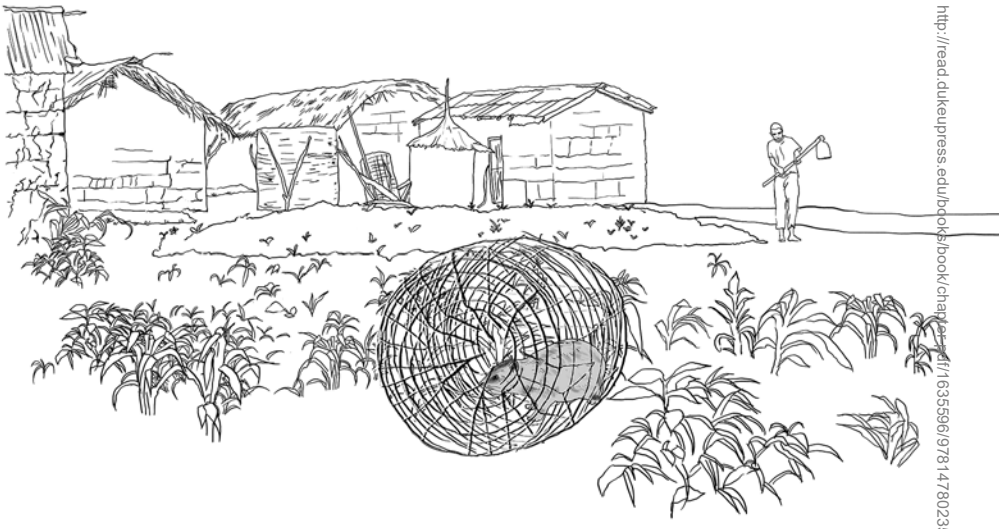

7

Rodent Trapping and the Just Possible

Jia Hui Lee

7.1 (*previous page*) Original drawing by Feifei Zhou.

IT IS A COMMON SCENE IN TANZANIA: On bicycles, at the market, and all around the bus station, men sell rat poison, glue boards, live traps, and snap traps. Some of these are imported from China, and others from Oman. Whether in the business capital of Dar es Salaam or in smaller cities like Morogoro, people talk and complain about *panya*, a Kiswahili term meaning "rodent" and encompassing all gnawing small mammals. Panya figure in stories about children getting bitten, missing articles of clothing, denuded corncobs, and occasionally witchcraft, all told by Tanzanians who purchase rodent control technologies in the hopes of keeping rodents out of their homes and fields.

Iddy Juma Kilongola is a man in his mid-forties who designs and makes rodent traps, which he then sells at the weekly Saturday market (see figure 7.2) in Morogoro not far from the Sokoine University Pest Management Center.[1] His stall features several small kill traps, which resemble a box fitted with a spring mechanism. There are also larger traps made of thin steel, woven in the shape of a lantern. These contraptions are used for live trapping. Pointing to a coffin-sized trap filled with scurrying, squeaking mice, Iddy boasted with a salesman's shrewdness, "This can catch four hundred in one day." My curiosity was piqued by the array of traps he had fashioned—and particularly by those designed to catch rodents alive. "Why would you want to catch them alive?" I asked. "Because," Iddy chuckled, "in the countryside, panya are a snack [mboga]."[2]

In our interviews, Iddy often spoke about his traps as technological inventions that offered more just modes of rodent control over other commercially produced traps and rodenticides. In this chapter, I explore how Iddy and

7.2 Iddy at his rodent trap stall and workshop in Morogoro town center. Photograph by Jia Hui Lee.

other inhabitants of Morogoro struggle to earn a living that often requires meditating on practices of killing rodents. Central to these practices of attaining "the good life" is the imagination of the *just possible* that manifests materially in the design and use of rodent traps. In an agricultural region of Tanzania where rodent abundance constantly threatens human sustenance, the just possible comes to life through Iddy's situated trap making, capturing the many ways in which Tanzanian selves and communities successfully produce sustenance in a world where it is seemingly scarce. Visions of the just possible like Iddy's trap-making endeavor, as we shall see, generate new social relations and forms of value that in turn hold unexpected promises of multispecies justice.

Commensal rodents—that is, rats and mice that share food with humans and are thus usually copresent with people—are widely regarded as pests. The figure of the pest occupies an ambiguous position within discussions of animal welfare and ecological conservation.[3] Most ecologists and proponents of animal welfare agree that the prioritization of certain ecosystems and economies often justifies control of animal populations that threaten conservation goals or business.[4] Debates concerning humaneness as it pertains to various pest management methods are in fact conversations about killing. *Humane*, as an adjective used by practitioners of animal population management, signals how swiftly, efficiently, and painlessly animal pests are

killed or removed through culling, trapping, or poisoning.[5] The designation of the term *pest* itself implicates political valuations that strike at the heart of what Achille Mbembe calls "necropolitics," or "the power and the capacity to dictate who may live and who must die."[6] When considered within the lexicon of pest management, necropolitics makes visible who has power to influence policy decisions, whose livelihoods are worth protecting from the threat of pests, and—in the context of colonialism and racism in Africa—which human and nonhuman lives are deemed extinguishable. When considered within historical and social contexts of human-animal relations in Africa, the term *humane* as it is understood in terms of pest management does not just center on questions of how humans should treat other animals but also who is afforded the dignity of being human. This double meaning of *human/e* threads through Iddy's traps, as well.

In the following, I show how we can interpret Iddy's traps as instruments both of killing and of justice. The very practices of making technologies for rodent killing are, through Iddy's creative designs, meditations on the limits of animal welfare as a framework for discussing pest control. Discussions about animal welfare can sometimes overlook those precarious livelihoods that depend on minimizing the effects of "animals that cause damage" (waharibifu), the Tanzanian expression for "pests." Rather than focus on the term *human/e* and its accompanying ethical considerations of what killing should look like, I hope to underscore how Iddy and other Tanzanians articulate a version of multispecies justice through their efforts to preserve their livelihoods amid challenges posed by rodents, a lack of resources, and limited formal education. Through creative design, Iddy's artisanal traps are deeply informed by a desire to improve the lives of his community while struggling with the ethics of killing rodents. I present Iddy's traps as crucial material-semiotic interventions into discussions about multispecies relations in contexts where human lives exist at the very edge of survival.

Beyond multispecies considerations, I also hope to interrogate notions of justice in relation to decolonizing scholarship on African technology. The Kiswahili term *fundi*, or fabricator, succinctly captures Iddy's ability to assemble and mobilize skills, experimentation, and social relations to bring his traps to life. In attending to the intellectual and physical labor entailed by fundi like Iddy, I seek to recuperate African technological endeavors that are often written out of global histories of technology. In doing so, I follow Kenda Mutongi's call for scholars to "take seriously what ordinary Africans are making in Africa and how they are making it."[7] To this end, I approach Iddy's artisanal repurposing of construction materials and techniques as a

form of inventive and intellectual labor. Through his technical mastery of trap making, Iddy imagines and generates just-possible futures, whose subjects include not just Iddy and his community but also the intended target of Iddy's traps—rodents.

The "First Robot": Traps as Intellection

At the workshop located opposite the daladala (minibus) stand, Iddy displays his traps under an umbrella on a reused Vodacom advertisement banner amid piles of wood and metal spokes. He is usually seated on a machine he calls a goat (mbuzi), which he invented to drill holes through wood pieces and conjoin them into traps. Iddy painted the so-called goat and decorated it with the slogan "Tanzania ya Viwanda," meaning "Industrial Tanzania," which invokes the government's development plan to build up Tanzania's manufacturing economy. Under this he added "Ubunifu Kwanza" (Imagination/Invention Comes First). In Kiswahili, *ubunifu* simultaneously refers to imagination, creativity, and invention, all qualities that Iddy's enterprise embodies. In our conversations, Iddy expressed hopes for someday operating a "trap factory" that would provide economic opportunities to farmers and youth, many of whom struggle to find gainful employment in Tanzania. Placing himself squarely within the nation's industrializing aspirations through colorful designs on his machine, Iddy dreamed that his trap factory will "bring fortune [baraka] to the whole country."

Putting together bicycle gears and leftover construction materials to design and build innovative rodent traps, one could argue that Iddy shares certain qualities with engineers and computer scientists who create and support software that is free and open source. These efforts allow anyone to distribute, modify, and make use of software without profits accumulating exclusively to owners of intellectual property. Iddy's ability to tailor his trap designs to better suit community needs, rather than commercial ones, evokes practices of designing free and open-source technologies that cybernetics scholar Ron Eglash describes as a form of engendering "generative justice." Inspired by the makers of Arduino and other open-source platforms, Eglash contrasts "generative justice" with "distributive" and "restorative justice." These latter ways, he suggests, often place demands for social justice on authorities and governments, conceding a top-down view of justice.[8]

On the contrary, generative justice emerges from the very people whose work creates value for themselves and for others in their communities through constantly shifting social arrangements. Instead of conceptions of

justice that issue from questions about distribution or individualist capabilities, generative justice prioritizes social practices of living well that transform oppressive systems.[9] I consider Iddy's engineering a kind of generative justice within a multispecies community of farmers, trappers, and rodents. His traps are deeply embedded in a production process substantially shaped by interspecies relations and communal concerns, specifically suited to the needs of the more-than-human communities that Iddy inhabits.

To recognize rodent traps as instruments of justice making is not to ignore the fact that traps capture—and often kill—their prey with "unthinking, poised violence"[10] and "deliberate wickedness,"[11] as the anthropologists Alfred Gell and Lewis Henry Morgan respectively observe more than a century apart.[12] Donna Haraway notes that "there is no way to eat and not to kill."[13] In Tanzania, where agriculture subtends and supports people's ability to thrive, rodent trapping exists within a matrix of quotidian calculations for survival. To be able "to eat," which is also an idiomatic way of saying "to earn a living" in Kiswahili, depends on how much food one must share with uninvited others such as rodents. In this regard, Iddy's traps are material manifestations of how Tanzanians think ethically about killing those with whom they must share food.

Growing one's own food became an important survival strategy in the context of food rationing measures in the 1980s, when Tanzania was subject to austere structural adjustment programs. Yet even before that decade of struggle, having enough to eat had always been a key priority for many Tanzanians and the foundation for all personal development (maendeleo). "Chakula ni uhai," so the saying goes, or "Food is life." For this reason, the figure of the farmer holds a high moral position in Tanzanian society. The hard, grueling labor of farming is considered noble and associated with feeding the family and developing the nation. Agriculture has always been Tanzania's largest economic sector. Tanzania's founding father and first president, Julius Kambarage Nyerere, described agriculture as "the foundation of all our progress."[14] Thirty years later, in 2009, President Jakaya Mrisho Kikwete launched a national economic initiative, Kilimo Kwanza ("Farming First"), to modernize the agricultural sector as the nation's main driver of development. Agriculture accounted for roughly one-third of the country's gross domestic product in 2017, a figure that does not include the many food products that come from people's gardens, sometimes supplementing household income.[15]

Almost all the men and women I know in Morogoro participate in some form of agriculture. Being able to garden or farm is considered a crucial life skill. In small pockets of gardens, even close to the town center, people plant

stalks of corn and cassava or tend banana and papaya groves. Often, salaries from paid work are insufficient to meet household need, so people rely on their gardens for nourishment. As Rashidi, a rodent trapper, explained when describing his 250-square-foot garden, "What we grow we don't buy. The money we save, we use to pay for our children's schooling." The room I lived in during fieldwork was part of a larger compound owned by a landlady who often shared her bounty of fruit, lemongrass, and vegetables with me. "If you don't eat them, the ngedere [vervet monkeys] will," she would say.

If food is indeed life and part of an intricate calculus for survival and success in Tanzania, then the harvesting of garden produce by nonhuman entities must be weighed up against household budgets, school fees, delayed wages, and rapidly rising costs of living. Experiences with animals that cause damage to harvests, or waharibifu, are common. These critters include grain borers and weevils, vervet monkeys, bamboo rats, field mice, and mongoose, among others. Rodents figure frequently and perniciously in local residents' accounts. They "attack" during the planting and growing seasons. They infest homes, biting children or stealing items of clothing, especially underwear (chupi). They appear without warning and in swarms. Rats and mice devour newly planted seeds and seedlings or climb up corn stalks to gobble up maturing cobs. During the months of January and February, it is common to meet a despondent acquaintance who has had an entire weekend's worth of sowing devastated overnight by a ravenous pack of rats.

Due to its mountain ranges, fertile soil, and diverse climates, Morogoro region supplies Tanzania with myriad fruits, grains, and vegetables, including strawberries, maize, rice, papaya, bananas, onions, and millet. Consequently, Morogoro town is also home to the Ministry of Agriculture's Rodent Control Centre, as well as Tanzania's only agricultural university, the Sokoine University of Agriculture (SUA). Iddy's trap-making enterprise thus stands within a society that confronts in many ways the problem of learning, in Haraway's words, how "to live responsibly within the multiplicitous necessity and labor of killing" as part of daily life.[16]

Embedded within a context where killing rodents is unavoidable, Iddy and other trappers are deeply "engaged in intellection, firmly anchored in their own philosophies, and alert to the world around and beyond them as a source of things that they render technological."[17] Striving to flourish with just enough resources in ways that foster socially just and possible futures, they practice what I call the condition of the just possible. Trap makers and farmers leave open the possibility of cultivating multispecies well-being through their experimentation with and deployment of traps. Contending

with the labor of killing, they wrestle with the entangled, "emergent ecologies" that bind crops, rodents, and humans together.[18] The act of trapping rodents does not always fit within schemes for eradication and control. Sometimes, traps serve to catch food, which may include rodents. In their effort to craft just-possible futures for themselves, others, and "other others," trap makers thus complicate the simplistic and deadly designations of rodents as pests.[19]

In positioning traps as practical and theoretical tools that navigate the daily realities of living with rodents, I both invoke and challenge extant anthropological literature on traps and trapping.[20] Anthropologists have long admired the technical sophistication involved in the design of traps, often comparing their workings to electrical circuits or motherboards. Like open-source software, traps and their designs circulate freely. They are adopted, appropriated, and repurposed through dynamic processes of migration, exchange, and circulation. Edward Burnett Tylor, writing at the end of the nineteenth century, considered traps alongside other implements such as weapons and wheels as evidence of mental development among people whom he called "primitive."[21]

Other anthropologists like Julius E. Lips, who did extensive work among the Innu of the Labrador Peninsula, considered the trap to be the "First Robot," an invention that was "certainly of greater consequence to the history of mankind than the invention of the wheel."[22] Lips surveyed traps from North America, West Africa, and Europe, concluding that they are possibly "the oldest application of relay structures" and that they formed an integral part of any "modern technique" of automation and information processing.[23] In a comparable vein, Alfred Gell in his essay entitled "Vogel's Net: Traps as Artworks and Artworks as Traps" describes traps as a kind of "automaton," with a cybernetic ability to produce action in the absence of a person. Gell praises traps as devices that "embody ideas [and] convey meanings" because the trap, "by its very nature, is a transformed representation of its maker, the hunter, and the prey animal, its victim, and of their mutual relationship."[24] Posing traps as a "nexus of intentionalities between hunters and prey animals," Gell evokes their ability to bring together different worlds.[25] In other words, Gell suggests that traps are portals through which sensory worlds collide and converge. Trap designers imagine and inhabit the sensory worlds of their prey, building them into traps to capture prey without catching the specific prey's attention.

The imaginative adoption of the prey's sensory world featured centrally in the rodent traps I surveyed in Tanzania. Some, for instance, incorporated

enclosed, dark spaces into their designs, mimicking a rodent burrow. Suleimani, a trapper and research technician at the university's pest management center, explained that this is because rodents find wide-open spaces threatening. "They walk next to a wall, or around rocks and bushes, but never across a field," he said. "Panya like small, dark spaces. It is like their home." Individuals like Suleimani draw on a deep well of experiential knowledge about rodent ecology and behavior in fashioning and using traps. Often, Suleimani would share with me behavioral details about panya that are absent from established scientific literature or, occasionally, how they behave in contradictory ways to published reports. On one trapping expedition, Suleimani placed a live trap close to a burrow entrance of a panya buku (*Cricetomys sp.*) and then skipped the next burrow we found. "This is the exit," he said. "Usually, panya buku have territories of around fifty meters, so we have to walk further to set the next trap." Other trappers volunteered behavioral notes when we passed by suitable trapping locations. Once while we were in the mountains, a trapper named Rashidi directed my attention to some long grass. "You will find panya mchanga there," he said, referring to the striped *Rhabdomys pumilio* rodent. He followed this revelation with a description of the scraggy vegetation and lightly disturbed soil that led him to know what species of rodents lived there. Trap technologies are thus imbued with human knowledge *about* animal behavior gained primarily through experience with, and proximity to, a given species. Setting up traps in suitable locations relies on "intimate knowledges" that trappers possess about rodent ecology and ethology.[26]

Taken together, traps materialize processes of knowledge making and imagination that go beyond "the given, the already there, [and] the taken for granted of social life and the world in which social life unfolds."[27] The embodied practices of designing, building, and laying traps are ways that people grapple with the possibilities of living with rodents amid constant struggles to eat and live well.

How to Make a Rodent Trap

Loud squeals of grinding metal competed with traffic noises from the transport stand opposite Iddy's stall. His hoarse voice overcoming the din, Iddy walked me through the steps of making a box trap. He was seated on his goat (mbuzi), the machine that resembled the animal, its neck jutting out to the level of Iddy's face. Attached to the cyborg ungulate's head are bicycle gears, one large and one smaller, conjoined by greasy chains. Iddy had fashioned a

kind of handle in place of the pedal, which he turned with one hand to drill through wood held in the other.

Iddy and his siblings grew up in Kilosa village, some seventy miles from Morogoro. "After my mother got pregnant, my father left and I have never received any support from him," he said. In the mornings, Iddy and his elder brother would go and tend to the four-hundred-square-foot field where his mom had planted crops. "My mother would be in town, selling firewood or sugarcane in exchange for maize flour to feed us," he explained. Iddy attributed his difficult life to the fact that he never went to school. "Everything I learn, I learn from the street," he said. He initially worked for food and then later for pocket change (posho) unloading produce from trucks. He roamed the streets and met people who would sometimes offer him construction jobs, such as hauling bricks, cement, and metal.

"It's not always fair [haki]," he admitted, "Sometimes I get paid much less than what was offered, but I never demanded more. I worked hard from morning to night and learned a lot."[28] Iddy's ability to invent new tools like the goat came from having to perform construction tasks without proper equipment. The conditions were often challenging, but he credited those days for gifting him with creativity (ubunifu). "I had to use my brain a lot. My boss was impressed and started paying," he recounted. Eventually, he started saving up wages obtained from his labors. Soon, Iddy was buying Chinese-made traps and selling them on the street.

Moving from town to town, Iddy regularly heard people complain about rodents and other pests destroying their crops. "In one of the villages, I tell you, there must have been something occult [mambo ya ajabu] going on. You could not walk without stepping on a rodent!" he recalled. This gave Iddy the idea of starting a trap business. "But these Chinese traps," he went on, "the customers complain about them." Snap traps imported from China were made of light metal with sensitive triggers. Several customers had returned with complaints that the traps he had sold them maimed rodents but did not kill them. Customers woke up to find blood stains on their sheets and floor, traces of what appeared to be a painful escape. Worse, if a rodent had crawled into a crevice and died, they were often unable to find the decomposing body except by its festering stench.

Iddy realized that he had to make his own traps to accommodate his customers' requests. He experimented with four or five designs, which were all constructed from wood and metal spokes with different trigger mechanisms. Using only hand tools, Iddy created a box trap with a trigger mechanism that he fashioned out of metal spokes twisted into springs. "I discovered that the

springs are important. You need enough strength to kill but you don't want it to be too strong," he said, showing me a model that he had just built. "Why not?" I asked. "So that if a child puts her fingers into the trap, she won't get hurt," he answered.

This ethnographic moment reveals how traps are sites for figuring out multispecies well-being. Traps are more than just what Gell called "texts on animal behavior."[29] Rather, as Iddy explained, traps may be designed to constrain and influence the behaviors of rodents and humans who both share a penchant for satisfying their curiosity. For instance, rodents are wary of new objects (neophobic), but they also tend to explore and forage for new sources of food. Similarly, a child's curiosity might be aroused by a trap—a contraption that invites fiddling and play with its dangling bait and mechanical workings. The problem with Chinese traps, Iddy said, is that they are too sensitive. At the slightest touch, they snap and maim, causing the rodent to die slowly and in pain, or in the case of a child, injuring their unwitting fingers.

Iddy's very movements of twisting metal, drilling wood, and fastening a trigger in a trap embody an artisanal calculation that balances the demands of child safety, the need for immediate rodent death, and the efficacy of a trap. "I design traps so the springs work *only* when panya is fully inside and he is killed instantly. The springs are not strong enough to injure a child's finger," he assured me. Iddy does not claim that his traps are humane. However, he respects rodents as living beings capable of experiencing pain, and in some cases, of outsmarting his traps. Some rats, he noted, can avoid getting ensnared. "I haven't found a good design for house rats [panya wa nyumba]. They are too smart [wajanja sana]. They recognize a trap, and very few are tricked," Iddy conceded.

At the market, Iddy's traps are popular because they are cheaper than imported ones and are less likely to fail. Chinese metal traps rust and degrade quickly whereas Iddy's traps, which are made of wood, are more durable in Morogoro's tropical weather. The modular design of Iddy's traps also means that he can easily customize them to specific requests. Fusing business and community interests, Iddy's trap designs draw on his own experiences as a casual laborer to offer better ways to protect people's livelihoods from rodents. As Ron Eglash and Ellen Foster write of maker communities in Africa, Iddy is "simultaneously pulling the warp of innovation geared toward the future while also weaving in the weft of repair practices already deeply entrenched" in their lives.[30] The very practices of drilling holes, bending metal, and hoisting wood into a trap embody the imagination of a future where children are

not injured and where rodents are swiftly killed—in other words, where multispecies interests are enfolded into the design of traps.

Rodenticides Are a Poisoned Chalice

Within their political economies of use, traps are material practices that confront us with critical questions about survival, the good life, and multispecies well-being. Traps, trap alternatives such as rodenticides, and deliberations over their respective uses represent the very material ways in which Tanzanians grapple with their own positions within multispecies relations of killing, eating, and living together.

When considering rodenticides, many Morogoro inhabitants are attuned to the risks of toxic exposure. This is reflected in daily conversations about natural products (asili) and locally (kienyeji) grown produce, which they tend to prefer over factory-farmed and store-bought food. "Only foreigners buy frozen store chicken," several Morogoro residents told me, adding, "You don't know what chemicals and antibiotics they pump into them." People also tend to buy produce on the street or in the wet markets, sold by women "from the mountains" that are "free from pesticide." Stacey Langwick noted that Tanzanian gardeners harbor similar suspicions toward industrially produced food. Practices of cultivating medicinal foods (dawa lishe), Langwick writes, are sites of meditation and mediation for cultivating a politics of habitability amid an industrializing Tanzania.[31] For the same reasons, small-scale Tanzanian farmers with whom I spoke rarely use rat poison (sumu). "We don't know if these chemicals go into our food or our water," they mused.

Shawa is a retired agricultural officer at the Rodent Control Centre located along the main road to the Sokoine University of Agriculture. He commands the respect of all current staff and still regularly comes by the office. During the early days of the centre in the late 1980s, Shawa conducted several studies monitoring long-term population fluctuations of panya shamba, or field mice (*Mastomys natalensis*). He performed several "palatability studies" in which he tested several mixtures of bait with poison to see which ones attracted (and killed) the most rodents. In our interview, Shawa explained that the Rodent Control Centre was initially established to improve Tanzania's agricultural sector by providing advice and technical assistance to farmers dealing with rodent pests. More recently, however, the under-resourced centre functions as a clearing house for government-distributed rodenticides during outbreaks. These included several varieties of warfarin and zinc phosphide, well-known poisons used throughout the world to combat rodent infesta-

tions. Shawa worried about the long-term health effects of these poisons. "I see that people who used poisons in the 1990s, they now have some kind of illness," he explained. When I asked him to elaborate, he recalled that farmers developed growths on their hands and had difficulty clenching their fists.

Shawa was skeptical when I told him that I could not find any published research on the long-term effects of warfarin on the health of humans, other animals, or plants.[32] Most of the studies dealt only with measures to prevent the accidental, immediate poisoning of livestock and people. "The problem with using poisons," Shawa noted with concern, "is that you use a lot and so you have huge sacks of it lying around that farmers didn't use, even today. Who knows what happens to the poisons? Are they seeping into the ground? Are they going into the well water?" Shawa continued, "Children may die because they eat rodenticide. Disposing of poisons is a challenge." He recounted how rodents could build resistance to these rodenticides so that farmers must use second generation versions to keep up. Shawa opined that the centre's main job should be to educate farmers about farming responsibly, including the responsible use of poisons. Yet, with the centre's reduced budget, deteriorating equipment, and dwindling staff, this was difficult to do. Common to many scientific institutions throughout Africa, these challenges cause Shawa to worry over the fact that he was never able to study the unintended, toxicological consequences of rodenticide use.[33]

Iddy echoed Shawa's sentiments about poisons: "I tell you, some of these poisons take time to work, up to seven days. By then, the rodent would have gone far. What if someone eats him? What if a cat eats him? Where does the poison go?" Like Shawa, Iddy questioned what happens to poisons once they have been ingested by the rodent. "Do they end up in the water, in our food? When you poison a rodent, you poison other animals together," he said. For this reason, Iddy discourages his customers from using rodenticides. His advice is always to use a trap, or raise a cat, but never to resort to rodenticides. "Our body might transform when we eat something that has rat poison," Iddy conjectured. "And the rodents suffer. They don't die right away. They crawl around, they go mad, they go to a corner, and then they slowly die."

Iddy's distrust of rodenticides articulates a particular stance in relation to multispecies justice. Iddy arrives at his position through his work of inventing and building traps as he generates alternatives to rodenticides that nonetheless remain imbricated with important questions about human-rodent relations in an agricultural context. In this regard, trap making is both a practical and a theoretical endeavor. Through the very handiwork of

building traps, Iddy thinks about and imagines a future that is just possible for the intertwined lives of people and rodents in Morogoro.

Toward a Generative, Multispecies Just Possible

Iddy had been invited to set up his stall at the Annual Nanenane Agricultural Fair, where I sought to meet him. In a long queue to enter the fairgrounds, people shuffled slowly under the midday heat. I could smell the charred fat of mishikaki (skewered meat) and roasting popcorn. Buses brimmed with school children in bright white uniforms, jostling for space and prompting piercing shrieks from the policewomen and their whistles.

Once I finally bought a ticket and entered the fairgrounds, I waded through the crowd to Iddy's stall. On the way, I passed by shiny tractors, a patch of gigantic eggplants, a snake gallery, and a mock Bwana Sukari factory demonstrating how sugar is made. At last, I found Iddy at his stall, seated on his goat. I was surprised to see that he was drilling through a piece of metal rather than the usual wood. This was a new design. He had also repainted the goat in bright colors and added a new motto: "Tanzania ya Viwanda. Morogoro Kwanza. Ubunifu jadi yetu." In English, this translates as "Industrial Tanzania. Morogoro Comes First. Imagination is our heritage." Iddy's stall was shot through with the country's flag colors and symbols, thus positioning his work as part of a national aspiration that boasts creativity as traditionally Tanzanian.

As I watched Iddy work, I soon recognized his new trap design. It was a Sherman. Made of aluminum and light to carry, these live traps are the tool of choice for ecologists conducting trap-and-release studies of small mammal populations. And just a few days earlier, over a hundred Sherman traps laid out overnight by Sokoine University's Pest Management Centre had been stolen. Data collected from this study was intended to contribute to a long-term project to predict rodent outbreaks and implement pest management strategies that did not rely on poisons. The trappers Suleimani and Rashidi had been able to track down and retrieve several stolen traps at Chamwino market. Yet, they only recovered several dozen, and the research had to be halted.

This was where Iddy came in. He had bought sheets of aluminum, cut them into smaller pieces, and constructed several Sherman-like traps. "I'm still testing the trigger springs," he remarked. He inserted a pencil into the trap, which meekly snapped shut. Thanks to Iddy's ability to reverse engineer a Sherman and construct the trap with an entirely different spring mecha-

nism, the university research project was able to continue. The university could buy the traps more cheaply, without incurring the exorbitant import duties that Tanzanian customs frequently levy. With Iddy's technical ability, Suleimani and Rashidi continued to trap mice, and their data collection was only briefly interrupted.

Both Iddy's kill traps and live traps are interventions into an ongoing multispecies predicament that binds humans and rodents into close-knit relations that require constant negotiations of who eats, who dies, and who lives. Val Plumwood orthographically recognizes this intimate relation as "Food/Death," writing that the most "basic feature of animal existence on planet earth" is that "we are food and that through death we nourish others."[34] In Morogoro, where people rely on food they cultivate to make ends meet, human-rodent entanglements become sites where nourishment and death must be constantly negotiated. Rodents who consume too much food threaten human sustenance and endanger lives that depend on making just enough.

Trap making is first and foremost Iddy's means of earning a living. He is proud of his accomplishments, particularly given his journey from the days of moving hundred-pound loads in exchange for food. By serving his community's needs for rodent control, generating income, and eschewing the accumulation of profits exclusive to an owner of intellectual property, one could argue that Iddy's audacious creativity also proposes new ecological entanglements that try to resolve the Food/Death conundrum. Whether they are designed to kill quickly and thoroughly, or for live trapping so as to offer safer, poison-free methods, Iddy's traps knit together—materially and intellectually—human and rodent worlds. His traps make visible the potentially disastrous, cascading ecological consequences that ensue when rodenticides are used, in hopes of avoiding what Deborah Rose Bird calls "double death."[35] The fact that people may consume rodents and other plants and animals that have been exposed to toxic rodenticides means that the use of any rodenticide runs the risk of jeopardizing many lives. From the perspectives of Iddy, Shawa, and others who grow their own food, the use of rodenticides conjures anxiety about wide-ranging, long-term effects of poison on human and environmental health. Additionally, "double death" conjoins shared, multispecies vulnerabilities: rodents and children getting maimed by badly designed, faulty traps imported from abroad.

Tanzanians who use traps do not deny that traps mark the end of an animal's life. Yet, despite the many methods for trapping and killing rodents practiced in Morogoro, Iddy and others readily concede that their machina-

tions may be foiled by "smart" (wanaoakili) rodents. Even when faced with alluring (albeit poison-laced) baits, rodents adapt over the course of a few generations and build resistance to rodenticides. Rodents' ability to survive and subvert the most enticing of traps garners Iddy's admiration. "In the end, you can only do so much. Rodents are cunning," he concluded. "You can lay a trap but they know, and they will go around it and eat your maize."

What is valuable, then, for people in Morogoro living with rodents is not the total eradication of rodent pests through indiscriminate methods such as rodenticides. Rather, value is generated in the everyday endeavor, through the design and deployment of technology, to live well with those who eat together. These endeavors take on a concrete form in the traps that Iddy makes. When deployed, these traps become significant sites for reconfiguring relationships between rodents and people, informed by a constantly negotiated calculus of multispecies nourishment.

Conclusion: Imagining the Just Possible

Such a history begs the question, How does one delight in precarious life?

—**Joshua Bennett**, *Being Property Once Myself*, 8

Not so long ago, the white-minority governments of Rhodesia (present day Zimbabwe) and South Africa used warfarin and other rodenticides as chemical weapons against Black activists fighting for decolonization.[36] White supremacists in southern Africa saw little difference between Africans and rodents, and they sought to eradicate both. Black Americans, too, have been dehumanized by racist violence and other experiences of inequality that often placed them in close disposition and proximity to nonhuman animals, including rats.[37]

Against the backdrop of these histories, Joshua Bennett counters that such dehumanizing experiences prepare the ground for Black writers to articulate a "more robust vision of human, and nonhuman," and its "cognitive and otherwise potential."[38] For Bennett, it is important that his work acknowledges Black experiences of suffering and subjection without foreclosing possibilities for poetry, imagination, and resilience.[39] The stories I tell here of trap making in Morogoro attempt to answer Bennett's question, "How does one delight in precarious life?" Although Iddy and others who work with rodents in Morogoro live on the edges of making ends meet, they find delight and formulate visions of the future through their design and deployment of traps. It is for this reason that Iddy's trap making is a form of generative justice.

By designing traps that subvert their commodified counterparts, Iddy generates new spaces within which he and others in Morogoro can reconceive their social relations with one another and with other nonhuman animals.

In contemporary Tanzania, human-rodent relations manifest the practical realities of learning to live well with others—a theme of central importance to multispecies justice. People who opt to use Iddy's traps seldom appropriate the language of war against rodents that is characteristic of pest extermination efforts in Euro-America. Instead, they embrace them as part and parcel of everyday life. "They live with us, they eat with us," a fruit seller at the market once told me nonchalantly. While many of my interlocutors have relied on terms like "enemy" (adui) to denote panya, rarely did they want to see them eradicated or killed by the thousands. If anything, rodents were acknowledged for their intelligence and resilience, even if begrudgingly. "If only humans [*binadamu*] were more like panya!" said Rashidi, in the context of deploring the so-called antics of today's youth. For Rashidi, many young Tanzanians dress sloppily and have abandoned all effort to look presentable, behavior that paled in comparison with the conscientious, self-grooming habits of rodents. Human-rodent relations in Morogoro thus exemplify a cosmopolitics wherein possible notions of justice are not foreclosed by a particular view of rodents but rather worked out in the design and use of traps.[40] This cosmopolitical approach draws attention to the material ways through which people conceive of and enact justice, and how these practices relate in turn to the access and distribution of resources and technology.

The (unequal) material conditions that undergird Iddy's trap making came through in our final conversation. When asked about his hopes for the future, Iddy laughed. He gestured to his traps and said:

> First, I would like a power drill. A drill will let me make four times more traps. Second, I would like a factory. I want to provide jobs for youth who cannot find any work; if you don't have work, you don't have nothing [bila kazi, hamna kitu]! Third, I would like some stickers to put on each trap, with my name and phone number, so people know that this young man from Tanzania made this trap. It is the only one like it in the world, and when people in China, Malaysia, America see the trap, they know that this man from Tanzania, who never went to school, made this trap.

His technoscientific dreams notwithstanding, Iddy's desire to own an electric drill should caution us against celebrating this story merely as an example of African improvisation or a smart work-around. Iddy would not have chosen to make traps using the goat if he could have done otherwise. It is

for this reason that I have avoided using the terms *improvisation* or *bricolage* to describe Iddy's traps because these terms have so often and subtly marked African practices of technology as inferior copies of those found elsewhere.[41]

Instead, I appropriate the language used by scholars of computing, who credit hackers and makers for their ingenuity in designing open-source software that reconfigures existing notions of equality, freedom, and justice. By smuggling notions of activist creativity into Iddy's trap making enterprise, I avoid framing African hacks into extant technologies as improvisation, which as the term's etymology suggests, describes an unforeseen progress. On the contrary, Iddy's traps are purposefully designed through an intricate, intellectual process that brings together questions of livelihoods, well-being, and multispecies justice. They are ubunifu, or inventions, which at their roots in both English and Kiswahili foreground the new and deliberate, both as idea and object. And they arouse feelings of delight and pride in Iddy, who continues to show them off to passersby and potential customers.

Seriously engaging with both human-rodent relations and with the hardships and possibilities posed by such relations forms the ground upon which people like Iddy envision just-possible futures. It is within such knotty multispecies relations that Iddy finds delight and pride—so colorfully conveyed on his machine—in showcasing a vision for his trap enterprise and for the world. To be sure, Iddy's vision of life can be stark. "Maisha ni mapambano," he often says, "Life is a struggle." Although Iddy works under challenging circumstances and within limited resources, earning just enough money to get by, his traps are nonetheless modes of self-expression, pride, and aspiration. By "imagining other possibles and other realities" through his trap designs, Iddy, to borrow Arturo Escobar's words, "forces us to rethink many of our everyday practices and politics."[42] Seated on his goat, turning the drill, and constructing traps, Iddy crafts *just*-possible futures, in which he would own a trap factory that provided jobs to his community while his traps circulated across the world.

The just possible, as Iddy's story suggests, is the condition of doing enough to thrive while incorporating considerations of more-than-human well-being with ingenuity. It is a condition that acknowledges the radical potential in particular and local practices of kufanyafanya tu, or "making do with what one has."[43] Even as they evoke elegant objects of contemporary art and contemplation (see figure 7.3), as Alfred Gell would have appreciated, Iddy's traps embody his ubunifu (imagination) for crafting just possibles. They are informed by a striving to live well and delight in multispecies

7.3 One of Iddy's traps. Photograph by Jia Hui Lee.

worlds. Meeting the needs of Tanzanian farmers, whose livelihoods depend on safeguarding sufficient harvests from rodents, Iddy generates designs for killing *and* living with rodents without indiscriminately endangering the people, plants, and other animals who share the agricultural communities of Morogoro.

Notes

1 All names except Iddy's are pseudonyms.

2 *Mboga* literally means vegetables, but the word is also used to denote small, edible creatures including mice and termites. In Tanzania and throughout southern Africa, rodents are occasionally trapped or hunted as food. A rodent trainer from Iringa told me that rodents are considered a meat relish, or a "bonus addition" to the main meal, or *kitoweo*.

3 See Brooks, "Animal Rights and Vertebrate Pest Control."

4 Littin et al., "Humane Control of Vertebrate Pests."

5 John Hadidian notes that many of the terms used by advocates and critics of animal welfare such as *pest* and *humane* are not clearly defined. Hadidian particularly points out that the use of so-called humane traps that restrain or capture animals alive may often result in lacerations, trauma, and even death when an animal is left out in extreme heat or cold. What animals are seen as pests can often change depending on particular ecologies, communities, and histories of migration and colonialism. See Hadidian, "Taking the 'Pest' Out of Pest Control"; Hadidian, Unti, and Griffin, "Measuring Humaness." I thank Kat Poje for pointing me to Hadidian's works.

6 Mbembe, "Necropolitics," 11.

7 I am indebted to Clapperton Chakanetsa Mavhunga and Laura Ann Twagira's work for broadening the space to think about technological innovation from the continent. Mueni wa Muiu and Guy Martin use fundi (fabricator) as an analytical concept in political science. Kenda Mutongi encouraged me to think deeply about Iddy's ingenuity and his relationship to working on the streets of Morogoro. See Mavhunga, *Mobile Workshop*; Twagira, "Introduction"; Muiu and Martin, *New Paradigm of the African State*; Mutongi, *Matatu,* 271.

8 Eglash, "Introduction to Generative Justice."

9 Iris Young critiques the focus on distribution in social justice movements that pits different social groups against one another. She advocates for an "enablement" approach to justice, which emphasizes eradicating "structural injustices" that affect some groups more than others. In this respect, her work is similar to the capabilities approach of justice later developed by Martha Nussbaum and Amartya Sen. See Young, *Justice and the Politics of Difference*; Nussbaum and Sen, *Quality of Life*.

10 Gell, "Vogel's Net," 26.

11 Morgan, *American Beaver and His Works*, 236.

12 Alfred Gell wrote his essay in 1996 whereas Lewis Henry Morgan's book on *The American Beaver and His Works* was published in 1868.

13 Haraway, *When Species Meet*, 295.

14 Quoted in Mura, "Discontented Farmer."

15 National Bureau of Statistics, United Republic of Tanzania, "Gross Domestic Product 2017."

16 Haraway, *When Species Meet*, 80.

17 Mavhunga, *What Do Science, Technology, and Innovation Mean from Africa?*, 8.

18 Kirksey, *Emergent Ecologies*.
19 Jacques Derrida coined the term *other others* to refer to nonhuman animals who often fall out of human-centered ethical considerations: Derrida, *Gift of Death,* 69. I thank Sophie Chao for bringing this to my attention.
20 See also Jiménez and Nahum-Claudel, "Anthropology of Traps."
21 Tylor, *Anthropology*.
22 Lips, *Origin of Things*, 83.
23 Lips, *Origin of Things*, 80.
24 Gell, "Vogel's Net," 29.
25 Gell, "Vogel's Net," 29.
26 Both Hugh Raffles and Radhika Govindrajan write about intimacy and knowledge production in multispecies relations. Even Lewis Henry Morgan, in his work on a different, larger rodent, acknowledged the "knowledge of the habits of beavers [that] is necessary to the trapper to pursue his vocation." These trappers were "Indian and white trappers on the south shore of Lake Superior." See Morgan, *American Beaver and His Works,* 227, 133. See also Raffles, "Intimate Knowledge"; Govindrajan, *Animal Intimacies*.
27 Joel Robbins makes a case for anthropologically studying people's imaginations of alternatives and possibilities. Robbins, "Beyond the Suffering Subject," 457.
28 *Haki*, the Kiswahili word translated as "fairness" or "justice," is also the word used for rights. *Haki za binadamu*, for example, means "human rights." Haki is one of those Indian Oceanic words that shaped and marked Tanzanian cultural practice. I have encountered haki in the context of justice and fairness in Bahasa Melayu, Hindi, Urdu, and Arabic. See Geertz, *Local Knowledge*, chap. 8, for ethnographic examples of haqq from Indonesia and Morocco.
29 Gell, "Vogel's Net," 27.
30 Eglash and Foster, "On the Politics of Generative Justice," 129.
31 Langwick, "Politics of Habitability."
32 The World Health Organization (WHO), United Nations Environment Program (UNEP), and International Labor Organization (ILO) of the United Nations concluded, based on available studies, that "exposure of the general population to warfarin as a rodenticide through air, drinking-water, or food is unlikely and does not constitute a significant health hazard." International Programme on Chemical Safety, "Warfarin," https://inchem.org/documents/hsg/hsg/hsg096.htm#SectionNumber:2.7. Gwen Ottinger and others term this lack of research on a chemical's long-term health hazard as a "structured knowledge gap," meant to disempower communities and exclude them from procedural justice. See Ottinger, "Changing Knowledge." It is a webpage with text so there is no page number.
33 See Tousignant, *Edges of Exposure*.
34 Plumwood, "Tasteless," 324.
35 For Deborah Bird Rose, the death of an organism, ecosystem, or metabolic pathway usually results in a "relentless cascade" of more deaths, "fracturing a compact [beween life and death] that has been integral to life on earth." "Double Death."
36 See Gould and Folb, "Project Coast"; and Wittenberg, "Poison in the Rhodesian Bush War."

37 See Mavhunga, "Vermin Beings."
38 Bennett, *Being Property Once Myself*, 8.
39 Bennett, *Being Property Once Myself*, 8–10.
40 Isabelle Stengers outlines a deliberative framework for envisioning a world we want to live in that considers the experiences and existence of different actors—human and nonhuman—without foreclosing the political possibilities that emerge. Trap making could be considered a cosmopolitical practice according to Stengers's work. See Stengers, "Cosmopolitical Proposal."
41 Lily Irani critiques the term *jugaad* (work-around), as used by Indian entrepreneurs to describe rural technologies. Calling a technology jugaad ascribes it a lack of design, inferior to proper innovation. See Irani, *Chasing Innovation,* 175–92. Chakanetsa Mavhunga writes that "tinkering" is "such a horrible word because it refers to a mender . . . , a trial and error person, a meddler, or, worse yet, a clumsy, unskilled worker." *What Do Science, Technology, and Innovation Mean from Africa?*, 7–9. I am also grateful to Jean Comaroff for helping me think through these points in a conversation about Bedford lorries in Sudan.
42 See Escobar, *Pluriversal Politics*, 4.
43 Mutongi, *Matatu*, 35.