



# SCHOOL GARDEN ROOT NETWORK

# INTRODUCTION

## INTERNATIONAL SCHOOL GARDENS

Throughout the world, there is a long tradition of school gardens which have existed in many different forms and sizes, with just as many different soil types, plants, aims and expectations of pupils and teachers. It is common in school gardens for children to arrange their surroundings creatively and thereby affect their future as well as ours.

We launch international school gardens at IGA-Campus to have exemplary school gardens from all over the world and model partnership gardens. These were developed with partners (NGO, experts, schools) from

### **Costa Rica, Cuba, Morocco, Ethiopia, Kenya and the Philippines**

The project aims to reconnect young people with their environment and especially gardens, in both urban and rural settings, through international partnerships, exchanges and nurturing enthusiasm for nature and sustainable development. At the teacher's level it could be a platform for sharing experiences of setting up an *'outdoor classroom'* and sharing teaching resources across all areas of the curriculum and for pupils of all ages.

## SCHOOL GARDEN ROOT NETWORK

School Garden Root Network is a publication that celebrates school garden cultures around the world, and their meaning not only for school lunches, but also for teaching us how to grow food, how to use resources, as well as counting, reading, and creating communities. Like this, gardens become schools themselves where we can draw connections from a plot to questions of changing climates, soil, food sovereignty, traditional knowledge, socio-economic conditions, politics and human rights.

It is a joint project between IGA Campus / GRÜNE LIGA Berlin and the Design Department of the University of Applied Sciences Potsdam (FHP), lead by Ulrich Nowikow and Prof. Myriel Milicevic. It is created and designed by FHP students Anna Albert, Rina Celina, Leah Döllmann, Rosa-Sophie Hamburger, Mira Kellner, Marie-Louise Maas, Daria Radevich, Michael Rydzek and Thea Sparmeier, as well as many other supporters who we would like to thank here.

We would like to further develop successful cooperations with NGOs, experts, schools in Berlin and internationally as well as establish partnerships with school gardens.

Envision the Future and Start Now! Join and promote International School Gardens!

*Gardens are not made by  
sitting in the shade.*

– Rudyard Kipling

The International Garden Exhibition  
Berlin 2017 (IGA)

*The IGA Berlin 2017 will be a showroom  
and field-experiment area for the future  
dealings with urban green. The 100-acre  
venue in Berlin's eastern city district around  
the ever-growing "Garden of the World"  
and the surrounding Kienberg Park provide  
excellent conditions to showcase the art  
of urban gardeners, urban natural areas,  
sustainable landscape development, and  
groundbreaking green diversity.*

*In 2017, over two million visitors will experi-  
ence how international landscape architects,  
landscape gardeners, plant producers,  
artists and cultural workers transform the  
green periphery of the city in a garden  
laboratory of the future.*

The IGA campus is designed to be a place for learning, encountering and experimenting within the International Garden Exhibition 2017 (IGA) in Berlin. Primarily conceived for young people (teenagers and children), the IGA-classroom strives to integrate educational selections on urban gardening, development education, arts and media, and professional orientation. Besides green subjects such as gardeners and plants, biological diversity, healthy eating and exercise, also on the timetable are topical global issues: How does fair trade work? What exactly is ‘sustainability’? Can climate change be halted?

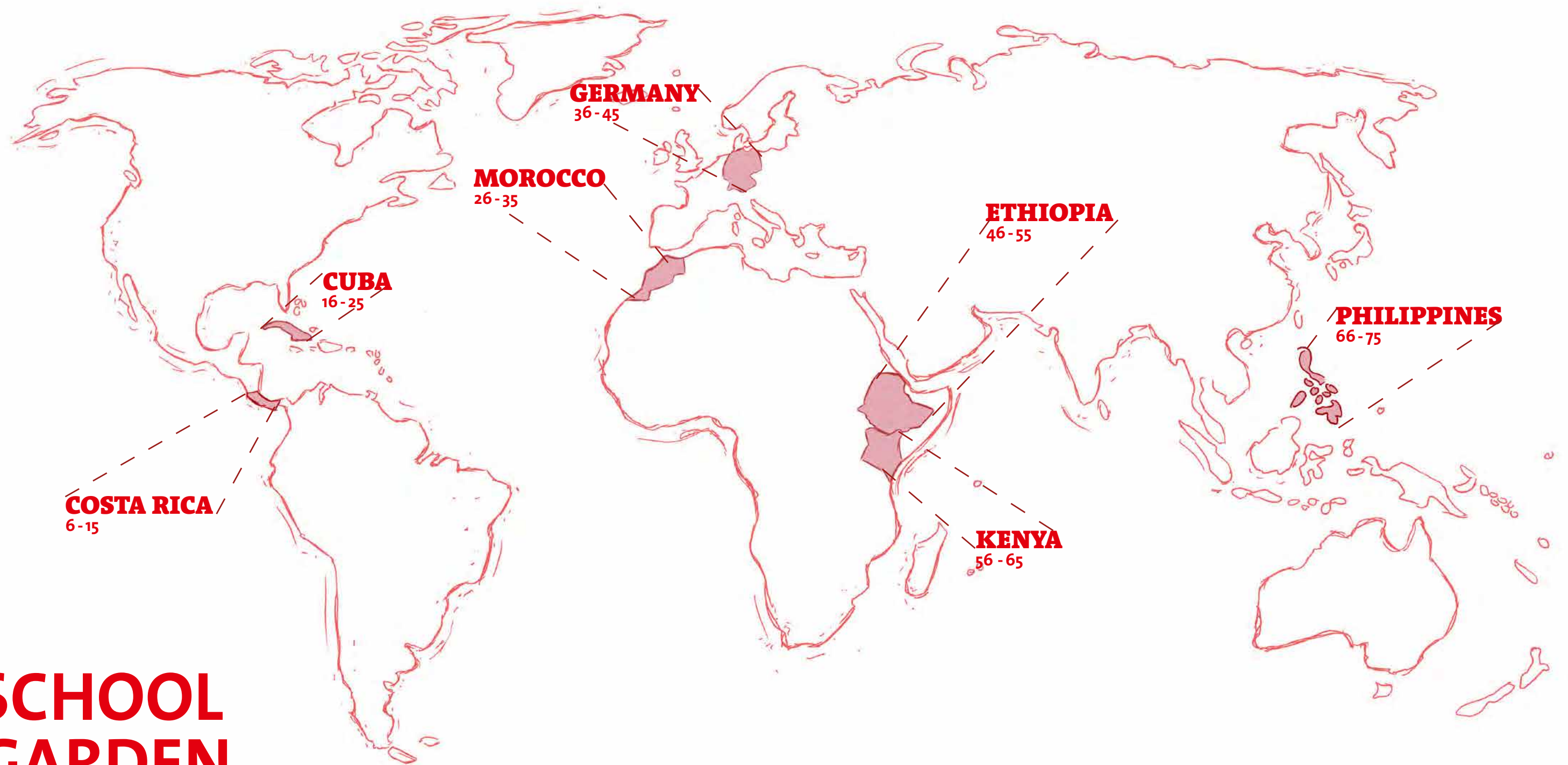
As a model location, the IGA campus lays the foundations for lasting environmental education in the district. During the 186 days of the international horticultural exhibition, more than 2,500 events invite guests to get actively involved and discover and try out new things. In addition to the age-specific events in the IGA-classroom, the IGA campus offers several cross-generational courses that promote community spirit and build social skills.

The IGA campus has been carefully integrated into the existing natural space on an area covering around one and a half hectares. The concept of conserving and reusing resources was a key requirement in terms of the design and the materials used. The playful, modular architecture divides the space into horticultural activity areas, ‘green classrooms’, workshops, cooking stations and resting areas and also provides room for encounters and social interaction.

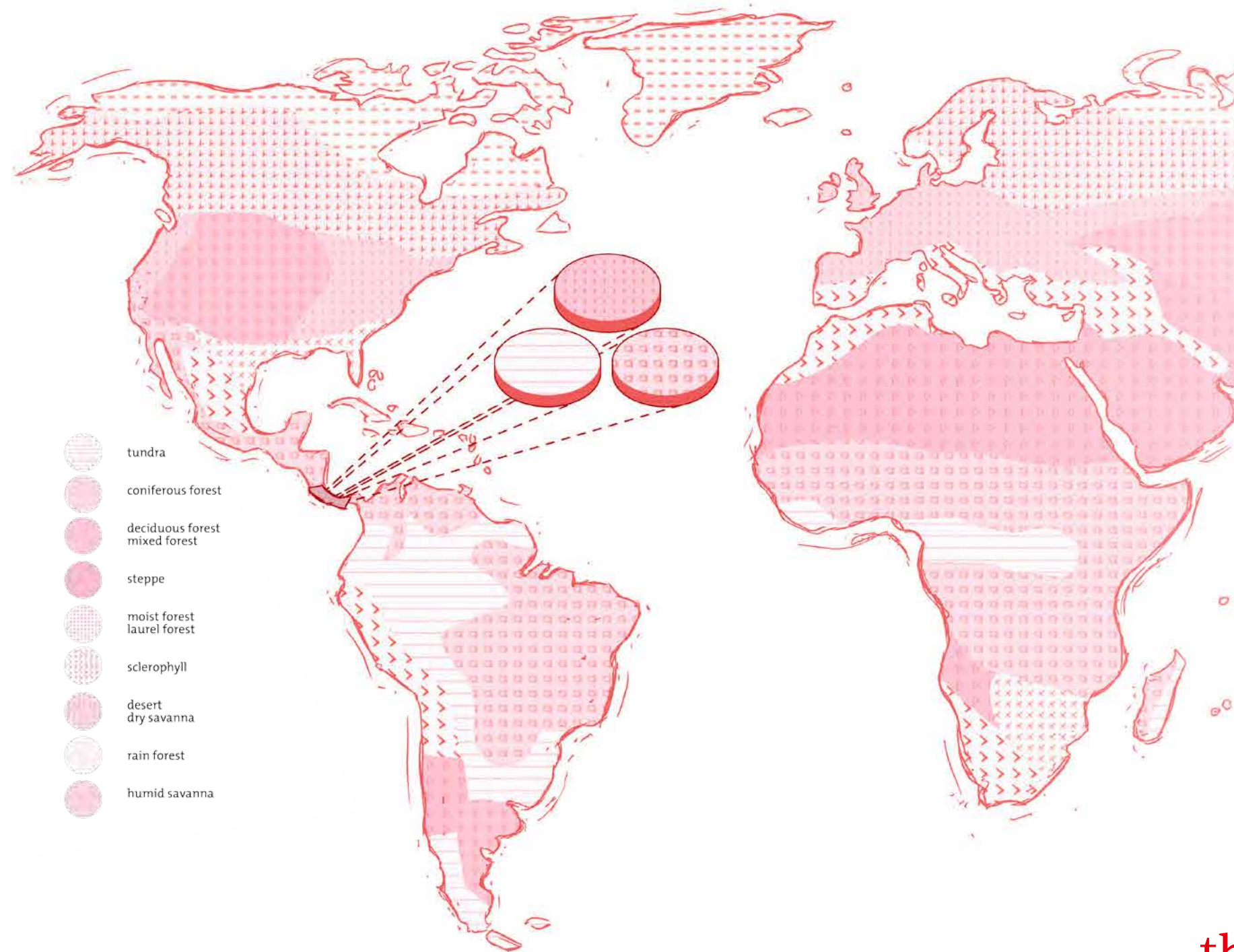
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# SCHOOL GARDEN ROOT NETWORK







Seven thousand years ago people in Costa Rica were already practicing agriculture, growing mostly tuber vegetables.

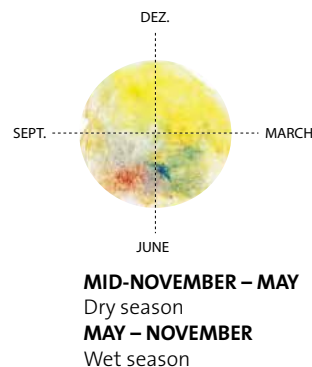
Coffee was introduced in the 18th century and is still one of the country's main crops exported around the world. Another major economic pillar is ecotourism.

With 25% of the country's rich biodiverse land environmentally protected, Costa Rica has become a popular tourist destination.

The high level of education and children's health is also reflected in the establishment of school gardens as outdoor classrooms and a source of nutritional school food.

# COSTA RICA





*No climate can, I imagine, be more favorable to fertility and to man's comfort at the same time than that of the interior of Costa Rica. Merlin the wizard couldn't have conjured the elements into a more blissful climate.*

Anthony Trollope,  
English 19th-century novelist

## environmental issues

Deforestation is one of the main environmental issues facing Costa Rica. Nearly 80% of the forests of Costa Rica disappeared since World War II. In the 1990s the country had one of the worst deforestation rates in Central America. The destruction started in the 1960s as the country prioritized cattle ranching and exporting beef to the U.S.

Banana plantations were also a driver for deforestation. The pesticides that are used enter in the hydrological system and pollute the water. The clearcutting of forests to make place for the plantations also destroys the nutrient balance in the soil.



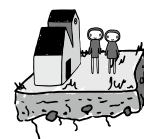
**POPULATION**  
4.8 million  
1.31 million under 18



**LIFE EXPECTANCY**  
80 years



**WORKING IN AGRICULTURE**  
12.7% of total employment



**SCHOOL ATTENDANCE**  
Primary school  
96%  
Secondary school  
m: 59% f: 65%

## forest protection

Forest protection policies were enacted to reduce deforestation and keep agricultural expansion from already-cleared areas. In 1996, a ban was passed on the razing of mature forests. Today, the country is among the most progressive in the world in fighting deforestation, with a decrease of mature forest loss from 2.2% to 1.2% per year.

Currently half of existing forests are protected under national parks, wildlife refugees, or biological reserves. Unfortunately, the other half of the nation's forests are privately owned with no protection rights. While companies get bigger and bigger, small-scale farmers are forced to use land that is unsuitable for agriculture. As the population grows rapidly, farmers use more and more land, clearing most of its foliage in the process. Costa Rica's laws are seen as very progressive in theory, but lacking in government resources to enforce them.

See also: Fagan, M.E. et al. »Land cover dynamics following a deforestation ban in northern Costa Rica« 2013



Student at Biolley School picking fresh coriander



# state of agriculture

Costa Rica’s warm climate and fertile soils form a perfect environment for growing food. Traditional crops, like coffee and bananas, have been the most important for agricultural production since the 18th century. Sugar is also an important crop in Costa Rica, but unlike coffee and banana that are also exported, sugar is mostly produced for local consumption. The local farmers and other companies practice two methods of farming: plantation and sustainable/permaculture farming. Many indigenous farmers, such as the Bribri tribe, practice subsistence agroforestry. Most large plantations are monocultures that grow traditional crops with mass output, but lack much-needed biodiversity for soil health due to the heavy use of agrochemicals. Though the production size helps the economy, these monoculture practices have a major destructive influence on the ecosystem and are one of the primary causes of deforestation. Today, sustainable farming is becoming more widespread in Costa Rica. Crop rotation and companion planting are important practices executed by the nation’s sustainable farmers. The major benefit of crop rotation is that each crop has a different harvesting period, providing food and money all year. This method also reduces soil erosion which is a major environmental issue. Industrial agriculture, which has very little concern for smaller farm communities, is leading the agricultural society. When Costa Rica prioritizes the needs of the poor populace while prioritizing the efforts of those who are already reaching out to them, there will be a much clearer path to food security and sustainability.

# subsistence farming

Subsistence farming is mostly practiced by indigenous tribes in Costa Rica. They rely on natural growth within the forests and small gardens to produce enough food to survive. The Bribri tribe from the Limon region produces more than 120 wild and domestic crops, as well as construction materials, medicine, crafts, and firewood. They practice agroforestry while using the natural nutrient cycle and symbiotic relationships between plants, insects, birds, and other animals to provide natural mechanisms for controlling pests and producing harvests throughout the year.

## sweet pepper

*Chop a pepper into cubes, rings or long stripes. Use it as a snack, addition to a salad or a main dish.*

## garlic

*Mix garlic with butter or oil and apply it to different kinds of bread. Chop the cloves and cook it in soup or hot pot.*

## aloe vera

*Add some aloe juice to your daily meal or smoothie. Healing effects of aloe vera allow to use it as a skin treatment.*

## oregano

*As a culinary herb it is more flavourful when dried than fresh. Use its oil as a dietary supplement.*

## zea mays

*Cook or eat raw not fully ripe seed to taste its deliciously sweet flavor. Heat the dried seed in an oven until they burst to make popcorn.*

## coriander

*Use the fresh leaves and the dried seeds in cooking. Add coriander to the dish just before serving.*

## chili pepper

*Remove stems and seeds during preparation. Use fresh or dried chilies to make a hot sauce which will add spice to the main dish.*







## policies for school gardens

Costa Rica is one of the countries that has settled policies of identifying school gardens with healthy food and improving the nutrition and eating habits of children.

In Biolley district, there is an elementary school, which is visited by village kids. With the help of parents and volunteers, the school garden was built as an educational tool. All sowings are biologically native and free from pesticides to ensure the health of the students. Children are also allowed to take their harvest home.



*Students gardening at the Biolley School*





**REPORT FROM**  
Pablo Arce Serracin

## school of biolley

In the school garden, students learn subjects including maths, Spanish, music, history, biology, and English. In the Biolley school, the kids also have one important class called *agriculture*. In this class, the kids learn how to grow plants and how to take care of them in an organic way. Many topics, which are part of different classes and subjects also find their way into the subject of agriculture. For example, children learn how to write the plants names in Spanish and English and they use those plants to learn counting. Signs are made of recycled materials in different colors and shapes. All this is included in the regular curriculum. Usually after the harvest the students take the plants to the school kitchen and follow the complete process from the garden to the table.

This region is rich in opportunities to grow food, and it is part of the local culture. The school garden strengthens agriculture as children learn the importance of food safety. The aim of the program is to bring together institutions like the Ministry of Education of Costa Rica and local development groups, engaging the parents of the kids and the members of community of Biolley to create an environmental friendly society.

*Pablo Arce Serracin is a Natural Park ranger from Costa Rica. From August 2015 till August 2016 interned at GRÜNE LIGA Berlin.*

# Empanadas

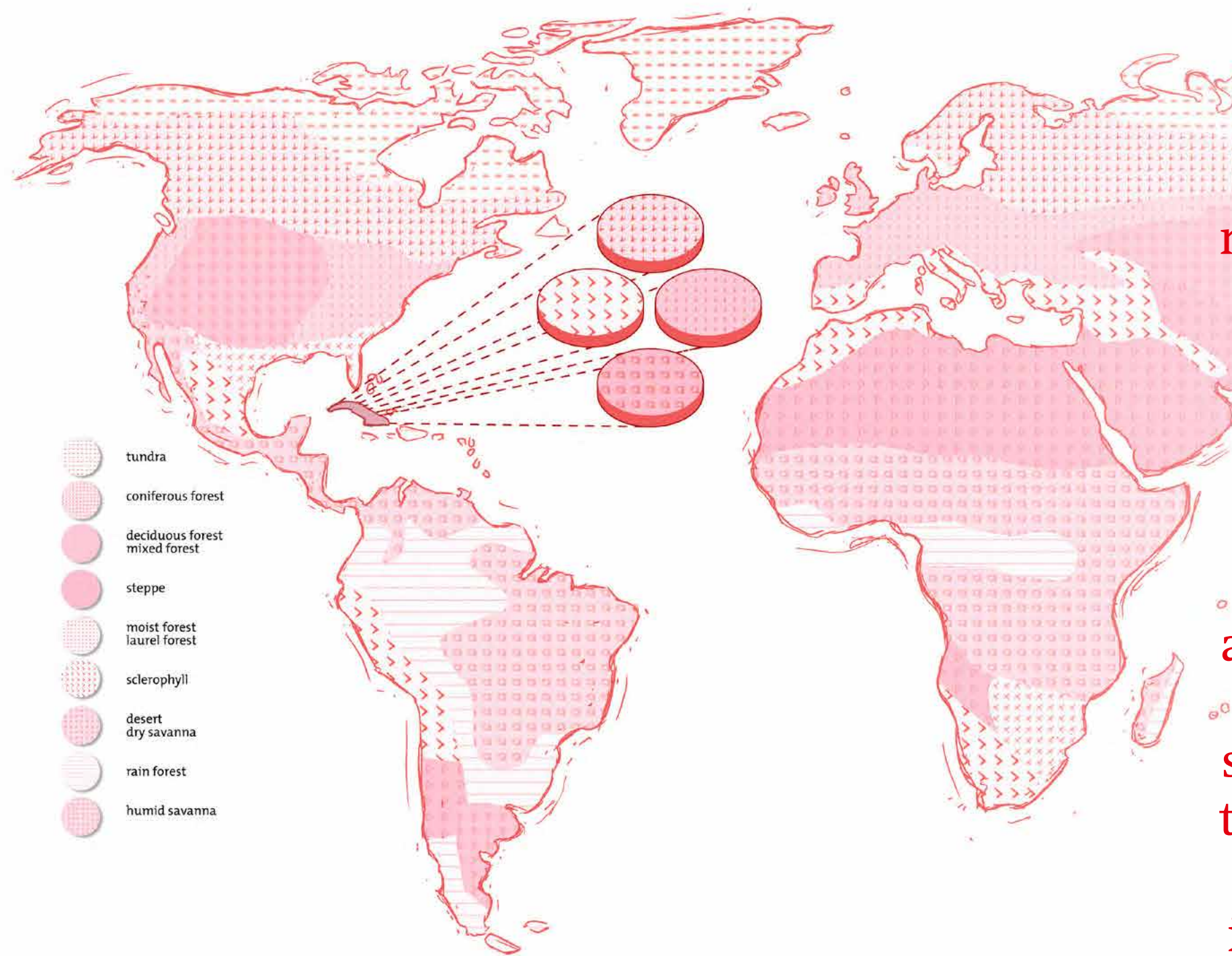
*Make the filling:* In a 12-inch skillet over medium-high, cook meat until no longer pink, breaking it up into small pieces, 5 to 7 minutes. Add onions and jalapenos; cook until soft, 5 minutes. Stir in chili powder and tomatoes. Cook over medium until mixture has thickened, 12 to 15 minutes. Season with salt and pepper. Fold in cilantro. Let cool.

*Make the dough:* In a bowl, combine flour, baking powder and salt. Using your fingers, cut in butter until mixture is crumbly. Add just enough cold water so dough comes together.

*Form empanadas.* If desired, freeze on a baking sheet until firm, 2 hours. Wrap tightly in plastic, freeze in plastic bags. To bake fresh or frozen empanadas, preheat oven to 400 degrees. Place on parchment-lined baking sheets. Brush tops with egg wash, avoiding crimped edges. Bake until golden brown, rotating sheets halfway through, 30 to 40 minutes.

*For the Filling:* 1 kg ground pork or beef, 2 medium onions (finely diced), 2 jalapeno chiles (minced ribs and seeds removed for less heat, if desired), 1/2 teaspoon chili powder, 2 cans each 450 ml tomatoes (diced) *For the Dough:* 480g all-purpose flour, plus more for dusting, 2 teaspoon baking powder, 2 teaspoon salt, 145g cold butter (cut into small pieces), 1 cup cold water, 1 large egg (lightly beaten with 1 tablespoon water (do not beat until ready to bake))

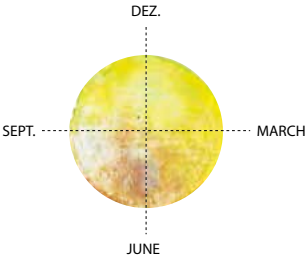




The Caribbean island nation of Cuba is a shining example of subsistence agriculture and has shown itself as a leading global model for the integration of school gardens in everyday life. Despite deforestation, desertification, and other environmental problems caused by climate change, Cubans have managed to make the most of their agricultural opportunities and prioritize subsistence farming. A catalytic effect in the success of sustainable farming techniques and the growing number of edible school yards, can be witnessed, resulting in the rise of healthy lifestyles and educational attainment.

# CUBA





**MARCH – JUNE**  
Sowing season  
**AUGUST – NOVEMBER**  
Harvest season

Tropical climate prevails,  
forging a dry winter (25°C)  
hot, wet summer (31° C)



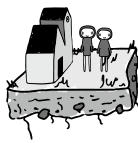
**POPULATION**  
11,2 million  
20% under 18



**LIFE EXPECTANCY**  
Women: 77 years  
Men: 81 years



**SUBSISTENCE FARMING**  
ca. 90% of the population



**SCHOOL ATTENDANCE**  
per 100  
Primary: 96  
Secondary: 84

## rain periods and hurricanes

Cuba’s weather patterns are ruled by two main seasons. In summer, the tropical climate is dominated by periods of heavy rain and hurricanes. Winter is often very dry and thus prone to droughts. Besides weather-related problems, there are critical environmental issues. This includes a decrease in the agricultural and forest landscape, a rising sea level, extreme variation or absence of precipitation, desertification, air pollution, and waste management problems.

## agricultural conditions

Cuba has optimal soil conditions for agriculture; fertile and cultivable clay soil and calcareous soil contribute to high yields during harvest. Plants grow fast and the country has a high level of biodiversity, with about 50% of all plants endemic to the region. For many Cubans, farmers become role models for a subsistence economy. The population is obliged to help secure water, the soil, flora, and fauna by the law (art. 27). Farmers are careful to use only local seeds and resources while rejecting most fertilizers and pesticides. Instead of large corporations owning seeds and monopolizing the fertilizer industry, as in many western and developed nations, Cuban farmers have more independence and control over their agricultural production. Urban gardens also have a known presence in the economics of food production. In 2007, 14.6% of agricultural produce was grown in urban gardens. In Havana, local gardens and farms produce 90% of the fresh produce for the city.



Red soils and limestone hills known as “mogotes”

## campesino a campesino

The Cuban agriculture can be described to a great extent as agro-ecology. This form benefits from the system of nature and does not use any chemical means of monoculture. Instead, nitrogen-fixing plants like beans and flowers attract useful insects and are used to prevent pests. What’s more, Cubans generally live according to the principle Campesino a Campesino, which means that the people share their produce with their community. Agricultural equipment is very expensive and hard to acquire, requiring most farmers to build and fix everything themselves. This is optimal for a sustainable agricultural system, because dependence on external factors is minimized.



Cuban landscape -the mountain fields Vinales Pinar del Rio





A typical way of arranging plots, lining them with stones



Farmers overlooking a field with vegetables

# politics and land rights

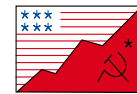
In 1959, formerly dictatorial Cuba was revolutionized and accordingly a socialist political system was established. However, expropriations of US companies and US citizens went hand in hand with this progression and consequently, the US enacted an embargo on Cuba, which made export and import to western states nearly impossible. Support was received only from communist states such as the Soviet Union, wherefore a well functioning agriculture in the sense of subsistence farming was desperately required.

Because of its strategically good position, Cuba was heavily involved in the cold war conflict between the US and the USSR. In 1962, the conflict culminated in the Cuba Crisis, and more western states disabled their trading with Cuba. To further disseminate a self-supporting agriculture, the administration of land was decentralized and estates were broken up. These were leased in small parts or given to the populace. Additionally, farms got limited to a size of a mere 13 km<sup>2</sup> and properties must only be as large as 4 km<sup>2</sup>. Today, these limitations are luckily a prevention against land grabbing.

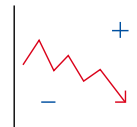
In the 1990s, agriculture experienced another low in succession to the economic crisis. To prevent crashing sales and production, the government initiated a series of urban gardens, so-called Organopónicos. They secured a steady supply of fresh produce for the people living in highly populated areas. These gardens are still popularly used and help in giving the populace power over their land. Today, more than half of agriculturally-used land is administered by non-governmental organizations.



1959



1962



1990





Farmers share their experiences with the children and show them how to care for the plants



A typical school meal:  
rice with bean soup, spinach and fried plantains



School gardening is an integral part of the curriculum

VEGETABLES OF EACH SEASON

- yucca root
- black beans
- sweet potatoes
- plantain
- malanga
- white cabbage
- avocado
- papaya
- cane sugar



AROMATIC PLANTS

- mint
- hibiscus
- chamomile
- calendula
- aloe vera
- eucalyptus

USE OF THE PRODUCE

The produce is often not only used as a means of feeding the population, but is of multifunctional importance to the people. Plants such as hibiscus are also used to make healing tea or medicine.





AN INTERVIEW WITH  
Laura Herrmann

Laura Herrmann is co-chairman at the Freundschaftsgesellschaft Berlin-Kuba e.V. She has been traveling and living in Cuba extensively, supporting the establishment of the Botanical Garden of Pinar del Río.

### To which extent is gardening integrated into school life?

Children who go to primary school start to regularly care for their garden when they are in 4th grade. They work together with a gardener and sow, water and preserve plants. The older kids from 8th grade onwards visit one time a year a rural area for 4 weeks and help with the agriculture.

Schools that do not have their own garden take part in urban gardens, so-called Organopónicos, which exist in nearly every neighborhood. Participation is obligatory and is integrated in the curriculum. In addition, students can participate in study groups that focus on environment and nature.

### What kind of experiences can the children make?

The children learn to value simple food as vegetables and legumes and can observe the plants as they grow and get to know their traits. They also learn about the effects that natural powers like drought and hurricanes may have on the soil and plants.

### What happens with the produce?

The food that the children grow is partly preserved and then sold at school functions. Families that don't have as much money are allowed to take produce home at minimal cost. Often medicinal plants, such as aloe vera, are grown and used to produce digestive tea and tinctures.

### Are there any problems the schools have to deal with?

School gardens unfortunately have little money, so they are dependent on donations from foreign countries. Donations are needed to build water collection tanks, to set up irrigation systems, and to buy garden tools.

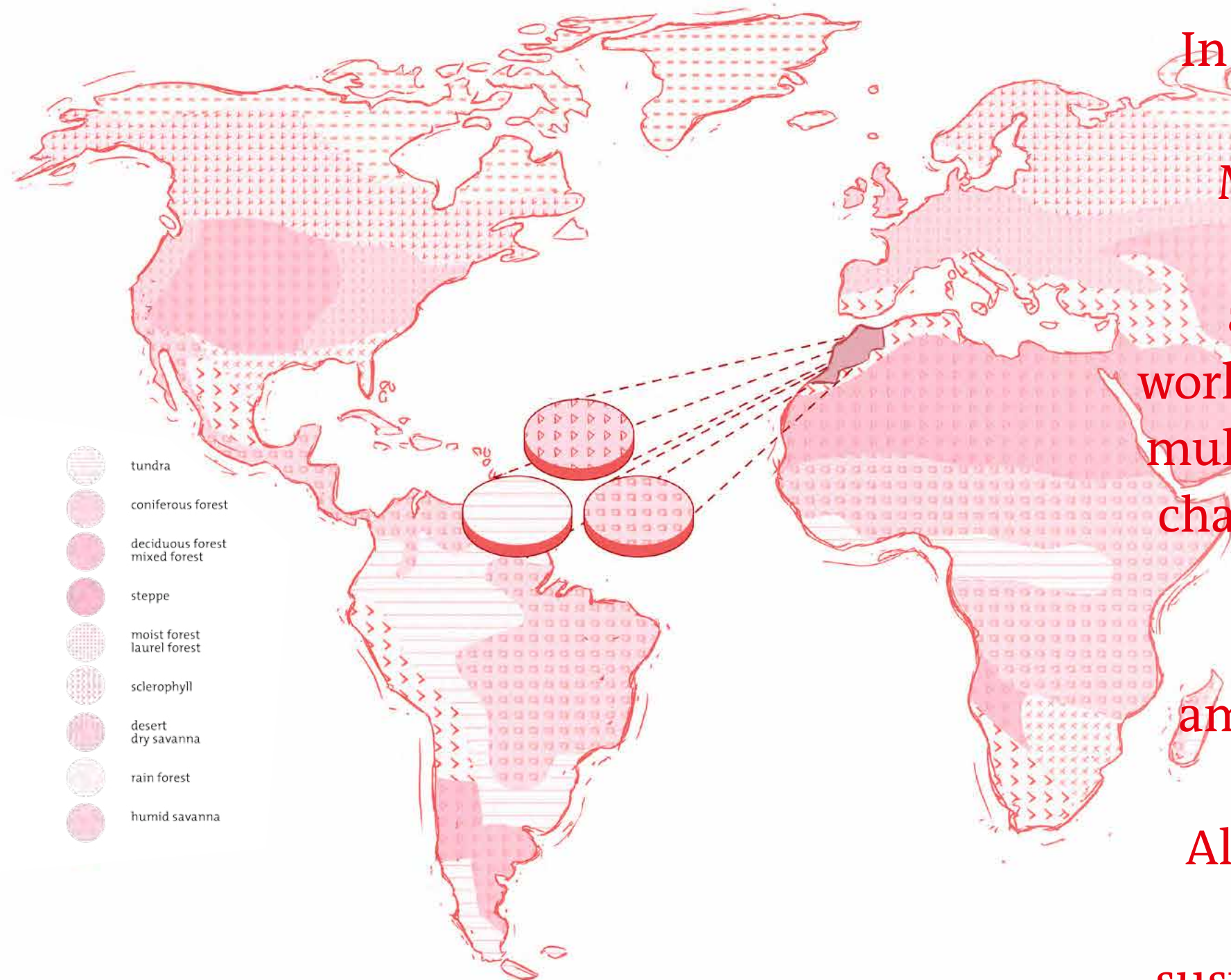
## Moros y Cristianos

Black Beans and Rice

Heat oil in a skillet at medium-high heat. Once hot, add the onion and minced garlic and sauté for a couple of minutes until the onion is transparent. Add the beans and cook for about 2 more minutes, allowing them to absorb some of the flavor of the onion. Stir in the cooked rice and pour the bean broth in the skillet. Keep cooking for about 5 minutes, until everything is hot. Season with salt and add oregano and cumin.

1 tablespoon vegetable oil, 1/2 onion, 1 garlic clove, 130 grams of cooked black beans, 30 grams of bean broth, 400 grams of cooked rice, 1/2 tablespoon oregano, a pinch of ground cumin, salt to taste



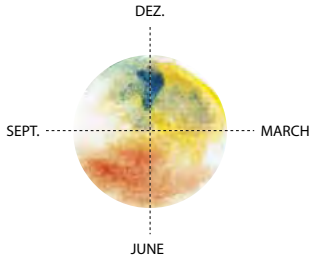


# MOROCCO

In Morocco, over half the active labour force works in the farming sector. Morocco is still highly dependent on imports, consuming three times the amount of imported cereal than the world average. The country is faced with multiple problems in regards to climate change, most significantly drought and soil degradation.

There is a strong economical divide among the rich and poor and between large- and small-scale farmers. Although there is no mass production in play, there is a great need for sustainable agriculture in Morocco, and school gardens educate students about sustainable farming techniques.





**APRIL-OCTOBER**  
Hot and dry  
**NOVEMBER-MARCH**  
Rainy season



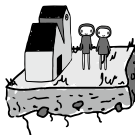
**POPULATION**  
33 774 000  
20% under 18



**LIFE EXPECTANCY**  
61 years



**WORKING IN AGRICULTURE**  
40% of the population



**SCHOOL ATTENDANCE**  
Primary school  
m/f: 91% / 88%  
Secondary school  
m/f: 38.7% / 36%

# living from farming

Forty percent of the nation’s workforce is subsistence farming. Agriculture is the largest employer in the country. More than 70% of farmers work fewer than five hectares, however this accounts for only a quarter of the total land under cultivation. The large farms dominate the fertile areas. Inevitably, large farms have a more substantial income, earning approximately nine times more than the average family farm. Many small farms face problems that make it difficult to increase their earnings, including ambiguous land ownership, a lack of infrastructure or access to credit, and poor technical and marketing support. Without registered land, small farmers cannot benefit from government programs; even with registered land, many programs favor larger farms. Morocco’s rural areas have poor socio-economic infrastructure, low levels of education, and an ageing farmer population. Small-scale farmers are economically vulnerable, particularly to instability in global markets and the impact of large farmers flooding local markets with produce when they fail to sell it abroad. Like this, small local farmers are facing great challenges with an economy that is heading towards liberal markets, competition and a greater emphasis on cash crops. For wheat, the top export destinations of Morocco are Spain, France, Brazil, Italy, and Germany.



Moroccan desert areas are very stony and dry

# dealing with desertification

Morocco is conditioned by a Mediterranean weather climate which is difficult to predict. The government faces a huge challenge in mitigating the impact of climate change, and has even been attempting to desalinate seawater for agricultural use. Prolonged droughts are increasing soil degradation, with desertification threatening 80% of land while soil erosion affects nearly half. A rising population is leading to increased pressure on resources and the removal of natural vegetation as more land is converted to agriculture use.



## seed exchange is vital

In Morocco most farmers buy their seeds. Through initiatives that work in agro-ecology, permaculture, and organic farming, some traditional farmers produce their own seeds and exchange with others.

Morocco is highly dependent on imports, consuming three times the amount of imported cereal than the world average. However, current policies encourage farmers to produce cash crops for export rather than food for their own population. The government also leases land to foreign investors, such as the 700,000 hectares leased to an investment firm from Abu Dhabi. Investors can keep 100% of the produce and export it.

This shows the degree to which raising income is a priority over producing food for domestic consumption. But what are the long-term costs of such an approach? Will Morocco's vibrant and diverse local food economy be lost? There is already a loss of farmers, as people from rural areas migrate to cities for work. This shift to urbanisation now includes 50% of the population.



*A group of women talk about the characteristics of seeds*

## terre et humanisme

While Morocco's current borders and entity as a nation state were not recognized until 1956 (following independence from France), women there have played a significant role in its conception, which spans several centuries. From their roles of relaying oral traditions and stories, to forging the foundation of important institutions, to their involvement in resisting colonialism, and holding positions of power following the establishment of the Moroccan state, women continue play significant roles in Morocco. The association Terre et Humanisme Morocco launched a Seed Women project that works on the multiplication and conservation of local seeds.





**REPORT FROM**  
Boujemâa Gueghlan

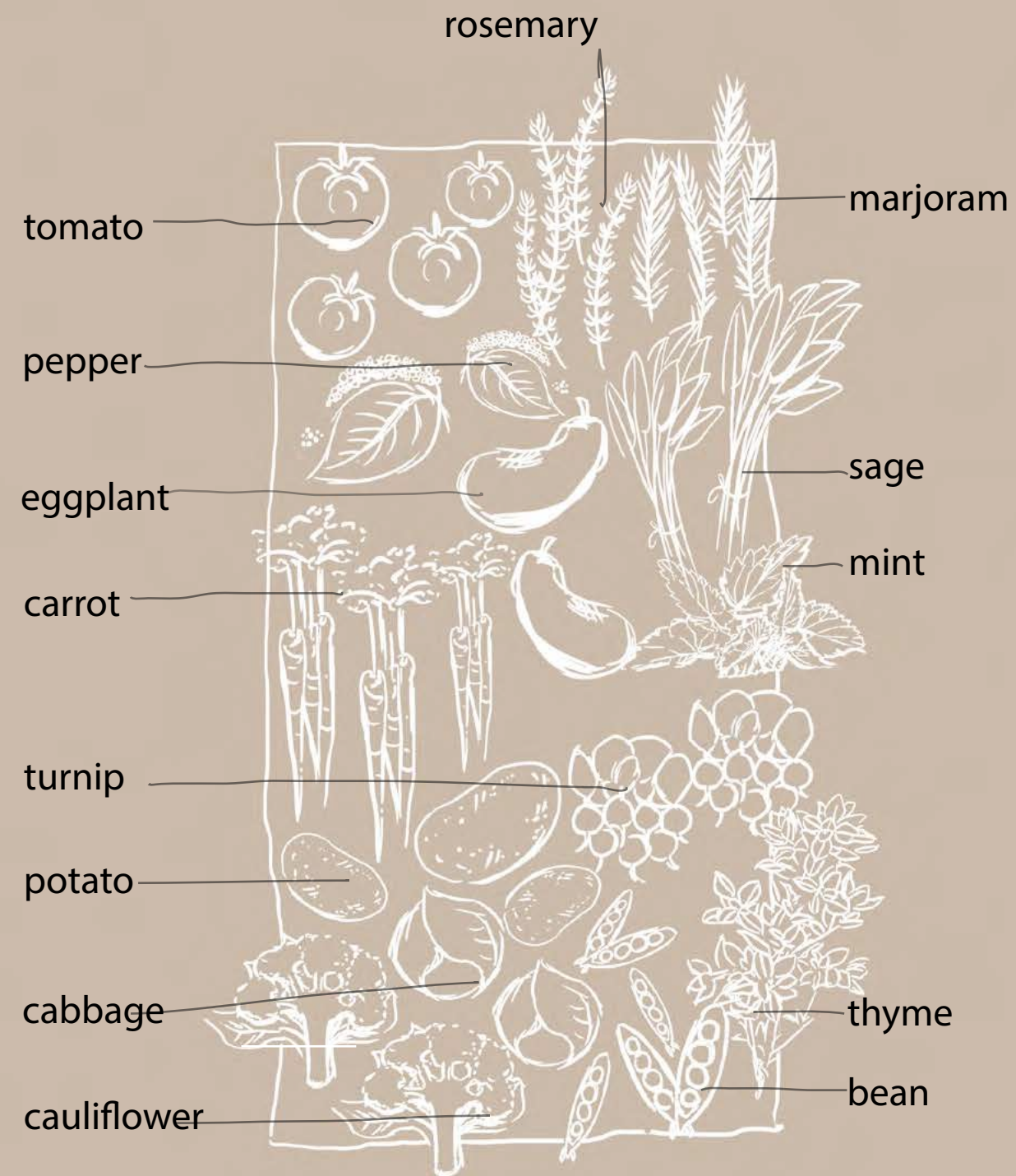
## about morocco's agriculture

The soil in Morocco – sometimes I want to cry when I see the situation of the soil that is subjected to strong human and climatic aggressions. The traditional techniques of plowing and soil conservation are disregarded, and the use of machines and tractors, monoculture, and the use of chemicals strongly contribute to soil degradation and erosion.

Sustainable fertilization is a current movement in Morocco. There are now several initiatives that encourage the techniques of agro-ecology and permaculture by creating community networks.

Morocco uses two main irrigation systems for agricultural production. Traditional irrigation is created by canals, flooding, or submersion. Modern irrigation uses drip tubing and sprinkling. A look at the Morocco Green Plan showcases a large budget of subsidized localized irrigation systems. With over half the active labor force working in farming, mixed farming is an important aspect of Moroccan agriculture, using livestock manure to build soil fertility.

*Gueghlan Boujemaa is the head of CIPA (Carrefour Initiatives and Agroecological Practices), a training and demonstration site in agroecological techniques in an arid area close to Marrakech. He organizes and facilitates Agroecology training series with several associations and NGOs in different regions of Morocco. Moreover, he keeps raising awareness about environmental education in schools and orphanages.*







## educational gardens

When we talk about school gardens we find schools with gardens that are more or less empty, because the budget of the school does not allow for development and maintenance of the garden. Other schools have classic gardens with trees, shrubs, lawns, flowers, roses.

The current trend is towards the development of educational gardens for production and learning as an extracurricular activity. These last types of gardens are generally managed by an environmental club within the school, which is constituted by students and supervised by teachers. In these gardens you typically have vegetables, fruit trees, aromatic and medicinal plants, aquatic plants, and honey plants.

The gardens which I have worked in followed the principles of agro-ecology as an approach to make gardens of experimentation in schools. One has to work with the vegetables of each season- especially tomato, pepper, eggplant, carrot, broccoli, turnip, radishes, cabbage, cauliflower, potato, beans, peas ... and aromatic plants such as rosemary, marjoram, sage, thyme, absinthe, mint. For fruit trees, there are olive and fig trees, pomegranates and quince.

Productivity is not a priority for the moment; what is interesting are mainly the workshops with the children and the introduction of these techniques within the schools.

### Moroccan chickpea soup

Heat the oil in a large saucepan, then fry the onion and celery gently for 10 minutes until softened, stirring frequently. Tip in the cumin and fry for another minute.

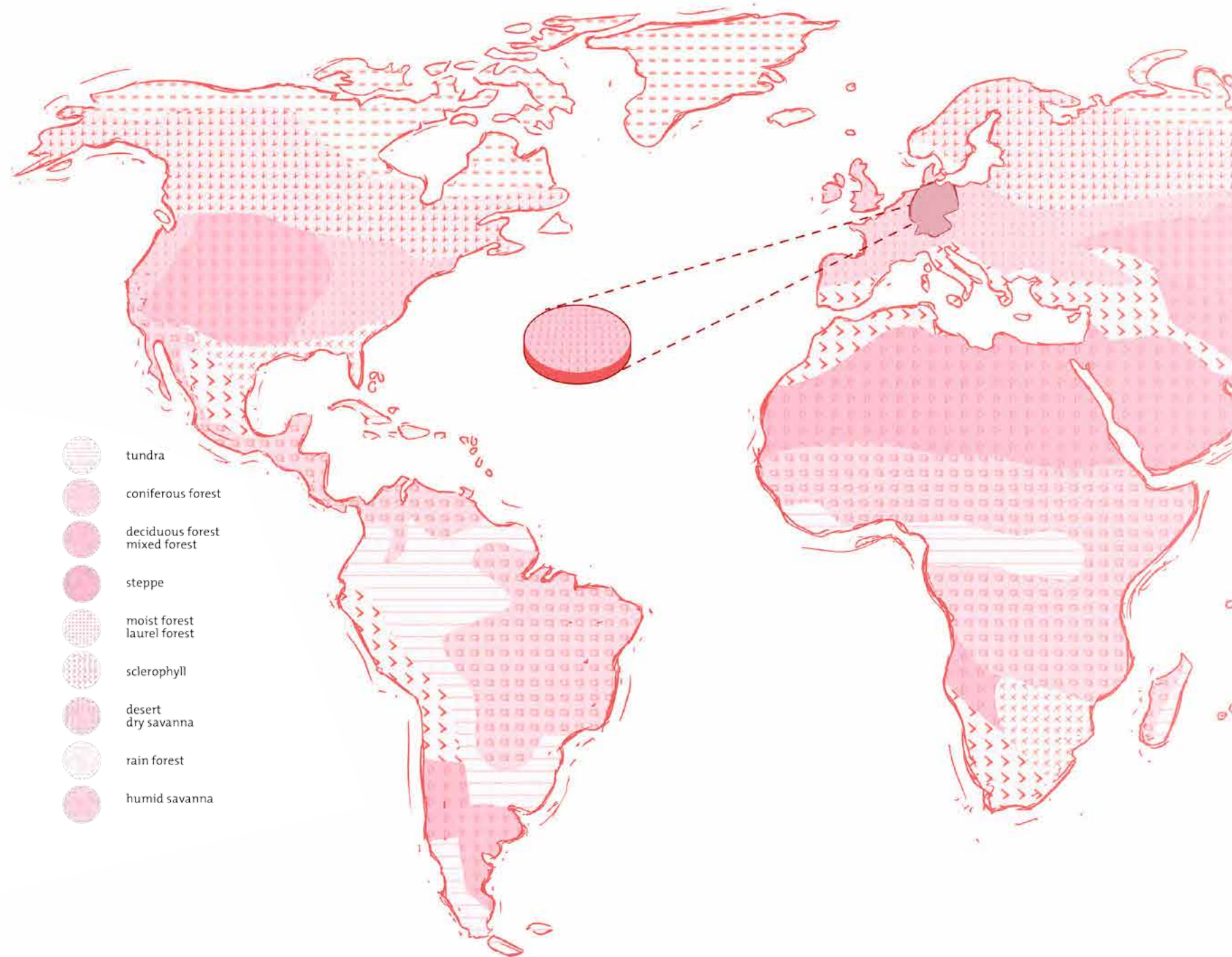
Turn up the heat, then add the stock, tomatoes and chickpeas, plus a good grind of black pepper. Simmer for 8 mins. Throw in broad and lemon juice, cook for a further 2 minutes.

Season to taste, then top with a sprinkling of lemon zest and chopped herbs. Serve with flatbread.

1 tablespoon olive oil, 1 medium onion (chopped), 2 celery sticks (chopped), 2 tablespoons ground cumin, 2.5 cups (600 ml) hot vegetable stock, 1 1/2 cup (400g) can chopped plum tomatoes with garlic, 1 1/2 cup (400g) can chickpeas, rinsed and drained, 1/2 cup (100g) frozen broad beans, zest and juice 1/2 lemon, large handful coriander or parsley and flatbread, to serve

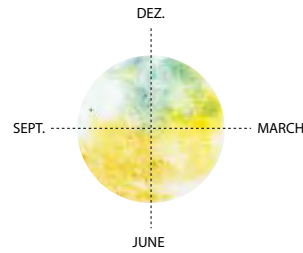


Agriculture is not a major sector<sup>27</sup> in the German economy since the industrialization took place in the 19th century, and growing food for one's own consumption is not a necessity. In fact, less than 0.01% of the population lives from subsistence farming. However, increasing interest in ecological and sustainable ways of living and eating pushes for alternatives to industrial monocrop food production, and towards a more social and local way of growing food. Within this movement the school garden also enjoys a revival – as an opportunity to teach kids that food is nothing you only get from the supermarket next door.



# GERMANY



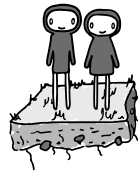


**MARCH – JUNE**  
Sowing season  
**JUNE – NOVEMBER**  
Harvest season

Mostly moderate climate with only short periods of very hot or cold weather.



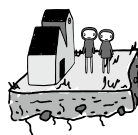
**POPULATION**  
81.8 million  
16% under 18



**LIFE EXPECTANCY**  
Women: 83 years  
Men: 78 years



**SUBSISTENCE FARMING**  
<0.1% of the population



**SCHOOL ATTENDANCE**  
100%

## vanishing farms

With the industrialization, less and less agriculture takes place in Germany. It went through a process of rationalization and many small landholders left their farms, and the remaining farms growing in size. Today, about 3% of the population still lives from agriculture, which amounts to about 300 000 farms. This number is continuously sinking. Most of these farms practice conventional agriculture, but the percentage of organic farms is slowly growing.

## who owns the land?

Land grabbing is getting a real issue that is especially problematic for the farmers in eastern areas of Germany. Large corporations buy farmland and lease it to the small farmers who don't have the finances to buy the land themselves.

Also, German investors are active worldwide in terms of grabbing farmable land - especially in Africa, where more than 70% of the German investments are made.

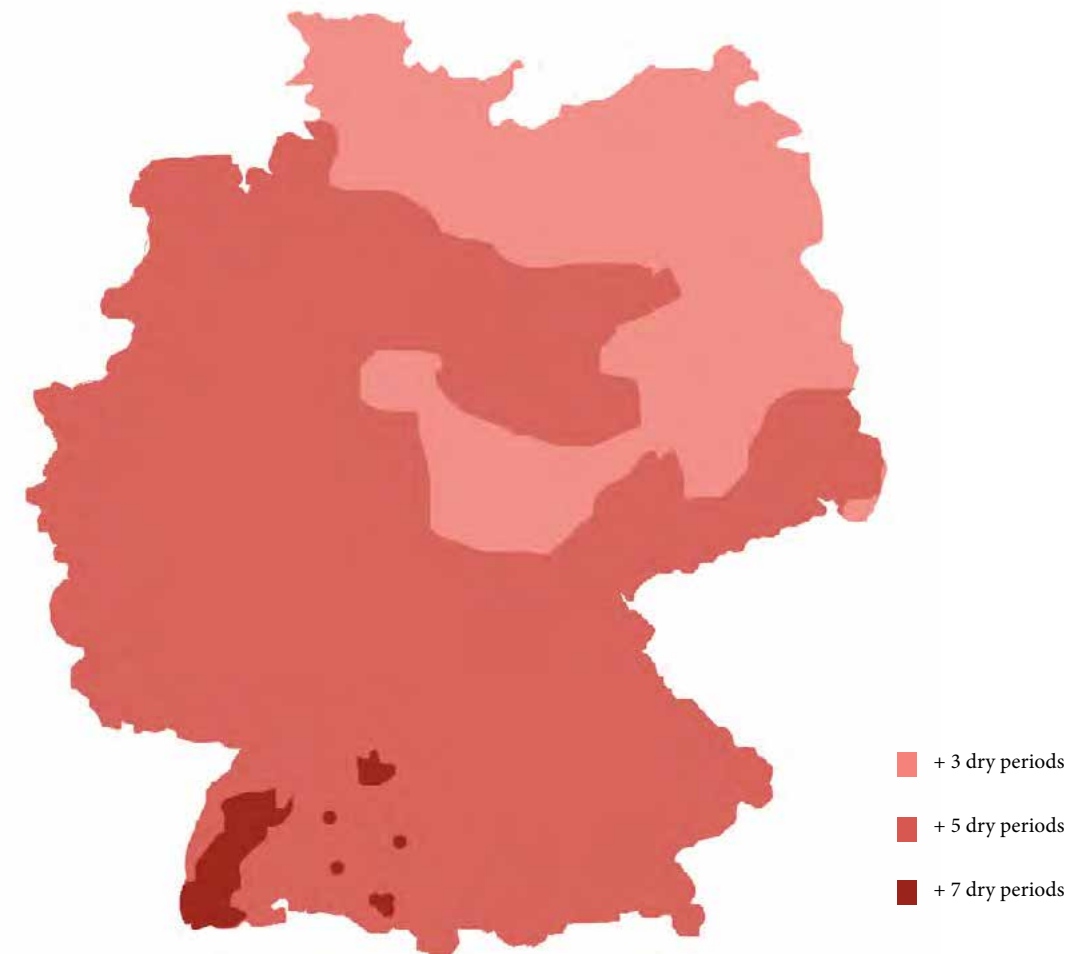
In fact, the German society needs about 20 million hectares of farmland, which is more than half of the country's size. To serve the dietary habits of the population, two thirds of the food are produced in foreign countries.

## germany loses its fertile soil

Every year 24 tons of fertile soils are lost in Germany due to the expansion of cities and streets, the use of pesticides and heavy agricultural machines compacting the ground.

Fertile soil is not only our basis for growing food; it is also a major carbon sink. That's why it is even more important to keep soils healthy and alive. Like many industrialized nations, Germany has a significant air pollution problem, emitting carbon and particles by vehicle exhaust, industries and coal-burning utilities. Decades of open-cast mining in East Germany has resulted in loss of top soil and significant water pollution in some rivers.

## future dry periods



*Increase of the number of dry periods (no rain for at least 10 days in a row) in Germany until 2100.  
Example: +3 dry periods means that there are at least 3 subsequent periods of 10 days or more without rain.*

## what happens in a changing climate?

Climate change will also have a significant influence on the foliage and mixed forest. The vegetation zone will shift towards the north, as it becomes too hot for a dense forest in the south, while the northern regions will assume a moderate climate and allow the growth of deciduous forests.

Further problems are the increasing pest infestation - also by invasive species - as well as the increased danger of forest fires.



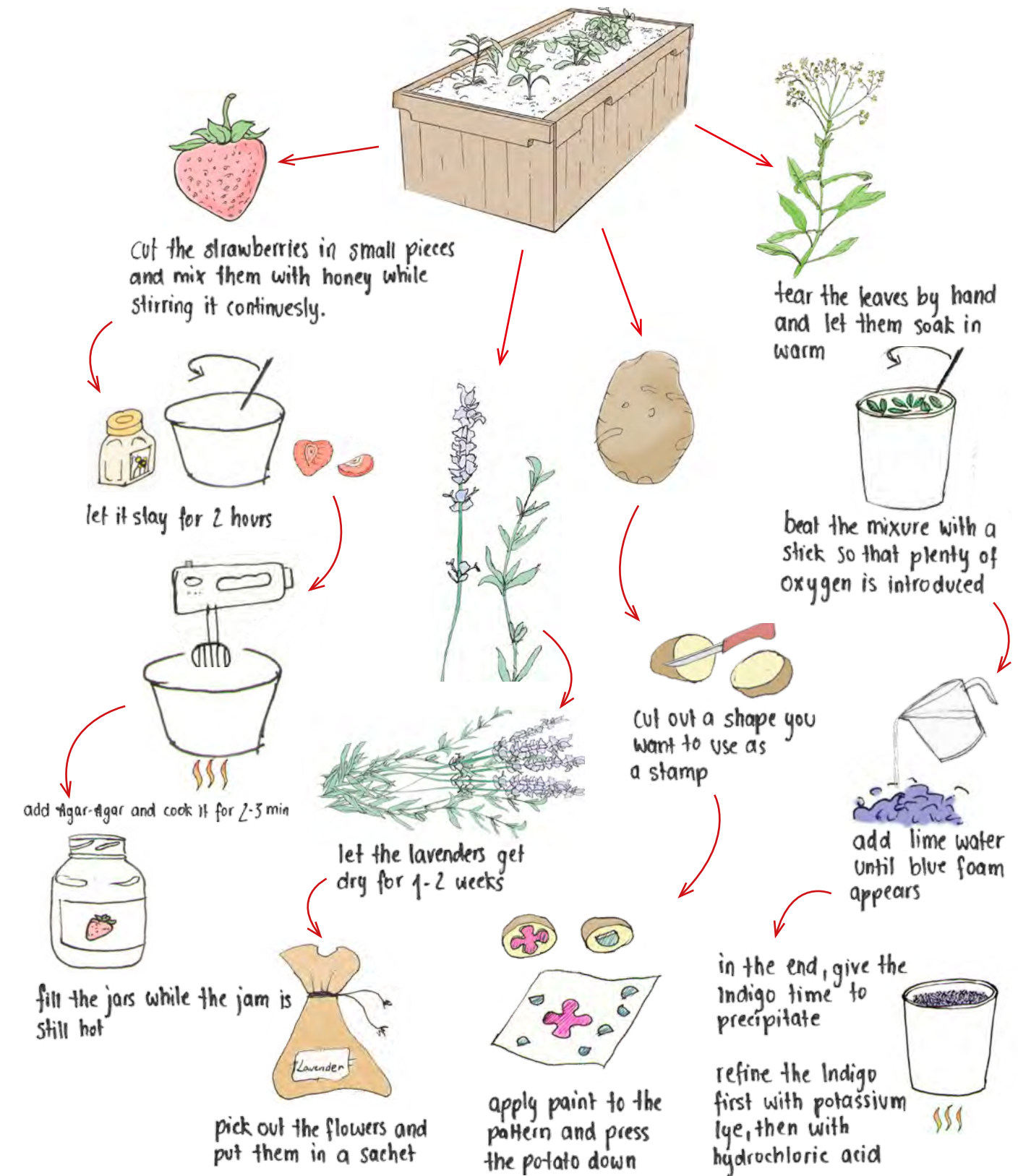
## creating things from harvest

School gardens in Germany are primarily used for educational reasons. The harvest is not urgently needed for the meals, but some schools have the possibility to make food together with the students, so that they get to know new recipes and learn how to cook.

Beside cooking, they also use their harvest for creative activities and make prints out of potatoes, lavender sachets, strawberry jam and produce blue dyes out of woad (isatis tinctoria).



Kids working in the school garden of Casper-David-Friedrich Oberschule



What can you make out of school garden plants?



**WHEN PLANTING A SMALL PATCH, THERE ARE SEVERAL THINGS YOU HAVE TO KEEP IN MIND TO REALISE A GOOD PLOT LAYOUT.**

**HERE ARE SOME TIPS FROM OUR EXPERT**

Eva Huttner

## companion planting

One of the advantages of companion planting is the prevention of soil exhaustion. Also, water loss through evaporation is reduced, weeds are almost completely kept in check, and diseases and pests have less chance of spreading. It is very well suited for small gardens. Also, a combination of light, medium and heavy feeders as well as deep rooted vegetables, and vegetables with a fibrous root system, ensures a balanced nutrient collection from the soil. Fast-growing plants such as radish, lettuce or cress work well with slow-growing plants such as tomatoes or cucumbers.

## different methods

In agriculture and gardening it is differentiated between pre-crop, main crop and catch crop. The main crop stays the longest on the patch, whereas the pre-crop, for example radish or spinach, is often planted in the beginning of spring and their seedlings are raised in glasshouses before being planted. The main crop – vegetables like carrots, cucumbers or tomatoes – follows in early summer. The catch crop, such as salad and Brussels sprout, follows just before the main culture is harvested. It's very helpful to know the plant family, because vegetables from the same family should not be planted right next to each other without paying attention to an adequate distance.

**carrot** .....  
*was first cultivated  
as medicine - not  
as food*

**radish** .....  
*grows very rapidly*

**lemon balm** .....  
*helps against  
tension headache*

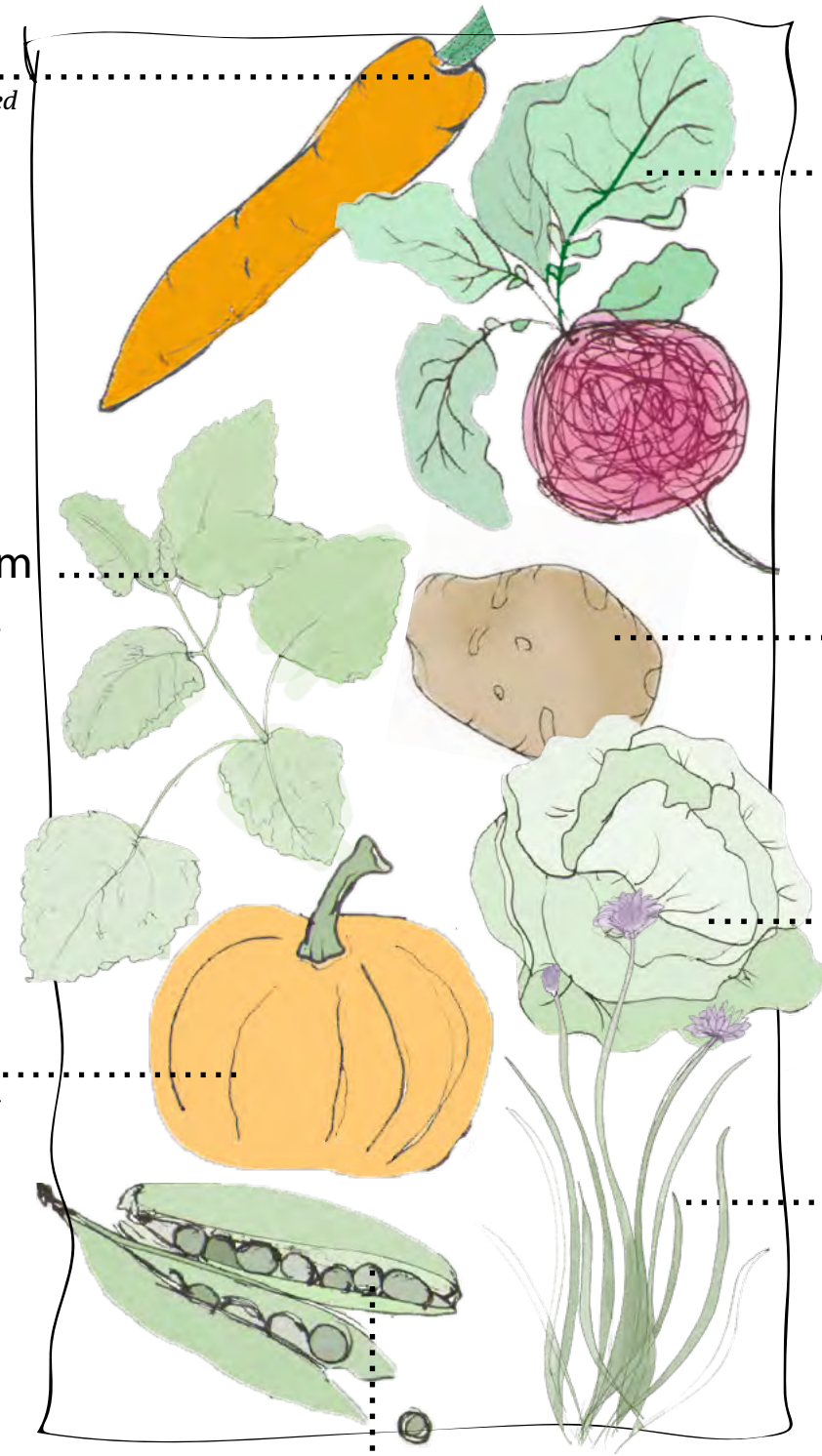
**potato** .....  
*has more  
vitamine C than  
an orange*

**pumpkin** .....  
*part of the gourd-  
family - same as  
the watermelon*

**lettuce** .....  
*is a member of the  
sunflower-family*

**pea** .....  
*pea starch can be used  
to make bioplastics*

**chive** .....  
*can be used  
instead of  
conventional  
insecticides*





**AN INTERVIEW WITH**  
Eva Huttner

Eva Huttner is a project co-ordinator at NAHhaft in the field of education. She is coordinating the educational project „Essbare Schule“ for NAHhaft at the Casper-David-Friedrichschule in Marzahn-Hellersdorf district of Berlin.

**You are teaching gardening courses at the Caspar-David-Friedrich Oberschule in Berlin. Tell me about your school gardening concept and what you are doing there at the moment.**

The school garden is still under construction and so far we have organized some days of action with different school classes. Two or three days per week, students cook in groups under the guidance of teachers. The goal is, however, to sell the homegrown food during the school break. Therefore, we still have to extend the school kitchen. In about two years, the harvest and fresh organic food from the region will be prepared in this school kitchen for the whole school.

**How is the gardening lesson integrated in the daily routine at the school?**

School gardens are included in the curriculum. The aim of our project, which is called “Essbare Schule” (Edible School), is to create practical learning modules, which are integrated into a usual school day.

**And how many hours do pupils spend in the school garden?**

It depends on the season. At it's peak, from May to September maybe 8 hours a week. But that is really hard to say, because there are many different groups who work differently.

# Pumpkin Soup

Halve the pumpkin and scoop out the seeds, then slice it in small pieces. Brush 1 tablespoon olive oil over the flesh of the pumpkin and roast it in the oven for at least 35 minutes and peel the pumpkin.

Braise the onions and garlic in a pot and add the pumpkin flesh, cinnamon, nutmeg, cloves, cayenne pepper and a few twists of black pepper.

Simmer for about 15 minutes.

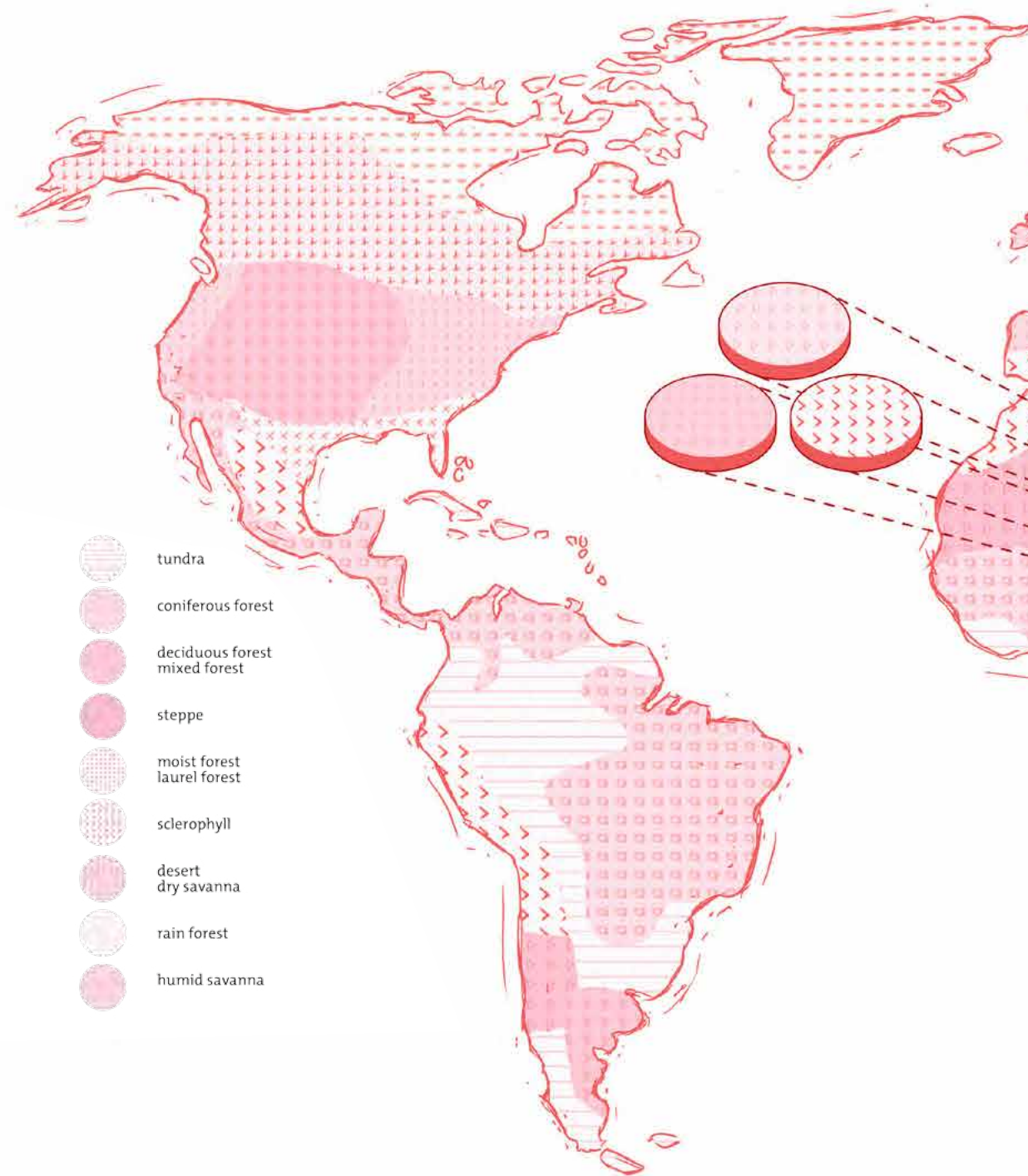
Afterwards stir in the coconut milk and maple syrup in the pumpkin.

Toast the pepitas.

In the end blend the pumpkin mixture and add spices to taste, if necessary.

4 tablespoons olive oil, 1 4-pound sugar pie pumpkin, 1 large yellow onion, 6 medium garlic cloves, 1/2 tablespoon sea salt, 1/2 tablespoon ground cinnamon, 1/2 tablespoon cloves, cayenne pepper (optional), black pepper, 4 cups (900 ml) vegetable broth, 1/2 cup (100 ml) full fat coconut milk or heavy cream, 2 tablespoons maple syrup or honey, some pepitas (green pumpkin seeds)

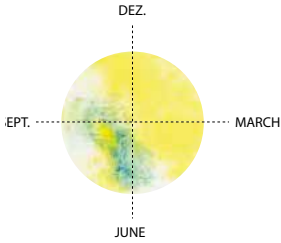




Ethiopia is not only considered a cradle of humankind, but also the origin of coffee, various kinds of grain, and 20 other plant species we cultivate today. With its diverse landscapes and climate conditions, Ethiopia is home to 7,000 plant species. While Ethiopia has a rich flora and an ancient history of cultivation, a large amount of the population still works as small-scale subsistence farmers. The country is one of the poorest in the world with about half the population suffering from malnutrition. School gardens in Ethiopia are very popular; however they do not serve as a direct source for school meals, but instead as an environment for teaching science classes.

# ETHIOPIA





**SEPTEMBER – FEBRUARY**  
Dry season  
**MARCH – APRIL**  
Short rainy season  
**MAY**  
Hot and dry  
**JUNE – AUGUST**  
Long rainy season



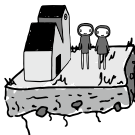
**POPULATION**  
103 million  
46.3% under 15



**LIFE EXPECTANCY**  
Women: 65 years  
Men: 61 years



**SUBSISTENCE FARMING**  
80-85% of the population



**SCHOOL ATTENDANCE**  
f/m per 100  
Primary: 96/104  
Secondary: 35/38

# geography and climate

Due to the big differences in altitude, the climate in Ethiopia varies a lot. The vegetation zones range from mountains to deserts and tropical forests. For example, the climate in the Ethiopian Highlands is generally cooler compared to other countries as close to the equator. From October to February the climate is very dry; from March to May there is light rain, while the heavy rainy season lasts from June to September.

# climate change

While Ethiopia contributes less than 0.3% to global emissions (World Resources Institute), it is directly affected by an increase of about 0.2° C every decade, and even an increase of minimum temperatures with 0.4°C per decade.

Those changes will presumably encourage the occurrence of droughts, but could also contribute to heavy rains and floods. The effects of these impacts will be a lowered agricultural production, endangering food security, decreasing availability of clean drinking water, and catalytically contributing to heightened health issues. Due to changing climate conditions, a variety of animals and plants, unable to adapt these quick environmental changes, are now threatened by extinction.

# environmental degradation

Dropping from 35% from the early 20th century to a current low of 11.9%, the forest cover of Ethiopia continues to disappear. This is a major problem because loss of forest causes soil erosion, loss of nutrients in the soil, loss of animal habitats, and reduces the biodiversity. Deforestation is lead by the Ethiopian populace because of the need for fuel and land for agriculture. In 2016, Ethiopia suffered a devastating drought, primarily due to the severe amount of land degradation. It is estimated that currently over one-quarter of the country suffers from degraded land, affecting about 20 million people. Official programs have started restoring one million hectares of land by reforestation and better irrigation systems, as well as through measures to reduce grazing and the harvesting of fire wood.

# seed sovereignty

Ethiopia’s national seed bank was founded in 1976, and is the oldest and largest of its kind in sub-Saharan Africa. Unlike other seed banks where crops are stored and often lost over time, at this bank, small-scale farmers and scientists work together to save old varieties and keep them alive. In an interview with the African Biodiversity Network, ecological campaigner Million Belay spoke about how rituals, sacred areas, language, and a rich variety of plant species are interwoven. If the cultural life is lost, then biodiversity will be forgotten as well. The younger generation will become disconnected from this culture by western education and not prioritizing time spent in nature. In the school gardens, most seeds are brought from home by students or bought from the local market. But in the main agriculture economy, the government promotes imported seeds, chemical pesticides, and fertilizers, which endanger the biodiversity and food sovereignty.

Belay also argues that increasing production leads to a destruction of ecosystems and communities becoming economically dependent:  
*Any scientist will tell you that small-scale agriculture produces more in total than a monoculture because it produces small but many varieties of crops and a system that doesn’t use the chemical fertilizers. We have tried this alternative approach in communities in northern Ethiopia. Increasing compost production, a natural fertilizer, and working on soil conservation so the soil won’t be washed away and also increasing the biomass of the area by planting more things. This way you heal the ecosystem. Production has doubled. Farmers can plant what they want, the soil is healthy and they are getting money back for their produce.*

From: [africanbiodiversity.org/ethiopia-doesnt-need-or-want-bill-gates](http://africanbiodiversity.org/ethiopia-doesnt-need-or-want-bill-gates)

# forced displacement

Ethiopia is widely targeted by the bad effects of land grabbing. To expand its agriculture, the government started to sell millions of hectares of land to foreign investors. In order to free up land, a ‚villagisation’ program was developed, which forces 1.5 million rural families to move from their home to new ‚model’ villages in other parts of the country. The human cost of it is nevertheless high and has caused human rights activists to accuse the government of political coercion, intimidations and violent evictions. People were allegedly forced to move by using gunshots. Furthermore, Ethiopians are no longer able to farm or obtain education and basic care services anymore, as the money the government gets from donors is not transferred. They have to give up the country’s most fertile land with access to water in favor of investments, and are consequently left with little options and bad living conditions. Meanwhile forests are destroyed and all food production is exported. Additionally, communities have also reported about minerals and gold being mined and exported without gaining any advantages from it. And it doesn’t stop - the government wants to resettle 200,000 people in the region over the next three years. Opposition is not tolerated and the populace does not have enough power to stand up on their own and resist, but needs support from outside.





Students of Gidole Full Primary School clearing weed from vegetable nursery

## living from agriculture

Due to drought, soil degradation, depletion and poor infrastructure, agriculture in Ethiopia is very difficult. Yet 80-85 % of the Ethiopian population is engaged in agricultural labor, while about 35% of the population is lacking enough nutritious food. Many other economic activities depend on agriculture as well, as for example the marketing, processing and export of the agricultural products. Ethiopian exports are almost entirely agricultural goods.

## cuisine

A typical Ethiopian dish is Wat, a thick meat stew. Traditionally it is served together with vegetable side dishes on top of a large sourdough flatbread called Injera. The Injera is used instead of utensils to pick up the meat and vegetables.

There is a custom called Gursha in which you feed other people of your family or friends.



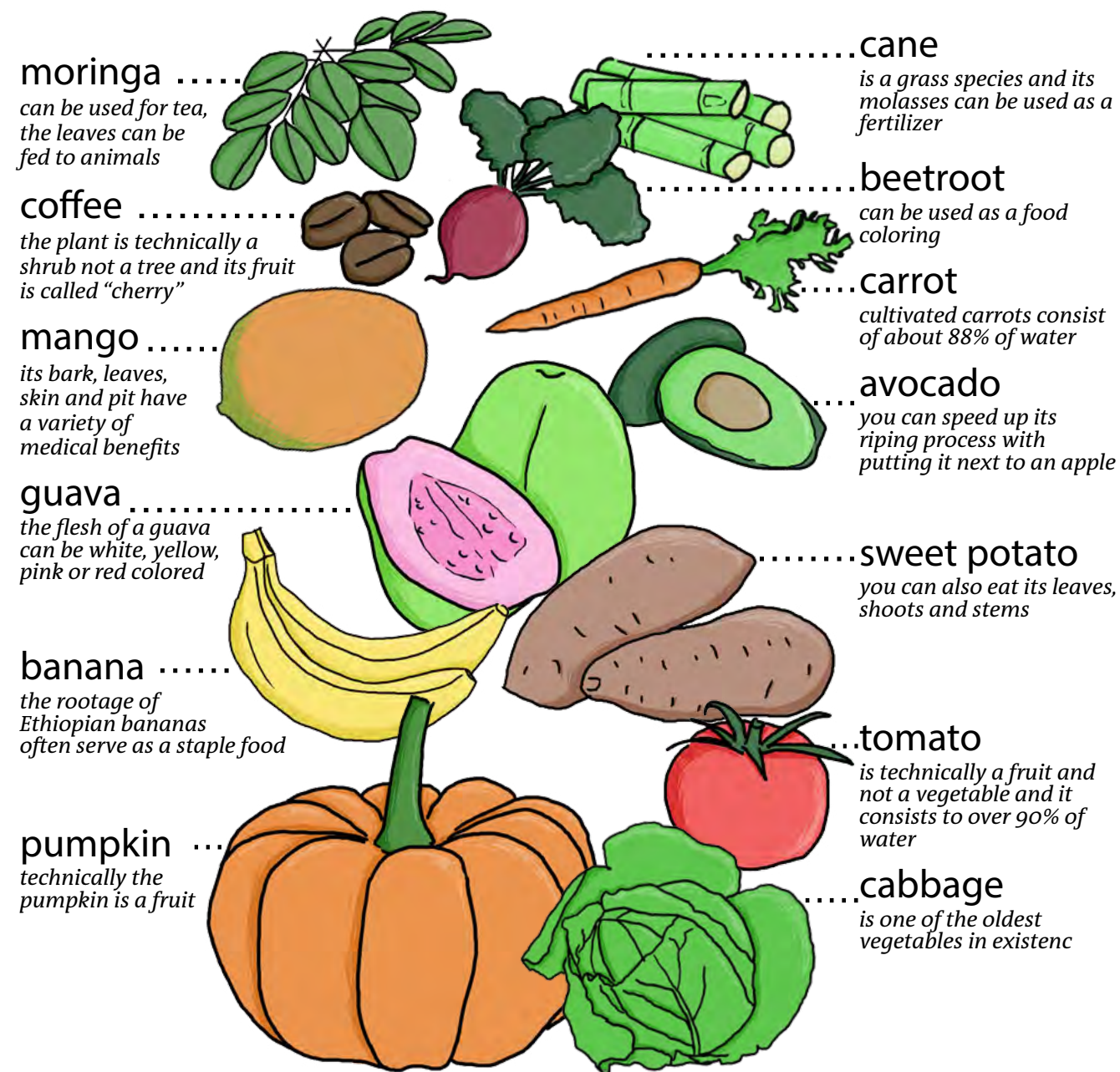


## farming as extracurricular activity

School gardening in Ethiopia is very popular. They are primarily used for for teaching science classes, and less for providing food in school. In the past however, farming and working in the garden was part of the curriculum.



Students planting flowers under a banana tree at Walesa Primary School



### USE OF THE PRODUCE

The plants are primarily used for teaching and are not needed for feeding the students. Students can take harvested fruits and vegetables at home. Only sometimes the produce is used for meals on special events in school.





**AN INTERVIEW WITH**  
Asmelash Dagne

Asmelash Dagne is an Ethiopian school teacher and a part of the Slow Food International movement. He is actively involved in school gardens due to the 10,000 Gardens in Africa project.

***Around how many school gardens exist in Ethiopia?***

There are already 97 school gardens on the website of the project *10,000 Gardens in Africa* and more are joining every year.

***Is it popular for Ethiopian schools to have a school garden? When are students introduced to gardening?***

Yes, it is popular for schools to have gardens. I would say since the beginning of school. Even when I was in first grade, there was a subject in the curriculum called *Farming* which is linked with lessons in the garden.

***Why do these gardens exist?***

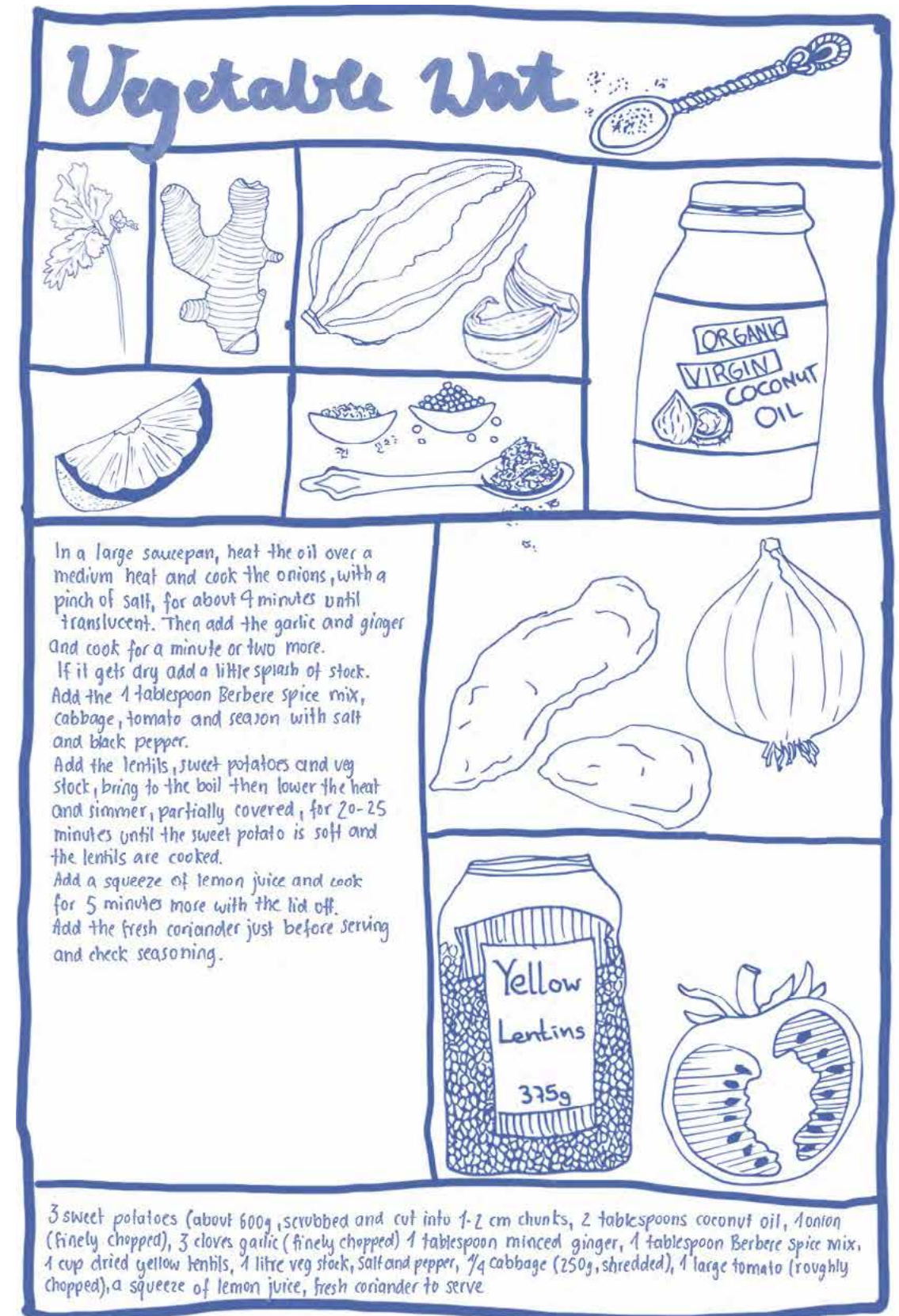
These days gardening is not involved in the curriculum, but is an extracurricular activity. Gardens also serve as a teaching aid for science teachers.

***Are the gardens providing food for meals?***

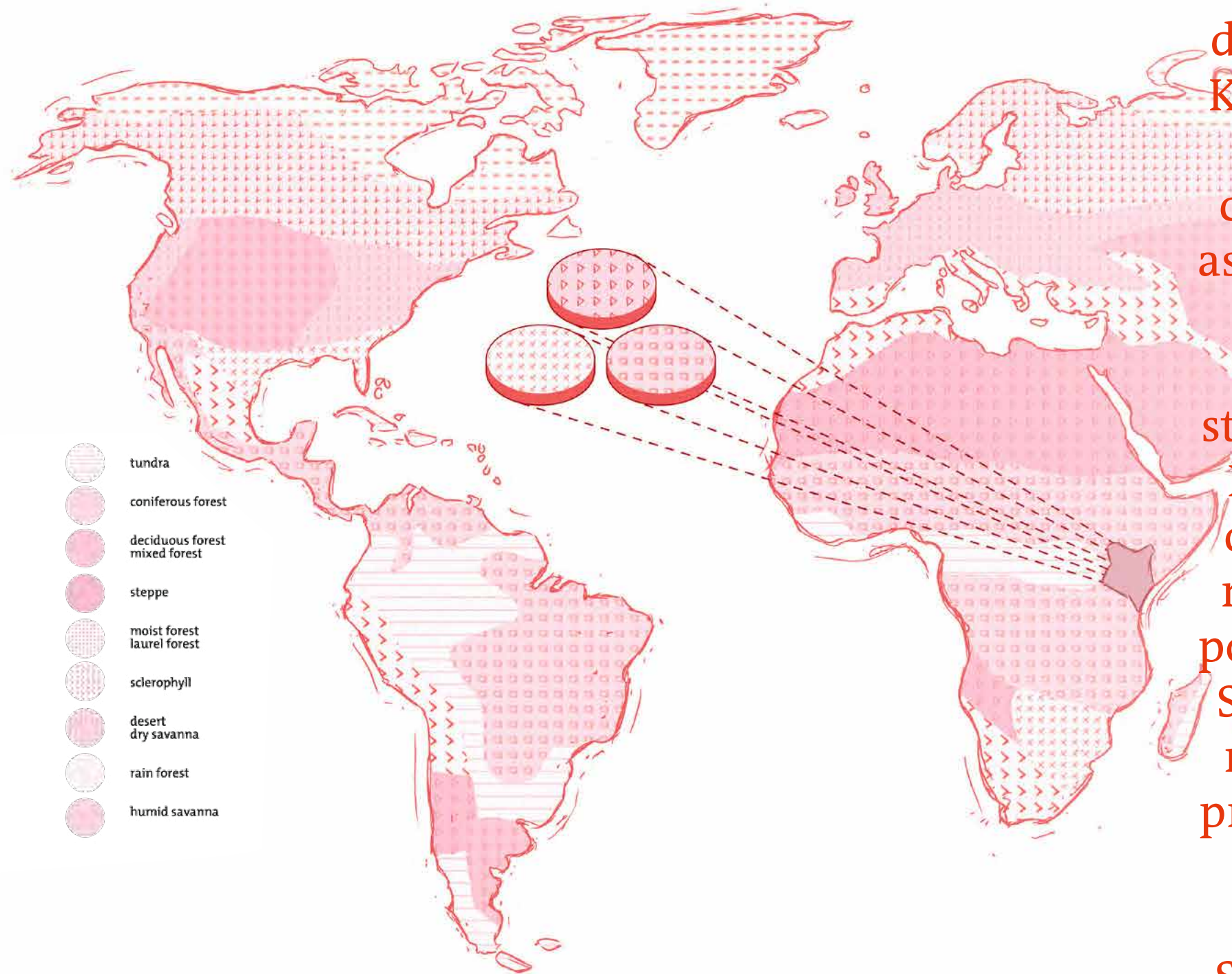
No, they sell the products to the school community (teachers, students and family). The income goes into sustaining the garden and supports the learning activities financially. If there are special events in the school like meetings, they prepare local food from the products of the garden and eat together.

***Does climate change affect Ethiopia in noticeable ways?***

Yes, last year the rain was very late (early April) and was heavy and destroyed much life and property.



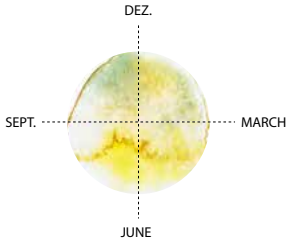




# KENYA

Due to little rainfall, most of Kenya's soil is very dry and makes farming difficult. Despite this, more than 50% of Kenyans make a living from agriculture. The country's main export goods are coffee and tea, but Kenya is also known as the third largest flower provider. Over 50% of the population is well below the poverty line. Many Kenyans die of starvation or are dependent on food aid. Kenya has a significantly large number of children per capita, with the average mother having 4-9 children; 42% of the population is younger than 15 years old. Since 2003, the amount of students has risen drastically due to the omission of primary school fees. Many teachers have over a hundred students, potentially lessening the quality of the schooling. School gardens are therefore even more important; they will not only feed the students but serve as a learning base for students studying agriculture.





**JANUARY AND FEBRUARY**  
Hot and sunny  
**MARCH – MAY**  
Rainy season  
**OCTOBER – DECEMBER**  
Rainy season



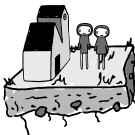
**POPULATION**  
46 million  
42,2% under 15



**LIFE EXPECTANCY**  
Women: 59 years  
Men: 60 years



**SUBSISTENCE FARMING**  
ca. 90% of the population



**SCHOOL ATTENDANCE**  
f/m per 100  
Primary: 84/87  
Secondary: 61/57

# geography and climate

Kenya is a country without seasons. The sun shines all year round. The warmest months are February and March, with maximum temperatures of 32°C. At night it gets comparatively cool, with a temperature of up to 10°C. Along the coast, Kenya has a tropical climate, while the northern and northeastern parts of the country are arid. It rains mostly in the afternoon or at night. The humidity lies between 65-75%. The rainy seasons are from March/April until May/June.

# farming

Only about 20% of the Kenya's agricultural area is farmable, yet most of the population lives on agricultural production. Mainly coffee, tea, seal, and pyrethrum are cultivated. However, 53% of Kenyans are still suffering from hunger and malnutrition. Often farmers have to leave their harvests in the fields due to the lack of maneuverable roads or waterways to bring their produce to market.



Lake Turkana

# water resources

Kenya's water resources are contaminated with agricultural chemicals as well as urban and industrial waste. There is a high risk that hydroelectric power plants and planned sugar plantations will significantly reduce the water level of the world's largest desert lake, Lake Turkana. The loss of water would not only abolish the livelihood of 300,000 inhabitants in the Turkana region, but would also have a devastating effect on Kenya's fish production.





## rights of women

More than 80% of Kenyan women work on small farms. Only 1% of them have the right to ownership of a farm. Since many women have no education, they have few other job opportunities. In Kenya there are still frequent violations of women's rights. Many girls are traditionally circumcised. However, the government is planning on stopping this by the year of 2019. Above that, a woman can be inherited. When the husband of a woman dies, she often is passed on to the man's male relatives.

## gardening to make a living

In Kenya, school gardening is nothing extraordinary. The main purpose is to feed pupils and teachers. Since the schools often teach many children, the gardens can be pretty large. When a garden is created, little attention is paid to esthetic aspects; the main focus is the nutritional aspect. Many school children work in the garden as a basis for livelihood, since many will make a living from agriculture in the future.



*A garden at a primary school*





Ugali is a typical Kenyan dish that people eat with their hands



“Sukuma wiki” means “to push the week”

spinach  
(spinacia oleracea)

maize  
(zea mays)

peanut  
(arachis hypogaea)

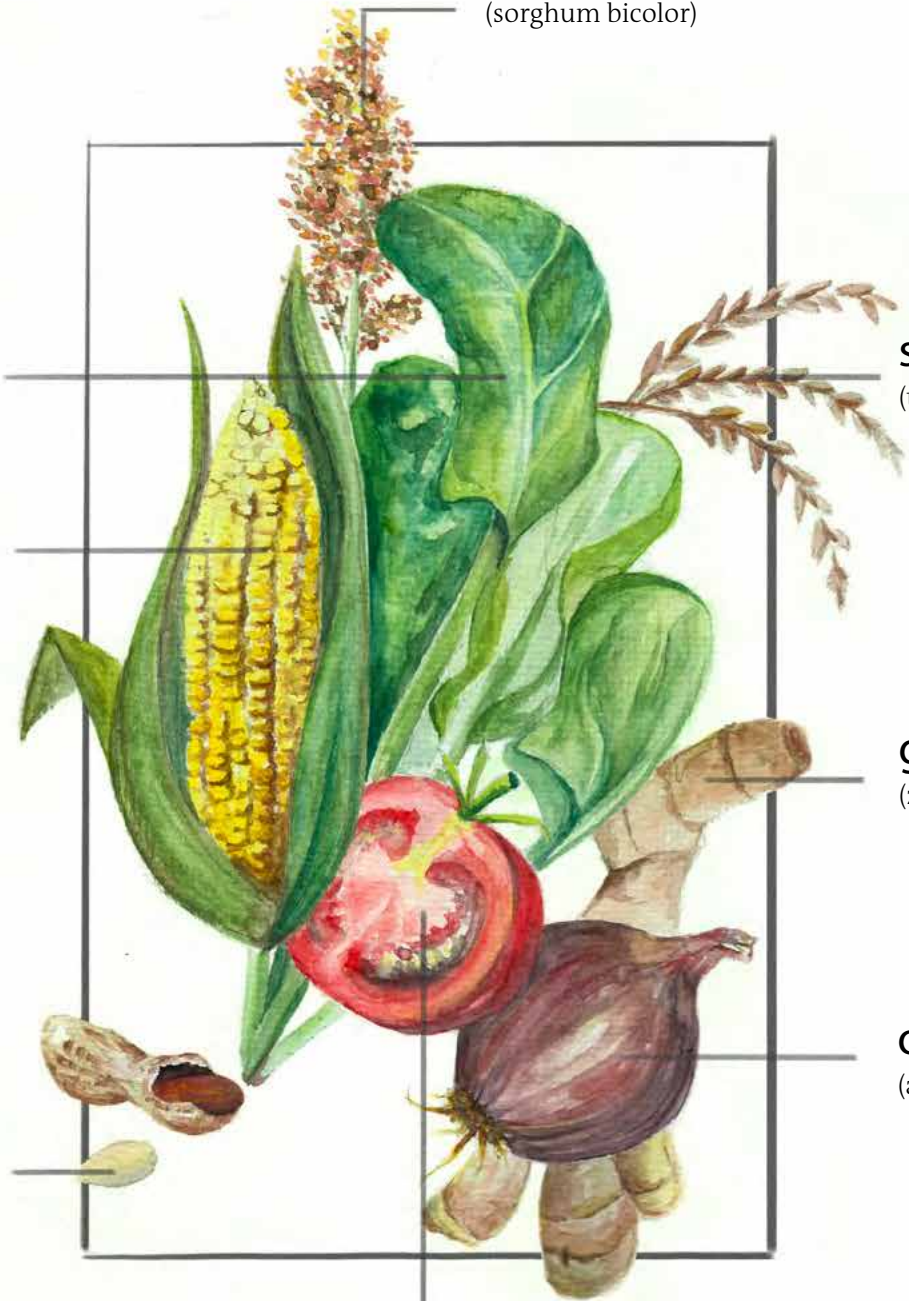
millet  
(sorghum bicolor)

spelt wheat  
(triticum aestivum)

ginger  
(zingiber officinale)

onion  
(allium cepa)

tomato  
(solanum lycopersicum)







### AN INTERVIEW WITH Ulrike Pop

#### How would you describe a Kenyan school garden?

Most of Kenyan school gardens are quite huge. For me as a German the gardens first seemed very unfamiliar, because in Germany school gardens are not as popular. But here in Kenya the school gardens are necessary for providing food for students and teachers. Therefore the fields are not planted in an organized concept to look beautiful, but mostly to produce food most efficiently.

#### Who is caring for the gardens?

Labor force in Kenya is not expensive, therefore the school can employ workers only for the fieldwork and harvesting the crops. Additionally the students tend the garden as a curricular activity. Sometimes the work in the garden also is used as a sort of punishment. Because many Kenyan live on agriculture and the produce of their own fields, the farming work in school prepares them for their future work.

#### You said that the garden mainly provides food for feeding the students and teachers. What meals can be prepared of the produce?

Normally there is no breakfast in Kenya, so they eat lunch all together in school. Here the focus also lies on efficiency instead of culinary diversity. Almost everyday the meal consists of Ugali, Sukuma Wiki, rice and potatoes. Ugali is a very heavy mush produced of maize. Because of the huge amount of Ugali that is needed for feeding all the people, the cook has to be very strong to stir the mush in a large kettle above a fire. The Ugali has to be cooked for a long time and finally is pressed into a loaf which can be cut into slices. For me, the food was very unusual because it mainly consisted out of carbs.

Ulrike Pop is a teacher from Brandenburg in Germany. For one year she supported a kindergarten project in Kenya which has now become a school project.

## Ugali with sukumawiki

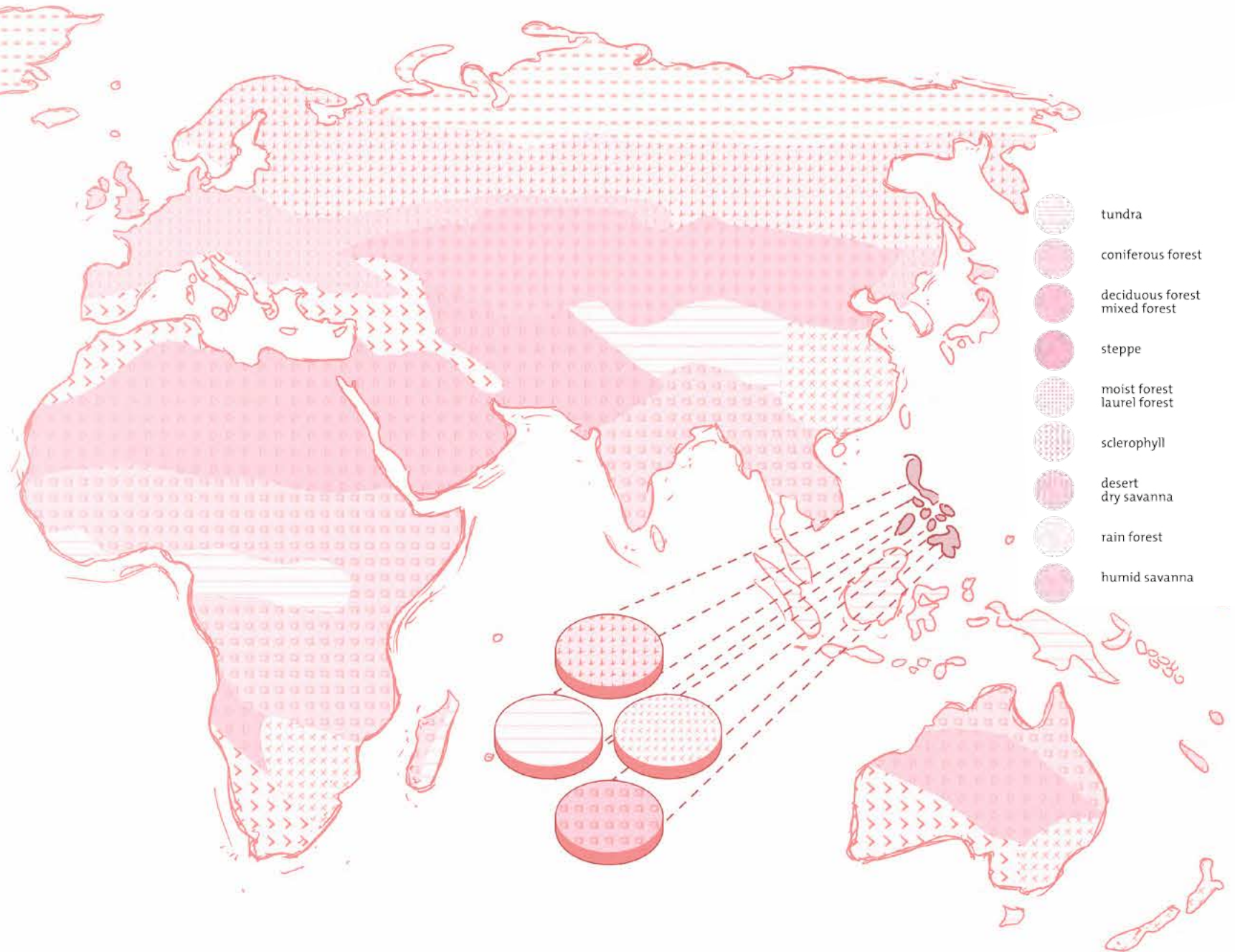
Put cold water in a medium-size saucepan, add cornmeal and salt, mixing continually. Bring to a boil over high heat, gradually stirring and slowly add 3 cups of boiling water to prevent lumps. Reduce to simmer, cover and cook for about 8 minutes, mixing frequently to prevent sticking. The ugali will be done when it pulls from the sides of the pan easily and does not stick. It should look like stiff grits.

You can serve ugali with everything from meat stew to sugar and cream, your choice!

1 cup cold water, 1 cup yellow cornmeal, 1 tablespoon salt (optional), 3 cups boiling water, 500g sukumawiki

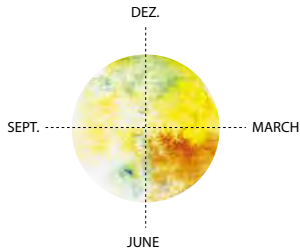


With more than 7,000 islands, the Philippines is home to some of the world's greatest biodiversity. However, rapid population growth and the associated pressure of rising housing and food needs is leading to the exploitation of natural resources. Multi-national companies have introduced genetically modified crops, reducing the traditional varieties of rice and other staple food crops, leading to severe environmental damage. Due to climate change, the Philippines is highly prone to natural disasters like typhoons and landslides. School gardens have a long tradition in the Philippines.



# PHILIPPINES





**DECEMBER – FEBRUARY**  
Cool and dry  
**MARCH – MAY**  
Hot and dry  
**JUNE – NOVEMBER**  
Hot and rainy



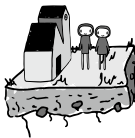
**POPULATION**  
102 million  
37% under 18



**LIFE EXPECTANCY**  
Women: 72 years  
Men: 65 years



**SUBSISTENCE FARMING**  
ca. 33% of the country's labour force



**SCHOOL ATTENDANCE**  
f/m per 100  
Primary: 89/88  
Secondary: 70/55

## climate change

While the Philippines contributes less than 1% of the global greenhouse gas emissions, it is listed by the Global Climate Risk Index 2015 as the most affected country by climate change. With its geographical location in the western Pacific Ocean, where surface water is becoming warmer and rising at about twice the global average, the Philippines is exposed to increasingly extreme weather, leaving the islands nearly unprotected from heavy typhoons. The coral reefs and mangrove forests that help lessen the impact of storms are continuously declining. Since 1918, almost half of the mangroves have been deforested.

## feudalism

A system that was part of medieval European history, still exists in some Philippine islands. According to the Food and Agriculture Organization of the UN (FAO), there are currently 11.2 million people in the agriculture labor force, while 8.5 million have no ownership of land. Millions of tenants, both male and female, work under extreme and inhumane conditions while only male workers are paid. The NGO Kaugmaon reports that this system is kept in place by the modern Philippine state and legal forces, as well as local politicians. For example, according to this report, the Vice-Mayor of Guihulngan uses his status as the largest landowner, to leverage political power with police and government officials for his own gain. Often this means displacing peasant families to create plantation farming and other for-profit developments.

## agriculture

32% of the country's total land area is cultivated with four primary crops: coconut, rice, corn and sugarcane. There are about 4.8 million crop farmers and/or other commodity farmers and 1.6 million fishermen, mostly 90% of whom are small producers.

## seed sovereignty

Rice has been the staple food in the Philippines, similar to most Asian countries. A previously rich number of heirloom varieties indigenous only to the Philippines was dramatically reduced with the policy of imposing only a small selection of mono-crops. With the introduction of genetically-modified corn in 2002, farmers now face severe penalties if they use their own non-GMO corn. In recent years, an initiative was founded by farmers (MASIPAG) , scientists and NGOs to establish a network of local rice breeders. With the massive imports of rice and the shift toward high-value crops, traditional farming practices that used to support a self-sustaining life of indigenous peoples have become marginalised. Water that used to irrigate rice fields is now directed to the newly-prioritized cash crops such as carrots, asparagus, broccoli, green onions, garden peas, lettuce, radish, and cauliflower. Female farmers who have been growing and breeding rice as well as other traditional crops, now unable to compete with the commercial market, are especially threatened in their livelihoods.





## a long tradition

School gardens are not new to the Philippines. The first ones were planted before World War II to support the feeding of school children. Today, they not only serve for food supply, but also for learning life skills, farming culture, and nutrition.

Besides growing food, schools also produce their own seeds and are encouraged to grow in particular indigenous vegetables, as they are more tolerant to pest and drought.

There are many programs and initiatives that not only support gardening at schools, but also research the effects of school garden programs. For instance, from 2012 to 2015, a research project funded by the International Development Research Centre (IDRC) showed that, in the Cavite province of the Philippines, feeding malnourished students using native produce and iron-fortified local rice, greatly increased their overall-nutrition. The report also connected increased cognitive responses and learning potential among those students who increased their nutritious diet.





Pupils at Maura Elementary School visiting their purple sweet potatoes in the school garden

### winged bean

is called "sigarilyas" in Filipino and tastes similar to asparagus

### finger chili

### round egg-plant

### bitter gourd moringa

### okra

also known as "lady's fingers"

### turnip

the root as well as the greens of a turnip are edible

### string beans

is called "sitaw" in Filipino

### lima bean

some varieties feature colors such as white, red, purple, brown or black

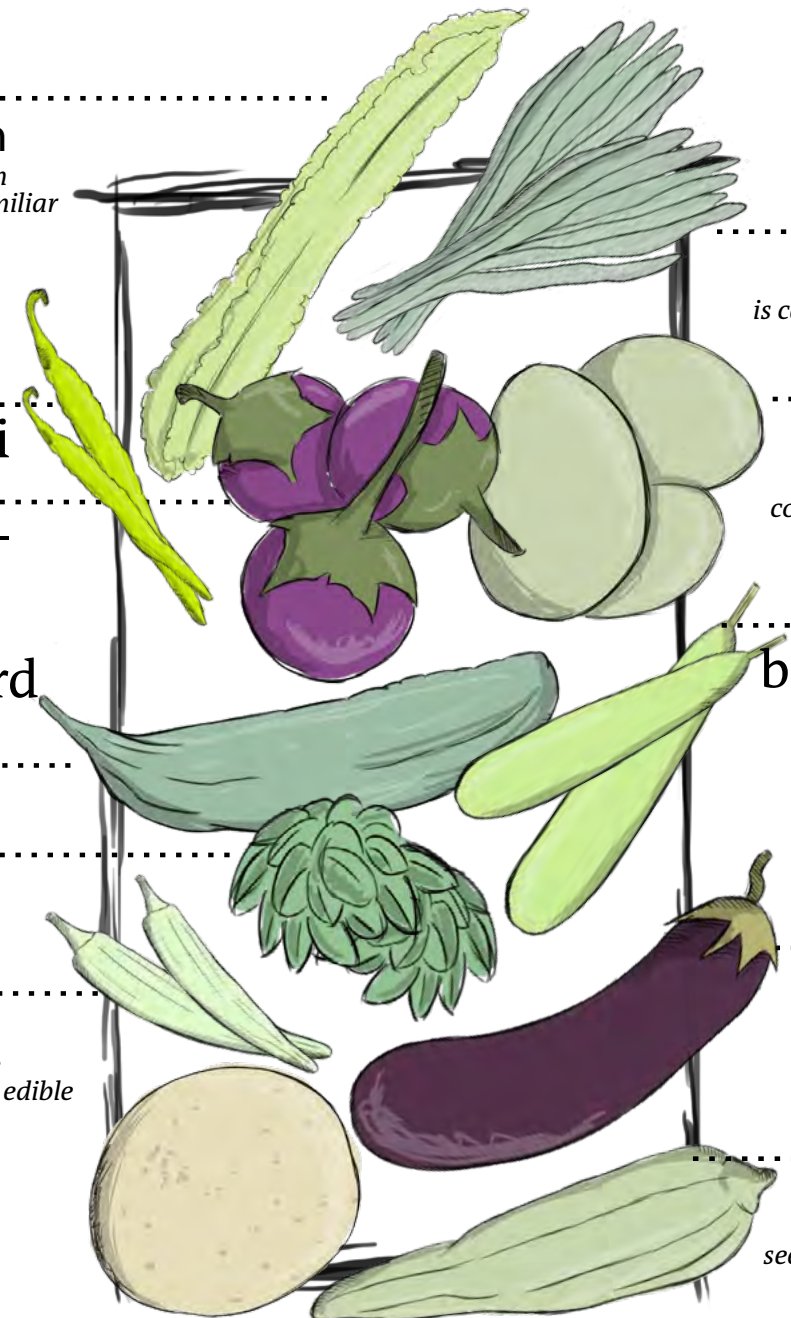
### bottle gourd

its leaves and tendrils even contain higher concentrations of vitamins than the fruit itself

### eggplant

### luffa

seeds can be processed to cooking oil







**AN INTERVIEW WITH**  
Minette De Asis

### *What are typical Philippine dishes?*

The Filipino cuisine has many Spanish, Malay and Chinese influences. Especially in the coastal towns, the diets of the population comprise of fish and seafood, vegetables and tropical fruits. Rice is a staple food. The other source of proteins is derived from pork, chicken and beef. With the colonization of the US, French fries, ham, hotdogs and burgers have been introduced in the urban areas which can be sourced from typical American food chains.

### *Do the children eat the produce of the garden in school?*

No, because in public and private schools, school meals are not provided by the state. The students get money from their family to buy snacks or lunch from school canteens and other food providers. There are some schools that provide feeding programs to combat malnourishment. However, this is only in a case to case basis when the schools have some cooperation with other ministries of the government or non-governmental organizations.

### *Why are there school gardens in the Philippines?*

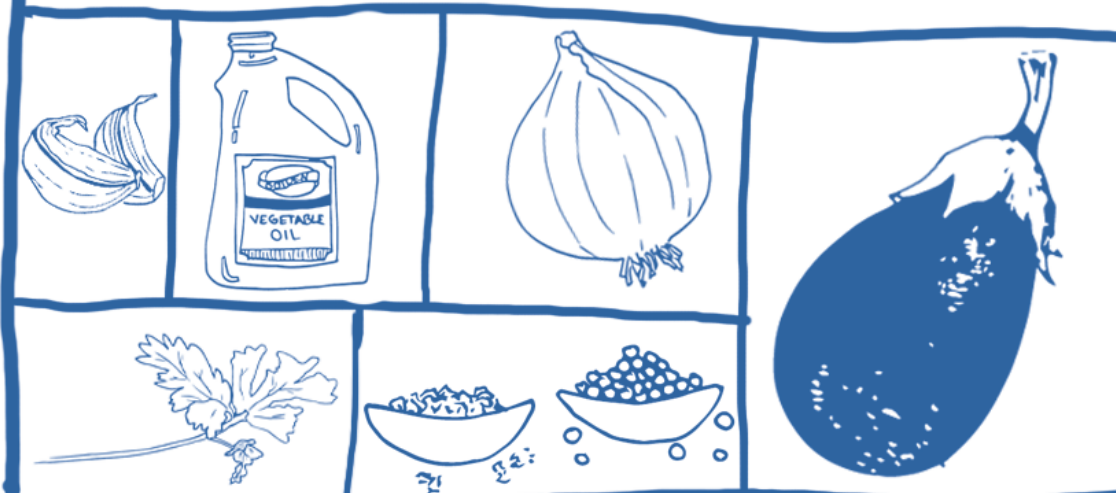
The students learn how to establish gardens in the school. From preparing the plot, planting the seedling and maintaining the plants. Daily watering, weeding and harvesting is part of the Home Economics - Agriculture Course that the students attend to in school. At the end, they get to harvest the crops and bring it home for consumption.

### *How many years do kids attend school in average?*

Average is 10 years but since 2016 there are another two more years of senior highschool.

*Minette Flora de Asis was born in the northern part of the Philippines and has been living in Berlin for 10 years now. She is currently in the final stages of her PhD in Agricultural Science.*

## Roasted Eggplant & Ladyfinger Salad



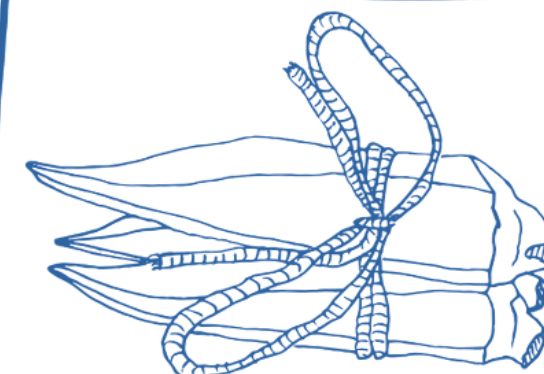
Preheat the oven to 200 °C.

Cut the eggplants in half, lengthwise. Pierce the skin with a fork. Place the eggplants with the skin side down on a baking tray. After 15 minutes, flip the vegetables flesh side down. Bake for another 10-15 minutes, or until the skin is charred. Set the vegetables aside until they are cool to handle.

In the meantime dice the tomatoes and onions.

When the eggplants are cooled, peel off the skin and mash the flesh with a fork. Add the vinegar and fish sauce and mix in the tomatoes and onions.

Add salt and pepper to taste.



2 eggplants, 12 pieces lady finger, boiled for 3 minutes, 2 medium sized tomatoes, 2 medium sized onions, 30 ml white wine vinegar, salt and pepper, 1 tablespoon fish sauce



The idea of growing and learning

# Relevance of school gardens

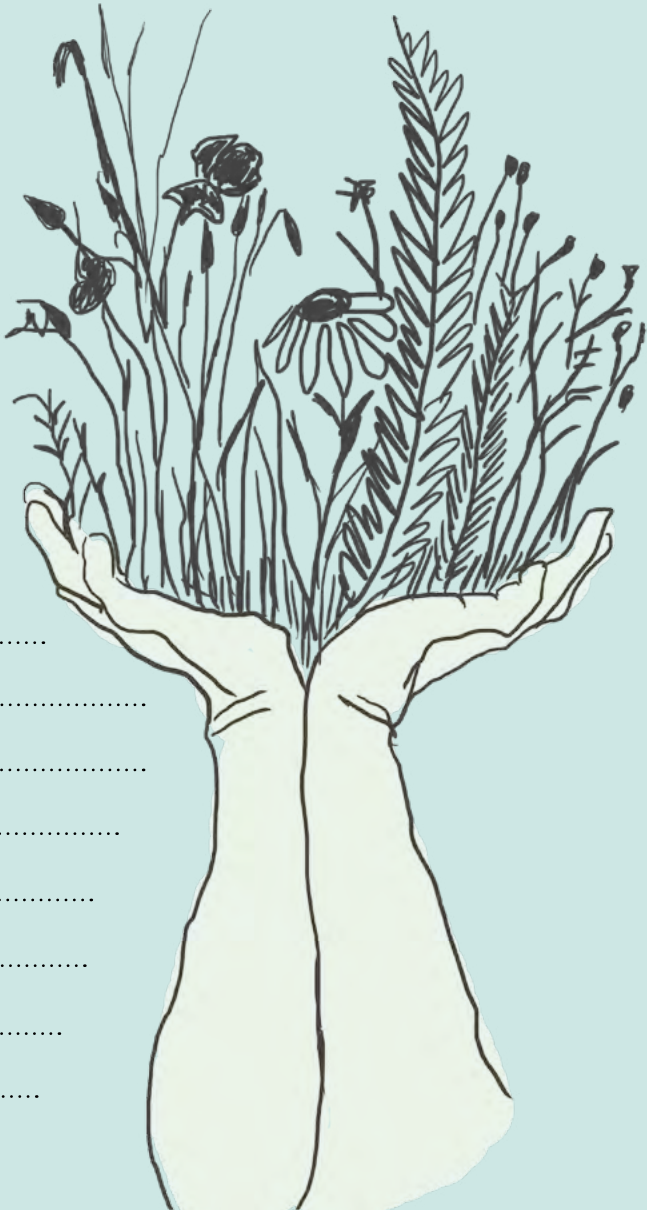
## What is a school garden definition

School gardens are cultivated areas, usually located on a school yard or in its vicinity. Mainly they produce vegetables and fruits. Activities of school gardening may include small-scale staple food production, husbandry and fishery, beekeeping, or ornamental plants and shading. School gardens are cultivated at least partly by the students.

Things you can learn

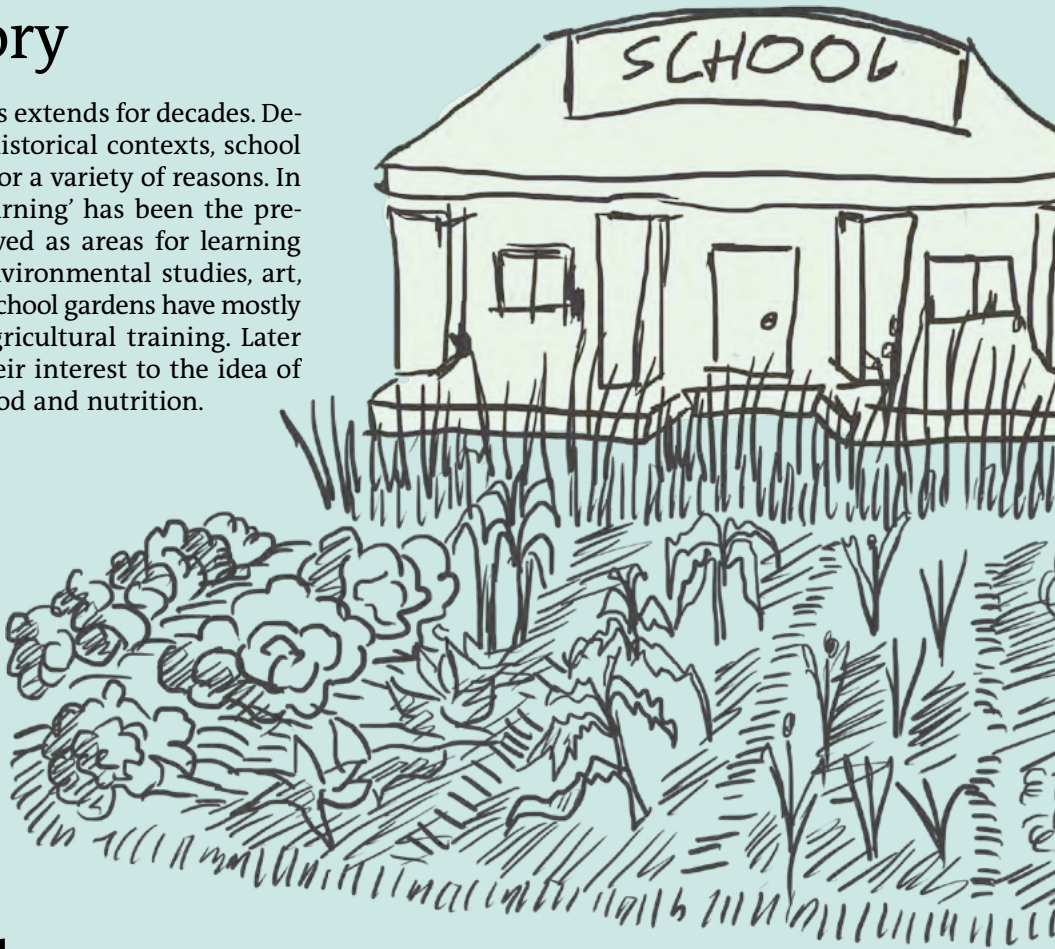
## get an experience

- learn how to plant a garden* .....
- gain agricultural skills* .....
- learn to preserve local food* .....
- understand healthy nutrition* .....
- produce fruits and vegetables* .....
- learn about local plants* .....
- understand natural systems* .....
- use harvest creatively* .....



## Growing food in different contexts a little history

The history of school gardens extends for decades. Depending on the particular historical contexts, school gardens have been planted for a variety of reasons. In the North, ‘garden-based learning’ has been the predominant use. Gardens served as areas for learning various subjects: science, environmental studies, art, and language. In the South, school gardens have mostly been used for vocational agricultural training. Later on enthusiasts extended their interest to the idea of linking school gardens to food and nutrition.



## urgent needs

Today a myriad of problems affect millions of primary school children around the world. High levels of poverty in many countries result in hunger, high school drop-out rates, and low levels of learning. According to the FAO, basic food insecurity is affected by such factors as climate change, increased demand for food, higher food prices and input costs. Human resources and agricultural skills are rapidly decreasing. Agricultural policy is being reconsidered by the governments. The main role should be given to a knowledgeable and skilled population in order to feed themselves and others. Environmental protection should be reconsidered even at the micro level of the school back yard and

the home food garden, addressing issues such as fuel and water conservation, soil enrichment, reforestation and organic approach to horticulture. Livelihoods are threatened today by the global financial crisis, economic downturn and climate change, which makes young people particularly vulnerable. It makes sense to develop horticultural and entrepreneurship skills in agriculture-dependent economies. Presently, a growing awareness and promotion of the school garden movement is being seen across the globe to promote school gardens and to integrate them into the existing curriculum.

Source: A New Deal for School Gardens, FAO, 2010  
[www.fao.org/docrep/013/i1689e/i1689e00.pdf](http://www.fao.org/docrep/013/i1689e/i1689e00.pdf)



Laying the right groundwork for a school garden is an inevitable requirement to ensure its success

# Building the basis



To realize a successful school garden, it needs to have clear aims, participation and value in the eyes of the community. Sustainability can be secured by a slow process and allowing schools to adapt. Governments are crucial in taking the lead, as they provide adequate resources, training, educational material and a strong educational profile.

## A winning combination

## gardening and nutrition education

Food production alone has little impact on the dietary practices, so it has to be backed by nutritional education. Only in correlation can school gardens, nutrition education and good diet make a difference.

## focussing on the right aims



School Meals

A school garden can not feed the whole school, but it contributes health-preserving food and establishes a healthy diet. The educational potential is outstanding, as learners, families, school staff and the community can make a connection between growing food and good eating.



Livelihood Skills

Practice in horticulture and husbandry in combination with marketing can develop important entrepreneurial skills. In addition, household skills as food preserving, meal planning and food hygiene build a base for jobs in the food industry and plausible family living.



Models for the family

If local expertise is respected and familiar produce is supported, the gardens may inspire home gardens and good eating in the family, as the healthy diet can be extended beyond school hours.



Education

In both poor and rich urban environments the experience of food production is lost, which is why education must take action against ignorance, poor practices and skill gaps. It must show the connection between good diet and good health.

## integration into the curriculum

Gardening itself is at the core of the growing cycle. Agriculture can guide the program and science may explain the practices through experiments. Environmental studies can help garden practices in tackling environmental concerns. Nutrition and health education is important in framing and explaining the garden activities didactically. Business skills are important to decide upon what to grow and how to handle the produce.

## strategic elements

Political commitment and institutionalization support school garden programs in the country and make them sustainable. This implies independence from external inputs and participation of the teachers, pupils, parents, school administration, funding agencies, NGOs and ministries of education and environment. They must become part of the national overall education goals to improve education quality.

**Considering location-specific needs** is essential as there is no program that fits every situation. It should adapt to the local socio-economic needs and the environmental situation.

**Putting education first** results in increasing its quality and will lead to an improvement of the knowledge of food production techniques and nutrition, therefore it will improve the overall food security and human capital, especially in the context of child headed households and the HIV/AIDS epidemic. The focus on

the food production itself has been overemphasized in the past, the indirect effect of stimulating home gardens and nutrition awareness is more efficient.

**Technical support and clean water** is indispensable, along with fences in countries with free-roaming animals.

**Preventing the misuse of school gardens** in areas where the teachers are poorly paid and unmotivated, resulting in an abuse of the garden as an extra source of income and exploiting pupils as a cheap labor.

**Partnering with organizations** as cooperations increase the outreach and effectiveness of school garden programs. They may pursue joint planning and program formulation, joint selection of beneficiaries and joint execution to reduce the overhead cost and avoid duplication and facilitating the cooperation with ministries.



Exploring the global journey of crop plants from the dawn of civilization to the rise of colonialism

# History of Crop Plants

Crop plants have drastically changed the way humans live. As early as 10,000 BC, these plants have influenced the lifestyle of homo sapiens from a hunter-gatherer society to a settled agricultural society.

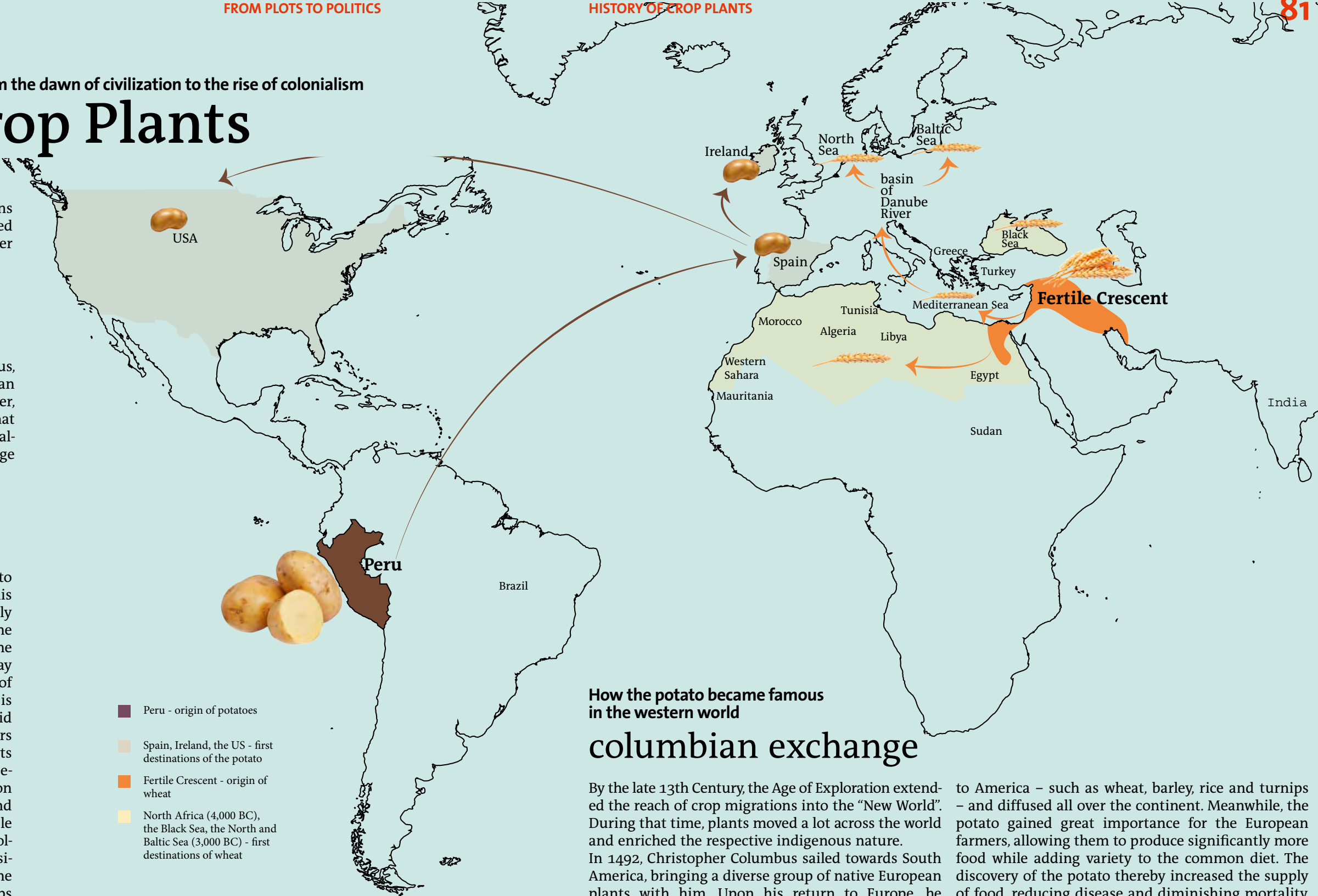
## What exactly is a crop plant?

Crop plants are defined as any cultivated plant, fungus, or alga that is harvested to fulfill some kind of human needs: food and clothing, as well as livestock fodder, medicine or biofuel. Cultivated plants are those that have been encouraged to reproduce by humans, allowing them to be grown beyond their natural range while increasing their productivity.

## The beginning of agriculture fertile crescent

The beginning of plant cultivation dates back to 10,000 BC; during this time, multiple origins of this harvesting technique were founded independently in different places all over the world. However, the most prominent of those early developments was the Fertile Crescent, located to the west of present-day Iran. The Fertile Crescent gained its name because of the crescent-shaped appearance of the region and is still the most fertile land in the otherwise rather arid area. This was the place where, almost 12,000 years ago, the first major farming-centre arose and plants like wheat, barley and peas were domesticated. Because of the especially suited climate, the evolution of large-seeded annual plants was encouraged and a great variety of species evolved over time. People came to notice that it was no longer necessary to follow the flow of plants but that it was instead possible to settle in fixed communities, subsisting of one year's harvest while waiting for the next year's crops to grow.

It was from here that cereals like wheat travelled across the Mediterranean Sea to the basin of the Danube River. From the Danube basin, agriculture spread towards the Baltic and the North Seas around 3000 BC.



This map shows how the potato and wheat crops were diffused in early times of civilization.

## How the potato became famous in the western world

## columbian exchange

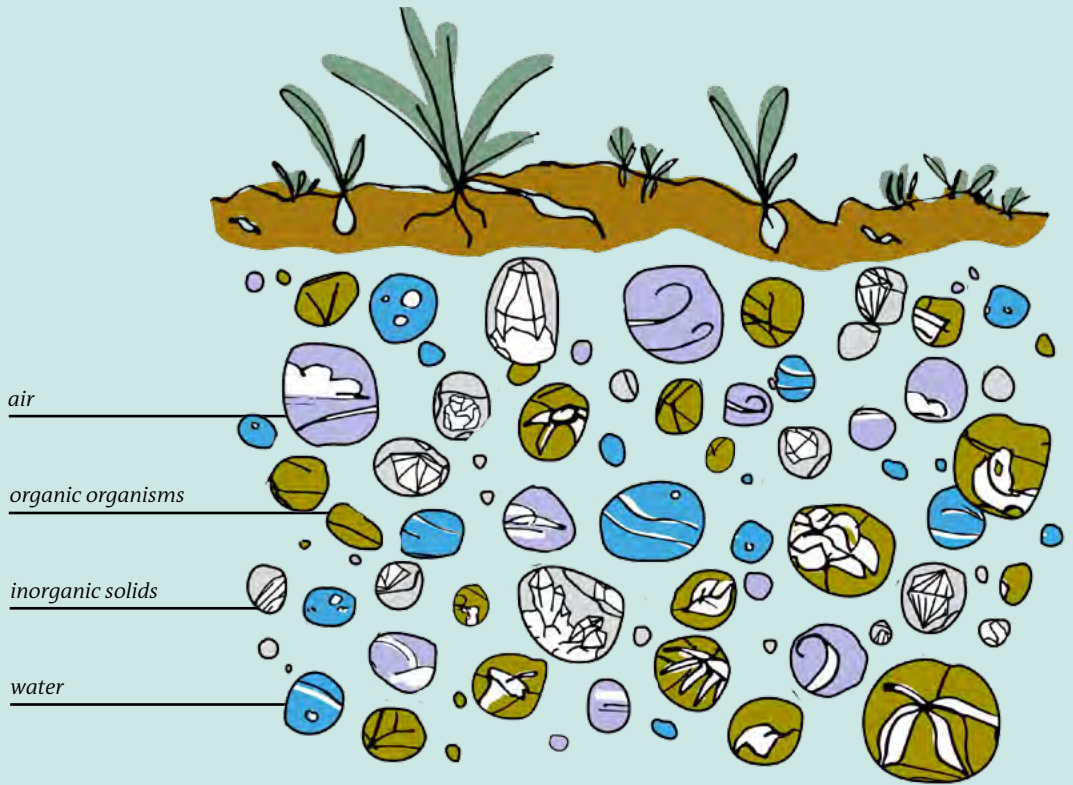
By the late 13th Century, the Age of Exploration extended the reach of crop migrations into the “New World”. During that time, plants moved a lot across the world and enriched the respective indigenous nature. In 1492, Christopher Columbus sailed towards South America, bringing a diverse group of native European plants with him. Upon his return to Europe, he brought back native plants from the West Indies. Crops like maize, potatoes, sweet potatoes, and cassava rapidly spread to the “Old World” and caused population growth with lasting effects on many cultures. Conversely, crops from the “Old World” were brought

to America – such as wheat, barley, rice and turnips – and diffused all over the continent. Meanwhile, the potato gained great importance for the European farmers, allowing them to produce significantly more food while adding variety to the common diet. The discovery of the potato thereby increased the supply of food, reducing disease and diminishing mortality, while causing a population boom in Europe and the British Empire. Many researchers believe that the potato’s arrival in Europe spelled an end to famine, catalytically fueling the rising global influence of the western world.



Healthy soil as a basic part of food production and the whole food system

# Living Soil and Food Production



components of fertile soil

## soil structure

Soil is a mixture of inorganic solids, air, water and organic material. It is a living system with micro- and macroscopic organisms that convert dead and decaying matter into plant nutrients. The biological activity of different soil systems depends on the organic matter supply load.

For sustainable food production, soil fertility need to be maintained. The balance of organic matter, water, air, and solids is essential for the effective nutrient exchange. Soil fertility and crop production decline when soil lacks the proper balance of organic matter and nutrients, often resulting in soil structure erosion and degradation.

Structure and porosity are equally important for healthy soil. The pore space determines water infiltration rate and water retention capacity within the soil, but also the aeration. Furthermore, it influences the biological activity of soil organisms and therefore plant nutrient availability. Ploughing, disc-tillage, and burning of vegetation accelerate the decomposition of soil organic matter and cause wind and water erosion. Good practices like using minimal tillage, providing protective crop cover, and implementing crop rotations increase soil health. These alternative soil management techniques maintain organic matter and help control weeds. Water infiltration is improved while runoff and erosion are reduced.

healthy soil	damaged soil
microorganisms	use of pesticides
high biological activity	low biological activity
pore space to let water infiltrate	no water retention due to unbalanced consistence
crop rotations	monoculture
protective crop cover	sealing for roadways
structure to support aeration	too dense to permit aeration
using min. tillage	ploughing, disc-tillage
> effective nutrient exchange	> fertility and crop production decline

## loss of soil

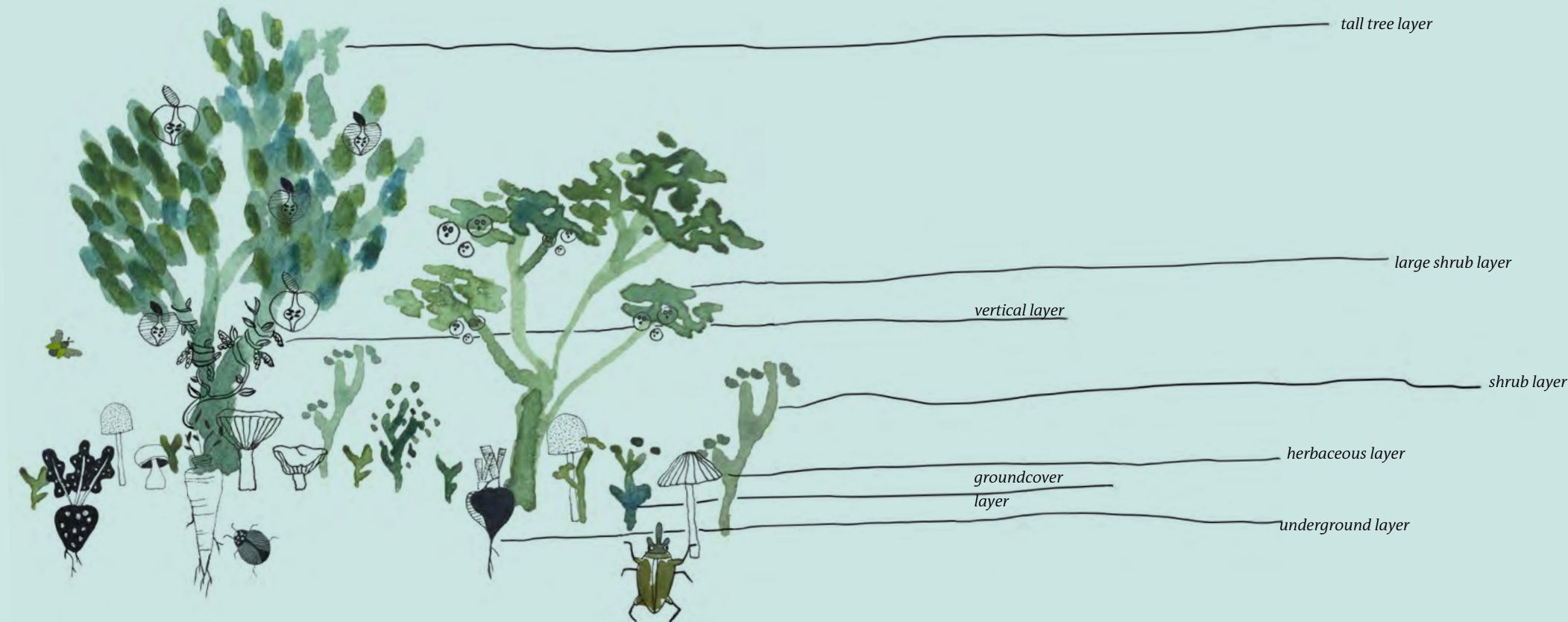
Every year 5 to 10 million hectares of living soil disappear. Globally, 20 to 25% of soils are affected. One of the reasons is erosion. Without an underground root network, topsoil can easily erode. Wind and rain contribute by washing and blowing away the unstable ground. Soil that is used improperly and too intensively loses its function and degrades. If the cultivation of fields is too rigorous, it can cause the salinization of soil, erosion, and desertification. Pesticides poison the soil. The sealing of the soil through increased use of concrete for roadways and housing foundations is another reason for loss of living soil. When sealed with concrete or through over-harvesting agriculture land, soil loses its air and water permeability. Healthy soil and organic farming are the answer.

Erosion can be prevented with the strong structure that microorganisms build in healthy soil. Those need to be viewed as a vital part of agriculture instead of being targeted and killed by toxic chemicals. Moreover, by not using chemicals and fertilizers, organic farming saves vast amounts of energy otherwise used in producing those products. In addition, cultivation of the soil must be adapted to the seasons. Some examples of methods that help sustainably manage our soil are organic farming, zero-tillage, crop rotations, and conservation agriculture. In a nutshell, healthy living soil does not only provide us with highly nutritious food – it also requires less work. It is greenhouse friendly and helps to stop the global degradation of soil. Let's make organic farming the norm.



Farming methods between conventional and organic farming

# Ways of cultivation



## conventional farming

Conventional farming focuses on producing very high yields of one kind of crop. Plants are typically grown in monocultures and treated with chemical pesticides and fertilizers. This leads to impoverished soils and soil erosion, water contamination and loss in biodiversity.

## organic farming

In organic or more sustainable farming, no chemical fertilizers and pesticides are applied. Instead, compost and organic wastes provide nutrients for a sustainable cycle and keep soil and microorganisms alive. Companion planting is an organic form of pest control. Also, traditional farming systems such as rotational farming or shifting cultivation are helping the soil to regenerate.

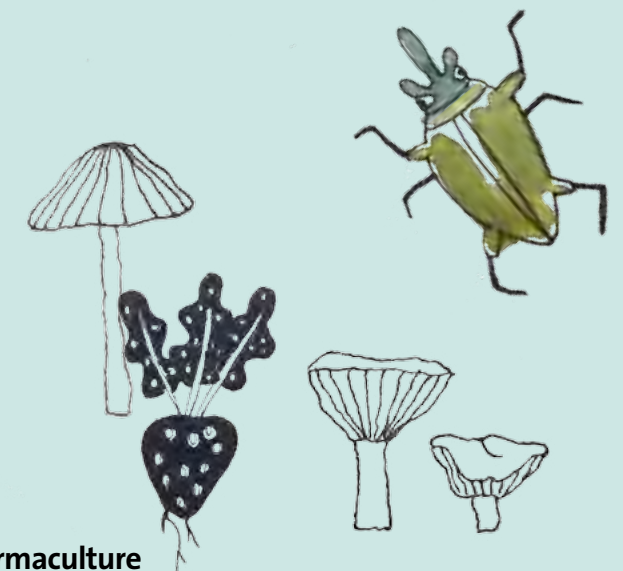
## irrigation systems

The cultivation of plants became possible with the invention of irrigation systems. Some early systems originated for example in the Mesopotamian plain, ancient Egypt and China.

Different irrigation methods often relate to different cultivation methods, such as terrace farming which can benefit from flood irrigation. Rice for example, needs a lot of water and profits from a natural flood irrigation. Because of the many steps of the terrace, the rainwater floods every level without washing away all nutrients in the soil.

## forest gardening

Forest gardening imitates the principles and structure of natural forest ecosystems. The typical trees and plants are replaced by fruit and nut trees, bushes, shrubs, herbs and vegetables that serve people as nutrition or medicine. By using the vertical space in 7 to 9 layers, farmers can use the full capacity of the available land area. In a forest garden, no insecticides and weed killers are needed. As a closed ecosystem, the garden is very stable and requires little maintenance. This system could provide a possibility to increase food security and makes farmers less affected by climate change.



## permaculture

The imitation of natural patterns and features like in forest gardening is called permaculture. Its principles are not limited to agriculture systems. Copying the way how natural ecosystems work and applying them to agricultural systems, increases not only the level of biodiversity, but also the stability of crop cultivation.

## forest school garden

The low maintenance of a forest garden could be a beneficial model for schools. Students can learn more about the diversity of plants and how an ecosystem works. Besides growing food, they can also be inspired by other uses of plants and build tree houses.

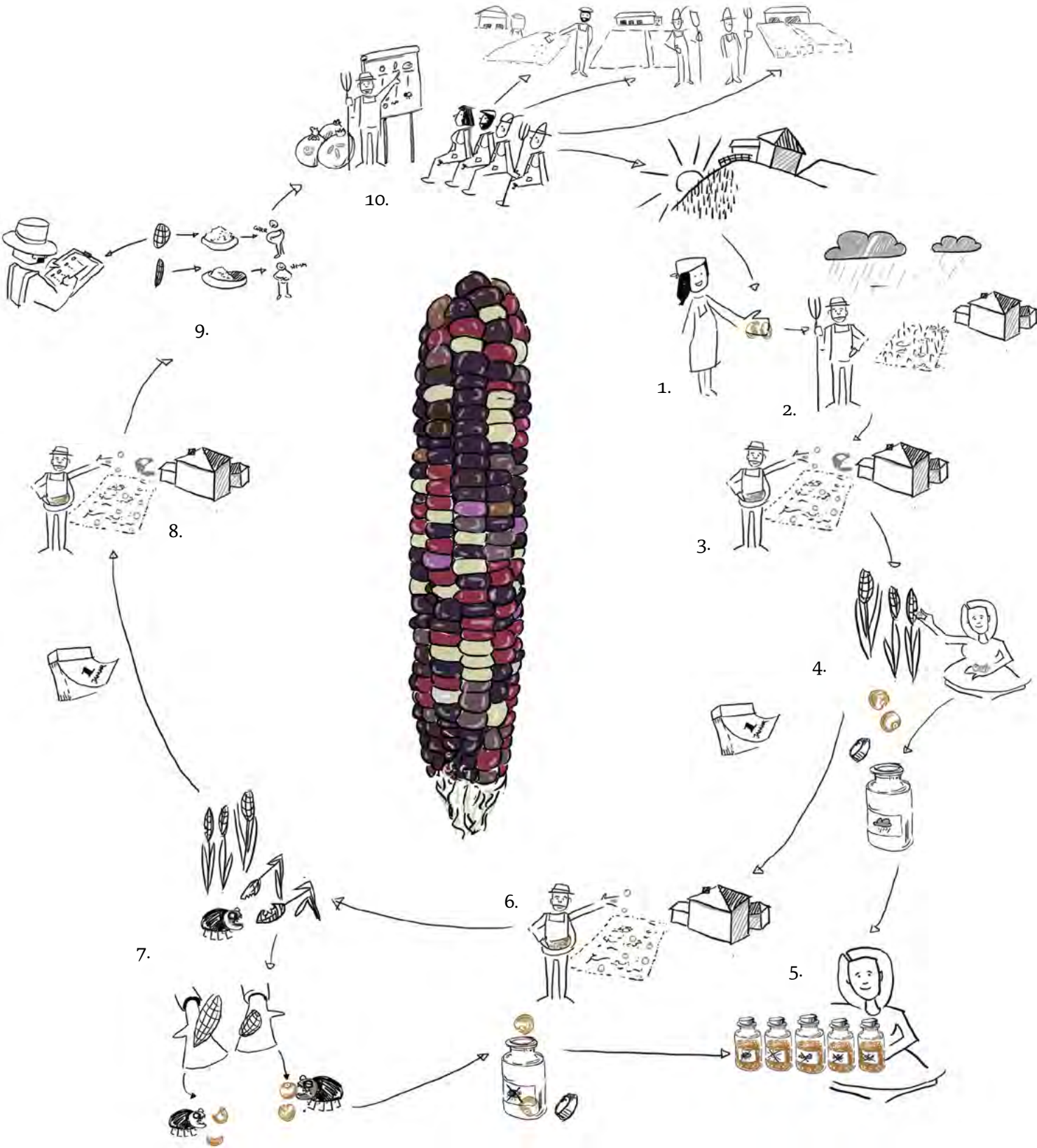
## slow food

Slow Food was founded by Carlo Petrini in Italy 1986. It is a grassroots organization, which means that action happens on a local level, but can effect change on the regional, national and international level. Originally Slow Food began as a movement about the way we eat, now there is also a growing number of Slow Food gardens, such as the „10,000 Gardens in Africa“ project. It fosters sustainable forms of cultivation, community building, knowledge exchange and the saving of seeds and local biodiversity.



# Seed Sovereignty

- 1. Farmer Lizzy lives in the south in a warm region. Her seeds could ripen well and they have a high quality.
- 2. Farmer Max knows about the quality of the seeds from warmer regions. He makes a deal with farmer Lizzy which provides him a higher yield.
- 3. After several farming cycles farmer Max realizes that some plants are more resistant to pests and severe weather than others. To reduce the loss he sorts out the weaker seeds.
- 4. In many countries it is traditionally the women who are the guardians of the seeds and biodiversity. They have the knowledge about cultivation, nutrition, curative effects, and storage.
- 5. Seedbanks secure the preservation and diversity.
- 6. With a new cultivation cycle, farmer Max finds that some of the crops taste better and have more nutrition.
- 7. He eliminates varieties that are prone to pests.
- 8. Farmer Lizzy receives a part of the favored seeds from farmer Max, so she can cultivate more nutritious crops herself as well.
- 9. They both continue making individual selections and maintaining important seed properties.
- 10. They tell others about their observations and share their knowledge with other farmers.



Approval procedure for seed:  
Since 1997, farmers have to pay  
a cultivation fee to the growers.

Farmers are not allowed to  
sell their own seeds.

1953

The seeds are tested and if  
they do not hold up to the  
DUS-Standard, the farmers  
may not sell their seeds.

1903

408

One century ago, the  
diversity of seeds of  
local vegetables was four  
times higher than today.  
Example of the loss of  
diversity of tomatoes.

1983

79

While today's customer only  
knows "the one tomato".  
Hardly anybody knows maize  
originally is multicolored.

The seed industry often sells  
complete packages that consist  
of fertilizers and pesticides.

Due to the permanent use of  
pesticides and fertilizers our  
soil constantly loses its fertility.

The pollen of the hybrid  
seeds sometimes carry  
over by the wind or bees  
to neighboring fields, that  
don't rely on hybrid seeds.

If hybrid plants are found on  
a field, the farmer needs to  
prove that he had paid for  
the seeds. If he cannot do so,  
the fine will be substantial.

large revenue

small revenue

According to the ETC Group,  
the Industrial Food Chain uses  
70% of the world's agricultural  
resources to produce just 30%  
of our global food supply.  
Conversely, the Peasant Food  
Web provides 70% of the glob-  
al food supply while using only  
30% of agricultural resources.

70%

30%

The properties of the hybrid  
seeds are lost if they are  
crossed with normal seeds.



# Climate Change & Food Security

## how does the climate change?



climate change will cause crop losses



crop losses will cause higher food prices



climatic extremes reduce the stability of growing crops



climate variability will make it difficult to predict how much food will be available

With rising effects of climate change, the global impacts include higher temperatures, heavy rainfall events, greater numbers of droughts and floods, and overall, more climatic ups and downs.

In contrast to that, each plant needs a stable temperature range for ideal growing and harvest results. A rise in temperature will result in large crop losses. For example, in the last decades, the small rises in global temperature have caused great crop losses of wheat, corn, and barley. Heavy rainfall events and floods have resulted in erosion and soil loss. More rain in winter has also intensified erosion.

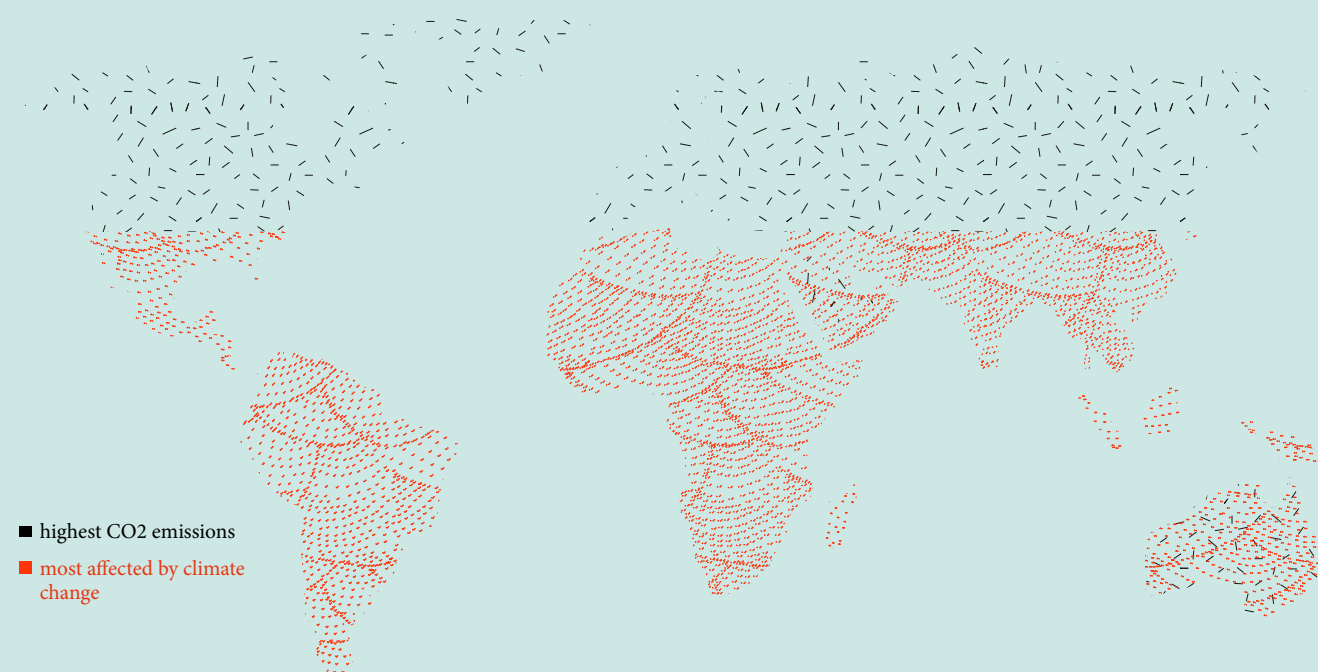
Droughts dry out soil and affect the organisms that are very important for sustainable tillage and a sound harvest.

Changes in insect and pest attacks may be another problem with global warming. In higher overall temperatures and warmer winters many will have better chances for survival. They will be more mobile and occupy new areas. It is also feared that pesticide use will increase.

Climate change will affect crop production in low latitude countries negatively, while effects in northern countries may be positive. Losses in southern countries could theoretically be compensated for by gains in the north; whether the costs of transporting crops in an age of shrinking oil supplies will result in profit remains to be seen.

Growing inequalities between the rich and the poor are expected. Increases in the frequency of bad weather will interrupt food delivery. Food prices after extreme events will be less stable in the future.

Other stressors such as population growth may magnify the effects of climate change on food security. Adaptation options like changes in crop-management or improvements to irrigation are more limited in developing countries than in industrialized nations.



Areas with high CO2 emission in contrast to areas that will be most effected by climate change

## what to do to handle climate change?

### Individual

- \* buy locally-grown organic food
- \* learn about the producers of your food, seek out local farmers, and buy from a farmer's market
- \* grow your own food in a school or community garden (then you will be sure that no pesticides and fertilizers went into the soil!)
- \* eat less meat



### Farmers

- \* diversify crops
- \* use sustainable techniques (i.e. using less water or drip irrigation)
- \* start permaculture or forest gardens



### Community, regional, and national level

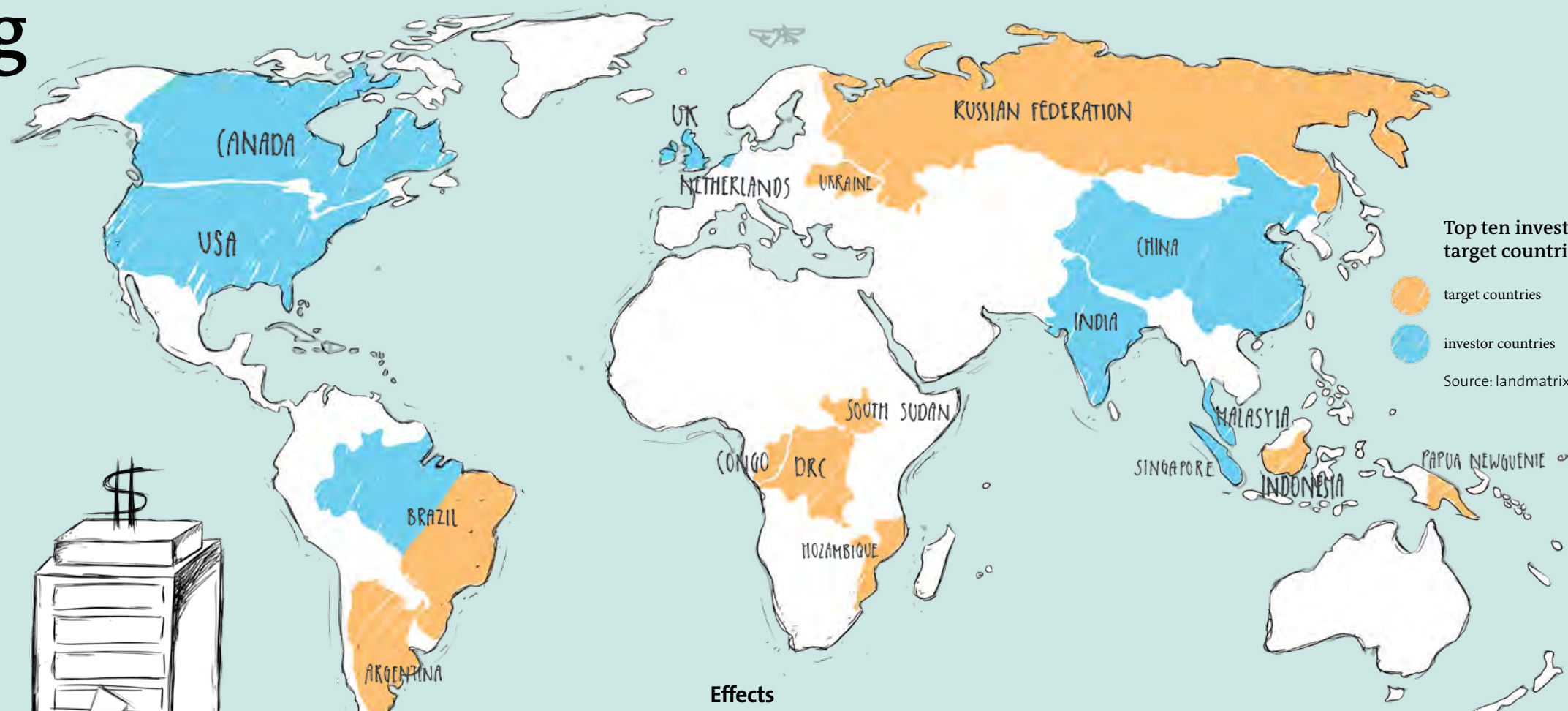
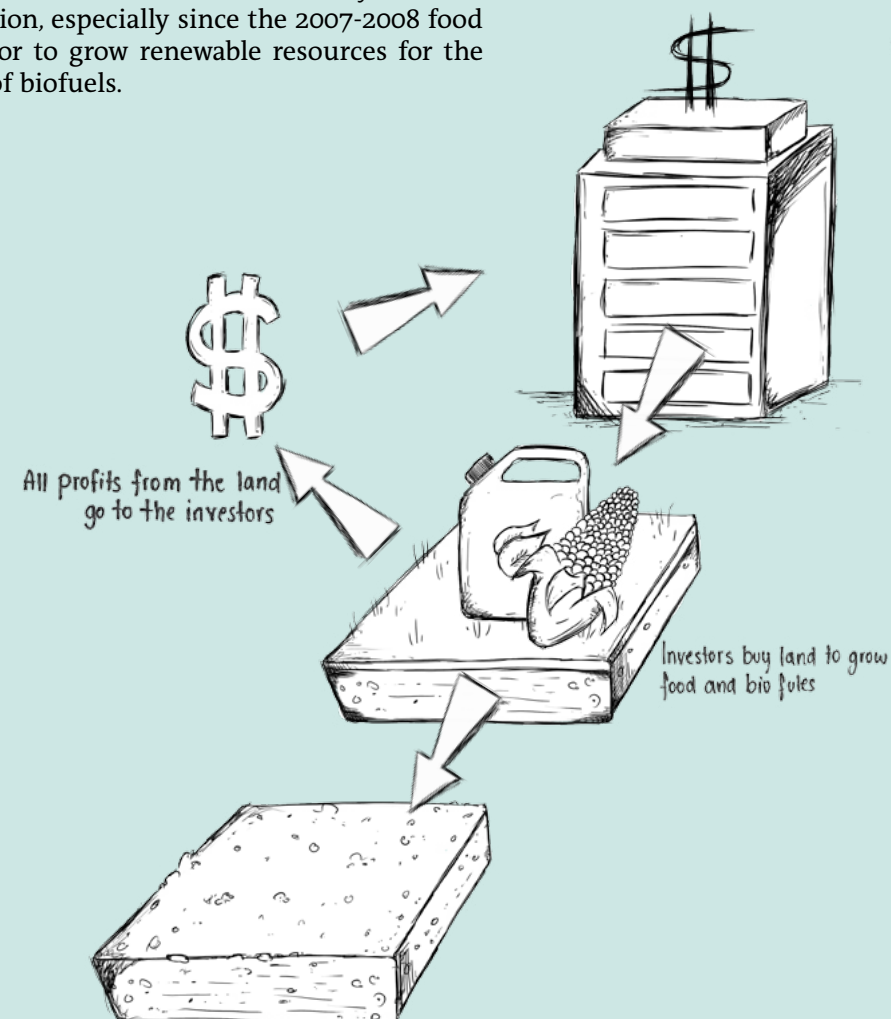
- \* encourage your policy makers to think more about the impact of climate change on food security, about locally grown organic food production, and about food education
- \* get involved with local politics and with land-use planning; be part of community or NGO activities
- \* support or get involved with the school and community gardens in your area



# Land Grabbing

The term “land grabbing” is defined as a form of very large-scale land acquisitions. It typically pertains agricultural land that is bought or leased by economic or political actors like domestic and transnational companies, governments, and individuals. In some cases, investments are intended to secure domestic food supply, but mostly it is a question of producing food as commodity, trading crops on the world market or for speculating with land.

Over the past decades, acquisitions of land in developing countries are primarily characterized by private profit motives. First, a main focus was on high-priced agricultural export products, not on the production of basic food. Later, governments began to acquire land abroad, with the aim of food security for their own population, especially since the 2007-2008 food price crisis; or to grow renewable resources for the production of biofuels.



## Effects

Countries with scarce land and water resources and sufficient capital are mainly the important players in this market. Investments usually take place in developing countries with low production costs and further destabilizes the food security and food sovereignty of these countries.

The “grabbed” land is no longer available for food production by local communities, farmers become displaced, and the harvest of the cultivated land is largely used for export. The countries that are affected by land grabbing then often become dependent on food imports themselves.

The large conglomerates create either no, or very badly paid jobs with poor working conditions for locals. Attractive jobs are typically filled with staff from the investor country.

Not only does this practice have a negative effect on the local economic situation, it also leads to long term ecological damage and environmental disturbances, for example by increased water consumption, the clearing of forest areas or the occupation of border areas.

The typical management of agro-industrial large plantations with extensive monocultures, the intensive use of pesticides and mineral fertilizers, as well as the use of genetically modified seeds carries a high risk of negative effects on the environment and the well being and social structures of the local population. Biodiversity is likely to decrease with animal and plant species becoming endangered or extinct.

## A case in Germany

In Brandenburg agricultural land must be offered to local farmers first before it can be sold otherwise. By purchasing the company ATU Landbau, Münchner Rück – one of the world’s leading reinsurers – was able to circumvent this law and acquire the land. This resulted in tax savings of 1.8 million euros. Small local farmers are not able to compete in these deals and become marginalized.

As this case shows, despite the laws which should prevent the illegal appropriation of land, land grabbing is nevertheless possible.



# Learning by doing

Ideas and suggestions to get started

### school gardens worldwide

Take a map and find the countries that are represented in this brochure. What latitudes and longitudes do they have? What kind of vegetation and climate zones and typical agricultural products do you find there? Most of the information you will find in this magazine.

### your own school garden

Think about your own school garden. It could be a very small one – maybe only a raised bed of two square meters on paved ground. What kind of vegetables and fruits grow there? Are these typical plants for your climate zone? If not, where are the plants originally from?

Think about a 2,000 m<sup>2</sup> garden. What might be possible in this garden and why should it be 2,000 m<sup>2</sup>?

### 2,000 square meters

If we were to divide the global surface of arable land by the number of people on the planet, each of us would have 2000 m<sup>2</sup>. Take a look at what happens in the 2.000 m<sup>2</sup> garden on the IGA-Campus and elsewhere in the world!  
[www.2000m2.eu](http://www.2000m2.eu)

### Explore food gardens in your neighborhood

Take a walk around your neighborhood and see what other schools or classes do in their school gardens. Arrange partnerships with other schools or community gardens or garden companies, so that you can get some expertise about seeds and plants, but also about soil, compost and so on. Furthermore, partners might be helpful to organize the work in the garden over the holidays. Make a (garden)plan for the year.  
More Information of the garden projects at IGA-Campus:  
[www.iga-berlin-2017.de](http://www.iga-berlin-2017.de)

# Zero Hunger

Worldwide 800 million people suffer from hunger – the vast majority in developing countries. Poor harvesting practices and food wastage contribute to food scarcity, but also the production of biofuel. In one decade (2001-2011) world biofuel production has increased five times. The steep rise in 2007/2008 occurred simultaneously with a sharp increase in food commodity prices and was quickly accompanied by food riots in many cities of developing countries.

If you want to learn more about the topic and initiate own research work, the following questions might be helpful:

*Do we have enough food for everyone?*

*Do we have enough food for 7.5 billion people at the moment? And will we have enough food for 9 billion people in 2050?*

*How much food is produced every year?*

*How much of our food is wasted?*

*How much food is wasted in the North?*

*And how much food is wasted in the South?*

*How much of our food is used for fuel?*

*How much food is used for the production of meat?*

*How much food can be produced every year?*

*What will the development in the next 30 years look like?*

Focus your research on factors like climate change and the loss of arable land. On the other hand, less food waste, no biofuel production and reduced meat consumption can also affect food production in general.

Make your own zero hunger plans for 2050!

# Sustainable Development Goals

On 1 January 2016, the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development – adopted by world leaders in September 2015 at an historic UN Summit – officially came into effect. Based on these goals every country will mobilize efforts to end all forms of poverty, fight inequalities and tackle climate change, while ensuring that no one is left behind over the next fifteen years.

In the context of school gardens the goals 2, 4 and 12 are most important. The following links provide more information about the topics, you can see facts and figures but also find further links. Use the materials for project days and lessons!  
[www.un.org/sustainabledevelopment/development-agenda](http://www.un.org/sustainabledevelopment/development-agenda)

The IGA-Campus team is working with schools in Berlin, but also with schools and NGOs worldwide. Our partners will send in news occasionally: pupils will write about their gardening activities, about harvesting fruits & vegetables and preparing & tasting them. They will send photographs and ideas for further co-operation.

Our website will be up-dated regularly with more information. Follow us online and send us your comments! We would be very happy if you can get new ideas from the magazine. We encourage you to get more involved with school gardening, food production and environmental education. Please send us results from your lessons as well as questions and suggestions!

### the goals are:

- 1. No Poverty  
[www.un.org/sustainabledevelopment/hunger](http://www.un.org/sustainabledevelopment/hunger)
- 2. Zero Hunger - End hunger, achieve food security and improved nutrition and promote sustainable agriculture
- 3. Good Health and Well-being
- 4. Quality Education - Ensure inclusive and quality education for all and promote lifelong learning  
[www.un.org/sustainabledevelopment/education](http://www.un.org/sustainabledevelopment/education)
- 5. Gender Equality
- 6. Clean Water and Sanitation
- 7. Affordable and Clean Energy
- 8. Decent Work and Economic Growth
- 9. Industry, Innovation and Infrastructure
- 10. Reduced Inequalities
- 11. Sustainable Cities and Communities
- 12. Responsible Consumption and Production - Ensure sustainable consumption and production patterns  
[www.un.org/sustainabledevelopment/sustainable-consumption-production](http://www.un.org/sustainabledevelopment/sustainable-consumption-production)
- 13. Climate Action
- 14. Life Below Water
- 15. Life on Land
- 16. Peace, Justice and Strong Institutions
- 17. Partnerships for the Goals

# IMPRINT

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[data.unicef.org](http://data.unicef.org)  
[www.worldlifeexpectancy.com](http://www.worldlifeexpectancy.com)  
[data.worldbank.org/indicator/SL.AGR.EMPL.ZS](http://data.worldbank.org/indicator/SL.AGR.EMPL.ZS)

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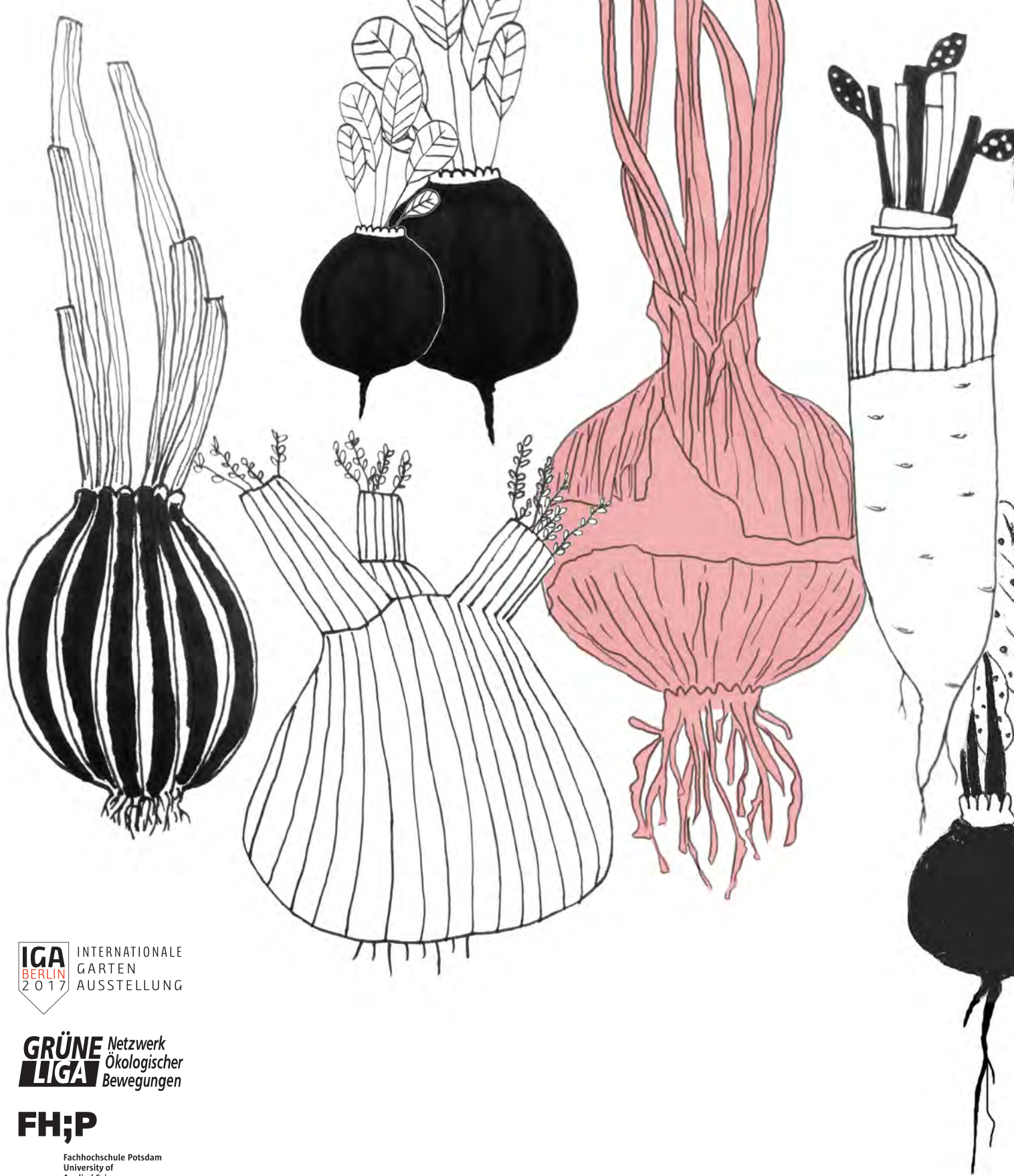
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