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Sino-German Agricultural Centre, 2nd Phase



Manual for a Global Plot

English Version

By Benedikt Haerlin and Dr. Pan Tao

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Implemented by



In partnership with



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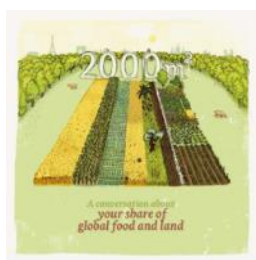
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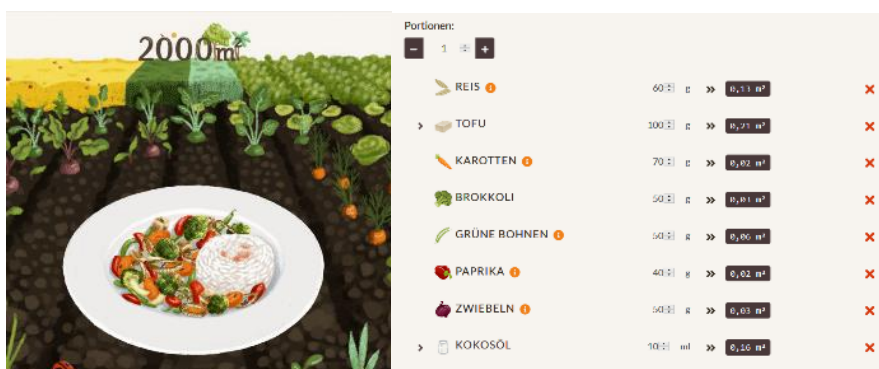
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<https://www.2000m2.eu/wp-content/uploads/2000m%C2%B2-Brochure.pdf>



www.mym2.de (German only)

Preface

Dear reader,

The Sino-German Agricultural Center (DCZ) proudly presents the „Guide to the creation of the 2000m² global plot“. This manual is an offspring (follow up) of DCZ’s activities to look at the impact of agriculture on climate change and related initiatives in Germany and China. In August 2019, the DCZ sub-project „Sino-German collaboration on agriculture and climate change“ organized a study tour to Germany for experts from both countries to learn more about the German policies, research and projects. This tour included a visit of the „Weltacker“ (Global Plot) Project at People’s Botanical Garden in Berlin-Pankow. The professors from the Chinese Academy of Agricultural Sciences were very impressed by Weltacker’s educational approach. This was how the idea was born to think of ways how Weltacker’s approach can be transplanted to China: A lively experience for urban people to learn how food is produced, that agriculture production has a local and a global dimension and last but not least how this is related to climate issues.



Members of the DCZ Climate delegation (Prof. Dong Hongmin, Prof. Li Yue from Institute for Environment and Sustainable Development in Agriculture of the Chinese Academy for Agricultural Sciences, Dr. Rita Merkle DCZ lead expert, Dr. Eva Sternfeld DCZ science advisor meet with Benedikt Haerlin at Weltacker in Berlin Pankow, August 2019

Although, in 2020 due to the COVID 19 pandemic it was not possible to travel and meet again in person, we decided to ask Benedikt Haerlin, from Foundation of Future Farming and founder of the Berlin Weltacker project to share their experiences how to establish such a project and introduce the range of educational activities that the Berlin Weltacker over the years has developed.

The present version of the „Guide for 2000m² Global Plot“ is the outcome of a very fruitful Sino-German collaboration: To adapt the manual better to the Chinese environment we assigned Dr. Pan Tao, the founder of the first Chinese Schrebergarden Project, the Ecoland Club in Shanghai. There Dr. Pan Tao has already reserved 2000 sqm and is ready to start a Shanghai global plot. In several Skype meetings we discussed the draft versions and Dr. Pan Tao developed the Chinese language version of the manual.



Dr. Pan Tao and Dr. Eva Sternfeld in November 2020 on the Global Plot project field at the Ecoland Club in Shanghai

We do very much hope that this manual will be the seed for future global plot initiatives in China. Of course, given the diversity of China in terms of climate and natural conditions this kind of manual can only show the direction. Details need to be adapted to different conditions. We very much look forward to learn from your experiences!

Dr. Eva Sternfeld

Advisor for the Science & Technology Platform of DCZ

Please check the following websites to learn more about:

Sino German Agricultural Center (DCZ): www.dcz-china.org

Foundation for Future Farming: www.zs-l.de

Weltacker: www.2000m2.eu

Shanghai Ecoland Club: www.ecolandclub.com

Introduction

Approximately 7.5 billion people currently live in the world, sharing roughly 1.5 billion hectares of arable land - which equates to 2000 m² of arable land per person. All plant based consumption for one year must grow on one's personal 2000 m² (excluding products derived from meadows, forests and the sea): This includes the rice we eat, the wheat for our bread and noodles, our beans and vegetables and the tea and coffee we like to drink every day. This land area must also produce the cotton for all the clothes we buy, the oilseed from which we make cooking oil and fuel, the soya that we feed to the pigs whose meat we eat and much more.



The original 2000 m² field in Berlin at the Pankow Peoples Botanical Garden in early spring

The 2000 m² global plot is the area of arable land available to every person in the world. If this area is well maintained and sustainably managed it should be enough to comfortably sustain each of us living on the planet. Even the 1500 m² that will be available per person at the expected peak of world population in about 60 years will be enough to feed each individual. However, in reality the acreage available for each 'individual' global plot is of course not distributed evenly, and nor is the level of consumption in different regions across the globe.

Not all the crops grown in the field are going into the food cycle. There are more than 10 % of arable land producing crops for fuels due to better economic benefits. Meanwhile there are more than 20 % of food produced ending as waste. Therefore, human being still have the room to manage our 2000m² global plot providing better food for more population.

Standing on the piece of land that represents 'my' share of global farm land is the first experience for visitors when they arrive at the 'Global Plot'. On the 2000 m² global plot in Europe we grow 41 out of the 55 most widely cultivated crops to scale, in relation to their global use. The Global Plot also shows what these crops are used for – from food and feed to t-shirts to car tires and energy. More favourable climatic conditions would allow us to grow all

of the “top 55” global crops as well as the popular and typical local vegetables, fruits and crops that have already been incorporated.

The land use of some typical individual dishes is also shown on so-called areal buffets. All the ingredients of various dishes, including the respective fodder for animal products, are grown together in one place and can be compared. How many square meters are we having for dinner tonight is a common question - which is then answered by an online calculator on a visitor's mobile phone or computer.

Additional theme stations and information booths situated around the plot deal with questions relating to soil life, the competition between plate, trough and tank, food waste and much more.

The global plot is an impressive place of learning for young and old, designed to excite your senses while simultaneously conveying the effects of one's own shopping and eating habits on global warming, biodiversity and soil fertility. In addition, the global plot also deals with other current topics relating to agriculture and nutrition. The reference to one's own 2000 m² gives a personal touch to many seemingly dry and abstract problems and questions. However, these questions do not appear overpowering on the plot, but are made tangible, and potential solutions, designed by the students themselves, can be submitted. It is clear from our experience that by standing on what would be your share of the world's agriculture makes the challenges we face real and the necessary changes meaningful.

The initial aim of the project is to motivate and enable people of all ages and educational backgrounds to make an important contribution on the global journey to a climate-neutral society by changing their own personal eating habits. The long-term aim of the project is to raise wider public awareness of the connection between one's own consumption of food and other agricultural products and the resulting impact on greenhouse gas emissions. The relationship of the soil ecosystem to one's own food and health plays a special role in this context. The participants in the diverse educational programme of the Weltacker can experience this directly and through their senses.

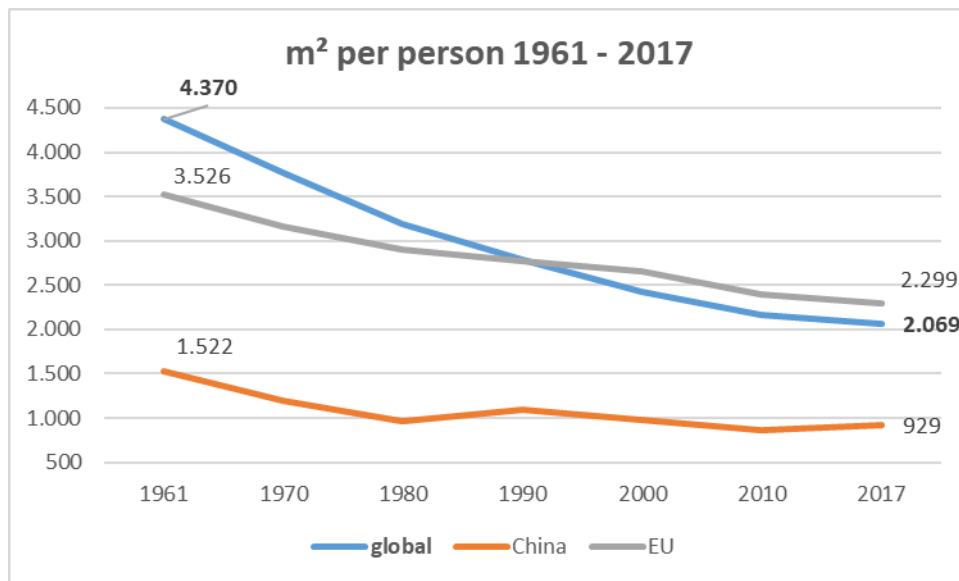
Against this background, basic information on the relevance of agriculture and nutrition is provided in a simple and easy-to-remember way that resonates with specific target groups. Options for action for a more climate-friendly diet are provided which can be easily implemented directly into everyday life.

The basic calculation: 2000 m² per person world wide

		World	China	European Union
Cropland	hectare	1.561.336.753	134.900.000	117.417.558
Total Population	persons	7.547.858.925	1.452.625.244	510.683.324
ha per person		0,207	0,093	0,230

basic calculation of the 2000 m² and historic development of m² per person 1961 to 2017 according to FAO STAT for the year 2017¹

¹ FAO STAT accessed 10. August 2020, <http://www.fao.org/faostat/en/#data/RL> and <http://www.fao.org/faostat/en/#data/OA>



Today China has less than 1000m² of cropland per capita to feed its population of 1.4 billion people. In order to fill the gap of arable land, China applies excessive chemical fertilizers to increase the short term yield efficiency and also import hundred million tons of soybean and other crops to meet the huge demand. More sustainable solutions are needed for solving the food security issues at the global scale.

A lasting experience

A visit to the global plot is an experience that appeals to all senses: seeing, smelling, tasting, hearing and touching, allowing visitors to try out and experience something new. Positive experiences serve as a means to open minds to new knowledge and promote a motivation for change. The global plot provides the relevant knowledge and stimulates action.

The worlds of experience and information in the global plot are freely accessible to everyone. The visit and participation in workshops, field tours and guided tours, especially for school classes and youth groups, is generally free. The researched and always up-to-date information, data, infographics and drawings are made freely available online and on paper in various languages.

The project idea is to be further disseminated. Multipliers should be encouraged and actively supported to realize single modules, possibly even a whole global plot by themselves and thus to impart experiences, knowledge and suggestions for action to more and more people.

"Everything I eat has a place where it grew. I help to shape these places through my way of nutrition." This insight should be established in various forms in the memory of the participants in our teaching programs. The long-term effect of the project consists above all in the sharpened awareness of the connection between one's own consumption of food and other agricultural products and concrete ecosystems and places where they grow, including their biological diversity. The relationship between the soil ecosystem and one's own food and health plays a particularly important role.

As awareness, attitudes and habits are formed at a young age, the global plot is designed so that impactful, long-lasting experiences are taken away by participants. At the same time, the pedagogical multiplication of the project or its components is decisive for its long-term impact. Therefore, multiplication seminars are a central component of the project. In the medium term, the terms "2000 m²" and "global plot" should establish themselves in the media through

multiple use of the 2000 m² narrative thus becoming a recognisable ‘brand’ for the careful handling of the biodiversity and soil that feeds us.

Messages

With the project we want to convey the following key messages:

- **There is plenty for everyone.** 2000 m² can yield far more than one person can eat in a year. The present global production of calories would be enough to feed 12 instead of 7,5 billion people.
- **Every mouthful has its home:** Whatever you eat comes from (at least) one specific spot in the world. When you use it you shape it.
- **My diet is an important part of my personal contribution to global warming,** and I can directly influence this, both positively and negatively, through my eating habits. Through my commitment to food, I can work towards climate-neutral nutrition and agriculture.
- **Reducing agriculture’s carbon footprint is central to limiting climate change:** Our food and agricultural systems (from fertilizer production to food production, processing, transport, distribution, cooking and chilling and wasting) play a key role in greenhouse gas emissions, responsible for around 40% of the total released each year. Food choices therefore have a significant impact on our personal contribution to global warming. **With every purchase we are, in effect, ordering farmers how to cultivate a piece of land.** The food we buy and the price we pay determines how the field can be cultivated.
- **An enormous number of other organisms have to live on my 2000 m² in order to keep the field fertile and to preserve biodiversity.** This requires cooperation and respect.
- **The state of my 2000 m² and whether I can survive on it depends on my consumption and eating habits and the trade, processing and cultivation systems serving my needs.** A considerable part of my field is probably cultivated outside my country. The European Union for example imports about 700 m² per person in addition to the 2300 m² available per person. In China less than 1000 m² are available per person inside the country, but a considerable area is imported, mainly through imports of soybean, cereal, sugar, milk and meat.
- **The global use of arable land for the production of animal feed, energy, fuel and waste must be reduced** in order to prevent the current overexploitation of natural resources and its detrimental impact on biodiversity and global warming. We must reduce production in order to ensure that there will still be enough for everyone in the future.
- **Arable land (as well as meadows and forests) can store carbon from the atmosphere and thus dampen global warming.** A stable **humus structure** (instead of over-fertilisation) stores carbon and at the same time increases fertility, adaptation capacity and resilience of the land.

Target groups

The project aims to provide visitors of all ages and from different realms with real life experiences and appropriate information relating to food and biodiversity, and its connection to a healthy and ecologically, socially and globally just and sustainable diet.

The focus of the educational programme is on children and young people. The thematic workshops and field tours are aimed particularly, but not exclusively, at school classes and youth groups (after-school groups, students, youth clubs, associations, etc.).

Other educational formats such as guided tours, seminars, workshops and advanced training courses are also aimed at adults, especially opinion leaders:

- School and extracurricular educators
- Civil society representatives in the field of sustainable food, agriculture and development, such as consumer, nature and environmental protection organisations, associations and institutions of development cooperation and their media environment
- Policy makers and institutions involved in sustainable food and agriculture
- Media representatives of all sectors, for whom the 2000 m² narrative serves to convey complex contexts
- Companies and their employees for whom sustainable nutrition, health, agriculture and/or development play a special role
- People involved in allotment garden associations or neighbourhood, community, teaching or intercultural gardens and projects.

Education

Educational events for children, teenagers and adults, from pre-school classes to all kinds of specialist events and senior citizens' clubs, are all part of the true meaning of global plot. It is their stage and their laboratory, enabling them to experience, in a fascinating and engaging environment, what is otherwise often an all too dry and complex subject matter. Through these educational events, the field becomes an experience for many that will be remembered for a long time. We are particularly pleased when the field is also used as a learning location by other organisations and institutions.

Audience

It is important to know from the onset to whom the educational offer should be directed and which groups of people are likely to attend. For our global plot we have set ourselves a very broad spectrum of target groups:

- Students and their teaching staff
- in-school and out-of-school teachers
- Representatives of communities with own school or community gardens
- young families, who care about nutrition and agricultural experiences of their children
- Families with a special affinity for healthy food and their own garden
- Grandparents and their grandchildren
- Traditional and modern urban allotment gardeners and their associations
- Sustainability and climate education initiatives, networks and associations
- Committed farmers and processing companies, retail and catering companies
- Young adults and vocational training institutions in the field of agriculture and food
- The media
- Communicators and influencers on sustainable nutrition, gardening, clothing and life style
- Consumer, nature and environmental protection organisations, associations and institutions of development cooperation



Special focus: Climate change and food

While it is important to convey a holistic perspective on all aspects of our food systems impact on the environment, health, culture and social justice, the special relation of our food habits with global warming deserves a particular focus, including its interrelation with other issues.

Experience the carbon cycle

On the global plot, all stages of the carbon cycle and the role played by the greenhouse gas CO₂ can be directly observed: Plants absorb CO₂ and transform the gas into oxygen and carbon. Some of it is incorporated into the soil with the roots and as compost. The humus layer provides the soil with fertility by storing carbon. As it increases, CO₂ is extracted from the atmosphere. A part of it is released again by plough and soil bacteria, another part remains stable in the soil.

Input - Output Greenhouse gases on the field

Beyond this carbon cycle, a lot of CO₂ is released for fuel, the energy for fertilizer and pesticide production, and the production of machinery etc. In addition, laughing gas (nitrous oxide) and methane is emitted in fertilization, anaerobic cultivation processes, decay and animal husbandry. All these greenhouse gases are present in our fields and can be experienced on site.

Heating, Cooling, Transportation

Our food and other agricultural products are often transported over long distances (by air, road, sea) and cooled, stored and heated, often several times during processing. In addition there is normally a packaging stage and often an organic waste and disposal route – all of which must be calculated to get the full picture. Using individual products as examples, these climate backpacks are calculated on site and added to the overall sum of greenhouse gas emissions.

Energy and non-food from the field

In theory our field helps to avoid CO₂ emissions when it becomes an energy supplier itself through agricultural fuel or biogas plants. How much greenhouse gas emissions are in this energy harvest from the field? Does this calculation add up or does it backfire?

Last but not least, we also deal with other non-food products from the field and their climate impact. Cotton, car tyres and new materials from renewable resources also have a climate rucksack on the field.

Event Formats

so far the following event formats have been successfully tested:

- School events (classes 20-40 people)
- Multiplier events
- Seminars
- Visitor groups (10-100 people)
- Workshops (10-30 people)

- with joint cooking
- with other practical elements (root window, microscopy, compost etc.)
- Work in the field (planting, weeding, harvesting)
- regular opening hours for individual visitors, also without supervision
- Celebrations (also sometimes with music and field kitchen, 30-150 people)
- Skype, Zoom, Powerpoint, video presentations and exchanges on the field (daylight display)
- Web based visits with presenters on the field and audience in remote places (home screens)
- Web based presentations with presenters and audience at their home screens

Here is a selection of the educational events for children, young people and adults that we have already developed and offer partly by ourselves, partly through freelancers and partly with cooperation partners.

Eating the field	Every bite has its place. Together we harvest, chop, cook and eat. In a vivid and interactive way, knowledge is conveyed and experienced via an interaction with the senses to help a visitor fully understand how much space is needed for one's own food and where exactly food is produced.
A Rally through the field	With the help of a questionnaire the global plot can be explored individually or in small groups. Answers to questions about food production, soil science, nutrition, climate, biodiversity and resource use can be found on the information boards of the guidance system.
Field Tour	A guided tour to jointly explore the global plot. Puzzles, guessing numbers and haptic elements complement the explanations. Amongst other things, the question is asked why the global plot has 2000 m ² , what grows in the fields of the global plot and what the harvest is used for.
Talk in the field	Field Talks are debates held on a special topic. Speakers present different perspectives on food related topics and discuss them with the audience.
Lesson in the field	Lectures on gardening, health and nutrition, in which experts share practical knowledge and actively involve the participants.
Workshop for multipliers	Volunteers and other interested parties are introduced to the teaching of the global plot and various educational formats.
Field Seminar	One-day seminars on special topics (environment, climate change, agriculture, nutrition, development), which are more impressive in the field and therefore more successful than in a closed room.

Topical events

Here is a selection of topical courses and events addressing different levels of age and competences:

Climate in the garden

This module is especially aimed at allotment gardeners and ties in with their special relationship to soil, self-sufficiency and horticulture.

In a lecture event essential aspects of climate relevance of agriculture and horticulture are presented and discussed:

- Which greenhouse gas emissions directly come out of the garden/field? (methane from paddy fields and ruminants, CO₂ from the soil and from burning of residues and fuel, ammonia and NO_x from fertilizer)?
- Which inputs to the field (fertilizer, pesticides, fuel, machinery) have caused emissions before they came to the plot?
- Which emissions are caused by the products of the field after harvest (transport, cooking, cooling, waste)?

These different sources of emissions are jointly depicted on the field with signs and symbols (e.g. balloons) and then roughly calculated and added up on a blackboard.

In the next session we look at the Carbon that is being extracted from the atmosphere by the plants, converted into sugar and organic matter. We look at the different ways of storing them (stems, fruits, roots) and finally depositing some of the carbon in the soil. From this a simple carbon cycle is constructed and depicted on the field, that would also include fossil carbon (oil, coal, gas).

The next session would then look at the climate “backpack” of different food items and dishes. Here, special emphasis would be given to animal products (meat, milk) and the conversion of plant calories into meat, milk and cheese calories. This is depicted by cultivating all ingredients of certain dishes in one place, including the animal feed for meat and milk ingredients (see areal and climate buffet). Finally participants would design and cook recipes, which are either especially high and low carbon emitting. In addition, they may even compare the nutritional and health properties of these different dishes.

Once these lessons are digested and discussed by the participants, the next step would be to jointly think about how to convey them to children and young people. Some of the hands-on symbols can be used to this end. Participants would be invited to jointly develop stories (fairy tales/fictional narratives) of the different plants and dishes as well as for example, bringing to life the journey of earthworms and other small animals in the soil talking about their roles in the carbon cycle. Also the story of one carbon atom going through diverse stages of the carbon cycle (e.g. CO₂, sugar, root, humus, microbe, CO₂ again) can be developed with the support of an animator.

Participants would then be invited to test their knowledge and concepts with their families and neighbors and to meet again after some time to exchange their experiences, get answers to questions they could not answer at the time and to refine the concept.

Food & Climate

A general introduction to the connection between food and the climate crisis. The tour to different stations on the global plot field (soya, information stand for pigs and stands relating to maize, wheat, rice, rape) provides key information about the different emissions (CO₂, methane, nitrous oxide), and food and feed, agro-fuel and energy stands shows direct and indirect options for change. The tour can easily be combined with the "climate menu" and adapted to the respective level of knowledge and education of the participants.

The climate menu

A joint calculation exercise of the greenhouse gas content of different dishes and ingredients and a compilation of different recipes with high and low greenhouse effect. This can be complemented with an extrapolation of the annual consumption and a comparison with other emission sources such as flight, car and train kilometres, kilowatt hours for computing power, cotton clothing.

The carbon in my plot

Introduction to the carbon cycle: How important is C for life and how does it migrate. How does CO₂ play a role; as food for plants, roots and trees storing C in the soil, microbial degradation, determining the amount of humus in the soil, calculation of CO₂ storage in my plot.

Digging for carbon

With simple means (spade, measuring tape, colour samples) participants determine the humus content of a soil sample taken on site together they calculate the carbon content per square metre.

Emissions from my plot

Which greenhouse gases escape from the soil itself naturally (CO₂, nitrous oxide, methane etc.) and during agricultural activities (methane, CH₄ and CO₂), additional emissions from production of fertiliser, pesticides and other inputs as well as emissions after production such as transport, processing, trade, heating/cooling, waste are investigated. What are the most effective measures to limit them?

Workshop: Can we feed ourselves climate neutrally by 2030?

This full-day workshop combining some of the modules described as an introduction. Based on this, participants will develop and calculate strategies for reducing the greenhouse effect of their own food in the short, medium and long term. They will be supported by experts and introduced to online research possibilities. Additional objectives are also addressed, from biodiversity, water and soil conservation, value of cultural landscapes and food traditions. The result of the workshop is a

joint description of the options for action by government, companies in the sector and farmers, as well as a to-do list from which participants can choose their own plan. The participants are invited to stay in touch and after three months invited to a meeting where results and new findings can be exchanged.

Climate knowledge of goods

This offer is aimed specifically at employees and trainees in the food retailing and catering businesses. It aims to give them a vivid idea of the greenhouse significance of the goods and their processing which they sell, label, store, collect, process and dispose of in their everyday working life. It aims to support the engagement of retail and catering companies in up-skilling and motivating their employees and increasing their competence in advising customers.

Participants will be familiarised with the global plot and its basic messages via the relevant learning modules and get practical information on achieving a more climate-neutral diet. A climate friendly lunch will be prepared together. In the end participants discuss how to apply their new knowledge at work.

The meat and milk tour

Animal products produced from crops grown intensively on arable land are significant "climate killers". Reducing their consumption is by far the most effective climate measure that each and every one of us can take. But meat and milk are produced very differently. Pure grazing, for example, has considerably less impact on the climate than feeding on soya meal from Brazil. Animals also play an important role in many agricultural systems and peasants survival strategies in the countryside.

Soil and climate: How soil can save the climate

What makes soil such an important resource and what impact does it have on our climate? Climate-impacting soil functions and different soil use systems are discussed and possible courses of action for the promotion of humus are developed.

Living soil - getting to know soil biology

Why is soil important for our survival and how do we create and preserve good soil? The importance of and ways to improve soil fertility will be discussed, soil life such as earthworms and compost will be studied as well as the soil effects of different forms of agriculture.

Soil and consumption

How much arable land do we consume with one meal, in one day, in one year and what impact do our consumption habits have on the soil? Advantages and disadvantages of different land use systems are discussed as well as global interrelationships.

Look what's crawling there! Discover agrobiodiversity

There is so much more to discover on a field than just its crops. Soil biology and agrobiodiversity can be made accessible for young as well as more advanced students of all ages as well as for families. Magnifying glasses play an important role here.

What do bees and bats have in common?

A special event dedicated to the world of pollinators. Their habits and specialisations, their impact on harvest and diversity are observed and discussed as are the threats and challenges pollinators experience today.

"Superfoods" and their regional alternatives

There is a whole industry promoting so called "super foods" for their individual health properties, usually based upon the specific micronutrients they contain. However, most of these micronutrients can also be found in traditional food and dishes. Grandma turns out to be a real superfood expert!

Composting made easy - using biowaste intelligently

What significance does composting have for the natural cycle and how can waste be avoided in households and business? Different composting systems are investigated and discussed. Some even work in the kitchen or on a balcony. Organic matter will be presented as precious raw material and not as waste.

Genetic engineering in agriculture

What exactly is genetic engineering and why is it done? What are the advantages and disadvantages of genetic modification of a plant and what are the consequences for agriculture, ecosystems and our health?

Following a crop through the year - from seed to kernel and back again

In this year-round learning program participants accompany one crop from the seed, to the young plants in the field (learning key lessons relating to plant protection) and then through to the fully-grown plant - which can then be harvested and eaten but also used to select and prepare seed for next year.



Learning to grasp plants

Information Points

In addition to the crops, various information booths and installations² are scattered across the field on various topics of special interest. We currently display the following Information Points:

Areal and climate buffet: for a variety of different dishes, all the ingredients needed for one serving (or four servings for a family, if space allows) are grown to scale next to each other in one plot. This might include rice, vegetables, oilseed rape or peanuts for the cooking oil, spices, soybeans and maize as animal feed for meat or cheese, hops and barley for a beer and so on. All the different dishes are arranged next to each other, so the area used per dish can be easily seen and compared to that of the other dishes. Thus, visitors can guess how many square meters they will be having for dinner this evening. They can also estimate what fraction of their 2000 m² this will be and speculate about the waste generated during production of that dish. The areal buffet referring to the space or land necessary to produce the meal can be supplemented by a climate buffet depicting the respective CO₂ emissions (with balloons hanging over the ingredients) of these dishes. Emissions do correlate with the area needed, but are not identical. On a table next to the little plots of this “buffet” the areal need and CO₂ emissions of the different ingredients and dishes are explained in more detail on plates with multiple layers that can be explored by the visitors. Here, also the emissions for post-harvest losses, transport, processing, cooling, cooking and eventual disposal of waste can be estimated and added. This buffet can also be used in small gardens, schools, restaurants and other places where there is not enough space for an entire global plot.



The areal buffet can be combined with our online calculator that would estimate the area needed for any ingredient. Here, people can insert their own recipe or use pre-entered popular examples and learn about the square meters needed for their own dishes. While not been developed yet, this calculator could, with the appropriate additions, also estimate the climate gas emissions in a similar way.



² Construction plans and information material on the individual stations are available upon request.

- **Biodiesel dispenser, plate & tank:** Here we show how far an average car could drive with the biodiesel that can be obtained from 2000 m².
- **Two pigs:** To illustrate the consumption of arable land for animal products, we show



A pig and his food

that 2000 m² would be just enough to grow the necessary amount of soybeans, grains, root crops and other ingredients for the concentrate feed required to fatten two pigs and bring them to a slaughter weight of 115 kilogram. "Imagine you would have to survive from eating nothing but these two pigs over the course of an entire year!" illustrates well the need to reduce our consumption of meat that is produced from crops. Of course, if the pigs were fattened mainly with biowaste or byproducts from food production that are suitable for their rearing, that would change the equation substantially.

- **Trash cans:** Three different dustbins show the different forms of waste and destruction of food, a demarcation line in the field indicates that about one third of the area is cultivated "for the bin"
- **International fields:** Here we present our project partners all over the world under one globe.
- **Root windows:** Many plants are bigger underground than above ground. This is shown by root windows with different plants, including leguminous plants and their root nodules fixing nitrogen.
- **Humus window:** An additional root window contains layers of different soil giving an immediate impression of their respective carbon content and displaying organic material in different states of development.
- **Soil station:** A diagram with magnifying glasses shows which animals and organisms animate our soil and make it fertile. Compost and worm boxes next to it show how humus is created from plant remains.
- **Carbon Panopticum:** Based on the scheme of the well-known charts of the carbon cycle, the most important impacts of agriculture and other food related activities are depicted and described on one huge billboard.
- **Indulgence food:** Cultures such as coffee, cocoa, tea, tobacco, as well as sugar and spices, which "nourish" the nerves of those who consume them (and therefore usually have the potential to be addictive) and are also known as "colonial goods" in Europe are given a special focus. These were the first agricultural products to be traded globally and, together with cotton, were also the foundation of slave trade and other extreme forms of exploitation. In Berlin we present them as a special group of crops, with their products hanging from trees as they cannot be cultivated in northern climates. They could be presented differently in more tropical conditions.
- **Rubber:** Instead of planting rubber trees, 14 m² of the field is covered with car tyres (the most important rubber product).
- **Memorial for the rainforest:** Instead of oil palms, charred tree trunks lie on the surface representing the rainforests felled in Malaysia and Indonesia for oil palm plantations
- **The Climate shelf** Various products (imitations made of synthetic resin) are placed on a large dining table or supermarket shelf. They are connected by a string with a weight

hanging under the table. This weight indicates the greenhouse gas weight of each product (in CO₂ equivalent). A piece of meat may be as heavy as a stone while a large melon is as light as a feather... a surprise effect is guaranteed. The calculations are listed on the tablecloth or on a price tag.

Practicalities on the Field

The field is the heart of the project. It's location is an important key to success. You will probably not find the ideal location, and you may therefore have to make compromises and weigh up your own priorities and possibilities. Establishing a 2000 m² global plot essentially requires

- A suitable surface
- A potentially interested audience
- A professional gardener or farmer
- A team of initiators
- The commitment of supporting individuals and organisations
- Sufficient time to implement the project
- Sufficient financial support

Requirements the area should meet

In our experience, the following points are important when selecting the location:

- good and easy accessibility by public transport
- positive environment (neighbourhood)
- Parking spaces for bikes and cars
- at least 2000 m² of cultivated area (protected from game, dogs and vandalism)
- Crop rotation³, ideally in connection with 4400 m² grassland
- good cultivated soil, if possible already used as a field or garden
- no toxic load, which is an obstacle to the cultivation of food! We recommend analysis for pollutants, nutrients, organic matter content
- Accessibility: paths around and through the field, if possible with a minimum width of 2 metres for groups
- Irrigation possibility
- shady area available, also for compost
- Lockable room or container for equipment, cooking utensils, crockery, information materials and other accessories
- Covered room or shelter for carers inside, reception in case of rain, etc.
- Power supply
- Internet access
- Water supply
- Waste disposal
- WC or dry toilet
- Access for delivery vehicles

Also an advantage, but in our experience not absolutely necessary:

- Access to an event room for 30 to 120 people
- Cooking facilities (mobile enough) with the possibility of washing up and cooling

³ Especially for the large cereal crops crop rotation is necessary. 2000 m² alone are not quite sufficient for this. As we would like to communicate anyhow, that in addition to the 2000 m² of arable land, there are also 4400 m² of meadows and pastures available per person, it would be ideal to have a field of 6400 m² on which we can show both areas and rotate the crops. However, we only have 3200 m² at our disposal on which we have additionally arranged the areal buffet garden and a small event area.

Which crops to grow?

Depending on the approach you take, different cultures and above all different relations are necessary. Approaches that you can follow with your global plot can be, among others

- true-to-scale reproduction of the current global situation on the fields of this world (our approach)
- ideal/realistic replica of a field that can provide for one person for one year

On the initial Weltacker in Berlin, the field is a small-scale replica of the use of the 1,5 billion hectare of cropland as reported by the FAO in its annual statistics⁴. To this end, we show all crops grown globally on more than 2 million hectares wherever possible. These include:

Category	Cultures
Root crops	Potatoes, yams, manioc, sweet potatoes
Vegetables	Tomatoes, onions, watermelons, cabbage, cucumber, pumpkin
Cereals	wheat, maize, rice, barley, millet, rye, oats, buckwheat, triticale
Pulses	Beans, chickpeas, cowpeas, peas, lentils, lupins
Fibre Crops	cotton, jute, fibre flax
Oilseeds	Soya, rape, cotton, sunflowers, peanuts, oil palms, coconut palms, olives, oil flax
Forage	lucerne, ryegrass, clover, grasses, green fodder
Fruits and nuts	bananas, grapes, mango, apples, oranges, cashew nuts
Sugar and indulgence	Sugar beet, sugar cane, tobacco, tea, coffee, rubber, cocoa

Not all leading crops can be grown in Berlin's global plot as they are not adapted to the prevailing climate here. In our field, these crops are listed in the guidance system and represented on the ground by other crops (representatives from the same plant family).

a suitable cultivation plan for crop rotation

The crop rotation concept should be the first step in crop planning if the field is planned for more than one season. The plots for the individual crops (calculated as percentages according to FAO statistics) are all different sizes and are not easily interchangeable. The cultivation for the Berlin arable crop is as follows (diagram in the appendix):

- The total area is divided into seven equally sized plots of 256 m² each.

- The first crop rotation link is clover/grass.
- After the clover/grass comes potato/maize.
- All other plots move in a clockwise direction.
- The permanent crops are located on plots that do not rotate in the crop rotation.
- On our corn field we also grow a "Milpa" (with beans and pumpkins) and a Push & Pull system (with elephant grass and Desmodium).
- After harvest, suitable catch crops are first cultivated (for green manure, soil improvement, humus build-up through phacelia, clover, lupine, oil radish, etc.).
- Compost is first added to root crops and vegetables, then to oilseeds and maize as available.
- All areas should be mulched with green matter wherever possible.
- The last crop rotation element is vegetables/oil crops, with clover/grass being undersown

What work is required in the field and when?

If you are planning to open the fields in spring (recommended), you should start preparation in the summer of the previous year. Of course that depends on whether the area has already been used as a field before. If this is not the case, sufficient time must be planned for the preparation of the field (breaking up with 5 - 6 soil tillage passes). If the area has already been used for agricultural purposes, this step can be omitted. In the second year, the actual global plot can then be planted. From the second year onwards, the cultivation plan can be applied and repeated every year, taking into account the crop rotation.



The ground must be prepared thoroughly.

Table 1: Annual overview of arable land use (for the field in Berlin and comparable locations)

First year

July	from July, ploughing the field, 5-6 tillage passes (for meadow- otherwise 3 shallow working passes are sufficient) with an interval of 10-14 days (preparation for green manure)
August	sow frozen green manure (e.g. mustard, oil radish, phacelia, all except winter cereals and clover/grass), sow clover/grass mixture by the end of August
September	Sowing winter cereals from mid-September to mid-October
October	Hoeing winter cereals between the rows
November	

December

Second year and following

January

February

Ordering seeds and young plants

March

Regulate weeds before they become visible (very important), incorporate/rake off green manure, seedbed preparation (adjust row spacing to crop and tools, see table), start young plant cultivation

April

Finish seedbed preparation, BEFORE sowing or planting, once again harrow (with rake or leaf broom), this significantly reduces wild growth! In dry conditions it is even worthwhile to sprinkle briefly (three to four days before sowing or planting) so that the seeds germinate in the soil. For recommendations for direct sowing in the field or pre-growing and planting see table

May

After germination, chop the seeds immediately!
Planting of the advanced crops from around 20 May (last "ice saint" on 15 May, late frost must be expected until then, varies from region to region)

June

chop or brush all crops two to three times, if necessary weeding by hand in the rows, start of harvest, from now on harvesting of different crops until December is possible (see table)

July

Start of grain harvest

August

Finish cereal harvest, turn over harvested plots and sow catch crops (for suitable catch crops see crop rotation plan), turn over clover/grass from the previous year, work flat twice, sow mustard, oil radish, Phacelia as catch crop, finish new sowing clover/grass mixture by the end of August

September

Sowing winter cereals from mid-September (until mid-October)

October

Hoeing winter cereals between the rows

Who does the work in the fields?

We recommend that at least half a job (15-20 hours) be planned for a professional gardener or farm manager and local farmer. In our experience, in order to cultivate the field successfully and presentably all year round, a professional is absolutely indispensable. Seasonally, this specialist needs additional support from the team or volunteers for peak work periods when setting up, planting and weeding.

Available support

The Foundation on Future Farming is happy to support new 2000 m² projects with many years of experience and services:

- Visits on site when your project has taken shape
- General and specific training seminars
- The example cultivation plan / crop rotation design (see appendix)
- A guidance system for the global plot
- The construction plan for individual field stations
- A variety of educational modules
- Calculations and research on individual aspects
- The concept of the areal buffet
- The food area calculator www.mym2.de
- Information material such as brochures, posters, exhibition boards
- Illustrations and graphical material
- Access to a common 2000 m² website www.2000m2.eu
- Contact to other world farmers at home and abroad



A good guidance system is important.

What the Foundation on Future Farming expects from its partners

In exchange to the support the foundation provides, we expect the following from our partners

- Agreement with our guiding principles and the messages we convey
- Compliance with the Creative Commons rules⁵
- Regular blog posts about their global plot on the 2000 m² website
- Ecological cultivation of the field, avoiding genetic engineering, pesticides and artificial fertilizers wherever possible
- The use of open pollinating seed wherever possible
- References to the joint project and the joint website

⁵ "Attribution-Not Commercial-Share Alike 4.0 International" for texts <https://creativecommons.org/licenses/by-nc-sa/4.0/legalcode.de> and "Attribution-Not Commercial-No Editing 4.0 International" for images <https://creativecommons.org/licenses/by-nc-nd/4.0/legalcode.de>

Working with volunteers

Our global plot in Berlin would not exist in this form without the many volunteers. The volunteers support our team with

- Field work
- Events
- Guided tours in the field
- School events
- Support of information stands and external events

In our experience volunteer support on the field is more successful than with organisational tasks and office work.

Volunteer work requires organizers, especially at the beginning. Fun and success are guaranteed by

- a **permanent contact person** supervising the work and available to answer all questions
- a small **manual** with all important information about the project and the organization
- a **shared calendar** - we keep it on the Internet and all volunteers have access to it to register for their work assignments and plan together.
- **regular meetings** (once a month during the season) where volunteers and team members exchange information and feedback, discuss upcoming tasks and socialise over food and drink.
- **Let's have a party!** Twice a year the team and the volunteers celebrate their cooperation at an internal event.
- **individual training courses** at the beginning of the voluntary work, which in the long run can also be done in self-organisation
- **own projects**, where volunteers realise their special interests

The person responsible for volunteer work in our organisation spends about 20 to 30 hours a



plot would not be possible.

month. Once all processes have been planned and basic structures are established, the initial workload eases. Working peaks are in late spring and summer, winter months can be used for preparations, development of new projects and evaluation.

Without our volunteers our global

Public Relations

Anyone who runs a global plot naturally wants to make it known in order to find visitors and volunteers and to advertise their own educational opportunities. We communicate our project with the following measures:

Project homepage

The tools for you to set up your own project homepage are already available and can be done with simple means and minimal costs – your site will become a resource that is (almost) indispensable.

On our own website we present our project via a regularly updated diary from the plot, we publish current news, run an e-calendar, write a blog and of course promote our educational offers. In addition, we provide directions "How do I get to the field?", introduce our team and offer the use of an online area calculator⁶ allowing our virtual visitors to calculate personally interesting data ie. 'How many square meters are in my dinner and breakfast'? In addition there are numerous downloads available on the website that complement our project.

Social media

In addition the project uses

- Facebook: suitable for texts, pictures, event announcements.
- Instagram: here you can publish mainly photos, supplemented by a little text. We use Instagram for our field updates.
- Twitter: Suitable for short messages.
- YouTube: Here you can publish self-made videos. Our regular column "Frag den Gerd" gives tips about gardening.
- Wechat: in China most people use this all-in-one platform

Newsletter

Our newsletters provide information about everything to do with the global plot and we relay information about current events via e-mail. We also publish the contents on our website.

⁶ <https://www.2000m2.eu/de/mym2/>

Costs

Below you will find a list of all cost items incurred by our project in Berlin, which may serve as a guide. You will have to find out for yourself if and to what extent these costs will be incurred in your project.

- **Personnel costs**
 - Professional gardener/farm manager/local farmer
 - Project coordination (including concept, fundraising, external representation)
 - Speaker/lecturer
 - Event management, coordination of the volunteers
 - Internships, Voluntary Services
 - Public relations (website, newsletter, social media, press work)
 - Graphics, illustrations, layout
 - Accounting and controlling
- **Material costs on the Field**
 - Control system
 - Material and equipment costs
 - Seeds and plants
 - Event costs (material costs, technology, catering)
 - Travel and transport costs
 - Insurance
- **Office material costs**
 - Rent
 - Office supplies
 - Communication (postage, telephone, internet)
 - Hardware, software
 - Printing costs

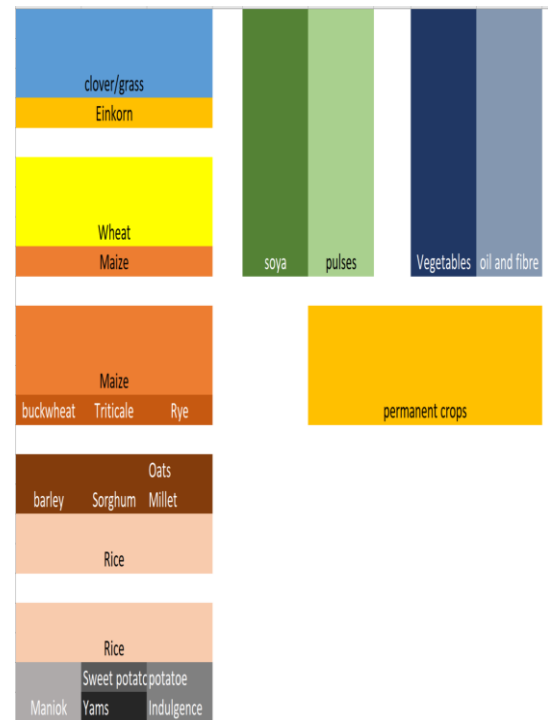
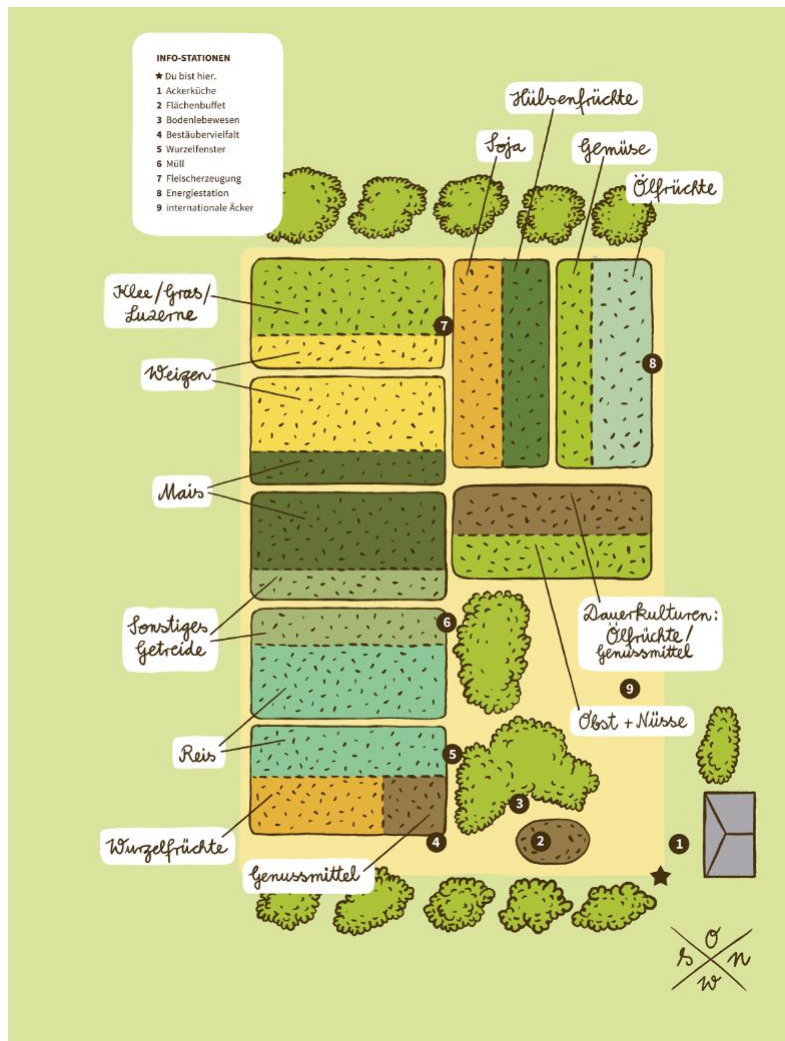
Annexes

Annex 1: List of crops and their respective areas

crop	area in m ²	Remarks	Sowing type	Height (cm)
Wheat	297,54	Winter wheat	Direct sowing	120
Corn / maize	273,75	Non hybrid conservation variety	Precultivation	200
Rice	223,66	Pre-breeding early April	Precultivation	60
Barley	70,28	Winter and Spring Barley	Direct sowing	120
Millet, sorghum	49,80	Conservation variety	Precultivation	180
Millet	39,69	Conservation variety	Direct sowing	150
Rye	8,23	Winter or summer rye	Direct sowing	180
Oats	13,98	Bare Oats	Direct sowing	120
Buckwheat	3,25		Direct sowing	120
Triticale	5,47		Direct sowing	180
985,67		Grain total		
Potatoes	27,37			60
Yams	10,23		Precultivation	200
Manioc	34,05			60
Sweet potatoes	11,47		Precultivation	20
83,12		Total root crops		
Bean	49,93	different varieties	Direct sowing	60
Chickpeas	24,06	black chickpea	Direct sowing	40
Cowpea	20,97		Direct sowing	40
Lenses	7,53	conservation variety	Direct sowing	60
Peas	12,32		Direct sowing	30
Lupines	1,09	blue edible lupine	Direct sowing	60
115,90		Total legumes		
Soya	152,16		Direct sowing	80
Sunflower	40,34		Precultivation	160
Canola	56,62	Summer rape	Direct sowing	120
Linseed	3,46		Direct sowing	40
Cotton	50,30		Precultivation	90
Peanuts	37,37		Precultivation	30
340,25		Total oilseed		

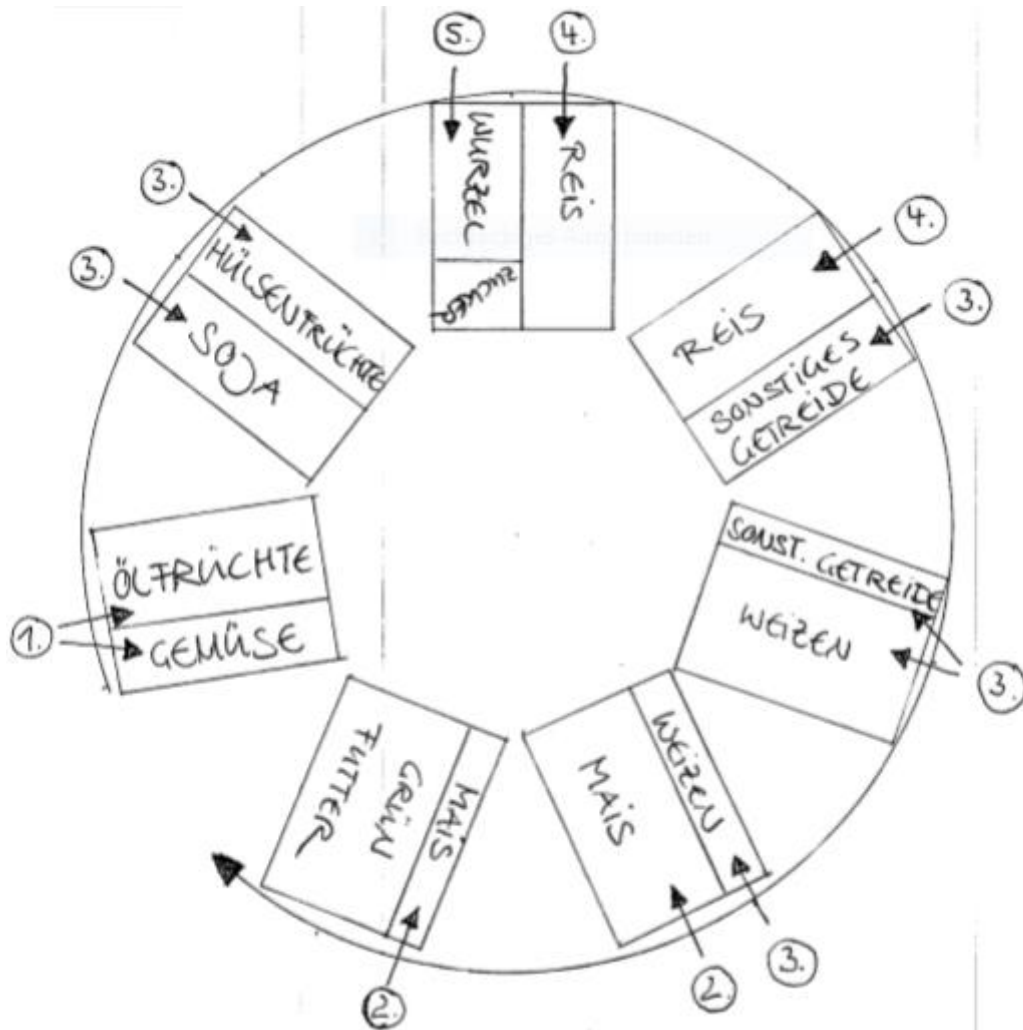
Tomatoes	9,06	cultivated seed breeding	Precultivation	180
Onions	8,47	cultivated seed breeding	Precultivation	30
Cabbage	4,72	Kale	Precultivation	180
Cucumbers	4,09		Precultivation	20
Pumpkins	3,46	Can include Zucchini	Precultivation	50
Peas	4,44		Direct sowing	60
Melons	6,71		Precultivation	50
other	38,10	Kitchen garden for local varieties and spices		
79,05		Total vegetables		
Fibre flax	3,19	Fibre flax	Direct sowing	max. 60
Lucerne		Mixture		40
Clover		Mixture		40
Grass		Mixture		
	211,50	Total green fodder		
Sugar Beet	5,93		Direct sowing	30
Sugarcane	36,63		Precultivation	300
	42,56	Total sugar		
Tobacco	5,75		Precultivation	150
other	6,02			
1873,00		Subtotal		
Bananas	14			
Wine	9			
Oranges	5			
Apples	7			
Other Fruits	36			
Mango	7			
Cashew	7			
Other Nuts	7			
Oil Palm	24			
Olives	14			
coconut	16			
Rubber	14			
Coffee	13			
Tea	5			
Cocoa	13			
	191	Total permanent crops		
	2064,00	Grand Total		

Schematic illustration of the Berlin cultivation plan



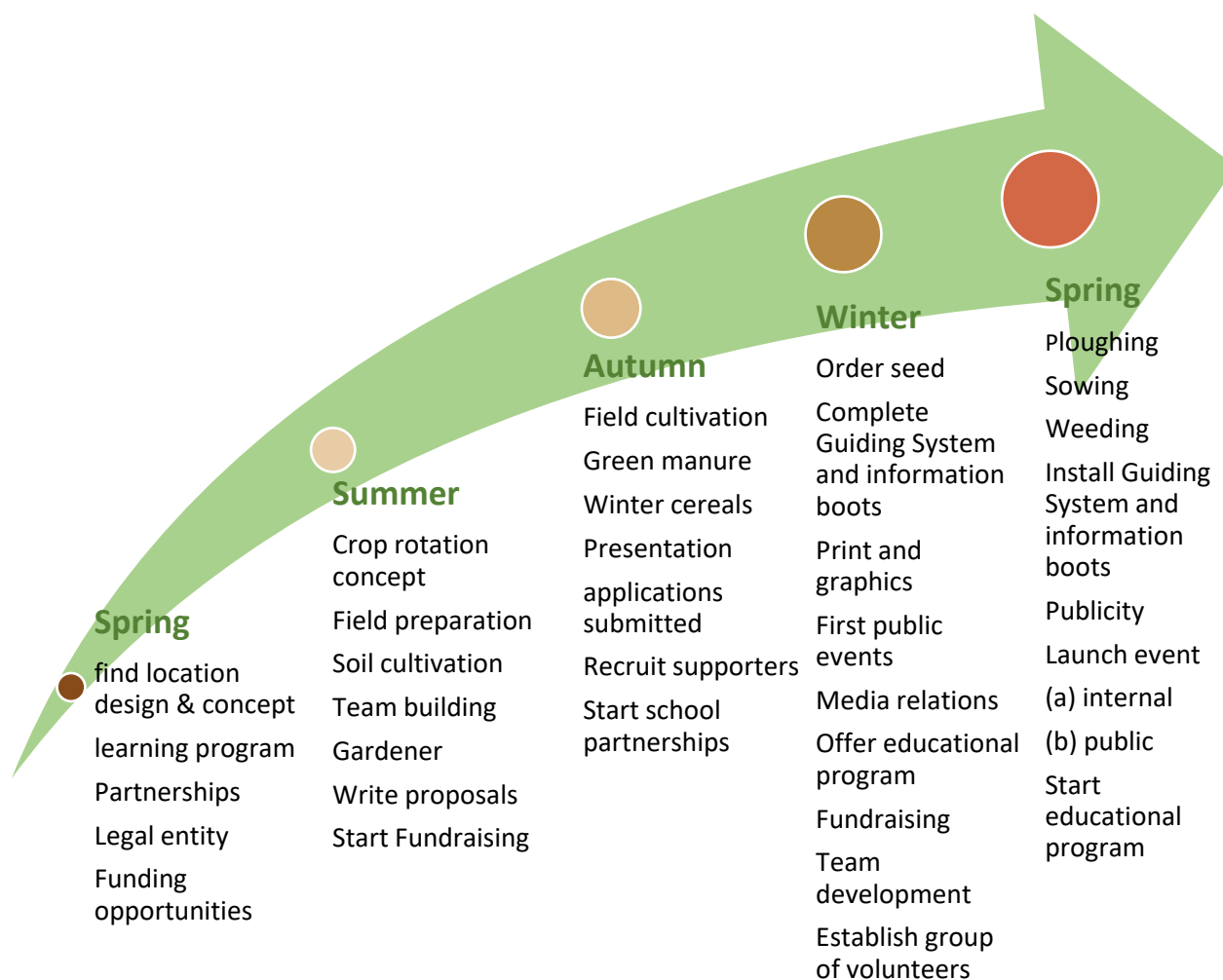
Annex 2: Crop rotation and cultivation plan (Berlin)

For conceptual purpose only, needs to be adapted to each local and climatic situation



1. compost 600dt/ha (0.75m³/100m²), clover/grass as undersown or catch crop
2. undersowing with Persian clover, possibly compost 300 dt/ha (0.375m³/100m²)
3. subsequent crop: Phacelia (mustard, oil radish)
4. undersowing in mid-August (e.g. Phacelia)
5. compost 600 dt/ha

Annex 3: A Project Timeline



Annex 4 : Mission statement and Code of Conduct

This mission statement and policy of the 2000 m² global plot is reflected in its operational management (from the horticultural cultivation on the global plot, to cooperations/partnerships, to the software of operational financial management) as well as in the organisational culture, including the ecological and social dimension of our actions.

1. We respect the dignity and protection of life as the basis of our actions (compliance with human rights, national laws, etc.)
2. We strengthen the commitment to solidarity and thus to the common good by setting an example and by our own actions.
3. We prefer to cultivate open pollinating organically bred arable crops and manage the arable land without chemical pesticides and artificial fertilizers
4. As a non-profit organisation, we commit ourselves to adhere to these ethical standards at all project levels and create the appropriate framework for our employees.
5. We carry out our activities with integrity, truthfulness and honesty
6. We ensure and improve the quality of our work by giving our full-time and voluntary employees the opportunity to build up, expand and reflect on their professional knowledge, skills and competencies.
7. We cultivate an open and trusting professional exchange between our own employees and those of other organisations, also beyond the national framework.
8. We ensure that all paid employees are paid on a non-discriminatory basis and that remuneration models are transparent.
9. We strive for the greatest possible transparency and do not enter into any obligations towards supporters, service providers or employees that unreasonably restrict our actions.
10. Our relations with third parties should
 - a. be consistent with the environmental and social objectives of the 2000 m² global plot described above
 - b. protect the name 2000 m² - global plot and promote its positive perception as an active, independent, international and credible organisation,
 - c. contribute to progress towards the achievement of our objectives.
11. Every global plot finances itself independently. Sponsorship and support by organisations, companies or institutions that are in conflict with human rights, environmental protection, our mission statement or our goals are to be rejected, as are donations that could compromise the goals, independence, values or integrity of the organisation. We reserve the right to refuse donations or other support.
12. Companies and organisations that have been proven to be guilty of corruption, fraud, serious environmental degradation, serious violations of international human and labour rights, food speculation or similar unacceptable acts must be strictly excluded. The core business should not be in areas incompatible with the objectives of the global plot Initiative.
13. We oblige all those acting on our behalf to comply with the basic rules of ethical conduct of the 2000 m² project. We also make these basic rules binding for those acting on our behalf.

14. 2000 m² of initiatives can use the common logo and illustrations as long as they are in line with our mission statement, follow common goals and are in line with our values.
15. All 2000 m² global plots that are active according to this manual are presented on the website of the Berlin global plot at www.2000m2.eu