BOOK REVIEWS

The Soil Under Shifting Cultivation

Such a good book about soils under shifting cultivation is welcome and timely. Early farmers in Europe used the system. Shifting cultivation goes under dozens of names in various parts of the world. Early Europeans called it "slash and burn." In much of South America it is known as "milpa." In the Philippines as "kaingin," in Thailand and Viet Nam as "ri," and in Assam as "jhum." The early British used "swidden"—a burned clearing. The fallow that restores the soil is commonly called "bush fallow" although "natural fallow" is better since the restoring vegetation can be more than trees and heavy shrubs, even good savanna.

Some 200 million people in the tropics and subtropics now get most of their food under systems of shifting cultivation in which mainly the natural fallows maintain soil productivity. These people are more or less isolated from the main currents of modern civilization and technology. Most of them live in small villages far from the sea.

Literature on shifting cultivation is large but widely scattered. A part of it—even some published by people in otherwise responsible institutions—is highly emotional, negative, and misleading. Yet it is very simple to know how the system works or the real place of trees and fire in soil management, and without suggesting any practical alternative for the people.

The system can be improved. But first we must know how and why it works as well as it does. The research problems and opportunities are enormous. The book suggests some of them.

Many of the shifting cultivators are suspicious of the outsider. Even well-meaning advisers commonly understand neither the biological nor social principles involved. Usually the land is held in common and history has taught these people to be cautious, else they will lose it.

The basic principles of maintaining soil productivity on any kind of soil are the same under shifting cultivation, of course, as under other systems. But the methods are different, and they vary widely according to the kind of soil and the associated climate and vegetation.

Roughly, the main features include: (1) Clearing of the soil and burning of partial burning in place of the cut trees or other plants; (2) cropping from two to several years (depending on the soil and culture) commonly with mixed cultures, with regard for soil protection and the rapid encroachment of the fallow plants under the last crop; and (3) a period of growth of the regenerating plants, which make the soil productive again. Considering the many combinations of kinds of soil and cultural patterns a multitude of systems are possible. One that grew up gradually, guided only by experience, and passed down as rigid traditions.

Some emotional observers look with horror at the cutting and burning of woody growth to make the soil productive. Why it should be a "virtue" for a Western farmer to grow the clovers and plow them under to improve the soil, and yet be a "sin" for these cultivators to use trees for the same purpose, escapes this reviewer.

The shifting cultivators are having trouble. Invaders are taking their land for other uses. The introduction of medicine has increased their numbers. Many are gradually being forced to shorten the length of the cycle and increase the proportion of cropping. This causes lower yields, accelerated erosion in some places, and, most commonly, an invasion of the fallows by very bad species, especially Imperata cylindrica. In places their plight is becoming nearly desperate.

Despite the enormity of the problem and its importance to millions of people, and the many papers by anthropologists, botanists, and others, no more than a handful of soil scientists have studied it. Much of that study has had to be "bootlegged" from other more "normal" research activities.

The authors have performed a great service in bringing together a large part of the relevant data that are available and organizing them into a logical and useful book, together with a good bibliography. So far as this reviewer knows this is the first sound book about soil management under shifting cultivation in the English language. It is a good beginning. More kinds of soil and more systems remain to be dealt with. The authors have depended a great deal on their experiences in Ghana and Nigeria and on the splendid work of the INEAC in the Congo. They have also drawn widely on the bits and pieces available from the few published studies in Southeast Asia, Latin America, and elsewhere.

The book is especially to be admired for bringing together data on the maintenance of plant nutrients under this system. As the authors point out, fallow plants differ widely in their ability to take plant nutrients from the soil and air and to return them to the soil. Even one small forest plot can support a wide variety of trees with strongly contrasting effects on the soil. Then too, the fate of these plant nutrients is related to cropping patterns and the intensity of leaching.

Some improvements are possible. Among these are: well-favored areas for paddy rice; permanent mixed cultures of palms and food-bearing trees; compost; the use of ashes or wood from outside the plot; and fertilizers.

The authors bring out clearly the contrasting physical conditions of the soil and erosion hazard in fields following savanna and those after forest. On comparable soils, the forest is a better fallow cover for several reasons.

They might have said more about the physical effects of growing plants and of micro- and macro-fauna on the soil. As one example: In the tropics young fallow trees grow to large ones. After cutting, the termites and microorganisms rapidly develop the crowns and roots. Yet we don't find holes where they were! The soil is worked back in place of the wood. When seeds sprout and grow into new trees, the soil is again pushed away to make room for the crowns and roots. One might call this process a kind of shifting cultivation under the forest fallow. But here again we have few quantitative data.

More is also needed on soil management under permanent mixed cultures of trees, vines, palms, and herbaceous plants for both food and industrial crops.

This reviewer commends the authors for this little book and strongly recommends it to soil scientists working in the tropics and especially to those with curiosity about the soils and peoples beyond the tropics—CHARLES E. KELLOGG, SCS, USDA, Washington, D. C.

Mention

In addition to a short review of the Institute's activities during 1959, this publication contains two interesting reports on land development. An article on measurement of basic land resources by Dr. L. Dudley Stamp, Director of World Land Use Survey of the International Geographical Union, gives special reference to Africa. It covers the general problem, national contrasts, units of farming output, concept of optimum and maximum population, and what population a country can support. An article on land development prepared by two members of the Institute staff, describes the land consolidation colonization, irrigation, and soil conservation work being done in that country. The authors conclude that much progress has been made, especially in the last few years, and that the organization and planning are well done. The many soil scientists interested in land reclamation and improvement should acquaint themselves clearly the work of the Institute. A postcard requesting this annual report would be a good way to start.

A Priority Scheme for Dutch Land Consolidation Projects. International Institute for Land Reclamation and Improvement, P. O. Box 45, Wageningen, Holland. 84 pp. 1960. $1.50.

This report was prepared by the Central Land Consolidation Committee. The full report was published in Dutch, and this English version with summaries in French, German and Spanish is very abbreviated. As in most countries, the need for national investments exceeds the financial and technical resources available for these purposes. In the Netherlands, about 70 percent of the agricultural area is in need of land consolidation but only 4 percent of this can be consolidated per year. The Dutch scheme takes into account not only the land development factors of parcelling, accessibility, water, soil and reclamation, but also social factors such as farmer income, location in relation to other economic units, existing facilities and public utilities. This publication will be of interest to those concerned with developing agricultural priority schemes in other countries.