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Just Below the Surface: Environmental Destruction and Loss of Livelihood on an Indonesian Atoll

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Early one morning in March 1992, I was sitting at my desk, getting ready for another day of fieldwork on the remote and generally peaceful Indonesian island of Balobaloang, one of dozens of coral islets scattered near and far along the coast of South Sulawesi. Lost in my thoughts, I was startled by the sound of a distant bomb going off. Running out of my house and down to the shore, my next-door neighbor, a military officer posted to the island, sensed that I was off to find the source of the sound. He waved to me and pointed in the direction of a fishing boat just beyond the edge of the reef flat.

"They are bombing for fish," he explained.

"What?" I exclaimed.

"They threw a bottle bomb from the boat." He looked at me and then back out at the boat rocking back and forth in the distance. "The bomb goes off under water and stuns the fish. Then they swim and dive to gather the fish. They catch a lot all at once in this way."

Although I knew very little about blast fishing at that time, I understood that it was highly destructive to the aquatic environment. In fact, the fishermen had dropped the bomb in a place where I often snorkeled, captivated by the luxuriant variety of colorful and exotically shaped corals and tropical fishes.

"Isn't that illegal? Why don't you stop them?" I wanted to ask the officer, but thought better of it. I was, after all, an American graduate student and guest of the Indonesian government and the local villagers. I was living on the island for a year and a half to study navigational knowledge and practice among the island's ethnically Bugis seafarers, long renowned across Southeast Asia as deep-water navigators and interisland traders. I had been trained as an anthropology student to be a "dispassionate observer," and I had been warned by my local host that I should stay out of politics or risk being asked to leave the country before my research was completed. In 1992,

Indonesia was still ruled by President Suharto, a former army general who held dictatorial control of the military and country and who allowed little dissent. No, challenging an army officer would not be a good idea. After a few more minutes observing the blast-fishing boat, I took leave of my neighbor and went back to my house to finish preparing my list of questions for that day's fieldwork.

I had been on the island for nearly a year by then, and I did feel comfortable asking those villagers with whom I felt closest about the blast fishing. During that time, it became clear to me that many of them were concerned about the practice, but no one dared speak out about it. I learned that blast fishing was only rarely practiced by the villagers of Balobaloang, and that the blast fishers came from other islands. Just before leaving the island for my return to the United States, I took a telephoto picture of a boat whose crew was gathering up fish stunned by a bomb they had detonated. I gave this photo to a trusted friend who had grown up on the island and had moved to the capital city of Makassar, where he was employed as a civil servant. He said he would show it to people and not reveal its source, but, as far as I know, nothing ever came of this.

After completing my doctorate and assuming a teaching position at Ohio University, I returned to Balobaloang in 1997 and again in 2000 to record the life histories of several retired senior Bugis navigators. On those occasions, I stayed in the home of Pak Razak, the captain who had first brought me to Balobaloang aboard his then new 40-ton *lambo*.[1] One morning in 2000, we were standing on the front deck of his house and were startled by the sound of a bomb being detonated beyond the reef flat opposite his house. Without being asked, he offered that this was, indeed, blast fishing and that its occurrences were increasing at a troubling rate, destroying the fishery near the island, and forcing village fishers to travel great distances to find enough fish to feed their families and sell to neighbors.

Further discussions with Razak and others revealed that the local fishers had been forced after more than nine years of destructive fishing to give up their indigenous and ecologically sustainable dugout boats equipped with outriggers and powered by paddle. Now they fished from narrow plank boats inspired by Western designs. Larger than dugouts and powered by diesel engines, these boats, called *joloro'*, are capable of traveling far enough from the island and covering enough ground to make fishing more profitable.

Disturbed by what I now saw as an attack on the very lives and livelihoods of the people who had been my gracious hosts and friends for more than a decade, I returned to the United States and made plans to spend my sabbatical year studying the impact of destructive fishing practices on the people of Balobaloang and the marine environment surrounding the island.

My plan was to carry out ethnographic research among the local fishers and their families, learning all that I could about their knowledge of the sur-

rounding reefs and marine life as well as the technologies they employed in foraging for fish and other marine life for subsistence and trade. I would also record their stories of the history of destructive fishing in the area and their responses to it.

I would not be doing this alone. I was joined by graduate students from Ohio University and Hasanuddin University, Makassar. One team from both schools carried out a survey of the health of the surrounding reef, while Amelia Hapsari, an Indonesian graduate student in Telecommunications at Ohio University, produced a "participatory" documentary video, one that allowed the fishers and their families to tell their own story about the impact of destructive fishing practices on their own lives.

In Indonesia as elsewhere, bombs used for fishing are made from plastic drinking bottles filled with explosives illegally obtained on the black market.[2] Such a bomb is tossed from a dugout into a school of reef fish. The dugout is quickly paddled away while the weighted bomb sinks to a predetermined depth and explodes. The fishing boat then moves in and divers using "hookah" rigs and goggles descend with empty sacks to collect the stunned and dead fish. They then load the fish aboard the boat and take them to a nearby island to be dried before taking them into port, or, if they are close to port, the fish will be ice-packed aboard the "mother ship" and sold "fresh" in local markets and restaurants.

The major long-term destruction from blast fishing, beyond the killing of juveniles and noncommercial species (or "by-catch"), results from the impact of the explosion on the corals that comprise the reef. Recall that corals are huge colonies of tiny living organisms called "polyps" of the class Anthrozoa and the hard "skeletons" they create around them. These corals provide the foundation for complex marine ecosystems and are homes to hundreds of species of fish and other marine life. When a bomb explodes on or above a coral reef, it smashes the coral skeletons to bits, killing the polyps and leaving only coral gravel behind. Because this gravel shifts with the waves, no new colonies can establish themselves, and the area can no longer support abundant life.

While blast fishing yields dead fish for local markets, potassium cyanide is used to drug valuable reef fish so that they can be easily captured alive and without injury for international markets, where they wind up as dinner in high-end restaurants or as pets in saltwater aquariums. Fishermen dive with plastic bottles filled with potassium cyanide solution, squirting it into holes and crevices in the coral where the targeted fish live. The fish then drift out and are kept alive in floating nets or holding tanks until they are picked up by the "mother ship" and taken into port. Meanwhile, the poison kills any polyps with which it comes into contact as it drifts with the current. This "bleached" coral is essentially dead, and, while new polyps may eventually recolonize the old substrate, these bleached skeletons are fragile and easily destroyed by strong waves or, in the worst cases, subsequent blast fishing. And even if corals aren't destroyed, breeding stocks of fish such as

groupers are often wiped out by cyaniders who have learned that these and other fish return to their birth places to spawn at the same time each year. When cyaniders return to the spawning grounds year after year for several years, whole generations of adult fish are lost, and eventually there are no more young fish being born at those locations. Interestingly, several fishermen on Balobaloang told me that grouper are "lazy feeders" when they are spawning; the effect is that they are highly unlikely to be overfished using traditional weighted hand lines with baited hooks.

On the island of Balobaloang, I was told, blast fishing was practiced up until about 1990 but only at times when large quantities of fish were needed for weddings, circumcisions, and other ritual events where large numbers of people were expected to be fed. On one occasion in the 1980s, a local fisherman was caught and arrested for blast fishing by the police officer stationed on the island; in those days, such an arrest meant a promotion and salary increase for the police officer and shame for the perpetrator and his family. Since then, I was assured, no one on Balobaloang has made a living from either blast fishing or cyanide poisoning.

By the early 1990s, however, fishermen from other islands, nearby and distant, began to exploit for profit the rich fishing grounds of the Sabalanas with both explosives and cyanide. Because key materials are illegal and, thus, expensive and hard to obtain, and because it is difficult for an individual to get his own larger catch to market, those who practice destructive fishing usually work for a patron, referred to locally as a *pongawa* or *bos*. Such patron–client relationships have a deep history in Southeast Asian social organization (see, for example, Scott 1979; Errington 1989; Pelras 1996; Robinson 1998; Chozin 2008). In this case, I learned over time, the boss provides, on credit, the needed illegal materials, as well as other fishing equipment. He also pays the requisite bribes to the police and other local officials to protect the fishermen from being arrested; if someone gets arrested and their boat impounded, the boss will pay the judge to have the case dismissed. The boss also buys the fish from the fishermen, taking out a large percentage of the profit plus payment on the debt. While the fishermen may freely enter into these arrangements, because of their ongoing indebtedness to the boss, it is often hard for fishermen to terminate the relationship.

When we arrived in September 2003, the first thing my wife and I set about was having a small house built in the village on the island's oceanward side. This would be our home and house for other researchers for the duration of our stay; later on it would become a research center for studying Sabalana Islands coral reef management. While it was being built, I began work with my longtime research associate and principal of the village elementary school, Supriady Daeng Matutu, interviewing local fishers in order to learn about their fishing knowledge and practices, past and present.

About three weeks after our arrival, I was sitting on the porch of our temporary home on the south side of the island, looking out across the exposed reef flat. Preoccupied with getting our own house built but anxious

to start my research, I spotted a dugout and some men fishing just beyond the flat. I picked up my camera and notebook, and ventured out to learn all I could about what these men were doing. As it turned out, there were four men, one pair fishing with a net from the dugout and the other pair diving for fish with home-crafted goggles and spear guns. Because I was on foot, I could only stand and watch both operations from the edge of the flat. After a time, however, the latter pair of men emerged with fish on their spears and more in a dugout they had anchored while they fished, one of them inviting me to photograph their catch and shouting proudly, "and we caught these with our own hands, not with bombs!" These two men, Mama' and Saleh, were among only about ten men on the island of about six hundred residents who made their living entirely from fishing. Within the following few weeks, I got to know more of them through conversations, interviews, observations, and participation aboard their fishing boats. I will now introduce a few of them and their individual stories as fishermen.

A close neighbor of both Mama' and Saleh, MuLammadong, better known as "Dadong," started fishing full time around 1985 when he was in his mid teens. Unlike his neighbors, Dadong never fishes with spear guns nor gathers other sea products like trepang.[3] Rather, he relies almost exclusively on the commonly used weighted hand lines of monofilament wound onto homemade wooden spools. Like others, when setting out in his boat to fish the reefs, Dadong first trolls for baitfish with homemade aluminum lures while heading for favorite spots, usually next to a patch of corals where specific species of fish are known to congregate during certain seasons. If the fishing looks promising, the anchor is dropped onto the sandy bottom and the boat is allowed to drift over the corals. Often, boats will join one or two others from the village, fishing near one another for a time and even sharing bait. If the fish are not biting, the boats will, one by one, move on to other areas.

While others like Saleh and Mama' prefer to fish for anywhere from several hours to up to three days at a time, depending on their fishing success, Dadong often goes fishing for up to three weeks before returning home. On these occasions, Dadong sells fresh fish to villagers on another island and dries the rest for subsequent sale to an agent after returning home; the agent then carries the fish to Makassar for resale. Others, like Saleh, prefer to carry their own baskets of dried fish into port aboard local trading ships, cutting out the middleman and realizing higher profits.

While at their peaks the east and west monsoons bring high wind and waves, Dadong will set out any time of year when the weather is good. When he first started fishing in the mid-1980s, fishermen usually needed only to travel to the edges of nearby reefs in dugouts powered by paddle and sail to secure large catches (see Figure 24.1). However, with the growing use of destructive practices by outsiders since the early 1990s, those fish stocks have been rapidly depleted, forcing Dadong and others to travel farther and farther across the Sabalanas in diesel-powered *joloro'* to ply their

Figure 24.1. Fishing from a dugout or *lépa-lépa.*

Figure 24.2. Fishing from a *joloro'.*

trade. Where once it took a dugout up to twenty-four hours to travel across the Sabalanas to reach the island of Saregé, 30 nautical miles from Balobaloang, Dadong can get there in just four hours in his *joloro'*.

With the reduction in travel time came much larger catches per trip, and while fuel prices have risen dramatically in recent years, so has the price of fish. So, until the use of blast fishing and cyanide poisoning became a common occurrence and spread to the far reaches of the Sabalanas, Dadong and others were, for a while, still realizing reasonable profits. Still, they understood that blast and cyanide fishing were driving them further and further from the island and that the entire fishery was rapidly being destroyed.[4]

Why, I wondered, in the face of this wanton destruction of their precious resource, hadn't the people of Balobaloang stood up against the blast and cyanide fishermen? Over several months of interviews and participation with them onboard their boats, local fishermen gradually revealed the history of their attempts to halt the destruction and the extensiveness of the corruption that blocked change.

The first thing I learned in 2003, after I had begun my research project of fishing, was that the majority of blast fishermen in the area came from nearby Sumanga' Island, while fleets of cyaniders traveled nearly 100 nautical miles to fish the Sabalanas from their home island of Lai Lai, just off of the coast of Makassar. While these were different operations run by separate bosses in Makassar, the cyaniders parked their boats at Sumanga' and got fresh water there. This relationship had evolved because while both bosses paid protection money to the village head living on Balobaloang, shares were distributed to the local leader on Sumanga' as well as the resident police and military officers. While only a decade earlier they had resided on the main island of Balobaloang, both now chose to reside on Sumanga', out of sight of the residents of Balobaloang, who had made it clear that they were opposed to the practice and wanted it to stop.

Initially, Dadong and others had hoped that, as in the past, the police would enforce the law if they had the evidence presented to them. Thus, a few years earlier Dadong boldly stole cyanide from the boat of one of the offenders and took it to the police as evidence, hoping they would lock up the illegal fishermen. Instead, due to endemic corruption among government officials, Dadong was threatened with arrest for possession of an illegal substance. Reluctantly, he dropped his case and returned to Balobaloang to fish rather than face possible prison time himself.

About a month after Dadong told me this, a boat carrying ice and a crew from Sumanga' detonated a bomb just a few hundred yards offshore from our house, not far from a spot where villages had recently begun a small reef rehabilitation project.[5] This had been the first bombing in a while in the area. A few people sat on the beach and watched, and a couple of dugouts from Balobaloang went out to share in the spoils by gathering fish that were floating dead on the surface. I had a hard time understanding this,

wondering again why villagers just looked on without protest and even took advantage of the situation.

Later, in an interview discussion with one of the local fishermen, I was told that as far as the bombers from Sumanga' were concerned, all one has to do is paddle out and ask them to not come so close to the island. This is what he and others had done on the south side: they explained that previous bombs had shaken and cracked the concrete walls and tall minaret of the village mosque, and the bombers agreed to stay away. As fellow Muslims, they consider the mosque a sacred place and one that cost the villagers large sums of money to build and maintain. As for the larger question of why they didn't impede blast and cyanide fishers from elsewhere, I was told that several years earlier, men from Balobaloang had boarded a boat from Lai Lai whose crew were fishing with cyanide and told them to leave the area. The captain agreed but went back on his word and simply continued sending out divers with cyanide. Angered by this, the villagers reboarded the boat and towed it to the adjacent island of Sabaru, where they discharged the crew and burned it. When the rest of the fleet returned to Lai Lai with their story, the *pongawa* was outraged that the authorities on Balobaloang and Sumanga', whom he had paid off, hadn't prevented this act of aggression. In retaliation, he sent word to the captains of the trading ships from Balobaloang, who were loading cargos in the harbor at Makassar, that should they try to leave the harbor, he would burn and sink their ships. Pragmatically, it makes sense that the value of a large ship laden with valuable cargo is many times that of a simple fishing boat, and that the act of destroying a cargo ship would immediately deprive the families of the owner and crew of their livelihoods. Seen another way, a ship owner had far greater political and economic power than the owner/operator of a small fishing boat. However, when the captains of the cargo ships went to the police, they said that there was nothing they could do; their superiors were already on the payroll of the *pongawa.* Thus, after several days of negotiations, the *pongawa* "forgave" the villagers on the promise that the ship owners and village leaders would never again allow the villagers to interfere with his operation.

By now, I was identifying with the fishermen who had been blocked at every turn from saving the reef and their livelihoods, not to mention that a major source of nutrition for all the villagers was being depleted. With the help of colleagues in the city, I met with an officer in the maritime police who appeared to be incorruptible and who had already led several sting operations against illegal fishing operations. As zealous as he was in his desire to end destructive fishing in South Sulawesi, he simply lack the money he needed to launch more than two or three raids per year. And, even with these sting operations, perpetrators and their boats had been released from custody by local judges who were in the pockets of the bosses. He did, however, manage to carry out one operation, capturing the mother ship with a

cargo of live grouper from the Sabalanas to Makassar. Covered on television news and in local newspapers, this event delighted the villagers with whom I spoke, but, understandably, did not overcome their lack of trust in the system. What it did accomplish was to rid the area of cyanide fishers for several weeks.

Soon after this, Amelia Hapsari, a graduate student and videographer from Ohio University, came to Balobaloang to produce a participatory video with the villagers.[6] Hapsari, a native of the city of Semarang on the island of Java, had never been to such a remote part of her own country, and, as an urban, middle-class ethnic Chinese, had to work hard to develop rapport with the relatively ethnocentric and class-conscious Bugis villagers. Inspired by the work of Paulo Freire, an influential Brazilian educator and philosopher, Hapsari believed that if oppressed people were provided the opportunity to tell their own story, they could start the process of becoming liberated from their oppression.[7] She was determined, therefore, to involve villagers in every major decision regarding the video, starting with the subject matter. This did not take long; after the second open meeting, it was clear that the fishermen and even several ship owners who were not allied with the village head wanted her to document the lives of the fishermen and the destructive fishing practices that were increasingly making life harder for everyone on the island.

By her shear dedication and risk-taking (she even traveled aboard a local fishing boat on a choppy sea to film a blast fishing operation and interview the fishermen aboard their boat while the fish were being loaded on board), Hapsari was soon able to gain the trust of many villagers. In the process, we learned about yet another obstacle to resolving the problem. Standing opposed to the "individualism" that Americans, in particular, take for granted as "human nature," most Indonesians have traditionally placed greater value on social "harmony" (Geertz 1961; Mulder 1996; Tobing 1961). This, in itself, is a complex idea and one that expresses itself in a variety of ways. In this case, we were immediately warned against inviting villagers to "go public" by discussing the problem of illegal fishing on a film that would later be viewed and commented upon by other villagers. By doing so, we risked upsetting the social harmony of the village and the complex web of social relationships upon which villagers rely to ensure that, no matter what, their material and social needs are met. Operating together with "patron–client" relationships, this meant, for example, that a fisherman who needed a loan to repair or buy a new boat or engine could go to a ship owner with the understanding that should the ship owner subsequently require help, he could rely on the fisherman and his family to provide it. For example, if the ship owner eventually needed assistance with a wedding celebration for his child, he could rely upon the fisherman and his kin to provide fish, help build the wedding stage, and prepare the food for the guests. Because almost everyone in the village was related to one another either by blood

or marriage, and many had relatives scattered across the Sabalanas, including on the island of Sumanga', openly criticizing or accusing any particular individual patron could tear at the very social fabric that held the small society together.

Hapsari and I saw this ethic of reciprocity or "sharing" manifesting itself in many ways among the fishermen themselves. For example, aboard local fishing boats, if the captain caught many fish while someone else caught few or none, the captain always shared part of his catch with the other fisherman. If, however, the accompanying fisherman had a particularly good day, he would share his catch with the captain to help defray the cost of fuel. Less benign than this, when blast fishers came close to Balobaloang, they always shared some of their catch with village fishermen, thus obligating them to put up with the destruction they were causing. And, on a larger scale, the village head could claim that if it were not for the bribes that he and other officials accepted from the bosses, he would have to raise revenue to build and maintain infrastructure—or to simply float a fisherman a needed loan—through taxation of the catches of the village fishermen.

It is all the more surprising, then, that in spite of this ethic, people did speak out, asking Hapsari to take the video to the mainland to show it to the authorities, believing that once they had the evidence, the authorities would feel compelled to intervene. Even after she had done so and had shown them footage of the noncommittal responses of the authorities, many villagers were pleased that their voices had finally been heard. When I returned to Balobaloang in 2006, the rapidly escalating cost of fuel, coupled with the reduced fish stocks, had forced at least one fisherman to take his family and move to an island further south where, it was said, laws were enforced and fish were more plentiful. By now only seven full-time fishermen remained in the village, but they and other villagers were happy to see an edited version of Hapsari's video. Still hopeful that it might force the government to act, they asked that it be broadcast on national television. I promised them that I would convey their message to Hapsari.

However, when Hapsari, herself, returned to the village a few months later to gather footage for the final cut of the video, she felt the full brunt of the ethic of harmony and sharing when none of the fishermen who had earlier spoken out on film allowed her to film follow-up interviews. Off camera, Dadong said that he could no longer participate in the project because he was afraid the village head would see him as a *pagar makan tanaman* or "fence eating the crops" (someone who is insincere, taking [from] both sides), saying on camera that the leaders were receiving bribes from the *pongawa* but then going to the village head to ask for money. He affirmed, however, that he and others like him who had little capital and wanted to remain independent would neither join the blast or cyanide operations and become bound by debt to the *pongawa,* nor would they buy larger trading ships and take on the responsibility, as patrons, of guaranteeing the livelihoods of crew

members and their families. He said that he and others had to decide carefully when and where to fish so as to not waste expensive fuel. Finally, he said he would continue to fish and, perhaps, explore other technologies such as mariculture (raising fish in enclosures in the ocean), and he believed he could remain an independent fisherman through ingenuity and hard work.

Across Indonesia—indeed, around the world—people and communities are facing grave and complex challenges to their lives and livelihoods. Whether we obtain our food by foraging on land or at sea, farming, and/or buying it in a shop or supermarket, in our daily choices each of us helps to collectively transform our environment at an ever-accelerating rate. These transformations, in turn, both limit and create future opportunities for procuring sustainable livelihoods.

For the people of Balobaloang, the choices seem rather limited at this point. As much as many of the residents would like to create a just and sustainable fishery, choices made by more powerful government officials have continually frustrated local efforts at resolving the growing environmental crisis facing them and their neighboring islanders. Traditional values of harmony and sharing help bind this community together, while global capitalism assumes that economic progress is the result of individual competition in a free market. With increasing demand for seafood in regional and world markets and lack of enforced regulations, fisheries like those surrounding Balobaloang are rapidly being depleted and even destroyed. In the meantime, stories like these are increasingly focusing international attention upon the need to foster sustainable fisheries and curtail the destruction of coral reefs worldwide. In Indonesia as elsewhere, this increased attention is forcing governments to respond with new regulations and development projects. However, even if fisheries can be saved and, over time, restored, questions remain as to whether people like Dadong, Saleh, and Mama' will be able to continue to rely on fishing as a sustainable source of livelihood for themselves and their families and as a source of sustenance for their neighbors.

NOTES

1. *Lambo* are a type of cargo ship that is used by petty traders across eastern Indonesia. Built according to traditional construction techniques and European design, they are powered by both sails and auxiliary diesel engines (see, for example, Southon 1995; Ammarell 1999).

2. An explosive mixture of ammonium nitrate fertilizer and kerosene plus detonator, and wick. To learn more about blast fishing in this region, see Chozin 2008.

3. Trepang (*Holothuria* spp.) are also know as sea cucumbers or sea slugs. They are gathered from the reef, dried, and sold in local markets or exported as an expensive delicacy.

4. As of 2006, the price of fuel was so high and the catches so small that Dadong and others were experiencing significant losses in spite of their hard work, and several men had either moved away or stopped fishing and found other work.

5. Funded and organized by a visiting graduate researcher from Ohio University, villagers had constructed and launched a small cement "reef ball" to provide substrate for new coral growth and habitat for fish.

6. The video *Sharing Paradise* was recently released by Documentary Educational Resources.

7. *Pedagogy of the Oppressed* by Paulo Freire was first published in 1968 and has sold more than 750,000 copies to date. Freire has widely been recognized as a founder of what has come to be known as "critical pedagogy" and "liberation theology."

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