

SAILING TOWARDS THE FUTURE OF AGRICULTURE

Report of visit to Cuba of Greenpeace with Mayan communities and Government Officials of Yucatan

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Content

0. Summary

- 3. Our visits to Cuba

3.1 Urban and peri-urban agriculture Cooperativa Vivero Organopónico Alamar UBPC (Basic Unit of Cooperative Production) "El Cachón" orchard Patio Las Americas "El Japonés" orchard Agricultural Shop Consultancy (CTA) Food and Healthy Feed Conservation Project "Vilda and Pepe" 3.2 Agroecology Research Centers Indio Hatuey Experiment Station of Pastures and Forages Institute of Fundamental Research in Tropical Agriculture (Inifat) and National Program for Urban, Suburban and Family Agriculture 3.3 Agroecological farms "El Cacique" farm "Cayo Piedra" farm "Finca Plácido" farm "Villa Hortensia" farm **Other Institutions** Antonio Núñez Jiménez Nature and Man Foundation Cuban Association of Animal Production (ACPA)

4. Main learning and future challenges. 5. Final agreements.

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1. Ecological agriculture in Cuba: background, development and current affairs 2. Agriculture in the Yucatan Peninsula and the ecological milpa



Mayan communities visit to Cayo Piedra Organoponic Farm in the province of Matanzas, Cuba.

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INTRO Summary

In January 2017, Greenpeace Mexico organized the visit to Cuba of an international group interested in the advances of Cuban agroecology. The visiting group was composed of Mayan farmers from the states of Yucatan and Campeche, representatives of the Government of Yucatan, representatives of farmer organizations in Argentina, and Greenpeace members, including the flagship Greenpeace crew: the Rainbow Warrior. We visited numerous orchards, patios, farms and agroecology centers on the island. We also had the opportunity to meet many Cuban farmers who are experts in agroecology. The main objective of this visit was the knowledge exchange between Mexican and Cuban farmers and the establishment of an agroecology collaboration framework between them and Cuban and international experts.

The policies focused on agroecology in Cuba since the 1990s are an example of transformation, from polluting and unsustainable agricultural production, to an ecological and sustainable food production, applied in response to a time of crisis.

In the Yucatan Peninsula (Mexico), a battle is being agriculture as a solution in times of crisis, just as Cuba fought between two opposing agriculture models: the did in the 1990s. The regional government of Valencia in industrial model based on agrochemicals, and the Spain, Sikkim in India², and Bhutan have also been in the ecological model based on biodiversity. Mayan com-100% Ecological production states. munities in this area are waging a legal battle against transnational Monsanto, which has sought to commer-Cuba is a pioneer in the commitment to ecological cialize its transgenic soybeans in the region. The Mayan agriculture on a national scale. But Cuba is not alone, communities decided to raise the voice against this and neither the Mayan peasants who are struggling to turn to learn from the agroecological experience, to strengththeir milpa into an ecological one. And this simple message, we are not alone in the search of the change to en it, and to promote it. organic agriculture, is the main learning for them in this We have to seek the promotion and strengthening of trip to Cuba, and also it is for all that we are dedicated to the agroecological model that provides food for life, promote a healthy, fair and ecological feed in the world. not against it. This was the message that summed up the international exchange and alliances created in this The challenges are big and growing. The present society journey towards the organic farming future. is having constant and hurried economic, ecological and social changes. The economic inequality in the As a close to the visits made to the "Indio Hatuey" world is expanding and is at extreme levels. Only eight Experimental Station of Pastures and Forages (EEPpeople have the same wealth as the poorest half of the FIH, Spanish abbreviation), Greenpeace counterpart on world's population, 3.6 billion people³. The environmenthe island, to agroecological properties in Havana and tal deterioration of the planet is increasingly evident. For Matanzas, as well as to the talks with representatives example, soil erosion is so alarming that United Nations of the National Institute of Fundamental Investigations experts estimate that there are only 60 years left to har-In Tropical Agriculture (INIFAT, Spanish abbreviation), vest if the soil continues to degrade at that rate.⁴ Volkert the Urban, Peri-urban and Family Agriculture Program of Engelsman, an activist with the International Federathe Antonio Núñez Jiménez Foundation and the Protion of Organic Agriculture Movements said: "Organic ject for the Conservation of Food and Healthy Feed; It farming may not be the only solution but it's the single was agreed to start a collaboration process. The "Indio best option I can think of". This phrase sums up the Hatuey" Experiment Station will be in charge of the link collective feeling after this trip to Cuba. between the various instances. Among the agreements, the joint objective of promoting training and the exchan-As we have evidently seen in Cuba, Cuban ecological agriculture is already reaping the future, a better future ge of agroecological knowledge stands out. for the environment and for people based on biodiversi-"We are facing major economic and ecological challenty, soil and peasant care, social justice and science. Now ges, organic farming is an essential part of the soluwe need Cuba to consolidate and improve this agrotion."1 ecological model, and that more countries and regions join this future, so that the international agroecological Ecological producers continue to increase worldwide, as movement grows and consolidates as the engine in the does the area devoted to organic farming and consusearch for solutions for a greener and more humane mer demand for this kind of food. Many governments world.

have already made a strong commitment to ecological

La agricultura ecológica valenciana busca ser "referente europeo". La Vanguardia, Noviembre 2016. Available on: http://www.lavanguardia.com/local/valencia/20161117/411942008525/plan-valenciano-produccion-ecologica-agricultura-elena-cebrian-ximo-puig.html Sikkim becomes India's first organic state. The Hindu, January, 2016. Available on: http://www.thehindu.com/news/national/Sikkim-be-2. comes-India%E2%80%99s-first-organic-state/article13999445.ecehttps://www.oxfam.org/es/iguales/foro-economico-mundial-en-davos-cinco-datos-escandalosos-sobre-la-desigualdad-extrema-global 3 Cinco datos escandalosos sobre la desigualdad extrema global. Oxfam. Available on: https://www.oxfam.org/es/iguales/foro-economico-mundial-en-davos-cinco-datos-escandalosos-sobre-la-desigualdad-extrema-global Only 60 Years of Farming Left If Soil Degradation Continues. Reuters. Available on: https://www.scientificamerican.com/article/only-60-4 years-of-farming-left-if-soil-degradation-continues/

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Aspects of crops on El Cachón orchard in Havana, Cuba ©Anaray Lorenzo Collazo/Greenpeace

ONF

Ecological agriculture in Cuba: background, development and current affairs

The policies focused on agroecology in Cuba since the 1990s are an example of transformation, from polluting and unsustainable agricultural production, to a production of ecological and sustainable food, applied in response to a time of crisis.

Since the 1950s, Cuba had produced food with an industrial agriculture system (monocultures, high use of chemical inputs and overexploitation of natural resources), and it was directed towards its export products, especially sugar. The economic blockade imposed by the United States in 1960 caused a critical outlook for the population of this country and its access to food. Cuba then strengthened trade relations with the Soviet bloc, which also promoted the model of industrial agriculture. In this way, the model was strengthened in Cuba for three more decades (from 1960 to 1990).

The economic collapse that followed the disintegrati of the USSR left Cuba without the source of its produ tion inputs and with alarming environmental and soci costs. Degradation of soils, loss of biodiversity, exten sive deforestation, low food self-sufficiency, low ener efficiency and high external dependence intensified the changes in the country.

As a result, the country and its population were force to radically decrease the use of external inputs, to ma much greater use of available resources and knowled ge. After 3 decades of industrial agriculture, in the ea 1990s and due to the economic crisis of the Special Period, Cuba strongly opted for organic farming.

As a result, the ecological movement was gaining stre gth with the creation and dissemination of Entomopat gens and Entomopagous Reproduction Centers (CREE Spanish abbreviation), which allowed the "greening" of Cuban agriculture as a basis for the biological control pests through techniques such as the use of sex phere mones, natural control, repellent plants usage, among others.

In addition, urban agriculture was promoted to reduce costs and access for families to food. This type of agr culture was previously prohibited due to the applicatio of agrochemicals that are used in the agroindustrial m del, a fact that changed completely when producing w ecological techniques.

This model of ecological agriculture grew thanks to a comprehensive scheme that incorporates scientific research, crop diversification, integrated pest management, organic soil nutrition, silvopastoral techniques, c rotation, education and training of people, support to the rural peasantry, and the knowledge exchange "among peasants", and other elements. Nowadays, Cuba has a land grant in usufruct by the Laws 259 of 2008 and 30 of 2012. In addition, it has promoted local developmer throughout the country with more than 100 thousand technicians in the activity.

Today, Cuba has more than 30 research and developm

Funes Aguilar and Vázquez Moreno. 2016. Avances de la Agroecología en Cuba. Estación Experimental de Pastos y Forrajes India Hatuey (Ed), La Habana, Cuba.

Funes Aquilar and Vázquez Moreno. 2016. Avances de la Agroecología en Cuba. Estación Experimental de Pastos y Forrajes India 6 Hatuey (Ed), La Habana, Cuba.

Who are the hungry? World Food Programme. Disponible en: http://www.wfp.org/hunger/who-ar

Funes Aguilar and Vázquez Moreno. 2016. Avances de la Agroecología en Cuba. Estación Experimental de Pastos y Forrajes India Hatuey (Ed), La Habana, Cuba. & https://www.wfp.org/countries/cuba 9

SAILING TOWARDS THE FUTURE





on IC- ial 1-	centers dedicated to finding solutions for small farmers and supporting policies that encourage organic farming, farmers' families and cooperatives of urban families who depend on it.
ed ake d- arly	Currently, Cuban farmers in cities and rural areas produce about 80% of the vegetables and fruits that the coun- try consumes. In addition, the number of cooperatives increased from 15% of cultivated land in 1989 to more than 70% at present and produces about 70% of the food grown nationally (86% of maize and beans grown and 90% of vegetables) ⁵ . The country also reduced its con- sumption of agrochemicals by 75% in the last 20 years. ⁶
en- :ho- <u>=</u> , f of 0-	In cities, urban farmers supply about 50% of the vegeta- bles and fruits consumed locally, a rate that continues to increase in recent years. The Urban Agriculture program is one of the seven most important priorities of the Minis- ter of Agriculture. It has created around 300,000 jobs in cities, with 50% of them targeting women and youth.
ri- on io- vith	Despite these progress signs, there are still many pro- blems in agriculture and other issues. Cuba still imports 70% of the food the country needs, most grains and lives- tock products, accounting for 14% of total imports into the country and about two billion dollars a year. However, it has also been estimated that by avoiding imports of seeds and agrochemicals, the country's savings reach an estimated \$ 50 million per year. ⁷
- crop	While half of the nearly 800 million hungry people in the world belong to smallholder communities; in Cuba, small farmers ⁸ produce enough food for them and also supply 90% of the vegetables and fruits consumed in the country. ⁹
a 10 nt nent	Raul Castro, president of Cuba, has recognized that food production in the country is the first priority. Now, more financial support is needed and new beneficiaries are encouraged; Training, equipment, implements, rural development and change of consciousness towards an agriculture in harmony with the nature and economic and social attractions for the new farmers that allows the revaluation of the small farmers' work.

El origen y la diversidad del maíz en el continente americano. Serratos, 2012. 2da. Ed. Greenpeace México. México. Septiembre 2012.

HACIAEL FUTURO DE LA AGRICULTURA Message in the area of the sails of Rainbow Warrior vessel on his way to Cuba © Alonso Crespo/Greenpeace

TWO

Agriculture in the Yucatan Peninsula and the ecological milpa

The Yucatan Peninsula, center of Mayan culture, is also the place of the milpa milenary development, an agroecological system in which maize, pumpkin, chili tomato, beans and edible herbs are grown together. The milpa is capable of supplying the population with healthy and sufficient diet, and is a living concretion of the Mexican biocultural heritage, is based on ecologic principles and the knowledge of the interactions between plants, animals and agronomic conditions.

The ecological milpa contributes to the conservation immense crop diversity, both in number of species ar of breeds and/or varieties of each. It is in this diversit that hides the ability of crops to survive and adapt to changes, something that farmers have preserved for centuries, in cultivars highly adapted to every environ mental condition in the world's cultivated lands.

Mexico is the cradle of maize¹⁰, the milpa's base crop least 65 breeds of cultivated maize (59 crossbred, 6 i precise) are recognized, each of which groups numer variants that differ in cob forms, flavor, color and grai texture, and particularly in their adaptation to environ mental conditions.

In this context of cultural and biological richness, a ba ttle is fought between two opposing models of agriculture ture: the industrial model based on agrochemicals an the ecological model based on biodiversity. The Maya communities of the Yucatan Peninsula appeal to their right to an agriculture that provides healthy, diverse a sufficient food, which is grown through the traditiona milpa ecological system. These communities are waging a legal battle against the transnational Monsant which has tried to market its transgenic soybeans in diazinon, and glyphosate. The Lancet Oncology. Available on: http:// the region in partnership with the federal government. www.thelancet.com/journals/lanonc/article/PIIS1470-2045(15)70134-Worldwide, these seeds already contribute to the mas-8/abstract sive increase in the use of the herbicide glyphosate, a substance classified by the World Health Organization

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ı İ,	Unfortunately the milpa model has been neglected by the Mexican federal government and the few "su- pports" to small producers consist on patented hybrid seeds and their respective agrochemical package. The Mexican milpa is at risk of being lost and with it all the knowledge applied for thousands of years.
h a of cal	Mayan communities decided to raise their voices and denounce it, but, above all, they decided to continue doing milpa, to learn from agroecological experience, to strengthen it, and to promote it as a culture that applies science, peasant knowledge, culture and love.
of nd ty 1-	Mayan farmers from the states of Campeche and Yuca- tan traveled to Cuba with Greenpeace, accompanied by representatives of the Yucatan government, to exchange experiences and knowledge on agroecology and to learn about the ecological transformation carried out in Cuba in recent decades
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ir and II - :0,	Pág. 19. Available on: http://www.greenpeace.org/mexico/es/Footer/ Descargas/reports/Agricultura-sustentable-y-transgenicos/El-origen-y- la-diversidad-del-maiz-2a-edicion/ 10. http://www.thelancet.com/journals/lanonc/article/PIIS1470- 2045(15)70134-8/abstract 11. Carcinogenicity of tetrachloryinphos, parathion, malathion

as probable carcinogen.¹¹



Arrival in Cuba of Rainbow Warrior vessel

© Aslam I. Castellón Maure/Greenpeace

Our visits to Cuba

In January 2017, Greenpeace Mexico organized the visit to Cuba of an international group interested in the advances of Cuban agroecology. The visiting group was composed of Mayan peasants from Yucatan and Campeche, representatives of the Government of Yucatan, representatives of peasant organizations in Argentina, and members of Greenpeace, including the Greenpeace flagship crew: the Rainbow Warrior. We visited numerous orchards, patios, farms and agroecology centers on the island, and we had the opportunity to meet many Cuban peasants who are agroecology experts. The following is a brief summary of the places and institutions we visited and the main lessons learned during

the tour at the island. The main objective of this visit was the exchange of knowledge between Mexican and Cuban farmers and the establishment of a agroecology collaboration framework between them and Cuban and international experts.

THREE POINT ONE

URBAN AND PERI-URBAN AGRICULTURE

COOPERATIVA VIVERO ORGANOPÓNICO ALAMA SPANISH ABBREVIATION)

Miguel Angel Salcines runs the Cooperativa Vivero Alamar since its founding in 1997. It began during the Special Period, when lands were distributed to produce vegetables and fruits, so necessary in that moment of crisis. Initially, it had 800 square meters of nursery, now has about 10 hectares, in the municipality of Alamar, about 10 minutes from Old Havana. They started with 6 workers, and now have 130, who mostly live in the community and are all part of the cooperative, and also feed themselves with the production of their land. The nursery has diversified a lot, and now produces a wide variety of vegetables and condiments, as well as fruits, medicinal, religious, ornamental and nursery plants for propagation, even tofu of own production.

The mojitos' peppermint served at Floridita or La Bodeguita del Medio is produced here, although few tourists know that they are taking their Cuban rum with an organic peppermint cultivated in Havana itself.

Isis Salcines, daughter of the founder, is also an important member of the nursery. She accompanies us in our visit, chatting cheerfully in English with the Rainbow Warrior's crew. Sailors take note of the ecological practices to apply them in the small potted orchard they care for on the boat. We are all surprised by the biodiversity of the place, more than 200 species of different cultures, with many trees and abundance of flowers and pollinators. A 'famous' tree of the place is the Moringa (M. oleifera). Entertained, Miguel Angel told us how Fidel Castro popularized it in the 90s as the poor people's viagra, he also said that it could cure 115 diseases. Today, it has lost its popularity, but it is still important as food for livestock and for its flowers for pollinators.

Miguel Angel Salcines frequently comments that the soil is an essential part of good ecological agriculture. Many of the elements present in the nursery revolve around techniques that allow a healthy and fertile soil. For example, there are 12 fattening bulls in the nursery, but their main benefit is not their meat, but the manure they produce and which in turn serves as food for the earthworms that supply the farm with 400 tons of high quality worm humus a year. "They are worth more for the humus of earthworm than for the meat" asserts Salcines. The team of Viveros Alamar has also developed different preparations of mycorrhiza that serve as enrichers for soil fertility. During these 20 years, Viveros Alamar has compiled a valuable experience in ecological practices for soil fertility, a knowledge that they impel and want to transmit to the rest of Cuban and international scientists and farmers.

Miguel Angel Salcines tells us about his international experience. "I recently visited California. Everything is fantastic in there, but in terms of ecological agriculture, here in Cuba, we are more advanced. The problem is that we lack everything else." He tells us about the limitations: "Irrigation pipes, water tanks, cisterns for sowing... we lack everything, getting any input is almost impossible and that slows us down. We need to develop business strategies. We still have a long way to go."

We left Alamar inspired by the achievements in this nursery, and above all, by its future prospects. "We can multiply the yield of the farm by four times" assures convinced Miguel Angel Salcines, "working with biodiversity, microbiology and soil fertility." A challenge that sums up the advances in 20 years of agroecological science in Cuba, and the hope of ecological agriculture on a global scale, which here seems to be achieved with the tips of the fingers.





COOPERATIVA VIVERO ORGANOPÓNICO ALAMAR. BASIC UNIT OF COOPERATIVE PRODUCTION (UBPC,

"EL CACHÓN" ORCHARD

In the municipality of Cojimar, the couple formed by Elisabeth Grillo and Rolando Martínez maintains "El Cachón" orchard, 1.3 hectares in a paradisiacal place, on the seafront and at the mouth of the Cojimar river. They have created this little paradise in what used to be the garbage dump of this small coastal community on the outskirts of Havana. Even the debris of a stranded old ship recalls the history of the place. That scrap of boat they want to transform into a classroom for children, since children are among the most favorite 'customers' of the place. "They come here to play, collect fruit and entertain themselves learning about plants and crops," Elisabeth tells us.

"Here we grow food, but above all, it is where I spend much of my life. It's where I believe and build," says Roland enthusiastically.

The orchard is small, but very rich and diverse. Rolando explains how everything they do is based on biodiversity. They choose varieties of fruit that are not on the market and, for example, they rescue common fruit varieties, such as a banana variety that is no longer planted on large plantations, but has a taste and a resistance to diseases, which makes it unique and valuable.

"This place is not just a place to produce food, it is a place to export knowledge to the communities and to expand it to other courtyards," says Rolando. "We have identified other 500 patios in the community where agroecological food can be produced in the community. Because the important thing is not just to feed, but knowing how to feed well."

They unite food and health, and bring them to medicine. They have entered into agreements with the doctors who care for this community and, in alliance with them, spread the message of the benefits for health of a diet rich in fruit and vegetables, specifically to treat the most common diseases in these families, such as diabetes and cardiovascular problems.

Children and schools are another priority in "El Cachón" orchard. With the help of the children of the community schools, in 2016 they planted more than 2,400 trees in the courtyards of this neighborhood, many of them are fruit trees very important for feeding.

They also try to link art to agriculture. A local artist named Nelson Domínguez built some scarecrows for the orchard. But the children realized that something important was missing. All those scarecrows were men. Then, they built more scarecrows, this time female scarecrows, and organized an exhibition.

The children had an idea: "let's have a wedding among scarecrows." And they married "Cachita del Cachón" and "Anastasia" with "Juan Jiribilla". In addition to the party, they used this game to talk about the importance of gender equity. And later, the town doctor organized a talk for adults about responsible sexuality. As Elisabeth and Roland say, the orchard is much more than food production, and they show it with wisdom and wit.

This is our first visit to the island, after disembarking after three days of sea crossing, from Progreso, Yucatan aboard the Rainbow Warrior. During the voyage, the weather was rough, with much wind, much movement of the ship, and many seasickness of the crew and the passage. This first lunch ashore, under the palm trees and orchards of "El Cachón" orchard, it feels like the arrival at the promised oasis in the Cuban land, where despite the bad weather, resilience and hope for a better future are built.



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PATIO LAS AMÉRICAS

America Alarcón is a country woman. During her childhood she lived in the mountain of Cuba, where she learned about agriculture to help her mother and her 10 brothers, after her father joined the column of Fidel Castro in the Cuban Revolution.

America left the mountain to get to live in the city, the municipality of Playa, now part of the metropolitan area of Havana, where she put her knowledge into practice and started a home orchard for self-consumption. Shortly before the 90's, in front of her house, she began the construction of a complex that would be dedicated to biotechnology, which among other things sought the development of genetic engineering, but with the advent of the Special Period, never prospered.

Several housing buildings were evicted to overthrow them for the construction of the facilities dedicated to biotechnology. America was one of the few that remained, then in the Special Period this project was stopped in Cuba. In 1990, America, alongside her husband and her children, began cleaning the half-a-hectare land, where today is its urban orchard called Patio Las Americas.

"My husband did not know anything about the field, which he learned from me," she says proudly and stands thus to say that her son has left the office work to help her. "For me, this is the good life: get up early and see the green of the field and hear the birds singing."

At first, the garden was maintained for the family's own consumption, always in an ecological way, without the use of chemicals. When realizing that their production increased, they began to commercialize the surplus. First, in trolleys to the neighbors of, afterwards the points of sale were formalized and hers was the first one of the Playa municipality that began to operate.

"Customers are looking for the organic, they come with me because I give them fresh food; when they come to buy a lettuce, I go, take it off the earth, wash it and give it to them. They have the guarantee that they are carrying something clean and healthy," she says.

The dedication and love for the field shown by America made her receive the "Tres Coronas" prize for excellence in agriculture in December, 2016. She was awarded by the Cuban government through its urban agriculture program, thanks to the fact that her field is well planted and has very good production, for example, she collects 7 quintals (700 kg) of lettuce every two months.

America grows vegetables, tomatoes, coriander, parsley, oregano and several varieties of lettuce, beet and carrot. She has fruit trees and also breeds animals, which is known as a closed cycle, because to fertilize the plants, she uses the organic matter of the animals, the surplus production is marketed it and the leftover serves to feed pigs, hens and pigeons that she also breeds.

The irrigation system she uses is aerial, because when she tried with one at ground level she did not like it. "I prefer the aerial because it takes away the dew that damages them in the morning," she explains. The knowle-

dge she has acquired is also due to the training she has taken.

For pest management, she uses plants to repel or attract them as the case may be, such as corn and sunflower.

Patio las Américas is one of almost 200 orchards that make up a cooperative of organic producers that meet monthly to talk about the peasants' needs and that the cooperative can help to solve them.

For America, working within organic farming has brought her great benefits, for example, being close to home, earning money, having food at home and feeling the countryside close to her.





"EL JAPONÉS" ORCHARD

This half-hectare urban orchard arises from an invitation agree a quantity that they sell to the state and, if they made to Santiago Oyé, who has a Japanese origin, to have a remnant, they can sell it at particular points. advise the Cubans for the planting of vegetables. Thus, Santiago arrives to Playa, in the city of Havana, and The food sold at the point comes from organic producbegins the project of the orchard that, at first, was a little tion, because it is the predominant model of production bigger, but later, it was adapted to have a point of sale in the country, and is mostly consumed by people in the with the intention of expanding its market. This last elearea and its surroundings that looks for fresh vegetament is one of the main characteristics of this project, bles. The point has a great variety of fruits, vegetables the point of sale it has to offer its products and those of and grains, for example, it has at least 6 varieties of other cooperatives. beans, as well as canned products produced by cooperatives.

The sale point stock up from 7 or 8 "credits and services" cooperatives which are authorized to sell in a particular way and belong to Havana and its periphery.

In Cuba, there are two types of cooperatives: "agricultural production", which work with a president / leader The garden is worked by 2 men. Julio is one of them, he who has a salary and manages incomes that are divided is a graduate in Penitential Law, but prefers to dedicate between peasants by the end of the year. And second, himself to working the field following the inheritance of those of "credits and services" that operate at an indihis parents who were dedicated to planting rice. vidual level, through a plan with the state, in which they

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The orchard uses agroecological techniques to produce food: crops are diversified, fertilized with organic matter, especially from dairy farms.

AGRICULTURAL SHOP OFFICE (CTA)

Among the visits that made our tour, we went to a bus stop in a large parking lot of a neighborhood in Havana. In the background, there is a seemingly small post.

This is one of the 44 Agricultural Stores Consultancies (CTA, Spanish abbreviation) in the city. The first one in the country was founded in 1994 in a particular way, and later the state absorbed it. It is like a doctor's office, if you feel badly, you go there. In case the plants that are planted in the urban agriculture of the city have some problem, they can turn to the CTA for advice to alleviate the problem. The CTA also offers services for the control of pests and diseases, treatments based on biological compounds (chemical and nutritional solutions), construction of organoponic and family orchards, shrub pruning, biofertilizers, compost and vermiculture, technology transfers, seeds of different species and varieties, posture, technical literature, work tools, veterinary drugs, among others.

At the office, they provide people with technical training to provide technical and material support for urban agriculture and cooperatives. Consultations are free, home visits cost 5 Cuban pesos, so their prices are very accessible for the population. The CTAs are part of the Ministry of Agriculture of Cuba, which has a group of companies such as agricultural logistics from which the public CTAs.

The CTAs are open to the entire population and are distributed throughout the country and with greater force in the city of Havana. The most important service, or the most demanded, is the sale of seeds, which are certified in Cuba, although they also sell imported seeds. The inputs offered by the CTA are organic and obtained by other state enterprises and producers. The most requested advice is for pest control.

An example of the products offered is the ecological insecticide-based plant repellent and strain 24, to achieve plant stability.

These offices are an example of attention to the families of the country to encourage ecological production and the provision of tools and advice by the Cuban state towards the population to promote this production model in an integral way.



PEPE"

The project started thanks to the creativity of Vilda Figueroa and José Lama, who, combining their experience in pig feed with cane honey and experimentation, decided to work with human foods to avoid food loss and to deal with feeding problems such as obesity and overweight that 42 percent of the Cuban population suffers. The project was founded 21 years ago, however the publisher turned 20 last November. The project in its beginnings was seen in the neighborhoods with information tables for the exchange with the population. It was in 1994-95 when they were given the place they currently occupy in Marianao, Havana, which became the main site of the project.

The experimentation of Vilda and José was based on the preparation of recipes and ecological techniques of preparation of preserved foods, which by 1995 translated into 95 created products. As a result, this information became more than 53 books that help the family economy and promote aood nutrition.

To continue disseminating knowledge, the project works with other organizations such as the Federation of Cuban Women and the Ministry of Public Health. In addition, they developed trainings to prepare volunteer promoters who, in turn, replicate the knowledge in their communities. Currently, the project has promoters in at least 10 provinces.

as outlets.

in other countries.

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FOOD AND HEALTHY FEED CONSERVATION PROJECT "VILDA AND

This is an example of a project that has contributed to disseminate the knowledge and training of about five hundred promoters in the country in the conservation of food and healthy feed.

This project becomes relevant considering that through the canning industry in Cuba, small initiatives (micro industries) have been developed to avoid food wastage, as well as supplying places such as homes for the elderly, centers for people with Down's syndrome, at a fairly affordable price, as well

This project is also part of the Slow Food network, as it complies with the principles of good, clean and fair. They have grown in such a way that they have promoters in Latin American countries such as: Puerto Rico, Nicaragua, Costa Rica, among others, and have been invited to give 14 workshops



THREE POINT TWO

Agroecology Research Centers

"INDIO HATUEY" PASTURES AND FORAGES EXPERIMENT STATION

"Four legs and only one way"

The "Indio Hatuey" Experiment Station, belonging to the Camilo Cienfuegos University of Matanzas (MES), in the center of the island, is a research, development and innovation organization that catalyzes the rural and local sustainable development. It has been dedicated to science and technological innovation for local development for five decades. Its mission is to contribute to local development through agroecological models that integrate food and energy production, aimed at promoting the socio-economic development, environmental care, and human well-being with gender equity.

It was created on March 8, 1962, with the objective of developing the science related to Cuban livestock, pastures and forages. Since 2000, the center adopted a priority approach in diversification, moving to a systemic model based on production, including objectives related to food security along with energy and having a special emphasis on aspects of human, local and rural development.

Dr. Maybe Campos Gómez, Deputy Director of the Center and Director of the Training School of the "Indio Hatuey" Experiment Station, welcomes us with her usual dose of positive energy and enthusiasm. She is not only an internationally renowned researcher, she is the promoter of Indio Hatuey's Sustainable Local Development research line and the tireless host on our visit. Something refreshing and inspiring about Dr. Maybe, and in general about the Cuban system, is the naturalness and the friendly treatment of all the different ranks and trades. Without distinction, they all are treated with affection, equity and without artifice. Dr. Maybe can also direct the training program to make sure that all rooms of the Motel "El Cacique" inside the Center is in perfect condition for its guests, or that the vegetarians of our entourage have tried enough of the exquisite yucca that they served us for lunch.

Dr. Maybe is also a clear example of one of the focal points in all projects in "Indio Hatuey": gender equity. She is an inspiring role model for all local students. Dr. Maybe demonstrates with freshness that she can be a researcher, mother, attentive hostess, effective director, and many other things; while still showing empathy, simplicity and femininity. We thank Dr. Maybe for her hospitality and inspiring example of a woman dedicated to improving the future of peasants in Cuba and in the world through agroecological science.

An innovative aspect that draws the attention of Indio Hatuey's scientific project is its commitment to change. It is not sufficient for these researchers to develop science, but rather science must contribute to improving the lives of peasants and society and contributing to sustainable development. And this aspect is a priority for Indio Hatuey: the same emphasis is placed on the scientific research production, so that they produce a change of mentality in the producers. For 20 years, they have focused on understanding, diagnosing and implementing strategies that make this mentality change possible in the producers. In that way and by the use of science, attitudes and behaviors will have a transition to an agroecological model that benefits the lives of peasants and the environment care.

Dr. Giraldo Martín Martín is the Director of the Indio Hatuey Pastures and Forages Experimental Station, and one of its 41 permanent researchers. From our first conversations, he showed an open and genuine interest in our project and his kind disposition to find possible ways of collaboration. It is easy to understand the spirit of innovation and excellence that we can breathe at Indio Hatuey through the deal with its director. Intelligent, direct, effective and clear, such as research programs at Indio Hatuey. Dr. Giraldo relies on the potential of agroecological science to be a driving force for improving livestock and silvopastoral systems in Cuba, where structural changes in the last decades still require adaptation to meet the objectives of food self-sufficiency and sustainable development.

"If we join forces to implement the knowledge generated in the country, it would be possible to turn animal production on an agroecological basis, to care for the soil, the environment and the health of people." ¹² said Dr. Giraldo Martín Martín, Director of the Indio Hatuey Pasture and Forage Experiment Station.

In pursuit of innovative solutions, Indio Hatuey was a pioneer center since the 1990s in research on lawn and sericulture development, which generate additional income sources that allow it to be a self-financing institution with a comprehensive curriculum and research program.

In addition, the sericulture research, generates an additional project with social content. Local groups of people with disabilities are dedicated to the crafts, using as raw material the cocoons of silkworms. This generates additional income for local and social development strategies.

Indio Hatuey is the counterpart of Greenpeace in this visit to Cuba and our inspiration. We hope that, in the future, we will continue collaborating to the creation of "agricultural systems that depend less on external inputs, with a high use of local resources, diversified and efficient in the use of energy, capable of achieving sustained results over time", as the purpose of this center says and in which we fully concur.

12. Ganadería: Cuatro patas y un solo camino. Bohemia, septiembre 2016. Available on: http://bohemia.cu/en-cuba/2016/09/ganaderia-cuatro-patas-y-un-solo-camino/



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SAILING TOWARDS THE FUTURE **19**

INSTITUTE OF FUNDAMENTAL RESEARCH IN TROPICAL AGRICULTURE (INIFAT) AND NATIONAL PROGRAM FOR URBAN, SUBURBAN AND FAMILY AGRICULTURE

Founded in 1904, it is an organization recognized nationally and internationally for its contribution to the development of urban agriculture and the conservation and management of phytogenetic resources, including microorganisms.

The Urban, Suburban and Family Agriculture in Cuba is an extensionist productive movement, which contributes to boost the food production in the cities and its periphery on the possibilities that exist or that can be created in each locality.

Urban agriculture is developed by the different forms of land tenure that exist in the country, which are also present in traditional agriculture, such as state enterprise, basic cooperative production units (UBPC, Spanish abbreviation), agricultural production cooperatives (CPA, Spanish abbreviation) and small producers grouped or not in credit and service cooperatives (CCS, Spanish abbreviation).

The production is achieved through the diversity of forms of production that are stimulated, ranging from the courtyards of the houses, organoponics, intensive orchards, state farms, etc. The patios of the houses constitute a genuine expression of this agriculture for the production of vegetables, some fruit trees and the raising of small cattle.

Premises in the Development of Urban, Suburban and Family Agriculture

1.- Agroecological design in the organization and exploitation of the productive base, the production development plans and the producers training.

2.- Territorial sustainability using the existing productive potential in each locality and the creation or production of inputs in each locality or farm.

3.- Permanent technical and technological updating of the productive base and general training.

4.- Direct linkage of the producers to the final result of their work and to the distribution or commercialization of their production.

It has succeeded in grouping all the scientific institutions and of the services related to the production around the objectives proposed by the Urban and Suburban and Family Agriculture: the food processing and distribution.

The National Group of Urban and Suburban Agriculture that coordinates and directs INIFAT, operates with a multidisciplinary approach and is conformed by specialists from different institutions of 6 ministries.

In turn, collaboration agreements have been established for the development of Urban, Suburban and Family Agriculture between the National Group and entities such as the Small Farmers National Association (ANAP), the Cooperative Production Basic Units (UBPC), the Animal Production Cuban Association (ACPA), the Agricultural and Forestry Technicians Cuban Association (ACTAF), the science and technology forum, the Committees for the Revolution Defense (CDR).

According to Dr. Rosalía González, urban and suburban agriculture in Cuba has been intensively developed in the last 14 years on an agroecological basis. More than 350 thousand jobs have been generated, including more than 70 thousand women. The production of vegetables in urban agriculture has increased a thousand times in ten years, and a production-extension system that reaches all human settlements with more than 15 houses has been achieved. The Public Health authorities recognize the important role it has had on people's health the increase of popular culture in relation to the consumption of vegetables and fruits. Through Urban and Suburban agriculture, a supply level of vegetables to Public Health, Education and other users of local consumption is achieved.



Tour of El Cacique farm of the Indio Hatuey Experimental Station during the visit of Mayan communities to exchange knowledge on ecological farming.

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THREE POINT THREE

Agroecological farms

"EL CACIQUE" FARM

Inside the Indio Hatuey Station there is El Cacique farm, worked mainly by Reynaldo Catalán, who for almost two decades has been in charge of agroecological cultivation on the site. In this farm, they mainly produce vegetables, parsley, coriander and lettuce. The production is intended for the preparation of food in the Station workers dining hall and the surplus is marketed in nearby villages.

20 SAILING TOWARDS THE FUTURE





Reynaldo explains that having a farm and producing food is not only for sowing, it is a creation process in which one must first think what one wants to do on the land and then design it, so that one has greater production without external inputs dependence. "The field is something that you have to love and to give you time to it."



"CAYO PIEDRA" FARM

The Cayo Piedra farm, located in Perico (Matanzas) and led by Fernando Donis, is a 46-hectares family farm with 30 fruit and vegetable crops such as cabbage, beans, corn, avocado, guava, coconut, among others.

The work of the land is ecological, even though it used to be completely dedicated to cane monoculture and the soils were very degraded. Since 2000, the farm was transformed with a conservation model, through the application of organic matter, crops rotation, windbreaks and biological corridors to improve the soils quality. Thus, in 2008, they began working with efficient microorganisms, a technology that represents 90% of the production base that allows the nutrition of plants and has achieved a low incidence of pests.

As a result, the crops have increased their yield, such is the case of the cabbage that produces 80 to 120 tons per hectare on the farm. "Cabbage and beans have shown a high yield from these practices. With the agroecological model, 3 to 4 times less water is used than with the agroindustrial model", says Fernando.

One of the main practices in the Cayo Piedra farm is the use of efficient microorganisms, which transform the chemical elements to feed the plant more efficiently, thereby it creates a greater independence for food production, and they train farmers so they can produce these inputs.

In maize, excluding non-potential varieties, they have reached 4.8 tons per hectare despite being of low productivity. The farm also has pumping systems, biodigestion, composting, among other ecological practices for food production

"FINCA PLÁCIDO" FARM

This farm has been working since 1989 and arises from the first agrarian reform, it is part of a credit and services cooperative made up of more than 200 members. This project is part of the "peasant-to-peasant" program and it applies innovative techniques in livestock and ecological agriculture. Such is the case of an innovative irrigation system that is easy to build at home, since it only needs a bottle, weight and a hose to regulate the



amount of water and the frequency with which it is irriagroecotourism activities. gated. The farm also produces ornamental plants.

An important part of the income of the farm comes from the vermicompost, generated with the animals' excreta, like the rabbits, who produce more excreta the other animals in relation to the amount of food they consume.

This family farm was also the first to produce the Mo ga tree and to increase its production for its nutrition wealth, integrating it with food for human and livesto health, as well as rooting for other crops.

Experimenting on a small scale, diversifying and integ ting agriculture with livestock are some of the principles followed in Finca Plácido, in addition to efficient microorganisms, biodigesters, among other ecologic techniques.

This farm provides hotels with ornamental plants and humus worm and markets with vegetables. As well, pig production is sold to the state and seeks to integrate

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"VILLA HORTENSIA" FARM

han orin- al ock	It is a 7-hectares farm, dedicated mainly to ornamental plants and fruit trees that are commercialized in hotels and restaurants; it also sees the agroecosystem as an option for sustainable tourism, for the great biodiversity they offer and microclimates that are generated. Villa Hortensia has become a tourist attraction in the town of Artemisa, not only for its beauty, but also because it houses a "living agriculture museum", with 100 years old
gra-	The great plants variety allows that inside the farm, the
	temperature is or annost z Cless than in the outside.
al	A barrier of areca trees around the farm protects biodi- versity from the impacts of hydrometeorological events, such as hurricanes. In this farm, the integral approach

has also allowed to be an awareness and environmental

education space within the community.



THREE POINT FOUR Other Institutions

ANTONIO NÚÑEZ JIMÉNEZ NATURE AND MAN FOUNDATION

We visited the José Antonio Núñez Foundation, where the group of Mayan companions from Campeche and Yucatán listened to Maria Caridad de la Cruz, coordinator of the Foundation's sustainable localities program. We talked about permaculture in Cuba, a philosophy of life, which seeks to change the relationship of man with nature, in the understanding that everything is connected.

The Cuban community transformed the crisis of the so-called Special Period into an opportunity to reconnect itself with ecological farming practices that had abandoned because of the idea of producing more, on a large scale, at the expense of contaminating natural resources. Permaculture began to be embedded in the Cuban daily life; small spaces within houses and apartments became the ideal place to plant vegetables or edible plants and the benefits jumped to the eye: cooler houses allowed to decrease the electric energy consumption used in fans or air conditioners, savings in the food purchase, increased creativity and, above all, a more humane relationship with the environment.

José Martí said: "The land is the mother of wealth", from it we get everything we need to survive, but we must take care of it. This thought is the point of coincidence between Cuban and Mayan peasants who, during their first day of stay in the island for the exchange of experiences in agricultural matters, realized that they are not alone in their love for the land, in their care and in the willingness to do things differently for their own benefit and for future generations. development, sustainable productive technician and the animal production and industry. As part of its strategy, it seeks to have a strong impact of international cooperation projects in the sector and it is a signatory of the International Convention on the Environment. Its projects incorporate a gender and popular education approach.

One of the most important principles of permaculture is to seek cooperation rather than competition. In that sense, people are sought to produce what they need, and surpluses of agricultural production should not be taken with the idea of selling more, but of exchanging with one who has what another does not.

Small-scale farming is more humane. Although permaculture is a philosophy that has been gaining ground in Cuba, it is still sailing against the current, it has great challenges that Cubans are ready to face. José Antonio Núñez Foundation started in 1994 in honor

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of the geographer, speleologist and revolutionary of the same name. Currently, the foundation also has the character of a historical national museum. It has four work programs: 1) Economics and responsible consumption, 2) Nature and community, 3) Historical research and 4) Sustainable localities.

CUBAN ASSOCIATION OF ANIMAL PRODUCTION (ACPA)

The Cuban Association of Animal Production emerged in 1974 following a trip of Cuban scientists to an event of the Latin American Association of Animal Production (ALPA) in Mexico. They return convinced of the need to create a Cuban Association with similar characteristics and they created the ACPA.

At first, its mission was to break the scientific isolation that Cuba was subjected to after the US blockade; as well as disseminate the scientific achievements reached in animal production after the Special Period.

The growth of the ACPA is due to the sum of individual producers, cooperatives, State, scientific and educational and institutional societies that accept and comply with their regulations. Its aim consists of contributing their actions, experiences and resources to human development, sustainable productive technician and the animal production and industry.



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FOUR

Main learning and future challenges.

"We are facing face major economic and ecological challenges, organic farming is an essential part of the solution." 13

Despite the hope and positive energy that we have all found in this agroecological trip to Cuba, we also know Elena Cebrián, representative of the Government of the that the challenges are great and growing. The present society is in constant and hurried economic. ecological and social change. Economic inequality in the world continues to grow and is at extreme levels. Only eight people (eight men in particular) have the same wealth of organic farming to 500 million euros. With this amas the poorest half of the world's population, 3.6 billion people¹⁶. The environmental deterioration of the planet ples of regions that have strongly opted for ecological is increasingly evident, it is directly affecting agriculture and our ability to produce food. For example, soil did in the 1990s. erosion is so alarming that United Nations experts estimate that there are only 60 years left to harvest if the Organic farming continues to grow around the world. In soil continues to degrade at that rate ¹⁷. But this same expert concludes with a phrase that perhaps sums up the collective feeling after this trip to Cuba: "Organic farming may not be the only solution but it's the single best option I can think of."

This statement was not pronounced in Cuba, nor in the 90's. It is a declaration of November, 2016 made by Valencian Community in Spain, in the presentation of the Valencia's Ecological Production Plan 2016-2020, whose objective is to achieve a 20 percent of the area under organic cultivation in 2020, while doubling the turnover bitious goal, this Spanish community joins other examagriculture as a solution in times of crisis, just as Cuba many European countries, the area devoted to organic farming is over 20 percent, and in some Alpine regions, most farmers practice agroecology. In some Latin American countries, exports of organic crops such as coffee, cocoa or bananas are higher than conventional crops.¹⁴ Some Himalayan states, such as Sikkim¹⁵ in India, or As we have directly seen in Cuba, its ecological agricul-Bhutan, have been declared 100 percent organic producture is already reaping the future, a better future for the tion states.

Cuba is a pioneer in the commitment to ecological agriculture on a national scale. But Cubans and the Mayan farmers who are struggling to turn their milpa into an ecological one are not alone. And this simple message, we are not alone in the search of the change to organic agriculture, is the main learning for them in this trip to Cuba, and also for all that we are dedicated to promote a healthy, fair and ecological feed in the world.

La agricultura ecológica valenciana busca ser "referente europeo". La Vanguardia, noviembre 2016. Available on: http://www.lavanguar-13. dia.com/local/valencia/20161117/411942008525/plan-valenciano-produccion-ecologica-agricultura-elena-cebrian-ximo-puig.html ORGANIC 3.0. For truly sustainable farming & consumption. Segunda edición, 2016. Available on: http://www.ifoam.bio/en/organic-policy-guarantee/organic-30-next-phase-organic-developmenthttps://www.oxfam.org/es/iguales/foro-economico-mundial-en-davos-cinco-datos-escandalosos-sobre-la-desigualdad-extrema-global 15 Sikkim becomes India's first organic state. The Hindu, January 2016. Available on: http://www.thehindu.com/news/national/Sikkim-becomes-India%E2%80%99s-first-organic-state/article13999445.ece Cinco datos escandalosos sobre la desigualdad extrema global. Oxfam. Disponible en: https://www.oxfam.org/es/iguales/foro-econo-16. mico-mundial-en-davos-cinco-datos-escandalosos-sobre-la-desigualdad-extrema-global 17. Only 60 Years of Farming Left If Soil Degradation Continues. Reuters. Available on: 17.

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environment and for people based on biodiversity, soil and peasant care, social justice and science. Now we need more countries and regions to join this future, so that the international agroecological movement grows and consolidates as the engine in the search for solutions for a greener and more humane world.

FIVE Final agreements

During seven intense days of work in January 2017, the Greenpeace delegation accompanied by representatives of the Mayan communities of Campeche and Yucatan, as well as officials from the latter's government, visited agroecological farms, organoponic nurseries, patios and plots to learn about practices that have been used to deal with the great crisis of the Cuban Special Period, which have made of Cuba an iconic case of conversion from a polluting and unsustainable production model to an ecological and sustainable one.

As a close to the visits made to the Indio Hatuey Pastures and Forages Experimental Station (EEPFIH), Greenpeace counterpart on the island, agroecological properties in Havana and Matanzas, as well as talks with representatives of the National Institute of Fundamental Investigations In Tropical Agriculture (INIFAT), the Urban, Peri-urban and Family Agriculture Program of the Antonio Núñez Jiménez Foundation and the Conservation of Food and Healthy Feed Project; It was agreed to start a process of collaboration in the short, medium and long term. The Indio Hatuey Experiment Station will be in charge of the link between the various instances.

Among the agreements, stands out the joint objective of promoting training and the exchange of agroecological knowledge on:

- Production of native seeds.
- Replacement of pesticides with integrated pest management.
- Exchange of plant varieties.
- Development of strategies for the promotion and implementation of urban agriculture, benefits of permaculture and ecological agriculture with a gender focus.
- Beekeeping projects and their different branches in the work plan.
- Exchange of knowledge regarding traditional medicine.
- Integral forest management.
- Canned food to avoid wastage.
- Multisectoral work plan, emphasizing the relevance of children, researchers and peasants.
- Accompaniment to transmit practices and promoters training.
- Include livestock in the work plan to move towards ecological livestock management in conjunction with the Animal Breeding Research Center of CIMAGT Tropical Livestock.

The participants conclude that we must work together, through different channels (projects, local roads of mutual aid, multisectoral collaboration), draw global strategies beginning with diagnoses at the national level Mexico-Argentina-Cuba.

"We have to seek the promotion and strengthening of the agroecological model that provides food for life, not against it."

Overview of Havana from the Rainbow Warrior on its first visit to Cuba

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28 SAILING TOWARDS THE FUTURE



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