Forces and Policy Issues Affecting Forest Use in Northeast Thailand 1900-1985

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Keepers of the Forest

Land Management Alternatives in Southeast Asia

Editor

Mark Poffenberger

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CHAPTER FOUR

**Forces and Policy Issues Affecting Forest Use In Northeast Thailand 1900–1985**

*James A. Hafner*

_The flowing of the never-falling rivers, the fall of the periodical rains, the favor of the tropical sun, the richness of the soil, all invite the cares of the cultivator, and would bring the recompense of abundant harvests._

—Sir John Bowring, 1857

SINCE THE EARLY Ayutthaya period, successive Thai monarchs faced the challenge of controlling a vast domain rich in resources but largely underpopulated. The country Bowring described a century ago still retains an essentially frontier character. Indeed, the last of these frontier areas, Northeast Thailand, did not come under central government control and settlement by lowland Thai until the latter half of the nineteenth century. At that time the region was still heavily forested and only sparsely settled. Since then, however, social, economic, and institutional changes have substantially altered the human-environmental balance. Among the many symptoms of this changing relationship, none illustrates it more clearly than the rapid dwindling of forest resources in the Northeast.

The postwar period has seen a rapidly accelerating depletion of Thai forest resources. Between 1945 and 1975, forest cover declined from 61 percent to 34 percent of the nation’s land area and the rate of forest degradation over this period has been placed at 333,000 hectares per year. Recent trends in Thailand’s balance of trade in forest products indicate that Thailand, once a major world exporter of valuable timber and forest products, is now a net importer of forest products. Between 1981 and 1985, Thailand had the highest annual rate of deforestation in Southeast Asia and ranked third behind Indonesia and Malaysia in the area of tropical forest resources lost over this period. The first symptoms of this problem were rising tenancy rates, shortages of arable land, and the conversion of marginal land to agriculture in the central region; the most alarming trends, however, develop in other regions, especially the Northeast.
Although awareness of contemporary forest management problems in the Northeast is growing, the process of deforestation is not new. Indeed, the situation has its foundations in conditions which began to develop at the turn of this century. This chapter explores the complex fabric of macro-level forces and policy issues that have affected the extent and use of forest resources in Northeast Thailand since 1900, particularly the relationships between population growth and the expansion of cultivated land, the postwar spread of field crops, the evolution of forest policy and law, changes in the land code, postwar investment in regional infrastructure, and the more tenuous links between internal political instability, national security policies, and new programs for forest land management. There is no intention here to rank these various factors in importance; indeed, the complexity of these relationships requires that, for the most part, they be examined separately. Our discussion spans the period from 1900 to 1980, beginning with a brief profile of Northeast Thailand and regional trends in deforestation in the postwar period.

THE PATTERN OF DEFORESTATION IN NORTHEAST THAILAND

Of Thailand's four major geographic regions, the Northeast is the largest, contains one-third of the nation's population, and by most measures is the poorest and least developed. This region encompasses 170,000 square kilometers in a large, gently sloping plateau of undulating mini-watersheds, flood plains, and a zone of hills and uplands that are most pronounced on the south and west. Regional per capita income is only 40 percent of the national average and just 60 percent of the average in the more developed central region. The region's poverty is linked partly to its historical isolation from the capital in Bangkok, past neglect by the central government, and low agricultural production due to poor soils and erratic rainfall. A key problem throughout the Northeast is instability of rainfed farming, which varies in productivity and yields for paddy. Floods and drought are common, rainfall occurs only occasionally during the dry months, and less than one-quarter of the farms are within reach of fixed-tank or reservoir irrigation. Consequently, the choice of cultivable crops is limited and much of the land is under a monoculture of rice, kenaf, or cassava. Postwar efforts at crop diversification have also been frustrated by declining external market demand for kenaf and an uncertain future for cassava.

The Thai government has long expressed a goal of maintaining at least half of the country under forest cover. Until the 1940s it appears this goal was never seriously threatened. At the end of World War II, 60 percent of Thailand's land area of 513,115 square kilometers was believed to be forested. In the following decade the government revised forest laws, updated the land codes, and simplified reserved forest legislation to strengthen its ability to protect, preserve, and manage national forest resources. A formal national policy was adopted of retaining at least 50 percent of the nation's land area in forests, a policy expressed in the first five-year development plan (1961–1966). In 1962, Royal Forestry Department surveys indicated that 57 percent of the country's land area remained in forest and, as recently as 1975, government officials stated publicly that adequate forest lands were available for new cooperative land settlements (nikhom), expansion of cultivated area, and population resettlement. In the fourth five-year plan (1977–1981), however, due to continued forest depletion, the target level for forest lands was revised to 37 percent.

Refined measurement techniques of the last two decades have dramatically altered the rather benign early estimates of Thailand's forest resources and their depletion rates. Estimated annual rates of decline in forest area vary from less than 3 percent for the period 1961–1975 to 10 percent for the period 1973–1977. Despite these discrepancies, it is generally acknowledged that deforestation has accelerated in some areas of the country. Comparative analysis of ERTS-I/LANDSAT imagery for 1974 and aerial photography for 1961 show that less than 37 percent of the nation was forested in 1974, a decline of 20 percent since the Royal Forestry Department's assessments in 1962. In the Northeast, annual deforestation rates varied widely between 1961 and 1974 (Figure 4.1). Among the Mekong provinces, Sakon Nakhon and Ubon experienced rates of less than 1 percent annually, while Korat, Mahasarakham, Kalasin, and Udon in the Korat Triangle exceeded 4 percent per year. There were similarly high rates of deforestation in provinces like Loei (3 percent) in the Western Hills and Nong Khai (3 percent) along the Mekong River in the north.

A more recent analysis by Wacharakitti and Chuntanapar confirms three general trends. Between 1973 and 1978, the average annual rate of deforestation in all watersheds was over 8 percent, although rates in Mun and Chi watersheds exceeded 10 percent per year during this period (Table 4.1). Between 1978 and 1982, the total deforestation rate for all watersheds had dropped 7 percent per year as the availability of forest land suited for conversion to agriculture diminished, leaving 15 percent of the region under forest. The largest conversion of forest land during this period has been to such field crops as kenaf, cassava, and sugar cane. While the deforestation process is generally slowing, in a few subwatershed areas in the Southern Hills and the upper Korat Triangle rates have actually accelerated. (See Chapter 10 for a discussion of the Lam Pao area of the Korat Triangle.) Projected trends suggest that forested area should have continued to decline to about 12 percent by 1986.

At current rates of population growth, the limits on arable land may be reached by the end of this decade. In fact, given present technological and ecological constraints on the rainfed farming systems of the Northeast, the recent declines in deforestation rates may indicate this has al-
ready occurred and the better lands have been occupied. Demands for building materials, fuelwood, and cooking fuels, however, will persist. The region consumes an estimated 10 million cubic meters of firewood and charcoal yearly. The Northeast has the nation's highest regional consumption rate for fuelwood and many rural communities already face moderate to severe fuelwood shortages. Despite expectations in the 1970s that off-shore natural gas could become an inexpensive replacement for fuelwood, this has not occurred. Under these conditions, conserving these

![Figure 4.1. Percent decrease in forest area, 1961–1974](image)

resources while accelerating rural development in the Northeast is a major challenge for forest management.

### THE CHANGING POPULATION–LAND BALANCE IN THE NORTHEAST

Historically, the Northeast has had a small population. Between the thirteenth and seventeenth centuries, the region was almost entirely "unpopulated." Lao and some lowland Thai populations filtered in slowly over the eighteenth century, particularly along the Mun and Chi rivers and around Nakorn Ratchasima in the southwest. In the early nineteenth century this situation was altered by political events and Siamese court policy, which encouraged Lao migration to the Northeast plateau. During the Third Reign (1824–1851), the thinly populated and densely forested region became increasingly occupied and controlled by the Siamese court in Bangkok. After the monarchy relinquished its claims to land east of the Mekong in 1893, this region was settled almost exclusively by lowland Thai. By contemporary standards, population density was still quite low in 1900; probably two-thirds of the region remained forested and suitable paddy land was being increasingly cleared and cultivated. Thailand's population has grown steadily since the beginning of this century, however, and except for a slowing of growth rates between 1939 and 1945, growth rates in the Northeast have consistently equaled or exceeded those for the entire country (Table 4.2). Constant population growth has accelerated settlement, substantially enlarged the area of land under cultivation, and placed increasing pressure on both land and forest resources, leading to their progressive decline.

Dixon has reconstructed the historical pattern of settlement based on

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**TABLE 4.1**

Rates of forest depletion by watershed, 1973–1982

<table>
<thead>
<tr>
<th>Watershed</th>
<th>Forest Area in km²</th>
<th>Annual Depletion Rate in %</th>
<th>Forest Area in km²</th>
<th>Annual Depletion Rate in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mun</td>
<td>18,422</td>
<td>12,337</td>
<td>6.91</td>
<td>12,337</td>
</tr>
<tr>
<td>Phong</td>
<td>3,029</td>
<td>2,219</td>
<td>5.38</td>
<td>2,219</td>
</tr>
<tr>
<td>Chi</td>
<td>9,919</td>
<td>5,536</td>
<td>10.21</td>
<td>5,536</td>
</tr>
<tr>
<td>Khong</td>
<td>9,610</td>
<td>5,912</td>
<td>8.43</td>
<td>5,912</td>
</tr>
<tr>
<td>Phen</td>
<td>9,681</td>
<td>5,217</td>
<td>10.85</td>
<td>5,217</td>
</tr>
<tr>
<td>Total</td>
<td>50,671</td>
<td>31,221</td>
<td>8.40</td>
<td>31,221</td>
</tr>
</tbody>
</table>

### TABLE 4.2
Regional population growth rates in Thailand, 1920–1980

<table>
<thead>
<tr>
<th></th>
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<tr>
<td>Central</td>
<td>2.7</td>
<td>2.6</td>
<td>2.6</td>
<td>3.2</td>
<td>2.9</td>
<td>2.6</td>
</tr>
<tr>
<td>North</td>
<td>1.8</td>
<td>2.3</td>
<td>1.8</td>
<td>3.1</td>
<td>3.1</td>
<td>2.2</td>
</tr>
<tr>
<td>Northeast</td>
<td>2.4</td>
<td>2.8</td>
<td>2.5</td>
<td>2.7</td>
<td>3.3</td>
<td>3.8</td>
</tr>
<tr>
<td>South</td>
<td>1.9</td>
<td>3.2</td>
<td>2.2</td>
<td>3.0</td>
<td>3.1</td>
<td>2.7</td>
</tr>
<tr>
<td>Kingdom</td>
<td>2.3</td>
<td>2.6</td>
<td>2.4</td>
<td>3.0</td>
<td>3.1</td>
<td>2.7</td>
</tr>
</tbody>
</table>


the capabilities of the Northeast’s four major ecological systems (flood plains, lower terraces, upper terraces, and the steeper ridges and ranges, here termed “uplands”) as determined by soil fertility, water supply, susceptibility to drought and flood hazard, and land slope in each of these morphological types. Throughout the nineteenth century, settlement expanded outward from the more fertile flood plains and reliable water supplies on lower terrace lands. By the early twentieth century, most lands suitable for homesteading were marginal or unsuitable for cultivation under existing farming methods. With continued population growth, village lands began to reach their maximum carrying capacities. In the Chi and Mun river valleys this produced overpopulation with respect to available land, declines in soil fertility, and emigration. Keyes reports that the population of Ban Nong Tun village in Mahasarakham province grew from 200 to 800 people between 1900 and 1940, and at least seventy-five families emigrated from the village between 1935 and 1963. Many of those with insufficient land emigrated to Udon, Kalasin, and Khon Kaen provinces, where marginal land was still available. Similarly, in Amphoe Kaset Wisai, Roi Et province, where most villages were settled between 1883 and 1913, growing population pressures forced some families to establish newer villages. Pendleton has even provided first-hand evidence that, by the late 1930s, the “centrifugal diffusion” of population beyond these core areas was affecting forests as far north as Udorn.

Thus, population growth in the first half of this century has contributed to increased settlement, expansion of cultivated land, and the penetration of agriculture into upland and forest areas. Also, the marginal quality of this terrain demands larger fields to compensate for lower production and greater variability in crop yields, thus increasing forest clearance and land development for agriculture.

The long-term decline in paddy yields per unit of land cultivated reflects these conditions. Between 1920 and 1960 paddy yields in the Northeast dropped from approximately 260 kilograms per hectare to less than 150 kilograms per hectare. Only when new agricultural technologies were introduced in the 1960s did productivity begin to recover to levels close to those of forty years earlier. Thus, while other rice-growing areas of Southeast Asia intensified land use to meet rising population, the response in the Northeast was to expand area under cultivation and convert more marginal uplands and forest lands to agricultural use. The acceleration of this process in the last quarter-century is reflected in two corollary phenomena, rising population densities and intraregional population mobility.

The Northeast is still the least urbanized region of the country; only 4 percent of the population lived in urban areas in 1980. Yet, between 1947 and 1970, population density more than doubled to seventy people per square kilometer, a level second only to the central region. Most of this increase has come in rural areas, especially those provinces which had relatively large areas of undeveloped uplands and forest land. The highest percentage gains in population density have taken place in provinces like Loei (58 percent), Nong Khai (69 percent), Udonthani (49 percent) and Sakon Nakhon (40 percent), which have recently had high rates of deforestation. Intraregional population mobility in the last thirty years also indicates the diminishing availability of cultivable land and the effects of population growth on forest land. Throughout the postwar period, the Northeast has had net losses of population through emigration, mainly to the central region.

Within the Northeast, however, there has been a persistent pattern of intraregional, interprovincial migration, dominated by movements from the older, more densely settled areas of the Mun and Chi river flood plains to the less densely settled uplands and more mountainous landscapes in the Western Hills and northern Mekong provinces (Figure 4.2). This pattern can be seen as part of a long-term trend in settlement growth and the use of a land-extensive system of agricultural production, a trend involving movements from densely populated areas with unstable rice production to increasingly accessible uplands and forests where sandy and low-fertility soils are better suited to field crop production. One cost of this adaptive response has been the accelerated conversion of forest land to agricultural uses.

Throughout the first half of this century, forest clearance took place at a socially optimal rate. Excess rural population was absorbed through an expansion of settlement and land under cultivation. Rather than intensifying land use, farmers sought to maintain traditional land-extensive cultivation systems by forming new settlements and expanding cultivated areas. Due to the instability of paddy production and variability in rainfall, extensive cultivation also minimized risk. For much of this century, the existing natural resource base has sustained this expansion, even
this change. Since 1950, however, when almost 96 percent of the area under cultivation was still planted to paddy, there has been an even more remarkable agricultural revolution in upland or field crops in the Northeast.

Between 1950 and 1984, the share of cultivated land under paddy in the Northeast declined from 96 percent to 73 percent, the number of total holdings increased by over 36 percent, and the total area in holdings rose by 53 percent. These shifts were due primarily to the dramatic growth in upland cash crops over this period. Beginning in the 1950s, three crops began to dominate the area being planted to upland crops in the Northeast: corn, kenaf, and cassava. Corn production, which first grew in response to export market demand (although since 1975 the local animal feed industry has absorbed a growing share of total production), expanded rapidly in the postwar decades. Most of the early production was concentrated in the Northeast, but by 1960 this share had dropped to less than 15 percent and the focus of production had shifted to the upper central region. Behrman attributes this to the Northeast's somewhat less favorable soil conditions and the increased profitability of kenaf due to rising prices between 1959 and 1961. Kenaf rapidly began to replace corn in upland areas and by 1965 it accounted for two-thirds of the land in field crops in the Northeast (Figure 4.3).

Between 1957 and 1965, when kenaf was concentrated in the southwestern half of the Northeast, production expanded at 35 percent a year. While kenaf drew somewhat on the same labor supplies as rice, it was grown primarily on uplands and did not displace paddy from lowland soils. Despite official views (especially after 1966 when yields began to decline) that farmers had begun to cultivate more virgin upland and forest soils, some studies have tended to contradict this. Nevertheless, in 1969, 38 percent of the farmers in Huey Sithon, Kalasin, were either clearing forest for kenaf or had assumed land-use rights over kenaf fields newly cleared from forest. By the early 1970s, cassava was replacing kenaf on upland soils and newly cleared forest land, primarily due to the decline in kenaf prices and problems with labor supplies and access to water needed for retting the crop, factors which made cassava easier to produce. In 1983, cassava accounted for almost half of the area under field crops in the Northeast and production represented 62 percent of the nation's total output.

The spread of field crop production in the Northeast has significantly affected the depletion of forest resources. Field crops are better suited to the marginal drought conditions and poorer soils of uplands and forested areas, where production and yields of paddy have been highly unstable. Also, field crop expansion has coincided with increased cultivation, especially after the mid-1960s; that is, paddy and field crops are not directly competing for land, but rather field crop production has increased through
in the lower Lam Pao watershed to irrigate some 52,000 hectares of land. The original vegetation in this area was dry deciduous dipterocarp forest, but most of this savanna forest had already been destroyed by heavy logging, fires, and illegal charcoal making. Migrants from the more crowded provinces of Roi-Et and Mahasarakham had traditionally preferred this area but, "as population densities rose in the more congested lower terrace areas, [migrants moved] to the forest margins to maintain the extensive land-use system." The resulting expansion of cultivated land, especially during the 1960s when kenaf cultivation grew rapidly, had been almost entirely in field crops. Almost two-thirds of the farmers in the irrigated project area acquired upland holdings for cultivating kenaf and, later, cassava. Throughout this process, the scrub and forest margin has gradually receded to accommodate the production of these cash crops.

Private entrepreneurs contributed significantly to the extension of field crop production by meeting farmers' financial needs and providing as much credit as state agricultural institutions towards the production, marketing, and processing of these crops. Thus, the rapid clearance of land for field crops was substantially underwritten by small merchants, middlemen, and traders.

Some observers also contend that the government's rice premium policy has altered relative crop profitability, thereby encouraging farmers to diversify their crops and adopt land extensive kenaf and cassava. This policy was intended to lower domestic rice prices and generate income, but its depressant effect on the farm price of paddy may have made field crops a more profitable source of cash income, thus providing farmers an incentive to diversify crops and extend field crop production by clearing forest land. The fact that the expansion of these crops has not occurred on land under paddy emphasizes the effects of the increased cash cropping on forest lands. In short, expanded cash cropping in the Northeast is at once a result of market and price incentives and a cause of increasing degradation and deforestation of forest lands.

FOREST POLICY AND FOREST LAND MANAGEMENT

The modern Thai economy is partly founded on an abundance of natural resources. Rice, rubber, tin, and teak accounted for over 80 percent of total annual Thai exports from the last half of the nineteenth century through 1951. Although the contributions of teak to total exports peaked early in this century, the commercialization of timber harvesting significantly influenced the creation of the Royal Forestry Department and subsequent forest policy and legislation. Despite substantial legislation covering forest use, logging permit procedures, replanting procedures, penalties for violations, and the settlement of public lands, forest land degradation has
accelerated in the past quarter-century. Indeed, this body of legislation, its interpretation, and enforcement have partially caused this problem.39

Until the late nineteenth century, the cutting and collection of timber or harvesting of forest resources was, except for teak, unregulated. The Royal Forestry Department (RFD), the basis for modern institutions for forest management and forest policy, was created in 1896 in response to concerns over the commercialization of teak production and weak administrative and tax controls on teak harvesting in northern Thailand. The policy embodied in the Forest Preservation Act of 1897 emphasized protection and management to increase production, supervision and administration of forest resources by the RFD, definition of forest rights, and the collection of revenues and control of timber in transit.20 The RFD had no control over the exploitation of nontean forests, however, until the Forest Conservation Law of 1913 was enacted, dividing forest species into reserved and unreserved categories. The latter types of forest species were unregulated and could be cut by anyone. Reserved species, including teak and yang could be legally harvested only through licensing and payment of stump fees. This legislation extended over most of the country, but was not enforced in areas where no forest products trade existed, as was generally the case in the Northeast. In 1925, the RFD estimated that 44,000 square kilometers, two-thirds of the forest area in the Northeast, was in dry deciduous forest, mostly unexplored or undeveloped. In 1937 this figure had been revised only slightly downward to 60 percent, suggesting that the annual deforestation rate over this period was less than 1 percent.

The harvesting of forest products has always been an important element of village economy in the Northeast. Rural households use fuelwood, charcoal, timber for house construction, and a variety of edible and inedible forest products. Loopholes in the original Forest Conservation Law have allowed collection of these products and harvesting of timber for domestic use to continue. Households residing near public forest lands, for example, were allowed to cut up to 26 cubic meters for house construction. The level of forest product harvesting by rural farm households reflects the failure of the 1949 Forest Act to close these loopholes. The 1953 farm survey indicated that 90 percent of farm families cut wood for home use, almost 4 percent earned income through wood sales, and the value of fuelwood for home use represented 8 percent of total farm production.21 Although timber harvesting for domestic use was subsequently prohibited in the 1960 Forest Act, other loopholes in the 1941 and 1960 acts still allowed households legally to possess up to 0.2 cubic meters of lumber for domestic use, and to circumvent even this limit. Houses constructed from timber cut for domestic use may be sold after a two-year waiting period and illegally cut timber, including teak, is often used to construct rough house frames which, after remaining unoccupied for two years, are dismantled and the timber sold at rather high prices.22 In Ban Non Amnuy, a new village in the Dong Mun National Reserved Forest in Kalasin province, sixty of these “houses built for sale” were constructed between 1983 and 1985 with timber cut from the reserved forest. Similar practices were observed in at least three other villages in reserved forest areas in Chaiyaphum and Nakorn Ratchasima provinces. Although the 1949 Forest Act further restricted cutting of nontean species by setting quotas for different categories of trees, “common trees” could be cut without restrictions. Banubatana, former director general of the Royal Forestry Department, noted that these methods of forest management and imprecise quotas had disastrous effects and encouraged the repeated cutting of timber near villages and transport routes.23

Forest conservation issues were officially acknowledged early in this century, but forest policy continued to emphasize exploitation until the 1930s, when the Protection and Reservation of Forests Act was passed, allowing for the designation of reserve and protected forests. Almost ten years passed, however, before the details of this legislation were clarified. In 1949, the United Nations Food and Agricultural Organization (FAO) recommended that an area of approximately 70,000 square kilometers in the Northeast be set aside as reserved forest. Yet, despite new revisions of the Protection and Reservation of Forest Acts in 1953 and 1954, the process of creating reserved forests made only modest progress. In apparent conjunction with this legislation, the Thanarat administration amended lenient forest laws, increased penalties for violations of these statutes, authorized courts to confiscate equipment used in violation of the Forest Act, and created the Forest Police and Forest Protection Units within the Royal Forestry Department. By 1957, only 12.5 percent of the areas proposed for reservation had actually been established, although by 1980 a program of accelerated mapping and registration had raised this to 64 percent. Nevertheless, protection of these reserved forests continues to be problematic. Few reserved forests have formally marked boundaries, and the rural population often does not recognize areas that have been identified as reserved forests. Inadequate budget allocations have hindered recruitment and training of forestry officials and the development of an effective public information and education program.24

Throughout this period, little thought was given to rates of population increase, existing population–land conditions, or the pressures they would create on newly designated reserved forests, especially in the Northeast. Under the 1954 Land Code, a National Land Classification Program was created to assess and reallocate land within Thailand. Budgetary and staff problems delayed this program until the first five-year plan (1962–1966). The National Land Allocation Committee was charged with designating areas for both reserved forest and the proposed conversion of nearly 5,000,000 hectares of forest land to agriculture use. (This figure was based on 1950 estimates of 30.7 million hectares of land in forest and
est codes themselves. Tongyai has suggested that Thai forest policy has four major weaknesses: (1) arbitrary choice of "competent officials" and their spheres of authority, (2) the leniency of prescribed punishments in both extent and judgment, (3) conflicts with the Land Code about the definition and legal uses of public versus private land, and (4) the general lack of emphasis on participatory corrective measures. Furthermore, a major policy paper issued by the National Land Allocation Committee in 1984 stated that farmers would not receive full land titles in new land allotment projects until the Land Code was revised. This tends to strengthen the argument that both land codes and inadequate forest legislation and enforcement have contributed to the depletion of forests. They have allowed generally open access to these resources, which has been reinforced by traditional views of rights toward land and forests and has done little to discourage forest clearance as the agricultural frontier expanded. Certainly these conditions prevailed until the postwar period, when more restrictive policies and legislation were enacted. Yet, in some respects these changes reflect the continued failure of officials and planners to appreciate both the nature of the country's forest problems and the forces underlying them. Until these more fundamental problems are addressed and the social and natural dimensions of forest systems are acknowledged, the nation's approach to forest management will remain at the center of the problem.

**LAND CODES AND TENURE SYSTEMS**

The foundations of land occupancy and ownership in Thailand are based on the principle of eminent domain. Full rights to land have traditionally been held by the crown or state, which in turn grants private ownership to individual citizens. Since 1901, a series of land codes have sought to refine the terms and conditions under which land may be owned and the steps required to obtain legal title to land. However, conflicts have persisted within the Land Code and between various civil codes and more traditional and informal land tenure systems with respect to individual rights of possession and ownership of land. This situation has been further confused by differing interpretations of successive pieces of legislation, delays in implementing the 1954 Land Code, inadequate funding for land management agencies, and the persistence of traditional land tenure systems in areas where modern institutions of the Thai state have been slow to be established. Although these conditions are not unique to the Northeast, they have facilitated illegal occupation of land, encroachment on reserved forests, and depletion of forest resources.

Until the twentieth century, the Northeast's low population density and slow rates of natural increase probably imposed few constraints on
access to land. Thailand’s first modern land legislation, approved in 1901, extended legal protection of land rights only to those with proper ownership. Keyes has noted that this legislation probably slowed encroachment on public lands in the Northeast as people came to recognize the legal restrictions on occupying land without proper title documents. This process was also slowed by the increasingly marginal quality of most public and unclaimed land for paddy cultivation. It was probably only in the first quarter of this century, as land suitable for paddy became scarce, that emigration in search of new land and legal rights to land assumed somewhat greater importance. The 1954 Land Code, adhering to ideas established in earlier legislation, is the most important piece of contemporary land legislation.

The code recognized three different stages in land acquisition: occupancy, use, and legal possession. Each category had a corresponding form of documentation, abbreviated as N.S.2, N.S.3, and N.S.4 certificates respectively. The enabling legislation for the 1954 Land Code also established certain provisions for recognizing legal rights to land occupied prior to the implementation of the Code. The S.K.1 certificate, or form for reporting land occupation, was established by this legislation, but accords no ownership rights, prohibits the sale or mortgage of land, and allows for land transfers only through inheritance. Nevertheless, many farmers continue to recognize the S.K.1 as evidence of legal ownership of land. It is perhaps this provision which has created the most problems regarding illegal land claims and encroachment on forest lands in the past quarter-century.

There is evidence that the 1954 Land Code actually encouraged clearance of forest lands, particularly in allowing S.K.1 certificates to be issued for previously occupied public land. In effect, this allowed people who had been using land without any formal land documents to register those holdings with district officials pending implementation of the new Land Code. In the Thap Lan National Reserved Forest in Nakorn Ratchasima province, Subhadira reports that many people obtained unoccupied and reserved forest land by making false claims of occupancy to obtain S.K.1 certificates. Once these documents had been received, the new certificate holders moved to clear land that had been claimed. Limitations on household labor and technology, however, made it rare for a single household to clear more than four hectares. In 1985, some of these original land claims had been given to relatives or sold to new immigrants. Local and district officials were also found to have claimed large tracts of forest land in a similar manner in order to sell it. Both actions were direct violations of the conditions of the S.K.1 certificate.

Questionable sales of land also enabled upland crop production to be expanded in the Lam Pao irrigation area of Kalasin province. In contrast to lowland areas, about half of the upland area had been acquired [through purchase and self clearance]... as a form of compensation for the effort devoted by those who cleared the land originally. Most of the recently developed upland cropping areas and some of the paddy areas come under this form [S.K.1] of ownership.” In retrospect, this appears to have encouraged continued or renewed land claims without the obligation to register those claims or secure more formal certification. Significantly, the 1954 Land Code provision that claims not registered within 180 days after the Code was implemented would be declared unoccupied was abolished in 1971.

In many parts of the Northeast, local tenure systems incorporate conditions of legal codes that preceeded the 1954 Land Act, interpretative responses to this act, and traditional modes of tenure. This situation results from delays in implementing the Code, the lack of land surveys, and the fact that provincial land offices only began to be established in the Northeast in the 1960s. It is not surprising that villagers persist in claiming and clearing previously unused land. Numerous examples of farmers claiming, clearing, buying, selling, and renting out unoccupied land or land in reserved forests have been documented. For example, a 1983 study of 125 households in six areas of reserved forests in Loei province has shown that over 40 percent of all land was held without any form of documentation, 45 percent carried S.K.1 certificates, and only the remaining land in housetop areas was registered with N.S.2 and N.S.3 documents. Most of these farmers expressed the belief that occupancy of the land or possession of S.K.1 certificates demonstrated ownership. Similar cases have been documented for areas of reserved forest in Kalasin, Udornthani, Chaiyaphum, and Nakorn Ratchasima. Consequently, recently designated areas of reserved forest represent both the final margins of the land frontier and those areas in which both formal and informal land tenure systems remain ambiguous.

Although our evidence is far from conclusive, it suggests that land rights and legislation controls over land ownership have been a significant factor in the accelerated depletion of forest resources in the Northeast. For the first half of this century these issues may have been less important, given the rather low population-land ratio and slow commercial growth in the region. In the postwar period, however, the more aggressive policy of legislative control over land has itself contributed to illegal occupation and use of land, particularly forest lands. The events following the promulgation of the 1954 Land Code and the rather ambiguous provisions for its implementation have encouraged the taking of undeveloped or unoccupied land. In the contemporary situation of rapid population growth, an expanding cash economy, and a growing scarcity of land, there is an urgent need to clarify land legislation. Unless many of the problems surrounding land rights are resolved in an equitable and efficient manner, solutions to Thailand’s problems of forest depletion will remain elusive.
INFRASTRUCTURE, REGIONAL DEVELOPMENT, AND SECURITY

Development planning and investment in Thailand since 1950 has been largely directed toward increasing production. An important element of this strategy has been the priority given to expanding infrastructure, especially transportation and multi-purpose dam and irrigation facilities. These investments in the Northeast have contributed to changes in agricultural land use as well as the depletion of forest resources. However, evidence of the relationships between an expanding infrastructure and regional changes in land use can be identified as early as 1900.

At the turn of this century, the Northeast was still isolated from Thailand’s expanding commercial economy. Only 6 percent of the country’s provinces, all in the immediate hinterland of the capital, were linked by rail to Bangkok. The extension of this rail network to Korat in 1900 resulted in some immediate changes in interregional trade, rice production, and clearing of forest in the Northeast. Rice shipments to Bangkok rose from 200,000 piculs (one picul equals 60 kilograms) in 1905 to 1.25 million piculs in 1925, reaching 4.6 million piculs by the mid-1930s, a level equal to almost 20 percent of total Thai exports. As we have noted earlier, this growth in paddy production and interregional trade from the Northeast resulted from an expansion of land under cultivation and the enhanced accessibility produced by new rail service. Over the next 20 years, the rail line was extended further, reaching Ubonratchathani in 1929, Khon Kaen in 1933, and Udonthani in 1941. As the rail line expanded, railheads became terminals for rice and paddy shipments resulting from increased production, especially on forest land converted to agricultural uses. In 1940, Pendleton observed “a marked increase in paddy [paddy] growing since the opening of the rail line to Ubon and expansion of padi growing into the forest... of thousands of hectares.”

The construction of new rail lines also created a demand for timber and wood for fuel, carriages, bridge timbers, and general construction that was initially met by clearing forests adjacent to the rail right-of-way. This was accompanied by increased local timber trade, the sawing of dipterocarps into planking for housing, and the extraction of minor forest products for local domestic use. More recently, the depletion of forest resources has also been reflected in changes in commodity shipments by rail from the Northeast. Charcoal shipments to Bangkok, for instance, declined between 1958 and 1968 and metropolitan supplies of logs and poles from the Northeast have also diminished with “depletion of accessible forests (largely mai prudu, teng, and rang).” It is hard to escape the conclusion that the expanding rail network was a leading cause of forest land clearance before 1950, especially in the southern subregion of the Northeast where prewar rail development took place, and that proportional declines of forest products in rail commodity flows indicate the continued depletion of these resources as the limits of accessible cultivable land have been approached.

Until the immediate postwar period, the government’s transportation investment policy considered roads only as feeder services to the rail system. The monarchy supported this policy as a means of keeping the state railway solvent and ensuring that foreign loans were serviced. There is little record of state-supported road construction in the Northeast except in municipal areas. Although few all-weather roads were constructed in the Northeast before 1950, Pendleton has reported for the period between 1935 and 1940 that, where new routes were developed, rapid forest clearing followed. After 1950, the government policy changed, and in the Northeast road building was given a high priority. The government’s development strategy emphasized investment in infrastructure as a way to encourage agricultural production, crop diversification, and trade, and in industrial development to increase economic growth (a strategy favored by the United States and international credit organizations such as the International Monetary Fund). A fundamental effect of the shift from rail to road development was to extend the area under subsistence cultivation through improved accessibility to more isolated areas containing lower populations and unoccupied uplands and forests. Between 1956 and 1960, when the first all-weather highway was built linking Bangkok to Korat, the road network increased to 4,505 kilometers, although only a third of this network was serviceable all year. Before the end of the decade, however, most districts in the Northeast were linked by road to provincial capitals and the interprovincial highway network. Only Buriram, Sirsaket, and Surin had no direct highway connections to Bangkok.

During the 1960s, infrastructure investment in the Northeast was about $325 million (U.S.), of which over half was used for road construction and improvement and a quarter for multipurpose dam and irrigation projects. The government’s emphasis on highway development was consistent with its use of economic programs to strengthen national security. Road construction was seen as a way of countering subversion and promoting loyalty to the government by stimulating economic growth (an argument also used to support the Forest Villages developed in the past decade).

In addition to improvements in communications, postwar development strategies have strongly emphasized investment in multipurpose dam and irrigation facilities. As these facilities were developed, settlements were created in reserved forests, poor resettlement planning led to forest degradation by resettled populations, and other groups of the displaced rural population migrated to areas where they claimed and cleared land in reserved forests. Several large and small-scale multipurpose dam and irrigation projects were developed in the Northeast in the 1960s. Between 1964 and 1969, over 15,000 rural households were displaced by six projects
in Khon Kaen, Kalasin, Ubon Ratchathani, Udornthani, and Nakhon Ratchasima provinces. The vast majority of those displaced resettled on their own in eighteen different provinces, mainly in the rural Northeast, rather than to government-designated resettlement areas. A study of over 4,300 of the displaced households shows that they migrated twice as often after being displaced as those moving to planned resettlement areas; they cultivated almost 20 percent more land, and 65 percent more area in uplands, than before being displaced, much of which was obtained by clearing forest; and they rarely held title documents to the new land. The development of the Nam Pong dam and reservoir provides one of several examples that illustrate this point.

When the Nam Pong dam was completed in Khon Kaen province in 1964, 60,000 hectares of reserved forest land were set aside as the Ubonratan Resettlement Area. Over half of this land was already occupied; the resident households were compensated for their land and each given 2.4 hectares of land in the resettlement area at no cost. By 1973, however, only 13 percent of the 5,012 households displaced by the project were living in the new resettlement area.

Farming opportunities differed sharply for households in the resettlement area, those in the reservoir draw-down zone, and those in areas served by irrigation. Net household income in the areas of irrigated agricultural land was almost four times larger than in the resettlement areas. Furthermore, most of the land allotted to resettled households was unsuitable for rice cultivation, land allotments were too small to meet household needs, soils were poor, and no irrigation was available for dry season cropping. Consequently, farmers found it difficult to change from rice to upland crops and were confronted with major economic problems. Johnson has observed in this context that most families “tended to intrude into the government forest areas to obtain wood and wood products for charcoal making [and many] were forced to look for alternative sources of income, of which illegal activities such as cutting firewood and making charcoal in the reserved forests are attractive alternatives.”

The development of infrastructure, especially improved communications and irrigation facilities, has featured prominently in Thai development strategies in the Northeast since 1960. The relationship between improvements in the road network and the depletion of forest resources cannot be determined precisely, but road systems have clearly been necessary for developing upland cash cropping, which has in turn accelerated the conversion of marginal uplands and forests to agricultural use. New roads have improved accessibility, widened marketing networks, and accelerated the process of forest clearance as logging has become increasingly mechanized. This has also made forest lands more accessible for settlement and farming by the poor and landless segments of the population. Infrastructure, including projects to expand irrigation, have contributed directly and indirectly to forest depletion. The removal of reserved status from forest lands to allow population resettlement and creation of new land settlements has had a direct impact on these resources. Displaced populations who have sought new land in the open market have also contributed to the problem by purchasing or claiming undeveloped or reserved forest land under existing land tenure conditions. While infrastructure investment had slowed significantly by 1980, its effects are already apparent in accelerated clearance of forest land and the closing of the land frontier in the Northeast.

**POLICY, PEOPLE, AND FORESTS**

Forest clearance for agriculture, authorized and illegal timber harvesting, and the collection of forest products by the rural population have all contributed substantially to the depletion of forest resources in Northeast Thailand. Throughout the first half of this century, land-use practices and forest clearance were determined by their profitability. As populations grew, returns from land clearance for both subsistence and slowly expanding commercial agricultural production, as well as extraction of forest products, encouraged expansion of cultivation, which increasingly took place at the expense of forest resources. In addition, existing forest policy allowed rather open access to forest resources. These conditions also allowed the population to maintain a more land-intensive system of agriculture production. In the first half of this century, the Northeast was being converted from forest to a variety of more profitable uses, primarily agricultural production, with forest clearance occurring at a socially optimal rate of exploitation under existing social and economic conditions.

In the last quarter-century, depletion of forest resources has exceeded this socially optimal rate. Population-land pressures have fostered migration between and within regions, deforestation rates have accelerated, fuelwood shortages have developed, and negative effects of forest land clearing are increasingly manifest in erosion, silting, and flooding. This situation is partly the result of long-term social, economic, and institutional forces. Yet, over the short term, new pressures have emerged with increased population growth rates, improved accessibility, construction of dams and irrigation facilities, which have forced rural populations to seek new land in the open market. Market price incentives for cash crops have also encouraged the spread of cash cropping into previously unoccupied forest lands. These pressures have been further strengthened by
lax enforcement of existing forest and land legislation, failure to revise legislative provisions that allow continued exploitation of forests, and economic and personnel inefficiencies in the administration of forest lands. In the last two decades, policy and program decisions aimed at resolving regional security issues, often at the short-term expense of improved forest land management, have further compounded the problem.

Despite recent attention to deforestation in Thailand, there have been few initiatives of the type necessary to resolve the situation. In 1987, the Thai army launched the “Green Northeast” project, which aims to rehabilitate environmental resources, raise incomes, and improve the standard of living throughout the region by allowing the army to facilitate and integrate programs that other government agencies have pursued for decades. Initial efforts have been directed at developing water resources, strengthening the forty-six Forest Protection Units responsible for guarding the remaining 2.4 million hectares of forest, and reducing the rate of forest destruction from 48,000 to 14,000 hectares per year. (In April 1988, responsibility for this project was transferred to the National Rural Development Committee.) Nevertheless, critics have questioned the over-protective nature of the government’s forest policy, its lack of a clear consensus on appropriate forest management strategies, and the continued lack of coordination among government agencies responsible for development in the Northeast. Other long-term schemes involve tapping the Mekong River for irrigation water, promoting crops more suited to the region’s climatic conditions, and creating more cooperatives to enable producers to influence market prices. It is uncertain whether proposals of this type will ultimately resolve the complex issues contributing to deforestation; clearly, however, institutional changes in the property rights system, incentives to encourage more intensive agriculture and industrial employment opportunities, and more effective and equitable forest management policies will be essential. Without a broad-based effort to overcome the varied social, institutional, and economic barriers to a stable and productive forest resource system, the one-rich forest resources of the Northeast will survive only in the memories and folklore of the people of Isan.

NOTES


2. World Resources Institute. 1985. Tropical Forests: A Call for Action. Washington, D.C. The annual rate of deforestation has been calculated at 2.4 percent, the thirteenth highest rate among all developing nations in the humid and subhumid tropics. The area of forest lost to encroachment by farmers, degradation by illegal logging, and harvesting of timber for fuelwood, charcoal production, and building materials has been estimated at 260,000 hectares per year, the ninth highest rank among this group of countries.


4. KKY-FORD 1982. An Agroforestry Analysis of Northeast Thailand. Khon Kaen: Faculty of Agriculture, Khon Kaen University. Recent research designed to develop crop systems for rainfed areas of the Northeast has identified four major systems: the Khorat Triangle, the Mekong Provinces, the Southern Hills, and the Western Hills. These systems have been differentiated with respect to levels of annual rainfall, stability of paddy cultivation and production; percentage of acreage in field crops; soils; and elevation and topography, among other variables.


6. Forest resources are by law publicly owned and their exploitation is regulated by permits and licenses issued by the Royal Forestry Department. However, in practice there is a considerable gap between the traditional views of rural people and official government policy.


13. Pejaranonda, C., S. Goldstein and A. Goldstein. 1984. Migration. Subject Report No. 2. Bangkok: National Statistical Office. Although the 1980 Population Census shows that Nong Khai, Khon Kaen, Udon Thani, and Nakhon Ratchasima were destinations for the four largest interchanging migration streams in the Northeast between 1975 and 1980, the volume of these flows has slowed relative to the period 1965–1970.


17. Subhadhiraka et al. have reported that merchants from the provincial market in Nakorn Ratbatasha province have been directly linked to problems of forest land encroachment and illegal cultivation of cassava on reserved forest lands. Landless farmers were encouraged to migrate to forest areas and provided with capital and tools to clear the land for cultivation in exchange for a share of the harvest. Hafner and Chansrusuan have noted a similar situation with respect to the spread of *luk dua* (Job's Tears) among illegal residents of some reserved forest areas in Loei.


19. A recent summary of the major features of this legislation can be found in *Thailand National Man and the Biosphere (MAB) Committee Report*. M. L. Prachakolp Tongtay (ed.).


25. 1961 aerial surveys by the Royal Forestry Department indicated that only 171 million rai (274 million hectares) of land was actually in forest.


27. There are indications that this program was originally conceived under the National Forest Development program, but proposed by the Internal Security Operations Com-

mand (ISOC) as a strategy to combat the growing influence of leftist guerrillas, especially in reserved forest areas. While overall responsibility for this program was held by the National Office of Readiness under the Development Projects for National Security, project design and implementation responsibility was given to the Royal Forestry Department.


35. Ibid.


39. Ibid., p. 199.

40. Ibid.


44. Ibid., p. 199.