CREDIT: SIMRON SINGH

Simron Singh had earned a reputation as a top expert on the Nicobarese. Then disaster struck, and Singh made a fateful decision: to ditch any pretense of objectivity and help rebuild their culture and their lives

After the Tsunami: A Scientist's Dilemma

BANGKOK—Two days after a massive tsunami pummeled southern Asia in December 2004, a message picked up by shipboard radio reached Simron Jit Singh at his parents' home in Lucknow, India. It was from Rasheed Yusuf, a close friend in the Nicobar Islands, a little-known archipelago a few hundred kilometers from the earthquake that triggered the tsunami. The news was bad: "Central Nicobars entirely washed out. … Do something as soon as possible."

Singh, a human ecologist and anthropologist at the Institute of Social Ecology in Vienna, had spent the previous 5 years chronicling the indigenous Nicobarese. He lived among them for weeks at a stretch, earning their trust and gathering a wealth of information. Now the society itself seemed to be slipping away: Out of a population of 30,000, about 4500 had perished in the tsunami; another 5000 were missing and presumed dead. Nine of every 10 homes on the 24-island chain were reduced to splinters. The islanders' economic lifeblood, coconut palms, was virtually wiped out. Most insidious, nearly every artifact—irreplaceable ossuaries and other relics preserved for generations—had been washed away.

The tsunami left the numbed survivors at a crossroads. Leaders were torn between either trying to restore their cultural identity or accelerating a fitful integration with the outside world in which many Nicobarese had already adopted Western clothing and other trappings of modern life, from television to pop music. Tribal elders sought the counsel of an outsider they knew they could trust: Singh.

That left Singh facing his own moment of truth. Until then, he had remained loyal to the scientific creed of minimal intervention. Yes, many research subjects had become friends and confidants. And yes, his work was influencing their lives in subtle ways. Now, however, the Nicobarese were asking Singh for much more: to cross the line between observer and participant and help make decisions that could determine whether the islanders would retain centuries-old traditions as a facet of their rapidly changing lifestyle.

It didn't take Singh long to decide. He flew to the Nicobars in late January 2005 and, since then, has assisted the islanders in restoring their culture and reshaping their economy. "He has literally single-handedly brought to the world's attention the cultural, social, and economic plight of the Nicobarese," says Mahendra Shah, a sustainable-development expert at the International Institute for Applied Systems Analysis (IIASA) in Vienna. Shah and others applaud the path Singh chose. "He could not in good conscience do anything else," says Pernille Gooch, a human ecologist at Lund University in Sweden.

Singh had looked into his heart and knew, he says, that "I really had no choice."

Listening and learning

Singh, 36, became involved with the Nicobars by chance. His first project as a student at Lund in the mid-1990s had been a study of the Van Gujjars, a tribe of nomadic buffalo herders in the Himalayas. Then one day in 1998, an Indian historian tracked him down at a Van Gujjars camp and urged him to study the Nicobarese. He was intrigued.

Working in this remote community, Singh learned, would not be easy. Many Nicobarese view outsiders with suspicion—for good reason. They have been host to a series of unwanted visitors. Situated on the trade routes between India and East Asia, the archipelago was colonized by Denmark in 1756, then by Austria, and finally by Great Britain, which held the Nicobars until India's independence in 1947; they are now formally part of India. But it remained a "marginalized society that few people had heard about," says Gooch.

To protect the indigenous peoples of the Nicobar Islands, as well as those on the Andamans to the north, India places strict controls on outsiders' access. Singh has Indian nationality, which helped him get a research permit, but he had to promise not to divulge any information deemed sensitive to Indian security. Yet his nationality was also a liability: The Nicobarese are wary of Indian traders on the islands. What's more, tribal elders held scien-

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Culture shock. A young man tests his mettle against a tethered pig in a festival on Chowra Island in 2001 (*left*). The same spot, viewed from a different angle, is shown here after the 2004 tsunami.

tists in low esteem. When Singh visited in April 1999, the first impression of Ayesha Majid, chief of Nancowry Island, was "that he was just like other people who come, hear, write, and leave." Singh spent 2 months on nearby Trinket Island and promised to come back. "We were rather sure that he wouldn't," Majid says.

Singh's return dumbfounded the Nicobarese. "After nearly a year, we see Simron walking towards my home with a black bag on his back and a smile on his face," Majid says. "His respectful behavior touched us all." She says he would partake in raw fish and pork with the islanders, observe ceremonies even in the dead of night, and quiz them "endlessly" about their culture and traditions.

Singh kept returning, season after season, fascinated by a "very rich" culture preserved by limited contact with outsiders on some of the islands. He witnessed unique traditions, such as the annual pig festival, *Panuohonot*, which features a coming-of-age rite in which young men prove their valor in hand-to-hoof combat with pigs, and an ossuary celebration, *Kinruaka*, in which ancestral bones are dug up and reburied. Singh learned how heavily the Nicobarese depended on coconuts. A third of production was reserved for raising pigs, which grew extra-fat on the oil-rich diet. "To be a Nicobarese means to have pigs. The more pigs you have, the better off you are," Yusuf says.

For his thesis at Lund University, Singh explored the social metabolism of Trinket, unraveling the island's life in a monograph, *In the Sea of Influence*. "It's a thorough political, economic, and environmental history of these forgotten islands," says Joan Martínez-Alier, president of the International Society for Ecological Economics and a professor at the Universitat Autònoma de Barcelona in Spain.

The more Singh got to know the islanders, however, the more he worried about their future. Long before the tsunami, he decided they needed better links to the outside. Tensions between Nicobarese and ethnic Indians over land use and trade were likely to worsen over time, he felt. And the one-dimensional coconut economy made the Nicobarese "very, very vulnerable," says Yusuf. "We needed an alternative economy."

Singh concluded that the more information the Nicobarese had, the better armed they would be to make decisions about their future. He helped arrange invitations from Vienna and Lund for Yusuf to visit Europe. The trips were eye-opening, says Yusuf, who was one of the first Nicobarese to visit a foreign land and now handles external affairs for the tribe.

Privately, Singh had reservations about his evolving relationship with the Nicobarese. With his supervisor, Marina Fischer-Kowalski, director of the Institute of Social Ecology, he discussed whether he should wrap up his research in the Nicobars and move on. "Many things I was doing, I wouldn't tell my colleagues," Singh says. "It was bad. I was intervening."

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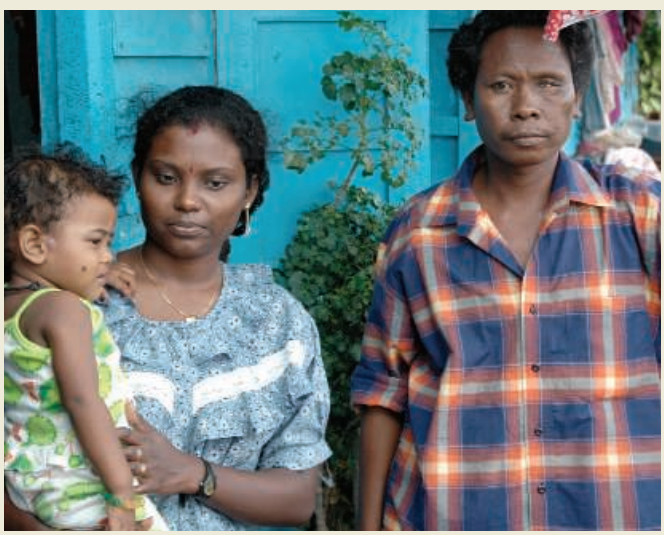
Fond farewell. Simron Singh (*far left*) receives a traditional sendoff—a smearing of coconut oil on his forearm and a garland of banana leaves—from a Nicobarese leader in Pilpillow village on Kamorta Island last April.

Isolate or Engage? Indigenous Islanders Pose Challenge for India

NEW DELHI—Three hours by air from this metropolis are a few societies of ancient lineage: the Nicobarese (see main text) and five other indigenous tribes of the Andaman and Nicobar islands, two of which still pursue a hunter-gatherer lifestyle. The Indian government is grappling with how best to protect these fragile cultures: whether to sharply limit their contact with outsiders or slowly integrate them into modern society.

"The approach we take does not promote complete isolation nor does it advocate complete integration, but a middle ground," says V. R. Rao, director of the Anthropological Survey of India in Kolkata. "Any policy on the Andaman aboriginal groups should allow them a large measure of independence in choosing their own future," adds Sita Venkateswar, a social anthropologist at Massey University in Palmerston, New Zealand, who has studied one tribe, the Onge, for several years.



Remembrance of genes past. Like others of their tribe, this Great Andamanese family has assimilated into modern society.

Indeed, the tribes themselves are largely setting the pace of integration. At one extreme is the Sentinelese of tiny North Sentinel Island in the Andamans. This group, estimated at 100 individuals, may be the last culture in the world maintaining a Stone Age lifestyle, according to the Tribal Welfare Department of the Andaman and Nicobar Administration (ANA). Contacts are virtually nil. "We know about wild tiger numbers in India but don't know the exact population of the Sentinelese," says Vishvajit Pandya, an anthropologist at the Dhirubhai Ambani Institute for Information and Communication Technology in Gandhinagar, who has studied the Onge and the Jarawa.

The Sentinelese prefer isolation. A friendly contact occurred 15 years ago, when an ANA team sailed to the island bearing gifts of cloth, coconuts, and bananas. But that overture was criticized by civil society groups on grounds that the tribe, which had not sought contact, should be left alone to prevent risks such as introduced diseases.

Since 1991, ANA has enforced a hands-off policy toward the Sentinelese. The only exception was a mission to check on how they fared in the 2004 tsunami. When an Indian Air Force helicopter flew over the island, it was greeted with a barrage of arrows and turned back. Then last January, two fishers entered the waters of North Sentinel Island, reportedly to poach crabs. They were allegedly slain and buried in the sand, says Samir Acharya, president of the Society for Andaman and Nicobar Ecology in Port Blair, the Andaman capital. Police exercised restraint by not pressing charges or venturing into Sentinelese territory to retrieve the bodies, Acharya says.

But other tribes are reaching out. The Jarawa, once hostile like the Sentinelese, began to visit ethnic Indian communities in 1998, sometimes seeking medical assistance. Their benign forays pose a challenge for the government: Heightened contact may erode tribal culture, whereas a hands-off approach would be difficult to sustain and justify, particularly when medical aid is sought. The government has since established a health outpost bordering Jarawa settlements.

Prodded by Indian courts, ANA in December 2004 declared the Jarawa reserve "inviolate" and set measures to protect it from further encroachment. Human-rights and environmental groups are not satisfied, however, and petitioned the Supreme Court to force the government to cocoon the Jarawa and other tribes from the outside world; a verdict is expected soon. "On paper, India's policy is … one of the most advanced on isolated peoples anywhere in the world," says Stephen Corry, director of Survival International, a London-based nonprofit organization that promotes the welfare of indigenous peoples and is not involved in the legal action. However, he contends, if authorities do not stiffen enforcement of a no-go zone around Jarawa land, "the Jarawa will not survive."

The other four Andaman and Nicobar tribes—the Onge, Great Andamanese, Shompen, and Nicobarese—are all assimilating into modern society. Last year, a mitochondrial DNA study of Great Andamanese and Onge individuals in *Science* suggested that these peoples could be the oldest surviving human stock in Asia (*Science*, 13 May 2005, p. 996). The tribes are "a gold mine of ancient, undiluted genetic information," says Lalji Singh of the Centre for Cellular and Molecular Biology in Hyderabad, who led the work. But these living links with humanity's past are fraying. The Great Andamanese, who are said to have been 10,000 strong at the end of the 18th century, are down to 20 individuals, and the Onge number only 98. **–PALLAVA BAGLA**

Wolfgang Lutz, an IIASA demographer and leader of IIASA's World Population Program, recalls Singh's quandary. "I remember well discussing with him in 2004 whether this unique culture … should be left entirely alone or whether there is a case for introducing some of the usual development measures such as health care and education," Lutz says. "It was evident from the past experience of many other populations that even the most 'benign' interventions, such as helping to reduce child mortality, in the long run will change the living conditions and therefore also the culture," he says. "My personal preference as a scientist was to restrict our role mostly to observation."

The tsunami, Lutz acknowledges, "made such considerations obsolete."

Cultural annihilation

When the magnitude-9.0 earthquake jolted the Nicobars in the early morning of 26 December 2004, Yusuf was among a group on Nancowry Island who retreated to the beach to keep clear of buildings in case of aftershocks. That's when he says he noticed the sea receding. "I told people to run. There was a hill nearby," Yusuf says. Thanks to Nancowry's favorable geography—it has high ground, and other islands shielded it from the full brunt of the waves—just one person on Nancowry died in the tsunami.

Other islands in the chain were not as fortunate. Some are so low that the waves washed right over them. Trinket, the site of Singh's in-depth study, was carved into three islets. The chief of the tribal council requested Fischer-Kowalski to allow Singh to travel to the Nicobars immediately and stay for a few months. "In this situation, it had little to do with scientific roles but was rather a matter of human reciprocity," Fischer-Kowalski says. Other colleagues preached caution. "We told him, 'The tragedy is

CREDIT: PALLAVA BAGLA

too large; you are only one young expatriate academic with not much influence in India,' " says Martínez-Alier. "We also said, 'Think of yourself.' He did not."

When Singh arrived at the end of January 2005, he was confronted with utter devastation. Most survivors were living under tarpaulin shelters. And their cultural heritage had been obliterated. All but two *kareau*, carved wooden effigies bearing ancestral bones, were gone. "We can bring back pigs," Yusuf says. "But the bones are lost."

Exposed to new ideas—and the elements. Nicobarese children in a makeshift school at a relief camp on Kamorta Island.

To the rescue

Back in Vienna, Fischer-Kowalski was rallying institutional support. Klagenfurt University, which oversees her institute, spearheaded a fundraising drive for reconstruction. Under the auspices of Caritas Austria, a Catholic relief agency, and Universal Music Group, which donated the proceeds from sales of a CD recorded to support tsunami victims, the university set up the Sustainable Indigenous Futures (SIF) Fund to support self-rehabilitation efforts of indigenous peoples affected by the tsunami. And the Austrian Science Fund stepped up to bankroll a scientific assessment of sustainable development in the Nicobars.

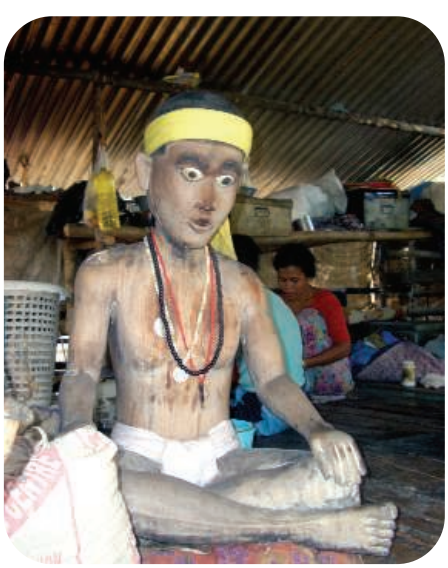
Many colleagues applaud Singh for taking on these responsibilities. "As I see it now, there is no dilemma left for the scientist at this point," says Lutz. Singh, he says, is "bringing the best scientific information available to the attention of the local decision-makers" as they plan for reconstruction of homes and other infrastructure. "Disasters happen daily to some of the peoples we study," adds Martínez-Alier. "I ask myself why it does not happen more often that social scientists turn into advocates."

Last September, Singh's institute and the SIF Fund hosted six Nicobarese tribal leaders. Colleagues took them to Austrian villages rebuilt after the disastrous floods of 2003. "These were villages with 900 years of history," says Singh. "We wanted to show them that no matter how difficult the ordeal, you don't ever have to give up your culture."

To help reconstitute the islands' cultural heritage, Singh is drawing on an extraordinary resource. The Museum of Ethnology Vienna has more than 200 Nicobarese artifacts collected in the 19th century—in the wake of the tsunami, one of the largest collections in the world. Some objects will be lent to the Nicobarese and copies of others manufactured. "These remind us of our way of life and will help us preserve it," Yusuf says.

Other momentous changes are on the horizon. The Indian government, pending approval from the defense establishment, may open the Nicobars to expanded trade and tourism. The Nicobarese "aren't saying they want to live like museum pieces," Singh says. But they don't want to lose their identity by integrating fully with the outside world. "What Simron is doing that's so special," says Brian Durrans, deputy keeper in the British Museum's Asia Department, "is a combination of refusing a patronizing 'isolationist' option while encouraging the Nicobarese to become their own advocates. It's a pretty inspiring approach in conditions of sudden catastrophe."

Singh is also advising the Nicobarese on how to diversify their economy, which had been based almost entirely on swapping or selling coconuts and coconut products for goods from ethnic Indians. Before the tsunami, Singh says, the Nicobarese were "not prepared" to shift away from a reliance on coconuts. Now they understand that it will take years to restore the palm groves. In the meantime, they expect to derive income from fishing and garden plots.



All the more valuable. One of only two *kareau*, effigies bearing ancestral bones, that was not swept away by the tsunami.

CREDITS: SIMRON SINGH

Singh, who returned to Vienna in May after a 2-month stint in the Nicobars, says the latest challenge is helping the islanders learn the value of money. Recently, each family received cash compensation from the Indian government. The money has been burning a hole through the tribal pocket, as islanders pay two or three times the going rate for everything from motorcycles to DVD players. "The accumulation of capital is rare, if not unknown," Singh says. "It's the major problem at the moment."

The jarring transitions have driven many young Nicobarese in search of a better life to Port Blair, the relatively developed capital of the Andaman Islands. "I fear that the younger generation might turn their backs on us," Yusuf says. Samir Acharya, president of the Society for Andaman and Nicobar Ecology in Port Blair, believes a mass exodus is unlikely. He says that conversations with a few dozen young Nicobarese in Port Blair suggest they are "all likely to go back to their respective villages." Nevertheless, most experts agree that the Nicobarese culture is hanging by a thread. The situation, says Gooch, "is really grim."

Now Singh has reached another crossroads. At the moment, he does not know whether to return to the role of detached observer, turn toward advising the Indian authorities, or continue with reconstruction projects. Singh's colleagues are confident he will choose a noble path. "He'll do the right thing," says Gooch—as a scientist and as an advocate.

–RICHARD STONE

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