



Towards the Circular Economy in **Ukraine**

FOOD PRODUCTS







OVERVIEW

Food is the primary land-based product, and the most exposed to natural disasters, climate change, economic swings, and human catastrophes such as war.

On the production side, there is huge potential for reducing farm inputs and waste, increasing efficiency in food production and distribution, and minimizing food and packaging waste.

On the demand side, food systems are the most embedded in communities and lifestyles: if there is motivation to change then food systems can be near-zero waste.

‘Food products’ includes the farm inputs of energy, water, fertilizer etc; the supply chain of production, distribution and retail; large volumes of imports and exports; and consumption by households, catering and public services. This covers a wide range from global-industrial systems to small-scale local production.

Which are the opportunities?

Ukraine is one of the **world’s top agricultural producers** and exporters of oilseeds and grains: over 55% of the country is arable land, and agriculture provides employment for 14 percent of the workforce, with exports worth \$27.8 billion (2021), 41% of the total. The invasion of 2022 caused a sudden reduction in production and exports, but as of early 2024, the pre-war levels have returned.

Overall, the agri-food sector has a heavy material footprint, and is intensive of energy, CO₂ and other emissions, chemical inputs, pollution and waste, both in production and post-consumer.

As for the future, much depends on the war, national economic growth, relations with the EU and others, technology innovation, population change and post-war reconstruction. There is already growing pressure for sustainable and circular food systems, and successful enterprises large or small will plan ahead for this.



CIRCULARITY PATHWAYS

These pathways show a broad combination of actions, looking towards a ‘future horizon’ of 10-25 years.



‘Food efficiency’ pathway

With Ukraine’s exports feeding 400 million people, there is great potential for increased efficiency in energy and other inputs, with processing waste to be recycled and recovered. This fits with the EU ‘farm to fork’ agenda for greening and modernization, and builds resilience to energy and water shortages and climate change impacts.

Precision agriculture brings technologies such as Synthetic Aperture Radar and AI-based crop management systems. For such innovations, for both global agro-industrial producers and local small enterprises, the circular principles can help with bio-methane and other forms of organic industrial symbiosis. Overarching these are institutional issues of land-owning, farm size, and farm subsidy and support for regenerative farming and nature conservation.



‘Food health’ pathway

On the consumption side, reducing food waste can also provide affordable healthy diets, and support food ‘livelihood’ in retail, catering and public services. In the short term, social marketing and policy incentives can be set up. In the longer term, fully circular food systems can be developed, with the ‘waste hierarchy’ of re-distribution, re-use, re-cycle and recovery. Healthy food then combines with low-impact regenerative farming and low-packaging food and drink processing.

In the wider view, food systems are shaped by psychology, community, and culture, for the questions of lifestyle and diet choice, food and packaging waste. The ideal combination of sustainable and circular, low-input, low-meat, high grain diets calls for a strategic partnership approach with government, health and education, business and civil society organizations.

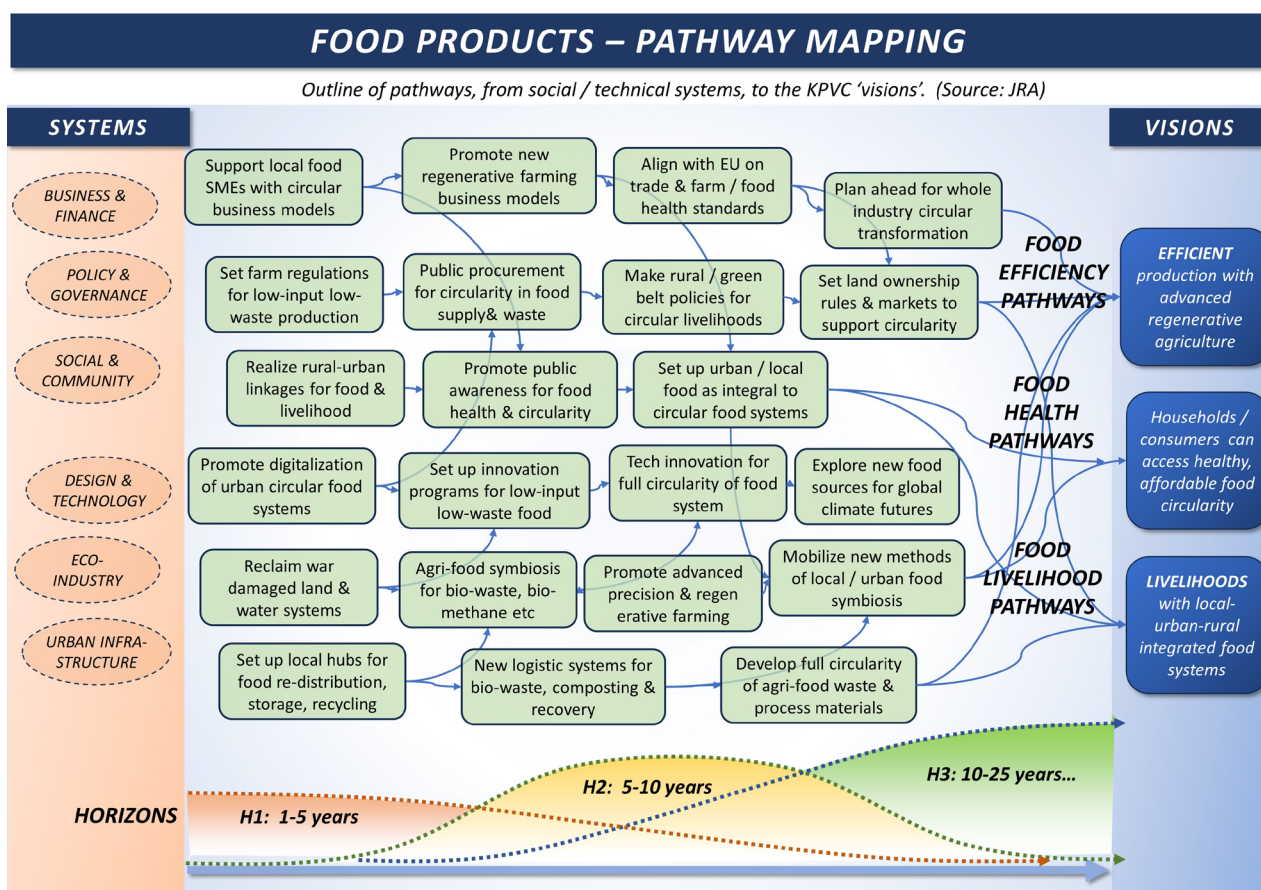


'Food livelihood' pathway

Food is also a livelihood issue, where for example, rural residents with family links bring food surplus to urban centres. There are opportunities to promote food quality, traditional and local food, public health, social enterprise, inclusive of veterans and internally displaced persons, and young people. Spatial planning and bio-regional policies then focus on green belt and peri-urban areas around cities and towns, and the urban infrastructures for growing, exchange, distribution and sharing of local food.

Land reform, housing reconstruction and spatial planning policy can all help to promote food enterprises based on local cultural and 'eco-social capital'.

For local and regional economic development, new techniques for bio-energy and other non-food products can bring new life to remote areas. This also contributes to food security and a wider agenda for social equality, justice and public health: there would be no place for hunger and poor diet in a fully circular food products and systems.





When to start?

The three horizons approach helps to map the priorities at each stage:



Summary of three horizons

| FOOD PRODUCTS | Horizon 1: 1-5 years | Horizon 2: 5-10 years | Horizon 3: 10-25 years |
|-----------------------|--|---|---|
| Business | Support local food SMEs with circular business models | Promote new regenerative farming business models | Align with EU on trade and farm and food health standards: plan ahead for circular food economy |
| Governance | Set farm regulations for low-input low-waste production | Public procurement for circular food supply and waste | Make rural, peri-urban & land policies to support for circular livelihoods & markets |
| Social | Realize rural-urban linkages for food and livelihood | Promote public awareness for food health and circularity | Set up urban and local food as integral to circular food systems |
| Technology | Promote digitalization of urban circular food systems | Set up innovation programmes for low-input low-waste food | Tech innovation for full circularity of food system & resilience to climate impacts |
| Industry | Reclaim war damaged land and water systems | Agri-food symbiosis for bio-waste, bio-methane etc. | Promote advanced precision & regenerative farming, local and urban food symbiosis |
| Infrastructure | Set up local hubs for food re-distribution, storage, recycling | New logistic systems for bio-waste, composting and recovery | Develop full circularity of agri-food waste and process materials |



CIRCULARITY IN ACTION

Here are examples from Ukraine and nearby, including circular waste management from both producers and consumers, and symbiosis which turns farm waste into new products.



 **Goodvalley Ukraine**

Installing biogas complexes to convert production waste into clean energy

Goodvalley Ukraine aims to become an environmentally friendly food producer with a carbon-neutral footprint. This is achieved in three steps: growing raw materials for feed on its own fields, breeding animals and producing green energy in its own biogas plants. This means almost zero waste. The biogas complex, with a capacity of 4.8 million cubic meters of gas, produces biogas through anaerobic digestion of animal and plant waste.



 **BIONUS Company**

Creating biodegradable tableware

...from natural raw materials like beet pulp, corn, flaxseed, hemp, and soybean meal. Each ton of vegetable meal produces up to 10,000 plates or bowls. These eco-friendly products decompose in 30 to 180 days, can be used as compost, withstand temperatures from -25 to 200°C, and maintain their shape and smooth surface, making them perfect for freezers, ovens, and microwaves.





Lviv Composting Station

Processing food waste into fertiliser

The Lviv Composting Station is the first such station in Ukraine for centralised collection and processing of organic waste. The final product is compost (fertiliser) ready for use. Typically, compost production involves the conversion of organic material of plant and animal origin into humus, which takes place in compost heaps or pits. In Lviv the main raw material is food waste from citizens and businesses, with branches and leaves collected by utility companies, all transformed into useful compost.



SIGUREC systems

Advanced household waste collection service in Romania

SIGUREC is a partnership of private companies, Ministry of Environment, municipalities and recyclers. SIGUREC machines were often located in supermarket car parks to collect various types of waste: packaging, paper, aluminium cans, glass, batteries, light bulbs and neon lighting units. The machines were fully automated and easy to use: once waste was fed into the machine, it sorted, counted and weighed the pieces automatically. The machine then printed vouchers for partner stores, providing a big incentive for household recycling.





FOOD PRODUCTS CIRCULARITY, NEXT STEPS

BUSINESS AND FINANCE

The integrated value chain approach can mobilize the crucial cooperation between farmers, agri-business, food and beverage producers, and food distributors and retailers. This can help to unlock whole 'farm to fork' chains, and rapid transition towards low-input, low-waste, low packaging food systems.

GOVERNMENT AND POLICY

Balance between regulation and standards in the agri-food sector, and opportunity building via industrial partnerships, procurement programmes, and innovation cluster building. On the demand side, education and health programmes can push towards circular, healthy and inclusive food systems. For local and regional economic development, the food products circularity can provide a parallel track to globalizing agri-business.

CIVIC SOCIETY

The livelihood pathway can be linked to local economic development, food health awareness, and the cultural value of local food systems. For vulnerable and marginalized communities, principles of food access and quality, can mobilize systematic food sharing of the surpluses of retail and catering activities. The social-cooperative enterprise model can enable synergy between producers, retailers, consumers and the wider community.

DESIGN, TECHNOLOGY AND INNOVATION

Can shift from individual 'products' to whole circular food products models.
For processing of farm and food industry waste, the eco-industrial management systems can follow the industrial symbiosis model for recovery and exchange, both for food and non-food products. New forms of urban infrastructure can then scale up from kitchen containers, to neighbourhood composting, to regional recovery facilities.

Overall, Ukraine at this critical moment has immense potential, and huge natural resources, for the transformation towards a healthy, inclusive, sustainable and circular food products systems.







WHAT IS A CIRCULAR ECONOMY?

UNIDO defines circular economy as an industrial economy that routes materials, parts and products back into use several times and creates more value and less waste. It is an alternative, in which value is maintained for as long as possible, products are designed to last, and the generation of waste is minimized.

This booklet is one of six publications dedicated to 'Key Product Value Chains' reviewed in the Exploratory Foresight Study: constructions, food products, electronics & ICT, textiles, plastics and packaging, and waste management.

Case studies are based on the National Circular Economy Case Studies and are available at: <http://www.recpc.org/recp-case-studies-en/>

Examples from other countries are from the <https://circulareconomy.europa.eu/platform/en/good-practices>

For more information about the **UNIDO Green Recovery Programme for Ukraine** please visit:
<https://www.unido.org/green-recovery-vision-ukraine>

Exploratory Strategic Foresight for Circular Economy in Ukraine: Final report | <https://shorturl.at/tsy63>
Circular Economy for Industrial Development in Ukraine: Baseline Study | <https://shorturl.at/DHscb>
UNIDO Online Training on Circular Economy in Ukraine | <https://shorturl.at/qfv4S>

More about Circular Economy in Ukraine is available at the **RECP Centre** page at
<http://www.recpc.org/circular-economy/>

EU4Environment Action (2019-2024) helps the EU's Eastern Partnership countries preserve their natural capital and increase people's environmental well-being by supporting environment-related action, demonstrating and unlocking opportunities for greener growth, and setting mechanisms to better manage environmental risks and impacts.

For more details, visit: www.eu4environment.org

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