

# A VILLAGE OF DEATH AND ITS HOPES FOR THE FUTURE

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This article from an official Chinese news source assesses some of the challenges in dealing with serious environmental problems.

Shangba Village in Shaoguan City, Wengyuan County is perhaps the most infamous “cancer village” in Guangdong Province. Out of a population of just over 3,000, more than 250 have died of cancer since 1987. This situation may improve in the next few years: a proposal by a delegate to the provincial people’s congress, Shen Yanquan, to construct a reservoir and water diversion project was scheduled for completion by March 2006, and may finally provide the residents of Shangba Village with clean drinking water.

Shangba’s environmental problem has also attracted the attention of research groups from Hua’nan Agricultural University and the Guangdong Soil Research Center, and Shangba could eventually become the first place in Guangdong Province to produce organic energy resources, a plan that would bring new hope to this cancer village.

What is it about Shangba that has attracted the attention of the government and the scientific community? What do Shangba’s past, present and future have to tell us? At the end of October 2005, these reporters went to Shangba Village for in-depth investigation.

## The destruction of the Hengshi River

Earlier in 2005, a CCTV program called “A Half Hour of Economics” identified the five most polluted rivers in China. The Hengshi River, which flows through Shangba Village, was one of them. That same program had already done a report entitled “The Hengshi River Flows Through the Village of Death.” In fact, the Hengshi River is a Class 2 tributary fed by a mountain spring in Shaoguan’s Dabao Mountain that in earlier years deposited fertile soil as it surged through Liangqiao, Shangba and other villages in Wengcheng County. Twenty years ago, you could see right to the bottom of Hengshi’s clear, limpid stream as it burbled past rocks and shoals.

Today, people call Hengshi “the dead river.” On October 26, these reporters stood at a section of river where the rocks along the shore were dyed dark brown and encrusted by what looked like the dregs of poor-quality tea, and a strip of black,

metallic sediment ran along the river banks. No living creatures were evident in this landscape, and villagers said they had seen no trace of fish or shrimp since 1980. The banks of the Hengshi River were eerily quiet. Not a blade of grass grew along the river; no one walked its banks, nor were there any signs of cattle or sheep. Not even the sound of insects could be heard.

Just how toxic is the water of the Hengshi River? When there was a flood in June and July of this year, professor Lin Chuxia of the Hua’nan Agricultural University brought some of his students to take samples of the water. They diluted it by a factor of 10,000, and the results of their tests showed that no aquatic life could survive in that medium for more than 24 hours. What this means in practical terms is that the water of the Hengshi River remains too toxic for use even after it joins the Weng River downstream. Lin Chuxia also told us that, in ordinary circumstances, the toxicity of the Hengshi River extends for 50 kilometers; during heavy rains, it can reach places as far as 100-200 kilometers downstream. The residents of Shangba Village have been living with this poison for more than 30 years.

The people of Shangba Village, though not rich, were able to raise enough money to build a water tower. When they pump water up from a well, the water is filtered through a pressure mechanism, and then a crude siphon is used to extract the water. After pumping up several buckets of water, they let the remaining sediment settle for as long as possible before using the water. This water tower, which is about two stories high, has the added function of collecting rain water. Professor Lin Chuxia, who has been monitoring the pollution from the coal mines in Dabao Mountain, said, “This is a simple idea that the villagers had. Although it does filter out some of the particulates, the water tower is useless against heavy metals.”

“Not only is the river water polluted, the underground water is polluted as well,” said He Shouming, head of the village committee. Holding a yellowed mail carrier’s bag that he’d brought from his office, He said, “Each of the two pouches on this mail bag can hold one bucket of water. We hang this from a motorcycle and drive up the mountain to carry back clean spring water for drinking.” He told us that for the past several years, everyone in the village who has a motorcycle goes up the mountain to collect drinking water.

### **The specter of cancer**

“The villagers have only started paying real attention to their drinking water in the last few years. Too many people have died of cancer in Shangba; it’s terrible.” He Shouming rifled through his drawer and pulled out a tatty, soft leather notebook in which were recorded rows and rows of names of people who have died in recent years. Next to each name was written the person’s date of birth and the year and cause of death. Eleven people died in Shangba in 2005, two of natural causes or from an accident and the remaining nine from cancer. He Shouming told us that three more of Shangba’s 3,401 residents were already in the last stages of cancer.

One by one, He Shouming pointed out the names of those who had died: “This person was named He Xuhuan. On August 9, a television crew came here to interview him. One month later, on the very first day that construction started on the water diversion and reservoir project, he passed away from lung cancer. He left behind a wife and three young children... This husband and wife both died at the age of 37. The wife’s name was Zeng Xihua, the husband was named He Yongtai, and they left behind four children and an elderly mother.”

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According to He Shouming, 250 people in Shangba have died of cancer since 1987, the youngest not yet 26 years old and the oldest over 60. The majority of the people on this long list were key members of farming households who were struck down in the prime of life. Their deaths have left behind not only orphans and dependant elderly, but also a profound dread that has cast a veil over Shangba.

At the same time, it seems that people have become accustomed to the way things are, and village life continues at its unhurried pace. During our visit, few of the paddy fields were ready for harvest, but a strip of light gold directed us to village children helping their parents thresh grain. As soon as they saw us, a group of happily chatting villagers immediately smiled and invited us home for tea.

There we met 87-year-old Qiu Xinfeng, who lost her son in March 2001 and her daughter-in-law in January 2005, both to cancer. People say the old woman’s daughter-in-law went to town one morning to sell sugar cane, and that afternoon she was dead; the money she made from selling her sugar cane just covered her funeral expenses. After her son’s death, Qiu Xinfeng suffered a fall that, combined with her osteoarthritis, prevents her from standing upright; she can only hobble around using a stool as a crutch. Then there was 26-year-old He Pei’en who died of cancer last year after her family borrowed 20,000 yuan from every available source in order to treat her illness. Her two brothers must now go outside of the village for extra work to manage their legacy of debt.

According to a village cadre in Shangba, most villagers are already in their final stages of cancer by the time the disease is detected. Because the villagers cannot afford regular medical examinations, they generally only go to the hospital when

their pain becomes too great to bear. The village’s Sanitation and Healthcare Station only provides anti-inflammatory medications that temporarily stop the pain.

Village Party Secretary He Laifu observes, “The cost of treating cancer has to be paid by the villagers themselves, but for them, the amount required is astronomical.” His sense of grievance over the misfortune he has witnessed was obvious in his tone of voice. He said that when he previously went to the Dabao Mountain Mine to discuss the situation, nobody would admit a direct connection between pollution from the mines and the villagers’ cancer. Is it possible that the cancer is hereditary among the villagers of Shangba? He Laifu responds with a rhetorical question: “If women who marry into this village from outside are also getting sick, how could that be?”

### **Toxic harvest**

In April 2004, Chen Nengchang, a researcher at the Guangdong Province Soil and Ecology Research Center, began taking note of the situation on Dabao Mountain. According to his statistics, the first large number of deaths due to cancer on Dabao Mountain was in 1997, and the same high rate has continued ever since. Chen Nengchang believes that the opening of the mines on Dabao Mountain immediately caused heavy metal contamination in Shangba Village, but that toxins entered people’s bodies gradually, accumulating over months and years before bursting into an epidemic of illness 20 years later. Chen believes that the situation on Dabao Mountain is a textbook case of environmentally-caused cancer.

Many epidemiologists have shown a causal relationship between cancer and the environment, with a probability factor as high as 80 to 90 percent. Furthermore, cadmium, arsenic, manganese and other heavy metals have been conclusively shown to cause cancer. After studying Dabao Mountain for more than a decade, Professor Lin Chuxia of Hua’nan Agricultural University finally received a special grant of 40,000 yuan from the province’s Science and Technology Bureau in 2005 to conduct a major study into how to solve Dabao Mountain’s ecological and environmental problems.

Lin Chuxia, an expert in ecological restoration who worked in Australia for 13 years on soil management projects, has spent three years carrying out similar work on Dabao Mountain. When asked for his analysis of Shangba’s ecological environment, he provided us with this data: the Hengshi River contains 11 times more lead, 12 times more manganese, 224 times more iron, 6.6 times more copper, 3.7 times more tin and 10 times more cadmium than tributaries that have not been contaminated by acidic run-off from the mines. The acidic mine water that flows from Dabao Mountain has already caused severe pollution to grains, fruits and vegetables, in particular sugar cane, bananas, lettuce, bitter melon, eggplant, hot peppers, spinach, yams and rice. The cadmium levels detected in these crop are respectively 149, 187, 7.7-29, 6.6-10.5, 15-24, 7, 15-59, 33 and 2-5.7 times the normal level.

The Shangba villagers are now aware that consuming polluted water and contaminated produce are the two main causes of cancer among them. For this reason, in recent years many villagers have been planting sugar cane instead of rice,

selling the sugar cane, and then using the proceeds to purchase rice grown elsewhere. Villagers who grow rice don't eat it themselves, but rather sell it in the market. Nobody dares to say that the rice comes from Shangba, because if they did, no one would buy it. And even if someone does want to buy their rice, the villagers must sell it at very low prices.

### The toxic source

What is the actual source of the poisoned water that comes from the mines? Driving along the Beijing-Zhuhai Highway, we passed one village after another—Shangba, Yanghe, Tangxin, Liangqiao—and then reached Dabao Mountain. Sitting 1,000 meters above sea level, the mountain is so rich in mineral resources that half of it has already been stripped. The road that took us to the top of the mountain has countless twists and turns, and all along the way we could see rusty water from the mines flowing downhill. Exactly how many more years miners can continue to extract ore from Dabao Mountain is a mystery even to the local people. A worker from the state-run mine told us that the iron ore is becoming gradually more impure. It is possible that Dabao Mountain has only another ten years' worth of ore left for mining.

On the mountain, nearly a hundred large trucks travel back and forth, ceaselessly transporting ore between the extraction and washing sites. Each load passes through two ore-washing stations, one halfway up the mountain and the other at the foot of the mountain. Professor Lin Chuxia's assessment of these two ore-washing stations is that they meet "basic zero emissions" standards and are high-quality, non-polluting projects. Li Zhongping, the head of the Environmental Division of the Dabao Mountain Mine Safety and Environmental Department, has referred to these two stations with great pride. The water used for washing the ore is recycled, and a huge tailings dam halfway up the mountain filters out impurities.

Driving down a fork in the road, we came upon several private mining sites. They were fairly small-scale, and the people in charge had put up numerous temporary railings along the slopes. The water used to wash the ore in private mines undergoes practically no treatment and is released directly into a nearby stream.

"The problem of private mines is actually quite serious," said He Laifu. "However, the main polluter is the state-run Dabao Mountain Mine, which has stripped ore off the whole mountain. The private mines generally dig holes and drill into the mountain to extract the ore, and the amount of ore they extract is about the same as the state-run mine."

This is the same point made by Lin Chuxia, who said that in terms of the ore washing process, the Dabao Mountain Mine uses more standard methods than the private mines, but the ore-stripping operation has caused extremely serious soil erosion that is the main source of the pollution.

Li Zhongping, head of the Environmental Division at Dabao Mountain Mine, has a different opinion. "There is some soil erosion, but mountain water is not being used to wash the ore." He believes that the soil erosion caused by opencast mining is a purely natural process, and that once the soil settles, the water will simply flow off.

However, this logic does not meet with the approval of Lin Chuxia or the villagers that live downstream. "You look at the water that runs down off the mountain," says Lin. "Although it does have some color, it doesn't look all that dirty. But in fact that water is many times more toxic than the water used to wash the ore!" Lin also told us that some types of ore, such as sulfurous iron ore, are stable when covered by rock, but that during the stripping process, contact with the air causes a chemical reaction that produces sulfuric acid. "So opencast mines are really just natural sulfuric acid factories!"

Stripped soil piled on the slopes washes down Dabao mountain when it rains. According to Lin Chuxia's statistics, one ton of mining soil can produce up to 200 kilograms of concentrated sulfuric acid. Adding in large quantities of heavy metals such as cadmium and lead, the water that comes flowing down from Dabao Mountain ends up being "both acidic and toxic."

Li Zhongping said that Dabao Mountain Mine constructed a kilometer-long mud embankment to prevent soil erosion from polluting the river downstream, but it hasn't been used for the past few years because it has already reached capacity. He said the mine is planning to invest hundreds of thousands of yuan to raise the height of the embankment so it can prevent soil erosion for another few years.

If one walks along State Road 106, one can easily see the long embankment believed to be the main source of the pollution. Upon closer examination, the mud walls are an unusually



**Cancer specialists dispatched to a village near Chongqing in 2004 suspected tainted water as the cause of 17 cancer cases among the village's 500 residents within three years. Photo: Getty Images**

rich color, and dark brown sludge has congealed and hardened at the base. A little farther off, water flows slowly from several shallow ponds; upon reaching the edge of the dam, it rushes over a waterfall and then flows directly into the Hengshi River. Lin Chuxia's tests have determined that the water pouring from the dam contains 1,000 times the nationally permitted level of sulfuric acid.

### **A reservoir brings hope**

Shangba Party Secretary He Laifu told us that the Hengshi River began showing signs of pollution soon after the state-run Dabao Mountain Mine began operating in the 1970s. During the first nationwide agricultural inspection in 1984, the Ministry of Agriculture found that Shangba's soil and water contained heavy metals greatly in excess of acceptable limits. At the time, the residents of Shangba were called upon to solve their drinking water problem, but in He Laifu's words, "How could we have the ability to solve this huge problem by ourselves?"

Talks with mine management finally led to the first phase of a water diversion project in 1988, but geographical contours meant that only about one third of the land could be irrigated with clean water. In addition, much of the river water diverted to Shangba is also contaminated by water from the mines.

Last year, provincial congress delegate Shen Yanquan, who is also principal of the Wengyuan Middle School, put forth a motion to solve the water problem at Shangba once and for all. The motion was passed, but funding was slow in coming and difficult to obtain. The province finally came up with 4.29 million yuan, Shaoguan provided five million yuan and Dabao Mountain Mine contributed 5 million yuan. Once the money was raised, the project could be completed quickly.

On the afternoon of October 26, we had a look at the reservoir on which the people of Shangba pin their hopes. The basic framework was complete, forming a huge bowl the size of several mountains in which spring water from Dabao Mountain will be stored and channeled to Shangba. Experts worry that the reservoir's capacity will be inadequate for irrigating the village's 2,000 mu of farmland, especially in the dry season. Nonetheless, even the supply of clean drinking water is an incalculable benefit to the residents of Shangba, whose main worry is the cost of that water. He Laifu says the village is responsible for laying water pipes from the reservoir. He intends to ensure that all of the villagers have clean drinking water, and says that given the low incomes of the village's households, the village government may be able to provide some assistance.

### **Three more villages**

Shangba is the village that has seen the highest number of deaths caused by pollution from the Dabao Mountain Mine, but it is not necessarily the most seriously polluted of all the area's villages. Upstream from Shangba are the villages of Yanghe, Tangxin and Liangqiao. Liangqiao, the village nearest the Dabao Mountain Mine, is a bleak and depressing little hamlet, with most of its fields running fallow. Liangqiao Party secretary He Baofen told us that when villagers irrigate their land with water from the Hengshi River, nothing will grow.

He brought us to the banks of the Hengshi River and pointed to piles of brown soil. "That has all been dredged from the river. Each year, a 50-centimeter layer of sludge and sediment from the mines accumulates at the bottom of the river. It has to be dredged out and piled along the river banks, but now the banks are piled high and there's no more room left," he explained.

The few plots of farmland currently being cultivated in Liangqiao are irrigated with water piped from individual family homes, water that comes from the mountain's Yangmei Cavern. Nearly every family in Liangqiao has spent thousands of yuan to lay down plastic pipes carrying water to their homes, but Shangba is too far from the mountain to use this source.

Although their drinking water problem is solved, the people of Liangqiao are poorer than those in Shangba, and their houses are shabbier. When the head of Liangqiao's village committee, He Chunxiang, first saw us, he refused to say a word until he had pulled out a booklet listing all those who had died in the village. Out of Liangqiao's 300-odd residents, two died of cancer in 2005 and five in 2004. Another three died in 2002. The overall proportion of cancer deaths in Liangqiao is about the same as in Shangba. In 2005, one of Liangqiao's elderly residents contracted a rare form of eye cancer and is now in the terminal stage of the disease.

Compared with Shangba, the village committee heads of Liangqiao, Tangxin and other villages are more direct in their criticism of Dabao Mountain Mine. "Our village has more than 300 residents, and each year the total compensation the whole village gets for the pollution is just 1,288 yuan!" said Liangqiao Party secretary He Baofen as he pulled out receipts that had been presented to the mine.

We later learned that the 1,000-odd villagers in Tangxin received a total of 9,800 yuan in pollution compensation, while Shangba, with 3,000 residents, received 33,000 yuan. According to Li Zhongping, the head of the Environmental Division of Dabao Mountain Mine, the compensation is based on a document issued by the Shaoguan government in 1995, which stipulates a total of 80,000 yuan to be paid to the villages downstream of the mine. The mining company hands the funds over to the Wengyuan County Environmental Bureau for distribution to the villages.

The reservoir that will soon supply Shangba sits too low for Liangqiao, Tangxin and Yanghe. Feeling neglected, cadres from each of those villages told us they are working together to propose their own long-term solution to the mining company. He Laifu, Party secretary of Shangba Village, has also suggested that the local government and mining company help arrange alternative employment to replace income lost from the ruined fields.

### **An alternative future**

Perhaps the residents of these cancer villages can look forward to a better future. Two teams from Hua'nan Agricultural University and the Guangdong Soil Research Center are currently hard at work in Shangba. The team led by Professor Lin Chuxia of Hua'nan Agricultural University is trying to restore the ecological system of Dabao Mountain by preserving vege-

tation and soil and planting crops that are sources of energy. The team led by Guangdong Soil Research Center researcher Chen Nengchang is developing a system of crop rotation to produce and restore plant life.

Chen Nengchang, who holds a Ph.D. in Environmental Biology, is experimenting with cultivating rice on Dabao Mountain through a water management method that uses additives such as lime and silicon fertilizer to prevent the absorption of cadmium and other heavy metals into the rice. He plans to try similar experiments with other crops that have high rates of heavy metal absorption, such as vetiver grass, mustard leaf and rape. In the first half of 2005, Chen's experiments yielded positive results: in the best section of land, the rice contained levels of cadmium that were actually below the nationally permitted levels.

Professor Lin Chuxia's team from Hua'an Agricultural University is engaged in a comprehensive treatment of Dabao Mountain and the surrounding areas by managing pollution at its source and restoring the local ecology and soil quality. In Shangba, Lin Chuxia was cultivating 10 mu of experimental fields with sugar cane, elephant grass and acacia trees, all described by Lin as sources of plant-based energy. Each crop was thriving. Lin believes that developing plant energy sources while simultaneously controlling pollution is the most sensible path to take.

A number of other experts have also mentioned the production of methane and fuel alcohol from organic sources as a very hot topic in agricultural and industrial circles due to the current oil shortage. Turning Shangba into production base for organic fuel is one of the main points in Lin Chuxia's comprehensive plan for Dabao Mountain. At this point, it is a matter of choosing the kinds of plants to cultivate, taking into account the social, ecological and economic effects crops such as acacia trees and elephant grass might have on a local level. Lin believes similar crops could be raised in the other villages, as well as on land closer to the Dabao Mountain mines, making Dabao Mountain the first experimental base in Guangdong Province for growing crops as sources of energy.

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Lin Chuxia pointed out, however, that Shangba's pollution goes very deep into the soil, so the results from his proposed plan would not be seen for at least ten or 20 years. Crops such as acacia trees can survive even in heavily toxic soil, and also extract toxins from the soil, so large-scale planting would serve the dual purpose of ecological restoration and energy resource development. However, the development of organic energy sources has yet to attract government support. Provincial congress delegate Shen Yanquan has expressed strong interest in Lin Chuxia's ideas and told us he will consider submitting a new proposal for Shangba during the 2006 session.

For the villagers, organic energy is a concept that seems far in the future compared with the reservoir. Still, it has brought

further hope to Shangba Party Secretary He Laifu, who has encountered too many obstacles in attempting to establish a factory to supply residents with a new source of income. "If Professor's Lin's experiments are successful, we could start a new industry right here!" As dusk approaches, this Party secretary stands on the banks of the Hengshi River, drawing up a blueprint for Shangba's future.

### Pollute first, treat later?

"Pollute first, treat later" is hardly a new model, but for the cancer villages at the foot of Dabao Mountain it has become an unbearable headache. Only after years of petitioning did the village win annual compensation of 33,000 yuan from Dabao Mountain Mine.

Li Zhongping, the head of the Environmental Division of Dabao Mountain Mine, says the mine pays hundreds of thousands of yuan per year to the Wengyuan County Environmental Protection Bureau, even though Li denies that all of the pollution on Dabao Mountain is caused by the state-run mining company. Tu Shao'an, bureau chief of the Wengyuan County Environmental Protection Bureau, told us that as a county-level agency, the Wengyuan County Environmental Protection Bureau actually has no authority to administer these fees. Therefore, 15 percent of the money is paid out as compensation, while the other 85 percent is put into a special fund for pollution-abatement projects approved by the provincial Environmental Protection Bureau.

Does levying fees imply that pollution can be emitted at will, as long as the fees are paid? Provincial congress delegate Shen Yanquan sees a problem with this kind of model. He would like to see the fees combined with government funds to build a number of local waste water treatment plants. Shen also pointed out that all future industrial or construction projects should include pollution abatement planning at the initial stages.

Lin Chuxia has also stated that the pollution on Dabao Mountain, while mainly a result of poor management, also has practical economic factors. While the mine's ore-washing system is a near-zero emission facility, there is no way to effectively control emissions from the ore-stripping operation.

In late 2005, at a high-level forum on green economics, Professor Sun Liping from the Sociology Department of Qinghua University observed that in today's society, setting up a mechanism to control resource consumption is unlikely to be completely effective, but a perfect plan to deal with the problem has not yet surfaced. In the meantime, levying a pollution emission fee is one feasible solution, and if those fees are used as public funds to treat emissions, that seems relatively fair.

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