

CHAPTER 3

Revolutionary Forestry, 1928–1942

In December 1929 the forest warden Andrés Orozco made an inspection tour of several Purépecha townships in the gently rolling hills of Michoacán's Meseta Purépecha. Orozco set out on horseback and soon reached the small village of Cocucho, where he discovered fresh stumps and other signs of recent logging activity. He knew that something was amiss because the community had never formed a producers cooperative or filed the required forestry study, much less received the appropriate permissions from his office. Orozco spent several days trying to learn who had made the unauthorized cut, but he never succeeded in identifying a culprit or learning what had become of the wood. He had to settle for giving the local authorities a tongue lashing and ordering them to put an end to the illegal cutting. From Orozco's perspective, the whole incident revealed the villagers as cunning and oblivious to the law. He wrote dispiritedly to his superiors acknowledging that he knew "the residents of that place [would] return to their fraudulent use of the forest" the moment he left town, "owing to their deprived habits and remoteness from our offices." The only hope of turning the situation around, he believed, was for the governor to demand that the municipal authorities crack down on the villagers.¹

Orozco had stepped into a terrain that would become familiar to regulators and rural people in subsequent years—one in which each side deployed particular forms of knowledge and authority to vie against the other. The locals used their familiarity with the landscape and relative isolation to anticipate the arrival of inspectors and, if possible, to dispose of any incriminating evidence. Notwithstanding the political, social, and personal cleavages that characterized daily life in many highland communities, rural people often showed remarkable solidarity when confronted by meddlesome outsiders such as Orozco. Whether because they habitually protected each other from "the government" or because village bosses (*ca-*

ciques) had cowed their followers into silence, the members of communities typically presented a united front to forestry officials and pled ignorance when asked about those responsible for unauthorized logging. Then they resumed work as soon as the inspector moved on.²

Orozco found evidence of unauthorized cuts in each of the six communities he visited. At one point, he went so far as to request an armed escort from Governor Lázaro Cárdenas in order “to make [himself] respected by the Indians who carry out these actions.” The governor suggested that Orozco should instead give tact and goodwill a try; persuasion rather than force might convince villagers to organize cooperatives and request the proper permissions. The forest warden took Cárdenas’s proposition to heart. He discarded the idea of surrounding himself with soldiers, and resolved “to convince [the villagers] by means of advice and instruction [*consejos e instrucciones*] to request their permits as quickly as the Forest Code allows, offering them any help they need[ed] to complete the paperwork while making them see that their previous behavior was a grave violation of the law that could have a range of possible consequences.”³

Orozco’s epiphany anticipated a broad reconfiguration of the relationship between forestry experts and villagers in the 1930s. Leading intellectuals came to believe that education and technical assistance could build an environmental consciousness among rural people, converting villagers from passive objects of environmental regulation into modernized and self-disciplined environmental subjects who understood how their actions affected the natural world.⁴ They recognized that a social metamorphosis on this scale would not come easily, but the stakes were high. On the one hand, conservationists such as Miguel Ángel de Quevedo continued to insist that deforestation posed a potentially catastrophic threat to Mexico’s climate by reducing rainfall, increasing the potential for flooding, and rendering cities unlivable. On the other hand, scientists and political leaders regarded forests as a linchpin to economic development whose value rivaled that of the nation’s storied petroleum deposits. Yet the forests’ vast potential could disappear virtually overnight if it were not managed properly.⁵ To meet these challenges, professional foresters proposed a series of measures ranging from Arbor Day celebrations to policy interventions intended to refashion peasants’ relationship with nature.

The incipient move to educate rural people and regulate the use of forests leapt forward when Cárdenas became president, in 1934, and strove to make good on the “promises of the revolution” as he understood them. His

administration rejuvenated the land reform process, assailed foreign landowners and corporations, and coaxed the popular classes to join officially sanctioned associations meant both to empower and discipline them. He elevated the forest service to a cabinet-level ministry called the Autonomous Department of Forests, Game, and Fisheries and charged Quevedo with making it work. The newly energized organization redoubled its oversight of logging operations—and particularly of peasants' use of forests received through land reform—and launched ambitious educational and research programs that both deepened scientific understandings of Mexican ecosystems and burnished experts' claims to have privileged knowledge of proper forest management. Foresters renewed their efforts to organize villagers into producers cooperatives that functioned as community-owned enterprises while making peasant production more visible and easily controlled by local authorities. Taken together, these Cardenista initiatives reflected a broad vision of environmental governance best characterized as *revolutionary forestry*: a socioenvironmental ideology that sought to grant rural people wide latitude to work their own forestlands, subject to the often paternalistic supervision of forestry experts, and provided that they organize themselves into formally constituted organizations. At its core, revolutionary forestry proposed to modernize campesino production in order to achieve the rational, sustained use of forests. Income from logging would allow villages to bootstrap themselves into the economic mainstream while furnishing a growing proportion of the raw materials needed for national development.

Revolutionary forestry was one of many official intrusions into rural life during the period of postrevolutionary reconstruction, and rural people greeted it with a characteristic mixture of skeptical enthusiasm, indifference, and passive resistance.⁶ Over time, however, an important contingent of rural society came to accept elements of its conservationist message. People in many places came to identify with village cooperatives, for example, because they regarded them as a viable means of managing their own woods and distributing the earnings from community production. In a few cases, rural people clung to their cooperatives even after a 1948 law formally abolished them. The cooperatives faced myriad challenges, however. One of the most serious derived from the paternalist attitudes of the technocratic elites who tended to conceive of rural people as a dangerously backward impediment to modernization on a par with countries that they considered more technically and “culturally” advanced.

INVIDIOUS COMPARISONS

Professional foresters in postrevolutionary Mexico worried that their nation did not measure up to the developed world's institutional capacity to manage forests and train a professional cadre of experts. In future decades, such transnational comparisons led Mexican intellectuals to conclude that their nation's ecology and social structures differed in fundamental respects from the richer and more temperate nations of the global north and therefore needed to be understood in their own terms—an intellectual development that the historian Stuart McCook has labeled “creole science.”⁷ In the 1930s, however, the scientists' musings led them to conclude that their compatriots' understanding of nature lagged dangerously behind those of the so-called advanced nations. These experts reckoned that their country had the ability to catch up in practical terms, such as in the drafting and enforcement of management policies, the modernization of manufacturing techniques, and the application of scientific research. What troubled them was the “backwardness” of rural society. Most intellectuals felt that Mexico came up short in terms of people's attitudes toward nature, and they knew that changing their countrymen's proclivities would not be easy. At a minimum, it would require a nationwide educational campaign built, in the first instance, around didactic civic rituals such as Arbor Day celebrations.

In the 1920s and 1930s, Mexican forestry experts published a steady stream of articles in *México Forestal* and the national press suggesting ways of bringing their country in line with more developed parts of the world. Their foremost goal was to pass conservationist legislation on a par with that of other nations (ultimately condensed in the 1926 Forestry Code), but they also suggested that Mexico follow the lead of foreign countries on issues ranging from the use of creosote to preserve railroad ties to the creation of forest reserves.⁸ Quevedo, who was widely recognized as the dean of Mexican forestry, singled out the United States as a particularly worthy role model. He described it as a “Saxon, preservationist, disciplined and highly progressive” nation whose leaders intended to preserve and restore its forests thanks to the “magnificent” administration of natural resources. He also praised Japan, Switzerland, and, above all, France as examples of nations with well-developed educational and regulatory systems worthy of Mexican emulation.⁹

Quevedo placed part of the blame on a lack of effective political leadership. He complained, for example, that the authorities did nothing to

stop peasants from burning their fields in the early spring to stimulate the growth of new grass and cut down on weeds, even though these fires often spread into the woods. Mexico's beautiful forests, he wrote, were being sacrificed to "pyromaniac campesinos, whom equally ignorant and perverse municipal authorities . . . abet and even encourage" to make their annual burns.¹⁰ Other scientists agreed that Mexico's political leaders were at least partially responsible for the nation's environmental troubles. The distinguished public works engineer Roberto Gayol y Soto bitterly denounced politicians for selling out to logging interests and evading their moral obligation to protect the forests for future generations. He recognized that laws were in place to do just that, but lamented that "in practice, everything is subordinate to political considerations, and it is an illness that is killing our country."¹¹

Though scientists lacked faith in political leaders' commitment to conservation, they explained Mexico's "backwardness" primarily as a consequence of its large class of impoverished and, to their eyes, atavistic rural people. Foresters often articulated the essentially tautological argument that Mexico's conservationist efforts fell short of the standards of the "advanced" world because peasants exploited forest resources in primitive and heedlessly destructive ways. More than a mere description of rural people's behavior, such arguments construed rural people's observable actions—which certainly could include the conscious or unconscious misuse of forest ecosystems—as evidence that they shared a uniform and deeply problematic orientation toward nature. Such ideas not only disregarded potentially sustainable campesino practices, but also suggested the existence of a peasant *culture* that stood as a stumbling block to forest conservation.

The language that foresters employed to discuss the nation's forests underscored their assumption that rural people represented the primary threat to the nation's ecosystems. Forestry experts routinely described the unnecessarily deep cuts that peasants used in the early twentieth century to draw the resin from pine trees as "barbarous" or "primitive."¹² Quevedo had argued as early as 1923 that native people should be prohibited from using slash-and-burn techniques to clear new lands because "such methods are repudiated as savage and condemned in advanced nations."¹³ Local forest wardens echoed Quevedo's concerns about "primitive" tapping techniques and the use of fire to clear fields at the beginning of the growing season. As one warden from the state of Mexico noted, these behaviors came as no surprise "since we are not dealing here with well educated people but rather with rural folk [*gente campesina*], who for the most part

lack understanding, study, and so on.” He recommended putting teachers in charge of reforestation projects who could encourage people everywhere to recognize that the conservation and repopulation of forests represented a “sacred duty to our Homeland.”¹⁴

In the 1920s, however, the forest service had no ability to carry out such a project.

The Forestry Code of 1926 was little more than a dead letter, and federal officials had few resources to command, so the Mexican Forest Society decided to make Arbor Day, known in the 1920s and 1930s as the *Fiesta del Arbol*, its primary means of outreach. Quevedo and his *Junta Central de Bosques* had organized various celebrations to plant trees and raise consciousness about urban forestry in Mexico City as early as 1893, and the *Junta Central* organized a revolutionary Arbor Day celebration in 1912, but Victoriano Huerta’s military coup later that year put an end to the nascent educational initiative.¹⁵ In 1922 Quevedo convinced the Forest Society to resume the tradition and expand the celebration into other parts of the republic (though educators in Michoacán had organized their own celebrations at least two years previously). He gave a speech that year in a working-class neighborhood of Mexico City in which he observed that the rising population density posed a threat to public hygiene not only because the growth of industry polluted the air but because the very process of human respiration entailed the exhalation of “highly noxious carbonic gases, meaning that man, like all animals in the urban agglomeration, constitutes a diminutive yet deleterious chimney.”¹⁶ What Quevedo’s audience made of his rarified vocabulary is an open question, but his words did serve to reiterate most scientists’ belief that urban life was inherently unhealthy, and that the best hope of improving conditions was to raise public appreciation of the ecological services offered by forests.

Arbor Day acquired a more overtly patriotic hue in the mid-1920s. Quevedo announced at the 1924 celebrations, for example, that reforestation projects formed an integral part of national reconstruction and helped to ensure national progress.¹⁷ The Forestry Society reported the following year that it had organized an Arbor Day event in every major city, though by that point the majority of these events were aimed specifically at schoolchildren.¹⁸ The federal Secretariat of Public Education (SEP), headed by José Vasconcelos, directed schools to turn their students out for the celebrations in which forestry officials and, on some occasions, notable politicians planted saplings in ceremonies captured by the flashing cam-



Figure 3.1. Elementary school students preparing to plant saplings during Arbor Day celebrations in the Colonia Campestre of San Ángel (Mexico City), 1924. *México Forestal* (March–April, 1924), 102.

eras of reporters.¹⁹ In what may have been a typical celebration, the school inspector Evangelina Rodríguez Carvajal held an Arbor Day celebration in a land reform community outside Tuxpan, Michoacán, attended by the local authorities, two schoolteachers, students, and local residents. She gave a simple speech, “appropriate for the audience,” then led the enthusiastic group outside to plant forty-four saplings.²⁰ Arbor Day was only one of many civic rituals established in the 1920s to honor everything from motherhood to the Constitution and intended to instill a sense of patriotism and revolutionary citizenship among citizens. Nonetheless, it represented the first national initiative to disseminate a broad message of environmental conservation.

As the political atmosphere heated up in the 1930s, politicians and popular leaders took an increasingly combative stance toward wealthy landowners and others identified as exploiters of the people, and Arbor Day celebrations also acquired a harder edge. In 1934 the radical politician Francisco J. Múgica defined forest conservation as a form of class struggle, declaring in one Arbor Day speech that the popular classes should “clamor” against the despoilers (*devastadores*) of the forest. After enumerating the usual climatic and agricultural benefits of healthy forests, Múgica concluded that “society in general [*la colectividad*] and government officials will plant trees for the well-being of everyone, for the good of the nation, not for the benefit of the few.”²¹ In 1938 the Forestry Society claimed that every secondary school in the nation observed Arbor Day in some fashion and that “all the nation’s institutions and its inhabitants in general” supported the government’s “crusade” in favor of forests and against anyone who would do them harm.²² The following year, radio transmissions, sporting events, and military parades were added to the festivities. According to the Forestry Society, students planted saplings and heard lessons about the value of trees even in the “smallest and most distant pueblos.”²³

Rural schools also promoted the ideals of nationalist conservationism in the 1930s. The forest service established eighteen small tree nurseries in public schools in 1936 and used at least some of them as “propaganda centers.”²⁴ The following year, it announced plans to create nurseries in over a thousand more and claimed to have begun a campaign in public schools against forest fires. Officials took special aim at rural people’s practice of burning underbrush and dead grass to encourage the growth of new vegetation. Schoolteachers were told to lecture their students and local fire brigades about “the grave problem caused by fire, which actually ruins pastures because it impedes reseeding and impoverishes soils by making

them more alkaline and sterile and has a similar effect on the forest under-story.”²⁵ By this point, Arbor Day celebrations were only one component of a much wider initiative to modernize not only the way that rural people used the forests, but the way they understood them. Forestry experts recognized that Arbor Day celebrations aimed at schoolchildren would not go very far toward realizing the sorts of broad changes they had in mind for the countryside. By that point, however, they had a more direct means to at their disposal.

SCIENCE, COOPERATIVES, AND PEASANT VISIBILITY

Despite the Forestry Society’s lobbying and consciousness-raising efforts, there was little that Mexico City intellectuals could do to regulate the use of forests in the 1920s and early 1930s. The forest service had little administrative capacity, and its leadership had a reputation for incompetence and corruption. One of the capital’s most prominent newspapers even labeled it a notorious “blight” on the Secretariat of Agriculture.²⁶ Only a handful of particularly well-organized ejidos (as well as most timber companies) complied with the requirement to file forest management studies and detailed logging plans. Few rural people understood forestry regulations, and those who did often ignored them. Clandestine cutting happened everywhere, from the hills outside Mexico City to the mahogany forests of Tabasco. Even when foresters such as Orozco (the warden who traveled to the Meseta Purépecha in 1929) learned about illegal logging, they rarely issued sanctions for fear of antagonizing agrarian leaders or politically connected logging companies. In any case, many people refused to comply with legal restrictions placed on their use of the land. The warden stationed in eastern Michoacán warned peasants year in and year out not to burn fields or plant near young regrowth, until finally the leaders of one Otomí community wrote authorities in exasperation to ask how they were supposed to plant corn without making these so-called *rosas*, as they had done “since very distant times.”²⁷ Jurisdictional disputes also added to villagers’ confusion. While only the Division of Forests, Fish, and Game (itself a unit of the much larger Secretariat of Agriculture and Development) had the authority to issue multiyear logging permits, the law contained a loophole that allowed federal employees and mayors (*presidentes municipales*) to grant short-term “provisional” authorization to log. Local officials, and in some cases army officers, routinely approved such requests, often with no more than a verbal assent. As a result, most logging operations could

legally put their lands into production without informing the forest service at all.²⁸

The situation changed radically when Cárdenas became president in 1934. His emphasis on resource management in general, and the forest service in particular, translated into a massive expansion of personnel. The young institution soon had 22 full-time administrators, with duties ranging from overseeing ejidal and communal land to the publication of informational pamphlets about the virtues of conservation. By the end of Cárdenas's administration the forest bureaucracy had delegations in 29 states and 224 wardens charged with overseeing 42 relatively small national parks, 9 national forest reserves, and 37 "forest protection zones" meant to preserve forests in watersheds and ecologically damaged areas where the woods needed to recuperate. Together, these protective areas accounted for over 800,000 hectares (or nearly two million acres, an area about half the size of Mexico's smallest state). Foresters also launched an ambitious reforestation project outside Mexico City, planting over a million saplings in an arc from the Desierto de Los Leones to the foothills of El Ajusco. Fearing that excessive logging elsewhere in the nation could permanently degrade certain forest ecosystems, Cárdenas also declared temporary logging bans in no fewer than 23 municipal districts.²⁹ The forest service began to build up a corps of professional wardens by opening a vocational school in Tlalpan (later relocated to Los Molinos, Veracruz) that recruited young men from rural areas for a three-month course of study on the basics of law enforcement, forest management, and truck driving. The Porfirian-era National Museum of National Flora and Fauna was reopened, and visitors once again browsed through exhibits on the nation's animal and plant life, along with dioramas of the national parks and murals depicting the diversity of national ecological zones.³⁰

The initiative nearest to Quevedo's heart was the organization of a research center to train professional foresters and carry out studies of the nation's forest resources. President Pascual Ortiz Rubio had authorized such an entity in 1932, but a lack of funding kept it on the drawing board until 1936. The Institute of Forest Research (Instituto de Investigaciones Forestales) began to admit students the following year, and Quevedo personally taught one of its required classes. He directed the staff to begin compiling a complete geography and classification of the nation's forests—technically known as a forest inventory—that would catalogue the distribution of tree species throughout the nation. He began a second line of research into the

physical qualities of commercially valuable flora in order to understand the influence of climate and soil on their growth.³¹ In addition to its intrinsic scientific value, the institute's agenda had an unambiguously economic logic. From the point of view of foresters, the information it compiled was a necessary prerequisite to commercial logging, since any long-term plan required baseline knowledge about the current extent, condition, and botanical characteristics of the nation's forests.

These incipient studies codified a particular understanding of the forest ecosystem. The forest service's official journal not only announced relevant legislation and administrative orders, it featured scientific articles on such topics as the growth rates of conifer species in the experimental nurseries in Mexico City and Veracruz, complete with graphs, tables, and formulas. It published technical discussions explaining how to estimate the total volume of wood in a stand of timber expressed in cubic meters, a measure that both conservationists and loggers would find useful. Forest service researchers took a stab at enumerating the total number of pines in Mexico and arrived at the improbably precise (and likely underestimated) sum of 285,769,555 trees.³² These sorts of studies unquestionably moved the science of forestry forward and began the long process of liberating Mexican specialists from adapting North American data to their own country's conditions. But the production, publication, and consumption of such studies also elevated the scientists and foresters who read them to the status of incontrovertible experts with specialized knowledge that distinguished them from laymen. This scientific authority conferred a unique capacity to decide how forests should be used.³³ No one believed in the rule of experts more firmly than did Quevedo himself.

In his memoirs, Quevedo traced his stint in the government to a discussion he had with Lázaro Cárdenas in 1934, when the future president took a moment away from the campaign trail to invite Quevedo into his administration. Cárdenas mentioned how much he regretted his inability to stem the pace of deforestation during his four-year term as governor of Michoacán, and Quevedo responded that the constitution permitted the federal government immense latitude in the regulation of woods and other natural resources. All that remained, he said, was for the government to establish the proper institutions.³⁴ Quevedo's reminiscence has a ring of truth. Cárdenas had not only taken steps to break indigenous communities' long-term contracts with lumber mills when he was governor, but he clearly believed that the federal government should have the final say

on the use of the nation's resources—a viewpoint that eventually led to a standoff with foreign oil companies and his watershed decision to nationalize the petroleum industry in 1938.

Yet Cárdenas had other agendas, too, both as governor and president. Most of all, he intended to realize a grand political vision of organizing the popular classes and channeling their energies behind his regime. The producers cooperatives mandated by the 1926 Forestry Code fit this bill nicely. In theory, they could function as vehicles for organizing rural people into small-scale institutions that worked with foresters and federal administrators, while at the same time giving rural people greater authority over their own resources—just the sort of “regimented empowerment” that was the hallmark of Cardenismo.³⁵ The problem was that only six ejidos (all of them in Mexico state or the Federal District) had completed the paperwork to incorporate producers cooperatives by 1935, although several dozen other communities had begun the process. Spurred along by Cárdenas and Quevedo, the forest service wasted no time in moving to address the problem. Within a year, it had identified over a thousand ejidos that possessed timber and needed a forest warden to visit and organize a producers cooperative.³⁶ After three years, foresters had organized 498 cooperatives on ejidos and indigenous communities with common lands, primarily in the states of Mexico, Michoacán, and Guerrero. By 1940, 866 forestry cooperatives had formally registered with the Department of Agriculture, accounting for 64 percent of the nation's 1,350 forest ejidos at the time.³⁷

The Cardenista vision fit squarely within the dominant current of thought among professional foresters, which regarded cooperatives as consonant with the principles of scientific management and revolutionary social justice. As early as 1930, one expert had argued that cooperatives could “achieve the basic ideal of the Revolution” by giving campesinos the means to improve their economic status, while providing administrators the means to ensure the “rational usufruct of our forested wealth.”³⁸ Officials often used a self-consciously revolutionary language to reiterate this point. A forest service spokesman explained in 1934, for example, that cooperatives would benefit both “capitalists” and “workers” because they ensured that the fruits of peasant labor would build the national economy. Other experts predicted that they would vitiate rural people's crass profit motive and lead them to appreciate forests from an aesthetic standpoint as well.³⁹ A few years later, forestry officials took this reasoning a bit further and suggested that cooperatives solved one of the central contradictions of capitalism: their members functioned both as workers and the owners

of the means of production, all the while displacing the intermediaries and “speculators” who took advantage of rural folk by underpaying them for their wood and then selling it to Mexican consumers at unconscionably high prices.⁴⁰

Cardenista initiatives to use small-scale forestry as a tool of local development went beyond mere revolutionary rhetoric. In addition to vastly increasing the overall pace of land reform, the president issued a series of edicts meant to help the poorest rural people to earn a living in the woodlands. He exempted producers cooperatives from half of the fees normally required for logging permits, making it significantly easier to comply with the law. In 1938 he ordered forest wardens to exempt charcoal makers from forestry regulations even if they did not have the proper permits, because they represented the poorest of the poor.⁴¹ Even the escalating numbers of forest wardens could be considered something of a populist initiative, since they helped to organize cooperatives and prepared the ground for professional foresters’ silvicultural studies and logging plans without which ejidatarios could not legally log their land.

In addition to opening the way for rural people to make a living on the land, the increasing number of cooperatives, laws, and wardens functioned to make villagers visible to the forestry bureaucracy and hence susceptible to regulation. Cooperatives had unambiguous leaders and established membership rolls registered both with the forest service and with the secretary of the economy. Foresters extended licenses to log trees or collect wood, not to individuals, but rather to the cooperatives themselves, meaning that the members of cooperatives had the sole legal right to work on communally held lands. This situation not only opened the door to internal conflicts about just who could belong to the cooperative, but made all villagers particularly dependent on foresters, who had the authority to cancel logging permits and hence put producers cooperatives out of work.

Making peasant actions visible to the state was precisely the point. Foresters argued that the organization and regulation of cooperatives would allow them to control the use of forest resources and hence serve as a linchpin of the overall project of using resources “in an organized way and in accordance with the laws of forest conservation.”⁴² Above all, they predicted that cooperatives would allow them “to establish the technical norms that must guide the use of forests.” In theory, the advent of cooperatives and a strengthened regulatory apparatus gave professional foresters the means to end damaging peasant practices such as cutting trees before they had reached their maximum size, building houses with commercially valuable

woods rather than dead standing timber, cutting railroad ties using hatchets rather than saws, using commercially viable wood such as oak for tinder or charcoal, and fabricating tejamanil shingles from the heartwood of pine trees.⁴³ In sum, cooperatives established a means for communicating the ideals of scientific forestry to “the people” and, if necessary, for sanctioning illegal behavior.

Perhaps for this very reason, villagers sometimes refused to establish a cooperative. Quevedo commented in 1937 that forest wardens struggled to convince peasants to create the new organizations and to get existing cooperatives to obey their management plans. He attributed the problems not to peasants’ conscious decision to stonewall foresters, but rather to their backwardness. The problem, he wrote, “no doubt” could be traced to the rural people who were “not accustomed to earning a living through the well-ordered use [*explotación ordenada*] of the forests themselves.”⁴⁴ The anonymous writers of an article in the forest service’s technical journal offered a more nuanced reading of the situation, noting that cooperatives took root more easily in indigenous communities, where native people had a “tradition of caring for their own forests.” In contrast to this favorable stereotype of indigenous people, the foresters suggested that mestizo ejidatarios were less willing to organize because they regarded their lands as a “gift of the Revolution,” to be logged off and permanently converted into agricultural land. The writers suggested that top administrators should order wardens to redouble their outreach work on ejidos, though one suspects that their presence served as a not-so-subtle reminder that campesinos needed to play by the rules established by the postrevolutionary state.⁴⁵

COOPERATIVES IN MICHOACÁN

A substantial number of ejidos incorporated forestry cooperatives in Michoacán during the Cárdenas administration, particularly between 1937 and 1940. By that point a total of ninety-one cooperatives had formally registered with the Departamento Agrario, the majority organized by local forest wardens. Cooperatives could be found in most forest ejidos in the Meseta Purépecha and the eastern sierras around Ciudad Hidalgo.⁴⁶ They no doubt helped the bureaucracy to gain a tighter grip on local production, in part because foresters could indicate which stands of trees the cooperative should cut during the following year; this assessment indirectly established how much the cooperative would earn. Despite

this intrusion on their economic and ecological autonomy, many villagers eventually warmed to the cooperatives because they promised a secure source of income. In the words of one local leader who attempted unsuccessfully to incorporate the buzzwords favored by politicians, the people in his area were “extremely in economic circumstances [*sic*],” by which he meant dire poverty, and needed a cooperative to put their communal woods into production.⁴⁷ Other rural leaders had less noble intentions and regarded cooperatives as instruments to make money from the labor of others. Whatever the case, ejidos that possessed forestlands had strong institutional and economic inducements to play by the rules, and Cárdenas sweetened the pot in 1937 by lowering their taxes and by signing legislation that encouraged villagers to experiment with a new way to use the woods: tapping pine trees for the oleoresin needed to make turpentine.⁴⁸

In these circumstances, cooperatives became one of the primary sources of (licit) income in the Michoacán forestlands, and several communities insisted on forming one. For example, delegates from the Purépecha community of Charapan who attended the Tarascan Regional Indigenous Conference in December 1937 demanded the expulsion of the *Compañía Resinera de Uruapan*, which had “invaded” their communal land and begun to tap pine trees for resin. Rather than letting the company do the job, they sought permission to do the same work “by the Community in a Cooperative.”⁴⁹ Representatives of the Indigenous Conference investigated these events and learned that the “invasion” consisted of the company’s decision to hire some of Charapan’s residents to tap trees in the village commons after signing a fraudulent contract with illegitimate local leaders. A federal forester canceled the existing contracts, which contained terms unfavorable to the village, and taught residents a more efficient technique for tapping trees without harming them. He then turned production over to the villagers, who, in an ironic twist, agreed to sell the resin they collected to the *Compañía Resinera*—the very company they had once accused of invading their property.⁵⁰

Producers cooperatives had the potential to help villagers overcome internal divisions and could rebuff outsiders’ efforts to intimidate or trick them into selling their wares at below-market prices. Unlike most cooperatives, the one in Uruapan’s indigenous “neighborhood” (*barrio*) of San Juan Evangelista required its forty-six members to pay a one-peso membership fee, in exchange for which they would be able to extract wood from community lands.⁵¹ Like their counterparts in Charapan, the *comuneros* of San Juan Evangelista had filed the proper paperwork and received offi-

cial permission to tap trees for resin. When they arrived in the communal woodlot, however, they were met by what one member characterized as a “group of people who don’t need any special advantages to earn a living and have only banded together to keep us from working.” Goaded by a local power broker (*cacique*), these interlopers chased the cooperative members out of the woods and began collecting sap themselves. The villagers hastily drafted a plea to a sympathetic political ally that succeeded in keeping these (alleged) interlopers from working the stands that the cooperative intended to use itself.⁵²

It is difficult to arrive at the truth (or truths) in such cases. Did the cooperative members really have a valid claim to the contested area? Or had they just taken advantage of the law and created an organization that excluded their village rivals, who may have had an equally legitimate right to the land? These may be challenging questions to answer, but perhaps they miss the point. What matters most about these cases is that one side of the conflict predicated their claims to legitimacy on membership in the producers cooperative, while the other lacked any official standing. Rural people had learned that, insofar as the agrarian bureaucracy was concerned, the cooperative was uniquely positioned to open legal access to village commons and provide an income for its members.

Unsurprisingly, then, cooperatives sometimes aggravated local conflicts and deepened the bossism (*caciquismo*) that characterized so much of post-revolutionary agrarian politics. It appears, for example, that the producers organizations in the low valley and rolling hills of La Cañada de los Once Pueblos functioned as agents of power for the Prado family, who had ensconced themselves as the *caciques* of the region nearly two decades earlier. The cooperative in the Prado stronghold of Tanaquillo had a total of ninety-four members, no fewer than fifteen of whom belonged to the Prado family. Forestry officials began to complain almost immediately that the cooperative’s members cut far more than its approved quota allowed and ignored the statewide ban on cutting live trees.⁵³ In 1941 the mayor of a nearby town, Chilchota, reported, “The residents of Tanaquillo appear to have formed a cooperative that doesn’t really exist; instead, it’s only a few individuals who are taking advantage of the communal woods to profit from trade” with timber companies.⁵⁴

The mayor’s complaint against the Prados went beyond economics. He also blamed the corrupt Tanaquillo cooperative for a “harmful change to the environment” of the region. In the mayor’s estimation, the unusually light rainfall in La Cañada could be traced to a massive expansion of illegal

logging, which changed the hydrology of the region and had dire consequences for “public health and agriculture.”⁵⁵ He repeated his charge four months later, explaining to the regional office of the Secretariat of Agriculture that the Prados’ “immoderate use of the woods” was to blame for “harmful climate change, since it barely rains now.”⁵⁶ Like many educated people of his time, the mayor drew a tight connection between forests and the rains they were said to attract, and he assumed that overly intense cuts would lead to diminished rainfall. In his version of events, the misuse of forest resources mirrored the Prados’ abuse of authority. The landscape literally reflected social ills, and society as a whole paid the price in terms of environmental degradation and drought.

More than just making villagers’ practices visible to officials and amenable to regulation, the cooperatives defined the boundaries of a privileged productive community. In several cases, the members of a single community created rival cooperatives and vied to receive logging permits. Since the law stipulated that each ejido could only have one cooperative, administrators had to distinguish “legitimate” groups from spurious ones. That is what happened in the Purépecha community of Cherán when a group of villagers who claimed to have their own duly formed cooperative wrote the authorities to say that mestizos who had settled in the area (but had not been formally accepted into the community) had already formed a co-op and received permission to work the forests.⁵⁷ An official dispatched to sort out the matter ruled against the indigenous group on the basis that they had never filed their cooperatives articles of incorporation with the proper authorities, whereas the mestizo “outsider” group had done so in 1939.⁵⁸

The losers in this bureaucratic gambit understood all too clearly what had transpired. They formulated a letter to the Secretariat of Agriculture explaining that their “ignorance” of the law left them unsure of where to direct their questions or how to address their problem. The petitioners, who claimed to speak on behalf of the vast majority of residents, said they now recognized that they had merely been “toiling in the void” (*obrando en basio [sic]*) when they expected that the government would recognize their cooperative rather than the rival mestizo organization.⁵⁹ They could hardly have expressed their condition more aptly. They knew that they lacked a juridical presence and would not receive just remuneration for their labors until they overcame the objections of the village bosses or won recognition of the forestry bureaucracy. Nevertheless, they pressed their case and won official recognition for their cooperative three years later. By then, however, the federal government had all but given up on its commitment to

cooperatives and community production, as it turned to a new regime of large-scale, industrial forestry.

THE MODERNIZATION OF PEASANT PRODUCTION

Cooperatives were the most obvious attempt to make peasant production visible to forestry experts, but they constituted only one element in the broader push to organize and rationalize peasant production in central Mexico and, above all, in Michoacán, the homeland of Cardenismo. The agrarian reform grew in geographic scope and administrative complexity during the first four years of Cárdenas's 1934–1940 presidency. The pace of land redistribution slowed considerably in 1938, at which time the number and variety of political organizers and technical advisors increased dramatically in the countryside. The arrival of technical experts, bankers, and putative advocates for the popular classes represented not so much the federalization of the agrarian movement as what might be called the “technification” of the land reform sector. Michoacán's agrarian movement had begun as a patchwork of highly localized, village-level movements under the guidance of schoolteachers, local intellectuals, and caciques, but Cárdenas moved to institutionalize it when he became governor, in 1928, by establishing a broad-based union intended to stir up and manage popular radicalism.⁶⁰ The advisors he sent to the countryside a few years later did not supplant the agrarian leagues and village revolutionaries that had made the agrarian movement into a potent political force. Instead, they worked to rationalize peasant production and advise villagers how to invest the income from ejidal logging.

Perhaps the most influential cadre of experts were extension agents employed by the federally funded rural development bank, the Banco Nacional de Crédito Agrícola (BNCA), which governed access to ejidal credit and savings. Most ejidos owed debts to the federal government for fees and professional services (some of which they did not want and had never requested). Communities that received land reform parcels in the 1920s were expected to help pay off the value of the property they received, and some of these obligations remained on the books even after the government eliminated such bootstrapping regulations in 1928. Other ejidos were expected to reimburse federal agencies, including the forest service, for the production costs of technical studies (*estudios dasonómicos*) needed for the approval of multiyear logging permits. On rare occasions, village residents borrowed a modest sum to complete a public works project. Rep-

representatives of the Secretariat of the Economy (like agents of the BNCA) could authorize withdrawals from ejidal and communal bank accounts, which were used either to make cash disbursements to the members of cooperatives or for public works projects like a new schoolhouse, improved roadways, or a sewage system. This financial red tape constituted yet another bid to regulate villagers' use of their collectively earned money, but it rarely worked as intended. The leaders of cooperatives usually just distributed profits however they saw fit, and many of them balked at the overall complexity and logistical difficulties of working with banks located in distant towns and meddlesome extension agents with their ledgers and calculations.

Bank representatives ultimately had far less impact on forest rural people's finances than on their production practices. The BNCA agent in the Uruapan area reported that he had formed four producers cooperatives in indigenous villages during 1937. He also drew up the contracts that guaranteed a minimum price for the railroad ties they produced, effectively becoming their main client and cutting out the "intermediaries and exploiters," who he said had preyed on the ignorance of villagers. He proudly informed his superiors that one community had started a small savings account and saved enough to buy a pickup truck.⁶¹

These local experts' authority expanded even more once the president began declaring temporary bans on logging (*vedas*) in ecologically distressed forests. In 1936, the first year that the forest service was fully operative, Cárdenas banned logging in thirteen regions of nine different states.⁶² The decrees usually affected relatively small areas or, at most, the woods in one or two districts (*municipios*), but Michoacán was different. Quevedo himself traveled through the southern Meseta Purépecha and discovered that most of its woods consisted of young trees under forty centimeters in diameter. He also found instances of peasants who had cleared forest for *milpa* corn fields, as well as creeping erosion and, above all, overcutting by logging companies in the Uruapan area.⁶³ Cárdenas responded in late 1937 with a five-year ban on logging in most of the forests in the Meseta, exempting only the *malpaís* areas of volcanic soil. People throughout the region worried about losing jobs in the timber sector, but the government once again deployed experts to serve as extension agents. Foresters, indigenous affairs officers, and employees of the BNCA fanned out in the sierras to encourage producers cooperatives to adopt the one type of forestry still legally available to them: tapping trees for pine resin. Although the resin industry was already well established in the region, the combined effects of

the logging ban, technical assistance from federal experts, and federal loans made it into the region's leading industry for decades to come.

Representatives of the BNCA, many of whom had received advanced technical degrees and held the title of *ingeniero*, took the lead in reorienting peasant production away from logging and toward resin tapping in the Meseta Purépecha. Agents for the bank showed villagers how to cut back the bark using the French "Hughes" system, which did the least damage to the trees, and they provided funds with which villagers could purchase buckets and barrels to capture the pine sap. The bank also extended a 26,000 peso line of credit to fund the construction of a distilling plant that eight communities around Uruapan used to make and sell their own turpentine. The bank's extension agents taught villagers how to run the distilling machinery and alerted foresters about unauthorized logging in their territory. Eventually, they built a few more small-scale distilling plants in the highlands. They even informed the forest service that some of its employees had approved unconscionable contracts between logging companies and cooperatives. In areas unaffected by the logging ban, BNCA agents guaranteed minimum prices for wood products and paid back taxes for communities and ejidos unable to keep up with their obligations after the logging ban cut into their income. It is not clear whether villagers regarded these interventions as beneficial or intrusive, though the indigenous community of Capácuaro held a public meeting to accuse bank agents of renegeing on their promise to buy timber. The agents blamed the episode on a division within the community and characterized the malcontents as outsiders who sought unwarranted access to village commons.⁶⁴

The bank extension agents were not the only *técnicos* to arrive in the woods during the waning years of Cardenismo. Beginning around 1939, officials from the Department of Indian Affairs (Departamento de Asuntos Indígenas) organized producers cooperatives of resin tappers in some Meseta Purépecha indigenous communities. The producers organization they founded in Charapan not only coordinated the local tree tappers, but also advocated on behalf of other indigenous communities beset by outsiders who illegally logged their land.⁶⁵

Foresters continued their own efforts to organize cooperatives and regulate peasant practices in the early 1940s. Although they sometimes clashed with the bank agents who had encroached on their area of expertise, they nonetheless helped establish tree-tapping as a viable occupation in the Meseta Purépecha, particularly after the logging ban went into effect. Federal foresters also renewed the campaign to convince villagers to harvest

only the trees specifically marked for cutting. They even showed villagers how to cut tejamanil shingles with a minimum of waste after BNCA officials overstepped their authority by granting some communities permission to start a small tejamanil enterprise.⁶⁶ These initiatives had their share of problems, not least because officials sometimes neglected to make sure that villagers actually received payments for resin tapping; indeed, a suspicious amount of cash ended up in the pockets of local leaders (or inaccessible bank accounts).⁶⁷ The presence of so many federal employees may also help explain the sudden increase, around 1938, in complaints from villagers that every transaction now required appropriate documentation and that foresters used “any and all pretexts” to punish them for improper logging practices. Yet these same functionaries represented a potentially valuable set of allies who had the capacity to help regain control of their woodlands.⁶⁸

The multiplication of forestry experts, extension agents of the BNCA, and other specialists signaled a subtle yet important shift in the Cárdenas political project. The first four years of Cardenismo (1934–1938) represented the apogee of postrevolutionary populism, as officially sanctioned unions and peasant leagues appeared throughout the countryside.⁶⁹ The decision to provide technical support for these local institutions was intended to consolidate these organizations and buttress rural people’s long-term productive autonomy by teaching them the rudiments of scientific forestry. Cooperatives became the conduit through which villagers might build a bit of wealth and develop new skills, and many villagers eventually received jobs in turpentine distillery plants. Ejidos and native communities in Michoacán were exceptionally well positioned to take advantage of this technification. The state’s long history of popular mobilization, beginning with the agrarianism of the 1920s, and its privileged position as Cárdenas’s home state, had created local traditions of associational life that primed villagers to accept producers cooperatives. Conditions were quite different in the highlands of Chihuahua, where the absence of a strong agrarian movement and the continuing influence of commercial logging operations made the social terrain less fertile for collective village organizations or the development of local expertise.

COOPERATIVES AND CORPORATIONS IN THE SIERRA TARAHUMARA

Unlike Michoacán, where a significant number of rural people joined cooperatives and, for better or worse, came into contact with the forest bureaucracy and began constructing something that looked like community

forestry, Chihuahua was divided between two very different worlds tenuously linked together. On the one hand, large timber companies continued to dominate the commercial sector. The Great Depression and economic nationalism had weakened the largest businesses and pushed some North American owners out, but a new generation of Mexican businessmen rose to take their place, as the northern timber industry retained a central role in the regional economy. On the other hand, some Rarámuri villages formed producers cooperatives (often at the behest of mestizos living within them) and launched modest attempts at locally managed logging. Even in the Sierra Tarahumara, revolutionary forestry made some inroads.

By the mid-1930s, the Department of Agrarian Reform had received petitions for ejidos from scores of mestizo communities and most of the larger indigenous villages in the Sierra Tarahumara. Nevertheless, it appears that few native people knew or particularly cared about the possibility of receiving a land grant. As in Michoacán a decade earlier, schoolteachers often wrote the petitions (with or without residents' knowledge), and they were probably behind the handful of producers cooperatives that appeared in the highlands.⁷⁰ The locals' relative apathy kept the land reform bureaucracy and community leaders from following up on most of these requests for land reform, some of which languished for decades, until logging companies (and mestizo immigrants) started to move south of Creel in the 1950s, advancing into the sierras and prompting Rarámuri leaders and mestizo settlers to dust off their old petitions and formally map out ejidos in the high sierras. In the short term, however, most Rarámuri tried to steer clear of mestizo people whenever possible. Many villagers preferred their existing, albeit precarious, strategy of scratching out cornfields and raising tiny herds of cattle and goats. Although they raised enough corn and beans to meet their nutritional needs, one observer wrote that they had "barely enough to subsist on . . . [T]heir food is so scarce that you could practically say they don't eat."⁷¹

According to one estimate, 33,387 Rarámuri lived in Chihuahua in the 1930s, approximately 1,800 of whom were non-Christian "gentiles," who kept largely to themselves. Few had attended the seven schools scattered about the Sierra Tarahumara because most natives regarded public education as something meant for *chabochi* (non-Indians). Nevertheless, they continued to regard forests as a bulwark of collective survival.⁷² Young men often hunted in the woods, mostly with bow and arrow, and sometimes tracked an animal for days before making a kill. Outsiders judged that the Rarámuri were quite "skilled with hatchets and woodworking generally."⁷³

They carved intricate masks and kitchen utensils, but most wood was still used to build houses (some of which also included stone walls) and as cooking fuel. The timber companies agreed about the natives' prowess in the woods and often sent bilingual Rarámuri men into monolingual villagers to hire young men as lumberjacks. Most were paid with *sotol* (a Chihuahuan version of tequila), salt, or bolts of cotton, but remained away for only a few weeks before returning home.⁷⁴

Even the Rarámuri communities that received an ejido continued to face subsistence challenges. The presidential orders approving a land grant in the woodlands included a raft of stipulations, such as the creation of a cooperative and an open line of credit, that had to be fulfilled before land reform beneficiaries could use their forests.⁷⁵ Moreover, the delimitation of ejidal plots sparked unexpected conflicts between native communities, many of which had traditionally shared their territories with each other during some parts of the year. Land reform officials made no accommodations for the possibility that ejidal boundaries and forest regulations might undermine these arrangements. For example, certain families in the village of Samachique (in the district of Guachochi) had a long-standing custom of spending the winter months in caves in neighboring Quívaro, whose inhabitants received in exchange the right to cut a modest amount of timber from Samachique's woodlot. The elders of Samachique abrogated this agreement when the forest service built a sawmill in their town in mid-1930s, prompting Quívaro to bar access to the caves.⁷⁶ Around the same time, forestry experts began to demand that villagers stop herding goats, because they devoured seed-bearing pinecones and nibbled on saplings and the shoots of young trees, "completely nullifying" the ability of the forest to reproduce. Yet indigenous people needed the animals, which were a key source of protein and family wealth. Most chose to ignore the new regulations.⁷⁷

Some early experiments in community forestry achieved a degree of success. Leaders of the large Rarámuri community of Guachochi were particularly interested in putting their commons into production. Mestizos had arrived in the *ranchería* around 1900 and claimed some of the villagers' best agricultural lands. Thirty years later, the Rarámuri leader Timoteo Martínez requested an ejido grant that would return those croplands and confirm native people's ownership of the adjacent forests. Seven years passed, but Guachochi eventually received a provisional land grant as well as a small, steam-powered sawmill. The new ejidal leaders gratefully wrote local authorities (presumably with the help of a priest or schoolteacher) to

predict that “this indigenous Pueblo [*sic*] will become equal to whites and will finally become useful Citizens to our Country.” They also requested permission to organize a cooperative.⁷⁸ These advances came at a high price, however. Incensed mestizo settlers killed Martínez that same year, and the request for a cooperative got so mired in red tape that villagers waited for months before they could begin logging.⁷⁹

Notwithstanding the agonizing growth of ejido-based forestry in the sierras, the largest single employer in the forestry sector in the 1920s remained the sawmill in Madera operated by the Canada-based Mexico North Western Railway Company. The original mill had burned to the ground in 1918 and reopened in 1922 with a modern diesel power plant and state-of-the-art debarking machine. The plant also boasted the nation’s most advanced box-making shop, which began operation in 1912 and eventually produced around 600,000 fruit crates per year for the Mexican agriculture industry. Despite its technological sophistication, the new mill had a far smaller capacity than the one it replaced and needed a complement of only 680 full-time employees, who worked in two shifts. The plant also generated income for another 640 or so lumberjacks, who worked on ejidal land and the company’s own 1.5 million hectare parcel.⁸⁰ Trees had already disappeared in the immediate vicinity of Madera by the late 1920s, so native people traveled up to 40 kilometers to sell their logs to the mill. Company lumberjacks also worked stands of timber on either side of the 800-kilometer length of the Mexico North Western Railway line and its dozens of spurs. Logging crews had long since harvested the easiest-to-reach trees there as well, so they made cuts on the mountainside and hired muleteers to drag the wood to the rail lines. Most of the rest of this huge Porfirian-era railroad concession remained largely untouched, however. No fewer than eight species of pine and fir grew in three distinct microclimates, with one-hundred- to three-hundred-year-old trees in abundance and individuals as old as four hundred years not uncommon.⁸¹

To the Madera Lumber Company’s full-time forester, this huge expanse of nearly untouched forest represented not so much an ecosystem to be preserved as a resource to be molded and exploited. Daniel F. Galicia, who later took a job with the forest service and acquired logging rights throughout the sierras, repeated a common refrain in classifying the largest, old growth trees as “decrepit” because they grew more slowly than younger trees. He also intended to “improve” the biological makeup of the forest itself by bringing about the “extinction” of the hardy black pine, which lumberjacks (most of whom worked only with hatchets) hated to cut, be-

cause its short, branchy trunk was hard to strip and often got caught in the debarking machines. He recommended a regime of selective logging aimed at thinning the oldest trees and black pines over a fifty-year period in order to encourage “more rapid and uniform growth” of commercially desirable trees, thus maximizing the forest’s productivity.⁸² Ecologists today often reject this practice (known as “high grading”), but it probably had little effect in this case because, in practice, the loggers made little or no selection of which trees to fell. They continued to cut the most accessible stands of timber, regardless of age or species. And the surging demand for wood during the Second World War soon stubbed out even the minimal pretense of forest management.

The Madera sawmill’s status as a prominent employer in the eastern Sierra Tarahumara, combined with its foreign ownership, made it a target for postrevolutionary reformers. Its owners began to feel the effects of economic nationalism in the late 1920s, when Governor Marcelo Caraveo threatened to increase the mill’s tax liability. The plant’s North American manager shut down operations, putting its employees out of work, in a failed bid to pressure the governor to relent. The mill started working again in 1929, but the higher tax burden made the company’s products uncompetitive north of the border, and company owners began to make secret arrangements to evade the tax on foreign corporations by “selling” the sawmill to the Mexican superintendent of the railroad, Gilberto U. Armendáriz, while secretly retaining ownership.⁸³

It turned out to be the beginning of a long process in which the mill and its huge landholdings moved into Mexican hands one piece at a time. The next step occurred in 1935, when labor organizers arrived from Mexico City and succeeded in forming a union of mill workers. The corporate owners regarded unionization as the most serious threat to their interests yet. After yet another fire damaged the mill, in 1939, administrators decided to shift production away from the main plant in Madera in favor of smaller (and much more wasteful) steam- or diesel-powered “portable” sawmills that could be disassembled and moved from one logging camp to another in a matter of days. Almost half a century passed before large and efficient sawmills reappeared in Chihuahua. The introduction of logging trucks capable of transporting huge sawlogs made it even more attractive to move smaller mills from one camp to another, though it also meant building roads deeper into the sierras. Even so, the portable mills plants ran at far less than their installed capacity both then and throughout the twentieth century. They hired small contingents of thirty to sixty workers, which



Figure 3.2. Logging in the North Western Railway concession, Chihuahua, 1939. Archivo General de la Nación, SARH/PF, caja 1974, exp. 2/402, leg. 7.

made unionization impractical and put these supposedly separate business ventures below the legal threshold that would have required the company to provide schools, doctors, and other benefits.⁸⁴

Another factor squeezing the mill's profitability was the exhaustion of forests leased from the sprawling ranch known as the Babícora Development Company, owned by the American newspaper magnate William Randolph Hearst. The relationship between the ranch and the sawmill had once seemed mutually beneficial. Logging opened up new pastures, and the mill ferried trainload after trainload out of Babícora at bargain rates. As one forester pointed out, this situation meant that the ranch administrators had no reason to conserve the forests; on the contrary, they hoped to eliminate them altogether. By the mid-1940s, the last stands of trees were on the verge of disappearing. Decades of clear-cutting followed by the introduction of forage grasses and cattle meant the land had permanently changed from a forest ecosystem to pasturage.⁸⁵

The sawmill still had access to the vast North Western Railway concession, which remained largely intact into the late 1930s despite the creation of several ejidos. At least some of these land reform parcels were given to lumberjacks who had once worked as casual laborers for the company.

The mill also continued to buy hand-hewn ties from nearby indigenous communities at twenty-five cents apiece. The continued strong demand for railroad ties was not enough for the once-mighty mill to compete with the multiplicity of “portable” mills in the old railroad concession, however, and the company found it increasingly difficult to compete with small-scale production on ejidos themselves.⁸⁶ In 1942 plant managers suspended the night shift, contending that wartime shortages of tires and truck parts left them no alternative. That same year, the owners turned the plant over fully to Armendáriz and an associate, who ran it for another two years, before the expiration of lease agreements with Babícora and other landowners forced them to declare bankruptcy. At that point, a workers’ cooperative acquired the mill and hammered out a new and mutually beneficial lease agreement with the ejido in the town of Madera, which held a few thousand hectares of forestlands that formerly belonged to Babícora. The forester assigned to survey the woods arranged for a provisional logging permit but also cautioned that the ejidal woodlots would quickly disappear if they supplied enough wood for the mill to work anywhere close to its capacity. He recommended making quick clear-cuts and held out the vague hope that the forest would eventually recover on its own.⁸⁷ In the end, logging out the ejidal lands was a temporary balm, at best. Madera’s ejidal woods had virtually disappeared by 1947, forcing the big sawmill to close for good.

Some foreign-owned companies continued to thrive in Chihuahua, though they faced increasingly serious threats from nationalist reformers. For example, the Babícora Development Company survived Cárdenas’s attempt to generate an agrarian movement on its lands by sending gunmen to kill the local leader Socorro Rivera. Shielded by “battalions of lawyers and editors,” the Hearst family subdivided the property into nine lots, which were titled to relatives and business partners. Each section was small enough to qualify for exemption from the land reform even though William Randolph Hearst maintained effective control of the property and continued to do so (despite the creation of fifteen ejidos on its property between 1915 and 1942) until the federal government finally bought the ranch for 2.5 million U.S. dollars in 1953 and converted it into “agricultural colonies” for the rural poor.⁸⁸

The Cargill Company also retained the quarter-million hectare property along the Papigochic River that it had acquired in 1906 from the most famous of the Porfirian científicos, José Yves Limantour. The company

rented the land to the Madera Lumber Company soon afterward, and the federal government expropriated over 7 percent of its territory between 1917 and 1935, to make a total of five ejidos.⁸⁹ A more serious threat cropped up in 1922, when President Alvaro Obregón invalidated Limantour's original title. In 1933 the Supreme Court upheld Obregón's decree and ruled that nearly all of the disputed land in fact belonged to the nation. No sooner had the ruling been made than General Antonio A. Guerrero, a former regional military commander who became one of Chihuahua's most notorious landowners when he seized an hacienda during the revolution, convinced sixteen of his friends to solicit their own "individual" concessions of 4,000 hectares on these supposedly vacant federal lands. By this time, the territory was home to Rarámuri and mestizo smallholders, but the group of sixteen cronies nonetheless received their grants and then formed a company known as Maderas de Chihuahua, with General Guerrero as its chairman.⁹⁰ President Cárdenas allocated most of the remaining Cargill lands to the 58,030-hectare Papigochic forest reserve in 1939, although his decree did little to protect the northern ecosystem. In the first place, a large number of sawmills surrounded the reserve and sent logging crews over the boundary to cut trees illicitly. Second, Maderas de Chihuahua received permission to begin logging within the forest preserve soon after it was formed and began producing railroad ties for both the domestic and North American markets.⁹¹

A small proportion of the Cargill lands did end up ejidos, however, the first of which was the 5,493-hectare parcel granted to the town of Bocoyna in 1935. Within a year, eighty-two men in the predominantly mestizo ejido had formed a cooperative and raised a hundred pesos of working capital. The lands they received had once been a logging tract, though only a few stands of timber adjacent to the rail lines had ever been cut. In July the villagers wrote President Cárdenas to say that their meager agricultural lands did not "produce anything because of its extreme sterility and poor quality." They also complained that frequent hail storms ruined whatever crops poked through the ground. They could make a living, they said, if the president gave them funds to buy a small sawmill. They explicitly requested direct access to the money, without the intervention of "outsiders" from the rural development bank (the Banco Nacional de Crédito Ejidal, or BNCE), which had a reputation for excessive bureaucracy and a tendency to meddle in land reform communities' internal affairs. The president agreed to release the funds, but did so via the BNCE just as the cooperative had anticipated.⁹²

The cooperative functioned surprisingly well in the following years despite some commonplace setbacks. A question over leadership erupted in 1942, when some members denounced the cooperative's president as an interloper. In fact, this conflict probably arose because some of the young men on the ejido had reached working age but had never been allowed to enroll as members of the cooperative.⁹³ The land reform beneficiaries also began logging without an approved management plan and initially made slipshod and environmentally damaging clear-cuts wherever it seemed easiest to harvest timber. They selected too many young trees for railroad ties and electrical poles, leaving the older and less productive trees standing in the forest. Yet despite these missteps, a professional forester held out hope that the situation would improve. He determined that the villagers had used their woods "in a more-or-less rational manner, which is to say, in line with certain precepts of a technical nature but without following them completely." He felt confident that if the cooperative would let forest wardens mark the appropriate trees for cutting and monitor its own members' behavior, the ejido's woods should generate a sustained yield of timber for the foreseeable future. Almost as an afterthought, he mentioned that a representative of the Secretariat of Agriculture had visited the ejido and may have disbanded the cooperative. After all, the new forestry code of 1943 did not specifically empower cooperatives to work on ejidal lands, which left their legal status in limbo.⁹⁴

UNFULFILLED PROMISES

Despite what had happened in Bocoyna, some foresters interpreted the 1943 code as prohibiting the creation of *new* producers cooperatives but allowing existing ones to continue working. Nevertheless, it was already clear that Cárdenas's grand experiment in revolutionary forestry would not endure, and the complete prohibition of cooperatives, in 1949, hardly came as a shock.⁹⁵ The prospects for village-based logging under the watchful eye of experts had already started to crumble in 1940, when Cárdenas dissolved the Department of Forests, Fish, and Game as an independent entity and placed it back under the authority of the Secretariat of Agriculture. The reorganization forced Quevedo to eliminate his signature programs and ultimately to resign in protest. The Institute of Forest Research closed its doors, ended its work on a national forest inventory, and donated its equipment to the National Museum.⁹⁶ Its educational mission eventually came to reside with the National School of Agriculture (now the Autono-

mous University of Chapingo), though Quevedo continued to maintain, for many years thereafter, that foresters deserved an independent institution of higher education.⁹⁷

Cárdenas cited budget constraints as the reason for his decision to gut the department, but that explanation does not ring true. The department had actually raised more than enough money to fund its own operations, by assessing logging fees. The historian Lane Simonian has suggested that something else lay behind the president's decision. Quevedo's abrasive personality and constant harping about an inadequate budget, not to mention his unrelenting complaint that forests should not be subject to the land reform, had not earned him many friends in the administration or among peasant activists.⁹⁸ As early as 1938, a pair of experts had published a thinly veiled attack on Quevedo, calling him a "tree worshiper" (*dasólatra*) who considered the forests untouchable and comprehended "nothing about campesino misery." Instead of blaming deforestation on rural people and recommending sanctions for unauthorized peasant logging, the writers argued that regulators would do better to clamp down on landowners who clear-cut or torched entire stands of forest rather than turn it over to peasants as ejidos.⁹⁹ Regardless of their argument's merit, the writers had succeeded in identifying the primary contradiction in Quevedo's approach to conservation: it focused most attention on campesino behavior, while downplaying the threats posed by logging companies and big landowners. Quevedo's ill-disguised suspicion of rural people and faith in major corporations was simply out of step with the populist spirit of Cardenismo.

Even the forest service's signature initiatives did not live up to expectations. Despite years of work to reforest the southern reaches of the Federal District, for example, land reform beneficiaries continued logging in the area and sometimes cut down the saplings that wardens had just finished planting.¹⁰⁰ Forestry cooperatives also failed to displace *contratista* middlemen in most instances, nor did they help forestry officials craft a national regime of sustainable logging. More disturbing still, forestry on ejidos never accounted for more than a small fraction of the nation's commercial production.¹⁰¹ By Quevedo's own assessment, the forest service had made little headway in rationalizing the timber sector. "Despite the best intentions put into practice," he reported in 1939, "the problem [of deforestation] has not been addressed in an integral way; palliative measures that leave much to be desired have failed to get at the root of the problem."¹⁰²

One reason that community forestry did not survive very long after the Cárdenas years was that *contratistas* quickly adapted to the new regime of

cooperative production. Forestry officials recognized in 1939 that speculators and middlemen continued to hold sway in most places. *Contratistas* encouraged villagers to ignore conservationist regulations and continued to pay them a pittance to cut wood, much as they had before the revolution. In addition, foresters had a hard time convincing rural people to obey their tidy maps and logging plans. Few land reform beneficiaries had access to trucks or even to oxen, so they had to cut the trees closest to roads, paths, and railroad tracks regardless of what the authorities had approved. By 1940, when Cárdenas decided to pare back the authority of forest service, its top officials had all but given up on revolutionary forestry. Better to ban *ejidal* logging altogether and allow commercial interests into forest preserves, they concluded, than to continue down the uncertain path of locally managed production.¹⁰³

Despite these unfulfilled promises, the policies that Cárdenas and Quevedo put into place constituted the first serious effort to find a more sustainable and equitable use of the nation's forests. For all its scientific chauvinism, the forest service under Quevedo had set as its goal the management of forests on a national scale based in part on the ideal of local management. Foresters began work on a research program to identify and map woods in all of the nation's varied ecosystems. Such a baseline study, had it been completed, would have given insights into the real economic potential of forestry and provided a means to measure overall rates of deforestation over time. Moreover, the Cardenistas hoped that cooperatives would eventually turn rural communities into the primary producers of forest products. Not until the 1980s did Mexican leaders once again make such a serious effort to break villagers' dependence on timber companies and contemplate the possibility of using sustainable, community forestry as a major component of national production. Taken in its broadest context, the eclipse of revolutionary forestry came at a great cost to rural people and the ecosystems on which they depended.

By the early 1940s, the rural populism of Cárdenas gave way to a new, more urban development imperative adopted by his successor, Manuel Ávila Camacho. Mexican leaders from the 1940s to the 1960s tended to regard forests as just one more natural resource that could contribute to the great push for industrialization, particularly in northern cities and the area around the Federal District. Yet cooperatives survived in many places even after they lost their legal standing in the 1940s. Many rural people in Michoacán and Chihuahua continued to describe themselves as members cooperatives when they wrote federal authorities, for example. The



Figure 3.3. Directive Council of the Cusárare ejido and cooperative during construction of a sawmill in the village of Yahuir, ca. 1948. Archivo General de la Nación, SARH/PF, caja 1575, exp. 28, leg. 3.

community of Cusárare in the Sierra Tarahumara even received a special dispensation for its cooperative to continue functioning as a constituent of a new kind of regional development organization known as a Forestry Management Unit, or UOF, and its leaders posed for a photograph in 1948.¹⁰⁴ Some villagers presumably clung to this obsolete institutional form because they never learned that the laws had changed. Yet others recognized the value of a locally controlled institution capable of managing village production and negotiating with outsiders. They seem to have embraced the concept of collective and potentially sustainable forestry, regardless of legal formalisms.

Rather than legal or institutional developments, the effects of the Second World War did the most to put an end to rural people's productive autonomy in the forests, limited though it was. Soon after taking office, Ávila Camacho deepened ties with the United States and agreed to put his country's resources at the service of the war effort. In 1940 he ordered an easing of export restrictions on such primary goods as oil, minerals, and forest products. He consummated Mexico's alliance two years later by declaring war on the Axis powers. The unprecedented demand for wood

products undermined the forest service's once scrupulous oversight of logging operations, which all but vanished. North American and Mexican companies raced into the woods, where they built new roads and set up makeshift logging camps at a furious pace. The federal government also hurried the construction of the western branch of the Northeast Railroad (also known as the Chihuahua al Pacífico) by dedicating three labor gangs to the task.¹⁰⁵ Nearly all of the logging for these initiatives was done using "temporary" permits that forestry officials granted without requiring the usual environmental studies or long-term forest-management plans. In many cases, emergency permits did not even specify where to cut, meaning that they generated little or no paperwork for federal officials (or historians) to review.

While some villagers found jobs felling trees and transporting them out of the woods during the war, timber companies rarely hired locals for the highly skilled positions. This was particularly true in indigenous regions such as Michoacán's Meseta Purépecha and Chihuahua's Sierra Tarahumara. Logging companies occasionally ignored ejido boundary lines altogether. They allowed their lumberjacks to make camp wherever they saw fit and to cut the surrounding woods for railroad ties, mining timbers, and construction material for the American military.¹⁰⁶ Something similar occurred in the Papigochic forest reserve, where Maderas de Chihuahua clear-cut woods adjacent to the railroad tracks that kept snaking deeper into the reserve. Once the loggers had exhausted the stands of timber closest to the rail lines, logging crews began to invade Rarámuri lands that abutted the reserve.¹⁰⁷ Even the struggling sawmill in Madera launched an unfettered regime of clear-cutting in the old railroad concession before the disappearance of prime stands of timber turned the ledgers red and convinced the owners to sell.¹⁰⁸

The scale of logging during the Second World War overwhelmed what remained of the forestry bureaucracy and dealt the coup de grâce to Quevedo's vision of a rational and scientifically regulated regime of forestry. The waning presence of producers cooperatives and the explosion of unregulated markets for forest products closed off the potential for community forestry, while the demands of global warfare favored the rough logic of quick and efficient production. By the time foresters collected themselves after the war, the tide had already turned in favor of industrial logging and scientific planning on a regional scale, neither of which took into account the needs of rural society.