FOOD
in the USA

Fixing a culture of
produce, poison & waste

FOSSIL FUELS - CLIMATE CHANGE

POP QUIZ: Cows don't fart, so how do they emit so many GHGs?

Our food relies on fossil fuels in many ways. Crops that we eat directly (fruits and vegetables) require fertilizer, which is made with natural gas. If those crops are being used to feed an animal, like a cow, then there's even more energy required to raise and butcher the cow. Fossil fuels are also used in transporting and storing our food.

LEARN MORE: https://foodprint.org/issues/agriculture-energy-consumption/?cid=982

WHAT PERCENTAGE OF GRAIN PRODUCED (IN PARTICULAR SOY) IS GROWN FOR ANIMAL FEED?

AGRICULTURE

PROTECT OUR SOIL, WATER, AIR, CLIMATE AND HEALTH

Plants use carbon dioxide and energy from the sun to create simple sugars.

The plant uses some of these sugars to grow, while the rest are sent into the soil through the roots to feed microbes and other tiny critters. It is this process that enables plants to sequester carbon from the atmosphere and put it into our soils, where it can improve the quality of food, retain precious water and help to reverse climate heating.

However, intensive, modern farming practices rely on putting chemicals into the soil, which destroy the soil ecosystems.

Without healthy soil, we reduce the amount of microbes and in turn the amount of carbon that can be “drawn down” into the ground.

The UN predicts we have around 60 years of topsoils left.

We need to act now.

Just like Indigenous peoples have been doing for millennia, we need to return to regenerative practices for our food, our soils, and our climate.

WHY IS THIS SOLUTION IMPORTANT

What if we could reduce CO2 in the atmosphere, restore health to the planet and secure our future food supply all that the same time? Well, we can!

Regenerative agriculture is a system of farming and grazing practices that can reverse climate change by building healthy, biologically-diverse and mineral-rich soils, all the while sequestering carbon from the atmosphere. Global soils contain 2 to 3 times more carbon than the atmosphere. It is estimated that at least 50% of the carbon in the earth's soils has been released into the atmosphere over the past few centuries, partly due to destructive agricultural practices.

Moving forward, regenerative farming practices presents an amazing opportunity to restore both carbon balance and the climate. This is because agriculture is the one sector that has the ability to transform from emitting CO2, to sequestering CO2. Sequestering carbon is key to halting the warming of our planet. Even if emissions dropped to zero the planet would still continue to warm because of all the greenhouse gasses already in our atmosphere. Stopping emissions isn't enough. We need to take carbon out of the atmosphere. Project Drawdown, has estimated that regenerative agricultural could remove an astonishing 23.15 gigatons of CO2 from our atmosphere by 2050! All the while making our soils healthier and our food more nutritious. It's a win-win for people and the planet!

TRANSITION

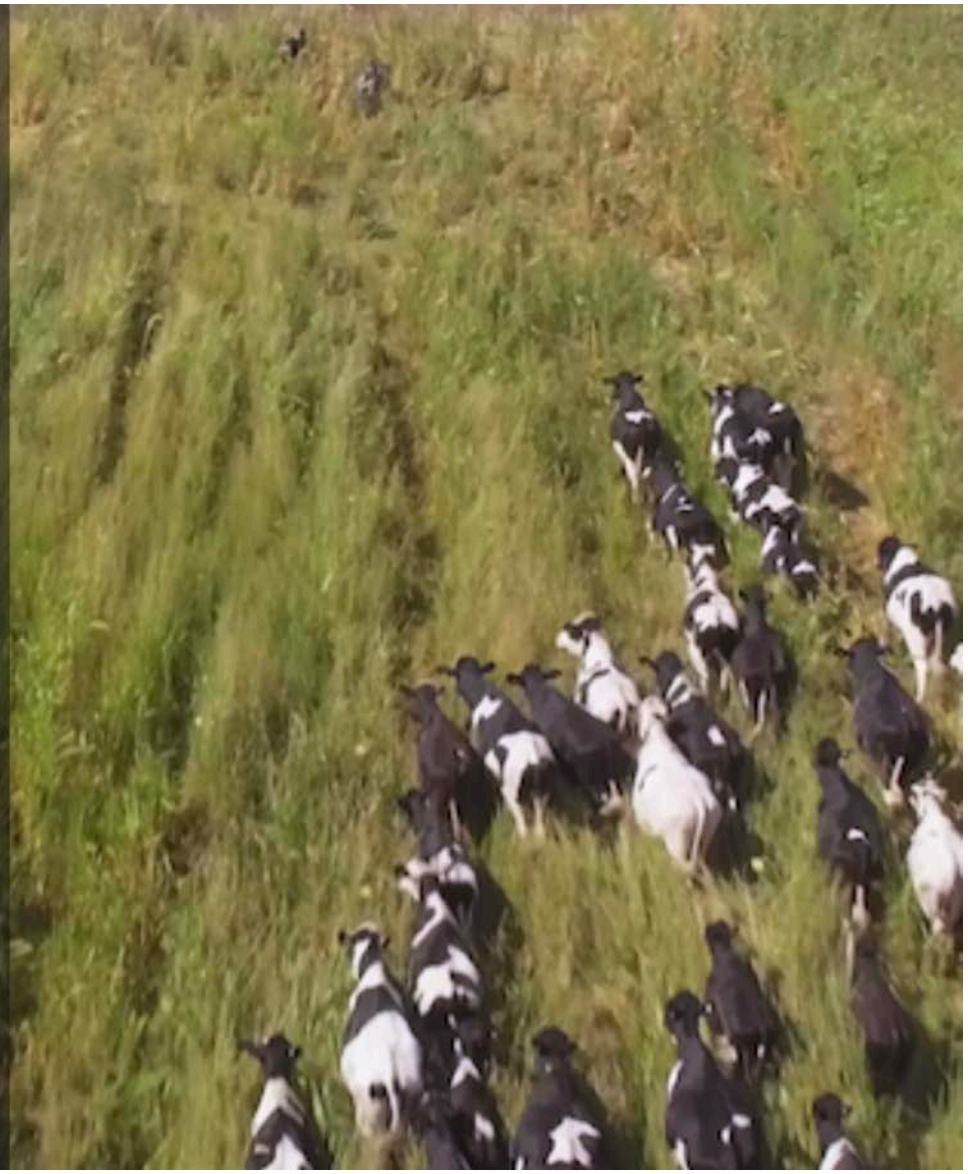
WHAT NEEDS TO HAPPEN BY 2040

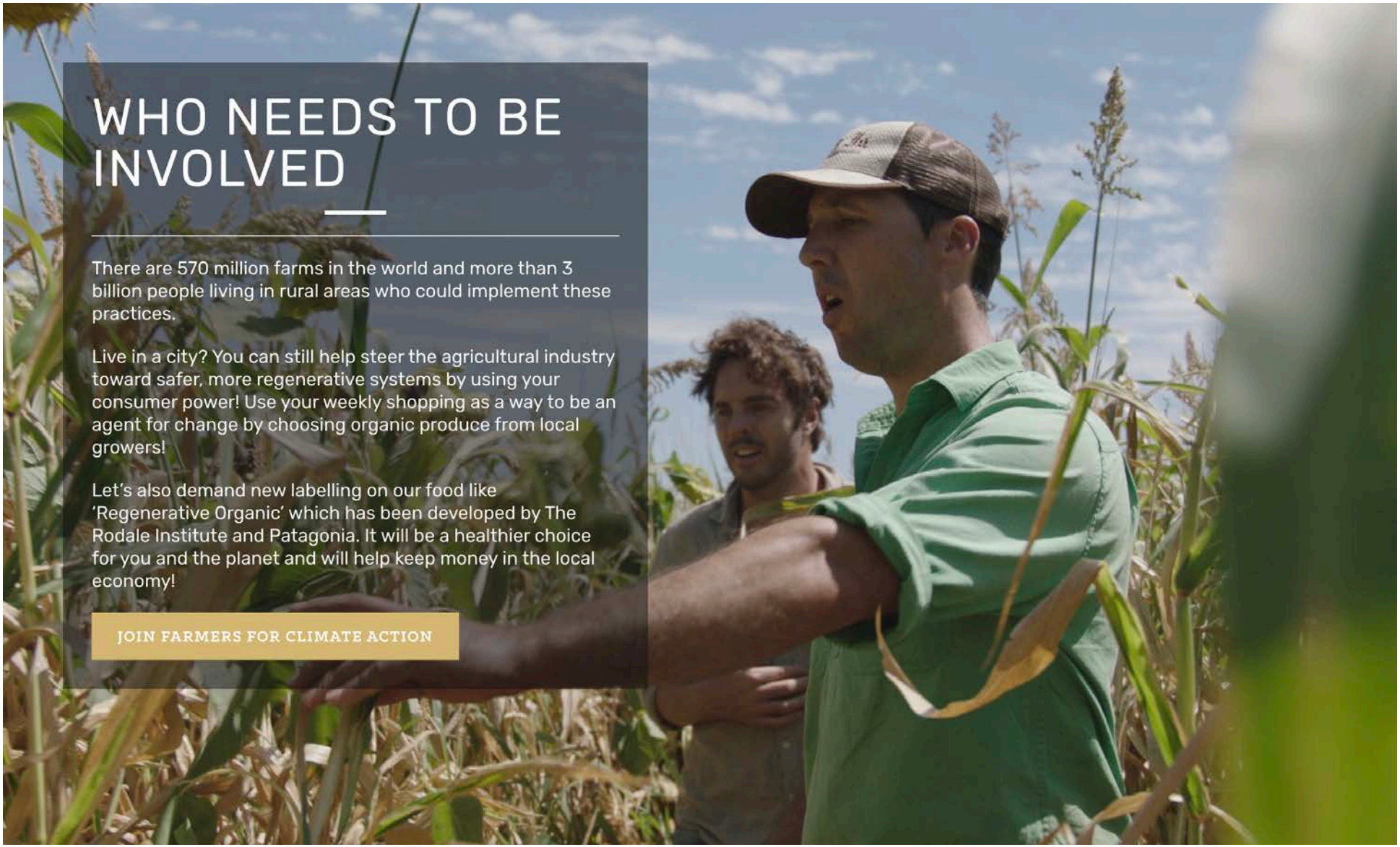
Industrial agricultural techniques like deep tilling, mono-cropping and an overuse of chemical fertilisers and pesticides, have diminished our soil's natural ability to sequester carbon from the atmosphere. This means that the C02 that would normally be drawn down into a healthy, carbon-pumped soil, is now staying in the atmosphere and contributing to the warming planet. We need to change this quick smart!

Switching to regenerative practices will restore soil health and function, reboot plant activity aka photosynthesis, and enable nature to re-balance our currently out-of-whack carbon levels. Regenerative agricultural techniques include: using cover crops and perennials to protect the soil, no tilling, no pesticides or synthetic fertilisers, multiple crop rotations and bringing grazing animals back on the land in ways that mimic natural cattle migration. Regenerative agriculture also offers many benefits beyond carbon storage! It increases the soils water holding capacity, stops soil erosion, protects the purity of groundwater and sets up the conditions for crops to become more disease and pest resilient. The benefits are many-fold.

This kind of farming system improves our health by increasing the nutritional value of our food, the health of our planet by regenerating our soils and increasing the ability for soil to sequester carbon from the atmosphere, and the livelihoods of the farmers by providing better yielding crops in the long term.

FARMER TRANSITION





WHO NEEDS TO BE INVOLVED

There are 570 million farms in the world and more than 3 billion people living in rural areas who could implement these practices.

Live in a city? You can still help steer the agricultural industry toward safer, more regenerative systems by using your consumer power! Use your weekly shopping as a way to be an agent for change by choosing organic produce from local growers!

Let's also demand new labelling on our food like 'Regenerative Organic' which has been developed by The Rodale Institute and Patagonia. It will be a healthier choice for you and the planet and will help keep money in the local economy!

JOIN FARMERS FOR CLIMATE ACTION

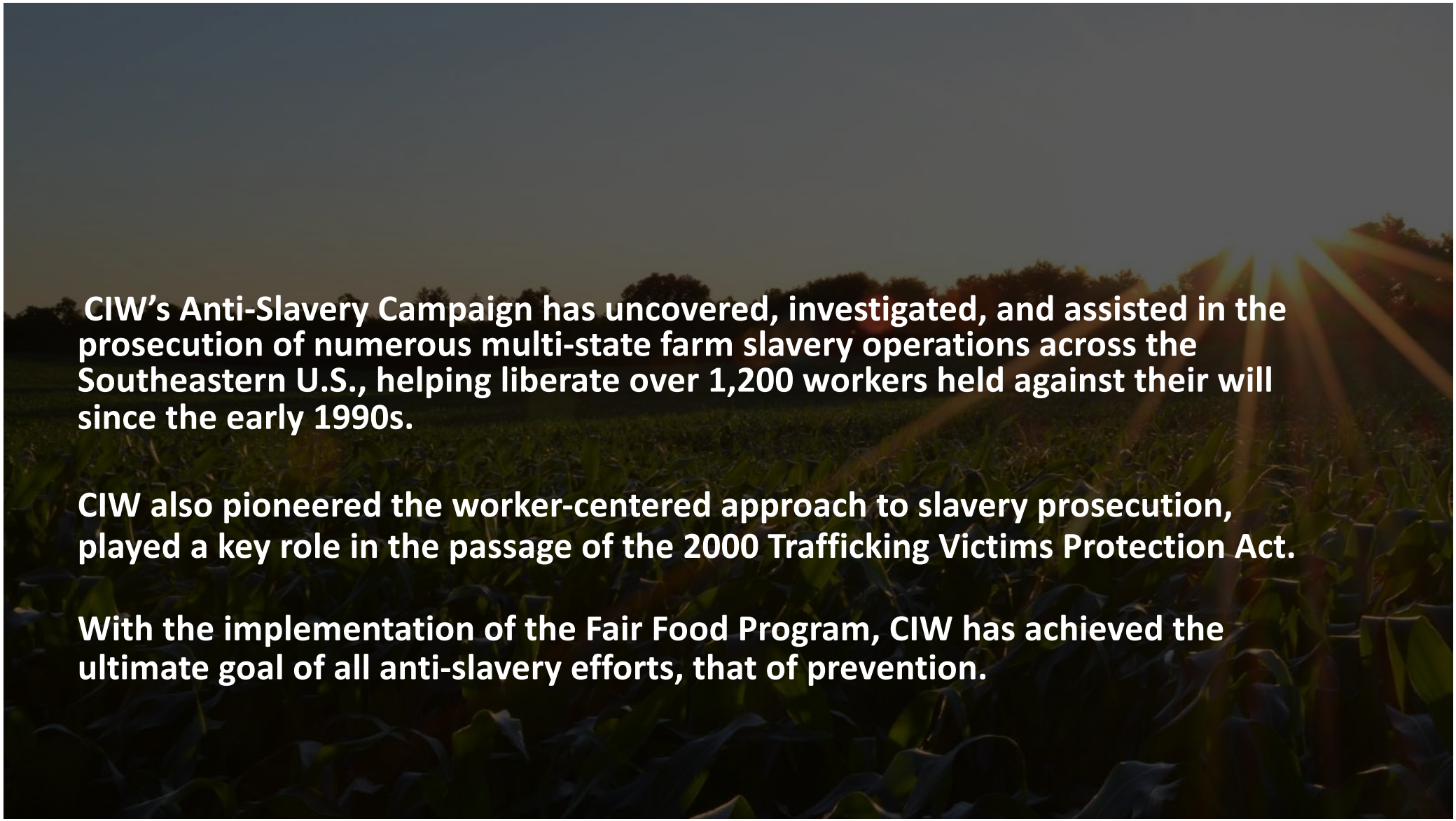
THERE'S ALSO THE ISSUE OF FAIR LABOR & SOCIAL PROTECTIONS PART OF THE JUSTICE STRUGGLE

The Coalition of Immokalee Workers (CIW) is a worker-based human rights organization internationally recognized for its achievements in fighting human trafficking and gender-based violence at work. The CIW is also recognized for pioneering the design and development of the Worker-driven Social Responsibility paradigm, a worker-led, market-enforced approach to the protection of human rights in corporate supply chains.

from the CIW website

In 2011, CIW launched the **Fair Food Program** (FFP), a groundbreaking model for **Worker-driven Social Responsibility** (WSR) based on a unique partnership among farmworkers, Florida tomato growers, and participating retail buyers, including **Subway, Whole Foods, and Walmart**.

In 2015, the Program expanded into tomatoes in Georgia, South Carolina, North Carolina, Maryland, Virginia and New Jersey, as well as Florida strawberries and peppers.


CIW's Anti-Slavery Campaign has uncovered, investigated, and assisted in the prosecution of numerous multi-state farm slavery operations across the Southeastern U.S., helping liberate over 1,200 workers held against their will since the early 1990s.
CIW also pioneered the worker-centered approach to slavery prosecution, played a key role in the passage of the 2000 Trafficking Victims Protection Act.
With the implementation of the Fair Food Program, CIW has achieved the ultimate goal of all anti-slavery efforts, that of prevention.


TAKE OUR JOBS
11
ONE WAS STEPHEN COLBERT

A Sample Workday for a Florida Tomato Picker

4:30 AM: Wake up. Prepare lunch in your trailer.

5:00 AM: Walk to the parking lot or pick-up site to begin looking for work.

6:30 AM: With luck, a contractor will choose you to work for him for the day. The job may be 10 miles to 100 miles away. Board the contractor's converted school bus to go to the fields.

7:30 AM: Arrive at fields and begin weeding or simply waiting while the dew evaporates from the tomatoes. You are usually not paid for this time.

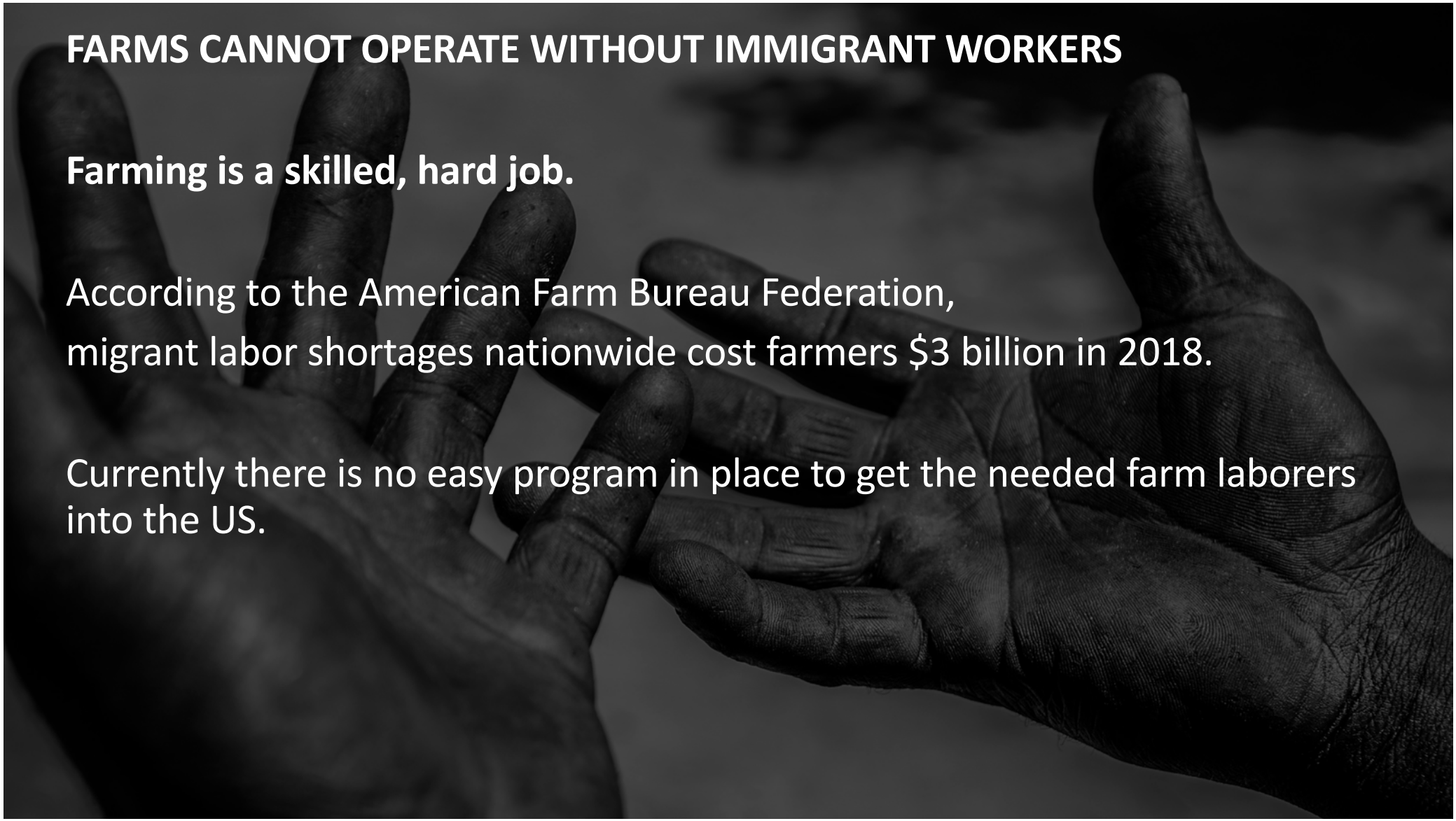
9:00 AM: Begin picking tomatoes – filling buckets, hoisting them on your shoulder, running them 100 feet or more to the truck and throwing the bucket up into the truck – all for a token worth, on average, 50 cents.

Work fast because you must pick nearly 2.5 tons of tomatoes in order to earn minimum wage today. This may or may not be possible depending on the time of year and quantity of tomatoes on the plants.

12:00 PM: Eat lunch as fast as you can, often with your hands soaked in pesticides. Return to work under the smoldering Florida sun.

5:00 PM (sometimes much later, depending on the season): Board bus to return to Immokalee.

Between 5:30 and 8:00 PM: Arrive in Immokalee and walk home.



FARMS CANNOT OPERATE WITHOUT IMMIGRANT WORKERS

Farming is a skilled, hard job.

According to the American Farm Bureau Federation,
migrant labor shortages nationwide cost farmers $3 billion in 2018.

Currently there is no easy program in place to get the needed farm laborers into the US.

To sponsor their labor force, farmers must estimate several months ahead of time how many workers they will need.

The federal govt. is making it harder to get these visas.

Is the US labor movement starting to be forced to grapple with climate change and climate protection?

WORKERS' UNIONS HAVE LOST POWER (WORKERS HAVE LOST RIGHTS) Organized labor has also changed in the past several years. The proportion of unionized workers has continued to fall; by 2011 fewer than 12 percent of all workers and fewer than 7 percent of private sector workers were members of unions. States like Wisconsin, Ohio, Michigan, and Pennsylvania have rolled back basic union rights, and attempts to eliminate unionism altogether continue.

THERE ARE ALSO NEW FORMS OF MINI-REVOLTS representing the eruption of new constituencies and forms of working-class organization, such as the **CIW**, but also in movements like **Occupy Wall Street** and its equivalents in 600 cities around the US; and **strikes in rapidly expanding low-wage industries like fast food**, with high concentrations of young, minority, and immigrant workers.

EMERGING VOICES IN THE LABOR MOVEMENT ARE EXPRESSING CONCERN FOR CLIMATE CHANGE The Labor Network for Sustainability has just made available a **set of tools**, called the *Labor Landscape Analysis*, of those in labor that are transitioning to become central to the movement **to create a sustainable future for the planet and people**.

A growing number of unions, federations, and other labor organizations are becoming **increasingly linking labor issues to environmental issues**, changing their positions on important public policy issues such as globalization and immigration.

WHY ARE WORKERS AND THIER UNIONS BECOMING CONCERNED ABOUT CLIMATE CHANGE?

Though they are often not fully articulated, workers and their unions have strong reasons to support climate protection:

the universal interest in protecting our planet that workers share with all people

the threats of climate change to their own workplaces and the resulting economic devastation and job loss – climate change is the real job killer

the positive interest of specific unions and groups of workers in healthier work environments, such as pesticide exposure

the negative interest of specific unions and groups of workers whose jobs are threatened

the interest of the labor movement as a whole in its overall social role and its alliances with other social groups

the jobs and other benefits to labor as a whole from pursuing a pathway to sustainability

How important are these issues as they relate to sustainable agriculture?

Neonicotinoid insecticides are found in 75% of global honey samples and half contain a cocktail of chemicals.

PESTICIDES
DO WE NEED THEM?

Neonicotinoids, Glyphosate & Organophosphates

Neonicotinoids (aka neonics) are one of the most common **pesticides used in agriculture and are also used extensively by home and garden centers.**

Exposure to neonics kills birds and bees and makes them more susceptible to other impacts like pests, diseases, loss of habitat and a changing climate.

Glyphosate (a.k.a. Monsanto's Roundup®) is the most widely used herbicide in the world. **Glyphosate is wiping out milkweed, which monarch butterflies** rely on as the only food for their young. Use of glyphosate has increased dramatically in the past two decades since Roundup® has been used on vast monocultures of corn, soy, canola and cotton.

Organophosphates are a class of toxic nerve agent pesticides that threaten human health and the environment. The EPA was set to **ban all uses of chlorpyrifos (an organophosphate) nationwide until the Trump administration reversed that decision**. This class of pesticides is so toxic that even the smallest doses lower children's IQs, increase risk of Alzheimer's and Parkinson's and learning disabilities, and structurally change the parts of the brain that control language and memory. **Organophosphates are toxic to wildlife, including pollinators, birds and aquatic organisms — and chlorpyrifos poses a risk to about 1,800 critically threatened or endangered species**.

https://foe.org/neonicotinoids-glyphosate/ https://www.nature.com/articles/nature13531

Farms could slash pesticide use without losses, research reveals

Study shows almost all farms could significantly cut chemical use while producing as much food, in a major challenge to the billion-dollar pesticide industry

Lechenet, M. et al, *Nature Plants*, 2017

A study published today in the journal Science reveals that since 1970, bird populations in the United States and Canada have declined by 29 percent, or almost 3 billion birds, signaling a widespread ecological crisis. The results show tremendous losses across diverse groups of birds and habitats — from iconic songsters such as meadowlarks to long-distance migrants such as swallows and backyard birds including sparrows. And guess which group of birds is one of the hardest hit?? "Grassland birds are especially hard hit, with a 53-percent reduction in population — more than 720 million birds — since 1970."

The *Silent Spring* prophecy that pesticides could "still the leaping of fish" has been confirmed, according to scientists investigating the collapse of fisheries in Japan. Similar impacts are likely to have occurred around the world and have been confirmed in UK rivers.

The long-term study showed an immediate plunge in insect and plankton numbers in a large lake after the introduction of neonicotinoid pesticides to rice paddies.

This was rapidly followed by the collapse of smelt and eel populations, which had been stable for decades but rely on the tiny creatures for food.

Japan has had a tragic experience with nerve-agent insecticides. In the paddy fields, where the air once hummed with the clatter of dragonfly wings, these insecticides have imposed near silence.

The annihilation of humble flies and the knock-on effects on fish serve as further testament to the dreadful folly of neonicotinoids.

Yamamuro, M. et al. Neonicotinoids disrupt aquatic food webs and decrease fishery yields, 2019. https://science.sciencemag.org/content/366/6465/620

Nakanishi, K. et al. Were the sharp declines of dragonfly populations in the 1990s in Japan caused by fipronil and imidacloprid? An analysis of Hill's causality for the case of Sympetrum frequens. 2019. https://www.ncbi.nlm.nih.gov/pubmed/30343370

IT'S NOT JUST THE BIRDS & THE BEES….
THE COLLAPSE OF FISHING INDUSTRY

Common pesticides found to starve fish 'astoundingly fast' by killing aquatic insects

▲ The research looked at the periods before and after the introduction of neonicotinoids on rice paddies in 1993. Photograph: Andy Rain/EPA

AGROECOLOGY: the application of ecological principles to agricultural systems and practices

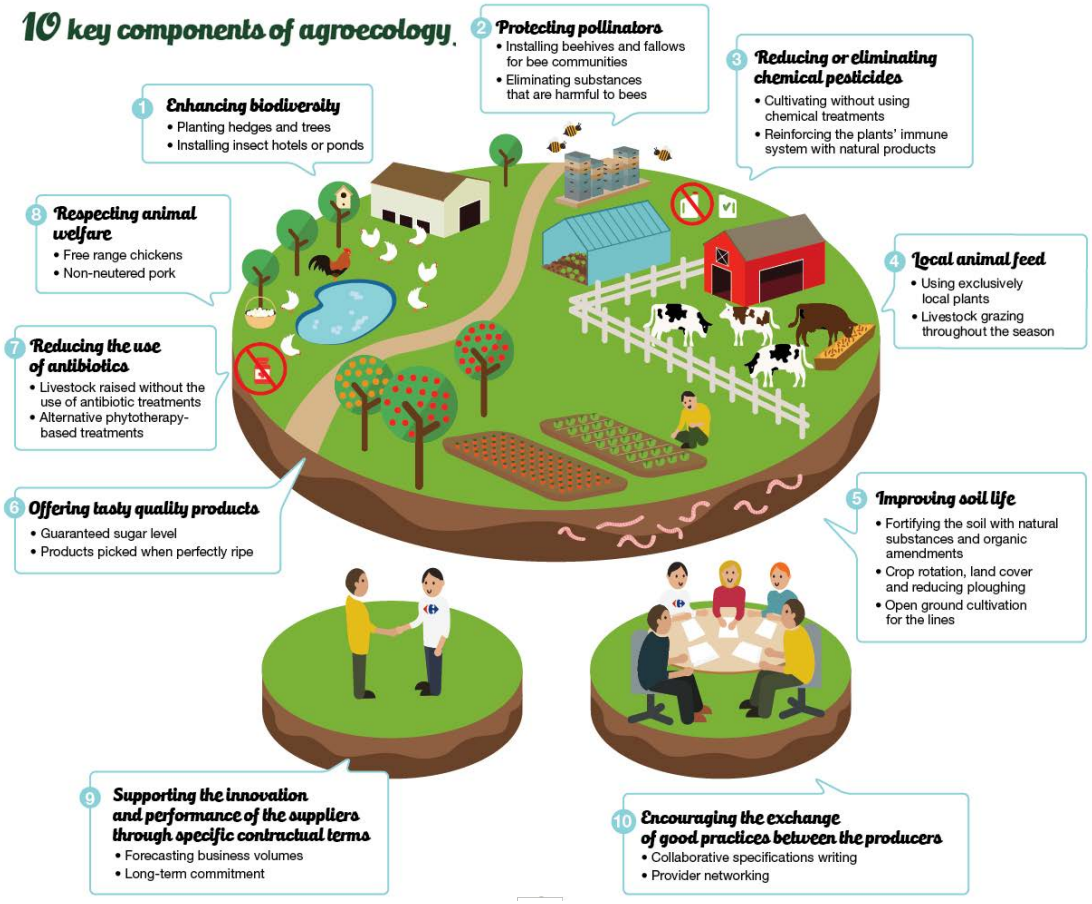
Finding solutions to river pollution and river-friendly development along the Mississippi

Sustainable agriculture policies and approaches emphasize the power of farming perennial trees and shrubs that grow for more than two years and that have roots that survive the winter, and cover crops to protect water, provide habitat for pollinators, and more.

Getting more plants and roots to stay in farm fields means more fertilizer stays where it's needed, and out of drinking water, rivers and the Gulf of Mexico / Dead Zone.

Adding perennials into the cropping mix can also reduce harmful blue-green algal blooms and create habitat for Monarch butterflies and other imperiled pollinators.

Approached the right way, agroecology can be profitable, be powered by renewable energy, produce healthy food, and restore ecosystems .



A food forest is a garden of edible plants that mimics the edge of a forest.

Tall trees, small trees, shrubs, herbs, and ground covers. Tall, canopy trees grow inward from the edge. Correspondingly, smaller trees peek out from underneath the tall trees to catch the sun's rays. Shrubs step farther out into the sunshine, along with herbs, flowers, and ground covers blanketing the sunniest edge.

A typical forest edge looks a little busy. Sometimes vines grow up the trees and mushrooms grow under the tallest trees in the shade. All of these layers of the forest stack together, each situated for sufficient sun exposure. Intertwined, they produce a vibrant, productive, low-maintenance, and relatively self-maintaining ecosystem.

A healthy forest doesn't need humans to weed or fertilize.

HOW SUSTAINABLE IS A FOOD FOREST?

THE LONG-TERM VIABILITY OF FOOD FORESTS

800 people farm a 2,000 year-old food forest in southern Morocco, a desert oasis that includes, among other edible plants, date palms, bananas, olives, figs, pomegranate, guava, citrus, and mulberry.

In Vietnam there is a 300 year-old food forest that has been cultivated by the same family for 28 generations.

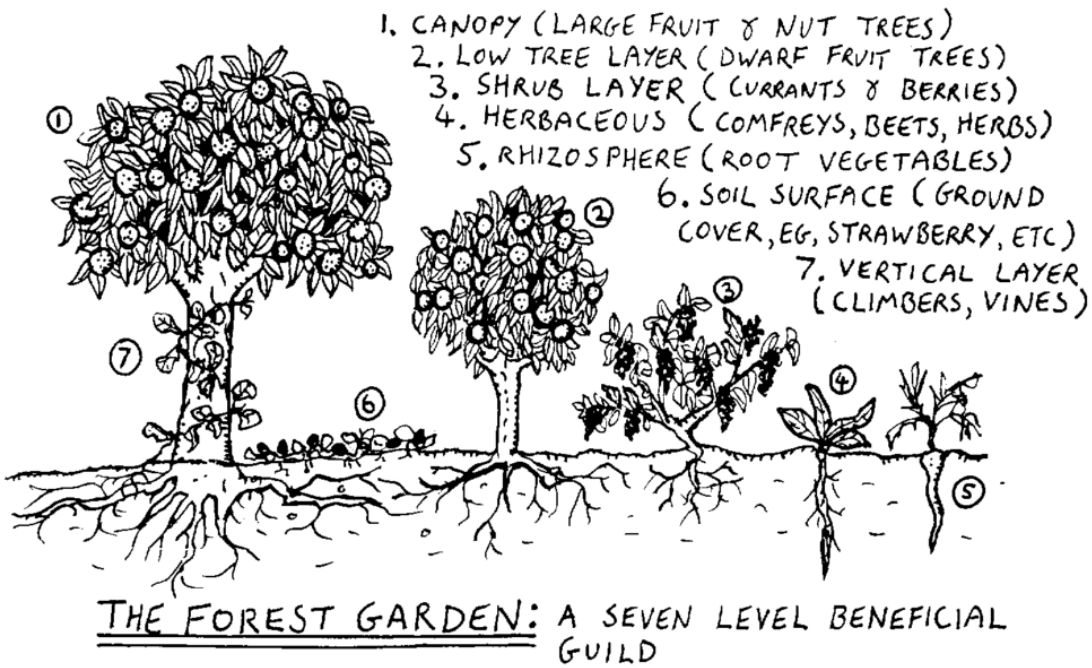
For more on these food forests watch these short videos by permaculturist, Geoff Lawton:

Moroccon food forest: https://youtu.be/NKIgqa49rMc

Vietnamese food forest: https://youtu.be/xZO0Nco2t5g

For more on permaculture and creating suburban food forests: https://www.tenthacrefarm.com/create-food-forest/

What we think of as normal, in terms of food production is actually not normal at all. Annual plants are very rare in nature, yet most of our agricultural fields are filled with annual plants. It's not normal. What's normal is a more forested or semi-forested system.



Perennial gardens help rather than harm the soil. They don't require tilling, which helps keep carbon sequestered, and they continually enrich the soil with organic material as leaves fall and plants die back at the end of every season.

WATCH A SHORT NAT-GEO FILM ABOUT FOOD FORESTS:
https://video.nationalgeographic.com/video/short-film-showcase/00000168-c3bb-d3a0-a17f-ffbf61780000?fbclid=IwAR1Jpam5G90-xJXw0qrFnIe_d_sushdeNQDErxpV4beL8WSvSP3hY22E8Ts

Sustainable Farms in Southwest Florida

Moving Ecoagriculture into the Mainstream

- FGCU food forest (student-led permaculture)
- Pine Manor (food Forest, community garden and culinary initiative)
- Rosy Tomorrows Heritage Farm (organic, pasture-raised animals)
- Buckingham Farms (hydroponics)
- Echo farm (global Christian mission)
- SWFL Small Farmers Network
- Florida International University Agroecology Program

- CSAs (**Community-supported agriculture**) is a system that connects the producer and consumers within the food system more closely by allowing the consumer to subscribe to the harvest of a certain farm or group of farms. Individual consumers typically receive a set weekly quantity – usually a box - of the seasonal round. It is a form of investment that allows small farmers to continue growing on a scale that may not be sustainable without the CSA model.
- Florganica / SWFL Produce (Food Cooperative/CSA)
- Farmers markets

THERE ARE NUMEROUS WAYS TO BE CREATIVE WITH GARDENING

GARDENS BRING TREMENDOUS HEALTH BENEFITS NOT ONLY TO GARDENERS AND THOSE THAT CONSUME NUTRITIOUS FOOD, BUT TO THOSE WHO ARE SIMPLY AROUND THEM.

WHAT ABOUT THE UNCONVENTIONAL?

Artist Laura Parker hosts an evening of soil tasting.

Biologist Terry Chapin tasting soil to assess its texture.

I don't know how the Georgia red clay tastes,
but I have visited the Wisconsin dairy lands and
Washington's Skagit Valley.
Mixed with rains and lush growth,
their dust is heavy and thick and has a richness,
like a fattening dessert of chocolate.

excerpt from *Epitaph For A Peach, by David Mas Masumoto*

Soil: a critical solution underneath our feet

Population growth, industrialization and climate change threaten soil health.
Soils are critically endangered, but the degradation can be rolled back.

Topsoil, the foot or so of ground underneath your feet, is responsible for almost all food production on Earth. It also stores more than 3x as much carbon as forests.*

Today, agriculture is a net carbon emitter, contributing about 14%** of all greenhouse gas emissions, but unlike power generation or automobiles, it can be turned into a net absorber, pulling carbon out of the atmosphere (drawing down).

If farming practices are changed through the use of cover crops, low-tilling and tree-planting, agriculture conglomerates and family farmers alike can theoretically make their farms more productive while fighting global warming.

Those changes can also replenish nutrients to the world's soil, of which 33% has already been depleted.

*Watch more about Soils for food security and climate https://youtu.be/AY9YVwJZDvw

**FAO synthesis report, *How to feed the world in 2050*
http://www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050.pdf

FAO soil article (Rome, 2015) http://www.fao.org/news/story/en/item/357059/icode/

"All good farmers become connoisseurs of dirt and dust"- farmer, author Mas Massamoto

Artist Laura Parker hosts a *Taste of Place* - soil tasting from 5 organic farms at Bioneers' event.

Ian Cheney and Curtis Ellis, *Truck Farm*, New York, 2010

St. Louis *Truck Farm,*
mobile summer camp

Truck Farm also resulted in
a film by the same name

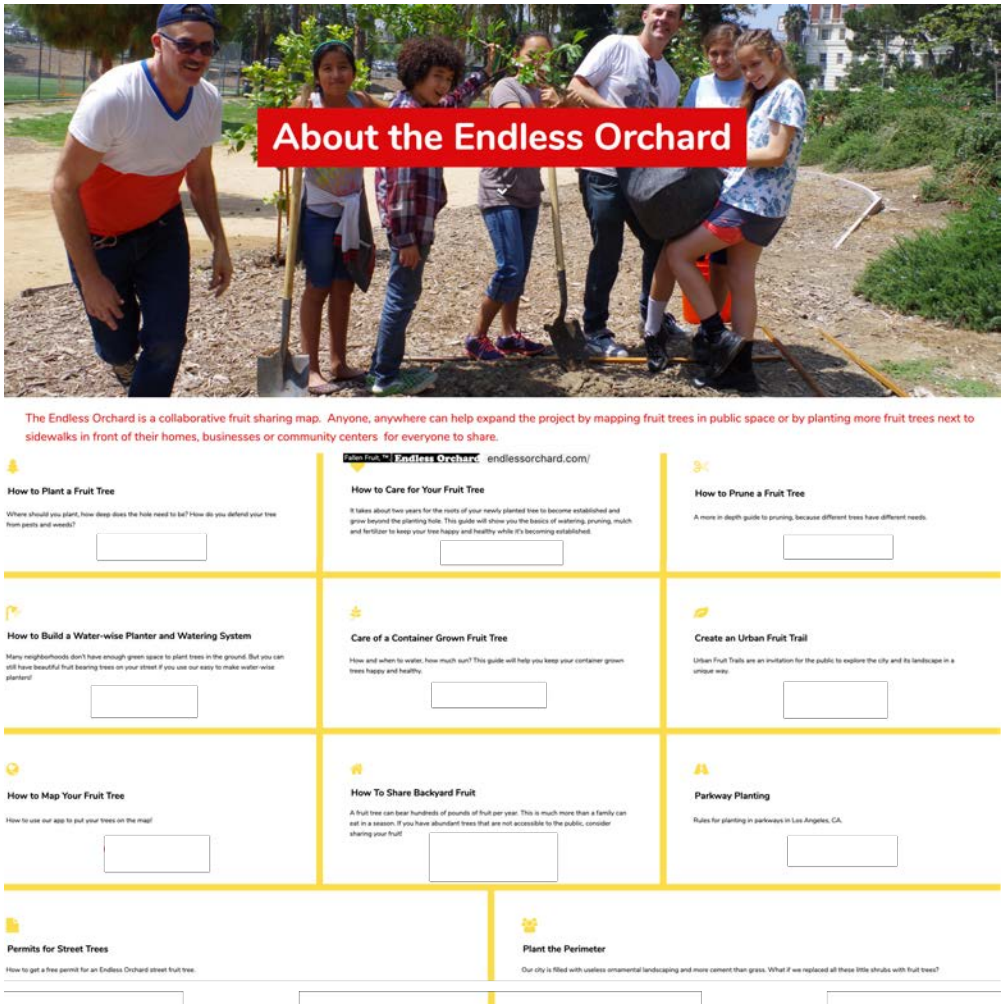
2007

TORONTO AREA SCHOOLS

DAVID SUZUKI FOUNDATION

Sarah Peebles, et.al. ***Resonating Bodies***

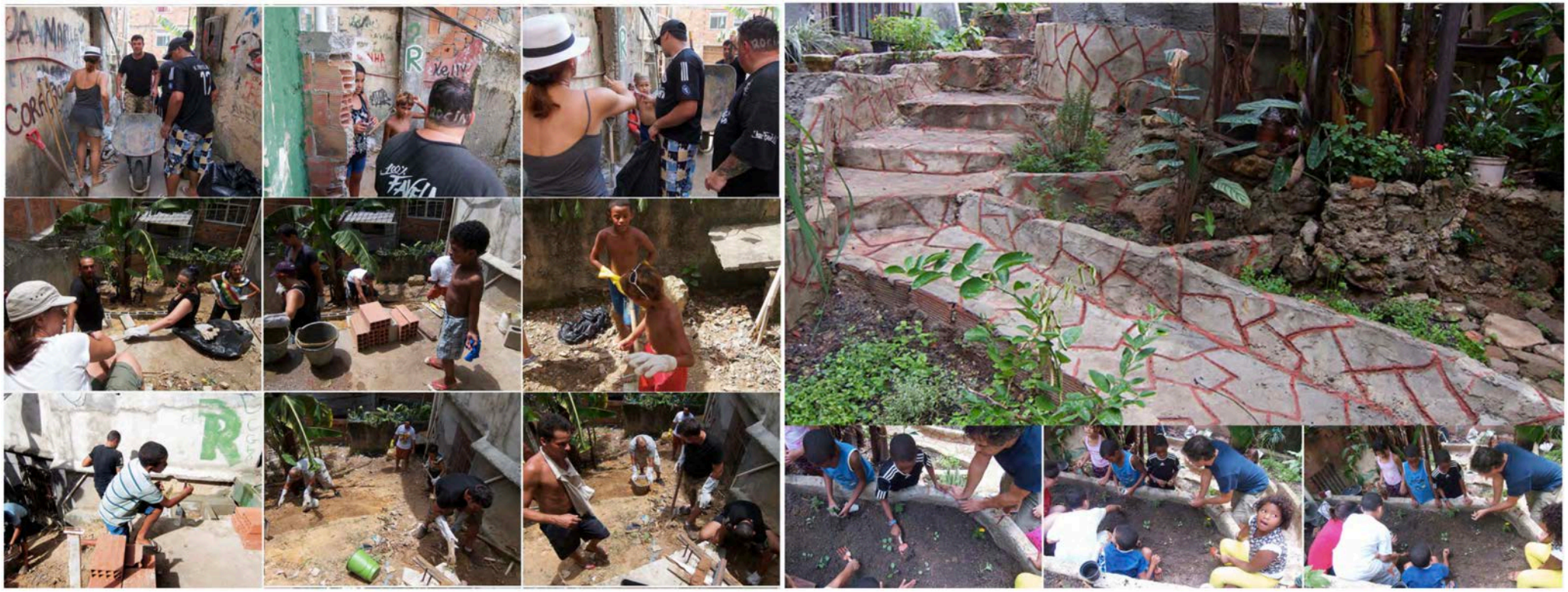
FALLEN FRUIT / ENDLESS ORCHARD



RON FILNEY, THE “GANSTA GARDENER” OF SOUTH CENTRAL LA

GREEN MY FAVELA

ROCINHA MAIS VERDE / 2012 UN SUMMIT



Soil, treebark, medicinals and seed studies at the Rocinha favela, 2011.

Medicinal Seed Bank lecture / field trip series, Belo Horizonte 2012.

***Medicinal Teaching Kit*, 2012.**

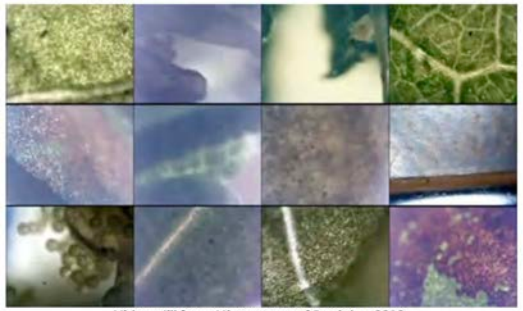
Each medicinal teaching kit contains a microscope, beacons and slides, a medicinal plant catalogue, field identification guide, teaching guide, seeds, biomedicinal samples and soil test kit.

Microscopy Hacklabs

DIY *Microscopy Hacklabs* use basic recycled hardware and software to demystify, inspire, and innovate. Workshops engage participants with sound and imaging concepts to expand ideas of perception and scale, allowing us to observe things outside the realm of our normative sensory experiences.

IMAGING WORKSHOPS: Participants create custom USB microscopes from hacking recycled consumer webcams.

AUDIO WORKSHOPS: Participants create contact microphones and use them to capture sounds from plants and trees.

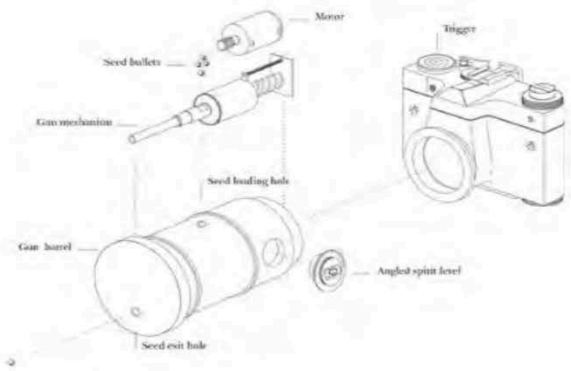


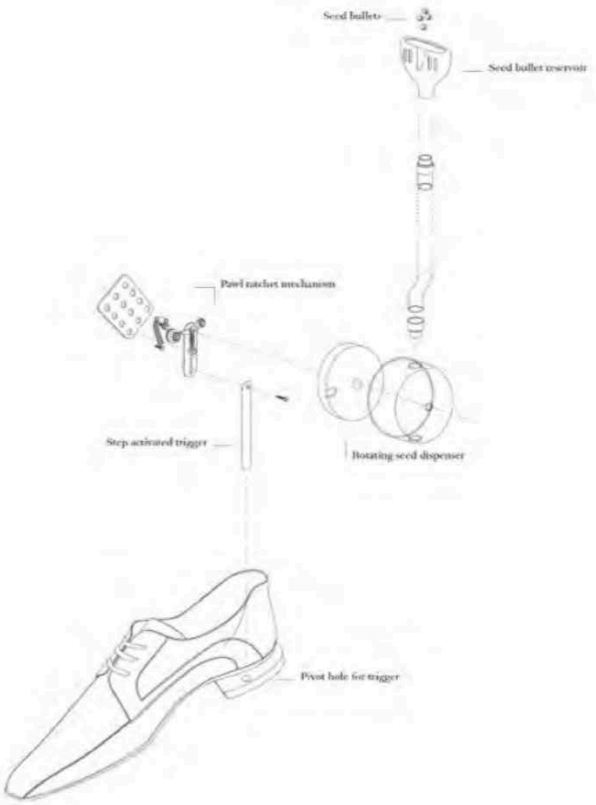
Video still from *Microscopy of Rocinha*, 2012.

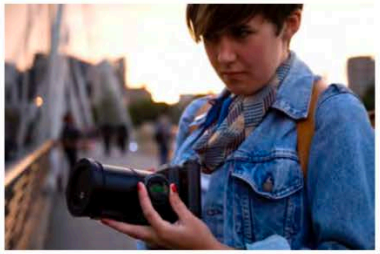
QT.movs of plants grown in a favela garden are captured using a custom-built microscope and montaged together with sound recorded using contact microphones attached to the plants. The workshops aim to provide youth with basic, hands on computer skills as well as an increased understanding of basic biology.

Instructables can be downloaded through the open source arts/science collective *Hacteria*

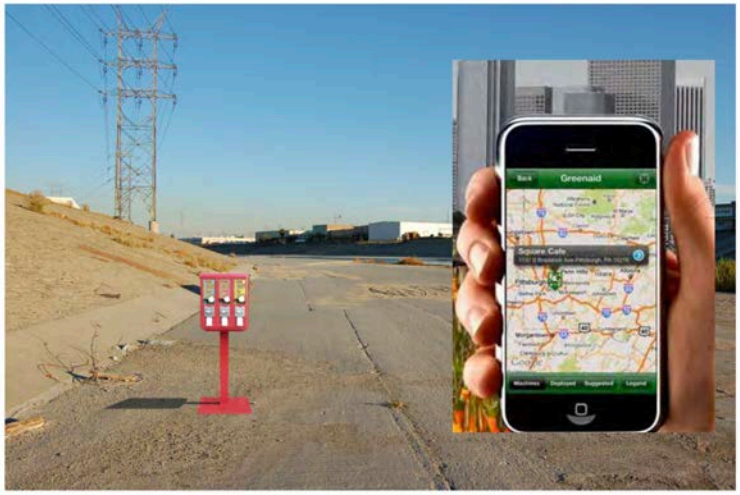
HORTAS CARIOCAS, a municipal scale favela gardening project led by Julio César Barros







Seed bomb dispersal devices



Commonstudio's *Greenaid* seed bomb vending machine, by Daniel Phillips and Kim Karlsrud

Basia Irland, *icebooks*

Planting seedballs after a workshop in Kenya

Simon Starling, *Island of Weeds*

RobGreenfield.TV

#DONATENOTDUMP

DUMPSTER DIVERS DEFENSE FUND


fruitcycle
providing second chances
REDUCING FOOD WASTE.


1/3 of food produced in the world is WASTED
Melbourne's Food Waste represents
waste of 3.6 million hectares of land and
litres of water and generates 1 million tonnes
of greenhouse gas emissions
ALL THE FOOD IN THIS SUPERMARKET IS FREE!
THE 'INCONVENIENCE STORE' IN MELBOURNE, AUSTRALIA
ONLY STOCKS DONATED FOOD THAT WOULD OTHERWISE BE THROWN AWAY
BREAD IS DONATED FROM LOCAL BAKERIES
AND FRESH PRODUCE COMES FROM NEARBY MARKETS AND SUPERMARKETS
SHOPPERS CAN FILL THEIR BASKETS AT NO COST
AND GIVE A DONATION IF THEY CAN
THE IDEA IS TO PROVIDE EASY ACCESS TO NUTRITIONAL FOOD FOR PEOPLE IN NEED
AND HELP CURB FOOD WASTE AT THE SAME TIME
RIGHT NOW, 40% OF EDIBLE FOOD IS WASTED
IMAGINE THE WASTE WE COULD STOP IF WE OPENED MORE STORES LIKE THIS!

PEOPLE IN THE US now waste 70% more food than they did in the 1970s.

Food waste is responsible for roughly the same amount of greenhouse gas emissions as 37 MILLION CARS.

Globally, if food waste was a country, it would be the third-largest polluting country in the world.

When food rots in landfills, it releases the potent greenhouse gas methane. But the largest source of emissions comes from growing the food; even if it's composted.

Food waste also wastes fertilizer, fuel, and other resources that went into producing it.

Agriculture uses nearly half of U.S. farmland and two-thirds of the country's freshwater.

Waste happens at every stage of the process, from farm fields (where food may be abandoned if a farmer has a surplus or if the food has imperfections), to distribution centers, supermarkets, restaurants, food processing plants, and homes.

Consumers throw out the majority of the food wasted in the U.S.:

roughly $450 of food for each person every year.

At the same time, more than 40 million Americans struggle with hunger.

(SOURCE: ReFed, 2019)


This Finnish start-up is making shoes from waste coffee
Every pair is made from 300 grams of used coffee grounds...
That's 21 cups of coffee


They are waterproof...
And vegan...
Containing six recycled plastic bottles
Footage: Rens


The start-up is not the only company to re-invent food waste...
Hugo Boss has made shoes out of pineapple leaf fibres
While Swedish fashion retailer H&M makes the soles of sandals from algae
And Stella McCartney is making clothes from mushrooms

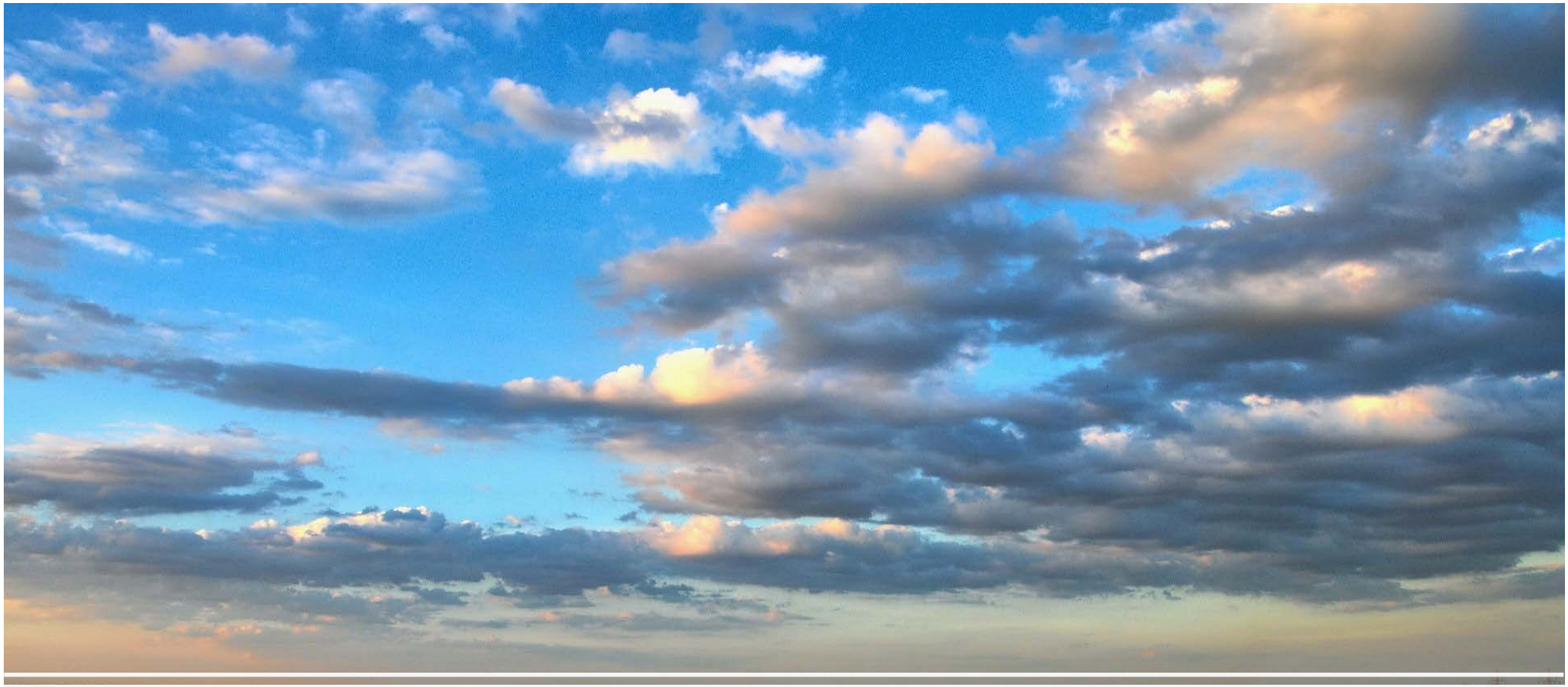

The fashion industry has a huge environmental impact
Consuming large amounts of land, energy and water
The fashion sector generates 20% of the world's wastewater
Finding alternatives could help ease this environmental burden


This supermarket
uses no plastic packaging
Asking customers to bring their
own bags, jars and containers
So they can fill them up with
exactly the amount they need
Cutting food waste


And ensuring less no plastic
ends up in landfills...
rivers and oceans


It's part of a growing trend
that's seen similar shops
open in London...
And Vancouver...
Image: Bulk Market


40% of all plastic made
is used in packaging
And only 9% of plastic
is ever recycled
How could you use less
plastic packaging?



Mainstream discourse focuses on the need to 'double' food production to meet the needs of a global population of 9b by 2050. Is this a good place to focus discussion?

What are some of the emerging challenges agriculture faces?

Agriculture faces new challenges: climate change, water depletion, peak oil & complex interactions.

- Must avoid knee-jerk pursuit of productivism as 'solution'
- Keeps the conversation on productivism: Business As Usual with a biotech magic bullet ('Gene Revolution')
- Agribusiness productivity not attentive to social & environmental consequences
- Over one billion people in the world are overweight or obese and susceptible to diet-related diseases, because the food they eat is unhealthy – they may be overweight and undernourished.
- An estimated one billion people in the world are experiencing hunger and malnutrition because of their lack of entitlements to access food, not because there is a lack of it.

Do you know of any global food insecurity events have sparked political unrest?

The Arab Spring was a series of anti-government protests, uprisings, and armed rebellions that spread across much of the Islamic world in the early 2010s. It began in response to oppressive regimes, a low standard of living, and food insecurity, starting with protests in Tunisia, which led to a revolution.

SUSTAINABILITY

Climate Change and Rising Food Prices Heightened Arab Spring

The effects of climate change on the food supply exacerbated the underlying tensions that have led to ongoing Middle East instability

One of the results following the 2007-09 rise in food prices due to climate change might have been the Arab Spring.

From the start, food played a bigger role in the upheavals than most people realise, though not everyone is convinced that the Arab Spring was due to a food crisis.

Many contest, however, that one of the driving forces behind the Arab Spring, may have been the high cost of food. A combination of shrinking farmlands, weather and poor water allocation continues to contribute to higher food prices and, in turn, anti-government sentiment, according to analysts.

The Middle East and north Africa depend more on imported food than anywhere else.

Most Arab countries buy half of what they eat from abroad and between 2007 and 2010, staple food imports to the region rose sharply. Because they import so much, Arab countries suck in food inflation when world prices rise. In 2007-08 they spiked, with some staple crops doubling in price.

In Egypt local food prices rose 37% between 2008 and 2010.

https://www.scientificamerican.com/article/climate-change-and-rising-food-prices-heightened-arab-spring/

https://www.economist.com/middle-east-and-africa/2012/03/17/let-them-eat-baklava

https://www.pbs.org/newshour/world/world-july-dec11-food_09-07

https://www.newsecuritybeat.org/2014/04/high-food-prices-arab-spring/

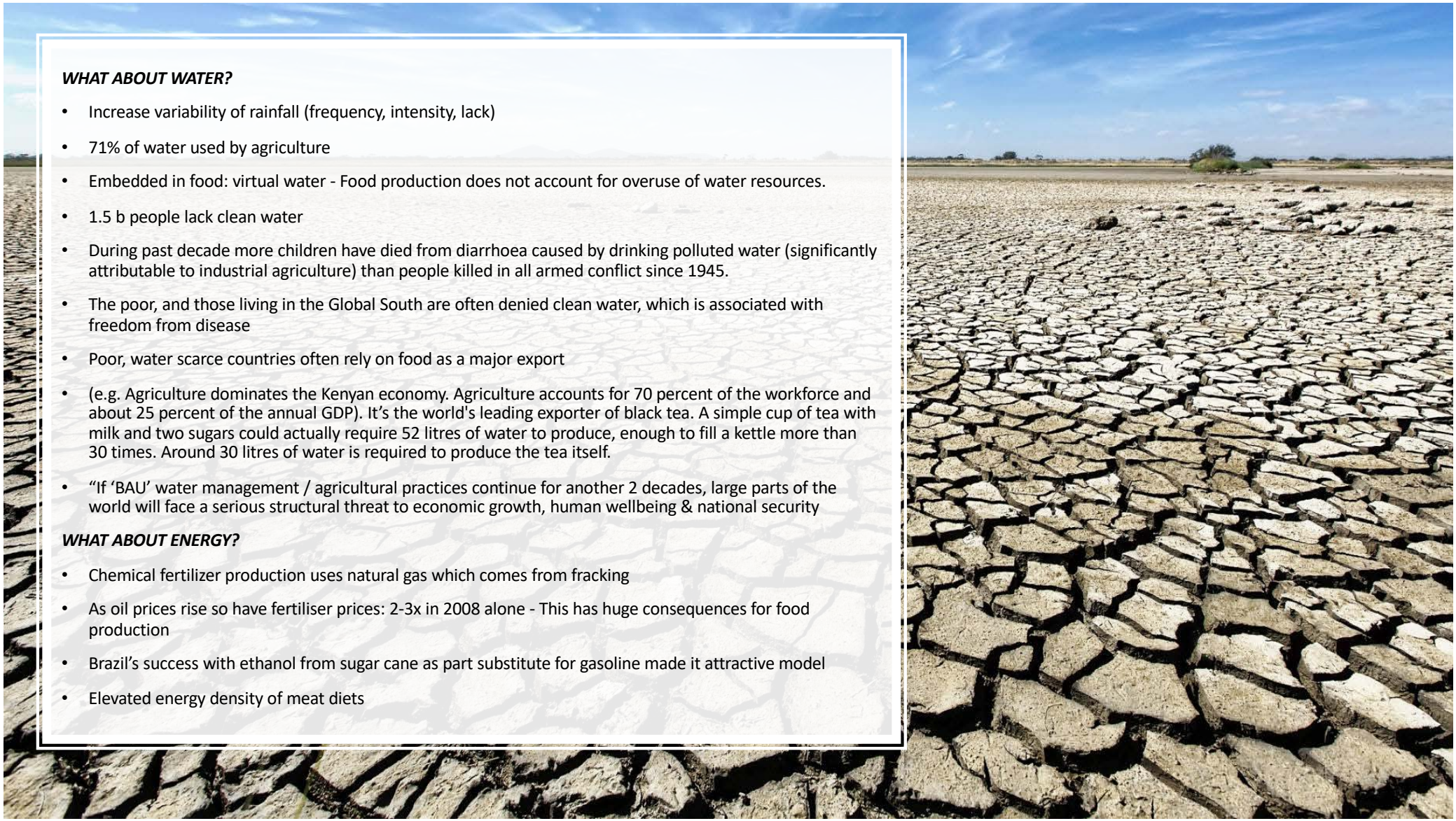
Agribusiness is based on large-scale factory farming and monoculture and is a major contributor to environmental degradation and climate change.

Conventional agriculture fails to account for externalities - what we pay for food fails to factor for the loss of ecological services, the depletion of resources, impairment of earth system processes, and the costs for human health and well-being.

- Livestock's contribution to global warming is getting worse as animal products have moved from the periphery to the centre of food consumption (location on the plate)
- Vulnerable to temperature, rainfall changes, rise of pests / disease, extreme weather events.
- With climate change, growing crops becomes too risky to pursue as a livelihood strategy across large parts of the global tropics
- Low latitudes/tropics: 3b people, many earning <$2/day & depend on ag. / Decline in length of growing period (Mexico – SE Asia) / Decrease in reliable crop-growing days (India) / High temperature stress (>30°C) (E & S Africa)

WHAT ARE SOME OF THE OTHER PROBLEMS WITH AGRIBUSINESS-AS-USUAL?

WHAT ABOUT ETHICS AND JUSTICE ISSUES?



WHAT ABOUT WATER?

- Increase variability of rainfall (frequency, intensity, lack)
- 71% of water used by agriculture
- Embedded in food: virtual water - Food production does not account for overuse of water resources.
- 1.5 b people lack clean water
- During past decade more children have died from diarrhoea caused by drinking polluted water (significantly attributable to industrial agriculture) than people killed in all armed conflict since 1945.
- The poor, and those living in the Global South are often denied clean water, which is associated with freedom from disease
- Poor, water scarce countries often rely on food as a major export
- (e.g. Agriculture dominates the Kenyan economy. Agriculture accounts for 70 percent of the workforce and about 25 percent of the annual GDP). It's the world's leading exporter of black tea. A simple cup of tea with milk and two sugars could actually require 52 litres of water to produce, enough to fill a kettle more than 30 times. Around 30 litres of water is required to produce the tea itself.
- "If 'BAU' water management / agricultural practices continue for another 2 decades, large parts of the world will face a serious structural threat to economic growth, human wellbeing & national security

WHAT ABOUT ENERGY?

- Chemical fertilizer production uses natural gas which comes from fracking
- As oil prices rise so have fertiliser prices: 2-3x in 2008 alone - This has huge consequences for food production
- Brazil's success with ethanol from sugar cane as part substitute for gasoline made it attractive model
- Elevated energy density of meat diets

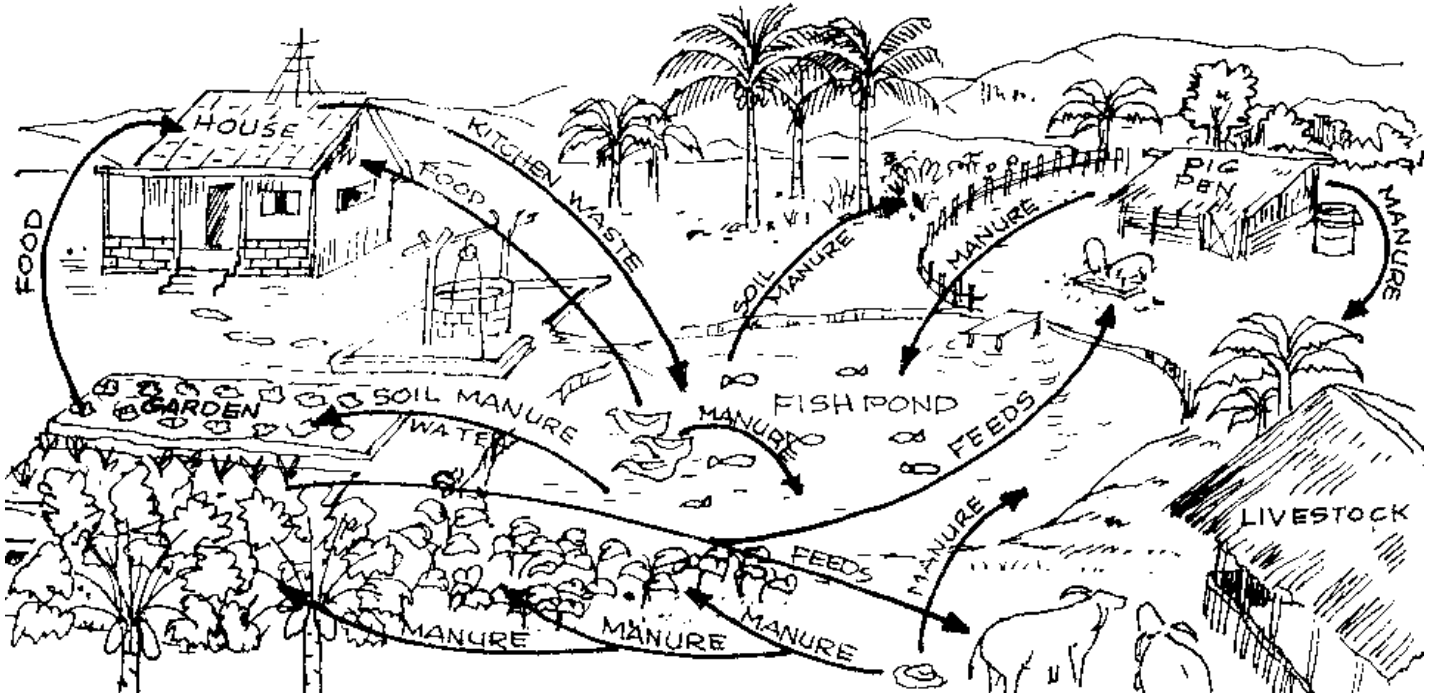
Other issues with conventional large-scale farming

- Carbon sink loss – deforestation / erosion
- Inequity in food distribution - surplus generating regions (Americas, Europe, Australia) fail to balance deficits in tropics
- A host of non-responses to environmental / climate change challenges
- Global food system rests upon cheap energy for agri-inputs, machinery, processing, distribution.
- US expansion of refinery capacity: corn as feedstock
- Insane federal subsidies for conventional farming
- Utilising arable land to grow fuel for mobility rather than food for hungry
- Conversion of forest to palm oil
- Foreign purchase and leasing of lands (e.g. 40% of total arable land in Madagascar) for biofuel & food. Protests led to fall of government.
- China, Gulf States, S. Arabia & India have leased land; e.g. Saudi negotiating 70% of Senegal's rice- growing area
- Japan has 3x more land abroad than it has at home
- Agribusiness is as much a grab for water as it is for land
- Agribusiness exasperates climate change; freshwater depletion; energy insecurity.
- Effort by the rich world to secure their own medium-term advantage
- Problem in relying on market to ensure food & nutritional security for the poor
- Poor suffer from vulnerability to commodity markets
- Intensive livestock systems have huge demand for feed and fuel deforestation
- 1/3 of world grain production + 85% soybean worldwide. Soya occupies area size of Egypt and fuels deforestation and climate change. Almost all is produced for export market for livestock feed and biofuel
- Food waste: scandalous level of discard in food chain
- Need for public policy innovation
- Meatification of the human diet worldwide.
- Nutrition decrease
- Resulting in rising levels of overweight/obesity & diet related diseases (diabetes, CVD, cancer)
- Toxic runoff and pollution
- Transportation
- Rubber Stamp Certification
- Corporate responsibility for pesticide impacts

GENDER EQUALITY

LOCAL-SCALE FARMING

AGROECOLOGY



WE CAN CHANGE THE FUTURE OF AGRICULTURE

Forest Gardens are far more beneficial than conventional agriculture.

CONVENTIONAL AGRICULTURE		FOREST GARDENS
Cash crops of rice, peanuts, & maize generate a maximum of $200-400 per acre	MAX EARNINGS PER ACRE	Forest Gardens can generate $1,000-$2,000 with a mix of fruits and vegetables
1-2 paydays per year, depending on the number of rainy seasons	# OF PAY DAYS PER YEAR	Something to sell, harvest or trade all 12 months of the year
One crop feeds families for 3-6 months	FOOD SECURITY	Dozens of food crops feed families for 12 months
Nutritional quality of intensified crops is falling; families eating the same staple crop everyday face nutrient deficiencies; few vegetables are grown	NUTRITION	Increase in dietary diversity and access to nutritious fruits and vegetables; more than 12 types of vegetables grown in every Forest Garden
Conventional agriculture (monoculture) is the #1 cause of deforestation; fields are burned and cleared every year	TREES	Forest Gardens have over 2,500 trees per acre
Fully dependent on carbon-intensive chemicals in the form of fertilizers, pesticides, herbicides	CHEMICALS	Eliminates the need for chemicals
Conventional agriculture is the world's largest emitter of greenhouse gases and degrades soil	ENVIRONMENTAL	Forest Gardens sequester an average of 62.8 metric tons of Carbon per hectare; revitalizes soil; enhances biodiversity
Maize, peanuts, millet and other staple and cash crops tend to be male-dominated value chains where women do most of the work in the fields and men control the transport and sale	EMPOWERMENT	Forest Gardens encourage female lead farmers to work together and promote self-reliance amongst all farmers
Input providers of seeds and fertilizer tend to take 60% of net profits	WHO BENEFITS?	Farmers keep most of their profits

- Creating a new economic morality around the global food system helps ensure attention is given to the human right to food, informed by social justice & environmental sustainability.
- Sustainable intensification utilising best agroecological methods and local knowledge to build local, agroecological food security, reduce vulnerability, and enhance resilience.
- Need for new policy options for food & livelihood security under increasingly constrained environmental conditions.
- Recognising that "BAU is no longer an option": need to rethink the role of agribusiness if we aim to achieve sustainable development goals.
- Not just about producing enough basic staples, nor about diversification into high protein foods, but about availability, access and the capacity to utilise appropriate & sufficient food for all.
- It also plays a major role in climate change mitigation through carbon sequestration and water conservation.
- Take personal responsibility but push for policy change