

innovations

TECHNOLOGY | GOVERNANCE | GLOBALIZATION

Special Edition for the Skoll World Forum 2009

Social Entrepreneurship: Shifting Power Dynamics

Lead Essays

President Jimmy Carter The Hope of Our Future World

Paul Farmer Three Stories, Three Paradigms, and a Critique

Cases Authored by Innovators

Matt Flannery Kiva at Four

Mark Plotkin Changing the Landscape of Power

Karen Tse From Fear to Hope
commentary by Kenneth Neil Cukier

Bunker Roy Empowering the Rural Poor to Develop Themselves
commentaries by John Elkington; Martha Stone Wiske

Martin Fisher Income is Development
commentaries by Paul Polak; Julia Novy-Hildesley; Eric Simanis & Stuart Hart

Analytic and Policy Articles

Brian Trelstad Simple Measures for Social Enterprise

Alex Nicholls Learning to Walk

J. Gregory Dees Philanthropy and Enterprise

FEATURING SKOLL SOCIAL ENTREPRENEURS

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Organization of the Journal

Each issue of *Innovations* consists of four sections:

- 1. Lead essay.** An authoritative figure addresses an issue relating to innovation, emphasizing interactions between technology and governance in a global context.
- 2. Cases authored by innovators.** Case narratives of innovations are authored either by, or in collaboration with, the innovators themselves. Each includes discussion of motivations, challenges, strategies, outcomes, and unintended consequences. Following each case narrative, we present commentary by an academic discussant. The discussant highlights the aspects of the innovation that are analytically most interesting, have the most significant implications for policy, and/or best illustrate reciprocal relationships between technology and governance.
- 3. Analysis.** Accessible, policy-relevant research articles emphasize links between practice and policy—alternately, micro and macro scales of analysis. The development of meaningful indicators of the impact of innovations is an area of editorial emphasis.
- 4. Perspectives on policy.** Analyses of innovations by large scale public actors—national governments and transnational organizations—address both success and failure of policy, informed by both empirical evidence and the experience of policy innovators. The development of improved modes of governance to facilitate and support innovations is an area of editorial focus.

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Changing the Landscape of Power

Innovations Case Narrative:
Amazon Conservation Team

Rainforests are disappearing more rapidly than ever—but not as quickly as indigenous cultures are being disrupted and destroyed. At the Amazon Conservation Team (ACT), we see the survival of these two—the culture and the ecosystem—as inextricably linked, so we call our effort to protect them “biocultural conservation.” Key to the ultimate success of this process is improving our indigenous partners’ ability to meet many challenges—to their cultural integrity, their worldview, their resources—on their own terms. Such a process can entail everything from protecting forest species to knowing the potential uses of those plants and animals. If native peoples are to make informed decisions, it is imperative that we help them understand the value and potential value of the species they know, as well as their healing techniques and diagnostic approaches, the products of their organic agriculture, and much more.

At the ACT, we have tested an array of strategies. Some haven’t worked, but two have been extraordinarily successful. One is ethnographic mapping, a partnership program with indigenous peoples to teach them to map, manage, and protect their own lands. The second is the Shamans and Apprentices Program, which creates ways to pass on traditional healing knowledge and practices to younger generations. We hope that this wisdom will some day benefit the tribes as they deal with the outside world, and perhaps scientists will uncover new, potentially useful plant-based medicines, should these tribes ever decide to commercialize their products. But that option will not exist unless the knowledge is passed on.

Mark Plotkin is the co-founder (with Liliana Madrigal) and president of the Amazon Conservation Team. Plotkin received the San Diego Zoo Gold Medal for Conservation (1993) and the Roy Chapman Andrews Distinguished Explorer Award (2004). Time magazine called him an "Environmental Hero for the Planet" (2001) and Smithsonian magazine hailed him as one of "35 Who Made a Difference" (2005).

Plotkin and Madrigal are 2008 recipients Skoll Award for Social Entrepreneurship.

This case narrative was written for, and appear first in, the Innovations special edition for the Skoll World Forum, 2009.

Medicines from Nature

The following are just a few examples of current and potential medicines that come from nature:

- The rosy periwinkle, a native of southern Madagascar, is the source of six different anti-tumor alkaloids, which are effective in treating and curing childhood leukemia.
- Statins, like the drug Lipitor, are effective treatments for lowering cholesterol. The single most widely prescribed drug in the last thirty years, Lipitor and the statin class of drugs are derived from fungi.
- Blood anti-coagulants occur naturally in the saliva of leeches and Amazonian vampire bats. Every species seems to have its own set of anticoagulants!
- Curare alkaloids, used by the indigenous peoples of the Amazon as blow-dart poisons and derived largely from the moonseed family, have revolutionized abdominal surgery.

My personal research has focused on the plants and peoples of the northeast Amazon, an area that straddles the borders of Brazil, French Guiana, Guyana, Suriname, and Venezuela. Like all rainforest plants and peoples, they face ever-growing threats from climate change, missionaries, deforestation, the encroachment of the outside world, and other factors. My work is threatened every day by the disappearance of existing species, and of cultures that have, over centuries, developed a wealth of knowledge about the possible uses of these species.

ETHNOBOTANY AND MY FIRST TRIPS TO THE RAINFOREST

In 1974, I dropped out of the University of Pennsylvania's program in molecular biology; it was too far afield from my interest in nature, by which I mean whole organisms rather than their constituent pieces. Within a year I had taken a menial job at the Museum of Comparative Zoology at Harvard in order to be closer to the objects of my fascination and passion. A few days after I started the job, a friend suggested that I take night school courses to earn college credit while I worked in the museum. So I enrolled in a class on the botany and chemistry of hallucinogenic plants, which was taught by the father of ethnobotany, Richard Evans Schultes. Schultes worked alongside many of the most eminent names in biology at Harvard, and the department itself was filled with famous explorer-researchers. I worked among extraordinary scholars like E. O. Wilson and Stephen J. Gould—it was like being in Florence during the Renaissance! Although I was usually just a laborer, making display cases and packing animals in formaldehyde, I reveled in the stories of adventure and discovery these scientists told.

Without question, Schultes was the most fascinating of them all: in 1941 he had gone to the Amazon for a six-month trip and ended up staying for 14 years! He immersed himself in native cultures and catalogued more than two thousand previously unknown plant species. The Indians had shown Schultes the power and potential of these plants, and in the decades that followed his work, these chemi-

cals would influence everything from our understanding of the human psyche to rock music. Completely under the sway of this extraordinary personality, I fell in love with the Amazon and its rich treasure of plant species, and learned of the enormous need to preserve this at-risk region.

In addition to instructing his students on the botany of the Amazon's flora, Schultes had made it his purpose to imbue us with a sense of the value, beauty, and fragility of the rainforest ecosystem and of the indigenous peoples who are a part of it. His most pressing warning to us was about the great dangers facing the rainforest and its cultures. It left a firm impression on me, and I finished that class with the certainty that I had found my life's work.

I finally had my first opportunity to visit the South American jungle in 1979, when Russ Mittermeier, an Amazonian field biologist at Harvard, invited me to assist him on a research expedition to French Guiana. There he intended to search for an endangered crocodylian, the black caiman. I jumped at the opportunity. Within months, I found myself in a small dugout canoe, searching out these giant reptiles that were much longer than the boat I was in! I was terrified, feeling like an hors d'oeuvre on a toothpick, but also exhilarated by our discovery. I detailed this search in my first book, *Tales of a Shaman's Apprentice*.

I soon returned to South America on my own, this time to Suriname (formerly Dutch Guiana), the culturally diverse coastal nation that is excitingly rich in unique species and traditions. I went there on the advice of guides I had met on the expedition with Mittermeier, who had advised me to visit the jungle society known as the Maroons (and earlier as Bushnegroes). Descendants of escaped slaves, the Maroons had established a West African society in the jungles of the northeast Amazon. In the centuries since their forced immigration, they had acquired a deep sensibility about the power of the plants that surrounded them in the jungle. Guided by Fritz von Troon, who would become a close friend and companion, I ventured deep into the jungle by river to study the Maroons' use of local species.

Fritz took me through the jungle to demonstrate different kinds of herbs and their healing potential, and the types of latex that had once provided a decent income for the Maroons. I witnessed traditional healing firsthand when I saw a young boy, ill and weak, cured of a serious ailment in a shamanic ceremony held upriver from the Maroon village. I was dazzled by the local people's curative techniques, an impression Fritz validated. The Maroons know a lot, he said, but the Indians know much more. "*Na boesi, ingi sabe ala sani,*" he said, "in the jungle, the Indian knows everything." I realized that to further immerse myself in the potential of jungle plants, I would have to return to the rainforest and learn from the Indians themselves.

The year was 1982, and I returned to Paramaribo, Suriname, amidst a tide of rebellion, as Cuban mercenaries supported the leftist government and quashed the strong opposition. Eager to get away from politics and into my intended destination in the jungle, I went to a small airstrip, where a bush pilot agreed to take me to a village near the Brazilian border. A three-hour flight over pristine rainforest

brought me to a small airfield in a jungle clearing. The pilot, not even turning off the engine, gave me only one warning as I extracted my meager possessions from the plane: stay away from the women, or face the poison-tipped arrows of the men.

As the small Cessna departed, I gathered my belongings and headed for the neighboring village of the Tirio Indians. A young man approached, and moved to help me with one of my bags. He spoke to me in Sranan Tongo: "I am called Koita." He began walking toward the village, my bag slung over his shoulder. Gathering my remaining things, I followed. My first stop would be at the hut of the village chief, where I would have to ask for permission and assistance in my research on the local plants and the natives' use of them.

The chief, I had been warned, was a Christian, converted by missionaries who had entered the country about a decade earlier. I soon discovered he was perplexed at my desire to learn about his native ways. He had been convinced that the white man's practices and medicines were far superior. In only a few years, traditions had been abandoned and the shamans, once respected members of the tribe, had been relegated to the margins of the culture. I explained to the chief in terms he would accept that, like Saul or David in the Bible, I had come to chronicle the tribe's traditions. I would write down the practices of the shamans, including their ceremonies and their healing uses of plants, and would provide the document to the tribe as a compendium of their history. The chief accepted. Koita, who had led me to the leader, would guide me through the jungle and the practices of the village, and introduce me to the elderly shamans.

For several weeks I remained in the village, meeting and working with several individuals who would influence me for years to come, as I returned to the region several times a year. Among my favorites was Akoi, a member of the Sikiyana tribe and a transplant into the village after his own was destroyed. He claimed to have killed over 20 white men, not to mention his own son-in-law, and Indians from several neighboring tribes—a fact that the Tirios repeatedly confirmed. After a decade of denying he knew anything about plants, medicines, poisons, or shamanism, he revealed that he was one of the Paramount Shamans. When I asked why he had spent so long telling me otherwise, he smiled and said that he had been playing a joke on me—and taking over ten years to deliver the punch line!

My first foray into the land and worldview of the Amerindians continued, as I further immersed myself in the culture and wisdom of the tribes. Meanwhile, I had obtained my undergraduate degree from the Harvard Extension School and a master's degree in forest science from Yale. This helpful step put me on the road to learning more languages, as well as economics, sociology, anthropology, botany, and public health in the context of the natural world. I went back to Harvard, taking a research position with my mentor Professor Schultes, and worked under a research grant from the World Wildlife Fund (WWF) while earning my PhD from Tufts University. Once Schultes retired, I took a job with WWF as director of plant conservation, and moved to Washington, D.C. Meanwhile, I returned to the Amazon at every possible opportunity, documenting indigenous plants and taking

a special interest in the toxins, called curare, that the Indians used to poison the tips of their arrows.

But soon I could see that the Indians' culture was disappearing ever faster. Edicts put in place by missionaries and enforced by village chiefs banned certain behaviors and even traditional dances and music, marking these practices as the "old ways" and making people see them as hindering progress. Indigenous cultures were being disrupted and destroyed through contact with the outside world, while the overall picture for rainforest conservation itself grew more dire. Population growth was spiraling out of control, multinational companies continued to encroach on indigenous lands, and forests were being cut down. As an ethnobotanist, I could see the connection between the deterioration of jungle cultures and the jungles themselves. By neglecting the critical role that native peoples played in preserving jungle plants and animal species, the conservation community was fighting a losing battle.

1988-1995: CONSERVATION INTERNATIONAL,
SHAMANS AND APPRENTICES, AND THE BEGINNINGS OF
AMAZON CONSERVATION TEAM

Ethnobotany takes a holistic approach to conservation and provides ample proof of how well indigenous peoples know and utilize the rain forest. The conservation community has been slow to acknowledge the importance of the ethnobotanical perspective of rain forest preservation and utilization, instead focusing on what Russ Mittermeier called "charismatic mega-vertebrates": those appealing creatures like pandas and monkeys that have been the poster children for the conservation movement. That focus cannot convey the potential importance of species and ecosystems. And, as an ethnobotanist privileged to see and experience so much of this firsthand, I believe both plants and indigenous peoples have to be factored into the equation as well. Unfortunately, most people are not intrigued by plants, but you cannot save the animal unless you also save the plants it feeds on. And useful plants—potential cures for so-called incurable diseases—can attract an even wider audience. Throughout the tropics, the most pristine tracts of remaining rainforest are typically strongholds of indigenous culture; in other words, where you have forests, you have Indians. More important, from the viewpoint of conservation, where you have Indians, you have forests. Indigenous peoples have spent generations coexisting with their surroundings, living off of them while sustaining a fragile ecosystem (usually) by not overhunting its creatures or exhausting its soil. The beauty of ethnobotany is that it brings people into the forest picture, showing that tribal peoples can help provide us with answers about the best ways to use and protect the forest.

When I first entered the Tirio village in 1982, I promised the chief I would present him with the record of my work. Almost a decade later, I gave him the manuscript—the record of all my research, documenting in hundreds of pages the jungle plants I had encountered and their use by the Tirio. The chief was sufficient-

ly impressed, and the village council deemed this tradition important enough to implement a program to translate my research into the native language. The elderly shamans who had taught me were enlisted to pass this knowledge on to the next generation.

This is how the Shamans and Apprentices program was born. Conserving the ethnobotanical knowledge among the Tirio and ensuring that it was passed on by the Indians to the Indians was the key to success. After my stint at WWF, I worked for Conservation International in Washington, D.C., but decided I wanted to be part of a smaller organization wholly devoted to biocultural conservation. With Liliana Madrigal, a cofounder of Conservation International, I established what was then called the Ethnobiology and Conservation Team. We launched Shamans and Apprentices programs in Argentina, Australia, Colombia, Costa Rica, and Mexico, in addition to the already successful effort underway in Suriname. The work was not only a way of preserving the ethnobotanical knowledge of all of these cultures, but also fit under the heading of larger efforts to preserve lands by preserving the cultures who lived there. Furthermore, it was an appropriate and sustainable mechanism operated effectively by the people themselves. After a few years, it was evident that a small organization could not be highly effective in such a widely dispersed geographic area, so we decided to focus on the Amazon. Hence the name, Amazon Conservation Team.

MAPPING, GOVERNANCE, AND PARTNERSHIPS

Our commitment to helping protect Amazonian lands first and foremost for those who live there has taken many forms. Creating projects according to models that are both replicable and sustainable for and with native peoples inevitably falls back on a process of trial and error. The Shamans and Apprentices program is one of our major successes. Another success, now one of ACT's most definitive efforts, is our program in indigenous mapping. It didn't happen in some eureka moment, but instead grew out of a request from the Indians themselves. Still, this approach has power far beyond anything we had envisioned. What started off as a request from one tribe has snowballed into a successful effort involving over 25 different groups. However, the project itself has come to encapsulate all of ACT's essential goals, rolling into a single endeavor the nurturing and continuation of native tradition, land and resource use, and indigenous rights, and the conservation of the life-giving treasures of the Amazon. Through it, indigenous peoples in the Amazon recognize their own wealth more fully and use cutting-edge technology to reinforce their own culture; it has created a paradigm that lets them relate to the outside world on their own terms and better determine their own destinies.

The project began in 1995, at about the same time that we became the Amazon Conservation Team, when the chief of the Tirios came to me with a request that we map the Tirio lands. Gold miners and other outsiders had begun to show up in the region, and in order to protect their land against encroachment, the Tirios had approached the government to demand title to the region where they had always

The Mission of the Amazon Conservation Team

At the Amazon Conservation Team, we firmly believe you cannot protect rainforests without Indians, and you can't protect Indians without rainforests. Working in partnership with indigenous peoples to protect their forests, their waterways, and their healing knowledge, ACT plays a role in the larger effort to conserve the world's tropical ecosystems by specializing in the Amazon cultures and their relationship with the rainforest. Twenty-five percent of the Brazilian Amazon is indigenous lands, while only five percent is found in national parks. Giant organizations like the World Wildlife Fund, Conservation International, and the Nature Conservancy spend hundreds of millions of dollars and have a major focus on protected areas.

Certainly, this kind of work is critical to the ongoing conservation effort, but it's only part of the equation. The single most effective way to preserve the type of rainforest that indigenous people inhabit is to involve them in the conservation process, engaging them by demonstrating the vested interest they have in preserving the tremendous resources that this ecosystem has to offer. Ultimately, it's the best bang for the conservation buck, and is the single most efficient and cost-effective approach in existence. This arrangement is a win-win for all parties involved. For decades, indigenous people around the world have been presented with false choices: between traditional lifestyles and moving to the city to live like the white man, between breechcloths and iPods, between shamanic wisdom and a house with a garage in the city. Pushed off their land or intrigued into the city by a deceptive image of a better life there, many indigenous populations move to urban areas, thinking they're moving up the social ladder. Anybody who's been in the tropics and has seen the slums that surround every major city knows how unlikely that is. The options that drug dealers present to Amazonian youths in their areas of origin are just as bleak: cartels entice them into poorly paid, illegal, and dangerous positions within the industry where they have little prospect of making any money.

For all these reasons, it is a far superior approach for them to develop their pride and a sense of where they fit in the world economic system, and to thrive based on their knowledge, agriculture, and medicine. ACT helps local peoples to make informed decisions and deal with the outside world on their own terms, allowing them to put money in their pockets or breechcloth based on things that reinforce the culture: agriculture, handicrafts, medicine. Showing the population of the Amazon the possibilities inherent in the resources they control, and helping them to utilize these resources in a sustainable manner that will ensure that they continue to provide for their futures is fundamental to ACT's endeavor to preserve the rainforest and the cultures that have so much to offer.

Government

The Amazon Conservation Team has helped to change the landscape of power through its projects that sustain the wealth of shamanic wisdom and through its ethnographic mapping programs. ACT has helped to build new partnerships between indigenous peoples and South American governments, in addition to assisting them in making informed choices about their cultural and environmental destiny. Providing all sides with a better understanding of the other parties at the negotiating table and of their own potential contributions has given everyone involved a vested interest in preserving the rainforest and the people who inhabit it. Changes in outlook from all sides have contributed to this progress. On the part of South American governments, new partnerships are now flourishing as indigenous peoples assert their rights and work in a truly collaborative spirit with local and national governments.

Meanwhile, governments have begun to recognize the potential benefit of working in cooperation with these native peoples. Throughout their relationships, governments have often been seen as whiners the tribes that are demanding to keep their land: after all, why would 2000 people want a piece of land the size of Belgium? These same officials, though, have come to understand the value of partners living on their borders, who are their eyes and ears in previously unmonitored swaths of territory. No one knows these lands better than their residents, who live at the headwaters of the countries' rivers and are the first to know of illicit airfields responsible for running controlled goods like drugs or guns into and out of the country. Criminals who once operated outside the government's control will have a harder time working under the radar of authorities responsible for protecting the public good.

This scenario should continue to advance as native peoples, employed as park rangers to monitor and protect Amazonian rainforest areas, come on the payroll of the state and enhance the enforcement of existing laws. Given the revenue-producing potential of these areas in new sectors like ecotourism and hydropower, as well as existing industries such as commercial fishing, this is a more valuable pursuit than ever. Power structures have also begun to change on

lived. The government responded with a request for a map—an unfamiliar concept for the Tirios. They were able to compile a simple hand-drawn map, but wanted us to take it to the next level. Faced with the chief's request to provide a map, I suggested that instead of making it for them, ACT would train them to make it themselves.

Of course, we didn't invent indigenous mapping. It has been done in Canada and the Congo, and throughout the world on behalf of First Nations peoples asserting their rights. One unique aspect of our effort, though, was our insistence all along that the Tirios make their own map. Furthermore, we would invite neighboring tribes to observe the map-making process so they could learn how to do it.

the village level, undoing decades worth of cultural destruction caused by culturally-insensitive missionaries and returning the village's determination back to its residents.

Traditionally, villages of only a couple dozen people, all part of the same extended family, were the typical demographic in the northeast Amazon. However, missionaries began to gather people into larger villages and anoint a paramount chief in order to proselytize more effectively, pushing both religion and Western culture. This process had two deleterious effects: it centralized the power structure in one person, with whom diamond mining companies and loggers would deal exclusively, and also pushed aside the shaman, nominally the wisest man in the tribe, in favor of Christian teachings. This separation of church and state had served the tribe well for centuries, and as a part of the Shamans and Apprentices program, the shaman has returned to sitting at the right hand of the chief.

A notable indication of the changing power structure's effect on outsiders' access to resources occurred just last year, when diamond miners approached a chief with a contract to extract minerals from their lands. Pressured by the company - told that this was the one chance to provide jobs for his people - the chief signed the contract without consulting other village members. When they heard about this, the indigenous cartographers trained by ACT approached the chief about the agreement he had signed. (ACT had no part in encouraging them—this all happened very quickly.) Cognizant of the destruction that unsupervised mining would entail and empowered to protect their resources, the indigenous cartographers demanded that the contract be frozen until the village members could discuss the matter. In fact, they threatened to depose the chief if he took the money because it would threaten the tribe's self-determination and collective benefit. The chief backed down, the villagers reviewed the contract, and it was torn up. The Indians themselves, passionate about their land, culture, and forest resources and newly empowered to have a part in its fate, made their own informed choice.

As such, the map became much more than just a document that charted boundaries and the geographical landmarks within it.

We took the first step, and made the map and management plan with an organization called Native Lands. They had extensive experience in Central America and were also experts in neotropical indigenous mapping. We then brought in the Surinamese government as partners in the project; this made the mapping effort an alliance-building exercise as well. We then invited a neighboring tribe to observe. Seeing what the Tirios had accomplished, they asked us to map their lands as well! We suggested that they instead approach the Tirios and learn directly from them.



Indigenous cartographers from the Trio and Wayana peoples of southern Suriname sit to input way-points gathered during an expedition to update the original map of their lands in southern Suriname, which cover 22.5 Million acres.

We did this again and again, until 20 million acres of indigenous lands had been mapped and were being managed and protected better than ever before. University of California geographer Bernard Nietschmann once said, “More indigenous territory has been claimed by maps than by guns . . . [and] more indigenous territory can be reclaimed and defended by maps than by guns.” ACT has certainly observed this in the years since our first ventures into cartography. Our mapping program, now largely headed by ACT staff members Vasco van Roosmalen (in Brasil) and Gwen Emanuels Smith (in Suriname), has seen many of these maps become legal documents. Indigenous peoples are staking their claims and effectively stopping outsiders from encroaching on their territory by simply engaging in and relying on the legal system already put in place by the government. This is clearly a step in the right direction.

For ACT, working in the field of mapping has fit in perfectly with our mission: as part of the cartographic process, native peoples find out precisely where resources are located. Furthermore, this enables them to reject the false choice presented to them of either maintaining their traditional ways or entering the modern world. Instead, they see the great value of their traditional ways expressed in terms congruent with that of the modern world. How cool is it when shamans



Members of the Ikpeng tribe in Brazil's Xingu Indigenous Reserve celebrate the creation of the first participatory ethnographic map of their ancestral lands..

learn to work with Google Earth? The program has encouraged members of the younger generations to better connect with the older generation, who before had been relegated to the margins reserved for holdovers of the old ways, especially the shamans. As younger mapmakers seek to generate accurate documents that feature all the geographic landmarks within a territory and the names their tribe has for those places, they find that they have only one resource at their disposal to fill in some of these gaps—the older generation.

In one such instance, young cartographers had been confounded by a particular river's path. They were using government maps which were based on extrapolations from aerial imagery, since cloud and canopy cover made it impossible to obtain accurate aerial photographs. This particular map was not accurate enough. So the indigenous cartographers decided to consult a tribal elder. Sitting nearly naked in his hut, smoking cigarettes and painted red was the man known as the Professor because of his vast knowledge of local culture and landscape. When they showed him the existing maps, he pointed out immediately that these figures were incorrect and that the river went in a direction different from their guess. He showed them its path, and one day when the clouds cleared and the cartographers finally had access to photographs, they saw that the old man had been right! These young tribesmen saw that grandpa knows stuff that the white man, the missionary,



Members of the Ikpeng tribe in Brazil's Xingu Indigenous Reserve celebrate the creation of the first participatory ethnographic map of their ancestral lands..

the military, and the gold miner don't know. And they have a newfound respect for their culture.

GOOGLE AND THE FUTURE OF ACT

As an outgrowth of our mapping project, we at ACT have made tremendous strides in the last few years as we continue to build strong partnerships between indigenous peoples, national governments, and the private sector. Most promising and productive has been our engagement of Google Earth in the effort by native peoples to protect their lands. We use Google software and the latest computer and global positioning system technology and top personnel from Google Earth headquarters have come to the Amazon to train the Indians directly; in all these ways ACT has assisted indigenous groups in utilizing the most modern tools to preserve and protect their culture and their territories.

Seeing the potential of Google Earth to bring the mapping program to the next level, in 2005 I approached Google through an introduction from a friend, and presented our work in the Amazon. They agreed wholeheartedly that their outreach program through Google Earth had an enormous amount to contribute to the project. Google Earth has also been helping the U.S. Holocaust Memorial Museum to map the destruction taking place in Darfur, the Jane Goodall Institute to track chimpanzees in Tanzania, and a local NGO in West Virginia to monitor

mountaintop removal. The ACT's mapping program enabled native tribes to monitor their lands and account fully for the resources within their borders; they could also include ethnographic information related to geographical landmarks that ensured their traditions would continue. Google Earth's outreach program was precisely in line with these efforts.

ACT's intention with Google Earth is to continuously acquire high-resolution maps to monitor and prevent illegal logging and mining in or near indigenous lands. Through this collaboration, indigenous peoples have now created land use and protection maps for over half a million acres of rainforest lands. At this point, Brazil's environmental agency has only one forest ranger for every 650 square miles of "protected" land, and the contribution of satellite images will fill an enormous void. Armed with information alone, tribes could report illicit incursions to government officials.

The work that ACT has done with Chief Almir Surui of the Surui tribe of southwestern Brazil exemplifies the effectiveness of empowering local peoples rather than making the maps for them. Chief Almir, the young leader of his tribe and the only member to graduate from college, has embarked on a crusade to protect and promote his culture and land, and has fully embraced new technology and a partnership with Google in order to do that. In the past, Surui has held organizations like the World Bank to account for funds owed to his tribe, denounced the Organization of American States for illegal logging on Surui lands, and sued the government of the Brazilian state of Rondonia for failing to provide basic services.

In 2007, Surui visited Google's California headquarters with me; he wanted to personally appeal to the company for assistance in his campaign. His efforts have had a tremendous impact, and with prize money from the International Society for Human Rights, he has established the Surui Sustainable Management Fund to support conservation and income-generating projects for his people.

In 2008, a team from Google Earth visited the southwest Amazon to see firsthand the importance of their contribution, and to carry out further training. As part of their visit, experts from Google participated in seminars to train natives from Surui's tribe in computer technology and global positioning systems; with the Indians, they also offered educational workshops to university students in Porto Velho, the capital city of Rondonia. The end result was learning on all sides, as the Indians learned from Google, and Google learned from the Indians. And imagine Indians, painted red and blue and wearing breechcloths, traversing the jungles while adroitly manipulating GPS devices—I have certainly seen this on some of our projects to map lands together. This is truly a marriage between shamanic tradition and twenty-first century technological innovation!! In addition, the program fits well with Brazilian president Lula da Silva's call for "digital inclusion" among all Brazilian peoples, and we have worked in close collaboration with the government in many aspects of our work with Google Earth.