



Managing the Anthropocene

The Labour of Environmental Regeneration

John Aloysius ZINDA

Since 2010, China has seen new carbon markets, closures of polluting factories, and expanded efforts to regenerate degraded landscapes and protect wildlife in intact ecosystems. All of this entails a great deal of labour. Yet when reporters or researchers discuss China's environmental management efforts, they may chronicle policies, regulatory actions, infrastructures, carbon figures, or impacts on humans and animals, but they seldom say much about the labour of environmental protection or the people who perform it. This is because scholars and journalists alike tend to place environment and labour in separate boxes.

Undoing environmental calamity takes a lot of work. For decades, the Chinese Communist Party (CCP) and its agents in the Chinese state have been grappling with the material consequences of socialist extractivism followed by state capitalist economic expansion. Lurching growth machines disgorged catastrophic floods, smog blankets, depleting aquifers, poisoned soils, dead rivers, cancer villages, eroded slopes, creeping deserts, and silent forests. Even as top leaders stressed that they must 'develop first, clean up later' (Hilton 2013), by the late 1990s Chinese state authorities were investing large sums in planting trees on denuded slopes. The next decade saw effectual restrictions on major pollutants and expanding biodiversity

Ladu view: Fields and community-managed forests in northwestern Yunnan. PC: J. A. Zinda.

conservation efforts. Since 2010, China has seen new carbon markets, closures of polluting factories, and expanded efforts to regenerate degraded landscapes and protect wildlife in intact ecosystems.

All of these efforts entail a great deal of labour. To implement pollution controls, someone needs to perform inspections and analyse monitoring data. Constructing canals and other infrastructure takes millions of worker-hours. Planting trees means moving seedlings, digging holes, and tending plantations. Wildlife conservation requires watching animals, plants, and people, and associated tourism operations employ guides, drivers, shopkeepers, and custodians. Yet when reporters or researchers discuss China's environmental management efforts, they may chronicle policies, regulatory actions, infrastructures, carbon figures, or impacts on humans and animals, but seldom say much about the labour of environmental protection or the people who perform it.

That environmental labour garners little attention is no surprise. Scholars and journalists alike tend to place environment and labour in separate boxes. Distinctions between nature and humanity may not be as stark in Chinese culture as in the West. Still, in China as elsewhere, in conversations about environmental management, people tend to be absent or appear as either incorrigible destroyers or nature's saviours. Given that many think of environmental regeneration as a matter of getting people out of the way so that nature can recover, it is hard to expect much attention to the people who do the labour of environmental regeneration. This state of affairs makes it all the more important to highlight these people's experiences.

Environmental labour is especially salient in the Chinese state's efforts to manage landscapes. These projects almost invariably summon the residents of rural communities in those landscapes to patrol, manage, or restore ecosystems. Much of this work happens in formally protected spaces. In this essay, I will use the terms 'parks' and 'protected areas' interchangeably to refer to a broad array of

units, from national nature reserves to wetland preserves to local forest parks, that have rules intended to constrain human activity in the interest of conserving or preserving objects of environmental, cultural, and historical importance. Still, a great deal of environmental labour also takes place outside of protected areas, in lands and waters that belong to rural collectives. In the following pages, I show how environmental labour plays out in efforts to protect intact ecosystems, to restore environments judged degraded, and to remove people and their labour from restricted lands.

Labour of Protection

We scurried through the brush. The two young women trailed quick, wiry Feng, who scampered between tree trunks and bamboo culms. We had been hiking all day, checking research transects for signs of the giant panda that trudge the ridges. Clad in green camouflage gear, Feng guided us with cheer and courtesy.

'Quick, come over here!' Feng called out. The rest of us clambered up. Feng held back a few bamboo fronds and pointed down to three balls of green fibrous muck. 'Panda scat!' The women scribbled in their notebooks. Nearby, Feng pointed to several truncated stalks likely chomped by the same animal.

Wanglang National Nature Reserve had hired Feng after a stint in the military. He and his cohorts, most of them ex-soldiers, do much of the reserve's day-to-day work. They walk transects, monitoring signs of pandas and other wildlife as well as watching for poachers and people grazing cattle in the park. They keep track of the infrared-triggered cameras that take pictures when animals' body heat sets them off. Much of their time goes to assisting researchers like the two doctoral students from Beijing—leading them through the woods, helping with their observations, and tending to their instruments.

This work is physically demanding, but government pay is steady, and room and board are covered. It also equips men from rural areas without much schooling with technical skills. They work scientific instruments and log data on computers. Back in the nature reserve office, professional analysts process and analyse the data.

In other parks, alongside full-time staff, people living nearby perform conservation labour. Baima Snow Mountain National Nature Reserve in Yunnan hires residents of villages within the reserve to patrol for poaching, illegal timber harvest, and fire control. These residents, usually men, must walk set routes, filling in checklists to return to park management offices. This means days of walking through forest and meadow. For locals, that burden may not be especially onerous. Depending on the season, villagers can work patrolling in with gathering mushrooms or medicinal plants, or start from pastures where they graze yaks and cattle in the summer. Why hire locals? First and foremost, they know the land. Locals need little guidance to find their way along patrol routes. They know where poachers or timber harvesters are likely to go. This familiarity can cut both ways. Working for the reserve can mean regulating their kin and neighbours, in which case patrollers' loyalty may not be with the reserve. Another reason for employing locals is that, with little education and with housing and agricultural livelihoods in the village, they may not demand high wages compared to personnel hired from outside.

Parks with tourism operations employ local residents in many more ways. They run shops and guesthouses, drive buses, sell tickets, and do custodial work. As with patrolling, residents present a convenient and low-cost labour pool. But they also raise challenges. Tourism operations often make use of land residents farm, graze, and harvest. That can mean limiting these uses. Moreover, seeing parks and outside entrepreneurs make large sums using land that had belonged to their village collectives, residents often demand a cut. Protests and drawn-out negotiations are common. Villagers

in Pudacuo National Park in Yunnan secured annual payments from the Park, guaranteed employment, and investment in village infrastructure. That guaranteed employment usually means a household member being hired to gather trash and clean out toilets. Residents receive preference for other jobs but usually lack qualifications for higher-paying jobs as tour guides, which go to people from other localities who have vocational training. While not directly related to conservation, tourism labour underpins these parks' management by making possible the activity that managers really care about: revenue-generating tourism. Managers also argue that tourism contributes to conservation by giving residents 'alternative livelihoods'. The idea is that with income from tourism, residents will no longer rely on grazing livestock or harvesting forest products. However, if a household has time and people available for the work, its members often prefer to continue using forests and meadows, treating tourism income as a supplement (Zinda et al. 2014). Where tourism does displace resource use, it is more common that by imposing restrictions on farming and livestock husbandry, park management forces residents into tourism alternatives.

The labour of environmental protection is not limited to formal protected areas. Across China, 60 percent of forestland belongs to rural collectives, usually villager committees. A substantial proportion of these forests are designated 'public benefit forests', managed to maintain ecological functions like erosion control and habitat provision. In much of the country, members of rural communities are charged with this work. Administrative villages employ forest guards (*hulinyuan*) who oversee forest stewards (*senlin guanhuoyuan*) recruited from hamlets within each village.

In northwestern Yunnan province, forest stewards and forest guards are assigned to prevent forest fires, control illegal harvest of timber and other forest products, and assemble their neighbours to implement forest conservation projects. Specific duties and arrangements vary across locales.

Forest stewards and forest guards with whom I have spoken report that patrolling forests takes most of their time. Forest stewards have to walk the forests under their charge once or twice a week, more in the dry autumn and winter, when fire risk is greater. Depending on the size of a community's forests, that could take a few hours or a full day. Once a month, an administrative village's forest guard leads all the village's forest stewards upslope to patrol state forests abutting village lands. They often spend several days and nights in the woods.

While patrolling takes up time, enforcement is the harder part of the job. When harvest season arrives, forest guards have to keep watch for people burning chaff, a common practice that breaks down plant matter and releases nutrients into the soil. At every hint of smoke, one has to rush out, put out the fire, and reprimand the person who set it. One forest guard speaks of having to disrupt funeral rituals: 'It's happened three times this year. After someone dies, they take their old clothes up the mountain and burn them. When that happens, if I discover it, I call them up right away—please, can you understand, this could cause a forest fire, at least don't do it by the forest.'

Whether the issue is fire, cutting down protected trees, or digging up the forest floor to gather mushrooms, forest guards and stewards are supposed to confront the perpetrator. Minor infractions bring only a warning, but serious ones must be reported to the township forestry office, which may impose a fine or other penalty. Enforcement actions can stir up tension—especially if stewards impose them preferentially. They can also cause trouble for people who use forests because they depend on them. Often, rules for forest use imposed from above conflict with customary practices and present needs. Strict limits on harvesting live pine trees for firewood can mean long forays into the forest. Forest guards and stewards can find themselves caught between official duties and relationships with kin and neighbours.

Forest stewards are compensated from funds given to communities as 'ecological benefit compensation' (*shengtai xiaoyi buchang*) for maintaining forests for the public good. Because these payments are based on forest area, stewards in villages with large forests, and thus more area to patrol, are paid more. Given the amount of time they spend patrolling, this remuneration is less than a day's pay for wage labour in nearby towns. This and the hassles of meetings and enforcement make many reluctant to serve as forest stewards. There is a lot of turnover. Forest guards are paid more—around 2,000 yuan a month—and tend to keep their positions for a decade or longer.

Labour of Restoration

Environmental labour goes beyond holding off poachers and fires on intact wildlands. Rural dwellers are at the front lines of the CCP's efforts to restore degraded environments. This is nowhere clearer than in the thousands of villages whose residents have been enlisted to plant trees in endeavours like the Returning Farmland to Forest Programme (RFFP, also known as the Sloping Land Conversion Programme and Grain for Green Programme) and the Three-Norths Shelter Forest Programme. In the RFFP, state authorities called on some 30 million households to retire erosion-prone farmland and plant trees there in exchange for annual payments. The programme's primary goal was to reduce the amount of soil washed into riverbeds, where it could build up and worsen floods or deposit behind dams. In the process, state agents aimed to restore forest habitats, sequester carbon, alleviate poverty, and transform agriculture.

Government reports and large-scale studies suggest that the RFFP and related programmes have brought modest net increases in tree cover and income. However, when researchers examine implementation on the ground, they often find situations contrary to official reports: failed plantations, forests that are

actually fruit orchards, and uneven delivery of payments (Zinda et al. 2017). The RFFP has increased tree cover and assisted poor farmers in many places, but more is going on than official accounts disclose.

Firsthand observers also reveal the considerable labour that tree-planting has required. In Yunnan, people would have to pick up seedlings at a delivery point, then haul them up to the village on horseback. There followed several days of digging holes, placing seedlings, and shovelling on dirt and fertiliser. In the years that followed, smallholders were responsible for making sure these seedlings flourished by fertilising, pruning, and managing pests.

It was an uphill battle. Tree varieties poorly suited to the area languished. As one farmer recounted: 'At first where the walnuts were doing poorly, the government distributed seedlings for replanting. But there weren't enough, so we had to go into the forest and find them. It would take two days to gather up seedlings in the forest, then another two to plant them. We had to do this every year for three or four years.' Year after year, people tracked into the woods to gather new seedlings and plant again. Beyond the RFFP, people who dwell in landscapes targeted for rehabilitation do much of the work of implementing efforts to control desertification, restore wetlands, revive wildlife populations, and reverse rangeland degradation.

Labour Removal

It takes a lot of labour to restore landscapes, but many restoration projects also remove labour. State authorities urge or order people, along with their crops and livestock, to be removed from a landscape. This can take place through bans on resource use in particular areas while people remain in place or through wholesale resettlement. While grazers, gatherers, and smallholders do not always use resources in benign ways, in many cases they manage landscapes to ensure that plants and

animals they use stay abundant, enriching biological communities. The removal of this labour transforms these landscapes, and not always beneficially. In the name of grassland restoration, tens of thousands of nomadic herders have been resettled. This has been done in spite of evidence that mobile grazing often does not degrade rangelands, and can enhance them (Cao et al. 2013)—in part because settlement makes these groups of people more easily subject to surveillance (Yeh 2005).

Protected areas, set up to limit human activity, are commonly sites of labour removal. Officially, most nature reserves have core and buffer zones where productive activities are not allowed—but across China, thousands of villages are located within these zones. Protected area managers facing hundreds or thousands of residents in their jurisdictions take varied approaches. In the Jiuzhaigou National Scenic Area in Sichuan, authorities banned grazing and farming. Not only did this make residents dependent on tourism, but it changed ecosystems. Absent yaks and herders, meadows once rich in grasses, forbs, and shrubs turned into uniform stretches of pine (Urgenson et al. 2014). Managers at Pudacuo National Park let residents continue farming and grazing, incorporating their agricultural labour into the tourism attraction. Tour buses pause to let visitors view herders on the high pasture, and a hotel near Lawzong village releases tourists to observe smallholders at work in their fields. Still, residents are not always allowed to stay. State authorities recently announced that between 70,000 and 80,000 people would be resettled from a reserve for tigers and snow leopards in northeastern China (Standaert 2017). In a broader wave of 'ecological migration', government agencies are uprooting entire villages in poor and remote areas to resettle residents in urbanised settings. In addition to their impacts on the people concerned, these removals of labour—as well as the knowledge people have acquired through dwelling in these places—have profound and varied impacts on biological communities.

Working for Ecological Civilisation

Environmental regeneration is labour-intensive. People do it through work in offices, fields, and forests. Analysts following expenditures, policy impacts, and vegetation measures often overlook these activities that accomplish environmental intervention on the ground.

Given the importance of this work, we need to ask, what are the conditions of environmental labour? In some cases, like tourism in protected areas, environmental workers are wage labourers working for corporations. Their working conditions and concerns present analogies with wage work elsewhere. Yet, far from the factory floors that dominate most labour scholarship, the kinds of domination and contestation that take place in tourism attractions are little known.

But much of the labour of protection and restoration is not wage work. People who patrol protected areas and village forests receive payments that are often effectively lower than wage employment. Compensation for reforestation and landscape management targets environmental impacts more than the work itself. Working conditions are difficult to gauge, too, as environmental labour intertwines with other livelihood activities in landscapes. As people are increasingly compelled to manage environments for the state's environmental mandates, and to do so in a transactional way, alienation from the landscapes within which they dwell is likely to follow.

Recognising environmental labour is all the more important as the CCP unrolls its proposal to create an 'ecological civilisation' (*shengtai wenming*). With this policy rubric, Party leaders recognise that managing China's economy and society for growth only cannot continue. From forest cover to air pollution to energy to hydrology, state authorities are implementing projects that use regulations alongside market instruments to promote durable ways of using resources. They also propose inculcating

citizens with an 'ecological culture' (*shengtai wenhua*) centred on thrift and care for nature (Geall 2015).

Discussions of ecological civilisation move beyond a picture of the world that pits humans against nature to a recognition that the social and the biophysical are always intertwined—a sensibility that may resonate with people who speak of 'socio-natures' or the 'anthropocene' epoch. Rather than embrace humility, as some participants in these discussions have urged, Chinese authorities have seized the anthropocene, declaring that nature must and will be managed by technocrats. In visions of ecological civilisation, from now on China's natures will be defined, built, and maintained by humans, in the vision of the CCP. This is no longer a matter of conquering nature, but of establishing flexible mechanisms of monitoring and response around complex and unpredictable social and environmental processes. Technocratic monitoring, maintenance, and intervention will require more environmental labour. Who does this labour and how will have lasting repercussions for the people and the landscapes involved. ■

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