The Basics of Shifting Cultivation Systems

Shifting cultivation defined

Shifting cultivation consists of many diverse land use activities and is, therefore, difficult to define. Broadly speaking, the term refers to any temporal and spatial cyclical agricultural system that involves clearing of land - usually with the assistance of fire - followed by phases of cropping and fallow periods. Most shifting cultivation systems blend agriculture with hunting, fishing, gathering, and resource-use systems in multi-niche strategies that make economic and social sense in many settings. Typically, shifting cultivators incorporate perennial crops such as fruit, medicinal, nut, and resin trees. All shifting cultivation systems are actually forms of agroforestry systems.

The colloquial term "slash-and-burn agriculture" refers to the method of clearing and preparing land, an activity common among shifting cultivators. This term, however, has pejorative connotations. Anthropologists prefer the term "swidden farming" as a neutral concept; it is drawn from the Old English word swidden meaning "burned clearing." As a term however, swidden farming does not adequately capture the dynamic quality and stages of shifting cultivation.

Extent of shifting cultivation

The total land area affected by shifting cultivation is difficult to assess because the practice includes many land use activities. In the mid-70s, various types of shifting cultivation were practiced on about 30 percent of the world’s exploitable soil. By 1985, roughly one half of the land area in the tropics was modified through shifting cultivation. In 1994, the global area was estimated at 2.9 billion hectares.

Shifting cultivation was common in the temperate zones of the Mediterranean and Northern Europe until the 19th century, as well as in the south-western and north-eastern pine woodlands of North America until the 1940s. Currently, it occurs almost exclusively in the humid and sub-humid tropics of Africa, Asia, and Latin America.
Shifting cultivation is found in different topographies, ranging from steeply-sloped hilly areas to flat lands and low-lying valleys. It is also present in diverse ecosystems that range from tropical moist forests to dry tropical forests and savannas, grasslands, and even seasonal floodplains. Land uses derived from shifting cultivation often blend with, or are mistaken for, natural forests. Some forest formations, as in the Babassu forests in northeastern Brazil, are the results of resource management by shifting cultivators. Many forests in Kalimantan, Indonesia, are dotted with forest and fruit gardens planted over time by shifting cultivators.

The total number of people engaged in some form of shifting cultivation system has only been loosely estimated. Some conservative estimates cite 300 million to 500 million people in the 1980s. However, some have argued that more than 400 million people in Asia alone are forest dependent and that many of them engage in shifting agriculture. It is possible that about one billion people (22% of the population of the developing world in tropical and subtropical countries) rely directly or indirectly on some form of shifting cultivation. These shifting cultivators belong to at least 3,000 different ethnic groups.

Main features of shifting cultivation

Shifting cultivation is cyclical, and its cycles encompass an array of land use activities. The specific stages and features of each cultivation cycle vary and are sometimes difficult to distinguish. Shifting cultivation in woodlands and hills, for instance, has six stages: (a) site-selection and clearing, (b) burning, (c) planting, (d) weeding and protecting, (e) harvesting, and (f) succession.

In other forms, the stages do not follow such a clear pattern. Graphic portrayals of shifting cultivation risk oversimplification of its complexities, but attempts to show the main general stages and their relation to vegetation regrowth are in Figures 1 and 2, respectively.
The cropping cycle in shifting cultivation refers to the planting, care, harvesting, and protection of introduced flora. The types of crops and the manner in which they are planted differ greatly among shifting cultivator groups. In South America, for example, intercropping of many varieties of the same crop species may take the place of the intercropping of many species of different crops. In some areas, swidden plots are like miniaturized tropical forests or complex agroforestry systems. Even individual households commonly manage a variety of crops and trees, depending on the local economy and ecology.

In general, the cropping cycle in any given system lasts several years and is followed by a fallow period where natural vegetation regenerates and soil nutrients are restored. The fallow period, clearing of vegetation, and burning are important activities in the cropping cycle.

**Burning** is the typical method employed for clearing vegetation and preparing a site for planting. Shifting cultivators use different techniques for burning, fire protection, and reburning.
- Chitemene (dry forest) systems in northern Zambia and Bhutanese grass-fallow systems use supplementary fuels brought in from outside the burning area.
- Many groups prefer broadcast burning because it requires the least labor.

The fallow stage follows the cropping stage, typically after a swidden field has been used for several years. The native vegetation is allowed to regenerate so as to improve the physical properties of the soil and capture nutrients from the sub-soil. Fallow fields are often perceived by outsiders as abandoned or wasted land. In reality, shifting cultivators usually manage these fallows, using them for planting trees or crops, for collecting edible and commercial products, or for hunting and pasturing animals.

Certain trees of economic value are often protected within shifting cultivation fields both during burning and during the fallow cycle. Shifting cultivators also weed, transplant, and carefully manage vegetation regrowth during the fallow cycle in preparation for the next planting.

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**Benefits of burning**

- Clearing of unwanted vegetation and weeds
- Elimination of unwanted insects and plant diseases. (Note: This will also eliminate desired species.)
- Alteration of soil structure to make planting easier;
- Increase in available soil nutrients;
- Decrease in soil acidity;
- Enhancement of soil fertility with nutrient-rich ashes from burnt plant biomass;
- Sterilization of soil and reduction of microbial pathogens; and
- Reduction of labor requirements compared with other forms of clearing.

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In the Kalahan Reserve in Northern Luzon, Philippines, the farmers have over 100 varieties of sweetpotato.
Fallow periods vary greatly in shifting cultivation systems and they are often adapted to existing demographic pressures and socioeconomic conditions. In many rainforests, shifting cultivation systems have long fallow cycles of one to three decades, and cultivation cycles of at least two to four years. In many parts of the world today, fallow lengths are becoming progressively shorter. In northeast India, for example, fallow periods historically reached as long as 40 years, but are now at an average of five years. This is well below the time required (10 years or more) to allow soil fertility to recover in a fallowed site. In Zambia, chitemene shifting cultivation systems have shortened fallow periods from 25 years to 12 years.

Succession refers to the multiple stages or cycles of vegetation regrowth in the fallow or in other lands adjacent to the cultivated plots. Shifting cultivators typically manage such successions for multiple purposes: they protect valuable species, plant desired ones, weed, burn, thin, and prune fallow vegetation and the remaining forest or woodland. This allows them to extract an array of forest products from the land. The products of the manipulated succession can equal or exceed the returns generated from the annual cropping phase or off-farm wage labor.

In most traditional forms, shifting cultivation practices are closely tied to cultural and spiritual activities. For example, among traditional cultivators in many Philippine upland regions, religious beliefs and practices are intimately linked to swiddening, especially in relation to activities like site selection, clearing, burning, planting and harvesting. The cultivators generally have detailed knowledge about local ecological factors and constraints and adapt their practices accordingly. Such complexity of culture and knowledge has been documented in many countries, such as Malaysia (see box below).

**Culture and Ritual in Iban Shifting Cultivation**

Among the traditional Iban shifting cultivators of Malaysia, rice production is interwoven with their worldview, beliefs, and social organization. Ritual and religion are integrated into all aspects of swiddening - from appeasing the "spirits of the earth jungle" with the mango ritual before clearing, to rituals associated with the storage of harvested rice. Rice itself is viewed as sacred. Various rituals before and during harvesting ensure that the spirit of the paddy is not frightened away, that there will be sufficient rice for the coming year, and that the crop will be abundant and easy to reap.
Ecological values of shifting cultivation
Swidden farmers have developed their own ecological values over long periods of upland cultivation. For example, they have internalized the importance of maintaining a high level of biodiversity as a means to insure a wide variety of food products to enhance family health, and to guard against widespread crop destruction by insects and diseases in monoculture crops. They likewise recognize the value of including animal components in shifting cultivation systems for multiple purposes like providing protein-rich food sources, acquiring animals for farm work, utilization of grass as fodder, and collection of animal manure for organic fertilizer use.

Dynamics of shifting cultivation
The features, stages and lengths of cycles of shifting cultivation have changed over time. The pace of change has been rapid during the last 30 to 50 years, largely due to the political, economic, and cultural transformations discussed here. In particular, the length of time that fields are left in fallow is increasingly shortened, which leaves less time for restoration of soil fertility.

At the same time, shifting cultivators generally have been intensifying their land use practices over time, usually through the introduction of new crops and technologies. In some regions, they have expanded their practices into forested areas. Such changes can sometimes increase the cultivators' immediate incomes.

However, these changes have also resulted in disruptions or instabilities in previously well-adapted shifting cultivation and resource use, and have made systems unsustainable ecologically and economically in some cases.

The main factors contributing to such changes include government restrictions of forest use, changes in land tenure systems, demographic pressures including large-scale migration and resettlements, and policies that promote cash crops. These factors have also raised concerns about the sustainability of shifting cultivation and have led to research and development efforts on alternative land uses.

Such unstable, changing conditions are not found in all shifting cultivation systems, but they have reinforced public misconceptions about shifting cultivators. The ecological and socioeconomic sustainability of shifting cultivation needs to be understood in relation to local conditions and the causes of change to these conditions. Finally, the general principles that underlie shifting cultivation must be appreciated.

Reference:

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