captivity in Papua New Guinea. Villagers there also plant shrubs and leafy plants to attract and feed butterflies, which they catch and sell to museums, collectors and craftspeople. A woman in Guatemala cooks on a stove, molded of mud and sand and fitted with a metal pipe and damper, which uses half the fuel of the traditional design.

"We have in hand many of the necessary technologies to tackle the global [tropical] deforestation problem immediately," Rep. Don Bonker (D-Wash.) said last week to mark the release of a report prepared by the Congressional Office of Technology Assessment (OTA) on sustaining tropical forests. The examples above are some current applications of activities that support both the forests and the local population. "We can act now to prevent these

cleared land can remain unproductive for more than a thousand years.

Besides confirming "these gloomy facts," the recent study revealed some good news, says Bruce A. Ross-Sheriff, also of OTA. "Some methods exist to use tropical forests profitably while maintaining the soil-protecting tree cover. Furthermore, it will be possible to make such technologies more productive and less risky for the tropical people."

Tropical forests may be sustained by either of two strategies. One is to establish parks and other protected areas. But strict preservation with total exclusion of economic activity is not practical for many crucial sites, so innovative approaches are being developed that take into account the needs of the local population, the OTA report says.

The other preservation approach is to make undisturbed forests more economically valuable: "Incentives to maintain un-



H. Bollinger, OTA

*Much tropical forest in Latin America has become temporary grazing land.*

such production methods do not yet exist for many of the tropical forest areas... The level of scientific effort in the tropics is still far from commensurate with the rate of natural resource degradation."

Approximately 80 percent of the estimated 1 billion cubic meters of wood removed annually from tropical forests is used for cooking or heating, the OTA report says. Therefore, increasing the efficiency of woodstoves and charcoal kilns and substituting alternative energy sources might have a large effect on conservation in some areas. Techniques to preserve the wood used in local housing could also reduce wood use. Improved wood processing methods and markets for more tree species and sizes could decrease the area that must be logged. The report points to the "press-dry paper process," which can use wood chips of different species, a method recently developed at a U.S. Forest Products Laboratory.

"As the population of tropical nations doubles to 4 billion over the next thirty years, the need for forest products and services will increase dramatically," the OTA says. "To meet these needs, new ways to use forests without degrading them must be developed and demonstrated."

—J.A. Miller

J. J. Swift for FAO



*Park wardens fight fire in a Chad park. Fires set by poachers to flush wildlife or by ranchers to increase forage land can destroy long-term productivity of the land.*

forests from becoming a non-renewable resource," Bonker says. "The threat posed by unchecked tropical deforestation cannot be overstated."

According to the OTA report, each year tropical forests with a total area equal to that of Pennsylvania are cleared by loggers, farmers, ranchers and people in need of fuel, while only one-tenth that amount is replanted. The irony is that even when the land cleared is intended for agriculture, it often rapidly loses its productivity. The soil is exposed to extreme erosion, high temperatures and severe weed infestations. Treeless watersheds give rise to destructive floods, and reservoirs and irrigation canals clog with silt.

The transition from forest to wasteland has occurred in as little as five years in some regions, says Walter Parham of the OTA. And archeological studies indicate

logged forests would be greater if methods were developed to use forest resources other than timber more fully — either by discovering new, valuable products or by encouraging collection and processing of existing products," the report says.

Both strategies require techniques for extracting selected renewable resources from a tropical forest while leaving the forest nearly intact. The report says that U.S. scientific and managerial expertise, especially in the areas of ecology, botany, business and forest management, could be applied to this problem.

"Such technologies have been developed for certain tropical forest situations," says Ross-Sheriff. "These range from conventional forestry to agroforestry and even butterfly-farming. They demonstrate that substantial production and conservation can occur together. Unfortunately,

### New flippers fail turtle

Lucky, the 350-pound loggerhead sea turtle who was surgically provided with synthetic rubber flippers earlier this year, has turned out to be unlucky after all. After a shark bit off her natural front flippers, Lucky underwent the first surgical procedure to provide a turtle with artificial limbs. But the bone to which one flipper was attached soon broke (SN: 1/28/84, p. 54). Now the other flipper-bearing bone has broken, and Lucky is front-flipperless again. Her surgeon, Patrick Barry of Miami, says the bones are too weak to hold the bolts required. Lucky is expected to spend her remaining life in captivity. □