



INFRASTRUCTURAL DECAY: Maintenance Ecologies and Labor in the Çoruh Basin

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It was late spring, when the snow melts and erosion control work begins in northeastern Turkey's Yusufeli District in Artvin Province. On the slopes, villagers would build erosion control walls—low retention stone walls preventing rain from washing down soil—and foresters would commute daily from town to the uplands to monitor the work's timeliness and quality. That day, the trip took three young foresters, the driver, and me one and a half hours over narrow, winding roads, with a tea break halfway. Soil conservation took place high up on remote hills and mountains. Unless there were footpaths used by people and animals on their way to forests or highlands, quality control mostly demanded figuring out how to keep one's balance while climbing up and down steep slopes. Scattered shrubs, as well as oak, aspen, and juniper trees provided branches whenever I needed to hold on to something. While climbing, Ferhat—a young contract forester working for the District Forestry—explained that most forests here were considered “damaged”—they have become sparse because of natural factors such as landslides or human use.¹ But there was also good news, Ferhat emphasized: These sparse forests were now growing back.

As he explained, thanks to the gradual decrease in husbandry and farming activities since the 1980s, “social pressure” had diminished, paving the way for

nature's recovery. Pointing to the terraced fields and houses amid the pine forest near the foot of the mountain across, he asked: "Do you see the *titrek kavaklar* [quaking aspens] over there?" Quaking aspens have a light, greenish-gray bark and trembling round leaves that in autumn turn a startling yellow. Ferhat continued:



Figures 1 and 2. Climbing up with foresters to monitor the erosion control walls and the overgrown lands across the hill with quaking aspens. Photos by Ekin Kurtiç.

“These *evlek* are areas cleared of forest.² But now quaking aspens are growing in these fields. You see? Now the forest is reclaiming its own space. This is something positive for us, for erosion control.” Quaking aspens grew not only on small, formerly cultivated plots but also on stony hills near erosion control walls, giving foresters hope that vegetation would grow on the soil expected to accumulate behind these walls.³ For foresters, the rural landscape of diminishing human presence, agricultural production, and animal husbandry offers a hopeful indicator of nature’s recovery. Accordingly, forests reclaim spaces once occupied by villagers, thus becoming an auxiliary to erosion control in the uplands.

Erosion control activities in Yusufeli were conducted as part of the Çoruh River Watershed Rehabilitation Project. Justifying this nature rehabilitation project in the uplands was the building of hydroelectric dams on the valley floor. Multiple large dam constructions on the Çoruh River during the past two decades required addressing the detrimental effects of watershed erosion and soil sedimentation in the reservoirs. Similar to the growing concerns about siltation in Lesotho’s highland reservoirs (Hoag 2022), dam maintenance in the Çoruh Watershed rendered erosion a problem of sedimentation. Consequently, the upper watersheds—where erosion is considered to originate—became sites of environmental intervention. This intervention was designed as an integrated watershed management project, bringing together in collaboration various state institutions and villagers to restore a purportedly degraded landscape.

Framed by a participatory vision that emphasized villagers’ involvement in rehabilitation, rising environmental interest in the Çoruh uplands coincided with the area’s increasing depopulation. In a seemingly perfect picture, uplands, cast as valuable ecological sites for dam maintenance, became less “disturbed” by humans. Far from the dams, formerly cultivated but now overgrown landscapes turned into more-than-human components of infrastructure maintenance that, alongside human labor, would prevent soil erosion and sedimentation. In this seemingly ideal context, villagers’ narratives of and relation to the landscape drew my attention to notions of decay and dissolution associated with overgrown lands, standing in sharp contrast to their celebration as registers of restoration. This contrast reveals that the work of repairing ecologies for dam maintenance is undergirded by the gradual decay of another maintenance labor: villagers’ arduous practices of dwelling in, tending, and maintaining the landscape.

By exploring how resurgent vegetation matters differently to foresters and upland villagers, this article shows that dam maintenance through watershed rehabilitation, while claiming to prevent the decay of both infrastructure and ecol-

ogy, draws on another kind of decay: villagers' practices of tending the landscape. While foresters celebrate "nature's comeback" because it facilitates rehabilitating the erosive watershed and maintaining dam infrastructure, for villagers, trees such as quaking aspens, shrubs, and weeds spreading over formerly cultivated lands mark the erosion of their arduous landscape maintenance for and through agriculture and husbandry. Dam maintenance, therefore, is predicated on the decay of other forms of labored landscapes, insofar as it requires active work in repairing ecologies considered decaying.

This article offers a novel anthropological analytical perspective that foregrounds the continuum between maintaining and decaying and traces the role of labored landscapes in this continuum. In a world of ongoing ruination, rubble, and disturbance (Stoler 2013; Gordillo 2014; Tsing 2015), anthropological attention to maintenance work elucidates the mundane and often undervalued practices of sustenance of relations, meanings, claims, and affects alongside material configurations of technical systems. The analytical and methodological focus on maintenance and repair calls for considering breakdown and failure as pivotal generative moments of "learning, adaptation, and improvisation" in a world that "constantly decays" (Graham and Thrift 2007, 5). It calls for shifting attention from production to the innovative, creative, and consequential—yet commonly underappreciated—work of sustenance and restoration (Jackson 2014). Scholarly attention to practices of maintenance and repair as part of infrastructural life reveals that breakdown, decay, and leakage do not constitute endings but, rather, starting points to explore the politics, socialities, labor, affects, and temporalities entangled in material infrastructures (Anand 2017, 2020; Barnes 2017; Schwenkel 2015; Ramakrishnan, O'Reilly, and Budds 2021). Still, an antagonistic notion dominates our thinking about the interplay between maintenance and decay: maintenance is understood as encountering, preventing, and mitigating decay. Building on studies that explore the intricate ways in which relations of care may involve violence and injustice (Puig de la Bellacasa 2011; Bocci 2017; Scaramelli 2018), this article reveals the forms of decay that are not necessarily antagonistic but integral to maintenance and repair. Social theorists have long emphasized the paradoxical logic of modernity—a logic that Stuart Hall (1992, 16) has eloquently defined as "the Janus-face of modernity"—simultaneously constructive and destructive and involving both beneficiaries and victims. Infrastructures—the building blocks of modernist and developmentalist programs—constitute key sites where such contradictions and paradoxes get enacted (Howe et al. 2016). My exploration of the paradoxical logic of infrastructure maintenance offers an analytic to observe de-

cay not merely in the absence of but also as a key component of maintenance. As illustrated through rehabilitation efforts in Yusufeli, maintenance practices, while intending to counter decay, entail other forms of decay. Just as processes of decay and decomposition entail vitality and life (Hage 2021; Lyons 2020), practices of upholding and sustaining involve forms of ruination and dissolution.

My unmaking of the maintenance-decay divide is guided by upland villagers' everyday experiences of the changing landscapes and by anthropologists' attention to ecological-infrastructure relations. Notwithstanding the ecologically destructive impacts of infrastructure projects, anthropologists and human geographers have recently revealed and reconceptualized the manifold entanglements between infrastructure and ecology: Nature is rendered infrastructural for risk management and resilience through emphasis on environmental services (Wakefield 2020; Nelson and Bigger 2022); the earth is an integral component of material infrastructures (Barry 2016); ecologies are constituted by human-built material infrastructures (Scaramelli 2021); and infrastructures and their ruins become sites for unexpected, unruly ecologies (Carse 2019; Jasper 2020; Stoetzer 2018). This perspective lends itself to further problematizing the long-held division between maintenance and decay. Resurgent ecologies in Çoruh's uplands (such as proliferating quaking aspens) that are incorporated into dam maintenance shed light on the moments and experiences in which plant emergence is associated not necessarily with vitalism but with decay. As Ghassan Hage (2021, 3) puts it, things are often declared as decaying when experiences of decay are not "routinized" and "normalized" processes. At stake here is de-routinizing the emptying of upland mountains—often normalized as natural decline—by illuminating villagers' lived experiences and articulations of the process as historically situated, affectively loaded, and biophysically manifesting decay.

Thinking through *infrastructural decay*, therefore, points to two interrelated processes: (a) the decay of material infrastructures, and (b) other forms of decay rendered infrastructural for maintenance work, albeit with limitations. This multiplicity of decay as process is well-illustrated by the filling-emptying continuum across space (Djunda 2021). The mountain villages' gradual emptying is expected to prevent dam reservoirs filling with sediment on the valley floor, thanks to resurgent ecologies on uncultivated fields.⁴ In anthropology, the abandoned countryside has recently been studied through the concepts of rural voids (Driessen 2018) and emptiness (Dzenovska 2020).⁵ While rural voids indicate places' loss of meaning and value, emptiness signifies the emergence of new life forms amid abandonment, between a lost old world and no hope for an alternative future. Uncultivated

lands in Yusufeli, however, are entangled with imaginaries of future ecological recovery, and their gradual emptying offers potential to be tapped for infrastructure maintenance. As [Jonathon Turnbull, Adam Searle, and Sandra Jasper \(2021\)](#) posit, emptiness always constitutes an ecologically entangled process, since “the other-than-human beings . . . also experience, and are constitutive of, processes of emptying.” The multivalent meanings and experiences of resurgent ecologies, such as Ferhat’s quaking aspens, reveal that political ecological issues of marginalization and injustice in dam building consist not only of drastic events such as submergence and displacement but also of the celebration of decaying livelihood practices in favor of another kind of maintenance.

This point resonates with [Ashley Carse’s \(2012\)](#) argument on the selective and exclusionary logic of work that renders nature infrastructural: The valorization and protection of the Panama Canal watershed forests’ environmental functions of water provision for the canal exclude and subordinate other types of services they have long provided, such as agricultural production. Infrastructure maintenance, therefore, is a practice of marking boundaries between different anthropogenic environments based on their “suitability” for the aspired order. [Carse’s \(2014\)](#) analysis reveals the limits of this boundary-making since existing agricultural infrastructures in the Panama Canal watershed render it difficult for watershed management to accomplish its environmental aims in practice. Conversely, in the Çoruh watershed, agricultural practices are already declining. Yet this decline does not always contribute to the foresters’ idealized ecological order as beneficial for sediment control. As I will show below, human withdrawal from uplands does not automatically lead to beneficial plant resurgence. Challenging the nature-culture dichotomy within the celebratory narrative of nature’s comeback, villagers’ accounts of unmaintained landscapes reveal that vegetation proliferating in the absence of humans and livestock can also prove harmful for trees. Infrastructure maintenance work that includes uncultivated and ungrazed lands as suitable ecologies for erosion control is simultaneously challenged by unruly ecologies. The work of making a boundary between ecologies that fit into the aspired order and those that do not, I argue, also entails the unmaking of the boundary.

SEDIMENTED RESERVOIRS

The Çoruh Basin is located in northeastern Turkey, at the border to Georgia. The river’s local name, *Deli Çoruh* (Crazy Çoruh), reflects its swift flow. Since the late 1930s, its flow has been incorporated into the national mobilization to know, map, and control river waters. In his memoir, *The Story of Çoruh*, the state-em-

ployed engineer [Vural Selcen \(1999\)](#) wrote: Since 1938, “on every span of land of the Çoruh Basin, there are the footsteps, elbow grease, and eye-straining labor [*göz nuru*] of the workers of the Directorate [the now obsolete Directorate of Electrical Power Resources Survey].”⁶ A rare engineer’s account about the onsite work of river surveying, Selcen’s words emphasize the importance of labor as a way of knowing nature, thus merging the natural and the cultural ([White 1996a](#)). By 1982, numerous engineering surveys and reports had culminated in the Çoruh River Basin Master Plan, proposing the construction of fifteen large hydroelectric dams, which began to materialize in the late 1990s through public and private investments. State officials and engineers glorified the reservoirs as transplanted lakes beautifying an otherwise rugged landscape ([Demirtaş 2013](#)) and as precious blue necklaces made from the Çoruh’s waters.

In Yusufeli town, where Turkey’s tallest dam is currently under construction, I often heard praise for dams as technology retaining soil within the national space. “Dams will stop the river from taking away *our* rich soil to Georgia,” said Mehmet, a villager whose lands the dam will partially submerge. This trope circulates among various actors, from local inhabitants to state officials and engineers, as they refer to the river creating a fertile delta across the border, unlike the lack of flat land along the Çoruh in Turkey. They point to the sharp contrast between the river’s long, swift-flowing course through Turkey’s deep valleys and its short, meandering run in Georgia. There, the river’s velocity drops drastically, leaving alluvial deposits in the Batumi Delta before reaching the Black Sea. Contrary to the water’s and sediment’s ecological movement across human-made territorial borders, the dam in this nationalist imaginary becomes a border patrol preventing soil transfer.

The disruption of sediment flow, in fact, leads to crucial environmental and infrastructural problems. Coastal erosion in deltas due to decreasing sediment deposition constitutes an important environmental consequence of dams. Sediment retention also poses significant challenges for dams. Sediment infiltration into water intakes causes wear and tear. Moreover, sediment accumulation in reservoirs limits storage capacity, shortening these seemingly paramount infrastructures’ life spans. It presents a sharp contrast to nationalist and modernist imageries of dams as immortal monuments to development. For foresters and engineers in Turkey, high amounts of sediment accumulation in reservoirs have long been a serious concern. Since the construction of the country’s first dam, the Çubuk Dam (1930–36), foresters have actively called attention to the roles that forests play in

water regulation and soil protection, indicating the importance of their environmental expertise for ensuring the dams' long-lasting functioning (Kurtiç 2019).

One forestry expert who brought this issue to public attention was Selman Uslu. In a 1968 newspaper article, he provided a numeric account of sediment drastically filling Turkey's dams and referred to the forests' role in water storage:

Forest topsoil, which has a humus layer like a feather cushion, with vegetation and millions of organisms, resembles a kind of sponge. By absorbing even the strongest rain shower that falls onto it, forest soil filtrates this rain-water into the deeper layers to be used gradually; hence, it nourishes the springs. Practice shows that none of the human-made constructions such as ponds or dams can be compared to the water storage and sustenance capacity of forests. (Uslu 1968, 2)

Not only did Uslu compare forests' water-storage capacity to human-built infrastructures but he also promoted it as the guarantor of dams' proper functioning by preventing sedimentation. This emphasis framed dams as more-than-technical, environmentally entangled infrastructures; in forestry professor Necmettin Çepel's (1986, 17) words, "dams, at first sight, appear as mere technical objects storing water and serving the country's agricultural and industrial development," but "for dams to fulfill their functions—in addition to being outstanding construction technology—land use methods in their close and distant environs matter significantly."

Maintenance, together with its politics, labor, and materiality, has largely been overlooked in critical studies of dams. Long cast as epitomes of modernization and development, large dams (and their planning, design, and construction) have led to drastic transformations in political power and resistance that received scholarly attention (Baviskar 1995; Blackburn 2006; Blanc 2019; Klingensmith 2007; Sneddon 2015). What happens to dams after their construction is an understudied subject, except for a few analyses examining their long-term socio-environmental impacts (e.g., Scudder 2005). Infrastructure's changing materiality and maintenance practices still need anthropological and political ecological study; otherwise, analyses risk replicating dams' technopolitical representation as almighty constructs conquering the landscape.⁷

Built in what is considered Turkey's most erosive watersheds, the Çoruh's dams have encountered the question of long-term maintenance, leading to the development of an integrated watershed rehabilitation project. In this context, for-

esters' maintenance work occurs alongside actual dam building; efforts to sustain infrastructure do not follow construction but co-occur. This case thus challenges a linear temporal understanding according to which maintenance begins when construction ends. It also complicates understandings of destruction and conservation as mutually exclusive. In the Çoruh Basin, dam-induced environmental destruction on the valley floor coexists with—and is, indeed, undergirded by—environmental repair practices in the uplands. As scholars have shown, increasing cooperation occurs between the extractive and conservation sectors, the latter enabling a spatial and socio-ecological fix for the former (Enns, Bersaglio, and Sneyd 2019). Here, the fix is techno-ecological: If dams are environmentally embedded infrastructures, then fixing their technological limits (e.g., sediment filling reservoirs) requires environmental reordering. Project designers and implementers deem the repair of “damaged” watershed ecology infrastructural to long-term dam maintenance. Facilitating this repair work is the rural outmigration and depopulation indexed by overgrown landscapes.

“NO NEED FOR RESTRICTIONS HERE”

One hot June day in 2016, dozens of villagers, central and local state officials, as well as representatives of the Japan International Cooperation Agency (JICA), which partially funds the rehabilitation project, gathered for a beehive distribution ceremony in Yusufeli. The villagers received white hats with the General Directorate of Forestry's logo, to help them withstand the scorching sun during the long ceremony on a soccer field amid rugged mountains. The bees also suffered. The act of performing the benevolent state (Yoltar 2020) was realized thanks to the invisible labor of a young man who during the entire ceremony remained backstage, spraying water into the hives to make the bees believe it was raining. The fake rain prevented the bees from leaving their hives and facing harm from overheating. Following the speeches, the ceremony ended with a lottery distributing the beehives.

The villagers loaded the beehives onto trucks, while project managers, consultants, and JICA representatives from Ankara visited the completed project activities in Yusufeli's villages. I accompanied them. A brief visit to a village featuring barns renovated with project-provided materials sparked my curiosity about how project implementers approached animal husbandry in the uplands. I traveled with İsmet, a forester in his fifties, who had worked for the Regional Directorate of National Parks for sixteen years before being appointed to Ankara, hence knew Yusufeli very well. Since I knew that similar conservation projects restricted grazing to prevent “social pressure on natural resources,” I asked him about such restric-

tions here. Ismet said: “Look at these lands; there isn’t too much husbandry left here. So there isn’t a need to restrict anything here.” Content with the decrease, he indicated its advantage for nature’s recovery and smooth project implementation. Project designers and implementers often expressed that there was no need for restrictions. The project required enclosing only those plots of land where tree saplings were planted on the terraces built for erosion control. The collaboration between foresters and villagers to designate such plots for the most part went smoothly, given that animal husbandry, one potential reason for conflict, had declined.

On our return trip, we stopped along the river to see the wire fences built on the steep hills to prevent erosion. Remarking on the absence of human settlement nearby, one JICA representative asked why rehabilitation work was undertaken at this specific location. An experienced forester who worked post-retirement as a project consultant explained that their priority was to prevent the degradation of natural resources—namely, erosion. Wire fences would slow down waterflow and enable vegetation growth on accumulated soil, therefore protecting dams by preventing erosion. “If we don’t take these precautions, the roads, dams, and fields downvalley would all be filled with sediment. When it comes to erosion, one of the biggest factors is uncontrolled grazing,” he said, continuing hopefully: “We have an advantage here, thanks to the elimination of uncontrolled grazing.” Animal husbandry’s decline because of outmigration once again served as potential for faster natural recovery and smooth project implementation, without needing to impose restrictions on villagers. This common trope also surfaces in the project’s master plan:

Together with the recent decrease in pressure on natural resources, especially the decrease in grazing on pasturelands, due to migration out of the villages, which leads to rural stagnation, it became possible for pasturelands, which in the past had been ruined, to significantly recover through natural renewal. Many pastures that had been cultivated in the past were left uncultivated for years, and grass vegetation started to return. ([Pacific Consultants International 2004](#), 4–4)

In other words, the villagers’ “formative absence” ([Li 2014](#), 15) shapes the project’s course, seen as a facilitator for efforts to restore nature. At the rehabilitation project’s core lies a paradox that its implementers need to navigate constantly: While one aim is to provide socioeconomic support for the villagers through the distri-

bution of beehives or materials for barn renovation, the region's decreasing human and animal population is welcomed as potential for and auxiliary to restoration.

Casting human withdrawal as advantage for the project rests on the specific way in which project participants and their relationships with the landscape are defined. The master plan defines villagers as “the main party responsible for the increasingly accelerated soil erosion occurring in many places of the Çoruh River Watershed,” given that, “since old times, forest villagers have destroyed the forests for the purposes of procuring firewood and fodder, overgrazed the pastures, and converted the sloping pastures into cultivated lands” (*Pacific Consultants International* 2004, 5–1). Criminalizing accounts about forest villagers degrading the environment have remained consistent since Turkey's early republican period (*Özkan* 2013). The participatory approach has added a layer of potential for environmental stewardship attributed to villagers. The same villagers described as “forest destroyers” need to be converted and incorporated into the project as “forest guardians” (*Forsyth and Walker* 2008).

Nature rehabilitation in the Çoruh Basin draws on the premise not of wilderness conservation, but of protecting “working landscapes” where human livelihood activities coexist with lively ecosystems (*Hamilton* 2018, 20). Yet within this working landscape, the decline of certain livelihood activities—such as cultivating forest clearings—is celebrated, drawing a boundary between what suits purposes of rehabilitation and what does not. Recognizing their limitations, foresters often expressed that they conduct work in the villages and then return to their offices in town. Only the villagers stay there and can maintain erosion control measures; hence, the need for their involvement. Defined as actual managers of natural resources, villagers become necessary participants. Moreover, the construction of erosion control walls, fences, and terraces requires villagers' labor—they are what *Genese Sodikoff* (2012, 8) calls “manual conservation workers.” The village men perform the arduous, daily work of erosion control. In one of my field sites, the upland village of Gudashev, six men climbed the steep slopes from sunrise to sunset, six days a week over four months, to construct walls on three dry riverbeds, as well as cordons on a mountainside across from the hamlet. The foresters, who regularly visited for quality control, often praised these men, their skill, and labor.

During the fieldtrip following the beehive distribution ceremony, Ismet also praised the skillfully built walls. To answer my question as to why the Yusufeli men built so well, he pointed to the terraced fields and gardens: “Think about the terraces they have been building and maintaining for years!” On the narrow valley floor of the Çoruh Basin, land was scarce; terraced fields were thus created

by carrying soil from the riverside. Basin inhabitants had constructed land by flattening slopes, retaining earth with stones from the mountains, and bringing fertile soil from near and far, mostly from riverbanks. The rehabilitation project greatly depended on the villagers' sedimented skills in reshaping this sloped landscape. Also, Yusufeli's men used to seasonally migrate in spring and summer for construction work in cities, there acquiring knowledge and skill in construction, while the women stayed in the region to look after farms, families, and animals. The men on Gudashev's slopes often compared the job of building erosion control walls to seasonal construction work elsewhere, stressing that *bayır işi* (slope work) at least allowed them to return home at day's end.

The project therefore welcomes villagers, insofar as their livelihood activities conform to nature rehabilitation efforts. In her book on the Albufera Natural Park, Sarah Hamilton (2018, 21) notes: "When not erased from the scenic landscape altogether, farmers are valued for their work as stewards of the land or as exemplars of cultural traditions and national heritage but sharply criticized when their actions diverge from the roles into which they have been forced." Similarly, Yusufeli foresters recognize the value of human work in knowing and relating to nature, but they also distinguish between benign and destructive work (White 1996b).⁸ While building terraces for cultivation was praised as a practice that gave the farmers the skills necessary to construct erosion control walls, forest clearance or overgrazing were deemed harmful practices, the disappearance of which should be celebrated. The latter's gradual decrease becomes a condition of possibility for conducting rehabilitation work. This condition, however, indexes loss and decay for villagers. The rehabilitation project celebrates overgrown vegetation, as long as some villagers remain in the uplands and participate in project implementation. Yet as I will show in what follows, for the remaining villagers who witness the resurgent ecologies on formerly used lands, the decreasing human existence constitutes a sign of decay and source of sadness.

UNLABORED LANDSCAPES AS INDEX OF NEGLECT

It was lunchtime in Gudashev—a much-anticipated break after long hours of running after the herd under the scorching August sun—when my host Solmaz's neighbor Emine visited for tea. Emine used to spend summers in the hamlet after she had migrated to Bursa in 1972,⁹ when her husband found a job there. "Last night, it entered my dream," she said in a sad yet excited voice as she recounted her nightmare. "I was there on the *yaylalar* [highlands], standing at the cliff-edge and looking at the gardens across. The stone walls holding the terraced fields were

in place, but the gardens were so neglected! No one took care of them. No one mowed the grass. Everywhere weeds. I was so sad staring at it.” She guessed that our previous conversation about past village life had triggered this nightmare. Such conversations usually invoked sadness about unlabored land, indicating both the hard work needed to maintain the land and a sense of decay due to the diminishing village population. Put differently, the foresters’ dream of the forest’s comeback was Emine’s nightmare.



Figure 3. *Yaylalar* are gradually being covered by quaking aspens, shrubs, and grass. *Yaylalar* is part of the hamlet. In the past, villagers on their way to the highlands stopped there to herd their animals together. Photo by Ekin Kurtiç.

Gudashev is a small upland hamlet surrounded by mountains covered mostly in spruce, fir, and oak trees. Emine, in her late sixties, remembered how in her childhood every family had cleared a plot in the forest. Every *kırma* (forest clearing) had carried the name of the family who cleared and used it for crops such as rye and barley. As the hamlet had dwindled over the past decades, the lands first to remain uncultivated were *kırmalar*, since access and maintenance proved difficult. If for the foresters resurgent vegetation in uncultivated clearings stood as the epitome of natural recovery, for the villagers it indexed the erosion of the labor required to maintain a specific form of socioecological life and landscape. This divergent understanding emerges from the different notions of forest and nature that the villagers held.

Learning about the clearings' origins was not easy; it required putting one's hands in the dirt. One late September afternoon, Saniye was uprooting that summer's green bean plants. Each plant had climbed a long, flexible pole, which villagers made from shrubs. Saniye pulled the poles from the ground, tore the plant off, then carefully set them aside for next year. She left some plants to mature until season's end, so that their beans could serve as next year's seeds. While helping her, I asked about the forest clearings visible from Saniye's garden: Did she know how they had originally been cleared? She proudly narrated that her father's midwife had been the pioneer: "She was a very brave and strong woman. She was the first woman opening a *kırma*. May God rest her soul." There had already existed a small opening in the forest, and her father's midwife widened it to plant rye and barley. All other villagers followed suit and cleared fields for themselves. "Look there now," Saniye said, taking a break from gardening and dismissively gesturing



Figure 4. Saniye's green bean garden and forest clearings in the background.
Photo by Ekin Kurtiç.

toward the clearings: “Now, all these places are becoming forest.” Saniye, now in her mid-fifties, had still been irrigating their *kırma* in the first years of her marriage. But now she no longer dared to do so. Given how few people cultivated and maintained the clearings, the upper hills from where she used to bring water had already turned into forest, increasing the likelihood of encountering a bear or a boar. Nowadays, she grazed animals only on lower-altitude clearings. Underlining an understanding of landscape as constituted through collective work, she remembered the past as a time when nature had been in balance, when everything had been fertile. Indeed, Saniye saw nature as more than just bushes and trees; it required cultivation through labor. In her account, the forest, as long as it is not a “worked-in and lived-in area” (Howard 2017, 30), indicates decay, not merely of nature but also of a collectively built and maintained life.

Rather than being an indicator of degraded nature to be rehabilitated for maintaining far-away dams, forest clearings for villagers index a maintained ecology in accordance with livelihood requirements—what Solmaz called “giving back to the field what you have taken from it.” At season’s end, gardens, fields, and forest clearings are fertilized with cow manure collected and dried over the entire summer. The irrigation work that Saniye mentioned also constitutes soil conservation in the clearings. In Gudashev, irrigation ditches at the end of sloped plots feature a secondary ditch retaining the soil washed away by irrigation water. When cleaning ditches, villagers return the soil from the downslope ditch upslope. Overgrown forest clearings thus indicate the loss of a lively village where there once existed the need to cultivate more (and, hence, to open and maintain clearings) and enough people (especially youngsters) to perform the labor of cultivating, grazing, irrigating, and maintaining.

As result of outmigration, mainly for employment and education, Gudashev’s population had decreased from between thirty-five and forty households with four to five persons each to ten or eleven two-to-three-person households. The total number of cattle and sheep had also dropped significantly, from around seven hundred to fifty. While the master plan and subsequent project surveys mention significant outmigration in the region, they largely attribute it to natural conditions, such as land scarcity and geographic difficulty. Notwithstanding the biophysical landscape that contributes to regionally specific forms of life, explaining poverty based on natural conditions obscures the multilayered absences that have long shaped life there—the absence of state investment in the region and, hence, the lack of public services, education, and employment. This absence had a clear presence in villagers’ lives.

During my first days in the uplands, Solmaz introduced me to the animals and their manner of communication. She explained it as a mutual relationship: The ability to herd animals depends not only on using the right sounds and behaviors but also on the animals recognizing the person, implicating “a deeply felt sense of mutuality between villagers and livestock animals that was predicated on their imbrication in one another’s lives” (Govindrajan 2018, 7). One day, we took the cows out to graze and found some shade under a quaking aspen growing on a formerly cultivated plot. After a long conversation about the intensive, tedious labor that upland life requires, Solmaz explained why rural landscapes were neglected:

Investments should have started back in the 1990s to prevent outmigration. If they had opened a small weaving factory, people would have been working there. Or, if they had done something else, I don’t know, maybe a small factory or more support for pastoral animal husbandry, to support people’s livelihood Instead of opening ten, twenty, thirty factories in Bursa, or other places, cities, if they had built one small factory in these villages, our young people would have learned to work here.

The absence of income-generating work other than small-scale farming and animal husbandry, in her analysis, played a formative role in outmigration: “One day, one of us left, later followed by others. At the end, everybody left. Now only a couple of households stay here,” she bemoaned. “All these lands [pointing to plots in front of us] were once cultivated. Can you imagine that? Now there is no production at all.”

While Turkey witnessed “successive waves of rural-to-urban migration . . . to feed the needs of national developmentalism since the 1950s” (Bartu Candan and Kolluoglu 2008, 6), since the 1990s, a neoliberal transformation in agriculture has favored large-scale, corporate farming (versus small-scale production) and the proliferation of energy and extraction projects as sites of capital accumulation (such as the Çoruh dams). These developments, as well as the counterinsurgency practices adopted in the war between the Turkish state and the Kurdistan Workers’ Party (Partiya Karkerên Kurdistanê, PKK), have ushered in a new wave of rural depopulation and displacement. Furthermore, since the 1990s, many village schools have been replaced by a mobile education system, which means transporting students from villages to schools in town centers. The village schools’ closure, as my interlocutors often explained, pushed many families to migrate. For Solmaz, any attempt to reverse migration and ameliorate rural poverty required systematic

political economic change to bridge the urban/rural divide that favors the former at the expense of the latter.

In this context, the rehabilitation project provides access to some resources provided by the state, such as the renovation of irrigation canals and animal barns, as well as the provision of beehives and solar waterheaters. Participation in the rehabilitation project also means seasonal income for some households, as village men build erosion control walls on the hills. Yılmaz, the village head and my host, was one of them. At day's end, when Yılmaz returned home, he used to feel exhausted from the hard construction work on the mountain, especially given the chronic eczema on his hands. That summer, he lost thirty pounds while working on the slopes. Still, he preferred this to seasonally migrating to work on construction sites, as he had done in the past. The lump-sum payment he received at summer's end would go toward the renovation of the valley house, where he and his family stayed from late autumn to late spring.

At the end of one workday on the slope, as he was putting ointment on his hands and relaxing over tea, I asked Yılmaz how he imagined this village within the coming fifty years. "It will be forest [*orman olur*]," he responded without hesitation. "If there is no human being left here, all of this will be forest. Look at those hills, right above the place where I keep the [project-provided] beehives now. There were fields that we used to cultivate even there. You could not see a single tree there. Now all these places are turning into forest. If you don't work the soil here, it will become forest." It was hard to imagine these hills, where I had collected golden dwarf everlast and spruce tree gum, as cultivated places, except for the scattered stone wall remains that once retained small, terraced plots of land. Yılmaz imagined that even the houses would turn into forest if inhabitants all left eventually. This had already happened in a small, nearby settlement where the residents of another village once stayed every summer on their way to the highlands. Now left without maintenance, the crumbling stone houses were overgrown with bushes. Yılmaz saw nature's return in places where human activities retreated as less celebratory than Ferhat, the forester who had introduced quaking aspens to me. Ferhat's appreciation of proliferating aspens manifests an environmental conservationist concern imbued with a certain form of ecological care (Scaramelli 2018). Yılmaz's, Emine's, and Saniye's dislike of resurgent vegetation derives from the decay of another form of care that requires laborious practices of landscape maintenance.

Resurgent vegetation in Gudashev constitutes a form of "ruderal ecologies" (Stoetzer 2018) that spontaneously grow in disturbed spaces. Yet rather than oc-

cupying urban rubble, these ruderal plants emerge in changing rural landscapes. While the ruderal analytical lens that Bettina Stoetzer offers illustrates cosmopolitan urban life emerging in nationalist and capitalist ruins, this article expands the ruderal analytic by examining resurgent plants that do not emerge *in* ruined spaces, such as cracks in urban infrastructure, but that themselves are considered *as* ruination. Resurgent ecologies such as quaking aspens emerge in rural landscapes that, at first sight, are not associated with ruins. Rather, they are rendered ruderal when considered from the villagers' perspective and through their labor-intensive experiences of living in the uplands. Moreover, these ecologies become ruderal not because they reveal life amid disturbance and destruction (Stoetzer 2018), but because they index the decay of certain forms of laborious life. Consider, for example, the assemblage of matsutake mushrooms and pine trees that Anna Lowenhaupt Tsing (2015, 163) traces to attend to "scenes for considering livability—the possibility of common life on a human-disturbed earth." Overgrown fields in Gudashv for foresters indicate a similar livability—namely, the forest's force to reclaim the space that becomes auxiliary to the human work of rehabilitating the uplands for better dam maintenance. Yet if "disturbance is always a matter of point of view" (Tsing 2015, 161), then so is resurgence. Resurgent ecologies in villagers' accounts index a process not of livability, but of its decay.

In his article about the proliferation of weeds in formerly manicured and maintained places in Panama, Ashley Carse (2019, 113) traces loss amid resurgence by asking: "Beyond the (debated) ecological gains, had anything been lost?" Carse shows that, for the residents of Colón, the Panama Canal Zone's Atlantic terminus, the history of building the canal zone evolved alongside a form of environmental management that required practices of maintaining clean and manicured landscapes—for example, cutting the grass or draining mosquito habitats. On the one hand, such environmental management practices produced a register of modern landscapes while, on the other, they provided employment and contributed to expectations of development. Carse therefore understands the proliferation of unruly plants in this landscape as the unmaking of the modernist boundaries constructed between canal infrastructure and the environment, as well as the loss of development aspirations and experiences accompanying infrastructural investments and connections. I argue that unruly plants in unlabored landscapes unmake yet another kind of boundary—a boundary between maintenance and decay. While resurgent vegetation is cast as natural infrastructure (Carse 2012) of erosion control and dam maintenance to prevent decay, it also reveals other forms of saddening decay and neglect entailed in maintenance practices.

MATERIAL DECAY IN LANDSCAPES UNDER REHABILITATION

The glorification of what foresters define as “decreasing social pressure” is challenged not only by the villagers’ reframing of the same process as decay but also by the existence of resurgent ecologies not quite beneficial for protecting forests and soil. Quaking aspens are not the only vegetation proliferating in the absence of human activities. As use of the forest for fodder decreases, vegetation harmful to trees also overgrows. As [Andrew Mathews \(2018\)](#) shows, rural landscapes feature multiple layers of past entanglements among people, animals, plants, and soils, which materialize as trees, terraces, and irrigation systems; these challenge a single story of environmental change. Landscape forms such as quaking aspen, terraced fields, forest clearings, and erosion control walls tell a history of Çoruh’s uplands more complex than one of degradation giving way to recovery.

The higher altitudes now seemingly “untouched” were in previous decades regularly accessed by villagers to collect *pelüt* (a local term for oak tree) leaves for livestock. Oak leaf constituted an excellent supplement to the straw that villagers fed animals during winter. In a customary division of forest space, every household could gather oak leaves in a specific location. After collecting leaves with a pruning knife, the villagers piled them high, turning them upside down to shed rainwater. The leaves were left under a tree, next to its trunk, until they dried—hence the term “setting the bottom” (*dip kurmak*), referring to the practice of drying leaves at the tree’s bottom. It was crucial to prune trees properly so that they would produce more, better leaves in subsequent years. The villagers left smaller trees’ roots or bigger trees’ trunks and tips intact to allow for continued growth. Moreover, trees were then spared for two to three years to further enhance their development. As the number of livestock decreased, so did the practice of collecting *pelüt* leaves, leading to the loss of a way of knowing the forest and tending the trees.

Another source of fodder from the forest is a plant locally called *çakum* (mistletoe), which grows on pine trees. It took me another trip to the now sparsely populated upland hamlet of Göcek to understand its importance. Göcek is another rehabilitation project village at the bottom of the Çoruh Valley, to be flooded once dam construction reaches completion. In 2017, I had the opportunity to see this hamlet, now very much abandoned, when *muhtar* (the elected village head) Mehmet transported a repaired refrigerator to one of the last remaining families who kept livestock and stayed there over the summer. Mehmet’s relative Fikret and his wife, who had migrated to Bursa more than a decade earlier and now only visited the village during the summer holidays, seized the opportunity to see the hamlet.

The theme of landscape transformation dominated our conversations. Sitting in the front passenger seat, Fikret pointed to the faded brown trees among the otherwise verdant pine-dominated forests and proposed a research question: “If you wanna work on our relations with forests here, I will tell you something worth trying to find an answer to. Go and explore why these trees, which were green and healthy for so long, have died.” My first response was to ask whether they had consulted the District Forestry. They had, Mehmet said, and foresters had come to investigate whether pests were causing harm—without success. The foresters then suggested cutting these trees and replacing them with new saplings. The villagers objected and instead offered their own explanation: Previously, villagers had collected *çakum* to feed animals, as it is very nutritious. The plant is not, however, beneficial to the trees themselves. Birds carry the *çakum* seeds and allow the plant to proliferate in the forest. Decreased human and livestock presence meant that *çakum* was no longer collected to feed the animals, thus having a detrimental effect on the host trees.



Figure 5. *Çakum* (mistletoe) collected from Göcek’s uplands. Photo by Ekin Kurtiç.

The answer to the question as to why trees were dying therefore lay in the villagers’ decreased forest usage. As we continued our drive, everyone excitedly pinpointed mistletoe plants with their small, round, thick leaves, easily distinguishable on the coniferous trees. “Look! You can find it on every tree now. Was it

like that before? When we used to graze animals, it was so tiresome to find *çakum* to collect. Nowadays everywhere is full; no one even touches it!” exclaimed Fikret in a mix of excitement about the abundance of previously hard-to-find mistletoe and sadness about its impact on the trees. For them, *çakum*’s proliferation indicated a decrease in labored landscapes—a process they considered as entangled with the material decay of the forest itself.

On other occasions, material decay was more directly embedded in and challenged rehabilitation practices, and project implementers needed to overlook it. The construction of erosion control walls materializes insofar as socio-material conditions on the ground allow—conditions that forestry officials cannot always control on a daily basis, given that work is done in distant places. As a result, they constantly attempt to navigate between ideal project objectives and “field conditions” (*arazi koşulları*). One such moment of navigation occurred one October day, when the district foresters visited Gudashev to measure the dry walls that Yılmaz and his fellow villagers had constructed over the summer. I paired up with the chief forester, Menekşe, born and raised in a nearby Black Sea province, and with Ahmet, born in the village, but now working in a bakery in Yusufeli’s town center—a job from which he took a break to work on the slopes that summer. Menekşe and I stuffed our trouser cuffs into our socks to prepare for the climb uphill; only Ahmet felt comfortable enough to leave his trousers as they were. On the steep slope, small oak trees with their yellow-reddish leaves and other shrubs offered their branches to hold on to. After a one-and-a-half-hour, tiring uphill walk, right at the bottom of the wall we were to measure, Menekşe noticed a shrub whose roots lay buried underneath the erosion control wall. “This thing barely grew here by itself, and you built the wall on top of its roots! You need to be careful about this. We need to preserve the vegetation and build the wall accordingly,” she said, expressing her frustration. But the harm was already done. The foresters could not control every single wall before completion. Menekşe limited herself to alerting Ahmet to this failure after the fact.

As we headed to the next wall, we saw underneath a large rock a severely damaged young spruce tree. Its main branches and part of its trunk were broken, lying on the forest ground. As we passed, Ahmet—who always walked in front of us because of his familiarity with the landscape and the location of the walls—pointed to the destroyed tree. “Well, we are destroying as we are constructing, my chief,” he said and pointed to the spruce. Ahmet explained that, while they had tried to procure stones by crushing a larger rock and rolling it downhill toward the wall’s construction site (as they commonly do when building in areas with few



Figure 6. A forester and a villager are measuring the erosion control walls built in Gudashev within the scope of the watershed rehabilitation project. Photo by Ekin Kurtiç.

stones), they had damaged the tree. Menekşe was visibly upset about the explanation; in a serious tone, she emphasized that this was an incorrect practice and should not have occurred. Yet she still chose to overlook this destruction. Ahmet's genuine confession turned into a moment of what Mathews (2011, 5) calls "uncertain authority" on Menekşe's part: She performed authority while being "haunted by a sense of vulnerability" when "translating between the general and the local." Forestry officials oscillate between project logic and designs, on the one hand, and conditions on the ground, on the other. They appreciate quaking aspens as nature's comeback, while having to close their eyes to the trees and plants destroyed during the erosion control walls' construction.

CONCLUSION

Anthropology's renewed analytical attention to the relationalities of ecologies and infrastructures push us beyond antagonistic understandings to think about the myriad ways in which technical and more-than-human lives are entangled. These relationalities are always mediated through human practices and, hence, imbued with labor, politics, socialities, values, and meanings. In this article, I have proposed interrogating this interplay through the lenses of decay and maintenance. At a time when the representation of dams as monuments to modernization and

progress has been shattered by the recognition of their environmental costs, disastrous failures, and decaying structures, we need to expand a critical analysis of dammed landscapes to “take erosion, breakdown, and decay, rather than novelty, growth and progress, as our starting points” (Jackson 2014, 221). The environmental management of the gradual and often invisible accumulation of sediment in dam reservoirs enables us to attend to such forms of decay and mundane operations of sustenance.

As I have shown, in the Çoruh Basin the long-term maintenance of hydroelectric dams against the detrimental impacts of erosion and sedimentation have converged with environmentally conservationist forestry practices in distant uplands considered the starting point of soil erosion. Environmental repair of purportedly “degraded landscapes” has been rendered infrastructural to everyday maintenance practices for large dams, resonating with a recent turn in environmental conservation toward rendering nature infrastructural (Carse 2014). While tracing how uplands emerge as ecologically valuable sites to be restored, I take a step further and draw attention to the forms of decay that repair and maintenance practices entail. This is best reflected in the divergent affective and material registers of landscapes left uncultivated and overgrown with quaking aspens, bushes, or weeds. Such resurgent ecologies are rendered a potential for state- and expert-led nature rehabilitation schemes. Yet for upland villagers, those very same ecologies indicate a decay of labored landscapes. In Yusufeli, ecologies helpful for maintaining dams—namely, vegetation growth on uncultivated lands—simultaneously index the erosion of another form of maintenance and care in the form of the villagers’ labor in tending the landscape through farming and animal breeding.

Infrastructural justice (Sheller 2018; Enns and Sneyd 2021) is implicated in maintenance work through the just and fair provision of services and care for preventing and mitigating decay, malfunction, and breakage. However, “avoid[ing] *romanticizing* maintenance and repair” (Mattern 2021, 110; emphasis original) requires a critical inquiry into forms of injustice and political power sustained through maintenance (Barnes 2017). An ecological lens onto the exploration of infrastructural maintenance, I propose, reveals that the latter depends on the sustenance of some ecologies and the decay of others. The paradox of infrastructure maintenance means that, while arresting decay, it simultaneously entails decay. Attending to the lives and relations lost in the process of maintenance and repair expands the horizon of our inquiry to infrastructural and environmental justice in dammed landscapes—a horizon that extends beyond the dramatic event of submergence.

ABSTRACT

A growing ethnographic literature attends to maintenance and repair practices in the face of decay and ruination. This article explores the forms of decay that become an integral part of infrastructure maintenance. In Turkey's Çoruh Basin, hydroelectric dam constructions lead to a concern about the landscape's erosive character, which requires foresters' practices of watershed rehabilitation in the uplands to protect the dams against sediment accumulation in the reservoirs. The work of repairing ecologies for the long-term maintenance of dams, I contend, is undergirded by the gradual decay of another maintenance labor—that is, the villagers' arduous practices of tending landscape through farming and husbandry. Through an ethnographic study of how foresters and villagers experience the landscape under rehabilitation, this article offers a novel anthropological analytical perspective that foregrounds the continuum between maintaining and decaying, tracing the role of labored landscapes in this continuum. I argue that maintenance practices, while intending to counter decay, entail other forms of decay. [dams; sediment; infrastructure maintenance; decay; rural and environmental labor; Turkey]

ÖZET

Giderek büyüyen bir etnografik literatür, çöküş, yıkım ve tahribat süreçlerinin karşısında bakım ve onarım pratiklerine odaklanmaktadır. Bu makale, altyapı bakımının bütünleyici bir parçası haline gelen çöküş biçimlerine odaklanmaktadır. Türkiye'nin Çoruh Havzası'ndaki hidroelektrik baraj yapımları sürecinde arazinin erozyona yatkın yapısı bir mesele olarak ortaya çıkmıştır. Bu mesele, barajları rezervuarlardaki sediment birikimine karşı korumak için ormancılardan yüksek kesimlerde havza rehabilitasyonu çalışmaları yapmalarını gerektirmiştir. Barajların uzun vadeli bakımı için yapılan ekoloji onarım çalışmalarının, başka bir bakım emeğinin—köylülerin tarım ve hayvancılık yoluyla araziye bakma pratiklerinin—zamanla gerçekleşen çöküşü tarafından desteklendiğini ileri sürüyorum. Ormancılardan ve köylülerin rehabilitasyon altındaki coğrafyayı nasıl deneyimlediklerine odaklanan etnografik araştırmam sonucunda bu makale, bakım ve çöküş süreçleri arasındaki devamlılığı ön plana alan ve emekle şekillenen arazilerin bu devamlılıktaki rollerini takip eden yeni bir antropolojik analitik perspektif önermektedir. Bakım pratiklerinin, çöküş ve tahribatı engellemeyi amaçlarken, başka çöküş biçimleri içerdiğini iddia ediyorum. [barajlar; sediment; altyapı bakımı; çöküş; kırsal ve ekolojik emek; Türkiye]

NOTES

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1. Damaged forest (*bozuk orman*) is officially defined by degree of tree coverage (percentage of tree crowns covering the land). Below 10 percent, the forest is considered “damaged” (*bozuk*) or “sparse” (*boşluklu kapalı*).
2. *Evlek* is a unit of land area approximately equal to 250 square meters.
3. In forestry, quaking aspen (*Populus tremula*) is known as a pioneer tree species: They are among the first to colonize an area as the forest starts to restore itself. Quaking aspens require a good balance of environmental disturbance and stability. Without periodic disturbances, they are crowded out by shade-tolerant conifers, while frequent disturbances limit their expansion.
4. Neither the complete prevention of filling nor emptying is desired. Sediment accumulation can never be fully stopped, and villages’ total abandonment is not the aim.
5. For growing scholarly interest in the multispecies afterlives of abandoned urban and rural landscapes, see Gandy 2013, Jasper 2020, and Turnbull 2020.
6. All translations from Turkish to English are mine.
7. Few studies investigate the aftermath of dam construction. For an analysis of a dam-led disaster, see Huber et al. 2017. For lingering environmental, technological, and political entanglements, see Mitchell 2002, Derr 2019, and Folch 2019. For a brief discussion of reservoir sedimentation, see McCully 2001.
8. Genese Sodikoff (2012) explores the coexistence of conservation work and “slash-and-burn” agriculture in Madagascar, where conservation agents simultaneously deploy “good” and “bad” work.
9. Bursa, Turkey’s fourth-largest city, has a high number of migrants from Yusufeli. It is noteworthy that outmigration is not limited to upland villages, but pertains to the entire province of Artvin, which includes Yusufeli. Socioeconomic factors such as lacking employment and education opportunities contribute to Artvin figuring among Turkey’s five provinces with the highest number of outmigrants (Özbey 2019).

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