

Reducing carbon emissions and water footprints through sustainable diet promotion in university and company's canteens: the SU-EATABLE Life project

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Abstract

The EU food chain is at present highly carbon and water intensive. A significant contribution to reduce carbon emissions and water footprints can be achieved through the adoption of a more sustainable and healthier diet. However, while people are generally aware that food affects their health, the impact that food production and consumption have on the world's resources is less known. There is therefore the need to build methods and tools that raise awareness on the potential savings of resources that sustainable and healthy diets can bring, while also stimulate the population to adopt such diets. The EU-funded project SU-EATABLE LIFE aims at i) developing Guidelines that define a sustainable and healthy diet, ii) carrying out a wide range of initiatives aimed at increasing awareness and education on food-related issues by citizens/customers in universities and company's canteens in the United Kingdom and Italy and iii) implementing an easy-to-use Information Systems that enable citizens to engage on this dietary transition. The long-term objective of the project is to contribute to achieving EU targets in terms of GHG emissions reduction as well as more sustainable water use.

1 The global call for a shift towards sustainable diets

It is widely upheld that the planet is facing dramatic changes at unprecedented rates driven by anthropic activity [1]. Land is consumed and ecosystems altered by urbanization, agriculture, transportation, waste disposal, industrial settlements, withdrawal of primary resources and release into the environment all types of pollutants. Anthropic activities are modifying the climate [2] and impacting natural ecosystems with a drastic reduction of biodiversity [3].

The increasing level of ecosystem alteration is rising the awareness of governments and citizens. Examples are the Paris Climate Agreement, which has seen for the first time the global consensus in recognizing climate change as a real occurring environmental crisis led by human activities and has call for action by all the world states. A second example is the growing initiatives around the abatement in the use of plastic disposable items to limit the level of pollution and biodiversity loss in our oceans [4] including European Parliament's law, approved in March 2019, banning a wide-range of single-use plastic items by the year 2021. The food sector significantly contributes to the alteration of the climate and GHG emissions, and is responsible for water overuse and pollution, land use, excess release of nutrients like nitrogen and phosphorus, and biodiversity loss [1, 5]. Food production is expected to increase in the coming century driven by the increasing food demand, which will grow most steeply for meat as a consequence of the change in dietary habits [6].

Despite some of the pressure exerted by the agricultural sector is inevitable, there is a growing scientific evidence that important impact reduction targets can be achieved with key actions which include changes in dietary habits; reduction of food loss and waste; technological improvements for sustainable agricultural intensification [5, 7]. The most recent analysis of the world dietary habits has shown that, in particular in wealthy and developed countries, there is a strong unbalance in the diet composition, with high consumption of meat, dairy products, processed food high in saturated fats, salt and sugar, as well as sugar-sweetened beverages [5]. A global call for sustainable diets is hence timely and might contribute to keep most of the critical environmental targets by 2050 within the so called "planetary boundaries", i. e. "the global biophysical limits that humanity should operate within to ensure a stable and resilient Earth system" [1,5].

2 The SU-EATABLE LIFE project. Promoting sustainable and healthy dietary choices in canteens.

The most relevant reviews on sustainable dietary choices have shown that among the analysed environmental targets, the most significant results can be reached in terms of GHG emissions reduction [5, 7, 8]. The biggest change in diet composition would consist in a drastic reduction in animal derived proteins, in particular from ruminant animals, and a substantial increase in plant-based products, including legumes, nuts and plant-based oils as protein and fat sources [5]. The optimal composition of a sustainable and healthy plate proposed by the EAT Lancet Commission [5] would be, by volume, of approximately half a plate of vegetables and fruits, while the other remaining half, based on contribution in calories, would primarily consist of whole grains, plant protein sources, unsaturated plant oils, and modest amounts of animal sources of protein, which are optional. The same study predicted that such a shift might reduce, by the year 2050, GHG emissions from agriculture by 80%, compared to the GHG baseline emission in 2010. This might be much more effective than changes in food production practices (reduction of 10%) and halving food loss and waste (5%) [5]. A significant reduction of meat consumption might bring significant benefits also in terms of water use [9], since beef meat has a water footprint about three times higher than the respective protein input from legumes [10]. A shift to a pescatarian (or vegetarian) diet could reduce the water footprint per capita within the range 33-55% [9].

The project SU-EATABLE LIFE aims at engaging EU citizens to adopt a sustainable and healthy diet, to achieve a substantial reduction in GHG emissions and water footprints during the project timespan (2019-2021). The target is to achieve a reduction of 5300 tons of CO₂ equivalents and 2 million cubic meters of water. Addressing choices that people take daily can play a fundamental role in enhancing sustainability at the global level. The replication of the project has the potential to contribute to meet the EU targets of GHG reduction in accordance to the Paris Agreement and to reduce pressure on water resources by reducing the food-related water footprint of individuals.

3 Methodology and expected results

The SU-EATABLE project aims at carrying out a series of experiments aimed at raising awareness and knowledge of citizens on the impacts of food choices on human health and the environment and at prompting food behaviour change. The experiments will take place in a number of university and company canteens, starting from October 2019, with a duration of 5-8 months, in the United Kingdom and Italy, with a potential reach of about 56000 people.

The first phase of the SU-EATABLE project (from September 2018 to April 2019) has been devoted to three main activities:

- 1) research phase to explore the relevant academic literature on sustainable diets, as well as to collect and analyse best practice on sustainable diet promotion;
- 2) development of a database on CO₂ and water footprints of food items;
- 3) process of engagement of the canteens and experiment co-design process (still ongoing) with a participatory approach by means of stakeholder workshops, interviews and surveys aimed at understanding challenges and opportunities for each canteen.

From April onwards, further actions include:

- 4) Design and pre-testing of the theory and practice-based experiments
- 5) Design and pre-testing of the monitoring and evaluation plan and assessment tools

The initiatives that will be put forward regard three main areas and are expected to have the following outputs:

1) **Awareness and knowledge:** education material and other communication tools will be devised and deployed in order to increase customers' awareness and knowledge on sustainability, the impacts of food production and consumption on the environment; healthy diets; sustainable food choices etc.;

2) **Food offering:** sustainable and healthy meals and menus will be developed with the canteens so to endure a daily offer of delicious, healthy and sustainable food;

3) **Social engagement:** a digital platform will be used to enable learning about the meaning and understanding of sustainable diets and develop social- and practical skills for sustainable choices through participation in challenges and competitions. .

The target is the active involvement of at least 5000 people and to reach a consolidated change of dietary habits towards more sustainable and healthier options. Lesson learnt from experiments constitute the basis for a transferability strategy to other stakeholders, such as food retailers and municipalities, besides other canteens.

The dietary choices promoted in the canteens will be in line with the definition of a healthy diet, determined by world leading institutions and experts, among which, the World Health Organization [12], the Joint WHO/FAO Expert Consultation on diet, nutrition and the prevention of chronic diseases (Geneva 2002), the British Dietetic Association (BDA), the EAT-Lancet Commission on Food, Planet, Health [5]. Healthy diets are generally considered to include a diversity of nutrient-rich foods, such as vegetables, fruits, whole grains, pulses (beans, legumes, nuts and seeds), unsaturated vegetable oils, with (for non-vegetarians or non-vegans) modest amounts of meat, fish, eggs and dairy [5, 13]. Dietary choices should bring clear and recognized benefits to the environment, and in particular to GHG emission reduction and water footprint reduction. For example, reducing the weekly consumption of bovine and ovine meat and dairy products like cheese, while increasing plant-based food choices [5, 7, 9-11]. Other actions which might have a minor, although still recognized impact on the targeted environmental issues, will also be promoted. Examples include preference for fresh food, avoiding the use of bottled water and single use plastic items.

The Sustainable Restaurant Association (www.thesra.org) in UK and the Barilla Center for Food & Nutrition Foundation (BCFN) (www.barillacfn.com) coordinate the experiments in Italy and the UK, respectively. The greenApes benefit corporation (www.greeapes.com) will provide a social engagement platform to engage consumers in the experiments. The platform allows to test different challenges and approach clients with a gamification approach. Wageningen University and Research and the BCFN will monitor and evaluate the experiments' outcomes in terms of behavioural, social and environmental impacts.

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