THE TROPICAL AGRICULTURE PANACEA

For years we have been exposed to books, articles, and speeches urging intensive development of the humid tropics as the solution to the food problems of the world. 'The Amazon Basin has even been referred to as the “future breadbasket of the world.” Otherwise intelligent people not personally familiar with the humid tropics frequently are not even skeptical about claims concerning the “riches” of these regions. Informed biologists ignore this propaganda but, apparently assuming that those of importance do so also, rarely speak out. A few poorly informed biologists argue that all that is needed to increase productivity in the tropics to levels achieved in the Temperate Zone is increased expenditure on research.

It is seldom emphasized that differences exist between humid, subhumid, semiarid, and arid tropics; between tropical lowlands and mountains; between sandstone and calcareous substrata; between lateritic, potentially lateritic, and nonlateritic soils; and between nonseasonal and strongly seasonal tropical climates. Rarely do enthusiastic writings on the future of the humid tropics reveal such elementary phenomena as the difference in location of nutrient reserves, the increase in tropical savanna resulting from human activity, or even the incredible density of population in the more habitable tropical areas. Almost never is there a suggestion that certain areas are uninhabited or sparsely populated because there is a lack of the requirements needed for support of human populations.

Perhaps the most reasonable statement advocating “Tropical agriculture: A key to the world food crisis” (H. D. Thurston, BioScience 19: 2934, 1969) wisely avoids extremes suggesting that agricultural development is a long-term solution, or that it can replace population regulation. It is clear that he recommends it more as a means of averting an immediate crisis and buying time for more permanent solutions. However, even his title is unduly reassuring, and any suggestion that the potential in tropical agriculture can begin to buy enough more time is dangerously misleading.

Humid tropical ecosystems are fundamentally different from temperate grasslands, or even temperate forests. Comparable expenditures on tropical agricultural research show little promise of leading to the increased productivity obtained from temperate agriculture. The only resources which humid tropical ecosystems have in excess over temperate ones are solar energy and water. Otherwise, they are essentially depleted of mineral nutrients, and humans, an essential component of good soils, vanishes with unbelievable rapidity. Fertilizer application is essential for sustained productivity anywhere. In temperate agriculture, the combination of humus-rich soils and moderate rainfall retains essential minerals until they are utilized by plants. Soil decomposition releases and replenishes these nutrients at a rate comparable with natural losses. In the tropics, release and leaching are rapid, and over vast laterized areas nothing remains to be released. Soil colloids are inadequate to retain minerals from fertilizers as reserves. Like hydroponics, to be effective and efficient, agriculture in the tropics involves enormous expenditures. The results may be good, but the resource input will be high, and the world supply of several essential minerals, such as potassium and phosphorus, is limited.

David Prescott (Food, Overpopulation and Irresponsible, BioScience, 19: 111, 1969) says that over half the world’s population is malnourished. Where are these nutritionally deprived people? Mostly in those very tropics that are supposed to offer the solution to the world’s food problem!

I recommend that we intensify our pitifully inadequate research efforts in tropical biology and agriculture. Knowledge of tropical plants, animals, and their environments is scant compared with that concerning temperate or polar forms, and better understanding is vital to prevent even further degradation of tropical ecosystems. We should not cease our efforts to increase the productivity of the humid tropics, but we should not delude ourselves that this is a panacea for the inevitable disastrous consequences of unrestrained multiplication of Homo sapiens.

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