

Cuba's Organic Revolution

The US trade embargo of Cuba, plus the collapse of the island's Soviet market, has meant that the island has found it virtually impossible to import the chemicals and machinery necessary to practise modern, intensive agriculture. Instead, it has turned to farming much of its land organically – with results that overturn the myths about the 'inefficiency' of organic farming.

By Hugh Warwick

The Cuban revolution of 1959, which brought Fidel Castro to power, is considered to be the seminal moment in the modern history of the island. But the revolution begun in 1989, with the collapse of the Soviet bloc, is an equally significant, if much quieter, event.

During the early 1960s, as the US tried unsuccessfully to crush the new, revolutionary spirit of Cuba with the most far-reaching trade embargo in history, Castro's Cuba had to forge powerful links with the Soviet bloc in order to survive. And for some 30 years, the support Cuba received from the USSR helped to create the most well-'developed' island in the Caribbean. By 1989, Cuba ranked eleventh in the world in the Overseas Development Council's Physical Quality of Life Index (which includes infant mortality, literacy and life expectancy), while the USA ranked fifteenth.¹

The help Cuba received came in many forms – the Soviets bought Cuban sugar, for example, at over five times the market rate, and discounted oil was bought and then re-exported. For 30 years, from 1959 to 1989, 85 per cent of Cuba's trade was with the Soviet bloc.

The Soviet Collapse

But in 1989, the Soviet system began to unravel. Imports dropped overall by 75 per cent and oil imports by 53 per cent. Known officially by the Castro regime as the 'Special Period in Time of Peace', this moment in Cuba's history saw it slide close to the edge of collapse, as all aspects of life were affect-

"I don't care whether Fidel leaves vertically or horizontally, but he's leaving."

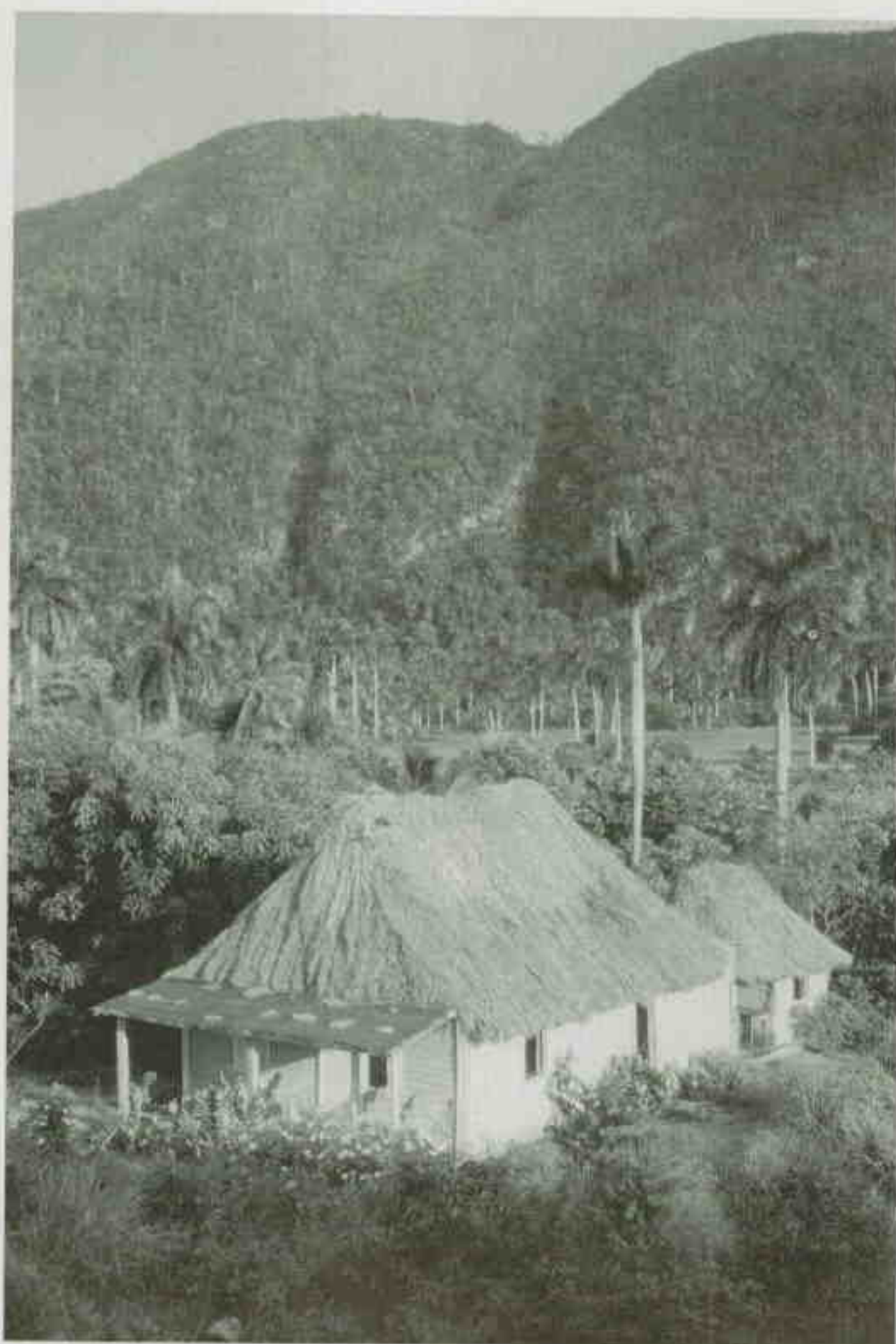
– US Senator Jesse Helms

ed by the crumbling of its international market.

The most significant impact was on food. Some 57 per cent of Cuba's calorific intake was imported, and it was estimated that the population relied on other countries for over 80 per cent of all their protein and fats.^{2,3} The Soviet collapse also led directly to an 80 per cent reduction in fertiliser and pesticide imports. Prior to 1989, most of Cuba's intensive agriculture was dependent on these imports – their disappearance was thus a disaster for its agricultural system.^{4,5}

America's Grip Tightens

This was exacerbated by the implementation in 1992 of the USA's punitive 'Cuba Democracy Act', which tightened its existing trade embargo, and further in 1996 with the signing of



Small farms are enjoying a resurgence in Cuba

the satirically-titled 'Cuba Liberty and Democratic Solidarity Act' (the 'Helms-Burton Act'). On top of an embargo that prevents the sale by any American or American-friendly industries of food or medicine to Cuba, upon pain of sanctions or legal action, the Helms-Burton Act is a deliberate attempt to stifle the re-growth of the Cuban economy by deterring foreign investment. US Senator Jesse Helms, one of the creators of the Act, is remarkably honest about its overall aim – the replacement of Castro's government by one more favoured by the US. "Let this be the year Cubans say farewell to Fidel," he said as the Act was passed in the Senate. "I don't care whether Fidel

leaves vertically or horizontally, but he's leaving."

For a less resourceful and determined nation than Cuba, such action by the world's only superpower could have spelled disaster. But rather than roll over and die, Cuba began to foment a new revolution. The nation responded to the crisis with a restructuring of agriculture. It began a transformation from conventional, high-input, mono-crop intensive agriculture, to smaller organic and semi-organic farms.

Urban agriculture

As oil imports crashed, Cubans looked for ways to reduce their dependency on it. In agriculture, this meant reducing transportation, refrigeration and storage costs by relocating agricultural production closer to the cities. Havana has some 20 per cent of Cuba's population, and at 2.5 million people is the largest city in the Caribbean. Feeding its population was obviously a priority. Urban agriculture was one of the solutions.

Urban agriculture played an important role in feeding urban populations around the world up until the industrial revolution of the eighteenth century, when nearly all food began to be imported from the countryside.⁶ Fertile areas inside and surrounding cities were lost to development. But since the 1970s, there has been evidence of a global reversal of this trend. It is estimated that some 14 per cent of the world's food is now produced in urban areas.⁷

As oil imports crashed, Cubans looked for ways to reduce their dependency on it. In agriculture, this meant reducing transportation, refrigeration and storage costs by relocating agricultural production closer to the cities.

Prior to 1989, though, urban agriculture was virtually unheard of in Havana. Thanks to State provision, there was adequate food for all and little need to grow any privately. The post-Soviet crisis incited a massive popular response, initially in the form of gardening in and around the home by Havana's people. This was soon given a boost by the Cuban Ministry of Agriculture, which created an Urban Agriculture Department, with the aim of putting all of the city's open land into production.

By 1998, as a direct result of this policy, there were over 8,000 officially recognised 'gardens' in Havana, cultivated by over 30,000 people and covering some 30 per cent of the available land.⁸ These farms and gardens have been organised into five main categories – though they are not comprehensive or exclusive, they do give an indication of the style of work.

- *Huertos Populares* (popular gardens): Cultivated privately by urban residents in small areas throughout Havana.



Castro is leading a new, organic, revolution in Cuba

- *Huertos Intensivos* (intensive gardens): Cultivation in raised beds with a high ratio of compost to soil. Run either through a State institution or by private individuals.
- *Autoconsumos*: These belong to and produce for workers, usually supplying cafeterias of particular workplaces.
- *Campesinos Particulares*: Individual small farmers, largely working in the greenbelt around the city.
- *Empresas Estatales*: Many of these State enterprises are run with increasing decentralisation, autonomy and degrees of profit-sharing with workers.⁹

The most common of these are the popular gardens, which range in size from a few square metres to three hectares. The larger plots of land are often subdivided into smaller individual gardens. Usually the gardens are sited in vacant or abandoned plots in the same neighbourhood as, if not next-door to, the gardeners' household. The local government allocates land, which is handed over at no cost as long as it is used for cultivation.¹⁰

Cuba Goes Organic

The crash in agricultural imports has also led to a general diversification within farming on the island. Oxen are being bred to replace tractors; integrated pest-management is being developed to replace pesticides no longer available; the promotion of better co-operation among farmers both within and between communities is promoted; and the rural exodus of previous decades is being reversed by encouraging people to remain in rural areas.¹¹

But the most significant aspect of the post-Soviet agricultural revolution has been the response to the removal of the chemical crutch, as imports of pesticides, herbicides, etc., collapsed. Fortunately for Cuba, it was well-placed to respond to this. While Cuba has only two per cent of the Caribbean

Cuba Goes Renewable

While Americans have deprived themselves the luxury of legally imported Havana cigars, for Cubans, the U.S. embargo meant total trade reliance upon the Soviet bloc, and when that collapsed, a bold – albeit forced – move into some form of self-sufficiency.

Nowhere is the struggle to replace previously imported goods with domestic products more evident than in the area of energy consumption. From 1989 to 1992, when the Soviet Union was breaking up, oil imports from the USSR to Cuba plunged from 13 to 6 million tons per year. To cope with petroleum shortages the Cuban government turned to local renewable energy sources, not solely as an emergency measure, but as a permanent alteration in the country's energy dependency.

Over 200 small hydroelectric plants have been built, mostly in isolated mountainous regions, of which 180 are now functioning. Wind energy is also being utilised through the construction of approximately 5,700 windmills. Abundant sunshine makes Cuba a prime

candidate for the development of a solar industry, and the government has established a Solar Institute in Santiago de Cuba that is looking at ways of bringing solar energy to the island. To date, there are around 350 solar heating systems operating. The priority at the moment is to install solar panels on the roofs of family doctor clinics and community centres in remote rural areas not already on the electricity grid.

In its search for alternative energy sources, Cuba has been highly successful in converting sugar cane bagasse (the pulpy residue left after extraction of juice from the cane) into electricity. Of Cuba's 160 sugar mills, 104 are powered entirely by their own bagasse. It is estimated that the utilisation of bagasse saves Cuba 700,000 tons of oil per year, while other biogas (methane from manure and waste material) operations represent the equivalent of 370,000 tons of oil per year. Together, almost 30 per cent of Cuba's energy supply now originates from biomass.

Shortage of oil not only requires energy innovation, but conservation too. Cuba's predicament has made her a world exemplar of environmentally sound transport policy: everyone in Cuba rides a bicycle – because they have to! It is not unusual for a Cuban to make a 50 km journey on a bike. The dominant make is a one-speed Chinese model affectionately known as the "Flying Pigeon". In recent years the government has imported 1 million such models from China and it is estimated there are

800,000 of them in Havana alone. Cuba will soon produce bicycles domestically – they are expected to be the principal form of local transportation well into the future. That reliance upon the bicycle is more coerced than voluntary makes the Cuban experience no less of an example to the congested cities of the world.

The embargo makes no special exception for medicine or medical equipment, imports of which (from countries outside the embargo) have dwindled since Cuba's



Because of the US oil boycott, Cubans have taken to cycling in a big way

economic crisis of the early 1990s. The response of the Cuban Ministry of Public Health has been to oversee the development of what it calls "natural and traditional" medicine. All medical students are now required to study alternative treatments relevant to their specialty (such as acupuncture and homeopathy); while practicing doctors and nurses are given intensive courses to update their knowledge. The result is that alternative medicine is now available in all medical facilities, as well as at special Centres for Holistic Medicine, lessening Cuba's reliance upon expensive foreign drugs.

Cuba in the 1990s provides a rare example of a poorer country seeking to provide for the basic needs of its people by embracing environmentally sustainable technologies.

– Edward Metcalf

Cuba's predicament has made her a world exemplar of environmentally sound transport policy: everyone in Cuba rides a bicycle – because they have to!

region's population, for example, it has some 11 per cent of its scientists.¹² And many of them, influenced by the ecology movement, had already developed a critique of Cuba's intensive agriculture system (to the displeasure of some in the establishment). They had also begun to develop alternatives to chemical dependency, which have since come into their own.¹³

Almost uniquely, Cuba has begun to develop a biological pest-control programme based largely on parasitoids. While this in itself is innovative, the effort has been reinforced by the establishment of 'Centres for the Reproduction of Entomophages and Entomopathogens' – (CREEs). Over 200 of these have been set up to provide decentralised, small-scale, co-operative production of biocontrol agents, which farmers can use instead of pesticides to protect their crops.^{14,15}

As a result of such necessary innovations, the Cuban landscape, once dominated by chemical inputs, has been changing

rapidly. And many of the new control methods are proving more efficient than pesticides. For example, the use of cut banana stems baited with honey to attract ants, which are then placed in sweet-potato fields, has led to the complete control of the sweet-potato borer – a major pest – by the predatory ants. There are 173 established 'vermicompost' centres across Cuba, which produce 93,000 tons of natural compost a year. Crop rotations, green manuring, intercropping and soil conservation are all common today. Planners have also sought to encourage urbanites to move to the countryside, as labour needs for alternative agriculture are now a constraint on its growth (organic farming is generally more labour-intensive than chemical farming). Programmes are now aiming to create more attractive housing in the countryside, supplemented with services, and to encourage urban people to work on farms for periods of two weeks to two years.¹⁶

Confounding the Experts

Conventional wisdom has it that a switch away from chemically-intensive agriculture will ultimately lead to a fall in yields – though this is not necessarily the case (see Rosset in this issue). In Cuba, the intensive State sector, controlling the vast majority of the land, suffered a fall in yields, but small-scale farmers were able in some instances to increase their productivity. Peter Rosset writes that, in many cases, peasant farmers had remembered old methods and re-applied them. “In almost every case,” Rosset says, “they said they had done two things: remembered the old techniques – like intercropping and manuring – that their parents and grandparents had used before the advent of modern chemicals, simultaneously incorporating biopesticides and biofertilisers into their production practices. Incidentally, many of them commented on the noticeable drop in acute pesticide poisoning incidents on their co-ops since 1989.”

It is still hoped that the successes with the peasant and urban farmers can be recreated with the former State farms. Many of the problems with the large farms have been put down to a dislocation of people with the land, so the government has set up a programme called “linking people with the land.” Whether it will work remains to be seen.

In the event of a trade free-for-all, Cuba's tentative steps towards environmental sustainability could be trampled under the feet of the Cuban exiles returning to claim the land and homes that were once theirs, and the US corporations flooding the island with their goods.

There is much reason to be hopeful that Cuba's turn to less-intensive agriculture will succeed – as it has elsewhere. Jules Pretty has analysed 45 non-chemical agricultural initiatives spread across 17 African countries. From these, some 730,000 farming households have substantially improved their food production and food security. In 95 per cent of the projects where yield increases were the aim, cereal yields have improved by 50-100 per cent. Total farm food production has increased overall.¹⁷

And while the large farms have not yet generated the successes that had been hoped for – which may well be down to their unmanageable size – the immediate crisis in Cuba has passed. By mid-1995, food shortages precipitated by the Soviet collapse had been overcome, and in the 1996-7 growing season, the harvest produced its highest-ever production of ten basic food items. Small farmers primarily have achieved these increases.¹⁸

Clouds on the Horizon

Cuba has taken enormous strides towards agricultural self-reliance without chemical inputs and without large-scale corporate or State control, and has shown that international food aid is not the only alternative to food shortages. But this is not an Arcadian idyll. While Cuba could be a model to the rest of the world, there is the risk of what Jules Pretty describes as “The Empire Striking Back”. Not all of Castro's old guard is converted to this green future.¹⁹ And Cuba is also involved in the development of biotechnology. Already it is being used on the local level, and there is no evidence that Cuba will join the call for a GMO-free world – though at least in Cuba they are free of the corporate control which blemishes the science else-

where.

There is also, ironically, the worry about what would happen if the US embargo were to be lifted. In the event of a trade free-for-all, Cuba's tentative steps towards environmental sustainability could be trampled under the feet of the Cuban exiles returning to claim the land and homes that were once theirs, and the US corporations flooding the island with their goods.

International Recognition

But such concerns should perhaps be set aside this month, with the news that the work taking place in Cuba has been recognised by an international audience. On December 9th the Swedish Parliament will see the presentation of the Right Livelihood Award – the ‘Alternative Nobel Prize’ – to the

Cuba has taken enormous strides towards agricultural self-reliance without chemical inputs and without large-scale corporate or State control, and has shown that international food aid is not the only alternative to food shortages.

Grupo de Agricultura Organica (GAO), the Cuban organic farming association.

GAO has been at the forefront of the country's transition from industrial to organic agriculture. Its President, Dr. Fernando Funes-Aguilar said of the Award. “We hope that our efforts will demonstrate to other countries that conventional chemically-dependent agriculture is not the only way to feed a country.” □

*For more information on GAO, contact: Grupo de Agricultura Orgánica (GAO) Tulipán 1011 e/Loma y 47 Apdo. Postal 6236C, Código Postal 10600, Nuevo Vedado Ciudad de La Habana, CUBA
Phone: +53 7 845 387; Fax: +53 7 845 387
Email: actaf@minag.gov.cu*

Hugh Warwick is a freelance journalist and Editor of *Splice*, the magazine of The Genetics Forum.

References:

1. Rosset, P. ‘Cuba: ethics, biological control, and crisis,’ *Agriculture and Human Values* 14: 291-302, 1997.
2. Rosset, P. *Alternative Agriculture Works: The Case of Cuba*. Monthly Review Vol. 50, No. 3, July/August 1998.
3. Murphy, C. ‘Cultivating Havana: Urban Agriculture and Food Security in the Years of Crisis,’ Institute for Food and Development, Report No.12, May 1999.
4. *Op.cit.* 1.
5. Altieri, M. et al. ‘The greening of the ‘barrios’: Urban agriculture and food security in Cuba,’ *Agriculture and Human Values*, 1999.
6. Smit, J. ‘Urban Agriculture and the 21st Century,’ *City Farmer*, 1997.
7. *Op.cit.* 3.
8. *Op.cit.* 3.
9. *Op.cit.* 3.
10. Chaplowe, S. ‘Havana's Popular Gardens: Sustainable Urban Agriculture,’ *WSAA Newsletter*, a Publication of the World Sustainable Agriculture Association, Autumn 1996, Vol. 5, No. 22.
11. Pretty, J. *Regenerating Agriculture*, 1995.
12. *Op.cit.* 1.
13. Rosset, P. and Cunningham, S. ‘The Greening of Cuba,’ *Earth Island Journal*, Vol. 10 Issue 1, Winter 94.
14. *Op.cit.* 3.
15. *Op.cit.* 1.
16. *Op.cit.* 11.
17. Pretty, J. ‘Can Sustainable Agriculture Feed Africa? New Evidence on Progress, Processes and Impacts,’ Paper for Environment, Development and Sustainability, Special Issue on Sustainable Agriculture, 1999.
18. *Op.cit.* 2.
19. Pretty, J., personal communication.