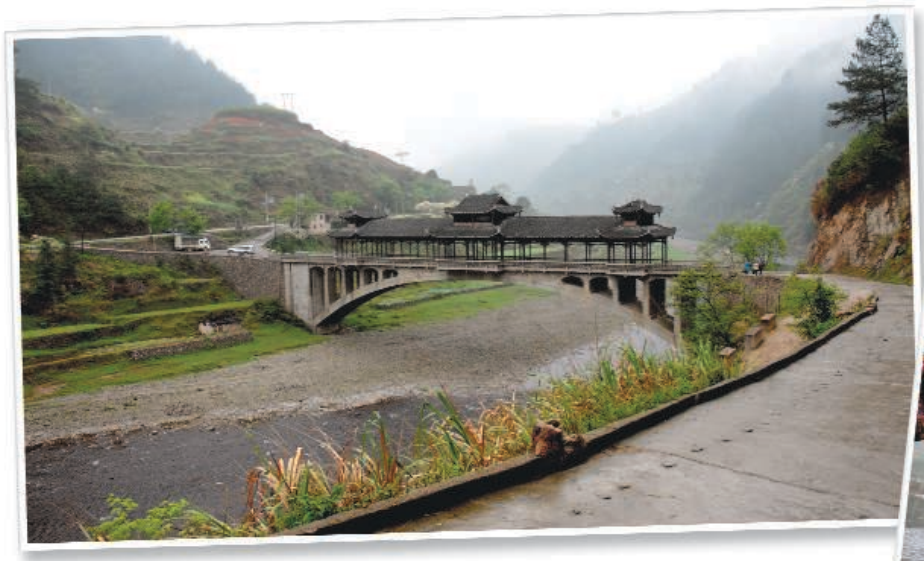




INTELLECTUAL PROPERTY

Chinese Province Crafts Pioneering Law to Thwart Biopiracy

GUIYANG, CHINA—Two years ago, a Chinese company hit upon a winner. The company planned to market a kind of sweet, sticky rice that Kam (Dong) people have cultivated for generations, without using chemical pesticides or fertilizers, on the terraced hillsides of southern China's Guizhou Province. That was the beginning of an entrepreneurial success story—especially for the Kam. Provincial legal experts intervened, helping Kam chieftains trademark the rare organic rice varieties and forcing the company and others to negotiate deals to return a percentage of profits to the Kam.

Guizhou officials are now hoping to build on this concept and head off any future attempts at "biopiracy"—the plunder of natural resources—by enshrining the protection of indigenous knowledge into law. Guizhou Intellectual Property Office (GIPO) in Guiyang, the provincial capital, has dispatched experts to enclaves of Kam, Hmong (Miao), and other ethnic minorities to assemble a compendium of know-how—from medicinal plants to embroidery techniques—that may merit legal protection. Such communities were once isolated and had no need to worry about theft of their traditional knowledge, says Long Yu-Xiao, director of the Chinese Institute for Indigenous Knowledge and Culture Property at Guizhou University in Guiyang. Globalization has changed that, he says. "Pandora's box is open."

Long and other experts are helping GIPO draft China's first legislation that would treat indigenous knowledge as intellectual property (IP). Their inspiration is the 15-year-old Convention on Biological Diversity, or biodiversity treaty, which seeks to balance innovation with the protection of biodiversity and fair compensation for traditional knowledge sources. "The legislation is not idealism, it's not romantic. It's realistic," says Li Fayao, Long's deputy and a researcher at the Guizhou Academy of Social Sciences. The focus is not on future scientific finds but on "actual circumstances in this province."

The effort is one facet of China's ambitious drive to bring its feeble and patchy enforcement of IP rights into line with international norms. Later this month, the State Intellectual Property Office is expected to release a national IP strategy that would strengthen rights of both domestic and foreign companies as well as increase penalties for piracy. And the Supreme People's Court last month announced that foreign experts will now be permitted to testify in patent-infringement cases involving foreign parties.

But by spinning a legal web of protection around indigenous know-how, Guizhou would enter uncharted waters for China. "Guizhou is regarded as an undeveloped province. Its scientific level is relatively low, but it's rich in traditional knowledge. Because we lack the means to turn knowledge into innovation, we have to protect the knowledge for future development," says GIPO vice-director An Shouhai, who trained as a plant physiologist and who initiated the legislation.

Other countries have made similar attempts to reconcile indigenous know-how and IP rights. But Guizhou is an interesting test case, says Shalini Bhutani, an environmental lawyer based in New Delhi for GRAIN, a nonprofit. Hmong, for instance, live in Laos, Thailand, and Vietnam. "What happens with shared knowledge across borders?" she asks. Guizhou's effort is also timely, as the issues provincial authorities are grappling with are at the heart of negotiations over a global regime for sharing traditional knowledge benefits that will be discussed later this month at the 9th conference of parties to the biodiversity treaty in Bonn, Germany. Conferees aim to devise policies that would achieve a target agreed to 6 years ago: to reduce the rate of biodiversity loss by 2010.

GIPO plans to present its legislation for approval in the provincial People's Congress by the end of the year. First, however, legal experts must settle a thorny issue: Which forms of indigenous know-how should be treated as IP? It's a tricky balancing act. "If the protection is too narrow, indigenous people may choose not to share their knowledge or know-how. Then everybody loses," says Zang Xingdong, a law professor at Guizhou University.

The Kam rice experience has helped shape Guizhou's draft legislation. Although most Kam farmers over the years have switched to the more common Indica rice, farmers in two counties—Li Ping and Cong Jiang—have stuck with their traditional varieties. "These villages have the last Kam sweet rice gene pool," says Long. "They have been able to preserve their varieties against genetic contamination from Indica strains."

By helping Kam chieftains register a trademark for "Kgoux Bagx Dangl" rice, Long's group gave the farmers leverage over companies that wanted to market the rice. "Of course the companies resisted," Long says.

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Shared heritage. Who should own the rights to rare rice varieties in Guizhou's terraced hills, or to Hmong costumes?

"But once the Kam acquired this right, they could get capital and work with an outside company without being dominated. They had the power to negotiate." To distribute any income from a marketing deal, Long's group used a new national law on rural development to help Kam farmers organize a cooperative.

Guizhou's draft legislation is, in part, a patchwork of statutes from existing laws on IP, ethnic minorities, and rural development. "We're taking statutes and integrating them in a creative way to build a new legal framework," Long says. A key task has been to define the legal concept of traditional knowledge to the exclusion of other legal concepts that are already protected. "Not all traditional knowledge must be protected," An says. Existing legal regimes cover the protection of cultural relics—legally defined as objects of cultural value made before 1966—and species.

GIPO is putting a heavy emphasis on indigenous medicines. One test case is a medicinal grass called *guanyin cao* that Hmong use to treat coughs and colds. Like many traditional Chinese medicine (TCM) remedies, *guanyin cao* is brewed as a tea. If a company were to identify the active ingredient and develop it as a drug, the innovation would win patent protection and the source of know-how could end up empty-handed. "Companies can misappropriate traditional knowledge by taking advantage of loopholes in the existing legal regime," says Long. Many prescriptions in other countries are based on open publications of TCM ingredients. "In these instances, there's nothing we can do about it; the law cannot protect the original TCM," says An. But Guizhou has a window of opportunity to protect the lesser known medicines of the Hmong and Kam. "That's why we are taking action and working on this pioneering legislation," Long says.

The Guizhou legislation would ensure that any innovation based on traditional know-how would return a portion of profits to the source of the knowledge. That principle is not controversial, although it may take some creativity to figure out how best to divvy up royalties. "One difficulty is how to divide IP rights. Do they belong to the community, the collective?" asks Lei Xiuwu, director of the Ethnic Research Institute in Kaili. "An IP system inherently based on private rights may not have solutions for the 'protection' of traditional knowledge, which is a shared heritage," adds Bhutani.

But the draft legislation may go further and provide legal protection to ancient wisdom—such as the Hmong's insight in the use of *guanyin cao* to treat cough. Guizhou's experts are struggling to determine where to draw the line: what is unique, and what kind of protection it should be afforded. Another issue is whether to regard customs and handicrafts as IP. "In a narrow sense, traditional knowledge only means traditional scientific knowledge. But our understanding is that it also includes traditional culture," says An.

In a courtyard on a misty hilltop in Nanhua, a village in the Hmong heartland in southeastern Guizhou, several young women wheel in sync around a tall wooden totem devoted to a butterfly god. They execute graceful dips and pirouettes under the weight of several kilograms of silver jewelry and ornaments, including elaborate headdresses. A trio of young men steps to the fore, playing a Hmong ballad on bamboo flutes called *lusheng*. Hmong have worn these hand-embroidered garments, danced these dances, and played and sung these songs at festivals since time immemorial. But is the living tradition IP? GIPO thinks so. "All these deserve protection as traditional knowledge," says An.



"Because we lack the means to turn knowledge into innovation, we have to protect the knowledge for future development."

—AN SHOUHAI, GUIZHOU INTELLECTUAL PROPERTY OFFICE

As Lei notes, many museums outside China purchased Hmong dresses decades ago. "But legally acquiring a dress does not mean you own the traditional knowledge. You cannot say the information belongs to that museum. We have to protect the information," he says. "There is no easy formula," adds Long.

If Long and his colleagues succeed, knowledge may not mean power for Guizhou's indigenous peoples, but it might help ensure their survival—or even prosperity—in today's global village.

–RICHARD STONE

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Korea Targets Basic Science

Worried about a widening deficit in high-tech trade, South Korea's President Lee Myung-bak said last week that he wants overall research spending to rise from 3.2% to 5% of the country's gross domestic product by 2012. Insiders say his Administration, which took office in February, wants to lead the way by doubling government spending.

The government currently funds about one-fourth of the $30 billion now spent on research. Private-sector spending is targeted at applications, and 75% of government spending goes to applied areas. Officials in the Lee Administration hope to make basic research half of the government's overall portfolio. Yu Hee-Yol, chair of the governmental Korea Research Council of Fundamental Science & Technology, says the country's scientists and engineers are "very excited about" the new funding targets. **–DENNIS NORMILE**

Solar Sensor Back on Board

A key climate sensor has been restored to the $12 billion National Polar-Orbiting Operational Environmental Satellite System (NPOESS). The Total Solar Irradiance Sensor (TSIS) had been removed along with four other key climate sensors in 2006 when the Pentagon restructured the program (*Science*, 31 August 2007, p. 1167). But lawmakers and officials who run NPOESS vowed to fix the problem, and last week, managers announced that the sensor will fly on the first NPOESS mission in 2013.

"It's fabulous," says space scientist Judith Lean of the Naval Research Laboratory in Washington, D.C. The last scheduled flight for the sensor had been as part of a NASA payload in 2010. Lean says it's important for TSIS missions to overlap for proper calibration. "Without that important [solar] record, the whole climate field is up for speculation," she says. **–ELI KINTISCH**

Not So Presidential

The 99 winners of the annual Presidential Award for Excellence in Mathematics and Science Teaching came to Washington, D.C., last week to be feted and to learn about federal efforts to improve science and math education. But for only the second time in his 8-year term, neither President George W. Bush nor his wife, Laura, hosted them at the White House. Coincidentally, the visit overlapped with a symposium in which academic and industrial leaders bashed the government for its inadequate support of science (see p. 728).

–JEFFREY MERVIS

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