# Worms DA AFF/NEG

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# Worms DA – 1nc

#### Ending the trade embargo undermines Cuba’s worm tech exports. Their expertise exist because of financial constraints – not choice

**Ewing 08** [[Ed Ewing](http://www.guardian.co.uk/profile/edewing), “Cuba's organic revolution,” [guardian.co.uk](http://www.guardian.co.uk/), Thursday 3 April 2008 20.02 EDT, pg. http://www.guardian.co.uk/environment/2008/apr/04/organics.food

But when the USSR collapsed in 1990/91, Cuba's ability to feed itself collapsed with it. "Within a year the country had lost 80% of its trade," explains the Cuba Organic Support Group (COSG). Over 1.3m tonnes of chemical fertilisers a year were lost. Fuel for transporting produce from the fields to the towns dried up. People started to go hungry. The UN Food and Agriculture Organisation (UNFAO) estimated that calorie intake plunged from 2,600 a head in the late 1980s to between 1,000 and 1,500 by 1993.

Radical action was needed, and quickly. "Cuba had to produce twice as much food, with less than half the chemical inputs," according to the COSG. Land was switched from export crops to food production, and tractors were switched for oxen. People were encouraged to move from the city to the land and organic farming methods were introduced.

"Integrated pest management, crop rotation, composting and soil conservation were implemented," says the COSG. The country had to become expert in techniques like worm composting and biopesticides. "Worms and worm farm technology is now a Cuban export," says Dr Stephen Wilkinson, assistant director of the International Institute for the Study of Cuba.

Thus, the unique system of organoponicos, or urban organic farming, was started. "Organoponicos are really gardens," explains Wilkinson, "they use organic methods and meet local needs."  
"Almost overnight," says the COSG, the ministry of agriculture established an urban gardening culture. By 1995 Havana had 25,000 huertos – allotments, farmed by families or small groups – and dozens of larger-scale organoponicos, or market gardens. The immediate crisis of hunger was over.  
Now, gardens for food take up 3.4% of urban land countrywide, and 8% of land in Havana. Cuba produced 3.2m tonnes of organic food in urban farms in 2002 and, UNFAO says, food intake is back at 2,600 calories a day.

Organoponico plaza

A visit to Havana's largest organoponico, the three-hectare Organoponico Plaza, which lies a stone's throw from the city's Plaza de la Revolución and the desk of Raul Castro, confirms that the scheme is doing well. Rows of strikingly neat irrigated raised beds are home to seasonal crops of lettuces, spring onions, chives, garlic and parsley.

Guava and noni fruit trees provide shade around the perimeter, while on the far side compost piles sit next to plastic tunnels used to raise seedlings. Outside in the shop, signs extol the virtues of eating your greens.

The shop is open only on Mondays. Produce is sold by the people who work the garden (they keep 50% of sales, so are motivated to produce a lot) to the people who live nearby. In this case, the organoponico serves an estate that wouldn't look out of place in Tower Hamlets or Easterhouse. Yet inside, butterflies flit and the head gardener, Toni, turns sod like he is digging at Prince Charles's Highgrove estate.

A success then? "In terms of improving the diet of the population it has had a beneficial effect," says Wilkinson.

"And it has been a success in terms of meeting some of the food security needs," he says, "but it has not resolved the problem since the island still imports a great deal of food."

And change is on the horizon, which might be good for living standards, but not be so good for Cuba's commitment to pesticide-free food.  
The US trade embargo is losing its "symbolic meaning", says Julie M Bunck, assistant professor of political science at the University of Louisville and author of Fidel Castro and the Quest for a Revolutionary Culture in Cuba, and as that happens, "Cuba will evolve, embrace the market in some way, begin to produce and buy and sell normally."  
General farming will "most likely" move away from organic methods says Wilkinson. Farming on a large scale after all, he says, has seen a reduction in pesticide and fertiliser use mainly due to "financial constraints, not choice".

#### Worms are key to our planetary survival. Vermicomposting expertise is limited

**Blakemore 10** - Studied ‘VermEcology’ for 30 years and holds qualifications in ecology, computing and permaculture. [Dr. Rob Blakemore, “Wonder Worm to the rescue,” Our World 2.0, July 2, 2010, pg. http://ourworld.unu.edu/en/wonder-worm-to-the-rescue/

Can worms help save the planet? I think so and, before arguing my case, please let me state my position from the start: I am an ecologist. Not just the type of trendy person who faithfully recycles — although I am fashionably green and a semi-vegetarian who tries to recycle as many beer bottles as possible. No, I am also the other, scientific kind.

The science of ecology is generally defined as a study of organisms and their environment, i.e., everything! However, I would be somewhat more categorical and say that it is “The study of organisms, their products whether alive or dead, and their environment” — i.e., even more of everything, including fossil fuels and human endeavour!

An ecologist then, is someone who considers holistic workings of a natural ecosystem in all its complexity and diversity throughout its time-cycle while breaking it down into its component parts and honing in on its few key, controlling entities. Simultaneously practicing as a generalist and as a multi-faceted specialist.   
Deeds of the dirt

The experience of growing up in rural England alongside my grandfather, the village farrier who was also a bee keeper and gardener, as well as my weekend work with farmers and gamekeepers, immersed me in general natural history. This education was formalized by academic degrees in terrestrial and aquatic biology and, for me the key to life, soil ecology. The main movers and shakers in the soil are the living organisms, paramount amongst which is the humble, hidden earthworm.

Here I must air my strong objections to marine biologists such as Sylvia Earle who pointed out after winning the TED 2009 Prize that the oceans make up 70% of the surface of the Earth and the rest is just “dirt”.

Approximately 99.4% of our food and fibre is produced on land and only 0.6% comes from oceans and other aquatic ecosystems combined, [according to FAO](http://www.fao.org/ag/AGL/agll/soilbiod/consetxt.stm). The calorific value obtained from ocean catches, freshwater fishing and aquaculture adds up to just about 10-16% of the current human total. (These figures are slightly skewed for maritime countries like Japan and Iceland but still, more than 80% of our nutrition is terrestrial in origin).

Furthermore, I am sure Dr. Earle accepts that the oceanic ecosystem is wholly dependent upon dissolved nutrients washed down or blown from the soil and is similarly affected by pollution mainly from activity on the land. Her survival depends as much as anyone’s on the “just dirt” part.

Thus it is abysmal that scientific knowledge of the oceans is infinitely deeper than for terrestrial ecosystems. Moreover, Leonardo da Vinci’s observed 500 years ago that “We know more about the movement of celestial bodies than about the soil underfoot” and this still rings true today. The journal Science, realizing that our knowledge is so scant, produced a special 2004 issue entitled [Soils — The Final Frontier](http://www.sciencemag.org/content/vol304/issue5677/#special-issue).

Why waste precious funds and brain resources on the vain discovery of useless planets overhead or new deep-sea species that will still be there tomorrow, while vital unrecognized organisms literally beneath our feet disappear at an increasingly alarming rate and to our peril?

Why are we not concentrating our efforts and valuable resources on protecting and preserving the tangible deeds of our earthly home patch for current and future generations of Earthlings? Where on earth is our Soil Ecology Institute?

Global worming

We talk of greenhouse gasses and global warming yet it is the [lithosphere](http://en.wikipedia.org/wiki/Lithosphere), not the oceans nor trees, that acts as the major global carbon sink. This is especially so following the discovery just over a decade ago of [glomalin](http://www.ars.usda.gov/is/ar/archive/sep02/soil0902.htm), a tightly bound organic molecule accounting for an extra 30% of stored soil carbon. (The energy crisis too can be cured by simply tapping freely into subterranean geothermal energy, as recounted in an Our World 2.0 article on this ‘ [red hot power](http://ourworld.unu.edu/en/geothermal-energy/" \t "_self)’.)

Proper management of our arable, pastoral and forest soils is the most practically feasible mechanism to sequester atmospheric carbon without any adverse effects. Atmospheric carbon is entirely recycled via the soil from plants in around 12-20 years — all of this being processed through the intestines of worms.

Vermicomposting of organics and encouraging soil biodiversity by rebuilding humus provides a natural closed-system remedy with neither waste nor loss of productivity.

Down-to-Earth soil species

All manner of dirt and disease always ends up in the sod and consequentially its ecology is naturally robust. Yet, the soil suffers the most profound and significant effects from over-exploitation and faces the greatest threat from erosion, destruction and pollution with artificial chemicals and/or transgenes.

Despite its importance, soil biodiversity is so poorly known that even obvious organisms like the relatively large worms are mostly unclassified. On each field trip I find new species and, of the 10,000 that have been given scientific names thus far (perhaps less than a third of the total), we know something of the ecology about a dozen species.

But what we do know doesn’t look good. Unprecedented loss of species abundance and diversity combined with high extinction rates are bringing Earth into new and uncharted territory. We urgently need triage.

Laboratories crammed with scores of ecologists could study just worms for their whole careers and still we would only progress slightly from our current poor state of knowledge, but our gain would be justifiable and have tangible effects on resolving pressing environmental issues. But this is not the current situation.

Fundamentally we can justify study of soil ecology because it affects all our lives and is a crucially important issue for immediate survival of humans and all other terrestrial organisms. Whereas earthworm specialists are an endangered and rapidly declining breed, some scientists attempt to defend their studies that look at a single crop or pest. In contrast, I would argue that without earthworms there would be no healthy soil in which any healthy crop could develop in the first place.

If we ask “Which group of organisms would cause the most disruption to life support systems on the Earth if lost?” My answer would be that — rather than fish, birds and bees, or humans — it is  the earthworms. They are key links in food chains (not just for fish and fowl), they act as hosts and vectors for diverse symbionts and parasites, and they are the major detritus feeders responsible for soil mineralization and recycling of organic matter. Can other scientists, outside of medicine, claim such importance for their study subject?   
Looking forward to the past

One of the main predictions, highly optimistic, in the revolutionary move into our post-industrial era (see [Alvin Toffler’s The Third Wave](http://en.wikipedia.org/wiki/The_Third_Wave_%28book%29) for details) was that genetic engineering would provide new production methods and have profound effects on future development. In many ways this has been borne out in medical use and microbial ‘manufacture’ with genetically modified organisms (GMOs) that provide some potential benefit and serve some purpose, albeit at huge cost.

But there are equally large risks. Rather obviously, the main characteristic of life is to reproduce and disperse. The architects of the modified corn, cotton, soy, wheat, rice and spuds are often of exactly the same companies (or at least profit-driven mind-sets) that produced the toxic chemicals that they are now telling us their new GMO technology will replace — just as chemical engineers promised solutions to all our problems previously.

In 1962 Rachel Carson’s Silent Spring first alerted us to risks of agricultural chemical pollution, exacerbated by bioaccumulation in body tissue (especially of invertebrates such as earthworms) and bioconcentration further up the food-chain. But whatever the problem, these chemicals will eventually disperse and decline once production halts.

With biology the reverse is true. Design a plant to be herbicide or insect resistant and it will increase and spread by its own means, by cross-pollination or genetic drift. Case in point is the [illegitimate escape in Japan](http://www.ncbi.nlm.nih.gov/pubmed/16827549) of feral oilseed rape ( Brassica napus) genetically modified to resist herbicide that, as with any similar calamity, will continue in an uncontrollable fashion.

Rather than addressing immediate environmental issues per se, much of scientific resources are diverted into molecular studies, mostly for industrial agricultural production, that are inordinately expensive, or into agronomic trials of effective toxic biocide applications. Mostly this is not requested by informed consumers nor by farmers who must rely on the advice of often industry-funded ‘experts’ and extension officers (hopefully not advertisers).

Surprisingly and shamefully, almost zero funding is available for research on organic production ‘alternatives’ that are dismissed as impractical fads. Yet it is their implementation, since the start of the agricultural revolution 10,000 years ago, that has brought us this far.

Let’s not let topsoil slip through our fingers

Topsoil is the most valuable resource upon which civilizations depend. Its rapid loss combined with soil fertility and soil health decline are of greatest immediate concern.

How important is loss of topsoil? Basically without fertile topsoil there is no plant growth and no life on land. How big an issue is loss of topsoil? The 1991 UN funded [Global Survey of Human-Induced Soil Degradation Report](http://www.isric.org/UK/About+ISRIC/Projects/Track+Record/GLASOD.htm) showed significant problems in virtually all parts of the world. Just 11% of the Earth’s terrestrial surface is cultivated and of the total available, approximately 40% of agricultural land is seriously degraded, according to the UN’S 2005 [Millennium Ecosystem Assessment](http://www.millenniumassessment.org/documents/document.300.aspx.pdf) (MEA).

Loss of topsoil has been due to the combined effects of desertification, salinization, erosion, pollution and urban/road or other development activities. In the United States alone it is estimated to cost about $125 billion per year. The MEA, which despite its scope did not consider ‘Soil Systems’ separately, nevertheless ranked land degradation among the world’s greatest environmental challenges, claiming it risked destabilizing societies, endangering food security and increasing poverty. Among the worst affected regions are Central America, where 75% of land is infertile, Africa, where a fifth of soil is degraded, and Asia, where 11% is now unsuitable for farming.

In addition to those pollutants commonly recognized as originating from biocides and fertilizers, there are many other sources — such as antibiotics associated with intensive animal production, plus a ‘cocktail’ of human-processed pollutants like drugs, solvents and synthetic hormones from birth control pills — that all make their way into the environment in an infinite variety of unforeseeable combinations.

Suggested remediation to soil decline and agricultural production are to use GMO crops and other high-tech applications, because there is an assumption that topsoil formation is a centuries-old process that is essentially non-renewable and thus is gone forever. This view is false and there are several examples of methods that can be applied to restore fertile topsoils to farms, and in a time frame as short as a matter of a few years.

Feed the worm

“When the question is asked, ‘Can I build top-soil?’ the answer is ‘Yes’, and when the first question is followed by a second question, ‘How?’ the answer is ‘Feed earthworms’,” so wrote Eve Balfour in the introduction to Thomas J. Barrett’s book, Harnessing the Earthworm.

Indeed there are many instances of organic farms around the world preserving or restoring healthy soils. Organic farming has many approaches, with Rudolph Steiner’s biodynamics being one manifestation. All these solutions comfortably find a home under the wide umbrella of permaculture, as defined by Bill Mollison. This philosophy and approach to designing our natural environment for efficient and effective production and for comfortable living under prevailing conditions is well known and widely adopted by national and local communities and individuals worldwide.

William Blake urged us “[t]o see a world in a grain of sand and a heaven in a wildflower”. Soil survey of  the abundance and diversity of earthworms in a soil will provide a good measure of natural fertility, as these are the monitors and mediators of soil health.  That some of our honourable predecessors appreciated the worm’s role is manifest by one translation of the Chinese characters for ‘earthworms’ being ‘angels of the earth’.

Seeing a worm turned up by the plough and eaten by a bird started Prince Siddhartha (Gautama Buddah) on his contemplative path to understanding the Cycle-of-Life. In the Classical world, the ‘father of biology’, Aristotle, called earthworms the “soil’s entrails” and it is reported that Cleopatra decreed them sacred.

Charles Darwin, British naturalist and father of evolution, also had an interest in earthworms. In 1881, the year before he died, his 40 year study culminated in publication The Formation of Vegetable Mould through the Action of Worms. As a founder of soil ecology, he was one of the first scientists to give credence to conventional wisdom from earlier civilizations about the beneficial effects of earthworms on soils and plant growth, and thus on human survival.

Believing his worm work one of his most crucial contributions, Darwin   
stated:

“It may be doubted whether there are many other animals which have played so important a part in the history of the world, as have these lowly organized creatures…

“The vegetable mould [humus] which covers, as with a mantle, the surface of the land, has all passed many times through their bodies.”

Hopefully it will continue thus.

In 1981, as a centennial tribute to Darwin’s seminal work, I completed a survey on Lady Eve Balfour’s [Haughley experimental farm](http://en.wikipedia.org/wiki/Haughley_Experiment) that showed organic methods encourage healthy soil and an earthworm abundance. Significantly higher maintenance of temperature, moisture and organic matter in the soil equated with double the carbon content. In this way we could readily fix runaway CO2 in the atmosphere. Moreover, crop production was equable between organic and non-organic management regimes, even without factoring in the cost savings in chemicals and environmental degradation. (Details are [presented here](http://bio-eco.eis.ynu.ac.jp/eng/database/earthworm/Haughley%5CHaughley.pdf).)

Look up to the worm

My thesis is that each of the three major interlinked influences on our world – mass extinction of species due mainly to human activity, global warming from excessive anthropogenic generated carbon, and risk of social and political dysfunction from impending resource and food shortages caused by population pressure — can all be redressed by educating people (and politicians!) about restoring soil health and fertility. One way to start is to re-process organic ‘wastes’ via worms, for a natural compost fertilizer.

# U – Cuba lead

#### Cuba is taking the lead in vermicomposting

[**Barrows**](http://contributor.yahoo.com/user/1071547/preston_barrows.html) **11** [[Preston Barrows](http://contributor.yahoo.com/user/1071547/preston_barrows.html), “Earthworm Compost Boosts Agricultural Production Around the World,” [Yahoo! Contributor Network](https://contributor.yahoo.com/), Aug 11, 2011, pg. http://voices.yahoo.com/earthworm-compost-boosts-agricultural-production-around-8907097.html?cat=32

Earthworms play an integral component in agriculture. Where when earthworms built up the soil naturally, the use of modern farming practices has greatly decreased their numbers. Some will say that via chemical means, like fertilizers and pesticides, we have elevated crop production. This is true, but every year our soil is becoming much more and much more barren. It takes much more and more chemicals to grow the same crops. The soil microorganisms that aid produce humus and give soils their growing capacity are dwindling. Points have to alter, and an example of forced change may be the modest country of Cuba.  
In 1986, the Cuban government began a vermicomposting program to style secure and efficient soil management tactics. Cuba was caught in a vise of economic sanctions, political pressures, and lowered crop production. Cuba was faced with no choice but to locate alternatives to its past dependency on imported fossil fuels, fertilizers, pesticides, and animal feed.  
Cuban scientists developed a full technological package for the [production of humus from earthworms](http://www.associatedcontent.com/article/8194717/how_the_body_of_an_earthworm_processes.html?cat=32), a process recognized as vermicomposting or vermiculture. They found the ideal application rate was 4 tons per hectare of earthworm humus for most crops. Because the implementation of this program, imported agricultural products have been cut by as much as 80 percent.  
Cuba's vermicomposting program began with two smaller boxes of redworms, Eisenia fetida and Lumbricus rubellus. Today you will discover 172 vermicompost centers throughout the country. In 1992, these centers produced 93,000 tons of worm vermicompost. A number of different institutions and companies are involved in vermiculture operations, but most of the study is conducted by the Institute of Soils and Fertilizers and by the National Institute of Agricultural Sciences..

# U – Composting now

#### Vermicomposting is growing rapidly

[**Barrows**](http://contributor.yahoo.com/user/1071547/preston_barrows.html) **11** [[Preston Barrows](http://contributor.yahoo.com/user/1071547/preston_barrows.html), “Earthworm Compost Boosts Agricultural Production Around the World,” [Yahoo! Contributor Network](https://contributor.yahoo.com/), Aug 11, 2011, pg. http://voices.yahoo.com/earthworm-compost-boosts-agricultural-production-around-8907097.html?cat=32

Cuba isn't the only nation seeking to worms to increase soil conditions. The Ecology Institute of Mexico, Peru's INIAA/NCSU Yurimaguas Experimental Station, the University of Rwanda, and Spain's Universidad Complutense have all completed the first stage of earthworm projects. India, France, and [Australia](http://voices.yahoo.com/theme/1531/australia.html) have been studying the rewards of worms for really some time and have vermicomposting facilities. Most of the countries inside the globe are taking a significant look in the impact of earthworms. Vermiculture is absolutely in its infancy throughout the world, but it is growing rapidly.

#### Demand is increasing

[**Yeager**](mailto:priedman@yahoo.com) **13** - Freelance writer [[Patricia Riedman Yeager](mailto:priedman@yahoo.com), “[Worm Composting on a Large Scale: How it Works](http://www.beginningfarmers.org/worm-composting-on-a-large-scale-how-it-works/),” Beginning Farms, May 10, 2013, pg. http://www.beginningfarmers.org/worm-composting-on-a-large-scale-how-it-works/

Demand for vermicompost is growing all the time, especially as more farmers seek ways to reduce use of synthetic fertilizers and to safely dispose of agricultural waste. Countries worldwide—from Cuba and India to the Philippines—are experimenting with large-scale worm composting techniques. In the Philippines, worms are fed organic residues such as sawdust, cereal straw, rice husks and cardboard. In Cuba, cow manure is composted in cement troughs or windrows covered with palm fronds. In the Finger Lakes region of New York State the Worm Power company operates the largest vermicomposting facility in the Western Hemisphere.

# Lk Ext

#### Embargo forced Cuba to shift to organics. Lack of access to petrochemicals is key

**Albert’s Organics 10** [Cuba – An Unlikely Model for Organic Farming,” Fresh Perspective, Albert’s Organics, May 12th, 2010, pg. http://blog.albertsorganics.com/?p=934

Going organic is typically thought of as a choice. Farms choose to become organic; retailers decide that organic is best for their customers and their business; and consumers select the products that best fit their lifestyle. In Cuba, it became necessary for them to think beyond the farm, or the store; they needed to think and act as a country. Simply put, the U.S. trade embargo of Cuba, plus the collapse of the Soviet market, meant that the country found it virtually impossible to import the chemicals and machinery necessary to practice 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.

“The driving force in these changes has been economic crisis. Since the 1989 collapse of trading relations with the former Soviet bloc, imports of agro-chemicals have dropped by more than 80 percent. Tractors are idle for lack of spare parts and petroleum, and the government is searching desperately for ways to provide incentives so that farmers will up their food production in the face of these difficulties. Yet in the midst of crisis, something is happening with positive implications that reach far beyond Cuban shores.”

Until the collapse of the Soviet Union, Cuban agriculture was based on large scale, monoculture farming, much like we would see in the Central valley of California. More than 90% of the fertilizers and pesticides that they used to grow their food were imported. When the trade relations with the Soviet Union collapsed pesticides and fertilizers virtually disappeared, and the availability of petroleum for agriculture dropped by half. As a result of this crisis, Cuba has been undergoing a conversion from modern conventional agriculture to organic farming.

During the 1990’s after the Soviet collapse, the U.S. tightened its existing trade embargo, making it nearly impossible for Cuba to rely on any help from other countries. As their oil imports diminished, Cuba had to reduce many of their agricultural costs, including transportation, refrigeration and storage. They did this by moving farming production closer to the cities. Urban organic agriculture became the method of farming in Cuba. Urban agriculture used to play a major role in feeding urban populations until the rise of the industrial revolution, when farming moved almost exclusively to the countryside. By 1998, Urban farming was beginning to take hold in Cuba, with over 8,000 “Urban Gardens” being farmed by over 30,000 people, using over 30% of the islands land mass.

With petrochemicals disappearing in Cuba, integrated pest management has begun to replace chemicals; farmer co-ops are replacing large monoculture farms; and rather than people fleeing the cities, the urban population remains strong.

#### Concessions on the embargo places Cuban organics at risk

**Barclay 03** [Eliza Barclay, “Cuba's security in fresh produce,” Food First, September 12th, 2003, pg. http://www.foodfirst.org/node/1208

Faced with the possibility of widespread starvation, the Cuban government foresaw that a full-scale mobilization of domestic resources, both human and natural, would be required in order to increase production to meet the demands of a hungry populace. And with few options to import food given the stringency of the U.S. embargo, Cuba turned over a new leaf by converting almost entirely to an organic production system within 10 years.

Cuba's nationwide commitment to food self-sufficiency without reliance on chemical or mechanical technologies has borne some startlingly successful results, not only in terms of food production but also in the development of a more personalized food culture, woven deeply into patterns of food consumption, nutrition, and community.

These trends, which many sustainable agriculture experts enthusiastically champion, also appear to be on the brink of a major confrontation with the powerful forces of the global market, from which Cuba was virtually exempt until 2001, when U.S. policy toward agricultural exports to Cuba began to shift slightly. The strength of Cuba’s food security, with all its growing bureaucratic and market support, will inevitably be put to the test as small but increasing concessions are made to expand trade between Cuba and its closest potential trading partner, the United States.

#### Embargo restricts access to food aid. Cuba is forced to rely on organics

**Barclay 03** [Eliza Barclay, “Cuba's security in fresh produce,” Food First, September 12th, 2003, pg. http://www.foodfirst.org/node/1208

Given the highly restrictive nature of the U.S. embargo on trade with and from Cuba, the Cubans have been forced to virtually sink or swim in terms of procuring or growing food. Because of the terms of the trade sanctions, Cuba has been ineligible to receive food aid from international aid agencies.

Peter Rosset, co-director of Food First/Institute for Food and Development Policy based in Oakland, Calif., has been researching food issues in Cuba since the early 1990s. He said, "Cuba has resisted three things: the blockade of the U.S. embargo, the fallout of the Soviet Union, and the industrial green revolution and economic globalization that has taken its toll elsewhere in the world."

Fortunately, with a combination of solid scientific expertise and institutional will, Cuba was able to replace conventional farming practices with more practical and affordable alternatives. By charting new courses in research, land management, and market supply, government officials and scientists were able to avert a full hunger crisis and activate farmers and urban citizens to dedicate themselves to meeting food demands.

# Lk – Model

#### Cuba is the model for vermicomposting. Their transition is driven by the embargo

**Project Censored 10** [“Cuba Leads the World in Organic Farming,” Apr 30, 2010, pg. http://www.projectcensored.org/top-stories/articles/12-cuba-leads-the-world-in-organic-farming/

Cuba has developed one of the most efficient organic agriculture systems in the world, and organic farmers from other countries are visiting the island to learn the methods.

Due to the U.S. embargo, and the collapse of the Soviet Union, Cuba was unable to import chemicals or modern farming machines to uphold a high-tech corporate farming culture. Cuba needed to find another way to feed its people. The lost buying power for agricultural imports led to a general diversification within farming on the island. Organic agriculture has become key to feeding the nation’s growing urban populations.

Cuba’s new revolution is founded upon the development of an organic agricultural system. Peter Rosset of the Institute for Food and Development Policy states that this is “the largest conversion from conventional agriculture to organic or semi-organic farming that the world has ever known.” Not only has organic farming been prosperous, but the migration of small farms and gardens into densely populated urban areas has also played a crucial role in feeding citizens. State food rations were not enough for Cuban families, so farms began to spring up all over the country. Havana, home to nearly 20 percent of Cuba’s population, is now also home to more than 8,000 officially recognized gardens, which are in turn cultivated by more than 30,000 people and cover nearly 30 percent of the available land. The growing number of gardens might seem to bring up the problem of space and price of land. However, “the local governments allocate land, which is handed over at no cost as long as it is used for cultivation,” says S. Chaplowe in the Newsletter of the World Sustainable Agriculture Association.

The removal of the “chemical crutch” has been the most important factor to come out of the Soviet collapse, trade embargo, and subsequent organic revolution. Though Cuba is organic by default because it has no means of acquiring pesticides and herbicides, the quality and quantity of crop yields have increased. This increase is occurring at a lower cost and with fewer health and environmental side effects than ever. There are 173 established ‘vermicompost’ centers across Cuba, which produce 93,000 tons of natural compost a year. The agricultural abundance that Cuba is beginning to experience is disproving the myth that organic farming on a grand scale is inefficient or impractical.

So far Cuba has been successful with its “transformation from conventional, high input, mono-crop intensive agriculture” to a more diverse and localized farming system that continues to grow. The country is rapidly moving away from a monoculture of tobacco and sugar. It now needs much more diversity of food crops as well as regular crop rotation and soil conservation efforts to continue to properly nourish millions of Cuban citizens.

In June 2000, a group of Iowa farmers, professors, and students traveled to Cuba to view that country’s approach to sustainable agriculture. Rather than relying on chemical fertilizers, Cuba relies on organic farming, using compost and worms to fertilize soil. There are many differences between farming in the United States and Cuba, but “in many ways they’re ahead of us,” say Richard Wrage, of Boone County Iowa Extension Office. Lorna Michael Butler, Chair of Iowa State University’s sustainable agriculture department said, “more students should study Cuba’s growing system.” (AP 6/5/00)

#### Cuba is the global model

**Barclay 03** [Eliza Barclay, “Cuba's security in fresh produce,” Food First, September 12th, 2003, pg. http://www.foodfirst.org/node/1208

The news of Cuba's success has been slowly leaking out since the early 1990s, and the country is beginning to take on legendary status as a model for sustainable agriculture and local food production in the eyes of environmental advocates, farmers, and development specialists. Already lauded for years by the steady stream of sustainable farming gurus from around the world who have made the pilgrimage to observe the success of organic and local food production, Cuba's experiment with sustainable agriculture has succeeded beyond its trial period.

American farmers have been shuttled to Cuba in "fact-finding missions" and "reality tours" by crafty NGOs who have obtained the highly coveted U.S. Department of Treasury Office of Foreign Assets Control (OFAC) licenses allowing them to sponsor travel to Cuba for educational purposes. Whether many of these trips will be allowed to continue is unclear; in March 2003, OFAC announced the end of people-to-people exchanges. Most groups who have had the appropriate licenses are scheduled to lose them by December 2003.

But a rapidly approaching future of shifting economic opportunities poses serious questions and potential risks to this Cuba’s model, regarded as precious by so many of its advocates.

#### Cuba’s selling its worm tech internationally. It is pursuing joint ventures and providing technical assistance

**Gersper et al. 93** - Professor of Soil Science @ UC Berkeley. [Paul L. Gersper, Carmen S. Rodrfguez-Barbosa (doctoral candidate in the School of Natural Resources at the University of Michigan.), & Laura F. Orlando (Executive Director of the Resource Institute for Low Entropy Systems), “Soil Conservation in Cuba: A Key to the New Model for Agriculture,” [Agriculture and Human Values](http://link.springer.com/journal/10460), SUMMER, 1993, Volume 10, [Issue 3](http://link.springer.com/journal/10460/10/3/page/1), pp 16-23

Cuba's vermicomposting program started in 1986 with two small boxes of redworms, Eiseniafoetida and Lumbricus rubellus. Today there are 172 vermicompost centers that in 1992 produced 93,000 tons of worm humus (see Graph 1).

Several different institutions and companies are involved in vermiculture operations. Research is conducted primarily by the Institute of Soils and Fertilizers and the National Institute of Agricultural Sciences. At the Soil Institute plans exist for a vermiculture research facility, but construction has not started. The Institute is presently spearheading efforts to market and sell worm humus in 40 kg, 1 kg, and 1/2 kg bags under the trade name Midas. A 40 kg bag of Cuban worm humus can sell for as much as $80-100 (U. S.) on the international market, though humus production has not reached levels that permit significant exports. Income generating schemes have focused on joint production ventures and the sale of technical assistance for start-up venniculture programs outside Cuba. Pg. 20

# Impx – Ecological Balance

#### Vermicomposting will preserve the ecological balance

**Rajendran et al. 08** – Professor of Zoology @Vivekananda College [P. Rajendran, E. Jayakumar, Sripathi Kandula & P. Gunasekaran “Vermiculture and Vermicomposting Biotechnology for Organic Farming and Rural Economic Development,” Eco Web, February 2008, pg. http://www.eco-web.com/edi/080211.html

Sujatha *et al.* (2003) reported earthworm castings in the home garden often contains 5 to 11 times more Nitrogen, Phosphorous and Potassium than the surrounding soil. Castings of earthworm also contain abundant sources vitamins, antibiotics and enzymes such as proteases, amylases, lipases, cellulases and chitinases. Vermicompost technology can provide employment to millions of youth, can eliminate dependence on chemicals; can convert wastes into fertilizer; can bring waste land under cultivation, can feed hungry citizen and can make a country green and prosperous in a span of just a few years (Shewta *et al.,* 2004). This technique also helps to conserve the biodiversity, which is the need of the hour. Apart from providing self-employment opportunities for the weaker section and profitable agricultural waste utilization it will also help in maintaining the environmental/ecological balance.

# Impx: Turns War adv

#### Global collapse triggers wars, spreads epidemics and destroys trade

**Ehrlich & Ehrlich 13** – Professor of Biology & Senior Research Scientist in Biology @ Stanford University [Paul R. Ehrlich (President of the Center for Conservation Biology @ Stanford University) & Anne H. Ehrlich, “Can a collapse of global civilization be avoided?,” Proceedings of the Royal Society Biological Sciences, Proc. R. Soc. B 2013 280, published online 9 January 2013

Virtually every past civilization has eventually undergone collapse, a loss of socio-political-economic complexity usually accompanied by a dramatic decline in population size [1]. Some, such as those of Egypt and China, have recovered from collapses at various stages; others, such as that of Easter Island or the Classic Maya, were apparently permanent [1,2]. All those previous collapses were local or regional; elsewhere, other societies and civilizations persisted unaffected. Sometimes, as in the Tigris and Euphrates valleys, new civilizations rose in succession. In many, if not most, cases, overexploitation of the environment was one proximate or an ultimate cause [3].

But today, for the first time, humanity’s global civilization—the worldwide, increasingly interconnected, highly technological society in which we all are to one degree or another, embedded—is threatened with collapse by an array of environmental problems. Humankind finds itself engaged in what Prince Charles described as ‘an act of suicide on a grand scale’ [4], facing what the UK’s Chief Scientific Advisor John Beddington called a ‘perfect storm’ of environmental problems [5]. The most serious of these problems show signs of rapidly escalating severity, especially climate disruption. But other elements could potentially also contribute to a collapse: an accelerating extinction of animal and plant populations and species, which could lead to a loss of ecosystem services essential for human survival; land degradation and land-use change; a pole-to-pole spread of toxic compounds; ocean acidification and eutrophication (dead zones); worsening of some aspects of the epidemiological environment (factors that make human populations susceptible to infectious diseases); depletion of increasingly scarce resources [6,7], including especially groundwater, which is being overexploited in many key agricultural areas [8]; and resource wars [9]. These are not separate problems; rather they interact in two gigantic complex adaptive systems: the biosphere system and the human socio-economic system. The negative manifestations of these interactions are often referred to as ‘the human predicament’ [10], and determining how to prevent it from generating a global collapse is perhaps the foremost challenge confronting humanity.

The human predicament is driven by overpopulation, overconsumption of natural resources and the use of unnecessarily environmentally damaging technologies and socio-economic-political arrangements to service Homo sapiens’ aggregate consumption [11–17]. How far the human population size now is above the planet’s long-term carrying capacity is suggested (conservatively) by ecological footprint analysis [18–20]. It shows that to support today’s population of seven billion sustainably (i.e. with business as usual, including current technologies and standards of living) would require roughly half an additional planet; to do so, if all citizens of Earth consumed resources at the US level would take four to five more Earths. Adding the projected 2.5 billion more people by 2050 would make the human assault on civilization’s life-support systems disproportionately worse, because almost everywhere people face systems with nonlinear responses [11,21–23], in which environmental damage increases at a rate that becomes faster with each additional person. Of course, the claim is often made that humanity will expand Earth’s carrying capacity dramatically with technological innovation [24], but it is widely recognized that technologies can both add and subtract from carrying capacity. The plough evidently first expanded it and now appears to be reducing it [3]. Overall, careful analysis of the prospects does not provide much confidence that technology will save us [25] or that gross domestic product can be disengaged from resource use [26]

2. Do current trends portend a collapse?

What is the likelihood of this set of interconnected predicaments [27] leading to a global collapse in this century? There have been many definitions and much discussion of past ‘collapses’ [1,3,28–31], but a future global collapse does not require a careful definition. It could be triggered by anything from a ‘small’ nuclear war, whose ecological effects could quickly end civilization [32], to a more gradual breakdown because famines, epidemics and resource shortages cause a disintegration of central control within nations, in concert with disruptions of trade and conflicts over increasingly scarce necessities. In either case, regardless of survivors or replacement societies, the world familiar to anyone reading this study and the well-being of the vast majority of people would disappear. pg. 1-2

# AFF – No Shift

#### No link – No shift back to petrochemicals

**Van Cleef 00** [Lisa Van Cleef, “The Big Green Experiment: Cuba's Organic Revolution,” [San Francisco Chronicle](http://www.sfgate.com), “Wednesday, March 15, 2000, pg. http://yeoldeconsciousnessshoppe.com/art9.html

Cuba's advanced organic farming techniques have led to major cultural shifts as many city-dwellers have become farmers. But what happens when the Cuban economy shifts and the embargo is lifted? Now that they are such capable organic growers, will they revert to chemical farming? Rieux says no.

"Yes, there are people who believe some of the gardeners will revert to the old practices, but many people will still farm organically. Even when the embargo lifts, the small farmer will make more money organically because he spends so little. He's not going to start buying chemicals. He won't have to. He has the knowledge now.

#### Organics will not disappear

**Ewing 08** [[Ed Ewing](http://www.guardian.co.uk/profile/edewing), “Cuba's organic revolution,” [guardian.co.uk](http://www.guardian.co.uk/), Thursday 3 April 2008 20.02 EDT, pg. http://www.guardian.co.uk/environment/2008/apr/04/organics.food

General farming will "most likely" move away from organic methods says Wilkinson. Farming on a large scale after all, he says, has seen a reduction in pesticide and fertiliser use mainly due to "financial constraints, not choice".   
But, he notes: "Organoponicos fulfil a local and specific need and are unlikely to disappear."  
He adds: "The commitment to organics in agriculture may not be 100% because of climate and the need to boost production. But policies that encourage environmental protection will continue so long as the present government remains."  
When that changes, Cuba's unique experiment with organic farming will change too.

# AFF – Cuba model not needed

#### India will lead – Cuban expertise not needed

**Rajendran et al. 08** – Professor of Zoology @Vivekananda College [P. Rajendran, E. Jayakumar, Sripathi Kandula & P. Gunasekaran “Vermiculture and Vermicomposting Biotechnology for Organic Farming and Rural Economic Development,” Eco Web, February 2008, pg. http://www.eco-web.com/edi/080211.html

Vermiculture and vermicomposting technology is easy to practice, ecologically safe, economically sound and can create more employment opportunities for the rural people to upgrade their standard of living. At present Vermiculture technology is all set to emerge as a big business of the next century. The organic manure obtained from different waste materials using this versatile technique will avoid pollution problems to a greater extent. India being agriculture based country, it could easily produce millions of tones of Vermicompost, and considerably reduce the use of chemical fertilizers.

#### Simple tech – Cuban expertise not needed

**Rajendran et al. 08** – Professor of Zoology @Vivekananda College [P. Rajendran, E. Jayakumar, Sripathi Kandula & P. Gunasekaran “Vermiculture and Vermicomposting Biotechnology for Organic Farming and Rural Economic Development,” Eco Web, February 2008, pg. http://www.eco-web.com/edi/080211.html

Vermitechnology is popular because it is a simple methodology with low investment and does not need sophisticated infrastructure. To process one ton of organic matter daily, it would require about 1500 sq meters of space with 6 workers. It would produce about 70 tons of earthworm casting annually (Gupta, 2003). Innovative, interested and talented rural people can be successful entrepreneurs in vermicompost production and accruing profits will enhance their life style and income. They will be able to spend time usefully by getting job opportunities with the help of self-employment schemes.

# AFF – Not prevent food insecurity

#### Cuba remains import dependent

**Patel 13** - Research Fellow @ Institute for Food and Development Policy [R[aj Patel](http://www.slate.com/authors.raj_patel.html)|” What Cuba Can Teach Us About Food and Climate Change,” Slate, Tuesday, June 18, 2013, at 12:29 AM, pg. http://tinyurl.com/77l7b32

So has it worked? That’s up for debate. The Cuban vice minister of the economy and planning ministry reportedly said in February 2007 that [84 percent of the country’s food was imported](http://www.landaction.org/spip.php?article422)—not terribly encouraging, if we are looking at Cuba to foretell our agricultural future. But a [recent paper](http://monthlyreview.org/2012/01/01/the-paradox-of-cuban-agriculture) by UC-Berkeley’s [Miguel A. Altieri](http://monthlyreview.org/author/miguelaaltieri) and the University of Matanzas’ [Fernando R. Funes-Monzote](http://monthlyreview.org/author/fernandorfunesmonzote) suggests that while the country still imports almost all its wheat (a crop that doesn’t do well in the Caribbean), it now produces the majority of its fresh fruit and vegetables—even much of its meat. In 2007, Cubans produced more food while using one-quarter of the chemicals as they did in 1988.

# AFF – Chemical fertilizer now

#### Venezuela provides chemical fertilizer now

**Patel 13** - Research Fellow @ Institute for Food and Development Policy [R[aj Patel](http://www.slate.com/authors.raj_patel.html)|” What Cuba Can Teach Us About Food and Climate Change,” Slate, Tuesday, June 18, 2013, at 12:29 AM, pg. http://tinyurl.com/77l7b32

For many, especially government officials, choosing agro-ecology wasn’t a red-blooded Communist decision. It was a practical one. They are quite ready for an industrial-agricultural relapse if the occasion arises. Recently, they have had an unlikely enabler: Hugo Chávez. In exchange for the 31,000 Cuban doctors who are treating Venezuelans, Cuba receives 100,000 barrels of oil a day, plus a great deal of chemical fertilizer. As a result, the parts of the country untouched by agro-ecology are starting to spray and sow like it’s the 1980s again.