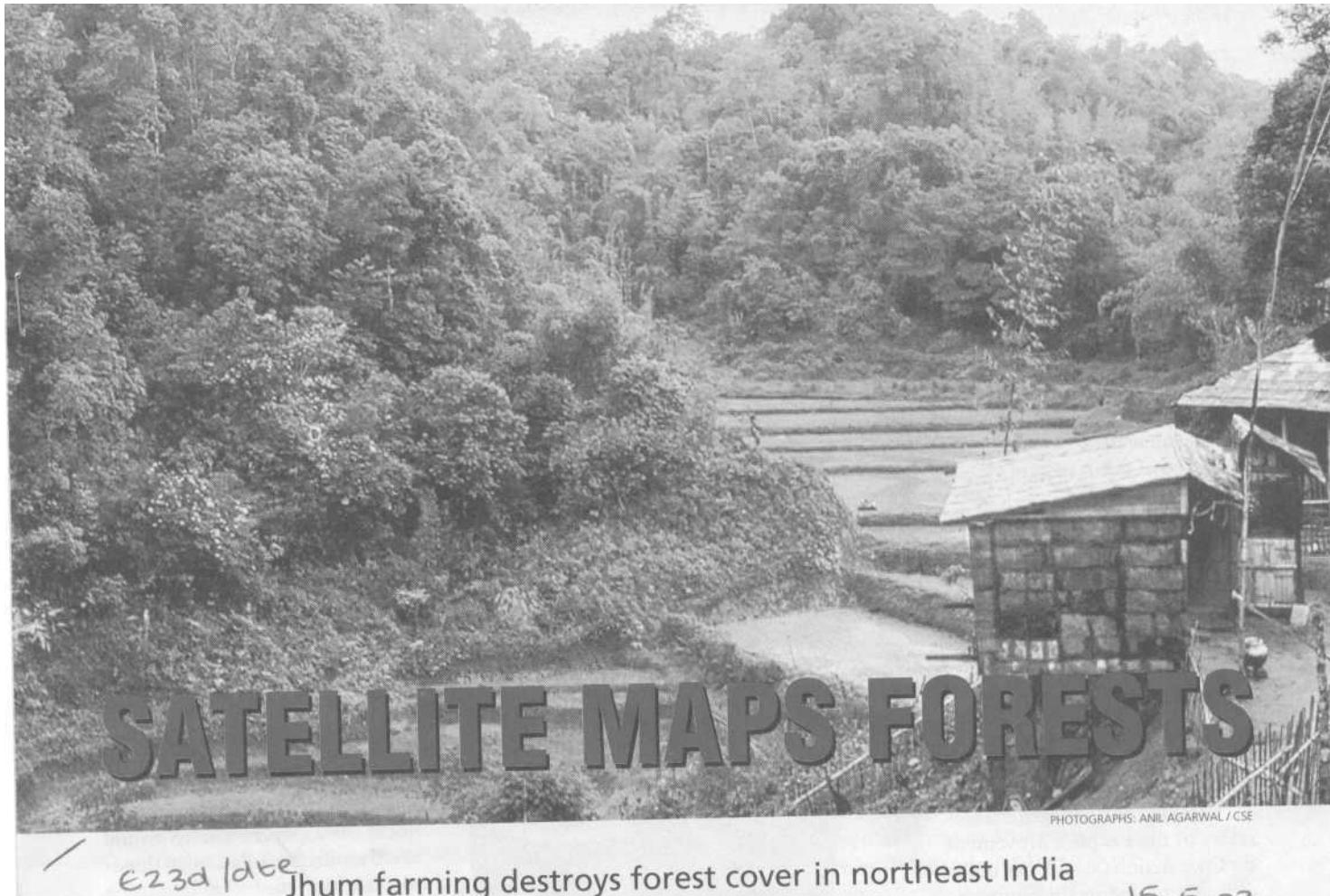


DOWN TO EARTH
15 MAY 2003



THE hills are alive with tradition. One method kills, slashes and burns, the other is healing, and sustains. In the northeast hills of India are found medicinal plants that are treasured for their life giving potential. Tribals use these plants to kill pain and treat diseases.

On these hills, people also practice the age-old method of shift cultivation, which involves clearing away forests to plant crops. After the nutrients in the soil are exhausted, they move away to newer forested areas for fertile land. The abandoned farmland needs almost a century to return to its former state. It is this method of cultivation that is solely responsible for the alarming depletion of land resources in northeast India.

For the first time a government sponsored study used space technology like satellite remote sensing and geographic information system for the purpose of bio prospecting and conservation.

This study found that about 0.45 million families in Northeast India annually cultivate 10,000 square kilometres of forests. With the phenomenal increase in human population, the cycle of shifting or *jhum* cultivation has decreased from 20-30 years to about 5 years and even up to 3 years in many areas. The total area already affected by this

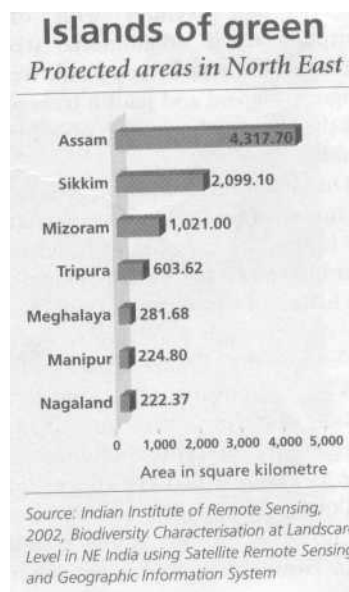
method of cultivation is around 44,000 square kilometres.

These are the gloomy results of this study on biodiversity characterization at the landscape level, jointly conducted by the department of space and the department of biotechnology in 1997.

The study aimed to create an information base for conservation by mapping land use, vegetation cover, and biological richness for the long-term maintenance of biodiversity. Bio-diversity is understood as the totality of genes, species, ecosystems and habitats in a region and the amazing web of connections between them. For example, the seeds that an elephants eats, which pass through its digestive system, tend to germinate better than ordinary seeds. Thus elephants do their bit to maintain biodiversity.

The study encompassed India's most biologically rich sites in forested landscape viz, Northeastern region, Western Ghats, western Himalayas and Andaman and Nicobar Islands. These areas constitute 8.73 per cent of the total forest cover of the country. Of this, the northeastern region comprises 5 per cent of the total forest cover. The recently published report focuses on biodiversity in northeast India.

Known as the bowl of diversity, Northeast India comprises the state of



Sikkim and the seven sister states of Assam, Arunachal, Manipur, Meghalaya, Mizoram, Nagaland and Tripura. This region has a broad range of ecological habitats from grassy meadows to dense humid evergreen forest, disturbed secondary formations to almost virgin natural forest. Of the 16 major forest types in India, 13 types are observed here. Of the 1000 reported species of flowering plants from the Himalayas, 5000 species are found in this region. These states also boast of 4 ecologically stable formations, out of the 221 identified in other parts of the country.

Sadly, however, the study found that forests here were threatened with uncontrolled degradation and conversion to other forms of land uses. The report states, "The tropical vegetation of this region, typically occurring at elevations of up to 900 meters including the evergreen, semi-evergreen and moist deciduous forests, is facing maximum pressure due to human intervention. The evergreen rain forests in the Assam valley, the foothills of the eastern Himalayas and the lower parts of the Naga Hills, Meghalaya, Mizoram and Manipur, where rainfall exceeds 2,300 mm per annum have been extensively fragmented."

The report notes that a higher level of fragmentation allows for low biodiversity. Fragmented forests mean fewer plant species. Fragmentation also reduces the density of forest cover and therefore the species diversity.

The primary cause of this fragmentation is shifting cultivation. Also, human pressure on land, encroachments on forest lands, illicit felling, lopping for fuel wood and fodder and even industrialisation in the form of saw mills and plywood factories have led to deforestation. The absence of a scientific forest management strategy and weak government policies have also contributed to this degradation.

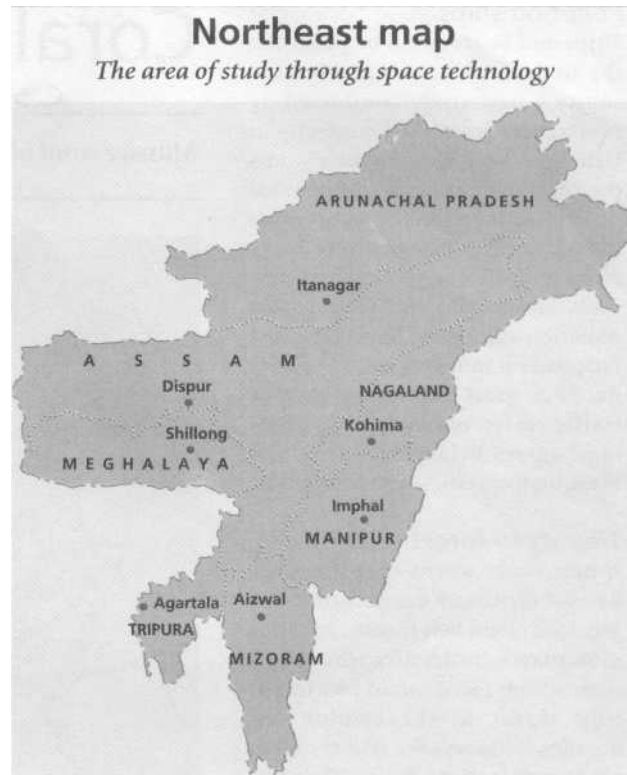
This has resulted in the loss of biological diversity, damage to wild habitats, soil erosion and degradation of watershed areas. Today, over-exploitation, habitat loss and fragmentation are the three threats to the bio-diversity of this region.

The study also found that the tropical semi-evergreen forest has higher diversity in Arunachal Pradesh followed by Meghalaya, Assam, Nagaland, Manipur and Mizoram. But

Verdant forests of the northeast



TR1
Jhum farming in North-east
Effects of Jhum farming



this forest too was highly fragmented. Tropical evergreen forests have highest diversity in Arunachal Pradesh, followed by Mizoram, Assam, Nagaland, and Tripura.

Temperate mixed forests possessed higher species diversity value. These forests were least disturbed in many states as they occur at higher altitude usually away from the human interference zone. Other vegetation classes, pine, rhododendron, fir, hollock, hollong, bamboo, sal and teak possessed low diversity. The riverine forests had average species diversity. The jhum lands and degraded forest possessed medium species richness and mostly mixed and cosmopolitan species were observed in these forest vegetation types.

On the positive side, the report states that the human population density in this region has not yet reached levels that would be detrimental to biodiversity. However, population is most likely to increase and cross the level of disturbance threshold. It therefore suggests that to avert this situation, it is important to develop alternate sources of livelihood for the local people, including tree-based occupations like horticulture on already degraded forest slopes.

The report also suggests development of corridors between patches of forest, which would increase species diversity. It also recommends development of ecotones between adjacent communities. The report warns that fragmentation of large patches of natural vegetation must be avoided and isolation of patches should be minimised. An environment rich in biological diversity offers the broadest options for sustaining human welfare.