



Ministry of Economic Affairs
and Climate Policy

Circular Food Turkey

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International.*



CIRCULAR FOOD TURKEY

An overview of the Turkish Circular Food Economy

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Circular Economy

Remake. Reuse. Recycle.

An increasing urban population worldwide, brings many challenging **economic**, **social** and **environmental** problems with it. The global population is expected to reach approximately 9 billion by 2050, tripling the current resource need. As the growing consumer population demands more, the as-usual **linear models** seem unsustainable. With its **take-make-waste approach**, it has been consuming the world's resources for years. However, the earth's resources are finite; we should not depend on its crude materials any longer. As human beings, we should preserve natural resources and learn how to manage it in a responsible way for a sustainable future.

Circular economy refers to where resources are not wasted but cycled to their full capacity with a **material saving method**. It aims to close loops as locally as possible, therefore avoids resource losses along the value chain and fosters new fields of sustainable value. The circular economy is also related to the concept of a cycle, biological-chemical cycles and recycling of products. However, the system is not only shaped on recycling; The aim is to increase the **reuse**, **repair**, **recycling** and **recovery** of existing materials and products, and the use of **sustainable energy sources** such as solar, wind, biomass and energy from waste.

The circular economy model is looking for ways to maximize value from natural resources. Moreover, in a circular economy, products are designed and made to last, which means that they often need to be of a higher quality than nowadays. It is **regenerative** and **restorative** in terms of design. It aims to **eliminate waste generation** through the design of **materials products systems business models**. Thus, environmental pressures associated with resource extraction, emissions and waste are reduced in this economy, while the need for new materials and energy input is minimized. It goes beyond only waste management; it also requires efficient and sustainable management of natural resources throughout their life cycle. As a result, it offers opportunities for **prosperity, growth, job creation while reducing environmental pressures**.

The transition to a circular economy model requires more technical or product design to be technical and product designs to be changed to traditional business models. It is necessary to apply design- and business model strategies in **product design- and business model strategies**. The circular vision of such a work method also strengthens **innovation and design**.

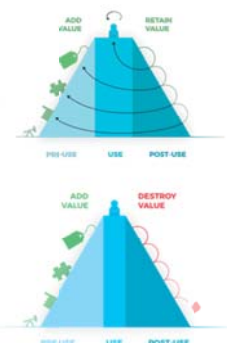


Circular
Remake. Reuse. Recycle

vs.



Linear
Take. Make. Waste





"A circular economy is based on the principles of designing out waste and pollution, keeping products and materials in use and regenerating natural systems". Ellen MacArthur Foundation

The researchers and experts from the [Ellen MacArthur Foundation and McKinsey](#), predict that the consumption of new materials can be reduced by [32% within 15 years](#). In the forecast scenarios based on some assumptions, if the circular economy is fully implemented on a global scale, there are forecasts that economic earnings will exceed [one trillion dollars annually](#) by 2025.

The circular economy is picturing the complex context of solution through the lens of [sustainability, design thinking](#), and [innovation](#) with a [systemic perspective](#) built on environmental, economic, and social dimensions. It is about a [smarter](#) way of handling the problems and [co-producing](#) the solutions by building capabilities and networks (cross-boundaries and cross sectors) with an [interdisciplinary approach](#). As a living system, it brings the contributions of many disciplines of thought together, in order to engage them in building linkages for a loop economy. The [emergent, contested, and nascent](#) circular economy with the interaction of its parts, aims to design waste which is inherently food for growth and yearns to keep the materials in the cycle for resource security and efficiency. The concept does not deny growth and tries to decouple it from environmental deterioration.

Read our 'Cycle or not to Cycle' report to learn more about circular economy in Turkey



Circular Food at a glance

The world's population reached 1 billion in the past 200,000 years of human history, and it took only 200 years to reach 7 billion. Cities consume **75%** of the world's natural resources and **80%** of the global energy supply. Agriculture, which response to the most basic need of human beings, employs more than a **quarter of the world's population**. At the same time, it has a production value of 7 billion dollars per day. Food systems are probably the **largest employers** worldwide and affect millions of people economically and socially, from **production to retail, distribution and consumption**. On the other hand, current food systems supported a fast-growing population and urbanization that puts considerable pressure on our planet's resources.

As awareness of the negative effect of human nutrition on climate change, food, and biodiversity loss increases, the need for a **better understanding of food systems** becomes more and more prominent. Global experts emphasize that we need to change our eating habits for the health of ourselves and our planet. The positive multiplier effect of development compatible with sustainable agriculture principles will enable many other problems to be solved. Sustainable agriculture means ensuring food security, and produce vegetable and animal products with techniques that protect the **environment, public health, communities**

Cities seize the opportunity to change the global food system through three ambitions

- To treat the food and agriculture system as a **broadly linked system**.
- Evaluating the whole food process in detail and integrating with each actor, from the character of the soil to the point of consumption, an approach from **farm to fork**.
- Sourcing of food is **regenerative** and **locally grown** where appropriate, designing and marketing healthier food products that get the best out of the food.

Consequently, sustainable development is necessary for the survival of species and to maintain natural resources. It describes the ability of the current generation to fulfill their needs without compromising future generations' needs.



Circular Food Economy in Turkey

As an upper-middle-income country with a growing population of approximately 81 million, Turkey is one of the world's 20 largest economies. The country is also a significant producer and exporter of agricultural commodities on global markets. It is estimated to be the world's 7th largest agricultural producer, particularly a top producer and export for a wide variety of crops and other agricultural products. However, according to Food Sustainability Index 2019, Turkey generated 18 million tons of food loss and waste in 2019, ranked 58th among 67 countries in terms of food sustainability.

Bread Waste

The Turkish government made its first step in 2013 against food waste with the campaign of "Preventing Bread Waste." The campaign aimed at preventing **bread waste** and the loss it creates in the economy and to create awareness and sensibility. With the broad support of the government and civil society, the Turkish Grain Board (TMO) organized a campaign that covered 12 major cities.² It targeted households and bakeries as well as cafeterias, restaurants, and hotels. Reducing unnecessary waste and excess purchases saved consumers. The wide-ranging yearlong campaign resulted in an **18 percent reduction in bread waste** in consumer households (a total of 384 million loaves of bread, worth US\$ 1.2 billion in

Zero Waste Project

In 2015 Turkey hosted the G20 presidency, which included a focus on **food security, food loss, and waste**. These topics are interesting for Turkish policymakers for several reasons, e.g. the desire to contribute **to UN Sustainable Development Goals** and **harmonization with the European Union (EU)**. The transition to the circular economy in the EU has taken shape through the integration of environmental policy and waste management as part of the sustainability objectives. Considering these developments and the current circumstances, harmonization with the EU, sustainability and resource efficiency are unavoidable for Turkey.

As a part of this, the Ministry of Environment and Urbanization launched the **"Zero Waste Project"** (Turkish: **"Sıfır Atık"**) in 2017, to use resources efficiently and to prevent, reduce, decompose and recycle waste at the source. The "Zero Waste Project", under the auspices of First Lady Emine Erdoğan, thus makes the **public aware** of waste management. The plan is still gradually shifting to cover the full economic cycle.





Local Initiatives

There are various grass-roots initiatives in Turkey and around the world aimed at solving problems in the food system. These movements include new generation producer cooperatives, consumer cooperatives and food initiatives, etc. Regarding the number of food initiatives, İstanbul, Ankara and İzmir come to the front. The food communities in İstanbul typically exhibit themselves as consumer cooperatives and have similar structures to those of buyer clubs. The reason behind this is the urbanization policy, which caused İstanbul to run out of agricultural land in city's hinterland. Consumers form their organizations with producers from different parts of Anatolia.

Earth Markets

The [earth markets](#) in İstanbul (2015) and İzmir are a good example of resilience in the face of the changing climate in Turkey. They are a particular type of

farmers' markets created and run by local communities of the [Slow Food Foundation](#), according to the principles of good, clean and fair. Only local and seasonal products are sold directly by producers, who ensure that they sell their products at fair prices, both for those who buy them and those who produce them. An Earth Market is not merely a place where food is bought and sold; it is a project built according to a multidisciplinary approach to food. By purchasing from Earth Markets, consumers and producers cooperate to protect heirloom seeds and promote organic agriculture and a shortened supply chain.

An understanding based on knowledge in agriculture, blending with innovation and R&D, ultimately reducing the use of input, improving the quality and efficiency of the product, offers an opportunity to reveal a more sensitive eco-system. The integration of technology into the food industry has also become an essential part of the rising enterprise wave. The expectation of responsible production and consumption indicates that the need for innovation will increase in the production line, packaging, and supply chain.

Fazla Gıda

An average of food waste per year costs 250 billion TL in Turkey. Twenty-five billion TL of this waste is recoverable. [Fazla Gıda](#) has saved 2,600 tons of food since its establishment. Fazla Gıda is established in December 2017 as an effective waste management platform for businesses. It enables food businesses to create economic and social value from surplus products by effectively managing unsold product stocks. If a fast-moving consumer-goods-manufacturer has a significant amount of waste, it enters all information, such as the type of product, expiration date, and location. Products that do not exceed the expiration date are being sold to places where it can be consumed instantly. Those that are never used are being sent to biogas production facilities. It also operates to support food banks in finding food donations and increasing their competencies and capacities. Besides, Fazla Gıda has collaborated with the Hotel Managers Association to prevent food losses in hotels and to re-evaluate the consumable foods, by proper planning and waste monitoring. With this collaboration, it is foreseen that hotels can reduce their food waste by 40 percent.





In circular food systems, waste does

not exist and all products must be designed

on the principle of reusability.

Doktar

Digital transformation in agriculture is essential by simplifying the communication between agricultural sector stakeholders' development; agricultural data will be in the fields of production, processing, and interpretation. [Doktar](#) is a farming technology company aiming to optimize the food ecosystem with the intensive use of information and data-driven decisions. For this purpose, they develop products based on new technologies such as remote sensing, machine learning, the internet of things, establishing effective distribution systems, and partnerships for the extensive use of the entire agricultural value chain. Doktar named this vision as "Connected Agriculture."

Biolive

[Biolive](#) is a company that designs and develops the production process of bio-based plastics from olive kernel, produces bio-based granules and is also currently continuing research and product development at Yıldız Technical University Technopark. It was established in 2016 as a start-up at the Istanbul Technical University Technopark. Later it became a company with the investment it received from Vestel Ventures within Zorlu Holding in 2017. Currently, the company works on bioplastic production for Vestel refrigerators. These bioplastics can be used in pet bottles, disposable cutlery and food packaging, which can be lost in nature within 3-5 months. It prevents a significant amount of plastic waste.

Komporize

Tea production in Turkey ranks **fifth** in the world, with approximately 1.2 million tons per year. **Tea fiber** waste is produced during this process. The amount of tea fiber that emerges is significant as **60-70 thousand ton annually**, which are not evaluated in any way and destroyed in the form of burning or being left to rot. **Komporize** is a startup that is dedicated to overcome the negative environmental impact of plastics by producing alternative bio composite materials, using inert agricultural fiber wastes. The fiber ratio in the mixes is up to 90% depending on the place of use. Komporize aims to reduce the harm of these plastics to the environment by ensuring that these products disappear earlier in nature than other plastics. The produced raw materials appeal to companies that provide end products for the automotive, furniture, construction, architecture, toys and consumer industries.





Innovation and entrepreneurship programs
are the key players for supporting
circular entrepreneurs and startups.

They aim to boost entrepreneurship skills and spirit by organizing events and trainings, but also to unlock the potential of small and medium sized enterprises (SMEs) with their funding, which in turn will accelerate innovation, create jobs, benefit businesses and increase competitiveness.

EIT Food

[EIT Food](#) is a consortium that focuses on entrepreneurship and innovation in the food sector. It is supported by the European Institute and Technology (EIT), a body of the European Union. The ambition to create a future-proof & effective food sector through a connected food system. The members of the EIT Food community consists of 50 partners from leading businesses, research centers, and universities across 13 countries in the international food domain. EIT Food Hubs are regional contact points in the countries whose main objective is to help boost local innovation ecosystems and their innovation outputs which would lead to an increase in each country's overall innovation performance.

Impact Hub

Turkey is one of EIT Food's countries, and [Impact Hub Istanbul](#) is the EIT Food Hub in Turkey. Impact Hub Istanbul is an innovation lab and co-creation venue that unites and empowers impact-driven individuals while pioneering social innovation in Turkey.⁴

FoodBack

An Impact Hub Istanbul initiative, [FoodBack](#) aims to support food and agriculture entrepreneurs in Turkey. Founded in 2018, FoodBack designs content and programs to strengthen the food entrepreneurship ecosystem in Turkey while building an expert network to foster know-how exchange within the industry. In 2019, within the scope of Regional Innovation Scheme (RIS) Innovation Prizes, Impact Hub Istanbul organized a Pitching/Demo-day event for early-stage entrepreneurs and startups to support the development of new products and services. In each country, up to 10 innovative agri-food companies competed. Windagrotech received EUR 10 000 as first, and Biolive EUR 5 000 as the second.

Key Institutions

Most circular initiatives require the involvement of multiple stakeholders who work together. Today there is more and more attention in Turkey towards local healthy food, sustainable food systems, and food waste. The institutions have an essential role in turning the spotlight on this issue. It needs much more participative initiatives and campaigns where key institutions (e.g., Ministries, Development Agencies) can collaborate with the local ones to support and enhance regional development.



Yaşar University

Yaşar University (In Turkish: Yaşar Üniversitesi) is a university in Izmir, Turkey. The university is divided into seven undergraduate faculties, and currently, the university is getting ready to establish their eighth faculty "Faculty of Agriculture and Technology" in cooperation with Wageningen University and Research Center (one of the most important Agriculture and Technology Universities of the Netherlands). The strength of [Wageningen University & Research](#) lies in its ability to join the forces of specialized research institutes and the university. ⁵ It also lies in the combined efforts of the various fields of natural and social sciences. The curriculum for the Faculty of Agricultural Technologies is projected to cover such academic units as agriculture technologies, animal sciences, aquaculture, food processing technologies and agricultural business management.

Boğazici University Innovative Agriculture and Food Management Platform (Bountarım)

[Bountarım](#) aims to contribute to the know-how that will improve innovative skills, support the technology integration and digital transformation of the agricultural and food sector. The platform's main objectives are to encourage vertical and horizontal connections among stakeholders of the industry, to support the relations between them, and to facilitate the entry of new institutions into the sector. The platform has also training programs to support new generation agricultural business and current agricultural practices.



The Scientific and Technological Research Council of Turkey (TÜBİTAK)

[Tübitak](#) has supported projects on the development of advanced technology products in agriculture and food between 2000-2019. In 2008-2019, the support was provided in the fields of "agricultural technologies," "digital technologies in agriculture," "smart agriculture," and "animal husbandry". Thus, a total of 1823 projects were supported in the agricultural sector through the programs of TÜBİTAK. The accumulation of knowledge gained from these projects is intended to provide a base for R&D and innovation issues. It aims to contribute to bring cooperations across the ecosystem to the fore. Tübitak determines agricultural research and development strategies and priorities with the guidance of the General Directorate of Agricultural Research and Policies (TAGEM).

TAGEM

[TAGEM](#), within the Ministry of Agriculture and Forestry, is the largest R&D organization in Turkey. TAGEM aims to improve access to quality agricultural products, ensure sustainable use of agricultural and ecological resources, and establish and implement policies to raise the liveability standards in rural areas. It has 48 research institutes in different Turkish cities related to their expertise in the fields of; Food, horticulture, agricultural economics, agricultural machinery, aquaculture, animal health, etc.



The Ministry has 3 different dimension for supporting the research institutes through TAGEM.

R&D Support Program

The aim of this program is to increase the R&D activities of information and technology in priority issues within the food and agriculture sector. The private sector, NGOs, farmer organizations, universities can apply for the funding. The private sector/NGOs are not able to propose projects without cooperation with TAGEM's research institutes. By doing so, TAGEM stimulates organizations to engage in multi-participant, multi-disciplinary problem-solving projects.

Institute & Private Sector Collaboration

The aim of this program is to:

- Utilizing opening the infrastructure of our institutes (including genetic resources, laboratories, specialized personnel, greenhouses, field, etc.) to the private sector;
- Utilization of our institutes' infrastructure needed by private sector R&D activities
- Providing access to the qualified human resources needed for R&D, thus reducing the private sector's R&D costs.

Network Application

To provide all kinds of information (expertise, project experience, inter-institutional collaboration, and communication network).

The vision for agricultural R&D and innovation in 2023

- Increase the share of Agricultural R&D from 3.5% to 7% in the Total R&D Expenditures,
- Increase the Agricultural R&D Expenditure by 100% from 900 Million TL to 1.8 Billion.
- Increase the private sector share from 4% to 30% in 2023 and 50% in the further periods.

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