Anđelka Mihajlov and Ana Puđa

-climate-responsible-
EATING

What is good for me is good for the planet
What is good for the planet is good for me
What we eat matters for us, climate change, and the planet.

AMBASADORI ODRŽIVOG
RAZVOJA I ŽIVOTNE SREDINE

ENVIRONMENTAL AMBASSADORS
FOR SUSTAINABLE DEVELOPMENT

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Contents

Extended summary

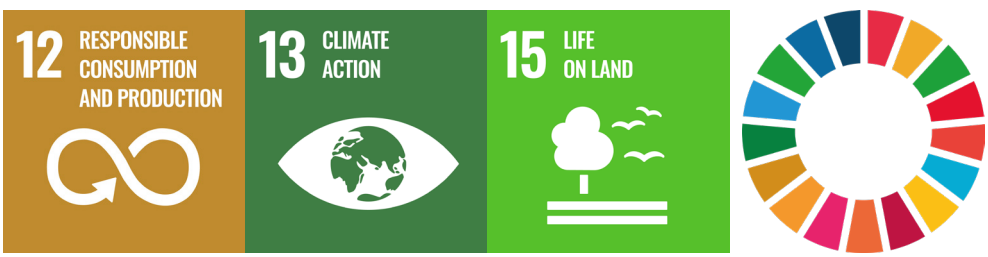
Addressing climate change and reducing (present and) future harm requires further global action. Delaying action could result in irreversible effects on ecosystems and could lead to significant additional greenhouse gas emissions; later in the century we could come up against very high risks approaching disastrous levels, unless we limit the global warming. The climate and ecosystems are becoming increasingly disturbed.

The analysis presented in this publication includes — in addition to the preface (focusing on the topic's importance) — four parts:

- introductory considerations;
- advice on responsible eating;
- science and research speak to advice on responsible eating (sustainable use of natural resources, climate change, waste and chemicals management, footprint — what is good for me is good for the planet, sustainable development goals);
- concluding remarks — afterword.

The presented scientific findings were used to support the posited interrelation: nutrition – natural resources – climate change – waste and chemicals – sustainable development goals.

The Special Report on Climate Change and Land by the International Panel on Climate Change (IPCC)[1] for 2019 encouraged and emphasized diversification in the food system as a possible mean of reducing risks of climate change. It is suggested that "*balanced diets, featuring plant-based foods, such as those based on coarse grains, legumes, fruits and vegetables, nuts and seeds, and animal-sourced food produced in resilient, sustainable and low-GHG emission systems, present major opportunities for adaptation and mitigation while generating significant co-benefits in terms of human health.*"



Attention is drawn to the significance and interpretation of responsible and climate-responsible eating. The three direct goals of responsible nutrition are less, more, and ethical (less: being able to estimate sufficient quantities and reduce them; more: defining the diet so that it fits the needs; ethical: changing consumption patterns in line with considered values). This publication aims to encourage thinking about conscious and more appropriate food consumption, with conscious consumption meaning more conscious selection and use, and appropriate consumption meaning re-examining consumption levels and drivers.

Climate-responsible eating is both simple and complex — it should not be understood as a weight-loss diet because it is more than that. It represents concrete action with the aim of mitigating climate change.

1 IPCC, Special Report on Climate Change and Land, https://www.ipcc.ch/srccl/

We designed a pyramid representing food hierarchy in line with the potential impact on climate-responsible nutrition.

According to recent scientific studies, avoiding meat and dairy is one of the key ways of reducing environmental impact. This could also reduce the individual carbon footprint coming from food.

The overall formula for each of us implementing (climate-)responsible nutrition includes the following components:

- Slightly reduce the amount of meat you use weekly;
- Prepare only the food you will eat — refrain from wasting food;
- Make choices that involve locally grown and produced food as much as possible (the link between food and the environment is complex, and often accompanied by negative impacts on the environment);
- Buy more fresh and less frozen food;
- Buy groceries without packaging. This will reduce the amount of ever-growing waste. If you must buy products that are sold in packaging, try to stick to the largest possible packaging and handle empty cans, plastic, and other packaging responsibly.

The advice also includes the following:

- Prepare sandwiches at home, refrain from buying ready-to-eat sandwiches;
- Think before you buy. Start paying attention to the labels on the products that you buy!

The research presented in this publication is an overall view of the issue through the lens of environmental protection, sustainable development, and climate change; it aims to educate and inform individuals across age groups, but it does not at all aspire to offer suggestions in the context of health impact. Likewise, the publication steers clear of analyzing elements that affect food production or addressing the problem of people around the world who go hungry every day.

The publication was authored by Prof. Anđelka Mihajlov, PhD (Technical Sciences, University of Belgrade), and Ana Puđa, PhD (Vienna Medical University). The authors thank Prof. Zora Dajić-Stevanović, who made a contribution by making sure that the parts pertaining to organic food had been written correctly. On behalf of the publisher — Environmental Ambassadors for Sustainable Development — Aleksandra Mladenović provided useful advice for improving the text. The publication is configured as a compilation, taking into account the authors' previous research, and it seeks to contribute to promoting climate/environmentally conscious populace, both young and not so young, through broader education.

Key words: climate change, food, food waste, responsible eating, SDG12, SDG13, SDG15, carbon footprint

Preface:
Relevance of the chosen topic

The Intergovernmental Panel on Climate Change (IPCC)[2] recently published its new Report on Climate Change and Land, prepared by more than one hundred scientists from more than 52 countries. The report clearly states that climate change continues to put serious pressure on the world's land and water resources, threatening the ability of humanity to feed itself. Sustainable land management could be part of climate solutions, including contributing to food security[3]; the existing food system feeds the vast majority of the world's population and supports the livelihoods of over one billion people[4], with around 1.9 billion adults and 340 million children in the world being overweight or obese[5].

*The **food system** includes production, transport, processing, packaging, storage, retail, consumption, loss and waste.*

Consumption of healthy[6] and sustainable diets presents major opportunities for reducing greenhouse gas emissions from food systems and improving health outcomes. Reducing food loss and waste could reduce greenhouse gas emissions and improve food security.

Agriculture and food systems are among key segments with regard to responding to global climate change. Combining action on the supply side — such as efficient production, transportation, and processing — with interventions on the demand side — modifying food choices and reducing food loss and waste — decreases greenhouse gas emissions and increases the resilience of food systems.

***Sustainable diets** are those diets with low environmental impacts that contribute to food and nutritional security and to healthy lives for present and future generations.*

Around 21–37% of total greenhouse gas emissions are attributable to the food system. The potential for climate change mitigation by changes in diet could be significant, but realizing this potential on a large scale depends on consumer choice and dietary preferences that are driven by social, cultural, environmental, and traditional factors, as well as income growth.

2 https://www.ipcc.ch/srccl-report-download-page/
3 The IPCC WG II AR5 - SPECIAL REPORT ON CLIMATE CHANGE AND LAND, Chapter 5: Food Security https://www.ipcc.ch/site/assets/uploads/sites/4/2020/02/SRCCL-Chapter-5.pdf
4 On the other side, an estimated 821 million people are undernourished, 151 million children under five are stunted, 613 million women and girls aged 15 to 49 suffer from iron deficiency, and two billion adults are overweight or obese.
5 https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight
6 https://www.who.int/news-room/fact-sheets/detail/healthy-diet

Adaptation and mitigation throughout the food system require creating conditions that facilitate policies, markets, institutions and governance.

*A **climate responsible food system** means rethinking the entire food system, taking into account that the food system is a major contributor to climate change.*

Without significant shifts in climate-responsible global diets, it is unlikely that the world will achieve its internationally agreed targets under the Paris Agreement[7].

1. Introductory considerations

"Each of us is the manager of their own life, and all of us together today are the managers of the next generation's lives."[4]

The research presented in this publication deals with the issue from the environmental protection, sustainable development, and climate change perspective with the aim of educating readers and a more general public across age groups, without tying in any health impacts (which would be interesting to study and include; we make reference to only some studies conducted in the country[8], whose reference values are established as the presence of toxic substances in the human bloodstream within the country's population, with the aim of identifying the impact of elements from professional and personal environments on human health).

***Responsible eating** is not a specific type of diet. When properly informed, you gain the possibility to make responsible eating choices, which will lead to a feeling of satisfaction because of your own actions.*

Also, the publication abstains from analyzing elements that affect food production — which is another interesting research topic. We are also aware of the fact that our research is a roadmap for those who have food, and we do not address the situation of more than 800 million people around the world who go hungry every day.

This publication aims to promote the education of an environmentally conscious population across age groups and serves as a compilation of existing scientific learnings, including the authors' previous research[9]. We want to put forward a way of using food through the "art of nutrition" that everyone will be able to design for themselves, while starting to feel better. We might also encourage advertisers of food products to think differently and stop spotlighting only prices, and instead make room for environment- and climate-related qualities. Communication strategies are meant to advance sustainable consumption.

7 https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement
8 Stojsavljević A, et al., The human biomonitoring study in Serbia: Background levels for arsenic, cadmium, lead, thorium and uranium in the whole blood of adult Serbian population., Ecotoxicol Environ Saf. 2019
9 Most references are specified; however, some self-citations, articles, and interviews from the media are not specified in the references.

*A **climate responsible** **diet** is reponsible eating with focus in lowering climate change; rebalancing our diets is one of the first steps to moving towards climate responible diet.*

By simply laying out the scientific and research background of the presented results, we want to demonstrate that consuming food fully validates asking how much does an increased level of food consumption elevates the quality of life. Conscious and appropriate food consumption is the responsibility of each individual consumer. Holding views that primarily focus on materialistic values is unsustainable[10].

This publication is a supplemented edition of the previous publication in the Serbian language[11], which was specifically intended for eco-school[12] coordinators, educators, teachers, professors, parents, and anyone interested in the title, with a view to prompting a nationwide conversation about the link between responsible and climate-friendly eating with sustainable use of natural resources and climate change. Because people can change both themselves and young people whom they teach, who see educators as role models. The publication is in English so that it can also be used throughout the region, and wider.

The publisher and the authors would be delighted to see the shared findings becoming a catalyst for change.

10 Mihajlov A., Odraz za budućnost [A Reflection for the Future], Hesperia, Belgrade 2007
11 Mihajlov A., A. Puđa (2019), Odgovorna ishrana [Responsible Eating], Belgrade, Environmental Ambassadors for Sustainable Development, available at http://ambassadors-env.com/odgovorna-ishrana/
12 http://feeserbia.com/programi/eko-skole/

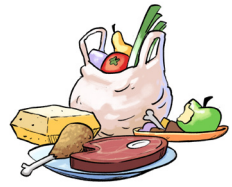
2. Advice on responsible eating and climate-responsible diet

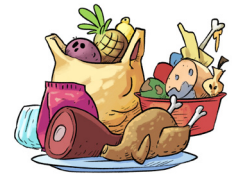
„The price of inaction is higher than the one we will pay if we immediately start taking action! If you do something, you deserve praise from the people around you, from climate future, and from the planet's future. Start being part of the solution!"[13]

The overall formula for each of us implementing **climate-responsible nutrition** (let's call it "ambassador diet"[14]) includes the following components:

- Slightly reduce the amount of meat you use weekly;
- Prepare only the food that you will eat — refrain from throwing food away;
- Make choices that involve locally grown and produced food as much as possible (the link between food and the environment is complex, and often accompanied by negative impacts on the environment);
- Buy more fresh and less frozen food;
- Buy groceries without packaging. This will reduce the amount of ever-growing waste. If you must buy products sold in packaging, try to stick to the largest possible packaging and handle empty cans, plastic, and other packaging responsibly.

Structured, both through food choices and diet, your ecological footprint could be smaller:





Small *ecological footprint*	Medium *ecological footprint*	Large *ecological footprint*
Almost never eating meat	Eating meat 1–4 times a week	Eating meat almost every day
Generating almost no food waste	Occasionally throwing away fresh or uneaten food	Generating food waste almost every day
Buying food at the local market from local producers or producing it yourself	Buying locally produced food in stores	Buying imported food in stores
Never buying food in plastic packaging	Buying food in plastic packaging	Buying food in plastic packaging

13 Mihajlov A., Odraz za budućnost [A Reflection for the Future], Hesperia, Belgrade 2007
14 Having in mind that the research was set by the publication's publisher, Environmental Ambassadors for Sustainable Development, www.ambassadors-env.com

We will support the advice with data (the numbers are to be taken as rough estimates and relatively, because different sources cite different figures, which as a rule pertain only to specific presented studies):

Diet changes we can all make to reduce our *ecological footprint*:
100 grams of beef less per week
100 grams of farm-sourced beef less per week
100 grams of pork less per week
100 grams of farm-sourced pork less per week
100 grams of whole chicken less per week
100 grams of farm-sourced chicken meat less per week
100 grams of store-bought frozen cod less per week
100 grams of frozen shrimp less per week
Half a liter of milk less per week
100 grams of store-bought tomatoes less per week
100 grams of white bread less per week
100 grams of soy less per week
100 grams of store-bought onion less per week
100 grams of store-bought potatoes less per week

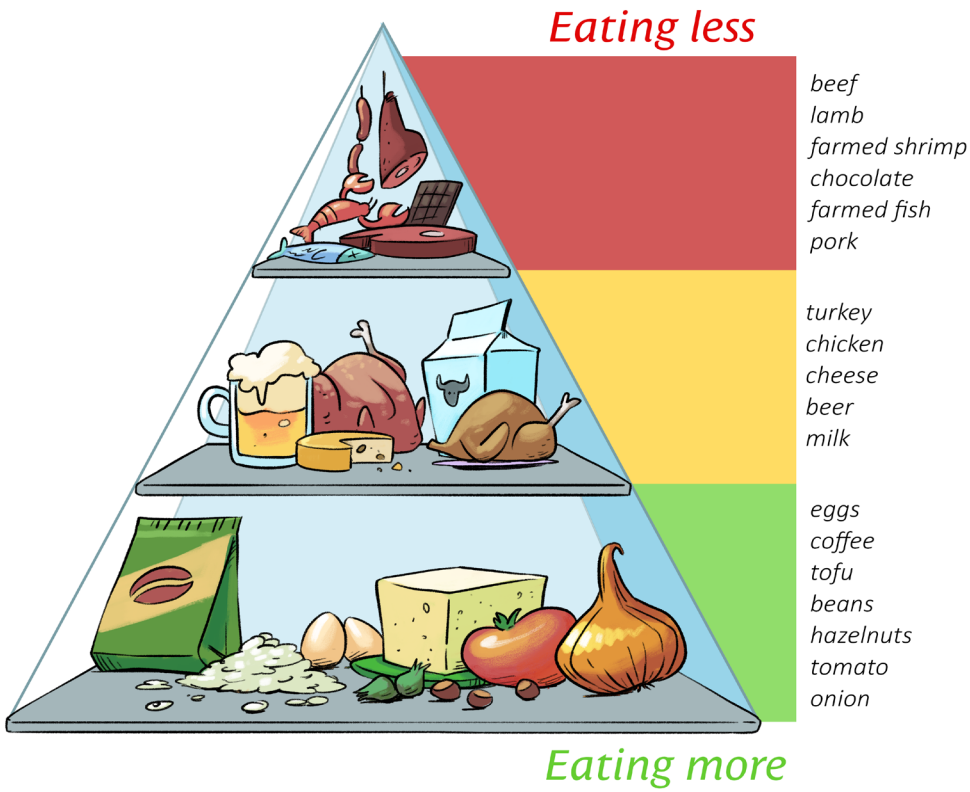
Keep in mind that being a vegetarian or vegan (completely avoiding food of animal origin) does not automatically make a person more responsible than people who do eat meat. For example, the stereotype that fruits and vegetables are more appropriate could immediately fail the test over the amount of water used to wash them, because water is a natural resource...

If sandwiches are your favorite food, prepare them yourself at home, and avoid buying ready-made sandwiches.

Meal size and daily food intake recommendations are not addressed here, but they can be found in the literature. Climate-responsible eating[15] should not be understood (only) as a weight-loss diet because it is more than that. Body weight does not equate to health.

15 Nutrition is understood as the science of organic processes that the body employs to digest and make use of food and fluids for normal functioning, development, and maintenance, as well as for preserving the balance between health and disease.

For better understanding, we designed a pyramid representing food hierarchy in line with the potential impact on climate-responsible nutrition:



Using the food placed at the pyramid's bottom has less impact on the environment and climate change, while the food at the pyramid's top have greater impact on the environment and climate change. Accordingly, reducing the use of food at the pyramid's top contributes to preserving the environment, mitigating climate change, and reducing our own ecological footprint.

We advise and challenge you to think this over. It seems likely that each of us could save at least 1,000 grams per week of total carbon dioxide emissions[16] (without feeling it), which makes 4,000 grams per month, or 48,000 grams (48 kilograms) per year... When multiplied with the number of people who make these changes, the result is significant.

Think before you buy! Start paying attention to the labels on the products that you buy!

16 Carbon dioxide is an atmospheric gas whose emission gives rise to a greenhouse effect; it affects climate change significantly.

3.Science and research support the advice on responsible eating and climate-responsible diet

"Scientific learnings come from people's need to learn about the world so that they can master it more easily."

The focus of this publication is not scientific research (not in nutrition, nor in food, the environment or climate change.

We use scientific findings only as a mean of supporting the posited interrelation nutrition – natural resources – climate change – waste and chemicals – sustainable development goals.

a. Sustainable use of natural resources

„Shared views on values, ideas, and dreams are critical cultural resources."[17]

Resources are generally categorized into human, physical, and natural. Natural resources are geological and biological assets that can be used or employed directly or indirectly and that have real or potential value[18].

Renewable resources have the capacity to regenerate, but if the renewal rate does not exceed the use rate, their utilization might be time-limited. Non-renewable resources were formed in the ancient geological past, over millions of years.

Natural resources classification scheme[19]

	Inexhaustible resources	Exhaustible resources
Renewable resources	**Flows:** sun, wind, waves, rainwater **Reservoirs:** air (oxygen, carbon dioxide), oceans (water)	**Biological resources:** forests, fish, biomass **Reservoirs:** freshwater basins, aquatic environments, fertile soil
	Space (soil, sea-surfaces, air-third dimension)	
Non-renewable resources	**Recyclable resources:** metals **Recoverable resources:** other minerals, soil	**Non-renewable and non-recoverable resources:** fossil fuels like oil, gas, and coal

17 Ulrich Grober, Aus Politik und Zeitgeschichte 24/2001, S. 3
18 Mihajlov A., Održivo korišćenje prirodnih resursa i sistem zaštite životne sredine [Sustainable use of natural resources and the environmental protection system], cliffnotes for the Faculty of Technical Sciences, University of Novi Sad, April 2007
19 Draft EU Thematic Strategy on the Sustainable Use of Natural Resources 2003; EC COM (2003) 572

Resource-intensive and harmful food production and consumption also have a major impact on our climate and environment. Saving and rational use of resources lead to responsible eating — the more resources we save, the more responsible the diet is. For example, water resources (water resources are surface water and groundwater by quantity and quality) shown through "virtual water" required for food production[20] (in the table below).

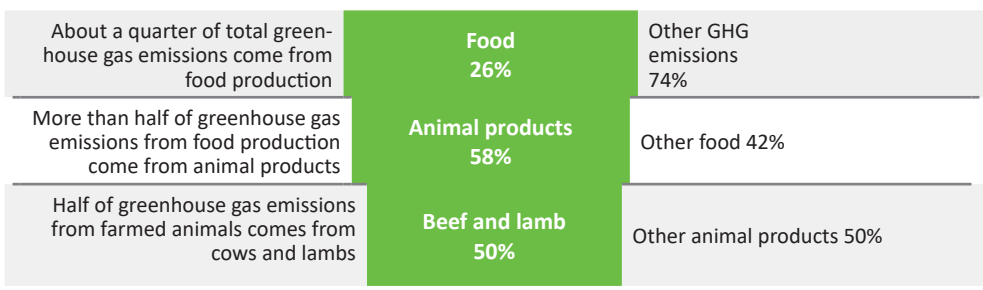
Water quantity in liters required for production	
15,000-16,000	1 kg of beef
3,000	1 kg of rice
1,350	1 kg of wheat
1,000	1 liter of milk
900	1 kg of corn flour
140	1 cup of coffee

Diet changes can make a big difference in your "personal footprint/environmental and climate change impact" (from saving in water use through affecting deforestation).

b. Climate change

Traditional mathematical models of climate change base their predictions on studying the relationship between greenhouse gases and the amount of heat that remains trapped on the Earth's surface. These mathematical calculations determined the possible increase of the average temperature from 1.4°C to 5.8°C between 1990 and 2100. Our region[21] is identified as one where climate change will significantly affect life. All rivers in Serbia have seen a significant downward trend of water supply (except the Danube and the Tisa, which originate in other countries). Significantly drier climate (less precipitation) is expected in some parts of the country[22].

Lifestyle changes can reduce greenhouse gas emissions. The proportions of total greenhouse gas emissions coming from food[23] are shown below.



20 Adapted from "Protecting resources and using them respecitevely", BUND, and from other different sources
21 The region including Serbia
22 Mihajlov A., Osnove analitičkih instrumenata u oblasti životne sredine [Fundamentals of Environmental Analytical Tools], Educons University, 2009
23 Poore J, T. Nemecek, Reducing food's environmental impacts through producers and consumers, Science, 360 (6392) 987-992, 2018, and interpretation https://www.bbc.com/news/science-environment-46459714

In more detail, the table of recommended activities in Chapter 2 can be supplemented with illustration estimations on reducing total carbon dioxide emissions (as a greenhouse gas, a cause of climate change):

Advice on responsible eating, per food type (advice is per week)	Reduction of total carbon dioxide emissions in grams
100 grams of beef less	6,800
100 grams of farm-sourced beef less	1,160
100 grams of pork less	458
100 grams of farm-sourced pork less	225
100 grams of whole chicken less	318
100 grams of farm-sourced chicken meat less	180
100 grams of store-bought frozen cod less	320
100 grams of frozen shrimp less	1,050
Half a liter of milk less	600
100 grams of store-bought tomatoes less	345
100 grams of white bread less	78
100 grams of soy less	62
100 grams of store-bought onion less	38
100 grams of store-bought potatoes less	22

A carbon footprint is the total greenhouse gas (GHG) emissions caused by an individual, event, organization, service, or product, expressed as carbon dioxide equivalent. This is unit that converts the impact of different greenhouse gases (like methane and nitrous oxide) to equivalent amount of carbon dioxide.

An alternative illustration through the carbon footprint from food[24]:

Food	kg CO2 equivalent [25] [26]
Lamb	39,2
Beef	27,0
Cheese	13,5
Pork	12,1
Turkey	10,9
Chicken	6,9
Tuna	6,1
Eggs	4,8
Potato	2,9
Rice	2,7
Hazelnut	2,3
Beans/Tofu	2,0
Vegetables	2,0
Milk	1,9
Fruit	1,1
Lentils	0,9

How personal contribution, at country level, could be important in lowering CO2 emissions, also in our region, is presented in table below[27].

Country	Total kg CO2 emission/person/year, for year 2018	
	Animal product	Non-animal product
Albania	1,774	44
Greece	1,446	51
Austria	1,176	35
Italy	1,158	49
Slovenia	1,077	34
Croatia	966	31
Turkey	836	61
Romania	734	32
Serbia	696	28
Bosnia and Herzegovina	604	24
North Macedonia	567	34
Hungary	552	25

24 http://static.ewg.org/reports/2011/meateaters/pdf/methodology_ewg_meat_eaters_guide_to_health_and_climate_2011.pdf
25 CO_2e or CO_2 equivalent is the standard unit for measuring the carbon footprint.
26 Most emissions occur during production.
27 https://www.nu3.de/blogs/nutrition/food-carbon-footprint-index-2018

Food production is extremely sensitive to climate change. In a changed climate, living conditions change (thriving plants, floods, droughts, heat waves, natural disasters, etc.), so that long-term planning of economic development (both agricultural and technological) becomes inaccurate unless climate change and the environment are taken into consideration.

c. Waste management and chemicals

Regarding the waste and chemicals management, the publication limits its focus to the relationship between food/diet and waste/chemicals.

We start with an example from personal experience: One restaurant offers large, medium, and small portions for the same price, with a vision of making the customer estimate the size of their meal in advance, so that no food is left on the plate as waste. Because reducing food waste protects resources.

The same values are taught to children in all-day schools (in some countries) — they determine on their own how much food they want in their plates for lunch, with the option to ask for more. This way they learn from an early age that food should not be thrown away, that the environment should be protected, and that each individual can make a difference with their actions.

At the global level, one-third of all food produced ends up in garbage cans — the average European is estimated to throw away 95 kilograms of food per person per year. Even in (African) low-income countries, food gets thrown away — however, quantities are different and estimated at 6 kilograms of food per person per year.

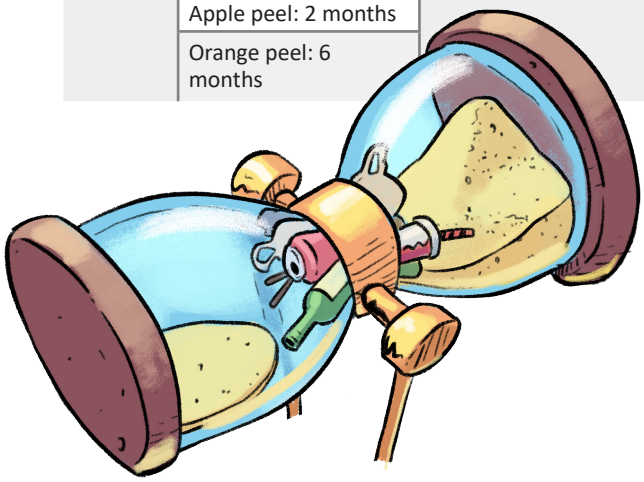
And one more thing about food: Avoid food that comes in plastic packaging. It is not enough to just get rid of plastic bags, although it is indeed a good first step.

Avoiding plastic and plastic packaging in order to reduce the total amount of waste is shown scaled according to alternatives (i.e. number of items that replace disposable product) in the table below:

Plastic products	783 plastic bags	**Alternative to plastic products**	1 reusable shopping bag
	83 plastic bottles		1 reusable bottle
	1,256 plastic cups		1 reusable cup
	295 plastic straws		1 reusable straw / drinking without a straw

It should be noted how much time it takes for different discarded materials and waste to decompose in nature (shown below), if they are not further processed and used.

Food waste	Banana peel: 3–4 weeks	**Packaging and other materials and products**	Paper bag: 1 month
	Apple peel: 2 months		Cardboard: 2 months
	Orange peel: 6 months		Plywood: 1–3 years
			Milk cartons: 5 years
			Styrofoam cups: 50 years
			Plastic containers: 50–80 years
			Aluminum cans: 200–500 years
			Plastic bottles: 450 years
			Disposable diapers: 550 years
			Plastic bags: 200–1000 years



Study results[28] show inadequate and uncontrolled use of fertilizers, pesticides, and other agrotechnical measures in Serbia. The quantities of tested pesticides found in soil indicate that the land cannot be determined as contaminated. However, it should be noted[29] that some sites show the presence of DDT[30] and its metabolites and lindane (lindane gHCH), which is associated with their use in forest protection. Some arable land has slightly increased values of trazen active substances, which are used in farm production.

The total content of heavy metals in soil differs in Vojvodina and central Serbia, while noting that most soil samples have high levels of heavy metals that are not from anthropogenic sources, but are instead linked to the geochemical origin and genesis of some soil types. Heavy metal soil contamination is present near major industrial plants, mines, and uncontrolled landfills[31].

It should be noted that sustainable agriculture (food production) benefits from knowing the properties of soil where the plants we use in our diet are cultivated (and many crops are used as animal feed in husbandry of animals whose meat we later consume). A global study from 2005 suggests that more than 40% of tested food that was not produced organically contained pesticide residues.

This created space for organic agriculture[32]. In essence, organic or bio- or eco-food is food produced by using practices specific to eco and organic agriculture, which includes a number of processes: from selecting organic seedlings through agrotechnical measures — crop rotation, soil preparation, weed control by mulching (protective layer on the soil made of natural material or fallen leaves, withered flowers, small twigs, straw...), use of natural fertilizers such as compost, earthworms, or boiled manure, protective agents based

28 Initial research on the soil fertility management system in the Republic of Serbia, 1992–2009, and other research
29 http://www.zzps.rs/novo/kontent/stranicy/propisi_strategije/S_prirodnih%20resursa.pdf
30 (Dichlorodiphenyltrichloroethane)
31 Testing done by the Serbian Environmental Protection Agency
32 As a set of interrelated principles and processes established by formal standards of organic production that are used in agriculture; see also http://www.vikendica.net/hortikultura/item/266-sta-je-organska-hrana, http://terras.org.rs/download/TERRAS%20za%20web%20strana%20po%20strana.pdf

on extracts of medicinal plants, plantings of protective belts, providing habitats for useful insects that protect the cultivated plants against harmful insects, etc. Organic agriculture is a system of agricultural management that strives for ethically acceptable, ecologically clean, socially just, and financially profitable agricultural production.

The customer should know how to identify organic products. Today terms like eco, bio, organic, from nature are popular and also used for products that are not produced using organic production methods. Professional control and certification are the only guarantee to the consumer that the product is produced in line with the requirements and standards of organic production; this needs to be distinctly labeled on the product[33]. The buyer/consumer needs to be informed about organic product labels (for example, the EU organic logo or the certificate of the national organic production body).

Genuine organic products, among others, contain no harmful substances — pesticide residues, heavy metals, hormones, antibiotics, veterinary medicines, mycotoxins, etc.; they have lower levels of nitrates and nitrites and no synthetic additives or products based on genetically modified organisms. Organic crop culture benefits animal welfare (animals are kept in natural surroundings contributing to animal welfare)[34] and environmental protection (comes from sustainable production, contains no synthetic or chemical protective agents or fertilizers that pollute the environment, soil, air, surface water, or groundwater, preserves biodiversity, comes from a closed production cycle that is in harmony with nature).

d. The footprint: What is good for me is good for the planet

„What happens to the land happens to its children. If one spits on the ground, they spit on themselves. The land belongs to no people - people belong to the land. We know that very well. Everything is interconnected."[35]

The diagnosis is rather clear: The way people live today is unsustainable. The planet is sick! Unsustainable consumption is obvious from its impact on the environment globally (this study could be taken to encourage diets that are good for people and planet, i.e. among planet-based diets[36]). Methodologies like environmental footprints[37], ecological rucksack, ecological footprint, and environmental space have been developed to facilitate linking indicator-based impact measurement with trends in consumption patterns in a normative fashion. The frameworks of these methods can be described along these lines:

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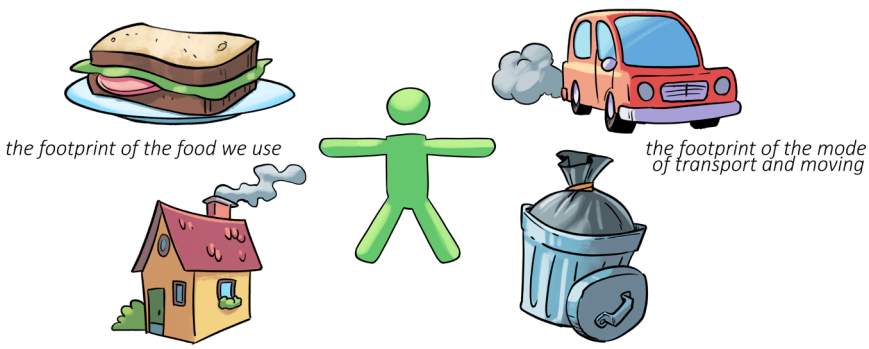
33 In Serbia, this area is regulated by the Regulations on control and certification in organic production and organic production methods, along with the Law on Organic Production; alignment with EU regulations is still underway. Serbia also has the Regulations on detailed requirements and procedure for obtaining the right to use the eco-label, components, appearance, and use of the eco-label for products, processes, and services, which enables evaluating products that are environmentally friendly — however, this label does not indicate that the product is organic.
34 There are also organic products of animal origin, which is sometimes overseen
35 Extract from a letter written by a Seattle tribe chief to US President Abraham Lincoln in 1854.
36 https://drive.google.com/file/d/1pVpYTNQKAE_izp8tsVK3tQ4fNWPgoQIz/view; https://planet-baseddiets.panda.org/
37 Explanation of "The Environmental Footprint Family" is available at https://ec.europa.eu/jrc/en/science-update/environmental-footprint-family-bringing-clarity-crowded-field-footprint-studies

• *Environmental footprints*: Quantify resource use and/or emissions; they are indicators of pressure on the Earth system;
• *Ecological rucksack*: The external environmental impact of the product and the supply chain;
• *Ecological footprint*: The total impact on the environment in terms of land use;
• *Environmental space*: Establishing the parameters for sustainable and fair use of resources.

A product's *ecological rucksack* is an estimate of the amount of resource used and the effects of the product's production, distribution, and disposal beyond what is required for the product itself and its normal use. An ecological rucksack is defined as the total quantity (in kg) of materials removed from nature to create a product or service, minus the actual weight of the product. It considers the entire production process, from the cradle to the point when the product is ready for use. Accordingly, the rucksack is the ecological "burden" carried by the product that is invisible to the consumer.

Environmental space ("the quantity of energy, water, land, non-renewable raw materials and wood that we can use in a sustainable fashion") is a method that requires fundamental fairness in access to a resource, but its analysis is based on an assessment of sustainable extraction rates and pollution distribution rates. Environmental space for individuals and groups is the freedom that the environment offers them by means of resource availability and pollution distribution.

While making an *ecological footprint assessment*[38], the impact of an economic activity is assessed in terms of "using land" required for the activity, analyzed against other potential activities and their land use requirements. The ecological footprint, as a synthesizing indicator, essentially leans on these properties[39]:

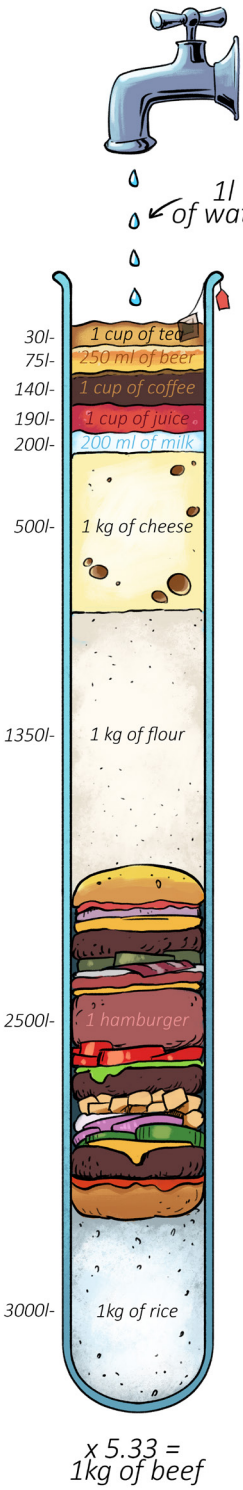


In addition to the above described, elements of the ecological footprint can be more complex[40]. For example: Cattle raised on forested land are responsible for more than ten times the greenhouse gas emissions of cows raised on natural pastures; chocolate and coffee

38 https://www.footprintnetwork.org/our-work/ecological-footprint/
39 Johnsson'Latham G., A study of gender equality as a prerequisite for sustainable development, The Env. Advisory Council — Ministry of Environment, Stockholm, Sweden, 2007
40 www.rprogress.org/publications/2006/Footprint%20of%20Nations%202005.pdf; www.gdrc.org/uem/footprints/wwf-ecologicalfootprints.pdf

that come from afforested rainforests produce relatively high greenhouse gas emissions.

In the context of showing the ecological footprint, different indices have been developed[41]: ecological index, climate change performance index, and others. An example of the footprint of the food we use is the *water footprint*[42], shown in the table below.



The total amount of water used for the production of some goods and services that we consume

The quantity of	250 ml of beer	takes:	75 l of water
	1 cup of tea		30 l of water
	1 cup of coffee		140 l of water
	1 cup of juice		190 l of water
	200 ml of milk		200 l of water
	1 kg of cheese		500 l of water
	1 kg of flour		1,350 l of water
	1 hamburger		2,500 l of water
	1 kg of rice		3,000 l of water
	1 kg of beef		16,000 l of water

As an illustration, the example of the sandwich's footprint always captures attention (the production of a pre-made sandwich, sold as such). Here are some pre-made sandwiches that are widely used in the country:

Sandwich type	Grams of CO_2 equivalent
Ham and cheese	1,350
Egg and bacon	1,182
Double cheese and onion	1,078
Cheese and tomato	1,067
Chicken and bacon	1,030

Analyzing[43] 40 types of store-bought and home-made sandwiches gives the following carbon footprint results (footprint shown relative to the CO2 equivalent):

- Store-bought, ready-to-eat sandwiches: 739-1,441g CO2 eq;
- Home-made sandwiches: 399-843g CO2 eq.

This shows and suggests that if sandwiches are your favorite food, make them yourself at home to help reduce harmful effects on the environment.

41 Ecological footprint and biocapacity, Global Footprint Network, 2006; www.footprint-network.org
42 Strange T., A. Bayley, Sustainable Development — Linking economy, society and environment, OECD Paris, 2008
43 Espinoza-Orias N., A. Azapagic, Understanding the impact on climate change of convenience food: Carbon footprint of sandwiches, Sustainable Production and Consumption, Volume 15, July 2018, Pages 1–15

e. Sustainable development goals

"In the equation of predicting the future, the concept of sustainable development — albeit with many variables — becomes an important cornerstone for the future".[44]

It is widely accepted that sustainable development represents the integration of social, economic, and environmental aspects of the environment in corporate and public decision-making within a framework that ensures full involvement and contribution. The list of priorities in the strategic planning[45] of sustainable development includes increasing the investment in people and technology for competitive economy; reducing the level of social disparities; promoting transportation systems that have the least negative impact on the environment and health; improving living conditions in cities; steering development and agricultural practices to protect the rural environment and the wild; improving energy efficiency; addressing the issues of waste (from the aspect of environment, economic and social policies) and hazardous waste (competitiveness); improving regional and international cooperation for the purpose of sustainable development.

In order to map out the road to sustainable development, in 2015, the UN General Assembly — as a continuation of the Millennium Development Goals — adopted the 2030 Agenda and 17 Sustainable Development Goals[46] (with 169 targets)[47], placing focus on poverty eradication, education, social protection and health care, economic growth, and climate change. Sustainable development goals should be viewed in tandem with the Paris Climate Agreement. A sustainable system of food, land, and ocean use is seen as one of the pillars of the European Green Deal[48], through promoting integrated strategies for productive, efficient, and sustainable agriculture, while respecting and preserving nature, as well as healthy diets with low food loss and waste[49].

For the purposes of this publication, a low-scale study was done to examine the main links between climate-responsible eating (food) and sustainable development goals[50]. The analysis is shown in the table below.

44 Mihajlov A., Odraz za budućnost [A Reflection for the Future], Hesperia, Belgrade 2007
45 Mihajlov, A.: Sustainable Development and Environment towards Europe in 95+ steps, monograph, Serbian Chamber of Commerce and Environmental Ambassadors for Sustainable Development; amended and revised edition in English (2006), Serbian Chamber of Commerce and Environmental Ambassadors for Sustainable Development, 2006
46 http://www.un.org/sustainabledevelopment/development-agenda/
47 The 2030 Agenda in Serbia: http://rsjp.gov.rs/malodrvo/agenda_2030_i_srbija/Agenda_2030_i_Srbija_-_Report_final_18.12.pdf ; http://sdg.indikatori.rs/sr-Latn/ Shadow Report, Environmental Ambassadors for Sustainable Development (2019)
48 https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en#:~:text=The%20European%20Green%20Deal%20is,just%20and%20inclusive%20for%20all.
49 SDSN & IEEP. 2019 The 2019 Europe Sustainable Development Report. Sustainable Development Solutions Network and Institute for European Environmental Policy: Paris and Brussels
50 An integrated approach is crucial to advancing multiple goals at the same time.

Sustainable development goal	Type of link: D = direct I = indirect	Explanation
Goal 1: End poverty in all its forms everywhere 	I	At the global level, more than 800 million people still live on less than USD 1.25 a day; many have no access to adequate food, safe drinking water, or sanitation. This rate is expected to increase amidst new threats posed by climate change, conflicts, and food insecurity.
Goal 2: Zero hunger, in particular 2.1, 2.3, 2.4 	D	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture. This includes promoting sustainable agricultural practices — improving the lives and capacities of small farmers, with equal access to land, technology, and markets.
Goal 12: responsible production and consumption, in particular 12.2, 12.3, and 12.4 	D	Ensure sustainable consumption and production patterns by changing the way we produce and consume products and resources. This also includes achieving sustainable management and efficient use of natural resources by the end of 2030, halving food waste per capita globally at retail and consumer levels, as well as reducing food losses in production and supply chains, which also includes post-harvest losses. Environmentally sound chemicals management needs to be established by the end of 2020.
Goal 13: CLIMATE ACTION 	I	Take urgent action to combat climate change and its impacts.
Goal 15: LIFE ON LAND 	D	Sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss.

4. Afterword

"Understanding what we hear is a prerequisite to changing ourselves and the world for the better."[51]

Food is medicine.[52]

"How can you buy or sell heaven or the warmth of land? We don't own fresh air or clear water. How can we then sell them?"[53]

When we listen to the planet and the environment, we should also hear messages, which can also be viewed as messages of future generations to the generations living today and using natural resources unsustainably. At times, it seems that many of us are deaf to messages that are based on data and scientific research — perhaps because we are not ready to understand and change. This publication aims to encourage thinking about conscious and more appropriate food consumption, with conscious consumption meaning more conscious selection and use, and appropriate consumption meaning re-examining consumption levels and drivers.

Climate-responsible eating is both simple and complex — the hardest thing for us to accept is that many things need to change, including ourselves. The three direct goals of a responsible diet are less, more, and ethical (less: being able to estimate sufficient quantities and reduce them; more: defining the diet so that it fits the needs; ethical: changing consumption patterns in line with considered values).

Coping with these challenges is not and will not be easy or simple. Find the motivation and the drive in yourself and you will succeed, both short term and long term.

The truth is that good life means different things to different people — there is a whole spectrum of possibilities for living a good life. When you cross the poverty line (everyday life for destitute people is actually a struggle for survival), a happy life does not depend on how much money you have. It all comes down to choosing values — never forget that in addition to materialistic, there are also social, cultural, moral, and spiritual values! The countries with the happiest people in the world are not so rich in terms of money[54]. The truth is that there are different approaches here, too[55].

It seems — even from our research presented in this publication — that it is extremely reasonable to reduce the intake of meat and products of animal origin. A sensible diet should not affect your enjoying of food — you can enjoy the same by eating differently. You must not lie to yourself and honestly note whether you are eating things on the go — this could bring into question your willingness to eat responsibly and use climate-responsible food.

How many times have you heard from our wise grandmothers, mothers, and fathers, "I'm not rich enough to buy cheap products"? If you understand this statement, you understand the concept and philosophy of sustainable development and climate-responsible

51 Mihajlov A., online article, https://www.globallisteningcentre.org/who-is-listening-to-whom-the-human-environment-nexus/
52 Proverb
53 Extract from a letter written by a Seattle tribe chief to US President Abraham Lincoln in 1854.
54 Happy Planet Index, www.happyplanetindex.org; www.neweconomics.org
55 World Database of Happiness, Erasmus University Rotterdam, The Netherlands

eating. Start wondering whether the price of using natural resources is included, or the price of impact on your health and the environment/climate change. Then you will start to understand that every commodity, thing, and product has its life cycle (from raw materials through production, waste, and pollution) and that they should be monitored from the cradle to the grave (from creation to safe disposal). The new currency system actually means a new values system. In our understanding of the global economy, we are aware that this system is very complex — we believe that the monetary system will also have to change. Money and money flows cannot think for themselves — we are the ones who steer them. To start with, you will have more money if you buy smaller amounts of food. This difference can buy you more fitting food for your climate-responsible diet. So, it is up to you!

Faster, *bigger*, *stronger* should be switched as soon as possible to *slower*, *less*, *better*, *nicer* in order to avoid it becoming too late to take action. Now is the time to start thinking about climate-responsible eating. Strong intentions to make changes are already the beginning of success.

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