

# A Different Growing Season South of the Mountains: Guangdong Province Rethinks Its Agricultural Development Model

By Peter Riggs

*Guangdong Province has been the bellwether of change in China since the beginning of the reform period. In the early 1980s Guangdong was home to China's first experiments with "Special Economic Zones," which opened the floodgates of overseas investment into manufacturing and other light industries. Generally overlooked, however, is that Guangdong is again has the vanguard of change in still another sector: agriculture, which contributes substantially to the province's GDP and exports. Sustaining this agricultural success will be a major challenge, for in the rush of economic development over the past two decades, the environmental health of Guangdong's countryside—and oftentimes the welfare of its farming communities—has suffered. However, provincial leaders, in partnership with Guangdong's agricultural university and its network of extension agents and consumer health specialists, are rising to the challenges threatening the province's agricultural sector. Today, Guangdong is dramatically reorienting its food production and agricultural research systems, putting long-term environmental sustainability and the promotion of chemical-free and/or organic agriculture at the center of its provincial rural development efforts.*



Guangdong Province has been the bellwether of change in China since the beginning of reform period. In the early 1980s Guangdong was home to China's first experiments with "Special Economic Zones," which opened the floodgates of overseas investment into manufacturing and other light industries. In the last decade the province has developed its capital, Guangzhou, and its second-largest city, Shenzhen, which borders Hong Kong, into major banking and finance centers. The province today remains at the forefront of the "economic revolution" that has transformed China in the space of two decades from a developing country into the world's most dynamic emerging economy.

Guangdong is again the vanguard of change in still another sector: agriculture. Too often overlooked by economists focused on the province's industrial muscle, agriculture contributes substantially to Guangdong's GDP, and agricultural products comprise a major part of its exports. Sustaining this success in the future will be a major challenge, however. In the rush of economic development over the past two decades, the environmental health of Guangdong's countryside—and oftentimes the welfare of its farming communities—has suffered. Several food safety and environmental health scares over the past few years have underscored the importance of developing "new thinking" for this vital economic sector.

But provincial leaders, in partnership with Guangdong's agricultural university and its network of extension agents and consumer health specialists, are rising to the challenge. Today, Guangdong is dramatically reorienting its food production and agricultural research systems, putting long-term environmental sustainability and the promotion of chemical-free and/or organic agriculture at the center of its provincial rural development efforts. It is giving farmers more control over production decisions, and in some cases, taking steps to ensure better treatment for farm laborers. Guangdong is skillfully positioning itself to take advantage of rising Chinese consumer awareness of food safety and quality concerns, and to secure the position of the province's agricultural-sector exports under the new international rules impacting China as a result of its accession to the World Trade Organization.

## *Stresses Sparking Change*

Before noting the steps in the transformation of Guangdong's approach to agriculture, and the stresses that led to this transformation, it is important first to note the particularities of the sector there. This coastal southern province has never been a "rice bowl," in the sense of committing vast acreage to the growing of staple grains. Rather, Guangdong has long enjoyed comparative advantage in the production of subtropical

fruits, sugar cane, as well as farmed fish and horticulture products. For example, in the very recent past, Guangdong accounted for more than half of the *global* production of lychee, a fruit much-coveted by the Chinese. While households in this region obviously grow products to meet their own needs, Guangdong's farmers are not known for pursuing the conservative, "subsistence agriculture" strategies characteristic of Chinese agriculture in the pre-modern period. As the scholar Robert Marks notes, farmers in the region have long had a strong market orientation, with a commercial agriculture sector dating back to the Ming Dynasty (Roberts, 1998).

Another distinctive factor has been range of agricultural systems based on Guangdong's diverse topography. The flat and well-watered Pearl River Delta region was famous for the "dike-pond" agriculture system, in which farmers devote the major share of their acreage to ponds for raising fish, particularly carp, and recycle pond wastes onto the bunds and dikes fringing the ponds to grow citrus fruits, sugar cane, pineapples, and mulberry trees for feeding silkworms.<sup>2</sup> Most outside observers equate Guangdong with the Pearl River Delta, but in fact this fertile area comprises only a fraction of Guangdong's total land base. Eighty percent of Guangdong's land is hilly, and in this subtropical climate zone the soils are generally poor and highly susceptible to erosion.

Three major deforestation events in China's recent past—during the failed "Great Leap Forward," the chaos of the Cultural Revolution, and in the late 1970s and early 1980s as a response to insecurity of land tenure—led to alarming levels of soil erosion. Indeed, control of soil erosion has been a major concern of the Guangdong government for the last twenty years, and while initial erosion control efforts were designed primarily to prevent catastrophic flooding in urban areas by rivers swollen with soil loads—rather than the conservation of the rural land base—these erosion control programs planted the initial seed for the agricultural transformation now underway.

Initially, provincial and local authorities focused on engineering solutions to erosion problems, but this approach is gradually giving way to a more holistic focus on securing farmers' access to land, and the promotion of multi-storied agricultural systems that do a better job of holding soils in place. Lower-value annual crops ranging from corn to peanuts are therefore increasingly found as components of an integrated cropping plan, rather than as disease- and pest-prone monocultures. This green-cover, "multi-story" approach

to agriculture (indeed, one Chinese term used to describe the cropping system translates as "stereo-agriculture") captures the pounding rainfall that visits this subtropical region and prevents soil loss.

Soil erosion is but one of the drivers in Guangdong's agricultural transformation. Of equal importance was another kind of erosion: loss of consumer confidence in the province's food supply resulting from increased awareness of pesticide residue problems. Southern China has been the epicenter for a range of food safety scares in the last few years, ranging from chemical use on pig farms to avian flu in poultry to high levels of heavy metals in vegetables. Hong Kong, with its more rigorous food safety regulations and stringent testing requirements, has often served unwittingly as the "early warning system" for some of these scares (Ng, 1999; Stewart, 1999; Civic Exchange, 2004). Fairly or unfairly, suspicions have fallen on exports from mainland China (especially Guangdong) to the Special Autonomous Region of Hong Kong.

A third, more prosaic driver of change has been market forces. As China's internal transportation system led to lower costs for moving products to market, and as supply of certain agricultural commodities outstripped demand, different growing regions in southern China came into direct competition for markets. A glut in key commodities—particularly fruit—has put a premium on differentiating products by quality, and on more aggressive marketing of products from Guangdong both within China and abroad. Over the past few years, municipal leaders from Guangdong have spent weeks each spring traveling to metropolitan centers in China's north and east to secure contracts for the purchase of their goods.

Finally, two other, more recent phenomena are important in understanding the nature of the rural sector in Guangdong today. One is the presence of a huge number of seasonal migrants from other provinces (particularly Sichuan, Guizhou, Hunan, and Anhui) who flock to Guangdong seeking wage-labor opportunities in its orchards and fields. Indeed, while the "smallholder" model of agricultural production most associated with rural Asia still prevails in some pockets of hilly Guangdong, the overwhelming majority of field jobs in the province are now held by migrants. A huge percentage of the land base is leased by rural families to corporate or other "scale-farming" enterprises. Due to China's social and political structure, Guangdong has not, in a formal sense, had the massive consolidation of landholdings that is found in, for example, the Philippines; still, the presence of outside investment,

particularly from Hong Kong- or Guangzhou-based firms, is a major factor in production relations in the province. Recent legal changes that further secure land-use contracts and leases are accelerating the pace of outside investment into the agricultural sector in China. One can again look to Guangdong as a model—and in many cases, as a warning—of trends now sweeping China as a whole.

The penetration of national and international capital into Guangdong's countryside has also necessitated a rethinking of agriculture extension services. Provincial authorities are wrestling with these transformations, forming public-private partnerships for agricultural development and allowing for new types of farmer organizations to flourish. It is fair to say that

and increasingly finicky Chinese consumers while simultaneously halting degradation of the rural land base and reducing reliance on dangerous pesticides and chemical fertilizers? The following describes Guangdong's accomplishments in meeting this challenge.

Critical to the transformation has been the South China Agricultural University (SCAU), located on the eastern outskirts of Guangzhou city. Led by its president, Professor Luo Shiming, SCAU has put agroecological approaches at the center of its research methods.<sup>4</sup> For the last ten years, talented graduate students from all over China have flocked to SCAU, attracted by the university's innovative approaches to ecological agriculture. While still a "work in progress,"

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the "next wave" of agricultural research in Guangdong will include much greater attention to social science concerns than was true in the past. Due to the fact that an increasing share of funding for agricultural extension is going to come from counties and townships, we can also expect that such support will become increasingly "site-specific" in orientation—with possible benefits for agroecological approaches based on local soil and climactic considerations.

### *Balancing the Food Production and Quality Demands*

Having served as the "laboratory" for many of China's market reforms in the 1980s and 1990s, Guangdong became China's wealthiest province.<sup>3</sup> This meant that the province had the financial resources to deal with the alarming legacy of environmental damage bequeathed from the policy instability of an earlier period. It also meant that there was a shift in the priorities of local consumers, from just being able to fill their stomachs to a greater concern for food quality and safety. This recent shift, however, may just be the reestablishment of a much older cultural pattern: food is absolutely central to Cantonese culture, and banqueting is the preferred medium of "social display" by those hoping to impress a sweetheart or a business partner.

The major agricultural policy challenge facing the province in the early 1990s can thus be summarized as: how can Guangdong meet the food production and food quality demands of both international markets

SCAU's curricular shift is worthy of study for institutions of higher education throughout China—how to bring priorities of the academe into accord with the broader social needs of China's people, particularly its less advantaged residents in the rural sector.

Another important player in the transformation has been the Guangdong Provincial Committee on Science and Technology, and its research-grant arm, the Guangdong Natural Science Foundation. While most Chinese research programs have had a highly applied focus, the Guangdong Natural Science Foundation—the first such provincial-level foundation in China—has shown unusual willingness to support long-term basic research, and to consider seriously input from farmers and other land managers. Dr. Luo Fuhe played a particularly important role in persuading the provincial science and technology committee to commit to long-term, participatory agricultural research. Dr. Luo is now a member of the National People's Political Consultative Congress. Further, high-quality research institutes at the provincial level dedicated to botany, geography, entomology, and animal science round out Guangdong's "knowledge infrastructure." With resources to contribute to collaborative research programs, high-level political support for rural development, and a scientific cadre oriented towards agroecological research, the structure was in place for Guangdong to make rapid strides in reorienting its agriculture sector away from an exclusive focus on production volumes, and towards ecosystem

health, environmental services, food quality and safety, and enhanced farmer incomes.

Current agricultural research and development (R&D) in Guangdong is organized in three areas: (1) demonstrating model systems, (2) enhancing core technologies, (3) and providing information and technical services. Below are some examples of agricultural R & D that is pushing Guangdong in the direction of more sustainable agriculture production systems.

#### *Organic Lychees*

*Lychee* is a fruit crop of particular economic importance to Guangdong, and has been a major focus of quality-enhancement efforts. At a number of research stations in lychee-growing areas of hilly Guangdong, SCAU has worked to develop organic and “high-quality” production lines. Pest management has been a major concern. Research has focused on stock enhancement, biological control, production of appropriate organic fertilizers through on-farm composting, and the intercropping in fruit orchards of species that provide habitat for those “natural enemy” species that keep pest numbers in check. It is also interesting to note the varied farm settings in which SCAU’s research teams work: on state farms, with farmer groups, and on lands leased by an outside entrepreneur. While this diversity of production settings is a complicating factor in the design of appropriate extension services, it helps diverse research programs to flourish.

#### *Integrating Animals into Farm Production Systems*

Despite a long tradition of integrating animals into farm production systems, the recent trend in China, as elsewhere, is towards more concentrated animal rearing systems. However, the severe water quality problems in Guangdong associated with over-reliance on chemical fertilizers has led researchers to consider ways to reintegrate poultry and pork production back into the overall farm plan, and also to expand research on composting of livestock wastes. Researchers at SCAU have developed organic “rice-duck” farming systems, and one can now buy “Organic Duck Brand” rice in urban markets! Both the organic rice and duck products are highly prized and fetch excellent prices. Research on organic pork production (including the formulation of organic feeds) is now underway at SCAU. Researchers in Guangdong increasingly take animal welfare concerns into account in the design of production systems. It may surprise westerners to learn that animal welfare concerns are even on the radar screen—but this

again shows Guangdong’s pragmatism: the province is merely anticipating the rise of these concerns as salient factors in international trade.

#### *Farm-to-Table Orientation*

Perhaps the most dramatic factor in the reorientation of Guangdong’s agricultural sector has been the advancement of a *farm to table orientation*—an approach not normally associated in China with scientific research and agricultural extension services. South China Agricultural University has set up an Organic Agriculture Information and Technology Service Center that is attempting to respond to the needs of producers and consumers alike. Organizing market and production services in such a way that brings concern for the entire agriculture supply chain under one roof is unprecedented in China. Provincial officials have harnessed the power of news media to promote and build broad social support for organic agriculture: the Organic Agriculture Information and Technology Service Center based at SCAU intends to use radio, TV, the Internet, and “informational hotlines” for disseminating consumer information, and to provide market information and production advice to farmers. This orientation, of course, reflects more than just the province’s concern for public health and the local supply of quality foodstuffs. It also demonstrates provincial leaders’ understanding that the future success of Guangdong’s rural economy will depend on its ability to develop and maintain a reputation for high-quality agricultural products. Guangdong’s long-term commitment to organic food production should enable it to maintain and expand its trade of fruits, grains, vegetables, meats and poultry in increasingly competitive domestic and international food markets. The Information and Technology Service Center is also an attempt to build a bridge between one model of agricultural extension—that based on former production brigade and smallholder models—to a newer, more integrative, and more corporate model for delivery of extension services. Rather than concern itself solely with production methods, the service center also attempts to give timely market price information to farmers, local leaders, and agribusiness concerns, which may affect planting and marketing decisions.<sup>5</sup>

Worldwide, much energy and attention have been devoted to organic certification and food labeling questions as part of the “sustainable agriculture movement.” The same is true in China. At present, two domestic food labeling programs in China compete for market share and consumer trust. One, administered

by the Ministry of Agriculture, is the “Green Food” program; the other, the Organic Food Development Center of China, is attached to the State Environmental Protection Administration, and is recognized by the International Federation of Organic Agriculture Movements. Both programs operate in Guangdong, but for the most part Guangdong has stayed out of the often-fractious debate over eco-labeling in China. The provincial “Green Food” office in Guangzhou failed to earn the trust of farmers, foreign investors, or quality-control inspectors, because it was seen primarily as a

general trend in agribusiness—a trend with profound implications for the future development of the Chinese organic foods sector, as well.

The organic sector in China did not originate as a “social movement.” From the beginning, the organics sector in China has shown strong “market fundamentals.” There is, of course, good and bad in this development trend: the market-price premium enjoyed by organic products helps to drive agricultural transformation, but farmers do not necessarily have the economic bargaining power to benefit from those

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marketing arm of the Ministry of Agriculture’s State Farm Bureau. The Organic Food Development Center (OFDC) carries out some certification programs in Guangdong. There is, at this point, a substantial body of research on different organic certification schemes in China.<sup>6</sup> To generalize the differences between the two schemes, OFDC has focused on partnering with foreign partners to certify particular products for export, while Green Food has concentrated its efforts on domestic marketing. Green Food has used its connections to the Ministry of Agriculture, and particular its close relation to the State Farm Bureau, to develop a vast array of certified products, and to market those products through retail outlets in most medium-to-large cities in China. Some Chinese researchers note that in a few cases, Green Food producers will quietly work with OFDC in order to gain certification of their products for international markets.

Private sector businesses are increasingly big buyers of farm products in Guangdong, and for them, supply chain management is a critical business parameter. The French retail giant Carrefour, for example, has contracted with particular farms for the delivery of high-quality lychee. In its negotiations with partners and research farms associated with SCAU, Carrefour made it very clear that it was uninterested in seeking third-party certification for these “quality product lines”—rather, what it wanted was supply chain assurances, which included spot-checks by Carrefour personnel in the fields and processing plants and greater vertical integration of its business concerns, “from farm to table.” This concern for vertical integration, of course, reflects a more

premiums. The broader question of how to increase the political and economic bargaining position of farmers and the rural labor force appears to have engaged China’s new leaders, and it will be interesting to see how such power might influence the development of the organics sector. At the other end of the “value chain,” we are seeing an astonishingly rapid rise in “supermarket culture” for urban Chinese. As buying patterns shift, the market position of major food retailers is growing much stronger. It remains to be seen if Chinese urban consumers will go the same route as consumers in Europe, Japan, and the United States in embracing the “organic farmers markets” and “community-supported agriculture” programs that place more control in the hands of farmers themselves.

For now, Guangdong farmers know that domestic markets for most agricultural products are completely saturated, which is pushing prices down. This relentless downward pressure on prices can best be combated by a focus on product quality. Again, the farm-to-table approach is backed by the province’s substantial efforts to market Guangdong’s products elsewhere in China. While there certainly is awareness amongst Guangdong consumers of the health and safety claims made for organic foods, the experience of food quality—*intensity of flavor*—appears to drive the market to an extent equal to that of the health and safety claims. And while exports of organics—to Hong Kong, and to further abroad—helped to jump-start this production orientation, urban purchasing trends suggest that local purchases of organic foods in southeastern China will grow at rates of 20 to 30 percent per annum, rates similar to that which has characterized the “take-off”

period of organic-sector growth in Europe, Japan, and the United States.

Guangdong has thus developed the *technical* capacity to reorient its rural sector toward “sustainable agriculture.” With South China Agricultural University as the focal point, Guangdong hopes to build the service infrastructure for organic production. There is political will at the provincial, county, and township levels to implement changes in orientation, but still in most cases a generally weak understanding of what is required to meet international organic production standards.

There are a number of controversial issues regarding the rural sector and the shift toward “quality production” that have yet to be fully addressed, whether at the national (Ministry of Agriculture) level or within Guangdong. These include:

- *The “planned” or “spontaneous” creation of farmer organizations.* Many voices in China are now calling for better rural-sector political representation—and political space for the creation of market-oriented cooperatives is opening up. Still, the creation of cooperatives is hampered by the long and distasteful hangover of past attempts at agrarian communalism; the creation of market cooperatives should be viewed in the larger perspective of building rural social capital in China. Of course, increasing the market power of farmers will obviously increase their bargaining position in other spheres as well—something to which provincial and central governments pay close attention.
- *Adoption and enforcement of national eco-labeling standards.* The Ministry of Agriculture feels that strict organic standards are simply too difficult for most Chinese farmers to meet, and hope to see less restrictive food safety and quality standards adopted nationwide. Yet farmers that enjoy OFDC labeling for their products have done extremely well in the international marketplace. China will need to take into account IFOAM (International Federation of Organic Agricultural Movement) standards if it hopes to penetrate the international organic food market.
- *Genetic engineering in food.* China has the most aggressive and well-financed GE sector of any non-OECD country, but there is also considerable consumer nervousness in China over genetically modified foods. The position of South China Agricultural University, for example, would strike

many westerners as schizophrenic: the university sees no fundamental contradiction between biotech and agroecology, and is encouraging research on both fronts.

- *WTO compliance.* While there is a strong national commitment to complying with the new rules and regulations brought about by China’s accession to the World Trade Organization, there is as of yet little understanding in rural areas about the potential impact of food safety standard rules. Local officials can be expected to resist enforcement efforts that undercut their authority. Still, it is tempting to overstate the degree to which WTO membership has driven changes in the agricultural model.<sup>7</sup> It is more accurate to say that Hong Kong’s proximity and tougher food-safety standards have long conditioned Guangdong’s thinking about markets “abroad,” and that the arrival of WTO disciplines merely highlights Guangdong’s greater readiness to take advantage of new market opportunities.

- *Water pollution.* Both the continued over-reliance on chemical fertilizers and the increase in concentrated animal feeding operations are wreaking havoc with surface water quality in Guangdong. There is an urgent need to develop organic fertilizers, improve municipal solid waste management (including through composting of the organic fraction of urban wastes), and prioritize the safe handling of livestock wastes. Much of SCAU’s research also focuses on the development of botanical pesticides and on relating chemical ecology to insect predator-prey interactions.

- *Re-tooling extension services.* The move from a planned to a market economy has completely changed the way that agricultural extension services should operate. In Guangdong, many such extension services have been privatized. A variety of public-private partnerships might be explored, but it is crucial that the worst abuses of the “contract farming” approach found elsewhere in Asia be avoided. To date, we have no evidence that new approaches to agriculture in Guangdong have had any impact on increasing rural-urban income disparities.

- *The proletarianization of Guangdong’s rural labor force.* With its huge number of seasonal and permanent migrants—speaking different dialects, working under harsh conditions of dubious legality, remitting major chunks of their income

back to families elsewhere—Guangdong province’s agricultural labor market may resemble more an “advanced industrial agricultural sector,” such as that found in California, than it does other provinces in China. This industrialization of Guangdong’s agriculture does not preclude the creation of an organic farming sector; it means that increasingly corporatized models of organic production prevail—another way in which Guangdong could resemble California. Rural social relations, where Cantonese-speaking bosses oversee groups of Sichuanese and Guizhou migrant laborers, admittedly can be tense in Guangdong.

• *The role of agricultural universities.* Traditionally, agricultural universities in China have been under the joint control of the Ministry of Agriculture and the State Educational Commission in Beijing. High provincial officials in Guangdong, along with the SCAU leadership, have lobbied Beijing to put SCAU under the direct control of the provincial leadership. At the time this article goes to press, this move has yet to be finalized. But in any case, the province is pouring money into the university, greatly expanding student numbers and curricular offerings. This may indicate a move toward the “land-grant institution” model prevalent in (for example) the United States, with potentially positive implications for agricultural extension.

### *Agroecological Restoration*

While the immediate driving force behind Guangdong’s rural-sector reorientation may be a concern for the competitiveness of its agricultural products in markets increasingly concerned with food quality and safety, the goals of the reorientation are much broader. The goals include restoring a degraded land base; maintaining rural communities and reconnecting them with local cultural traditions; and combating severe surface and ground water quality problems. To achieve these goals, scientists and planners in Guangdong have become practitioners of *agroecological restoration*, the attempt to “reconnect food systems with ecosystems.”<sup>8</sup>

Of course, one can see a number of fascinating agricultural-reform efforts in other parts of China today; indeed, the greater attention given to rural issues is one important way in which China’s new leadership is differentiating itself from Jiang Zemin and Zhu Rongji’s past urban bias. Yet it is in this wealthy southern province where the farm-to-table market opportunities, the “knowledge infrastructure,” and the

political willingness to innovate have come together most dramatically. Guangdong’s changing countryside may hold important answers not just for the future of agriculture in China, but also for the fate of rural livelihoods in response to globalization generally. The extent to which Guangdong’s new course can also assist western scholars and policymakers to focus on processes of regional differentiation occurring now in China—thereby correcting for the frequent Beijing-centric, urban, or Pearl-River-Delta-only lens we bring to our analyses—is also to be welcomed.

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#### ENDNOTES

<sup>2</sup> Silk production was formerly a mainstay of Guangdong's economy and remains in some areas an important alternative income stream for farm families.

<sup>3</sup> Municipalities such as Beijing, Shanghai, and Tianjin are wealthier on a per-capita basis, but none have a rural hinterland into which such calculations figure; and the disparity in rural-urban incomes is among China's more intractable social problems.

<sup>4</sup> Luo Shiming was one of the first students selected from China to study abroad in the early reform period (1979). Professor Luo worked at the University of Georgia's famous Institute of Ecology,

led by Howard Odum, where he imbibed the "whole-systems thinking" of this groundbreaking research group. Returning to China, Luo worked to combine the wisdom and experience embedded in traditional Chinese farming practice with newfound ecological approaches to agricultural development: hence the term "agroecological."

<sup>5</sup> Some additional examples of agricultural innovations can be found in an article by Parham (2003) that describes a workshop the Federation of American Scientists and SCAU conducted to educate Chinese environmental nongovernmental organization leaders.

<sup>6</sup> See in particular the work of Dr. Paul Thiers (1999, 2000, and 2004), Washington State University; reports from the International Federation of Organic Agriculture Movements (IFOAM, <http://www.ifoam.org>); publications of Pesticide Action Network Asia Pacific (<http://www.poptel.org.uk/panap/>); and an article by Jessica Hamburger (2002).

<sup>7</sup> This point was made forcefully by senior Ministry of Agriculture officials at a seminar in Beijing hosted by the ministry and Action Aid China in December 2002.

<sup>8</sup> See *The Farm as Natural Habitat* (Dana L. Jackson, Laura L. Jackson, editors; Island Press, 2002) for an excellent summary of how this rural-sector transformation is being approached in the United States. It is worth noting that several Guangdong scientists are also now establishing a China chapter of the Society for Ecological Restoration.