INTRODUCTION

Our motherland is rich with nature.
—"Ne tol'ko rubit', no i vosstanavlivat'," *Master lesa* (July 1963)

Russians have traditionally considered their forests as inexhaustible.
—Brenton M. Barr and Kathleen Braden, *The Disappearing Russian Forest* (1988)

WOOD USE, PROFESSIONAL DREAMSCAPES, AND SOVIET PATH TO INDUSTRIAL ECOLOGY

In the Soviet Union, as in Russia today, it was typical to refer to forests as an empowering resource; huge forest coverage across the country made this gigantic polity extending across Eurasia "a green power" (*lesnaya derzhava*), a holder of natural "treasure" and "abundance." Forests had always surrounded people living there, and supported a widely held image of national power, political might, and cultural prosperity. Indeed, the USSR was one of the most forested countries in the world, possessing a vast array of different tree species—calculated at over 570 in the early 1980s.[1] Most of these forest riches were located in the eastern part of the country—Siberia and the Far East. According to some calculations, about 80

percent of the Soviet Union's forests grew in these regions. As a result, they were often described by Soviet commentators as both reserves of enormous green gold and "the pot of nature."[2] Present-day Russian state agencies similarly estimate that national wood resources equate to over a quarter of the world's supply and attribute a positive role to Russian forests in global climate conditions.[3] The Soviet-grounded image of a green sea of taiga has become anchored in popular sentiment, contributing to a sense of national pride.

Beyond imperial forest poetics lies their crucial economic service. Together with coal, oil, and gas, forests have played an extraordinary role in many of the world's economies. They provided construction and fuel material for industrialization, facilitating the growth of industrial enterprises, transport infrastructures, and housing. As such, wood was regarded as part of the foundation of modern societies of the last century. If before 1914 industries were capable of producing twenty-five hundred types of wood-based products, after 1945 they were capable of manufacturing up to twenty thousand. During the Second World War, wood offered a substitute for many of the materials required for producing certain key components in ships and aircrafts, and especially those made of metals—scarce resources in those troubled times. After the Second World War, wood continued to function as the framework on which grand scientific and technological achievements were premised. It supplied the material infrastructure for experimentation and discovery. One particular example can be seen in an "electric paper" invention, developed to record an image of the other side of the moon and photograph telegraphic messages from the atom icebreakers.[4] Bolstering the nation's pride in making

modern technological material from a natural resource, the invention served to amplify the glorious achievements of the USSR in outer space while proving the military significance of wood production in modern times. In the age of high technological discoveries, the military and strategic application of wood was crucial. Wood also offered an alternative to modern polymers, and unlike oil, was a renewable and sustainable material. Cellulose, the material produced through the industrial cooking of wood, was used for manufacturing strategic goods such as gunpowder and military rubber, and enabled the essential material infrastructures for the war technologies at the center of the militarized economy of the Soviet Union.

The quest for modernity during the Cold War and the related growth in demand for mass consumer goods also made wood an important material. At this time, technology's role in society expanded due to its much wider applicability for consumption. New advances in wood processing, chemistry, and technology provided vast opportunities for transforming natural wood into synthetic materials and goods, surpassing the more technologically primitive use of wood for fuel, shipbuilding, and house construction.[5] Wood supplied the material for satisfying growing levels of consumption, providing people and their homes with numerous packages, plastics, cheaper furniture, and other commodities that had initially only featured in the United States and Western Europe. In the USSR, wood acquired a peculiar meaning in state-led attempts to develop a consumer society, starting especially with the rise of Nikita Khrushchev. As first secretary, Khrushchev placed particular emphasis on intensifying consumer manufacturing as a political project.[6]

The mass rollout of *khrushchevkas*—the new individual apartments pioneered by his government—demanded new material objects for individual consumers. And as a result, the state searched ever more urgently for cheaper furniture and construction materials to combat growing shortages in the Soviet planned economy.

This book considers the relationship between forests and industry under state socialism. It reconsiders what is known about the state socialist experience with nature, and shows the entanglement of the environment and economy. The USSR was a country underpinned simultaneously by a strong drive for the extensive exploitation of its abundant natural resources and desire for technological modernity. It logged and exported huge volumes of round timber to acquire the currency needed for purchasing industrial equipment and machinery. At the same time, the Soviet leadership saw strategic importance in developing sophisticated technologies to manufacture various valuable products from wood, this most versatile of materials in the context of the Cold War. This revealed the gap between the possibilities of the extractive economy and technological drive to maintain the lead in wood-based production, as captured in the well-known Soviet political mantra, "Catching up and surpassing the West." Declared in 1961, the goal of reaching Communism in twenty years was articulated as the main aspiration of Soviet industrial development and the scientific-technical revolution that became a key concept in the industrial discourse of state socialism.[7] To a large extent, this aim was premised on the material abundance and increased living standards of Soviet society. The notion of satisfying the consumer needs of modern citizens was part of the national

political agenda in later decades, especially during Mikhail Gorbachev's perestroika, and was connected with the imperative to manufacture consumer goods from various natural materials, including wood.

The Green Power of Socialism stresses the activities of specialists working in forestry. It employs the broad term *specialists* to denote the industrial scientists, engineers, and wood-harvesting managers who worked at the harvesting and industrial enterprises, along with those employed at research institutions and administrative organizations related to the forestry industry. In the twentieth century, specialists, including technocrats and experts, played important political, economic, and environmental roles in both capitalist and socialist technocratic regimes. They participated in massive projects of nation building, contributing, for instance, to the technopolitics of attempts to build new, modern societies in places like Egypt and Francisco Franco's Spain.[8] In the Soviet Union, as in other countries over the course of the twentieth century, these specialists gained crucial power as technocratic voices, occupying a peculiar place in decision-making related to industrialization at various levels—in departments of the central level, industrial institutes, and individual enterprises. While most famously they formed the cornerstone of the Stalinist industrialization of the 1930s, they continued to play a significant role in industry building and economic activity long thereafter.[9]

Specialists exercised significant influence in advocating for the modern technological uses of wood and wood products, insisting that in the age of technological progress, "paper and cellulose, like coal and ore, are extremely important for our country."[10] They saw paper and wood-based products as

crucial ingredients for technological and social progress—an idea that was primarily connected to modern consumption. While wood had served as a critical material in society and the economy for centuries, after the Second World War it became increasingly viewed as a modern material that could be put to much wider technological applications. While from the industrial and consumerist perspective, oil was undoubtedly a modern material, when converted from traditional to modern uses, wood came to be seen in similar terms. Thus as elsewhere following the war, modern science and technology rendered wood a liminal substance, transforming it from a *traditional* construction and fuel material to a *modern* raw material for the industrial manufacture of numerous consumer and military goods ranging from cardboard packages to the temperature-resistant cellulose used for making rubber for military aviation. The use of modern materials was seen to denote the pivotal change in the structures of production, consumption, and everyday life that underpinned notions of modernity.[11] Explaining the wide applicability of wood-based materials that became possible after the war, specialists responded to rapidly shifting models of consumption of natural resources.

These specialists were driven not only by real, empirically informed growth in wood demand but the anticipation of massive projected spikes in demand for wood too. With the beginning of the Cold War, many argued that the demand for wood would not decrease, despite the discovery of oil and progress made in the use of chemicals. Instead they predicted quite the opposite: technological advances would massively *increase* demand for wood due to the diverse possibilities of wood production, premised on the material's ability to

change. Rapid Soviet technological progress in outer space engineering, atomic energy, physics, and medicine led many to believe that the forestry industry could also make a breakthrough and serve as a major provider of modern materials. Given the high military and consumer importance of wood, the second half of the twentieth century was punctuated by experiments to create modern technologies through the most efficient use of wood as an industrial resource. Like their Western counterparts, Soviet specialists saw sophisticated technology as a black box through which a raw material could be transformed into a ready product; through the operation of technological processes at socialist enterprises, the commodities required for a modernizing economy could be produced.[12]

While technology seemed to be the driving force behind the more intensive consumption of wood, the question of wood availability for developing this large-scale production became a key area of concern, however. Observing the rapid growth in wood consumption and expecting even more intensive demand, many specialists grew anxious about the sustainability of the Soviet Union's resource base in facilitating the technological age. This book shows that some of the ideas expressed by specialists about the environmental impacts of the Soviet exploitation of wood resources laid the ground for more ecologically sensitive production in the future, even as their advocacy dovetailed with industrial interests.

THE INDUSTRIAL DIMENSION OF SOCIALIST ECOLOGY

Wood was a natural resource that had greatly influenced the form that nature-economy relations had taken in the past.

The use of forests in extractive economies surfaced a key tension, though: to derive full economic benefit from this abundance required sophisticated technologies that had always been in acute shortage in the resource-dependent economy. The Soviet Union harvested significant portions of its forests and was one of the world's four principal exporters of round timber. Yet it made only a small contribution to global trade in terms of highly processed wood-based products.[13] Like other extractive economies, state socialism relied on wood as much as it depended on ore, coal, oil, and gas, among other natural "gifts." But wood exemplified the peculiar way in which the Soviet state and experts dealt with nature. It revealed the tension between the high military and civilian consumer demand for wood, on the one hand, and the problem of wood harvesting and processing, on the other, bringing to the fore one of the biggest challenges of the Soviet planned economy: *the prospect of the future scarcity of rich natural resources*. A scarcity of wood, lack of modern technology, and dearth of efficient forest management systems produced a new discourse of professional alarmism over the future of socialist nature and industry. Some forestry specialists argued that the apparent abundance of wood was rendered illusory if one looked at forests as they did, through an industrial lens. Rapid economic growth and the rising demand for wood, combined with what they conceived as inefficient harvesting and wood-processing practices, would lead, they warned, to the devastation of forest resources.

Over the course of the twentieth century and beyond, mass deforestation proceeded in virtually all corners of the globe at an alarming rate. The Amazon rain forest, for instance, has been subject to heavy devastation over the past

fifty years, while some European nations, such as Denmark, depleted their own wood stocks much earlier. Soviet specialists rarely referred to the experience of other countries, but emphasized homegrown destruction and wasting practices. They warned not only against clear-cuts but also practices that produced vast amounts of wood waste—and especially those that left behind harvest waste in forests themselves. They criticized the rapid devastation of forests of the northwest and blamed it on *irrationality*, a term widely used in Soviet industrial parlance to signify economic loss. Indeed, the European part of the country had traditionally been heavily exploited, leading specialists to voice increasing concern about the possibility of the scarcity of industrial forests in the near future—particularly in light of the rapidly growing consumer demand, which was only expected to accelerate further. They also criticized the unequal geographic distribution of industrial operations, emphasizing what they referred to as the "weak" exploitation of forests in the eastern regions of the USSR, which remained largely industrially unspoiled. Imagining the forests of Siberia and the Far East of the Soviet Union as huge, untapped green riches, they insisted on the need to rationally industrialize them to halt depletion in the old industrial region of the northwest.

More specifically, some professional voices stressed that the vast promise that wood held in the making of goods could not be realized if the wasting practices of wood harvesting and manufacturing continued unabated. This densely forested empire was, they argued, putting at risk its share of the wood resources so crucial for facilitating modern consumer production. While for forestry specialists, nature offered important conditions for capitalizing on raw

materials, they also emphasized the environmental limitations that came with the use of wood in economic production and consumption, underscoring the need for careful treatment and economic calculation. This shared concern connected forestry professionals working across the country, and led to a change in the model they used to describe the interaction of industrial goals with nature and the resources it provided. Specialists working in industry, the cornerstone of modern society, imagined and experienced nature as a key factor for technological development. They not only worked to realize the modern industrial and consumer society but acquired an important role in rethinking the relations between forests and industry as well. Reacting to the tension between the technological drive to develop a modern industry, on the one hand, and the extractive economy, on the other, some specialists highlighted the contradiction between rapidly disappearing wood stocks and the rising economic demand for consumer and military production. Some enterprises indeed suffered from a lack of wood, as they were located in deforested areas. This professional view challenged the public image of forest abundance and warned about the prospect of wood scarcity. Structured around the solutions that specialists proposed to the prospect of wood shortages, this book explores how specialists tried to *reconcile* nature, technology, and industrial production, seeking to manufacture modern products while preventing the depletion of industrial forests.

This analysis invites the reader to reevaluate interpretations of the relationships between the socialist state, industry, society, and nature. Scholars and the public have often previously explained these in one of two polemic forms:

ecocidal and environmental. One of the first substantial works on socialist forestry by scholars Brenton Barr and Kathleen Braden, for instance, took the first position, arguing that Soviet exploitation of forests was wholly destructive. They showed that forests offered the state timber for export, through which it could accrue the currency needed for purchasing costly Western machinery.[14] For Barr, Braden, and other scholars, the Soviet approach to nature resulted in "a vast, toxic rust belt of chemical, metallurgical and nuclear factories and extractive industries spewed smoke, acid and poison into the air, water and land over decades of Soviet power."[15] Soviet practices echoed the experiences of other socialist countries like the German Democratic Republic, where political priorities led to "inevitable forest collapse."[16]

This scholarly view has been forced to reckon with emerging evidence that suggests that dictatorships can be more environmentally friendly than previously thought, decoupling the association of totalitarianism with environmental destruction.[17] In the case of the Soviet Union, some have come to describe socialist development as having been influenced by forms of environmentalism, either as a type of Soviet intellectual activism or state policy, and part of tensions around particular natural assets arising from industrial construction. Important and widely known events, such as the "storm over Baikal" in which protests erupted over industrial construction on the shore of this unique lake in the 1960s or the Chernobyl catastrophe in 1986, were triggers for scholarly and mass media discontent with Soviet technological politics.[18] They provoked late environmentalist attitudes within Soviet society, just as earlier criticism of agricultural chemicals caused anxiety in the United States.

The relation of authoritarian regimes to nature was more than one-sided, as the model of ecocide previously suggested. Some research is indeed more positive about the socialist (and more broadly, authoritarian) experience around the use of nature, even though one stresses the general technological backwardness of industry and thus wasteful forms of natural resource exploitation.[19] The utilitarian view of nature espoused by Soviet specialists as primarily a source of economic value came to overlap with a drive for developing a more holistic approach to the natural world.[20] This lent views of nature a sense of hybridity that emphasized the nexus between the natural world and technological infrastructures. The industrial ecosystem came to be understood as "a transcendental hybrid" of natural and artificial systems when engines included nature in the calculus of industrial production.[21] Now that the ecocide narrative that posits the economy swallowing nature has been considerably challenged, historians have been stressing the combination of exploitation and protection that appear in Soviet discourse.

This book offers a more robust interpretation of economy-nature relations under state socialism. It suggests that among scholarly analyses, the role of specialists working in industry deserves more discussion in the context of complex relations with nature. Existing bodies of work often depict specialists as technocrats who played different roles: decision-makers in their own right, victims of political decisions, or agents of global communication between the East and West.[22] Their place in Soviet economic policy and global agendas was enormous. But this book proposes examining socialist specialists in another light, focusing on their relation with natural resources. Furthermore, unlike much previous

scholarship that concentrates on forest protection (in particular on *zapovedniki*), environmental activism, and forestry legislation, this book discusses strands of socialist environmentalism by looking deep inside industry—the heart of the Soviet project. It examines how industrialists saw the past and future of forest exploitation in light of industry-nature relations.

These relations, this book demonstrates, were constituted by the combination of economic interest and ecology, highlighting the controversy of industry-nature interactions. Industrial specialists working under state socialism explained the trends prevalent in forestry and wood use as rapidly moving toward a *wood crisis*, and this stimulated an intensive search for new raw material resources from the early 1950s on. From this perspective, the Soviet project saw itself as not only a heroic movement toward Communism in which humans were victorious over nature but also filled with both economic and environmental risks. *Crisis*, which as historian Rosalind Williams has recently argued remains a hazardous term, proved a powerful category and found advocates in the Soviet Union.[23] Forestry specialists, moved by concern over the industrial future of the extractive economy, grew alarmed about the Soviet Union's forest stocks. The sense of crisis derived from the expectation of wood scarcity expressed by specialists in the context of growing economic demand, on the one hand, and intensive but wasteful woodcutting, on the other. The desire to compromise more for industrial purposes led to a less devastating orientation toward nature among specialists, or what this book calls the *industrially embedded ecology* of Soviet state socialism. This shows that specialists who worked in industry were not a priori killers

of nature nor were they its fervent protectors. Instead they evinced a complex vision of nature and its resources, framed by imperatives of economic and industrial growth. Wood, as an economic substance with a strong technological effect and wide applicability—both natural and technological—entangled industrial and environmental issues. Specialists insisted that forests should be treated carefully (or in their language, "rationally") in order to stop wastage and maintain a sustainable base of raw materials for the expected increase in production. Soviet industrial ecology represented a dimension of the Soviet environmentalism growing within the industry and stemmed from the envisaged increase of economic consumption that would, if practices of wood harvesting and processing remained unchanged, lead to a wood crisis. This shows how a form of industrial ecology was born from a productivist view of nature and overindustrialization.

Importantly, professional conceptions of industry and forestry were not informed by purely technical conceptions but quite often involved an emotional response on the part of experts sheathed in a studied professionalism. This can be seen in the invocations they made around the transformations of forests and wood, and waste and annual plants, in their descriptions of past and future wood stocks, state policy, and industrial experiments. Their actions were significantly colored by their professional imagination and expectations of the future as well as the comparisons they made between Soviet forest practices and those of other countries.

This included *alarmism*, the term this analysis uses to describe concern about—and even fear over—the future of industrially useful forests. Alarm about the prospect of shrinking natural resources moved many to advance claims

and make decisions to improve wood harvesting and processing. More broadly, it changed their relation with nature. It produced enthusiasm for and a belief in the industrial opportunities created by resource colonization and technological experiment. The great hopes in turn evoked disappointment with the frustrating results achieved in Siberia and the Far East. The forestry industry, as this book shows, was not a purely technical phenomenon but rather a space of technocultural emotional responses to deforestation. Emotional responses and perceptions of wood availability among specialists, who drew on scientific and industrial investigations, produced industrial processes penetrated with expectations, fears, and hopes that pushed forward certain economic and political decisions. This was important for how specialists participated in the setting of agendas about natural resources along with their availability and use. Specialists, however, were the generators of expert knowledge, explaining the parameters of crisis and proposing solutions from their own perspectives.[24] The chapters that follow examine industry as a space of technologies, critical problems, and decision-making deriving from responses such as alarm, fear, hope, and expectation.

The relationship between specialists and nature in the last century correlated with what political scientist James C. Scott has called "high modernism": interests and faith conducted through state action.[25] In state-led and sometimes market economies, the state provided investments and labor for advancing to the unspoiled lands and building experimental enterprises. Indeed, solutions to the wood crisis required huge investments and centralized action—to build technological and social infrastructures in difficult-to-access forests,

construct new industrial factories and research stations for experimenting with alternative raw materials, and modernize available forms of technology. Many forestry industry specialists combined expertise and administrative responsibilities working in state institutions and thus were state officials themselves. Looking at professionals and industry, this book also explains the development of state politics and decision-making in the planned economy.

Considering the technoenvironmental dreamscapes of specialists under state socialism illustrates how they measured economic geographies in terms of the availability of industrial forest resources as well as the technological possibilities to render them both more sustainable and productive. They dealt with various material substances, both dead and alive: forests as living species; timber, wood, and ready-made consumer products; and alternative resources such as harvest, sawmill, paper waste, and annual plants applicable in the forestry industry. All of these materials were the subject of physical and symbolic transformations that made up a modern variant of production. Hence the changed paradigm of nature-industry relations, and new technologies to manufacture wood pulp and cellulose, made wood waste and annual plants (such as reeds) valuable economic materials and stimulated numerous industrial experiments. Consequently, they provoked the enthusiasm of many specialists about a new age of making wood-based products without the intensive felling of trees. Importantly, they did not address wood, alternative raw materials, and manufactured goods as actors but instead as material resources for achieving progress and modernity to overcome an outdated state—goals that mattered a great deal in the calculus of the

Cold War. Forests were likely a source of valuable materials in their dreamscapes, but by the end of the epoch, specialists increasingly spoke about forests as living organisms and actors within complicated ecosystems that had not simply national but indeed global impacts.

EXPLOITING FORESTS, SAVING FORESTS

Three solutions, proposed by Soviet specialists in the 1950s, grew out of economic interest and concern about the disappearing industrial forests. These solutions can be summarized as follows: the imperial and extensive advancement to the eastern lands of the country; the development of no-waste technological production; and technological improvements in wood harvesting and processing. Advanced by different groups of specialists working across the country, these notions nonetheless represented overlapping responses to wood scarcity. Socialist specialists in this sense deployed their power to find critical solutions and develop environmentally compatible technologies for keeping industrial growth sustainable. In professional dreamscapes, alarmism about the future of wood resources provoked a search for ways to preserve natural abundance.

The imperial solution harnessed the ambition to exploit new—meaning unexplored—forests in Siberia and the Far East, facilitated by large-scale railroad construction along with oil and gas excavation. This unfolded in the course of the postwar colonial-industrial turn toward the eastern Soviet lands.[26] The late 1950s and 1960s represented the peak of Soviet discovery of carbon raw materials and heralded the construction of the famous Baikal-Amur Mainline

(BAM). It supported yet another episode of the colonization of the eastern territories, now much more technologically equipped and significantly more focused on industrial construction than it was in the nineteenth century when the government of the Russian Empire expressed a colonizing interest in its eastern regions. Thus in the mid- to late twentieth century, the Soviet Union proved itself an inland colonial empire moved by economic ambition. Forestry specialists, however, urged rational forest exploitation in the east to start a new page in wood harvesting and industrial production, advising the state not to repeat the negative results that had followed the exploitation of European and particularly northwestern forests, where the industrial wood stocks had been depleted. Rationality implied economic efficiency, and was connected to the so-called complex use of natural resources and production, underpinned by the concept of no-waste industrial manufacturing. This approach was partly implemented under the slogan "enterprises of the future," as Soviet propaganda and specialists themselves put it, or forest-industrial complexes (LPKs), many of which were indeed established in the Far East. Broadly, the availability of eastern riches and the state's turn toward them increased alarmist views, which referred to the fate of the overexploited northwestern forests. The rational use of natural resources referred to modernity, and was embodied in the struggle against technological backwardness and the ineffective use of resources extracted from nature.

The second set of solutions was underpinned by the discourse of complexity in Soviet forestry rooted at latest in the 1930s. From this time on, specialists began to advocate for the importance of using every possible element of natural

resources and not leaving behind anything as waste. Yet at that point, the industry suffered from a lack of appropriate technology. After the Second World War, threads of this approach were resurrected in the search for wood alternatives, including various wastes and annual plants, leading to significant changes in the consumption of resources and their economic sustainability. This alternative industrial production was primarily designed to foster a base of renewable industrial resources for the unforested southern regions, such as Ukraine, Kazakhstan, and the south of Russia, drawing on their stocks of reeds and other annual plants. Such approaches were, however, also employed in the old northwestern region and especially the new eastern forest regions. This tempered imperial ambition in the east, encouraging the more intensive use of waste and other available resources, the use of which would be less harmful to nature. But this situation was made more difficult by the fact that notions of the complex and rational use of resources were connected with imperial designs; it was in the course of discussions around the technological advancement into the new regions that specialists considered ways of using consumer (paper) and industrial waste in manufacturing processes at new enterprises. The Soviet authorities devised schemes of industrial construction that implied the building of a network of enterprises in both the densely forested east and sparsely forested south. This approach also aimed to solve the problem of supplying unforested regions, namely Ukraine, Kazakhstan, and the south of Russia, with renewable raw materials and ready manufactured goods in situ, thus decreasing transportation costs. Specialists conceptualized numerous alternative materials, ranging from industrial, wood, and consumer

waste to annual plants as wood substitutes to cope with the growing demand for wood-based products. Moreover, "used natural resources" or "natural remnants" were now conceptualized as *modern* materials of industrial production, which held potential as cheaper, more flexible, and transformative industrial resources. Experiments with alternatives were designed for the regions that were unforested or where forests were rapidly disappearing, but they were proposed as an important condition for the colonial exploitation of new forests to prevent the transfer of old negative practices of wood use to the newly opened eastern lands.

Finally, the third set of solutions proposed by specialists to deal with the wood crisis centered on attempts to develop practices of more efficient wood harvesting and industrial production in the forestry industry. This included the attempt to improve technology and methods of work within the industry by enhancing mechanization, automation, and the quality of manufactured products. It stemmed from expanding technological possibilities that substituted human muscles for mechanisms, a more or less continuous process from at least the 1920s and 1930s onward. Stalinist industrialization emphasized the significance of the mechanization of heavy works in forests and at industrial enterprises, particularly those related to loading and transporting raw wood and ready-made products. Later Soviet decades saw a more sophisticated approach stressing that all operations could be governed by machines. Specialists believed that due to their technological accuracy, mechanisms could make the harvest and consumption of wood more precise. Through technological modernization and automation, many hoped that efficiency would increase and wastage would be minimized

during processes of harvesting and industrial manufacturing. Together with the imperial and experimental solutions, the modernization solution implied huge investments in production in order to increase the productivity of wood supply and consumption.

Many of these approaches were not especially new. The notion of the sustainable use of forest resources dated back to nineteenth-century Europe, for instance, when foresters discussed the stable growth of trees. In addition, the concept of the complex use of natural resources—a notion this book will discuss in some detail—was popular in industrial discourse of the 1930s in the Soviet Union. Some projects were interrupted by the Second World War, though, while others could not be implemented due to a lack of proper technological infrastructures. In their conversations, late Soviet specialists often referred to the 1920s and 1930s, when their counterparts (and their younger selves) had worked on more efficient methods of using raw materials for the industry.[27] In this sense, many of their projects were not innovative but instead developmental. Yet there were differences between the post-1950s and earlier epochs in at least two respects. First, new technology made many ambitious projects possible after the war, giving the industry new sets of instruments for experimenting with wood. In the wake of growing consumerism, postwar technological advancement in forestry chemistry in particular helped render wood a more flexible material than before. The marriage of chemicals and wood could help satisfy demands for consumer products such as cloths, paper and cardboard packages, and cellulose-based soluble tablet shells, among many others. Technology also provided the possibility for the automation of harvesting and industrial

operations, making them more effective and less damaging to the environment. Second, professional attitudes toward nature resonated with developing environmentalism as a reaction to the intensive consumption of natural resources. Even as it remained concentrated on economic growth, the late Soviet industrial approach to nature evolved from exclusively industrial concerns to one that comprehended forests as complicated natural organisms. Later decades of the Soviet Union therefore exemplified how notions around forests were being transformed in professional dreamscapes: from an endangered industrial resource, forests came to be increasingly understood as a natural organism under threat. This became especially obvious by the 1980s, when many specialists emphasized the liminality of forests, addressing them as both a complex source of wood and factor impacting the environment.

As the following chapters will show, the images of future resource availability and the search for solutions to an impending wood crisis led specialists to conceptualize forests not only as a hybrid industrial material produced by nature and consumed by people but as a *finite* industrial resource of nature too. The book builds the argument that with a utilitarian view of nature, and searching for the rational use of natural resources for the economy and society, Soviet industry developed industrially embedded ecology as a *by-product* of hyperindustrialization. Placing industry at its core, state socialism aimed to achieve not only sustainable industry but also sustainable forests to provide a continual supply of resources to industry. This approach derived from earlier periods and flourished after the Second World War. By the 1980s, while nature was still understood in its service to

the economy, it was nonetheless to be treated with care. Taking economic growth as a nonnegotiable imperative, socialist industry was thus increasingly sensitive in marking this natural resource as a fragile industrial material whose exploitation required more careful approaches. Rethinking the past, present, and future of industrial forests and practices of wood consumption provided the impetus for reconsidering their economic function along with the shifting of focus to alternative resources, the more efficient use of wood, and attempts to stop the devastation of old forests. As such, forests were rethought not simply as industrial value or a sign of imperial might but as a *natural resource* of state socialism that was *at risk* as well. At the same time, while forests were increasingly recognized for their environmental value, waste and alternative resources accrued *industrial value* as substitutes for wood in industrial processes. Industrially embedded ecology thereby grew within the industry itself—a result of the industrial alarmism that suffused specialists in the sector who aimed to redirect the industry toward sustainable use. Hence Soviet specialists reconsidered the relation of industry and nature, seeking to render forests more productive resources by substituting natural wood with wood waste and annual plants in industrial production. Many specialists expected that further industrialization along the same old lines would perpetuate the wood resource crisis and so the search for alternatives was vital.

Out of the three alternatives proposed to solve the wood crisis—the imperial, experimental, and modernization approaches—none emerged as the singular winner. Instead, all demonstrated the desperate industrial search for saving forests from depletion. They contradicted the conventional

view of Soviet forest abundance, undermining the more general view of enormous stocks of wood resources in the country. While in Sweden, for instance, cooperation between industry, the state, and ecologists was fairly fruitful in terms of making production more ecological, in the Soviet Union it remained a matter of professional discourse. In practice, many of initiatives, given their cost, depended on state planning and action. The planned economy was eager to develop new technologies for the more efficient use of forests, but was itself frequently an obstacle and reason for the failure of specialists' initiatives. It did not succeed in investing enough resources into the reorganization of forestry as many professionals expected.[28] On the discursive level, however, this story illustrates that state socialism was not exclusively a space of ecocide but instead characterized by a much more complicated set of relationships. This leads us to reconsider socialism from an environmental perspective—a task that bears significant relevance today.

With the demise of the Soviet planned economy, the discourse of industrially embedded ecology disappeared almost entirely, demonstrating a rupture between socialism and post-socialism. If the postwar Soviet era showed continuity with previous periods, reviving some earlier initiatives in approaches to wood, the post-Soviet period disavowed the environmental approaches developed during the Soviet period. In the early 1990s, the forestry industry was in a critical state due to a significant lack of funding and declining numbers of employees. Russian and foreign logging companies exported large quantities of wood with little consideration of reforestation, neglecting Soviet experience as a remnant of Communism, the relic of an odious past. Importantly, many issues voiced

by Soviet specialists, such as nonwasteful wood harvesting and the use of wood waste, were largely forgotten even as the Russian economy has remained enormously extractive. Despite promises, private companies have neglected expensive and time-consuming projects—for recycling waste and experimenting with the use of alternative materials, for example—in favor of economic profit. Some aspects of logging have been undertaken by illegal companies that have contributed massively to levels of deforestation through voluminous exports of raw wood. Discussions around alternative resources and decreasing deforestation are currently unfolding in modern Russia and beyond. Yet few make reference to the Soviet past, seeking instead to find their own solutions. The fall of socialism thus created a rupture that saw forests—one of the major representatives of Russian nature—suffering significant losses. This book aims to facilitate a process of rediscovery, bridging this disruption by tracing processes of industrial "ecologization" in state socialism and its aftermath in postsocialist Russia.

The Green Power of Socialism

Wood, Forest, and the Making of Soviet Industrially Embedded Ecology

By: Elena Kochetkova

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