LEARNING AND ACTING FOR CHANGE

Fondazione Barilla
il tuo cibo, la tua terra

10 WORDS FOR SUSTAINABLE DEVELOPMENT

CONTENTS

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Teaching sustainable development: Change is in our words and in our hands.

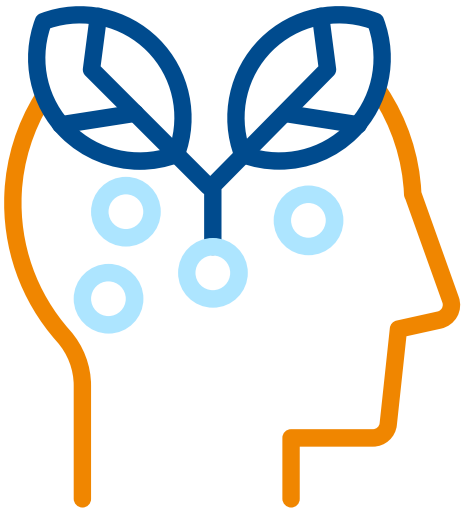
Education as "the ability to harmonize the mind (knowledge), the heart (sensitivity) and the hands (action) in a process consistent with pedagogical learning rhythms" (From: In cammino per la cura della casa comune a cinque anni dalla Laudato sì, page 46).

Education for food and environmental sustainability, agricultural production policies, with a view to ensuring a fair distribution of resources among the inhabitants of the planet, is a founding element of training for active and responsible citizenship.

The UN's **2030 Agenda** established 17 Sustainable Development Goals (SDGs) to be achieved within the next 10 years. The objectives relate to protecting the environment and natural resources, but also involve the construction of sustainable cities, guaranteeing or providing access to ways of living that are inclusive and respectful of the fundamental rights of people, beginning with health, mental and physical well-being, food security, decent work and protecting the tangible and intangible assets of communities. This core theme fully covers the aspects of health education and environmental protection. **So, why should we talk about food?** Because issues related to food, its consumption and production, can be used to describe the resource management processes of our planet, the critical issues of the current system and its effects on the environment and health. They are also useful for highlighting cultural diversity and belonging, as well as for stimulating sharing and participation in local life and local communities. Last but not least, eating is a primary need: our daily choices have the **power to change**, because they can bring direct or indirect benefits to sustainable development.

Learning and acting for change

is an educational tool for teachers and educators, created to stimulate action, starting from knowledge of facts.

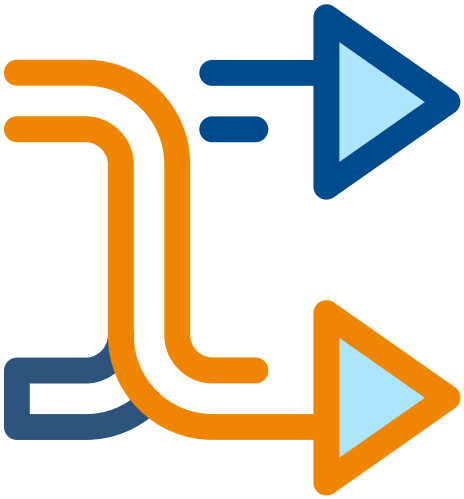


LEARNING:

I understand **words and concepts** associated with **food sustainability**;

ACTING:

I identify a **series of useful actions** to generate **change**;



FOR CHANGE:

Now that I have understood, I take **small daily actions** that can have a **real and major impact on the 2030 Agenda**, for both my **health** and that of **the planet**.

It is therefore an "enhanced dictionary" that aims at stimulating curiosity and goes beyond simple knowledge, because it provides elements of reflection for the development of critical thinking, helps to plan and experiment with different actions, so that more informed action can be taken from a social and environmental point of view.

Specifically, this tool **consists of 10 words which summarize the main elements and stakeholders of food and environmental sustainability**. Each term provides a definition and in-depth material, divided into several levels, allowing the topic, the actions for change and the direct and indirect effects that can be achieved in terms of sustainable development to be addressed with students. Finally, there is a number of tips and exercises to use the words in a creative way, taking into account different learning skills.

While the words can be used to talk about our current state of health and that of the planet, the actions serve to emancipate the citizens of tomorrow, making them proactive and responsible, while the focus on change enhances the feeling of reality and removes the feeling of impotence that can be experienced when faced with the extent and complexity of the problems associated with sustainable development. **Small daily actions** are in fact fundamental and can have a significant impact on the environment, as a driver of changes that rise from the bottom.
The transition towards more sustainable diets, which are needed to keep the population and our planet healthy, needs to be part of a more complex system of interventions and policies. In this frame, education for active and responsible citizenship is a fundamental step, because it develops critical skills and approaches, and shapes a common vision of the future, where caring for our "home" comes first.

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BIODIVERSITY

Biodiversity, from the Greek word "bios" (life), refers to the extraordinary variety of plants and animals that live in nature and interact with one another in their natural habitats and ecosystems.

Biodiversity is not a fixed value, because within the environment the quantity of plant or animal species can increase or decrease over time due to various factors that can be either natural and/or the result of human activity.

There are 3 levels of biodiversity:

1. **Genetic biodiversity:** the variety of genetic information contained in all individuals of the same species.
2. **Species or taxonomic biodiversity**: the set of species (and the relationships they maintain among themselves) that inhabit a certain region of the earth.
3. **The biodiversity of ecosystems**: the set of all of the natural environments in which life is present on our planet (for example, the forests, coral reefs, underground environments, the deserts, etc.).
The disappearance of these environments involves a risk of **extinction of the species that live there**.

Biodiversity mitigates the risks of ecosystems, whether they consist of agricultural land, a forest or the sea, and a loss of biodiversity contributes to food insecurity, because it impoverishes the ecosystems, leaving them more vulnerable. This means that they may no longer be able, on their own, to cope with sudden changes or attacks, as in the case of climate change or natural disasters.

BIODIVERSITY

- ***Why is it dangerous to lose biodiversity?*** Biodiversity is an essential source of wealth and natural resources that are fundamental for understanding life on Earth, adapting to changes and defending ourselves from attacks such as diseases. In fact, when a threat arises, the genetic variety of species and ecosystems allows alternatives and species/contexts to be found that are suitable for survival and reproduction.

- ***What causes biodiversity to be lost?*** Around 75% of the terrestrial environment and 66% of the marine environment are currently estimated to have been significantly modified and about 1 million animal and plant species are at risk of extinction. Several factors are directly or indirectly responsible for the loss of biodiversity, such as pollution, soil consumption, climate change or the introduction of alien species (i.e. species not native to a specific ecosystem). These factors, however, often have a common origin, which is human activity. For example, overfishing or fishing in protected areas, hunting for rare species for trade, loss of tropical areas and forests, pollution of the seas or land, modification of an ecosystem due to sudden climate changes (such as floods or droughts) are all factors that contribute to a loss of variability in the forms of life or variety of organisms (animals and plants) in a particular place, thus depleting our planet of important resources.

- ***Can the loss of biodiversity be stopped?*** Yes, and both direct and indirect action can be taken. Direct intervention includes trying to conserve species and ecosystems by law, creating oases, reserves and other forms of protection. Indirect measures aim at containing the impact of the factors that cause biodiversity loss. Examples are not only pollution control measures but also more sustainable consumption choices and reducing consumption and waste.

[1] Data source: IPBES 2019

BIODIVERSITY

Further details are available in chapter 1 of the teaching guide and in the following articles of our online magazine:

- A quarter century of responsible fishing:
  https://www.barillacfn.com/en/magazine/food-and-sustainability/a-quarter-century-of-responsible-fishing/

- Biodiversity: bees work better in the city.
  https://www.barillacfn.com/en/magazine/food-and-sustainability/biodiversity-bees-work-better-in-the-city/

- Save the bees for a sustainable development!
  https://www.barillacfn.com/en/magazine/food-and-sustainability/save-the-bees-for sustainable-development/

- Land sharing vs land sparing in the debate on food security and biodiversity.
  https://www.barillacfn.com/en/magazine/food-and-sustainability/land-sharing-and-land-sparing-in-the-debate-on-biodiversity/

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BIODIVERSITY

Acting - actions for change

1. Prefer seasonal agricultural products.
2. Prefer seasonal fish products.
3. Choose local products.
4. Choose products from environmentally friendly farming.
5. Reduce your consumption of meat and animal products.
6. Avoid wasting food as much as possible and redistribute surpluses.
7. Choose tap water, whenever possible, instead of bottled water.
8. Do not waste running water by properly closing taps and repairing them if they are leaking.
9. Use appliances, such as dishwashers, that save water as well as energy.
10. In the garden and in the vegetable garden, opt for drip irrigation rather than a water hose and run it in the cooler hours such as in the morning and after sunset. Another idea is to collect rainwater and use it to water plants and flowers, or recycle the water used to rinse fruit and vegetables in the kitchen.
11. Support biodiversity protection/awareness campaigns and actively participate in events/initiatives for its protection.

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BIODIVERSITY
For change

Small daily actions play an important role in stopping the loss of biodiversity because our choices, and particularly those relating to consumption, can have a direct impact on its protection, thus contributing to the achievement of various Sustainable Development Goals.

Some of them are described below:

SDG 2
Zero hunger.

Ending hunger, achieving food security, improving nutrition and promoting sustainable agriculture. **There can be no sustainable development unless hunger and food insecurity are wiped out**. Biodiversity is fundamental to protecting the global food security that COVID-19 has recently worsened. Loss of biodiversity makes plants and animals more vulnerable to parasites and diseases. Genetic, species and ecosystem variety, on the other hand, is the basis of healthy, nutritious and sustainable diets, reinforcing rural livelihood and the resilience of people and communities.

BIODIVERSITY
For change

SDG 14
Life below water.

Conserve and sustainably use the oceans, seas and marine resources for sustainable development. Fish resources are not inexhaustible, but fish is a food that has traditionally been eaten by many populations and cultures, including those in the Mediterranean area. The concept of seasonality is important there, as it applies not only to fruit and vegetables but also to fish. For example, buying fish that has been caught during its breeding season threatens the species reproduction and prevents the relevant population from being large enough to meet consumption. The same problem occurs if fishes are caught too small, before they can reproduce and contribute to the preservation of their species. Observing seasonality and opting for fish from nearby marine areas ensures you are buying and consuming fish products that protect marine biodiversity.

SDG 15
Life on land.

Forests, mountains and land provide a myriad of environmental goods and services: clean air and water, conservation of biodiversity and mitigation of climate change. Today, however, natural resources are deteriorating and biological diversity is decreasing around the world. To preserve diversity in agricultural systems, more sustainable farming techniques are needed. For example, agroecology improves the nutrient cycle in soils and regulates microclimates, which are essential for life on earth.

[2] Based on initial assessments, still under investigation, in 2020 the number of undernourished people in the world could increase by between 83 and 132 million people due to the COVID-19 pandemic, depending on the potential economic scenarios.

Source: FAO (2020). The state of food security and nutrition in the world.

CLIMATE CHANGE

The climate and the weather systems have always changed, particularly due to volcanic eruptions, changes in solar activity or the chemical composition of the atmosphere. Nowadays, however, when we talk about climate change we mean a change in the climate that is directly or indirectly attributable to human activities, which alter the composition of the planet's atmosphere and which is additional to the natural variability of the climate observed over similar time intervals.

The term climate change is related to two other important words: **global warming and greenhouse gases**. Global warming is a climatic phenomenon involving a general rise in the average temperature of the Earth's surface, in particular that of the oceans and of the atmosphere that surrounds our planet. Global warming is caused naturally by the sun's rays, but human action has accelerated this phenomenon, by producing more and more greenhouse gases. These gases are present in the atmosphere and tend to block the emission of heat from the earth's surface, from the atmosphere and clouds, thus hindering its escape into space. They work like the glass in a greenhouse, hence their name. These gases can be either natural or the result of human activity. Natural ones are part of life on Earth because they help keep the planet at the right temperature, making it suitable for life, while those deriving from our industrial activities and changes in land use are causing temperature to rise above the range of oscillations that have occurred over the course of human history and risk making the Earth inhospitable (in certain areas this is already happening). Human activities that contribute to climate change include **food systems** which not only **contribute up to 37%** of greenhouse gases caused by humans, but are also responsible for the excessive use of precious resources such as water and soil.

CLIMATE CHANGE

- ***What are the main consequences of climate change?*** Climate change is having various negative consequences in all areas of the Earth: melting ice caps, rising sea and ocean levels, acidification of sea water and increasing extreme weather phenomena (e.g. unprecedented floods, droughts and heat waves). These phenomena are expected to intensify in the coming decades and present serious risks to human health, wildlife, society and the economy.

- ***What are the risks to food security?*** Climate change is a major threat to our food security. Extreme weather events, long-term temperature changes in certain areas of the planet, changes in humidity levels, the amount of precipitation or heat waves are already causing various problems for the entire agricultural sector (including the spread of diseases, parasites or the establishment of "alien" (allochthonous, exotic, non-indigenous, non-native) species affecting the quality of production. Finally, the warming of sea water and oceans leads to imbalances in the composition of nutrients and in the proliferation of toxic algae that negatively affect the amount of fish and seafood available.

- ***Which countries are most affected by climate change?*** Developing and poorer countries are often the most affected by climate change, not only because they are in climatic areas where extreme weather events (such as floods or periods of prolonged drought) are concentrated, but also because the people who live there depend heavily on the ecosystem around them for their survival and have very few resources and technologies to cope with changes. The Mediterranean area is also highly at risk. Average temperatures in the region are rising at a faster rate than the world average. This means that farmers in the area must adapt their practices to cope with the consequences of rising temperatures, changes in seasonal rainfall, as well as the presence of new types of pests and diseases and the possible threats that could arise as a result.

CLIMATE CHANGE

Further details are available in chapters 1 and 4 of the teaching guide, in the online sustainability training course (MOOC) – Chapters 4 and 6. In the BCFN publication Fixing Food: The Mediterranean Region (https://www.barillacfn.com/en/publications/fixing-food-the-mediterranean-region-bcfn-foundation/) and in the following articles of our online magazine:

- The complex link between trade, food and climate change: **https://www.barillacfn.com/en/magazine/food-and-sustainability/the-complex-link-between-trade-food-and-climate-change/**

- The climate redefines the boundaries of agriculture: **https://www.barillacfn.com/en/magazine/food-and-sustainability/the-climate-redefines-the-boundaries-of-agriculture/**

- A trillion trees to combat climate change: **https://www.barillacfn.com/en/magazine/food-and-sustainability/a-trillion-trees-to-combat-climate-change/**

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CLIMATE CHANGE

Acting - actions for change

1. Prefer plant-based proteins and fats rather than animal ones.
2. Eat sustainable fish and other fish products two to three times a week.
3. Choose seasonal agricultural products.
4. Buy seasonal fish products.
5. Choose local products.
6. Prefer products from environmentally friendly farming.
7. Where possible, consume food and drinks in containers that can be reused and refilled several times, and recycle the containers properly after use.
8. Use your own reusable shopping bag.
9. Get involved in the dialog and support movements to contain climate change.

CLIMATE CHANGE
For change

Small daily actions are important for achieving the 2030 Agenda. Here are just a few examples of Goals that we can achieve through our daily consumption choices.

SDG 6
Clean water and sanitation.

Saving water, especially through our diet, by choosing foods that need less water to be produced, helps to increase the availability and sustainable management of water and sanitation. Agriculture consumes 70% of the fresh water we take from surface and underground sources and we are using more water than can be regenerated. It is essential to learn how to manage water consumption in a sustainable way because competition for its use (deriving from agricultural, industrial and domestic sectors) is very high and **irrigation has significant environmental impacts**.

SDG 13
Climate action.

A diet that favors plant-based foods (e.g., cereals, legumes, fruit and vegetables), like the Mediterranean diet, **helps to fight climate change**. Globally, the agricultural sector consumes 70% of fresh water and produces up to 37% of the greenhouse gases responsible for climate change. Intensively farmed meat requires more resources because animals need to be fed corn, cereals, hay and it takes a lot of land and water to produce animal feed. Plant-based food, however, can be eaten directly by humans, thus saving precious resources.

CLIMATE CHANGE
For change

SDG 17
Partnerships for the goals.

The transition to more sustainable food systems inevitably requires political dialog and coordination between the various institutions that represent citizens. Awareness of the problem and knowledge of the actions needed for change are the basis for long-lasting transformations that strengthen the means of implementation and encourage renewal of the global partnership for sustainable development.

DESERTIFICATION

Desertification means "land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities". It is a climatic and environmental process affecting the earth's surface that leads to the degradation of soils, the disappearance of the biosphere (i.e. flora and fauna) and the transformation of the natural environment into a desert. As in the case of climate change, it is a natural phenomenon, but it is often caused by humans or, in any case, accelerated by human activities. For example, overgrazing and deforestation can lead to desertification because both remove or damage the vegetation that protects the soil and keeps it moist and fertile. Similarly, using water inefficiently, for example through inadequate irrigation techniques, reduces the global water supply in a specific area, threatening local vegetation and promoting desertification.

Taking care of our soils is fundamental, for example by regenerating ecosystems and planting trees. In fact, soil erosion inhibits our ability to grow nutritious food, leads to ecosystem degradation, decreases water resources, damages infrastructure and increases poverty and migration.

DESERTIFICATION

- ***What is the link between desertification and climate change?*** Desertification and climate change are linked to each other by a two-way process, as climate change affects desertification processes and vice versa.

  In the first case, the increase in average temperatures and the intensification and worsening of extreme weather phenomena (e.g. floods, droughts, heat waves) enhances soil degradation (i.e. reduction or loss of biological or economic productivity), because dry soils are prone to erosion. When flash floods occur the top layer of the soil is quickly washed away, further aggravating the degradation of the surface. Soil degradation also contributes to greenhouse gas emissions into the atmosphere, increasing the risk and effects of climate change, as well as the loss of biodiversity.

- **Are desertification processes also affecting Europe?** The data collected and projections relating to climate change in Europe show that the risk of desertification is increasing.
  In Southern Europe, both in Italy and Spain, there are already some warm semi-desert areas where the climate is changing from temperate to dry, but the phenomenon is also spreading northwards. Collected data suggest that greenhouse gas emissions of human origin have considerably increased the likelihood of droughts in the Mediterranean region.

[3] "United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa" (UNCCD), Artic;e 1 (1994).

DESERTIFICATION

- ***Can desertification and land degradation jeopardize food security?*** Yes, soil degradation can reduce yields by as much as 50%, because it reduces the amount of nutrients available to plants and the space for them to take root. Furthermore, the crops that do grow tend to be of lower quality, deformed, smaller and poorer in nutrients, with negative consequences in both economic terms (because the products are harder to sell) and nutritional terms (because of their inferior quality). Moreover, 12 million hectares of arable land are lost every year due to desertification and drought alone, which is equivalent to losing about 20 million tons of a grain crop, endangering world food production as a whole, which is facing a significant increase in global population.

  Further details are available in the online sustainability training course (MOOC) – Chapters 5 and 6 - and in the following articles of our online magazine:

- Desertification and the global sustainability challenges: **https://www.barillacfn.com/en/food_sustainability_weekly_report/analysis/la-desertificazione-tra-le-sfide-globali-della-sostenibilita/**

- World Day to Combat Desertification and Drought: give the floor (and power) to the people: **https://www.barillacfn.com/en/magazine/food-and-sustainability/world-day-to-combat-desertification-and-drought/**

[4] Data source: UNDP (2019). Combating land degradation - securing a sustainable future

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DESERTIFICATION

Acting - actions for change

1. Prefer, if possible, seasonal products locally grown with environmentally friendly farming practices.
2. Reduce your consumption of meat and animal products.
3. Choose tap water rather than bottled water.
4. Do not waste running water by properly closing taps and repairing them if they are leaking.
5. Use appliances, such as dishwashers, that save water as well as energy.
6. In the garden and in the vegetable garden, opt for drip irrigation rather than a water hose and run it in the cooler hours such as in the morning and after sunset.
7. Plant trees and plants.
8. Support soil protection awareness campaigns and actively participate in events/initiatives for its protection.

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DESERTIFICATION
For change

Small daily actions are important for achieving the 2030 Agenda. Here are just a few examples of Goals that we can achieve through our daily consumption choices.

SDG 2
Ending hunger, achieving food security, improving nutrition and promoting sustainable agriculture.

There can be no sustainable development without achieving food security, however, hunger and food insecurity in the world are now rising again and, according to current forecasts, the number of undernourished people could exceed 840 million by 2030, especially due to wars, climate change and extreme weather events (e.g. drought, floods, hurricanes), but also due to the consequences of the economic slowdown, as in the case of the COVID-19 pandemic. With an increasing world population and changes in diet/lifestyles, a rethink of the approach to food production is required to include respect of the environment, elimination of losses and waste while ensuring equitable access to food. However, desertification and drought alone are leading to the loss of 12 million hectares of arable land every year, which is equivalent to losing nearly 20 million tons of cereal crops.

DESERTIFICATION
For change

SDG 12
Responsible consumption and production.

Sustainable consumption and production are intended to achieve the greatest possible yield with the least amount of resources: the goal is ensuring that economic activities can provide the greatest benefits in terms of well-being by reducing the use of resources, degradation and pollution throughout the entire production cycle, thus improving the quality of life.

SDG 15
Life on land.

Deforestation, desertification and soil degradation, caused by climate change and human activities, pose considerable challenges to sustainable development and the well-being of the planet and are putting a strain on the lives and livelihoods of millions of people struggling against poverty. It is therefore important to protect forests and combat desertification.

DIET

Food provides the body with the energy to run its metabolism and vital functions. A balanced diet must also consider all the physical, chemical and physico-chemical transformations that the nutrients undergo in the digestion and/or assimilation process.

Eating properly and being **physically active** are **fundamental to ensure health**, longevity and quality of life in all age groups. Scientists agree that a balanced diet is based on a proper distribution throughout the day of the main food groups: **fruit and vegetables; tubers, cereals and their derivatives; milk and derivatives; meat, fish, eggs and legumes; fats and seasonings**.

- ***What are the healthiest eating pattern?*** One of the eating pattern that is most acclaimed for its nutritional quality and its ability to help preventing non-communicable diseases is the Mediterranean diet. It is characterized by a high consumption of vegetables, legumes, fresh fruit and nuts, olive oil and cereals (approximately 50% wholegrain); regular but not excessive consumption of fish, especially fatty fish; a moderate amount of dairy products; and a more moderate consumption of meat (especially red meat and processed meats) and sweets.
  Healthy food paves the way for healthy blood vessels, strong bones and muscles, a sharp mind and much more besides. The Mediterranean diet[5], for example, has received a lot of attention from the scientific community, and numerous studies show a reduction in the risk of chronic diseases, a reduced risk of frailty, and an improvement in mental and physical function thanks to its anti-inflammatory and antioxidant properties.
  Furthermore, the Mediterranean diet is a delicious way to eat and be together.

DIET

- ***How are we eating today?*** More than 2 billion people are overweight or obese. This is caused by an imbalance between energy intake and energy expenditure. Globally, there is an increased consumption of energy-dense foods, high in fat and sugar, and a decrease in physical activity due to sedentary jobs, transportation use and increasing urbanization. According to the Food Sustainability Index [6], in Italy, 37% of children and adolescents, and 59% of adults, are overweight, and the population is moving away from the Mediterranean diet.

- ***Does eating well protect against infectious diseases?*** No diet can protect us against viruses, nor is it possible to improve the performance of the immune system in a short space of time. However, a body that is regularly correctly fed is a healthier one, which better responds to health risks. There are no "miracle foods", a healthy diet must be promoted as a lifestyle and not limited to specific times of the year.

- ***Is a healthy diet also an environmentally friendly one?*** Food is an important component of our daily life, both in terms of health and impact on the planet. With a healthy diet, we can also be sustainable, fight climate change and contain global warming. The Su-Eatable LIFE[7] project involves EU citizens in adopting a healthy and sustainable diet, which leads to a substantial reduction in GHG emissions and water savings, through a series of experiments conducted in university and company canteens.

Further details are available in chapter 2 of the teaching guide, in the special report entitled "Living healthily: let's start with food", in the exercise section and in the online sustainability training course (MOOC) - Chapter 9 and in the BCFN publication (2019) "Italy and food" ***https://www.barillacfn.com/en/publications/italy-and-food/***.

[5] Fonte: https://foodsustainability.eiu.com/

[6] Source: https://www.sueatablelife.eu/it

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DIET

Acting - actions for change

1. Avoid excess calories, like those from sugary drinks and snacks high in fat and sugars.
2. Distribute food over the course of the day (for example, having three moderate-sized meals, and two snacks).
3. Control portion sizes and avoid eating in-between the 5 recommended meals.
4. Prefer vegetable proteins and fats (such as extra virgin olive oil).
5. Among starchy foods, go for whole grains as they are rich in fibers.
6. Eat at least five portions of fruit and vegetables per day.
7. Reduce your consumption of added salt to a minimum, flavoring with spices and herbs.
8. Eat sustainable fish and other fish products two to three times a week.
9. Do at least 30 minutes of physical activity daily.
10. Combat a sedentary lifestyle by reducing screen time.

DIET
For change

Eating healthily, for example by following the Mediterranean tradition, allows you to directly or indirectly achieve several Sustainable Development Goals.

Some are described below:

SDG 3
Ensure healthy lives and promote well-being for all, at all ages.

Eating healthily is fundamental for health. To achieve sustainable development, it is essential to ensure a healthy life and promote well-being for all, at all ages. Great progress has been made in terms of increasing life expectancy and reducing some of the most common causes of death related to infant and maternal mortality. But obesity and overweight are increasing...

SDG 13
Climate action.

A diet that favors plant-based foods (e.g., fruit and vegetables, legumes, cereals), like the Mediterranean diet, **can help to combat climate change**. Globally, in fact, the agricultural sector consumes 70% of fresh water and produces up to 37% of the greenhouse gases responsible for climate change. Intensively farmed meat requires more resources because animals must be fed corn, cereals, hay and it takes a lot of land and water to produce feed for the animals. Plant-based food, however, can be eaten directly by humans, thus saving precious resources.

DIET
For change

SDG 14
Life below water.

Sustainable fishing is key to keeping the oceans and its inhabitants healthy while feeding the global population. Sustainable fish, such as the fatty fish typical of the Mediterranean diet (e.g. anchovies, mackerel, sardines), is particularly healthy for humans, because it contains good fats, but also for the sea, as the fish are not farmed and have a short life cycle (growing and reproducing quickly).

FOOD LOSS AND WASTE

Food waste is not all the same and within the food supply chain, from farm to fork, a distinction is made between food loss and food waste. Food loss reduces the amount of edible food along the supply chain leading to human consumption. It is the food that is lost before it arrives in stores. The focus is the production system itself, from cultivation to processing, before food arrives at the places where it is sold. Food waste occurs at the end of the food chain leading to human consumption. The key point in this case is the individual, as it consists of the waste that occurs at home, but also in restaurants and shops, such as supermarkets, or in other places where food is sold.

In developed countries, food is primarily wasted by stores and individuals, while in developing countries losses occur mainly during **agricultural activity** and in the phase prior to marketing, as a consequence of drought, natural shocks, inadequate road networks and the absence of storage or refrigeration facilities. **Over 20% of the food produced in the EU is wasted**, equating to 88 million tonnes per year and costing 143 billion euros. This represents 6% of the total greenhouse gas emissions of the EU. Instead, at global level, FAO estimates that the food that is lost is associated with around 1.5 gigatonnes of CO_2 equivalent.

FOOD LOSS AND WASTE

- ***What are the main causes of food waste?*** Food waste occurs in the home as well as in retailing and catering and the main causes are: poor management of expiry dates; incorrect food storage; incorrect stock management and expenditure planning; lack of knowledge about food and its storage; and, finally, cooking and/or serving too much food.

- ***What are the main causes of food loss?*** Food loss is attributable to various factors, the main ones being: unexpected weather phenomena and natural disasters; lack of adequate infrastructure, technological and logistical problems; lack of skills, knowledge or ability to manage the supply chain; losses during transport and the inability to access the retail outlets; lack of compliance with safety standards and specific market demands.

- ***What are the impacts of food loss and waste?*** One third of what is produced is lost or wasted across the world. This is not simply a moral and ethical problem but a situation that has serious environmental, economic and social repercussions.

- ***What is a circular economy?*** The circular economy model is an economic and social regeneration paradigm in which waste, energy and other materials are fed back into the production chain. It has a great potential to address both food loss and food waste. Actions that can be taken in this respect include regenerating materials (i.e. reusing scrap and waste, without destroying them) and valuing by-products (i.e. elements other than waste that are subject to legislation that defines their requirements).

FOOD LOSS AND WASTE

Further details are available in chapter 4 of the teaching guide, in the special report entitled "Let's Not Waste! Further details about food loss and waste", in the online sustainability training course (MOOC) - Chapter 8 and in the BCFN (2019) publication "Italy and food" ***https://www.barillacfn.com/en/publications/italy-and-food/***.

FOOD LOSS AND WASTE

Acting - actions for change

"Zero waste" spending

1. Shop rationally: before you buy, check what you really need, make a list - and stick to it - and remember that wasting food is a waste of money and the planet's resources.
2. When you're cooking, keep an eye on your quantities and only cook what you can eat.
3. Check your labels: always check the 'eat before' dates.
4. When storing food in the fridge, put the short-life food in front and store in the freezer what you are not likely to eat soon.
5. Recipes to avoid food waste: don't bin leftovers and food scraps, they can be turned into new creative dishes.
6. Fresh, seasonal products: preferably buy directly from producers.
7. Did you buy too much food? Share it with your neighbors or invite friends for a meal.
8. At the restaurant: ask to take your leftovers home in a "doggy-bag", if possible.
9. "Best before..." means that food can still be eaten after the given date if it is stored correctly. Always check carefully before throwing it away.

FOOD LOSS AND WASTE
For change

Fighting food waste contributes to achieving several of the UN's Sustainable Development Goals.

SDG 1
No poverty.

The global cost of food waste amounts to USD 2,600 billion per year (including environmental, social and economic costs). Reducing it can contribute to combating poverty and helping people live a more dignified life by shifting their focus away from basic subsistence.

SDG 2
Zero hunger.

There can be no sustainable development without achieving food security, however, hunger and food insecurity in the world are now on the rise again and according to current forecasts the number of undernourished people could exceed 840 million by 2030. Cutting food waste by 25% would be sufficient to feed all the people who are malnourished in the world.

SDG 12
Responsible consumption and production.

Sub-goal 12.3 clearly specifies "by 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses". Growing demands by consumers to reduce waste, combined with a commitment by the distribution (for example by redistributing surpluses) is a good example of responsible consumption and production.

MALNUTRITION

Malnutrition is a condition characterized by deficiencies and imbalances in the amount of energy/nutrients that an individual needs to consume on a regular basis. It is a very broad term that covers two macro-conditions: undernutrition and overnutrition. The former includes stunting (when children are smaller for their age), wasting, (when children's weight is lower for their height, as a result of rapid weight loss or the inability to gain weight), and underweight (when children and adults have a lower than expected weight for their age), as well as a deficiency or insufficiency of micronutrients in the diet, i.e. a lack of vitamins and minerals. Malnourishment can also be the result of overnutrition, causing overweight, obesity and diet-related non-communicable diseases (such as heart disease, stroke, diabetes and some types of cancer).

- ***What is the "double burden" in the context of malnutrition?*** In some countries, such as those in the developing world, there are paradoxical situations related to nutrition in which malnutrition and obesity coexist in the same society (even within the same family). This is becoming increasingly evident in big cities, where the structure of the environment greatly influences access to healthy diets and lifestyles (for further details, see the word urbanization).

MALNUTRITION

- ***What are the effects of malnutrition?*** Malnutrition generates physical and cognitive deterioration, and affects people's immune system, their predisposition to be exposed to diseases and the severity and duration of the illness. This relationship is strengthened by a number of other conditions that are often associated with malnutrition, such as poor health care provision, difficulty accessing drinking water and basic medicines. Malnutrition prevents people from achieving their full potential. Malnourished children have poor academic performance; adults have fewer opportunities to work, contribute to local economies and assist their families; malnourished women are more likely to have underweight children.

- ***Does climate change influence malnutrition?*** Yes, climate change has serious repercussions on food security and, consequently, can be responsible for malnutrition. In the most vulnerable countries, such as some of the countries of sub-Saharan Africa, environmental disasters, such as floods and droughts, have caused severe food crises, creating food insecurity for millions of people.

- ***What is the difference between hunger and food insecurity?*** When we talk about malnutrition, we often refer to people suffering from hunger and people suffering from food insecurity. The two terms are not synonymous. Hunger is an unpleasant or painful physiological sensation caused by an insufficient calorie intake from the diet. The term hunger also means chronic malnutrition. People who do not regularly consume enough calories cannot lead a normal, healthy and active life.

MALNUTRITION

Globally, an estimated 690 million people are currently suffering from hunger. Food security exists when people have constant physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. Based on this definition, four main dimensions of food security have been identified: availability of food, economic and physical access to food, use of food and stability over time. Food insecurity occurs when one of these dimensions is missing. People suffering from moderate food insecurity, for example, may have difficulty obtaining food and may compromise on the quality and/or quantity of the food they consume.

People suffering from hunger, which also means severe food insecurity, have generally run out of food and, in the worst cases, spend one or more days without eating.

Further details are available in chapter 4 of the teaching guide, in the special report entitled “living healthily: let’s start with food”, in the special report entitled “right to food” and in the online sustainability training course (MOOC) - Chapter 9.

Fondazione Barilla
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MALNUTRITION

Acting - actions for change

1. Know your calorie requirements.
2. Check the nutritional label, know the calorie content of nutritious foods (the carbohydrates, proteins, fats and salt) when buying food, opting for those with less added sugar and salt.
3. Eat fresh fruit and vegetables every day.
4. Avoid excess calories, like those from sugary drinks and snacks high in fat and sugars.
5. Reduce your consumption of added salt to a minimum, flavoring with spices and herbs.
6. Promote the dissemination of correct food information and promote a culture of prevention.
7. Encourage exclusive breastfeeding in the first 6 months of a baby's life.
8. Contribute to making action against undernourishment and malnutrition stable and lasting.

MALNUTRITION
For change

Combating malnutrition, in all its forms, allows people to directly or indirectly achieve several Sustainable Development Goals.

Some of them are described below:

SDG 1
End poverty in all its forms everywhere.

Poverty is not just a lack of income and resources to ensure sustainable living.
Hunger and malnutrition are among its primary manifestations. Having access to healthy, good quality and adequate food gives people more energy to invest in personal growth, allowing them to shift their attention away from basic needs (such as food).

SDG 2
Zero hunger.

There can be no sustainable development without achieving food security.
However, hunger and food insecurity in the world are now on the rise again and according to current forecasts the number of undernourished people could exceed 840 million by 2030.

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MALNUTRITION
For change

SDG 3
Ensure healthy lives and promote well-being for all at all ages.

Eating healthily is fundamental for health and for combating malnutrition.

To achieve sustainable development, it is essential to guarantee a healthy life and ensure healthy and good quality affordable food for the entire population. Great progress has been made so far in terms of increasing life expectancy and reducing some of the most common causes of death related to infant and maternal mortality, however malnutrition data (hunger and obesity) continue to rise.

SEASONALITY

The cycle of the seasons - summer, autumn, spring and winter -, each with its colors and its specific activities, marks the passing of an entire year. In astronomical terms, the solstices and equinoxes mark the transition from one season to another.

For example, in the northern hemisphere, spring (from the vernal equinox, March 21, to the summer solstice, June 21), summer (from June 21 to the autumn equinox, September 23), autumn (from September 23 to the winter solstice, December 21), winter (December 21 to March 21).

Opting for seasonal products allows you to buy fresher and tastier food, making a strong impact on food, agricultural and even economic sustainability as well as considerable savings because they are foods that usually require less energy to be produced.

The concept of seasonality applies not only to fruit and vegetables but also to fish. Buying fish that has been caught during its breeding season stops the species reproducing and prevents the population being sufficient to meet consumption.

The same problem occurs if fish are caught when they are too small, before they have reproduced, as they cannot contribute to maintaining the species. However, respecting seasonality and opting for fish from nearby marine areas is an excellent way to buy and consume fish products in a way that is sustainable for the environment and your wallet.

SEASONALITY

- ***What is the difference between "global seasonality" and "local seasonality"?*** The former definition is based on where the food is produced. It refers to food that is outdoor grown or produced during its natural growing/production period for the country/region where it is produced. Instead, the latter definition includes the role of consumption. In fact, local seasonality refers to food that is "naturally" produced (i.e., produced without high-energy use for climate modification or storage) and consumed in the same climatic zone.

- ***Why can some cultivated vegetables/fruit be found all year round?*** There are multiple reasons for this availability that range from cultivation techniques, such as the use of greenhouses, storage and transport, which favors trade with countries with different climatic conditions.

- ***What does seasonal mean in relation to fish?*** The concept of seasonality applies not only to fruit and vegetables but also to fish. For example, buying fish that has been caught during its breeding season stops the species reproducing and prevents the population being sufficient to meet consumption. The same problem occurs if fish are caught when they are too small, before they have reproduced, as they cannot contribute to maintaining the species. Respecting seasonality and opting for fish from nearby marine areas ensures you are buying and consuming fish products that protect marine biodiversity.

Further details are available in the following articles of our online magazine:

- Seasonality and sustainability apply to seafood too: ***https://www.barillacfn.com/en/magazine/food-and-sustainability/seasonality-and-sustainability-apply-to-seafood-too/***

- Zero miles and environmental sustainability, a topic for discussion: ***https://www.barillacfn.com/en/magazine/food-and-sustainability/zero-miles-and-environmental-sustainability/***

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SEASONALITY

Acting - actions for change

1. Eat seasonal fruit.
2. Buy seasonal vegetables.
3. Prefer seasonal fish.

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SEASONALITY
For change

Small daily actions are important for achieving the 2030 Agenda. Here are just a few examples of Goals that we can achieve through our daily consumption choices.

SDG 3
Good health and well-being.

A varied and balanced diet is the basis of a healthy life. Fruit and vegetables are the basis of our diet and should be eaten daily, to prevent overweight and obesity and fight non-communicable diseases. Every season of the year is characterized by different colors, flavors, scents: nature has “organized itself” and, every year, invites us to enjoy a cycle of four different menus.

SDG 14
Life below water.

Conserve and sustainably use the oceans, seas and marine resources for sustainable development. Fish resources are not inexhaustible, and fish is a food that has traditionally been eaten by many populations and cultures, including in the Mediterranean. Respecting seasonality and fish reproduction cycles, and adopting sustainable fishing, allow our seas and marine biodiversity to be preserved.

SDG 15
Life on land.

Ensure variety in the food you eat and your diet will be respectful of nature, the community where you live and the seasons. Respecting these seasons, valuing their distinctive features, is one of the fundamental ways of respecting life on earth.

SUPPLY CHAIN

The term supply chain refers to all the factors that contribute to the supply of a given product. It is a complex system that includes the main activities (and the relevant material and information flows), technologies, resources and organizations that contribute to the creation, processing, distribution, marketing and supply of a product. In general, a (long) agri-food chain consists of the following steps: production (sowing, growing, harvesting, collectively farming), processing, packaging, transport, sale, preparation and consumption.

The development of a sustainable supply chain contributes to generating shared and widespread value among all the players in the chain, generating positive environmental, economic and social returns, particularly in the community in which it operates.

The following can contribute to the sustainability of a production chain: traceability of the whole product life cycle, certification of environmental impacts and short supply chains.

- ***How is the impact of a supply chain measured?*** The impact of supply chains on the environment can be calculated in different ways, using specific indicators and analyzing the characteristic aspects of individual food supply chains, from cultivation to cooking, if necessary. Of all the assessment methods existing today, the LCA (Life Cycle Assessment) is the most valued, because it calculates the impact of the entire food supply chain: from the land to the table. In order to make the results of these studies understandable and communicable, summary indicators are used that allow

SUPPLY CHAIN

the environmental impacts to be represented in an aggregate and simple way. In the case of agri-food chains, the significant impacts relate to water, land and air and the indicators represent greenhouse gas emissions, the use of water and the area of land needed to produce the resources.

- ***What is a short supply chain?*** A short supply chain consists of a limited and circumscribed number of production stages, and of commercial intermediaries. In particular, some short chains can also lead to direct contact between producers and consumers. For instance, under the Italian law, agricultural and food products from short supply chains are understood to be products that come "from a supply chain made up of a limited number of economic operators who are committed to promoting cooperation, local economic development and close socio-territorial relationships between producers, processors and consumers". As the law shows, in addition to reducing the number of steps between the producer and the end consumer, short agri-food chains include the concepts of supporting the local economy, socialization, as well as a relationship of trust between producer and consumer.

- ***What is the European farm to fork (from producer to consumer) strategy?***
The European Union recently presented its strategy to make the EU economy sustainable, the so-called European Green Deal (the European Green Agreement). An entire section of the Agreement is dedicated to the "farm2fork" food supply chain. The goal of the "farm to fork" strategy is to achieve climate neutrality in the EU by 2050. The EU is therefore committed to making the food system more resistant and resilient to face any future crises, such as those caused by COVID-19 and/or climate change,

[7] Article 11 of law no. 158 of October 6, 2017, entitled "Promotion of products from short or zero kilometer supply chains"

SUPPLY CHAIN

including adverse weather phenomena (e.g. floods and droughts). Furthermore, European food is praised for being safe, nutritious and high quality. With this strategy, the EU Commission has stated its intention to become the "global standard" for environmental, social and economic sustainability. In this context, the key objectives of the 2030 strategy are to achieve a 50% reduction in the use and risk of chemical pesticides, a minimum 20% reduction in the use of fertilizers; a 50% reduction in sales of antimicrobials for farm animals and aquaculture; and the allocation of at least 25% of the agricultural surface area to organic farming.

Further details are available in chapter 1 of the teaching guide, in the online sustainability training course (MOOC) – Chapters 3 and 7 - and in the following articles of our online magazine:

- Europe focuses on the environment: ***https://www.barillacfn.com/en/magazine/food-and-sustainability/europe-focuses-on-the-environment/***
- From Farm to Fork: 10 actions to "fix" the global food system: ***https://www.barillacfn.com/en/magazine/food-and-sustainability/from-farm-to-fork-10-actions-to-fix-the-global-food-system/***

SUPPLY CHAIN
Acting - actions for change

1. Buy directly from producers.
2. Support collective farm shops.
3. Buy fruit and vegetables from farmers' markets.
4. Buy through the various fair-trade group strategies.
5. Prefer products from supply chains certified as sustainable.
6. Value the link between the foods you eat and the places they come from.

SUPPLY CHAIN
For change

Small daily actions are important to the achievement of the 2030 Agenda goals. Here are just a few examples of Goals that we can achieve through our daily consumption choices.

SDG 11
Sustainable cities and communities.

Strengthening the links between urban and rural areas involves people at different levels. The connection between these two dimensions is fundamental to improve people's food and nutritional security as it facilitates the availability of fresh food at affordable prices to an increasing number of people. Furthermore, there are significant economic and environmental benefits that include improving the income of farmers, developing markets and other points of sale, increasing rural tourism, as well as enhancing the variety of local products.

SDG 12
Responsible consumption and production.

Sustainable consumption and production are intended to achieve "the greatest possible yield with the least amount of resources, aiming to ensure that economic activities provide the greatest benefits in terms of well-being by reducing the use of resources, degradation and pollution throughout the entire production cycle, improving the quality of the production chain.

SUPPLY CHAIN
For change

SDG 15
Life on land.

Ensure variety in the food you eat, and your diet will be respectful of nature, the community where you live and the seasons. Respecting these seasons, valuing their distinctive features, is one of the fundamental ways of respecting life on earth. Buying directly from local producers or visiting farmers' markets allows you to follow the seasons better, enhance the richness of the land and support shorter and more sustainable supply chains.

TERRITORY

Every region of the world, and Italy in particular, is characterized by foods that reflect the territory, a term that, at the same time, may refer to a physical space/geographical area and to a set of historical and cultural values. In a broad sense, the term expresses a sense of belonging, which means feeling part of a group with which one shares behaviors, ways of thinking and attitudes. This is because behind the notion of belonging there is, in general, an identification process in which people recognize themselves and are recognized as members of a group, particularly by adopting distinctive signs.

Being aware of the typical foods of your local area/region/geographical area strengthens the relationship between food and territory and helps to ensure a more varied diet. Furthermore, local food "tells a story", not only about its nature and preparation, but also about the culture and traditions of its place of origin and of the people involved in its production.

- ***What is the connection between territory and Mediterraneanity?*** There is a strong connection between territory and Mediterraneanity. The concept of territory is found in the Latin etymology of the word (Medius = in the middle; Terraneus = terrestrial, that is, in the middle of the lands). The term Mediterranean describes a geographical area limited to Southern Europe, North Africa and Western Asia. A territory with its own recognizable identity, made up of many elements shared by the different populations that live there. An identity that is also very strongly characterized by food.

TERRITORY

Today, in the Mediterranean basin, the relationship between territory and Mediterraneanity requires a collective recovery effort to be made, not only for the sake of dietary well-being, but above all to restore the values of civilization, tolerance and dialog that have made this area of the world so “great” and attractive, distilling one of the most culturally and economically extraordinary socio-environmental contexts in the history of humanity.

- ***Can food make you feel part of a territory?*** Yes. Many foods such as olive oil, grapes, wine, herbs, bread, fish and pasta are common to the different people of the Mediterranean, and distinguish the region from other territories. Such foods, scents and flavors create a sense of belonging to a territory, a people and a family. They form a diet which is a distinctive sign that immediately identifies the peoples of the Mediterranean.

- ***How can the territory be protected?*** The territory can be protected indirectly through our consumption. Some of the fundamental dynamics of gastronomic cultures that are more attentive to the link between food and people, such as the Mediterranean one, need to be revived. This involves enhancing the aspects of conviviality, protecting local territorial variety while preserving the richness of identities, transferring knowledge and know-how related to food preparation, restoring a healthy relationship with the territory and the local context, focusing first of all on the excellence of the ingredients, recovering ancient flavors that can be updated to suit contemporary tastes, through a critical operation that allows the best of the gastronomic tradition to be preserved.

Further details are available in chapter 3 of the teaching guide and in the online sustainability training course (MOOC) - Chapter 2.

TERRITORY

Acting - actions for change

1. Value the link between the foods you eat and the places they come from.
2. Seek out typical, local products with distinctive flavors and their own identity.
3. Buy fruit and vegetables from markets.
4. Buy food products directly from producers.
5. Buy seasonal products.
6. Prefer locally produced food.
7. Transfer knowledge and know-how as extraordinary reserves of cultural richness.

TERRITORY
For change

Small daily actions are important for achieving the 2030 Agenda. Here are a few examples of Goals that we can achieve through our daily consumption choices.

SDG 3
Good health and well-being.

Ensure health and well-being for all and for all ages. A varied and balanced diet is the basis of a healthy life. Cultures that eat the most nutritious food are those that vary their diet, seem to pay more attention to food than to nutrients, to its origin as well as its composition, to quality as well as nutritional values and health, and to social occasions. In short, they are cultures that, like the Mediterranean one, value and are actively involved in their local area.

SDG 11
Sustainable cities and communities.

Strengthening the links between urban and rural areas involves people at different levels. The connection between these two dimensions is fundamental to improve people's food and nutritional security as it facilitates the availability of fresh food at affordable prices to an increasing number of people. However, the effects of this combination are not limited to the quality of the diet. They also have an impact on the economic and environmental aspects of the area involved, such as improving farmers' income, developing markets and other places of sale, increasing rural tourism, but also enhancing the variety of local products and maintaining the local areas, which is fundamental to face the environmental risks due to the abandonment of agricultural areas.

TERRITORY
For change

SDG 15
Life on land.

Every season of the year is characterized by different colors, flavors, scents: every year, nature invites us to enjoy a cycle of four different menus, giving us a different glimpse of the multitude of creation. Ensuring variety in the food you eat and your diet will be respectful of nature, the community where you live and the seasons.
Respecting these seasons, valuing their distinctive features, is one of the fundamental ways of respecting life on earth.

URBANIZATION

Literally, urbanization is the process by which cities are formed and grow. Today, more than half of the world's population lives in urban areas and the percentage is expected to rise to 70 percent over the next thirty years.

However, increasing urbanization, progressive depopulation of rural areas, the inefficiency of the current food system and climate change are some of the factors which, combined, have a considerable impact on the tangible and intangible characteristics of cities, including the lack of healthy, sustainable and affordable food for all.

Cities consume up to 70% of food produced nationally (FAO, 2018) but 90% of people living in the suburbs of large urban settlements in developing countries are already suffering from food insecurity. Therefore, in order to guarantee food to the growing number of inhabitants that will move to cities, we need to rethink traditional food systems and adopt common policies to support these transitions.

At the same time, **cities must turn from simple reception hubs into catalysts for food and environmental sustainability**, supporting the various transformations and involving different players to create solutions that strengthen relations between rural and urban areas and establish a link between producers and consumers.

URBANIZATION

- ***What are megacities?*** Megacities are cities with over ten million inhabitants. While only New York, Tokyo and Mexico City met this definition in 1975, now there are 33 such cities around the world and by 2030 there will be more than 40, with a growing expansion in Africa, Latin America and Southeast Asia. The C40 is a global network created to help such cities cope with climate change. In particular, in October 2019, 14 mayors of cities belonging to this network signed a declaration entitled "C40 Good Food Cities" precisely to guarantee food safety and sustainability, while at the same time stopping food loss and waste.

- ***What are food deserts and swamps?*** Food deserts are urban areas, usually located in the suburbs, where the lack of supermarkets, shops or markets greatly restricts the opportunity to buy fruit, vegetables and other fresh, good quality produce at affordable prices. Food swamps, on the other hand, are defined as urban areas characterized by a high concentration of fast food outlets selling processed and/or high calorie food and junk food rather than shops and retail outlets selling healthier food.

- ***Is food in cities different?*** In general, modern food systems, based on large-scale production, especially at industrial level, combined with greater economic availability, have favored a transition in cities towards diets characterized by a greater consumption of meat, dairy products, oils and highly processed foods, which often tend to cost less than healthy and fresh foods. All this is contributing to serious repercussions on people's health.

[8] FAO (2018). http://www.fao.org/3/I8568EN/i8568en.pdf

[9] Food insecurity: the lack of physical, social and economic access to sufficient, safe and nutritious food that fulfills their food requirements and preferences to lead a healthy and active life (FAO, 2006).

URBANIZATION

- ***What is an educational farm?*** An educational farm is an agricultural or rural tourism company which carries out a series of educational activities, especially for the very young, aimed at promoting more responsible consumption, as well as an active behavior for the protection of the environment. Examples of these activities include a presentation of the crop cycle, agricultural production, breeding, manual skills and the skills necessary to perform that work, as well as the production of processed foods of both plant and animal origin (for example jams and cheese). This visits allow to establish contacts between the urban and rural world, helping to keep interest in the sector alive, as an expression of the traditional world (for example in the case of farms focused on traditional rural culture, enhancing crafts and manual craftsmanship), and the modern world (for example in the case of an agricultural company that uses innovative production systems, based on information and communication technologies to achieve sustainable production goals).

  Further details are available in the special report entitled “Food in the city: Urban food policies for people and the planet”, the BCFN publication “Food and Cities” (2018) ***https://www.barillacfn.com/en/publications/food-cities/*** and the scientific paper “Urban Food Waste: A Framework to Analyse Policies and Initiatives” (2020) ***https://www.mdpi.com/2079-9276/9/9/99***

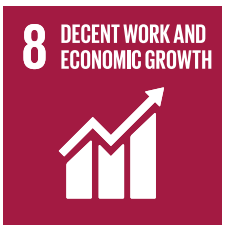
URBANIZATION

Acting - actions for change

1. Share or redistribute surplus food.
2. In authorized restaurants, ask to take home your leftovers.
3. Buy fruit and vegetables from farmers' markets.
4. Prefer locally produced food.
5. Value the link between the foods you eat and the places they come from.
6. Buy food products directly from producers.

URBANIZATION
For change

Small daily actions are important for the achievement the 2030 Agenda. Here are just a few examples of Goals that we can achieve through our daily consumption choices.



SDG 8
Decent work and economic growth.

Promoting and supporting urban and peri-urban food production and local processing, for example by buying directly from farmers or at farmers' markets, contributes to creating decent jobs, fosters entrepreneurship, creativity and innovation, as well as formally establishing and growing micro, small and medium-sized enterprises.

SDG 11
Sustainable cities and communities.

Strengthening the links between urban and rural areas involves people at different levels. The connection between these two dimensions i**s fundamental to improve people's food and nutritional security as it facilitates the availability of fresh food at affordable prices to an increasing number of people**. However, the effects of this combination are not limited to the quality of the diet. They also have an impact on the economic and environmental aspects of the area involved, such as improving farmers' income, developing markets and other places of sale, increasing rural tourism, but also enhancing the variety of local products and maintaining the local areas, which is fundamental to face the environmental risks due to the abandonment of agricultural areas.

URBANIZATION
For change

SDG 12
Responsible consumption and production.

Sub-goal 12.3 specifies "by 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses". Sustainable waste management is fundamental and a strategic part of implementing the transition to more sustainable societies and cities and can take place in different ways: for example, paying attention to purchases, properly disposing of waste, recovering or redistributing surpluses or actively participating in the circular economy.

Teaching suggestions

The contents, presented on the pages dedicated to words and actions that promote change, include all that is required to ensure that information is correctly conveyed to your students, even if you want expand on the subject and introduce a word in a specific context. However, in order to avoid the standard classroom teaching format, with the teacher at the front of the class, and promote more active learning by students, the following pages contain some suggestions for playing and exploring these words creatively in the classroom, real and/or virtual, considering the various levels of education of the children.

There are multiple aims to these suggestions:

1. Stimulating the curiosity of students.
2. Facilitating the discovery of complexity and its representation.
3. Developing the vocabulary and narrative skills.
4. Understanding the value and importance of the actions of individuals or small groups.
5. Supporting students on a path of change.

FIRST EDUCATIONAL CYCLE

The riddle of Sustainable Development

Objective:

to review creatively and gain an overview of the ten keywords for sustainable development.

Procedure:

this exercise can be used both to introduce words related to sustainable development, and to review them and have an overview of them. In both cases, the advice is to start with a brief description of what will happen (in order to make students aware of what they will have learned by the end of the lesson) and to continue inviting the students to work together to complete the "sustainable development puzzles" (making them read the definitions and guess the words). Depending on when it is used (opening vs review) it will be up to the teacher to decide whether to explain the individual words or ask the pupils to do so.

Solution:

1. **Diet**. A healthy one prevents overweight and obesity.
2. **Biodiversity**. It can be genetic and species related.
3. **Changes**. Those concerning the climate are dangerous.
4. **Desertification**. The process that leads to the soil being ruined.
5. **Supply chain**. A short one is more likely to be sustainable.
6. **Malnutrition**. It can be caused either by overnutrition or undernutrition (or: it can be the result of eating too much or too little).
7. **Food Waste**. Shopping appropriately prevents it at home.
8. **Seasonality**. It can be related to fruit, vegetables and fish.
9. **Territory**. Its conservation is very important (or: local products can be found by visiting it).
10. **Urbanization**. The process by which cities are formed and grow.

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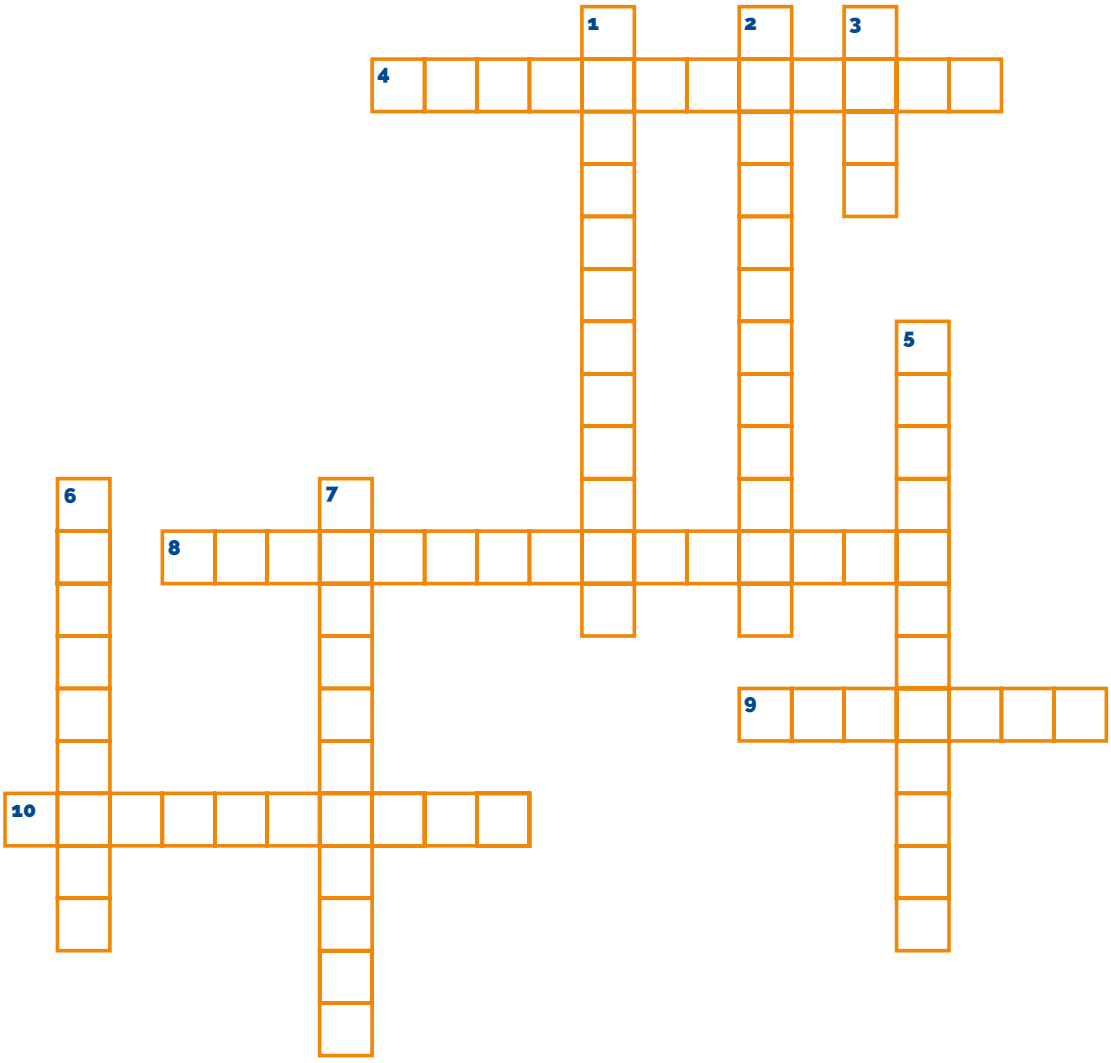
The riddle of Sustainable Development

Complete the crossword puzzle below with 10 keywords for change



HORIZONTAL

4. It can be caused either by overnutrition or undernutritrion
8. The process that leads to the soil being ruined
9. Those concerning the climate are dangerous
10. Shopping appropriately prevents it at home

VERTICAL

1. A short one is more likely to be sustainable
2. It can be genetic and species related
3. A healthy one prevents overweight and obesity
5. The process by which cities are formed and grow
6. Its conservation is very important
7. It can be related to fruits, vegetables and fish

"One Health":
alphabet for the well-being of people and our planet

Health is not simply the absence of disease, but a condition of physical and mental well-being due to the perfect functioning of the body. Furthermore, our health is linked to that of the environment.
The "One World, One Health" approach aims to protect public health while ensuring the sustainability of primary production and environmental protection.

Eating well has a positive effect on our health. However, eating well does not mean simply choosing the right foods, since no food can be classed as entirely good, bad or "miraculous", even though some foods are obviously considered healthier (for example, fruit and vegetables) than others (like foods high in sugar, salt and/or animal fats). Instead, the benefits of healthy eating depend on how we combine foods during the day and over the course of our everyday lives.
A balanced diet is not achieved with one meal, or in a single day, but progressively and continuously over time. Furthermore, eating well has a significant impact on the environment, as the foods recommended for our health are also those with a lower environmental impact (see the double Pyramid concept).

Words are important and literacy is the basis for becoming aware of the connections between problems and solutions in the world, to take action for change. How many words do we know that are related to health and food and environmental sustainability?

General learning objective: o broaden the use of vocabulary and understand the different areas that link our health to that of our planet.

Procedure: after introducing the 10 key words for sustainable development, using the methods appropriate to the learning abilities of the learners, create an alphabet with students, from A to Z, with other words related to health and food and environmental sustainability. The work can be done in small groups, working on a set of letters, which are then brought together on a board.

This exercise can also be done individually, entrusting a letter to each student (perhaps drawing them out of a hat), asking them to find a word and its definition. Students then present the result of their research in turn. This method is particularly well suited to an integrated **distance learning**. If some words are considered too difficult, the teacher can suggest them directly, without entrusting them to the students, thus actively participating in the construction of the alphabet.

Finally, for younger students (but not exclusively), it is advisable to accompany the words with drawings, images, photos, collages, etc. in order to associate the words of change with a graphic representation of them.

WORDS FOR SUSTAINABLE DEVELOPMENT	EXAMPLES OF OTHER WORDS	DEFINITION
A	**Agriculture**	The science or practice of farming. It includes cultivation of the soil for the growing of crops and the breeding of animals to provide food, wool, and other products.
B **Biodiversity**		
C **Climate Change**		
D **Desertification**		
E	**Energy and Bioenergy**	The power supplied to and used in the food value chain. It can be derived from physical or chemical resources, including renewable resources such as solar, wind, geothermal or biomass power produced by living organisms.

WORDS FOR SUSTAINABLE DEVELOPMENT	EXAMPLES OF OTHER WORDS	DEFINITION
F	**Footprints**	They are indicators that estimate the amount of natural resources consumed individually, in terms of land area (ecological footprint) and water used (water footprint), energy consumption converted into equivalent CO2 (carbon dioxide) emissions and waste to be disposed of (carbon footprint).
G	**Greenhouse gases**	These gases are present in the atmosphere and tend to block the emission of heat from the earth's surface, from the atmosphere and clouds, thus hindering its escape into space. They work like the glass in a greenhouse, hence their name. These gases can have a natural or human origin.
H	**Habitat**	The set of environmental conditions in which a specific species of animal or plant lives.
I	**Irrigation**	Watering of plants. FAO estimates that irrigated land in developing countries will increase by 34% by 2030, but the amount of water used by agriculture will increase by only 14%, thanks to improved irrigation management and practices.

WORDS FOR SUSTAINABLE DEVELOPMENT	EXAMPLES OF OTHER WORDS	DEFINITION
L	**Life Cycle Assessment**	Method for calculating the impact of the entire food supply chain: from farm to fork (including cultivation, industrial processing, packaging, distribution and cooking).
M **Malnutrition**		
N	**Nutrition**	The action of feeding oneself and others. The way we eat can have a considerable impact on our health and that of the Planet.
O	**Overweight and obesity**	They are defined as abnormal or excessive fat accumulation that presents a risk to health.

WORDS FOR SUSTAINABLE DEVELOPMENT	EXAMPLES OF OTHER WORDS	DEFINITION
P	**Poverty**	Poverty is not just a lack of income and resources to ensure sustainable living. Hunger and malnutrition are among its primary manifestations. Having access to healthy, good quality and adequate food gives people more energy to invest in personal growth, allowing them to shift their attention away from basic needs (such as food).
Q	**Quantity & Quality**	Two pillars of proper nutrition: correct portions (suited to people's age and the energy they expend) and quality of the products you consume.
R	**Resilience**	The capacity of a system, be it an individual, a forest, a city or an economy, to deal with change and continue to develop. It is about how humans and nature can use shocks and disturbances like a financial crisis or climate change to spur renewal and innovative thinking.

WORDS FOR SUSTAINABLE DEVELOPMENT	EXAMPLES OF OTHER WORDS	DEFINITION
S		
Seasonality		
T		
Territory		
U		
Urbanization		
V		
	Variety	Varying your diet is essential for your health and that of the Planet.
Z		
	Zoonosis	A zoonosis is any disease or infection that is naturally transmissible from vertebrate animals to humans. Zoonoses can be public health problem and many of the major zoonotic diseases prevent the efficient production of food of animal origin and create obstacles to international trade in animal products.

SECOND EDUCATIONAL CYCLE

Hunt for the link

Target:

15-18

General learning objective:

to discover and understand the complexity of the links concerning food and environmental sustainability.

Procedure:

In order to understand complex problems, the relationships between apparently distant elements needs to be understood. The teacher selects a topic and identifies the most important key words for that topic (to facilitate this process, in addition to this tool, some keywords are always recommended at the end of the teaching guide and at the end of each monograph).

Here a couple of examples of a sustainability-themed combination: ***"biodiversity, climate change, desertification, malnutrition, urbanization", or, a combination with a greater focus on health: "diet, seasonality and territory"***

The teacher splits the students into small groups (preferably drawn from a hat to facilitate the inclusion processes) and asks them to create a text (but also a graphic representation, a podcast, or a ppt) which contains (or represents, in the case of graphics) all the words, describing the problems connected to each word, the link between them, and possible solutions to stem the problems.

Depending on the level of difficulty desired, the teacher can choose to increase or decrease the number of words. If the exercise is done in real time at school (rather than, for example, as a group project at home), the words can also be suddenly added during the work, thus increasing the difficulty of the challenge.

SECOND EDUCATIONAL CYCLE

Talking about sustainability with (six) words

Target:

15-18

General learning objective:

to stimulate creativity and reflect on aspects of food and environmental sustainability.

Procedure:

Taking inspiration from the "six words memoirs" idea, the teacher asks the students to talk about one of the words using a total of just six (5 + one of the words for sustainable development). At the teacher's discretion, double words, like climate change, can be used as a single word. For example:

- ***"Short supply chains are more sustainable"***

- ***"Biodiversity: genetics, species and ecosystems variety"***

To get children more involved, you can ask them to talk about something that also relates to them: e.g., experiences, emotions, personal thoughts. In order for the exercise to better describe the different facets and points of view linked to a word, it is a good idea to focus on one term at a time and then compare all the resulting sentences, which can be condensed all together in an artistic and creative way, for example, in a single story or in a poster accompanied by images.

FOR ALL AGES

Seven exercises/games are described below to help the teacher introduce a topic, review it, and have students memorize the concepts and/or make them think

1. **Synonym hunt.** Associating a word from the dictionary with its synonyms is a great way to form lasting connections between the word and its definition. For a creative research project, divide the class into two groups and "secretly" assign a few words to each one. It is important that the two groups do not know each other's words. Now ask the students to use a dictionary (paper or digital) to find out the synonyms for each word. Once the synonyms have been identified, the groups challenge each other: one group reads the synonym of a word (and if necessary, its definition) and the other group tries to guess the original word. Continue until all the words are used up.

2. **Sustainable checkers.** Use the classic board game for a word challenge. Students play in pairs or in small groups with the checkers board in front of them, which can made by hand by drawing and coloring the squares on the paper - 8x8 squares - and using bottle caps or other stackable objects as pieces (if the board is very big, created using several posters, the students themselves can be the actual game pieces). Associate a word with each piece and leave two extra ones as free bonus pieces, or add other words to the board (for examples see the sustainability alphabet on page 64). The students can now start the classic game of checkers but they can't "capture" the opponent's piece unless they know how to correctly explain the word they intend to take (the two bonus/free pieces are used to lighten the game and do not require this step). If students are playing in small teams, they can discuss the words with their team members to get their suggestions. Alternatively, you can ask the students to put the word they intend to capture in a full sentence that is not the same as any other sentence given to explain the meaning (i.e. it would not be valid for the purposes of the game to repeat the opponent's example sentence).

FOR ALL AGES

3. **Sustainable development bingo.** This exercise is a good complement to the sustainability alphabet (see page 64) as it benefits from having more words available to be drawn. A board is created (which can be kept by the teacher) with all the words you intend to use/explain/expand on and each student creates their own card, selecting 15 different words, arranged five per row, in a 9x3 grid (as shown in the example below). The standard rules apply to the game but players can only collect the prize (a symbolic one, such as a cardboard medal, is more than enough) only if they can explain the respective words or put them in a full sentence (the level of difficulty is at the discretion of the teacher depending on the class).

SUSTAINABLE DEVELOPMENT BINGO

Waste		Supply Chain		SDGs		Territory		Circular Economy
	Footprints	Malnutrition		Nutrition		Urbanization	Seasonalityt	
Biodiversity	Diet		Climate change		Desertification			Habitat

4. **Draw and guess.** This is a team exercise inspired by a classic board game. In turn, each team leader draws the word, stated by the teacher, on the blackboard (we suggest picking the words from a hat, creating cards with the definition or simple notes, to increase involvement). The goal of each team is to guess the word first. When the word has been guessed it is advisable for the person who drew it or the teacher to give an explanation to the class. The team with the most points wins.

FOR ALL AGES

5. **Basketball!** Use a trash can creatively to make it easier to memorize words. This exercise is good for reviewing words that have been explained. The students are split into small teams and are asked to answer a question about the words they have learned in turn, preferably drawn from a hat (alternatively, the students can be given a pre-established package of words to which have to give answers). The team members can discuss words between them and if they answer correctly they can earn a point for each word described and the chance to take a shot at the trash can (e.g. using a ball made with scrunched up paper). Teams win an extra point for every ball that goes in the can. The team with the most points wins.

6. **Circle rotation.** A sustainable development word matching game involving movement. This exercise is good for reviewing words that have been explained. The class is split into halves and students are asked to form two concentric circles in the room. The students in the two circles stand facing each other. The teacher writes one word per sheet and hands them to the students in the smallest circle. He/she then writes the definitions of the words on other sheets (one definition per sheet) and hands them to the children in the outer circle (if there are more than 20 participants, see the sustainability alphabet on page 64). Both must hold the sheets in plain sight. The people in the inner circle must be able to easily read the sheets held up by the outer group and vice versa. Now the movement begins. The circles rotate (slowly) in opposite directions (one clockwise and one counterclockwise) and the challenge is to find the correct name-definition pairing When a pair has formed correctly (the teacher acts as a “referee”), the person in the smaller circle joins the larger one alongside his or her pairing (e.g. linking arms). The game ends when everyone is standing in the same circle.

FOR ALL AGES

7. **Words in context.** An exercise recommended for exploring words that can be used in distance learning and/or with a flipped classroom method. The teacher asks students, individually or in small teams, to look for newspaper/magazine articles and/or images that deal with the stated word, highlighting how many times it is repeated in the text. When they have finished searching, each team shows the result of their searches. Using one word at a time, students will realize the nuances and the variety of contexts in which the word appears and is used.

AFTERWORD

Fondazione Barilla
il tuo cibo, la tua terra

Barilla Center for Food & Nutrition Foundation

The Barilla Center for Food & Nutrition Foundation (BCFN) is a think tank and research center which analyzes the complexity of current agri-food systems and, through a variety of initiatives, fosters change towards healthier and more sustainable lifestyles in order to achieve the Goals set by the United Nations 2030 Agenda for Sustainable Development (SDGs). With its scientific research and public initiatives, the BCFN Foundation promotes an open dialogue between science and society both nationally and internationally. It addresses today's major food-related issues with a multidisciplinary approach and from the environmental, economic and social perspective, to secure the wellbeing and health of people and the Planet.

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SDSN Mediterranean

SDSN Mediterranean

SDSN Mediterranean is the regional Sustainable Development Solutions Network of the United Nations which promotes the 2030 Agenda and the Sustainable Development Goals (SDGs) throughout the Mediterranean region through research, innovation and new teaching methods and is coordinated by the University of Siena. The role of SDSN Mediterranean includes many activities, such as: mobilizing the relevant bodies, coordinating the activities of the network, disseminating the regional and global initiatives, also with policy makers, the private sector and NGOs, promoting initiatives that offer regional and global solutions, as well as forging close-knit communities of young academics with a strong awareness of the greatest challenges posed by sustainable development.

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