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Silent Stream Sentinels

Landmines Convert Africa's Water From Combat Catalyst to Civilian Battleground

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DOWNSTREAM OF NAMAACHA ON THE MAFAVUKA RIVER, Mozambique — Autor Issufo helped me fasten my Kevlar apron while other flak-jacketed men gathered up their pruning shears, probes, hedge trimmers, hand trowels, brushes and metal detectors. We paused at the edge of the minefield. It was a cold morning, but I shivered for more than one reason. Issufo again glanced up at the ambivalent overcast sky and at the row of portable kennels. Finally he gave the order: let slip the dogs of post-war.

Doors swung open and large anxious beasts leapt out at their handlers. Kimbo lunged at Zafanias, Sigo at Josefa, and Ramos at Lisio Echua. I had to smile at the incongruous image. Most black African men rightly fear and loathe barking, white-trained, purebred German Shepherds, Dobermans and Rottweilers. Years ago the team felt uneasy about the required human-canine partnerships. Now men embraced dogs, knowing that only mutual trust ensured survival of both. For these breeds discriminate not against skin color but against concealed containers of wood, plastic or steel, with TNT or plastic explosives locked within. They faced no shortage of buried 'bones' in the country.

Breeding involved a $10,000 investment; as a result dogs sometimes ate better than humans and had their own "para-vet," while 40 men shared one paramedic. But discriminating noses vastly increased efficiency of humanitarian landmine removal, making dog teams the vanguard of the world's largest-scale, longest-running demining operation. An average two-dog team cleared 1,200 square meters in the same week it took a platoon of 22 humans to clear 300 square meters, a rate that compressed demining schedules from months to weeks. Their rapid pace made the $400-per-month manual labor grumble at the direct competition and indirect pressure, but delighted foreign-aid donors, NGOs and governments hoping to reach a "Mine-Impact-Free Mozambique" target by 2012. Based on their performance on stream banks like this one, similar man/dog teams may be deployed on the tributaries of the Nile, Limpopo, Zambezi, Congo and Okavango, where another 25 million landmines patiently await.

But there's a Catch-22. Most landmines had been strategically sited beside, above, in, on or around water. To develop or gain access to that precious water again, the mines had to go. Yet water masked scent: depending on air and soil humidity the detection range of the dogs was limited to smelling an estimated 2-7 centimeters below the ground. That dangerously fluctuating margin for error was why Issufo, our platoon commander, kept nervously scanning the indecisive clouds, testing wind direction and estimating ground moisture. "After a dry summer, these morning showers are good for the land, but the water suppresses the scent of the explosive material," Issufo explained. "We'll wait 30 minutes, then go ahead if the rain hasn't resumed by then. But even then we need the sun's heat and evaporation

and wind to raise the smell. If not, we're fucked."

* * *

I tightened my Kevlar and consciously began stepping precisely in the shallow damp footsteps of the man directly in front of me. Africa ranks as the most mined region in the world, and Mozambique and Angola contain between 12-17 million of them, or two-thirds the continent's landmines. Of Mozambique's 13,000 mostly civilian landmine victims, one fifth are women and children. Some have been killed or maimed while taking a shortcut to fetch water and face a daily, satanic dilemma: mine terror vs. thirst.

On this tense morning I was struck by the ironic parallel link. My current path between mines was utterly dependent on an acceptable level of moisture in the soil, just as the children's path to wells and rivers was utterly dependent on an acceptable level of mines in the ground, binding us between modern ubiquitous weaponry and timeless finite water.

I began to unearth these binds and links last November while looking at dam-related flood impacts on the Limpopo, Inkomati, Umbeluzi and Maputo Rivers. Through these watercourses two years earlier, southern Mozambique endured the worst floods in centuries.[1] As the subcontinent's most risk-prone, downstream country, given to drought as often as deluge, it was not the first water-related disaster, nor would it be its last. So I began traveling the cross-border rivers here trying to assess the environmental and political affects of 46 dams built and managed by upstream countries.[2] Yet long after floodwaters receded, a dark current emerged to overshadow the dam-deluge connection.

Beyond Good or Evil: *Our mine-detection dog team discovered this Soviet-manufactured 'bounding' landmine half buried in fertile soil between a road and river. Millions of such devices remain concentrated around water in Mozambique and Angola, waiting patiently, not knowing or caring that the wars are over. Pressure to tripwire or fuse on top causes a small explosion that projects the mine a meter high, where the main part explodes and spews shrapnel fragments in a 360-degree arc.*

One unanticipated aftereffect of the 2000 floods was that, in addition to crops, houses, people, livestock and trees, the raging waters dislodged and uprooted landmines. Floods buried many, exposed some, and carried countless others downstream to transplant them in unknown locations among flood debris, or even float them out to sea. "In some of these floodplain places, near the mouth of the Inkomati or Limpopo, we can't ever begin to try to find them all," said Florencio Chongo, Assistant Director of the Maputo-based Accelerated Demining Program (ADP), which I temporarily joined. "It is a problem. Yes. No one knows where the mines are any longer. The area is vast, and we have no place to start. All we can do is warn people, raise awareness, and try to keep people out of the area filled with silt and flood debris."

I had seen the population density in the south, witnessed the poverty and hunger. I knew rich, flood-deposited silt made ideal subsistence farmland. Keep people out? Not likely. The prospect of hoes, ploughs and machetes biting into earth randomly re-mined made me shudder. It also made me focus on how many landmines had been concentrated upstream along rivers and tributaries in the first place. I began to ask why, where, when, how and by whom water attracted landmines like an electromagnet attracts iron filings. More ominously, I probed why some locals wanted to keep landmines in place forever.

* * *

As man-dog teams strained at both ends of the leashes, we traversed the road down to the minefield. It was festively decked out in red skull-and-crossbones flags and white-taped hundred-square-meter blocks. After watching several of these operations, I decided that an African minefield being cleared resembles an archaeological dig being excavated. Orderly quadrants. Simple tools. Tedious labor. Precious hidden objects. National pride. Foreign investment. Potential insights into human nature. The difference was that in one, an accidental discovery might make a reputation; here it might make an amputation.

After 30 minutes, the clouds neither rained nor dis-

[1] The March 2000 flood/cyclone uprooted 500,000, killed 700, caused $600 million in damages and made a celebrity of Baby Rosita, born in a tree and rescued while TV crews filmed from helicopters.

[2] There is a consensus that dams worsened the impact, not through sudden releases, as popularly assumed, but because dams: stop the seasonal small floods which would scour sediment and vegetation, shrinking the river bed; remove the space and absorptive capacity of the watershed; and actively or passively encourage hundreds of thousands of people to settle permanently in previously off-limit floodplains below the dams.

persed. So we entered. The government had mined this patch of wet, fertile communal land 18 years earlier to deny the advancing enemy any ambush sites, bush paths to water, food and village support. Now firmly in power, it wanted to demine it to 'allow development' and cement loyalty in the area.

There had been a lingering silence in the team, now broken by nervous teasing. A colleague had cell-phoned half an hour earlier to explain his absence: yesterday he arrived home early, after months in the minefields, and caught his wife in bed with another man. Divorce proceedings began on the spot. Several men commiserated with gallows humor, how they'd better warn in advance of their own overdue returns on leave, or risk tripping into a similar romantic minefield. Minds returned to mines. The stress remained.

$10,000 dog finds $10 landmine: *Kimbo, handled by Zafanias, sniffed out and sat by this mine, awaiting instructions. Mine detection was a game to the dog, a livelihood for the handler. Was discovery a win for the government but potential loss for the river?*

Even under ideal conditions, there were only so many stress-filled hours the team's dogs and handlers could work each day (3.5 and 4.5 hours, respectively) before both were spent, and started making mistakes. I had been assured repeatedly that no one ever felt under pressure to increase output, rush work or accelerate productivity. Perhaps. But demining remained a competitive industry with dozens of NGO and commercial firms vying for contracts. A timetable loomed. After eight years and hundreds of millions of dollars, donors were demanding more transparent, measurable returns on their investment, and pondered whether to move on to other priorities in the country or pull out entirely. The work may not be fast, but it's steady.

"In most places we have to go through a long, careful, deliberative process to determine where to focus our limited demining efforts and resources," said Chongo back at the ADP headquarters. "But where a concentration of water is involved, say a well, orchard, or a natural spring? We just know we have to clear it. And we do. There will be a conflict, because everyone wants to get what you free up. But we will clear it."

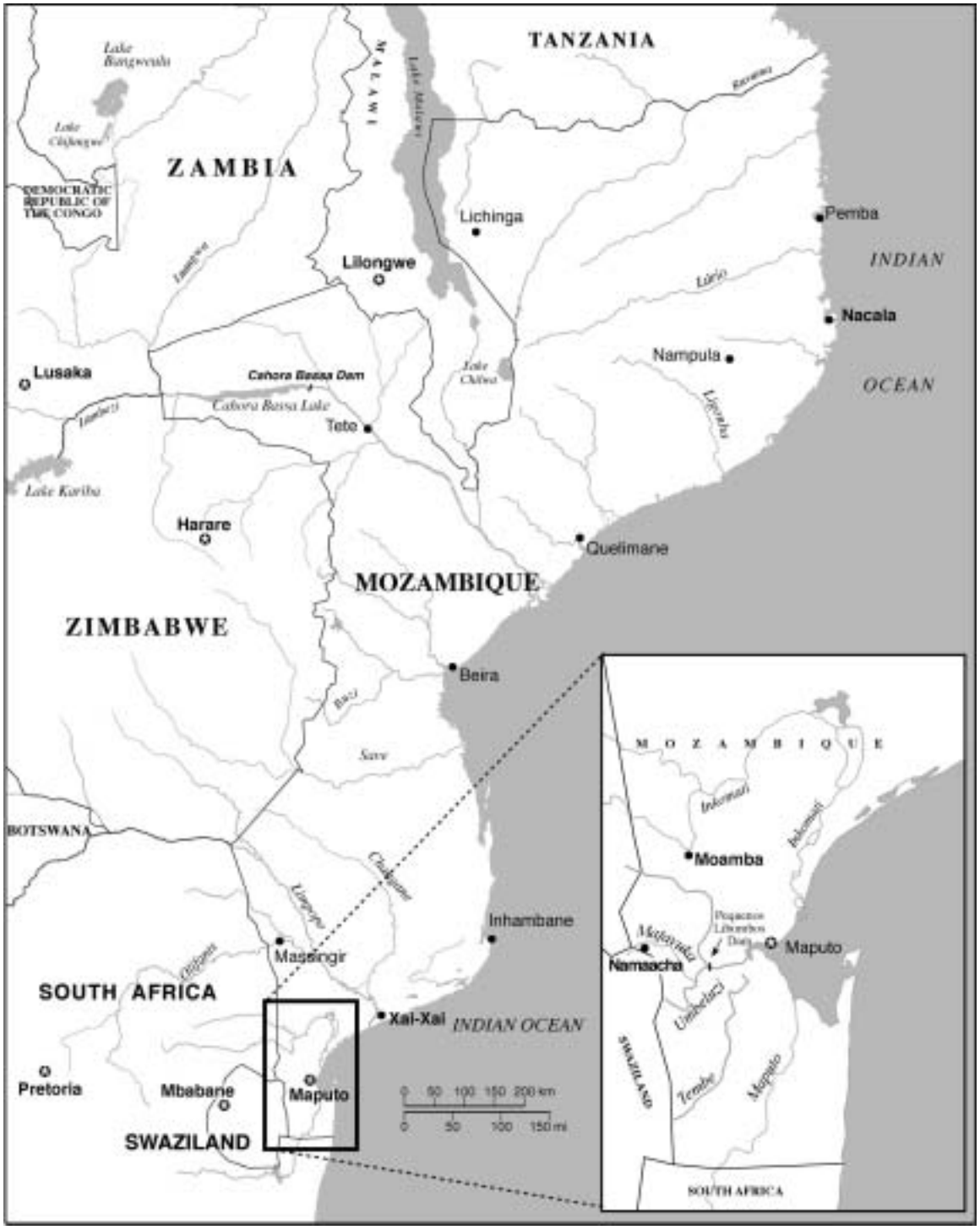
Watch Your Step: *While not all parties can agree on global vs. national vs. regional vs. local priorities for landmine removal, a fine place to start might be the same place the average minelayer started: with water.*

* * *

If water conflict follows landmine removal at the end, it also certainly precipitated landmine placement at the start. Though not an underlying *casus belli*,[3] water scarcity remained a major catalyst or factor of war; access to water often determined how, when and where armies fought each other, how they were supplied, where they moved, who supported them. Inter-and intra-national wars fought for other reasons (colonial independence followed by Cold-War ideology in the case of both Mozambique and Angola) compelled combatants to rank water at the top of their strategic assets. Both sides needed water to win. Both sides did anything they could to deny it their enemy and control it themselves. Without water one was forced to surrender in three days. That's why nations with air superiority, like the US over Bosnia or Iraq, clinically or 'surgically' bomb enemy (and protect allied) water installations from on high. Confined to earth, weaker, less affluent armies must resort to muddier and more septic methods of commanding and controlling water. Enter the land mine.

When Portugal's colonial authorities learned that the Mozambique Liberation Front (Frelimo) was advancing from the Tanzania border in the north, the first thing it

[3] Water scarcity by itself has never led to war in the past. To the contrary, throughout history it appears to induce transnational cooperation and hundreds of treaties, including many in southern Africa and the Middle East.



did was heavily mine Cahora Bassa Dam on the Zambezi River, then other water developments. Several years after independence, with the socialist Frelimo in power, the capitalist-backed Mozambique National Resistance (Renamo) advanced against it from the upstream national borders of South Africa and then-Rhodesia. Frelimo followed Portugal's example and mined Massengir Dam on the Inkomati River. For 16 years thereafter it mined other water infrastructures, large and small, from the Nacala port water pipeline in Nampula province to the urban reservoirs in the south.

To be sure, water wasn't the sole obsession of combatants. Power lines, roads, railways and villages suspected of helping the enemy were also mined by both sides to prevent the enemy from gaining ground. Even trees that offered shade were mined on the assumption that the enemy might later siesta there. Yet these objectives often hinged first on the presence of water: fertile fields became productive farmland because rivers enriched land with silt and water; productivity later attracted roads and other investments.

No combatants ever made or kept maps of their landmine placement. Yet if you lay a modern map of 'suspected mine areas' over a map of 'rivers and water infrastructure,' the overlapping correlation speaks eloquently. Transboundary streams, water points, paths to the

Pequenos Libombos Dam: *Once the focus of a hostile military combat, the mines have been removed from in and around this source of Maputo's water. The struggle has now turned on who controls the water, both within the country, and between Mozambique and upstream Swaziland.*

riverbank, canals, wells, springs, boreholes, bridges, culverts, installations, pipelines, pumps, sources, irrigation projects, water-treatment plants, hydropower plants and of course dams themselves — these may get taken for granted during peace. Their strategic value becomes manifest only during crucible of war, and its aftermath.

En route to and from the minefield, our demining team traversed a rutted road and crossed Pequenos Libombos dam on the Umbeluzi River, the source of Maputo's drinking-water supply. "Renamo mostly offensively mined the roads with 19 types of anti-tank mines, Frelimo mostly defensively mined water and sources such as this," said Issufo, who, like most of the team, has been removing mines for the past nine years as a wartime civilian and peacetime veteran. "Neither side really thought things through," he went on. "Sometimes Renamo forgot, and drove over its own mines. And they [Frelimo] would mine a borehole or well in a borderline village to deny water to the men and horses of the enemy [Renamo]. But in doing so, they would also deny that water, to the villagers themselves. When they left, you can imagine how the villagers felt about that, and where their loyalties turned."

* * *

As we checked progress and performance of the teams, I asked Issufo what exactly the dogs and their handlers were looking for. He took a deep breath and ran through a mental list for an answer: anything and everything. That included, even at this late stage of operations, several hundred thousand anti-personnel land mines and unexploded ordnance. Hand grenades. Mortars. Cartridges. Step-blast mines that rip off feet and splinter tibias. Directional fragmentation or circular 'bounding' mines triggered by tripwires. I plead ignorance about homemade weapons of mass destruction, but while here I have come across a few of Africa's brand-name weapons of selective devastation. "State-of-the-art anti-personnel landmines," I learned, "are designed *not* to kill, but to maim and inflict an unacceptable level of suffering on the enemy and its supporters."

How charming. But who, today, remains the enemy? The Colonial and Cold wars were, officially, long over. In their aftermath an undeclared, new unofficial war had apparently begun. It was being silently waged between locals and hapless refugees — of war, drought, famine, and floods — who 'advanced' into a locally controlled area unknowingly and were regarded as a threatening enemy. If such intentional negligence were a rare problem it would be another unfortunate but bearable African tragedy. But it isn't small or isolated. As I tiptoed through the taped-off blocks, watching the dogs and handlers trace up and down, I multiplied these rows across the country. With 750,000 to 1 million landmines, Mozambique remained among the world's worst cases. Yet even it paled next to the 10 to 12 million in Angola, which is becoming, with Iraq and Afghanistan, the new focus of a vast, globalized demining industry.

That industry is quite profitable, offering contracts worldwide; the UN estimates it will cost $33 billion to

Pandora's Box: *The lethal radius of these harvested and defused devices encompass one or both legs, the genitals, arms, chest and face. According to the December 1991 issue of the* British Journal of Medicine, *'Land mines … drive dirt, bacteria, clothing, metal and plastic fragments into the tissue, causing secondary infections. The shock wave from an exploding mine can destroy blood vessels well up the leg, causing surgeons to amputate much higher than the site of the primary wound. Plastic fragments are difficult to detect by x-ray'.*

Estimated Number of Landmines in Africa's Most Affected Countries

Angola	9-10 million
Mozambique	2 million
Somalia	1 million
Sudan	1-2 million
Western Sahara	1-2 million
Eritrea / Ethiopia	2-3 million

Source: United Nations and US Department of State

rid the world of landmines. Ironically, political momentum against landmines has increased commercial pressure behind this growth industry. Dozens of private commercial firms wanted a piece of the action and kept competing for, and getting, lucrative business in Mozambique, even as they prepared to move on to Angola. Demining here was the mirror image of the arms industry. I knew a South African former military engineer who benefited both ways. He chuckled at the irony of how he was "double dipping," hired once by South Africa to lay mines along rivers two decades ago, and now, a second time, hired by Mozambique to find and remove them. I asked which work was preferred. The response: "Removal is safer and pays far better."

* * *

The clouds broke just enough to let the sun to break through now and then. Handlers continued to methodically send their dogs up and down through 100-square-meter blocks. They worked downwind, or crosswind, but never upwind. The air filled with Dutch commands: "Souk!" "Foraid!" "Bliven!" "Kota!" *Search, forward, stay, heel*. Each taped-off block will be double-checked by the dogs. The dogs might pause at a spot, look back, and sit down. Handlers watched every movement closely. They had to judge expressions and pull the dogs back in case they tried to paw at, or dig, or worse, fetch and return with any objects they discover. "It is simply a game to the dogs," said Issufo. "Only the men know how dangerous it is."

As we watched operations from the middle of the field, I pointed to a few thatch structures that looked to be relatively recent constructions. Turned out they were. One belonged to a man who had planned to sell small items by the road. Others were subsistence sheds, and chicken farms. Each had sprung up after the war; working stands and huts had been built within a few meters of live mines.

I asked, "My god, didn't they know there was a minefield here when they built?"

Issufo smiled ruefully, shaking his head. "They built *because* there was a minefield here."

This took time to absorb. I had assumed that communities always stayed out of such places, and would unanimously welcome deminers with open arms, especially when they restored water or fertile land that had been off-limits for decades. Not necessarily.

"These people, they are crazy," said Issufo. "They said they didn't need us here. They said they knew where the mines were. The man with the shop told us we were jealous of his new business, when we made him leave until demining was finished. Other places, they want to keep the land mines in their area."

Perhaps people were crazy. Crazy like a trapdoor spider. The more I asked and explored, the more I realized I had been blinkered by accepting three logical if simplistic assumptions: that Mozambique's history could be divided neatly into 'past war' and 'current peace;' that communities were primarily underdeveloped victims asking for help from benevolent outsiders; and that mines were universally evil, their removal purely good.

It turned out that the process of 'nuisance' or 'terror' mine placement was rarely as 'random' as it might have seemed at first. Following paths to water, it was a kind of lethal real-estate development. Potential post-war victims — including women and children — were not always been entirely 'accidental.' There was more going on beneath the surface than I realized. After joining crews like this I began to see that the relationship between mines, water and human nature was far more intimate and complex. And far less moral.

Here's why. Ten years after Frelimo and Renamo negotiated a truce, agreed to elections, and gave up their arms in Mozambique, many of those arms remain lost, forgotten — unmapped, but more than likely hidden in plain sight of locals. Those who watched the mines being laid decades ago were not inanimate or stupid. They

Inedible Fruit: *I wondered how hand grenades got their name. Called 'pomme' or apple by some, the seeds, similar to those in open pomegranates, were shards of metal. Millions of such 'unexploded ordnance' and landmines were sown by one side, hoping the other side would 'reap' them. Post-war, the 'other side' became both sides.*

remembered. Their remembrance became information, and information was power. Sometimes landmine information was the only clout a peasant wielded. He or she would warn family and neighbors to adapt to the landmines, and live their lives. They slept soundly two meters away from rows of blast mines. They plowed fields around directional fragmentation mines. They knew to swerve to the middle of roads anti-tank mines were on the edge. At night in unfamiliar fields they simply walked behind their livestock, single file, just in case. At the same time they never forgot those mines as a potential asset, a defensive or protective instrument to be played carefully, and saved for the right economic opportunity.

Over time, information accrued interest. Many of the combatants who laid the mines moved on shortly afterward or were killed, but in any case rarely returned or recognized the overgrown landscape if they did. So the knowledge of a sedentary villager grew in value; it was his 'exclusive.' If only he and his associates knew where mines were, then by default the mined area — river, spring, road, dam, or well-watered farmland — remained for their use only. After the war, if the government wanted to demine an area, it had to prove that it would be in the villagers' political and economic interest, short-term or long-term, to do so. Villagers had to be convinced that, if they magnanimously informed authorities of mine placement, the demined asset (water, land, road etc.) would not later be turned over to others.

Sometimes a mix of persuasion and authority worked. Two years ago, a few dozen kilometers from this minefield, ADP demined a crystal spring. Its waters were pure and local people, with investment funds, then bottled and sold water at a premium. The enterprise has generated dozens of jobs. "This positive socioeconomic impact, the water freed and creating jobs, is how we should measure national demining success," said Chongo, "not in statistics of mines lifted or square meters cleared."

In the north a demining operation targeted a 'macro' goal of securing a main water-supply pipeline run by the Ncala Water Company. To succeed, demining operators had to spend time with the 'micro' community, some of whom originally had helped transport mines to the area. Before the operation could go, forward, villagers had to be persuaded of the benefits of clean water, fertile land, coal production, even limited hunting that would result through removal.

Failure to convince locals of such benefits can produce horrific results. I came across several cases where refugees from other parts of Mozambique (or more recently Mugabe-afflicted Zimbabwe or famine-struck Malawi) crossed into a known mine area. Perhaps the newcomers were equipped with skills, ambition and better education than local villagers. Perhaps they practiced a different religion, spoke a different language, kept different tribal customs. In any case, if the locals did not welcome the perceived competition, they were powerless against numbers, market demand, or official government policy. The only defense they had was information, and many saw no reason to divulge it. Rarely was the issue clearcut, but those who wandered into landmines and were maimed or killed were, unsettlingly often, outsiders. The other side. They entered an area to fetch water, graze livestock, build homes, hunt bushmeat, graze livestock or cultivate land to survive. *But none of the locals warned us the water or land was mined.*

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In hindsight the reasons behind counterintuitive beliefs — like local preference for mines to stay in place — grew obvious. Willy Sutton robbed banks 'because that's where the money was'; people mined riverbanks (or objected to demining) because that's where the water was. Only when you factor in the amorality of survival can you see clearly. You see how, just as rivers traverse artificial borders of 'here' and 'there,' so they also go beyond artificial measures of 'past' and 'present,' and comfortable, stable Western constructs of 'good' and 'evil.' Left alone, rivers are eternal and landmines are forever. Through flood and drought, both work in tandem, transcending time. I couldn't ignore the 8,000 amputees in Mozambique, or the fact that one out of every 470 Angolans has had a limb removed, or that landmines sometimes outnumber people in parts of Lusophone Africa. Nor could I change these facts. Yet by switching from the moral to the amoral perspective, landmines became autonomous tools, ever-vigilant sentinels of field and stream and, therefore, of the people who depend on those limited resources for survival.

Indeed, when stripped of ethical baggage, landmines seemed no more than silent pieces in an ongoing power game, a lethal game of chess. Like chess, distinctions over war or peace blur as much as distinctions of soldier and civilian, good and evil. All is relative. Like chess, parties try to calculate several moves ahead of the other, getting inside the opponent's mind. Like chess, stalemate is a possible endgame. Unlike chess, opponents are more interchangeable than pieces and there are no established overarching rules of win or lose, except perhaps one: control of access to precious water.

Looking at landmines through amoral rivers enables one to recognize how landmines may have saved lives in inundated 2000 by keeping settlements out of floodplains. Or why landmines prove essential to conservation of watersheds. Or the ways landmines may strengthen, empower and cement the local political status quo, while their removal can destabilize entire communities. After nine years of moving up the ranks to leadership of the young demining industry, Florencio Chongo of the ADP reflects on how some communities must be dragged back into demined areas, while others begin cultivation while the crews are still at work. The difference, now that he thinks about, is quite often the degree of water involved. "Every time we clear an area of land mines to improve

Post-War Machine: *The remote-controlled, $96,000 Tempest flails the earth with chains, mostly to clear vegetation but also to trigger the occasional blast mine. Dog teams follow, and ground crews zero in to excavate hotspots. Expensive machines can be helpful, but often miss places, or break down, like this one. And they add political momentum to the de-military-industrial-complex of demining.*

access to water for drinking or irrigation," he sighed, "conflict follows in our path."

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At 10:30 a.m. it was getting late, near the end of the working day for the mine-detection crew. In half an hour we would pack up. By then the nonstop tense concentration would have fatigued dog and handler alike. But as we crossed the field Issufo and I noticed one of the dogs, Brixx, stop, sit down, and look back at his handler. The handler called his dog back out of the taped area to safety, bent to reward it with a blue rubber ball, then rose and shouted at the top of his lungs, "Miiiiiiine!"

My pulse raced. They found one. It was a half-buried Soviet bounding circular fragmentation mine, with a missing tripwire. Now came the tricky part: excavation and 'removal.'

* * *

There are as many approaches to removal as there are models of mines; each requires a fresh look. I visited several storerooms of defused mines and unexploded ordnance. I held unused hand grenades, anti-tank discs the weight of dumbbells, and blast mines the size of hollow hockey pucks. Selling at an average $1 a piece, anti-personnel landmines like these appeared to have generated a brisk and widespread consumer market, with 70-100 different varieties and devices, all notably manufactured *outside* Mozambique or Angola. They're cheap, light, portable, easy to use, and reliable. Best of all, they require no batteries and endure for decades. Until the dogs and metal detectors find them.

To put the next delicate step in context, I sat down over drinks with Ben Blumenthal, regional co-ordinator of the Geneva International Centre for Humanitarian Demining. He was trying to establish a one-man office for the continent, and spoke of the flood tide he faced. "China, Russia, India and the United States are among the leading manufacturers engaged in trade competition for global market share," he said. "Perhaps coincidentally, each nation declined to sign the international treaty to ban land mines. Their leaders claim land mines are a legitimate and effective way to protect their national interests."

Maybe they were. I won't here explore the ethics of deploying landmines, just the pragmatics of their removal. For I had seen how 'national interest' ends at the precise moment the nation wins a war, loses or agrees to a ceasefire. After that, the residual landmines become, *de facto*, 'an effective way to protect the *local* interest.' The top-down, centralized "we're from the government, we're here to help" approach must overcome a credibility gap; some government or hopeful government put the mines there in the first place. Besides, top-down only works with strong, well-organized and well-financed states. That's rarely the case in Africa. Donors have artificially propped up Mozambique's government and economy, but they have also grown increasingly numb to heartrending, emotional fund-raising photos of dismasted poster children. There have been indications many donors are weighing the law of diminishing returns, and looking at exit strategies from demining in Mozambique. Observers fear a withdrawal of funds before the work is completed. "I'm a little bit afraid for here in the years ahead as the funds dry up," Mark Wing, a UN Warrant Officer deployed by New Zealand told me

Three former Terrorists: *I shot these Presidents at a political ceremony in the town of Xai-Xai, right after they proclaimed the Greater Limpopo Transfrontier "Peace Park." The park crossed their boundaries, following the Limpopo River (background), along with the landmines that blocked or aided their earlier shared struggles for power. Their fates were bound by shared past wars, and current legacy. Zimbabwe President Robert Mugabe, right, gestures to an area re-mined by the floods, while Mozambique President Joaquim Chissano and South Africa's Thabo Mbeki (far left) look on.*

as we watched another operation along the Inkomati River. "They might pull the plug before the place has recovered entirely."

That prospect encouraged a quiet revolution within humanitarian demining programs, away from emotive pleas followed by quantitative progress reports, and toward socioeconomic criteria. It looked harder at local needs and capacities, and integrated landmine removal in the context of other development projects. I followed a similar course. In early drafts it was tempting, but would have been self-indulgent, to emote here about my shameful impatience — running late to meet Chongo at ADP headquarters — at the several minutes it took to climb a single narrow staircase behind a man with a prosthetic leg. Or to relate how in the field, arriving at the demining school, I went to greet a man, looking him in the eye and extending my right hand for a handshake before realizing there was nothing but air to grip.

But it grew difficult to single out individuals or situations for pity when the vast majority of Mozambicans were stunted inside or out by something beyond their control: malnutrition, disease, hunger, foul water, floods, poverty. By focusing only on the admittedly horrific humanitarian impact of landmines, NGOs tended to inflate numbers, overstate severity and reinforce the perception of humans as inanimate victims rather than potential partners. They also understated human resilience, like that man who laughed at my awkward fumbling, clapped me on the back, reached out to shake with his perfectly intact left hand, and said, "Welcome to the demining school."

* * *

I'd joined up with this training 'academy' near Moamba to go through the drills, regimen and thought processes of veteran paramilitary deminers. While I was there, section commanders were taking a refresher course. I sat down with men aged 20 to 40, dressed in blue overalls, pants cuffs tucked into boots, who did this for a living, grumbled about the pay and the heavy risks, were secretly happy to have jobs at all and would head to Angola's demining fields in a heartbeat. It was a lonely outpost. Wind rattled the corrugated-tin classroom as teachers reviewed safety requirements. Then we went out to the field to hone mine detection and mine-destruction skills.

I watched while on knees the flak-aproned men cut and inched into the bush, moving a red stick into the uncertain zone, then a white stick behind it once it was clear. Snip, snip. Pluck, pluck. Wave of the metal detector. Dig sideways at a 30 degree angle with a hand trowel. Probe gently with a wire. Identify the object. A bullet. A metal shard. A rusty can. Every bullet, or unexploded ordinance (UXO) is kept track of, logged and sent to a central database for processing and progress reports.

I recalled how stockpiles were concentrated for destruction. "Do you remove the mine and take it to a bunker to be destroyed?" I asked the instructor, Francisco Muloshe.

Mindgames of mine games: *Here a detector's beeps revealed a bullet. To understand the approach to mine removal, it helps to get inside what many described as 'the devious mind of a landmine layer.' As an abstract diversion, devoid of consequences or morality, this proved disturbingly easy.*

"No, no. That's way too risky," he said. The mines are old, rusty and could go off for no reason, at any time. We don't want someone carrying it when it does." Muloshe paused, adding, "Some of the mine removal private companies do. They cut corners to save money on overhead expenses, and increase their profit margin, but they are crazy, or crazy to work for."

Bounding landmines, like the one the dogs found, were dealt with on the spot. Deminers had to detonate them at the site where they had been placed, and, decades later, discovered. Fight fire with fire, TNT with TNT, blast with blast.

Blowing them involved one of two approaches: electric or non-electric. Non-electric required a slow safety fuse, lit with a match, ideally a yard long enabling you five minutes to get away. The demining crews preferred it because it involved less work, but operators didn't like the high cost of materials that could not be used again. Electric blasting involved unrolling a long spool of red and black wires, testing them, then connecting them to

Tools of the Trade: *The equipment of removal is basic and deceptively simple, resembling the kit of an archaeologist, but the strategic approach gets complicated and removal goals require a sophisticated approach.*

disposable safety wires, then yellow detonator cords with silver blasting caps which burn at 7,000 meters per second. The cords are wrapped into and around red TNT-filled charges. Decades ago you might have pushed a plunger to generate the electrical current; now you turn a key in a battery pack.

On the last exercise of my last afternoon, we placed two charges on either side of a 'bounding fragmentation mine.' It had been windy, and we used gestures to each other in the distance to clear the area of people and livestock. Destruction of anti-personnel mines required a safe distance of 150 meters; anti-tank 500-1,000 meters; fragmentation, 300 meters. All cell phones had to be turned off, radios too. The electro-magnetic pulse might accidentally set off a charge. Muloshe tells me the number of deminers has declined since the beginning, from 500 in the mid-1990s to 308 today. "Many, especially those who had been combatants, just couldn't stand it any longer," he said. "Some were dismissed for carelessness." He paused, and added quietly, "Others died."

We fastened the blasting caps and began to walk away from the site. Muloshe turned to me, "You want to blow this one?" My palms began to sweat. I had played with firecrackers and M-80s as a kid. I had watched an obsolete dam blown in a previous job. But I'd never had my hand on the 'plunger,' especially for such an operation. Opportunities didn't come along every day. I leapt at it.

* * *

Since the end of war, Mozambique has had a steep drop-off of injuries, from 800 to 83 per year. This was measurable progress, but the number of mines still at large (especially post-flood) remained unknown, and at some point deminers would be injured as often as civilians. Operations would taper and end. At that point, once again, local communities would bear the brunt of living in proximity with landmines. They were seldom the first or greatest to benefit from mine removal, and rarely determined national priorities. But it may be time to consider creative new approaches, including removing landmines only *after*, not before, an area's political water and land use issues had been settled. Another approach, in Mozambique or Angola, was to carefully follow the locals' oldest and most radical suggestion: do absolutely nothing.

"Do politicians and donors ever decide to keep landmines in place? Just leave them alone?" I asked Blumenthal after my third drink at the bar.

"Definitely," he replied. "Governments might leave them in mountainous areas, deserts, places where people know of them and stay away. Sometimes the decision gets politicized, but doing nothing makes sense in some places."

His answer intrigued me. By again looking through the river or watershed's eyes — what is known as an 'ecocentric' or 'deep ecology' perspective — land mines were ironically the best invention *homo sapiens* had ever come up with. Landmines were horrific for humanity, as close as I had come to a tangible lingering evil. But because of that same physical and psychological terror, placed around rivers they became a boon to nature. The landmined demilitarized zone between North and South Korea, I read, remains a pristine mountain, jungle and

Inch By Inch into the Bush: *Water scarcity often governs the original placement and recent displacement; the former use and current abuse; the political reasons for past deployment and current motivation for employment; the model-type selection and canine scent detection…of antipersonnel landmines.*

wetland habitat untouched by humans for 50 years. The 250-kilometer-long strip is the cleanest, wildest, most biodiverse place on the otherwise vigorously developed peninsula. And here, conservation was the fastest growing industry in southern Africa. Hmm.

Such thinking was anathema, and a slippery slope. But it was too late to stop. True, African landmines maim and kill unsuspecting individual animals as well as humans, but they make the more valuable animal habitat a Garden of Eden. One ardently conservation-minded colonel in the Caprivi Strip mined (and clearly marked) a beloved wildlife sanctuary in order to keep out poachers. Farther north, in the Democratic Republic of the Congo, rhino and elephant thrive only in areas with mines. In Mozambique, several people I spoke with confirmed that one of the reasons some communities (and, off the record, some conservationists) liked landmines nearby was that the adjacent lands attracted a steady supply of animals into the area, for their own exclusive hunting. Finally, pollution or development pressure on rivers was absent wherever landmines were present.

Conservation International chose to spend a portion of its precious financial and human resources on removing landmines along "trans-boundary conservation areas" along rivers and elephant-migration corridors in southeastern Angola. This was clearly a good thing. It will also help measure the mine-impacts of 'peace parks' on peace. Yet its independent consultants acknowledge that removal may bring unintended consequences. It may allow and encourage water exploitation, hydroelectric dams, resource extraction, native-vegetation clearance for agriculture, hunting pressure, resource competition — all the very same forces that conservation groups have to face in the developed, un-mined areas of southern Africa. It may lead to the same set of problems or imbalances that led to conflict and mine-laying in the first place.

* * *

I picked up the ignition box and tested the battery by turning the key and holding it. It felt like a car ignition. The red light went on. I removed the key, inserted the wires: black, then red. I then inserted and rotated the key clockwise. It was live. The light flicked on.

Cool, clean water from a tap never crippled anyone. A child should be able to fetch from well or stream without worrying about stepping on a Chinese Type 72-alpha manufactured metal and plastic hockey puck that will maim her for life.

"*Fugo*!" I shouted. A split second later I saw the dust cloud puff 300 meters away, then heard the explosion. Someone shouted: "Clear!"

As the smoke cleared a minute later, birds resumed their interrupted song. It felt right. And yet I could not escape the realization that by detonating a landmine that had been there for decades, we might have opened a fresh power vacuum on the fertile, well-watered banks of the river. Each blast helped remove a delayed killer, a slow-motion leftover from the deadly battle over independence and ideology. But in ending water's role as a catalyst for combat during the war, we made it the source of a new power struggle during the peace. ❑

Fishermen or minesweepers? *Men near the mouth of the Inkomati River haul in an uncertain catch. Some of the landmines were washed out to sea by the floods in March 2000, becoming accidental water-mines. Because some were airtight, they floated; but it is unknown if any were caught in the nets of fishermen. The vagueness of a landmine's location is integral to its unique form of terror.*

INSTITUTE OF CURRENT WORLD AFFAIRS

Fellows and their Activities

Alexander Brenner (June 2003 - 2005) • **EAST ASIA**
Alex received a B.A. in History from Yale in 1998 and has just completed a Master's degree in China Studies and International Economics at the Johns Hopkins School of Advanced International Studies. He is prepariing for his two-year ICWA fellowship in China with four months of intensive Mandarin-language study in Beijing.His fellowship will focus on the impact of a new government and a new membership in the World Trade Organization on Chinese citizens, institutions and regions both inside and far from the capital.

Martha Farmelo (August 2001- 2003) • **ARGENTINA**
A Georgetown graduate (major: psychology; minor, Spanish) with a Master's in Public Affairs from the Woodrow Wilson School at Princeton, Martha is the Institute's Suzanne Ecke McColl Fellow studying gender and public policy issues in Argentina. Married to an Argentine economist and mother of a small son, Martha has been involved with Latin America all her professional life, having worked with Catholic Relief Services and the Inter-American Development Bank in Costa Rica, with Human Rights Watch in Ecuador and the Inter-American Foundation in El Salvador, Uruguay and at the UN World Conference on Women in Beijing.

Andrew Rice (May 2002 - 2004) • **UGANDA**
A former staff writer for the *New York Observer* and a reporter for the *Philadelphia Inquirer* and the Washington Bureau of *Newsday*, Andrew is spending two years in east-central Africa, watching, waiting and reporting the possibility that the much-anticipated "African Renaissance" might begin with the administration of President Yoweri Museveni. Andrew won a B.A. in Government from Georgetown (minor: Theology) in 1997 after having spent a semester at Charles University in Prague, where he served as an intern for *Velvet* magazine and later traveled, experienced and wrote about the conflict in the Balkans.

Matthew Rudolph (January 2004-2006) • **INDIA**
When work toward a Cornell Ph.D. in International Relations is finished, Matthew will begin two years as a Phillips Talbot South Asia Fellow looking into the securitization and development of the Indian economy.

Matthew Z. Wheeler (October 2002-2004) • **SOUTHEAST ASIA**
A former research assistant for the Rand Corporation, Matt is spending two years looking into proposals, plans and realities of regional integration (and disintegration) along the Mekong River, from China to the sea at Vietnam. With a B.A. in liberal arts from Sarah Lawrence and an M.A. from Harvard in East Asian studies (as well as a year-long Blakemore Fellowship in Thai language studies) Matt is also examining long- and short-term conflicts in Burma, Thailand, Laos and Cambodia.

James G. Workman (January 2002 - 2004) • **SOUTHERN AFRICA**
A policy strategist on national restoration initiatives for Interior Secretary Bruce Babbitt from 1998 to 2000, Jamie is an ICWA Donors' Fellow looking at southern African nations (South Africa, Botswana, Mozambique, Zambia and, maybe, Zimbabwe) through their utilization and conservation of fresh-water supplies. A Yale graduate (History; 1990) who spent his junior year at Oxford, Jamie won a journalism fellowship at the Poynter Institute for Media Studies and wrote for the *New Republic* and *Washington Business Journal* before his years with Babbitt. Since then he has served as a Senior Advisor for the World Commission on Dams in Cape Town, South Africa.

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