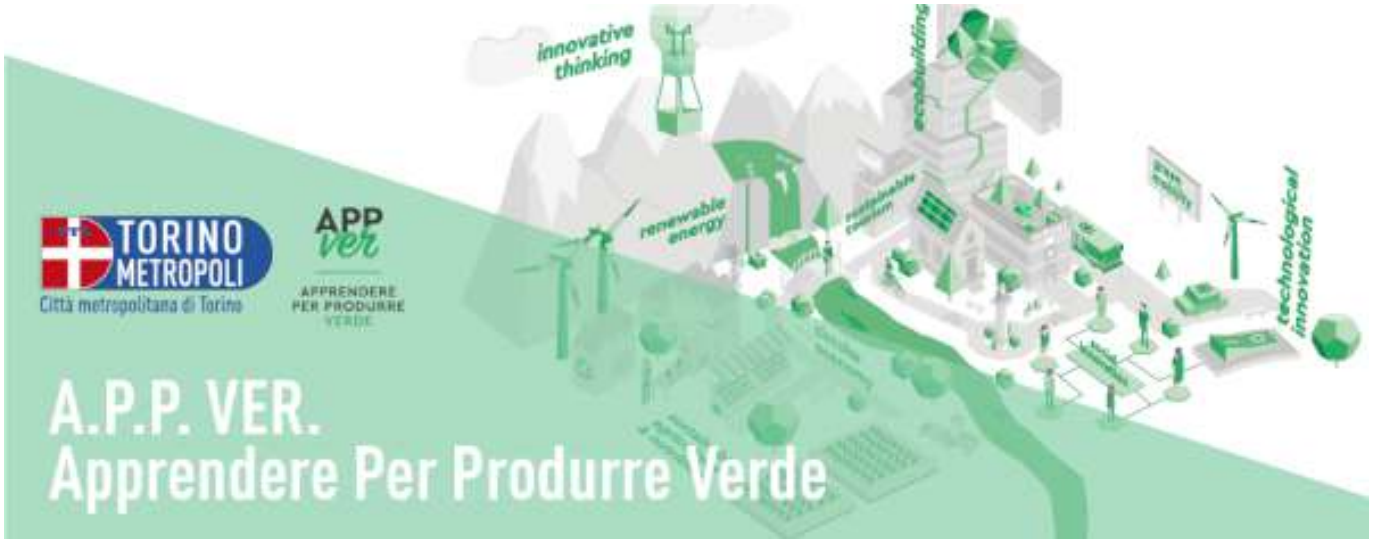


Economia circolare nella ristorazione

Nadia Tecco

nadia.tecco@unito.it

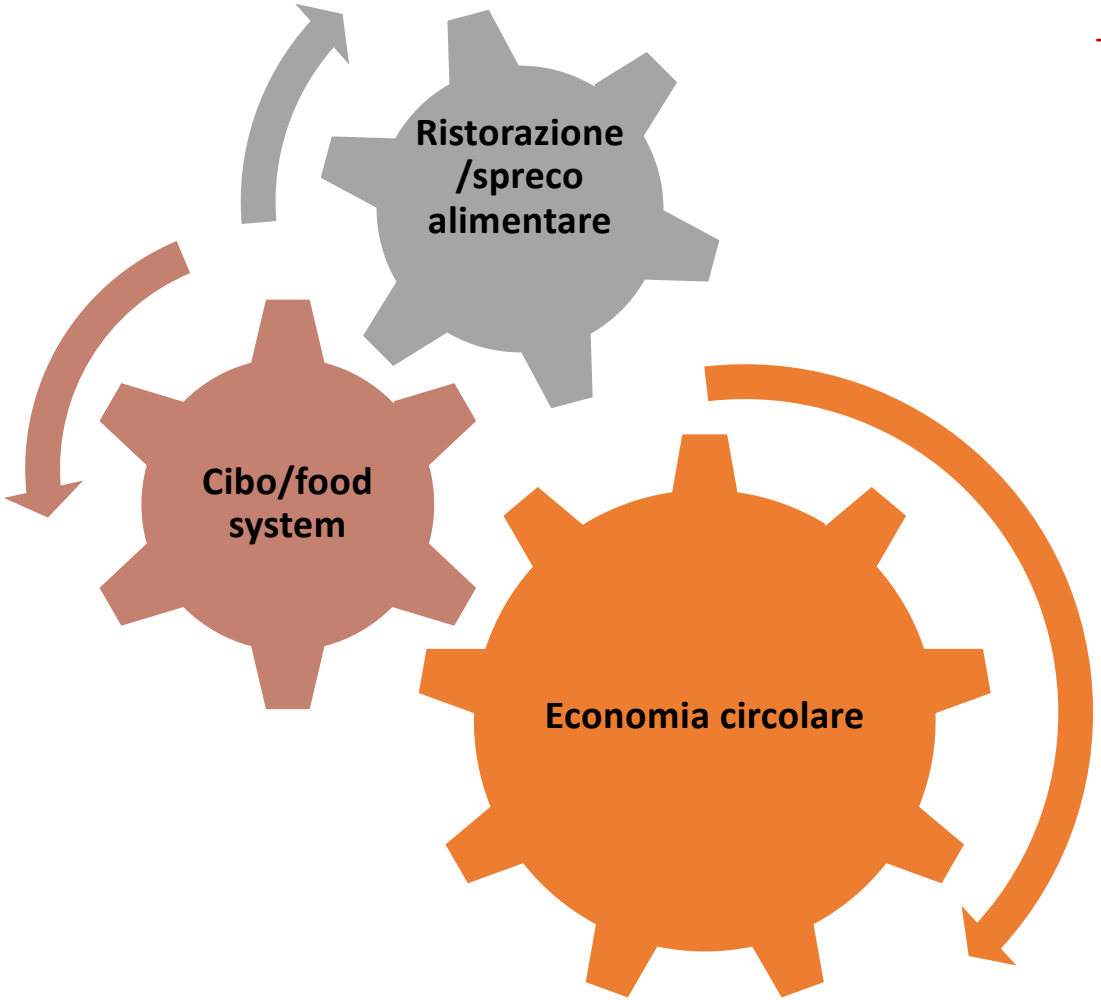
IRES Piemonte 11 dicembre 2019 14:30 - 18:30

2 parole su di me

UniToGO
UNIVERSITÀ DI TORINO
GREEN OFFICE

CIRCULAR
ECONOMY
FOR FOOD
HUB

love food reduce waste
FOSTER



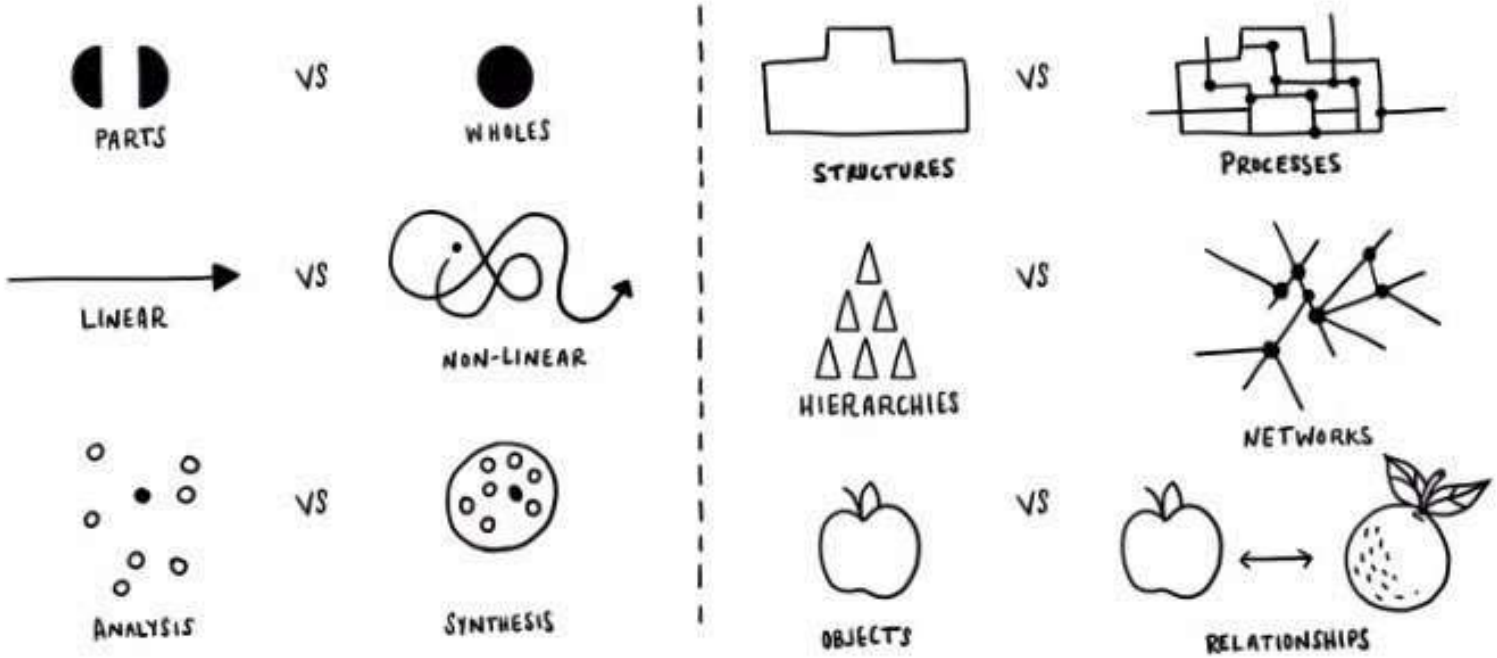
Systemic thinking

WHAT IS A SYSTEM?

- The founder of systems thinking, Ludwig von Bertalanffy, defined a system as ‘an entity which maintains its existence through the mutual interactions of its parts’ (etimology=stay with)

- Five elements are essentially to recognise in a system: **the components, the interactions between components, the flow, the boundary, and the hierarchy.**

Le categorie di analisi del systemic thinking



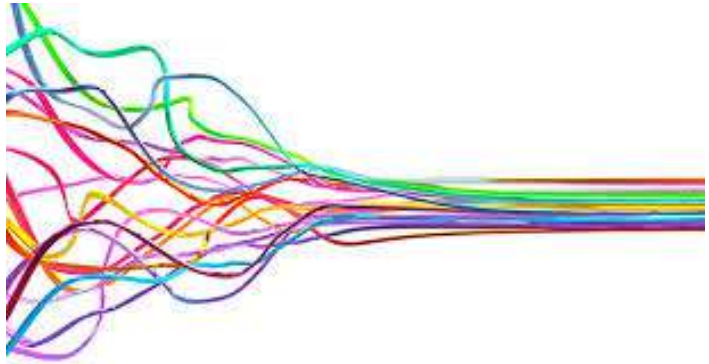
1. Che cos’è l’economia circolare? Che idea ci siamo fatti a proposito?

Capiamone la grammatica elementare per poi provare ad applicarla

2. Ha senso parlare di cibo ed economia circolare?

3. Capiamo come si possono applicare i principi dell’economia circolare

per la prevenzione dello spreco alimentare nella ristorazione. Partiamo però da una corretta definizione del problema



For every complex problem, there is a solution that is simple, obvious, and wrong.

H. L. Mencken

DIFFICULTY ≠ COMPLEXITY

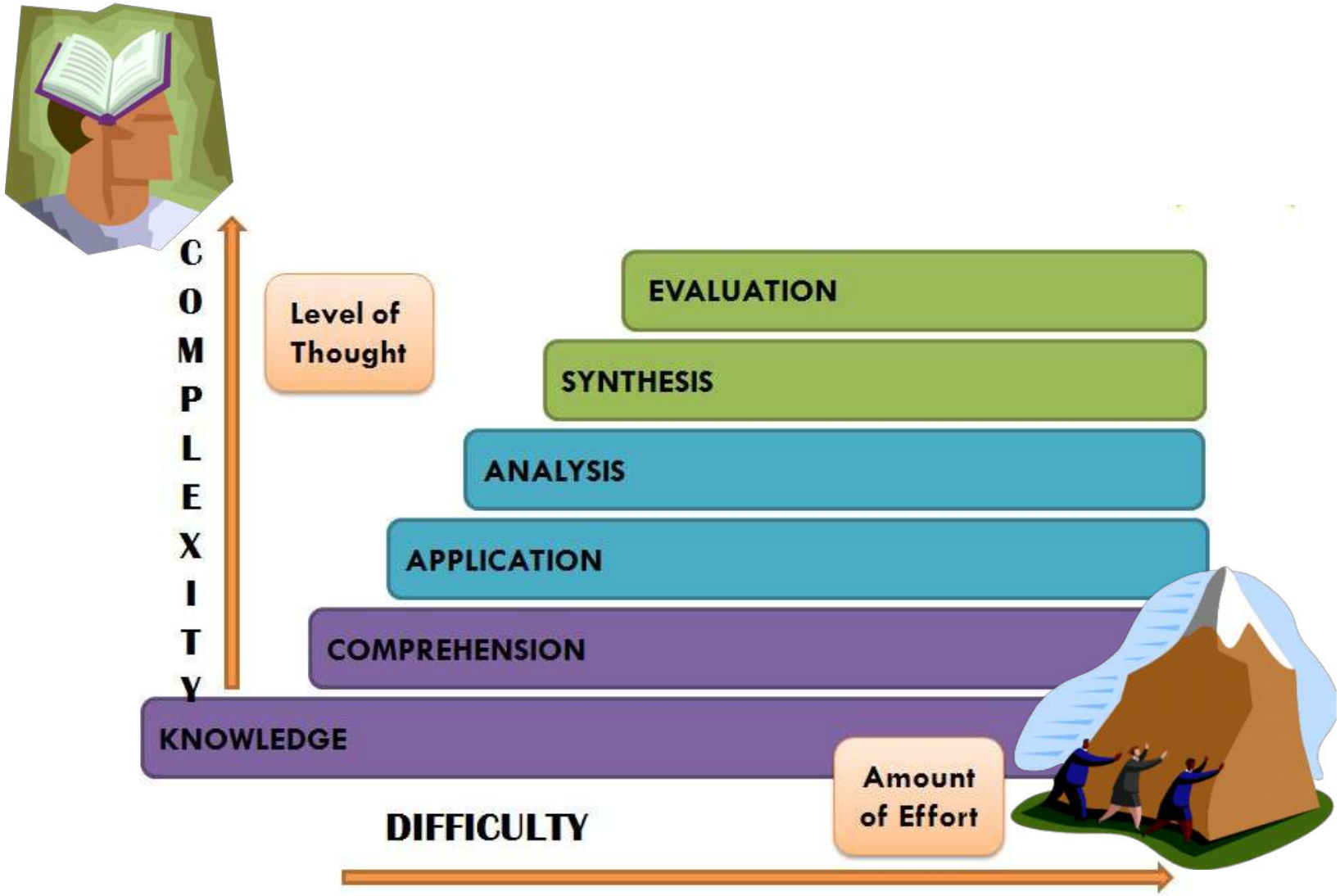
DIFFICULTY

- Amount of time and effort
- Circumstances and conditions
- Confidence and capability of the student
- Accuracy of answers
- Percentage of students answer correctly

$(p = {}^{c}/_{n} \times 100)$

COMPLEXITY

- Kind of knowledge
- Type of thinking
- Depth and extent of knowledge, understanding, and awareness
- Abstractness of concepts
- Quality of responses


COMPLEXITY
Level of Thought
EVALUATION
SYNTHESIS
ANALYSIS
APPLICATION
COMPREHENSION
KNOWLEDGE
DIFFICULTY
Amount of Effort


So YOU'RE FEELING USELESS?
THIS CIRCULAR ECONOMY-THING IS REALLY MAKING ME OBSOLETE...
LECTRR

Identificare 3 parole associate ai concetti di **economia circolare** e di **spreco alimentare**

ECONOMIA CIRCOLARE

- ….
- ….

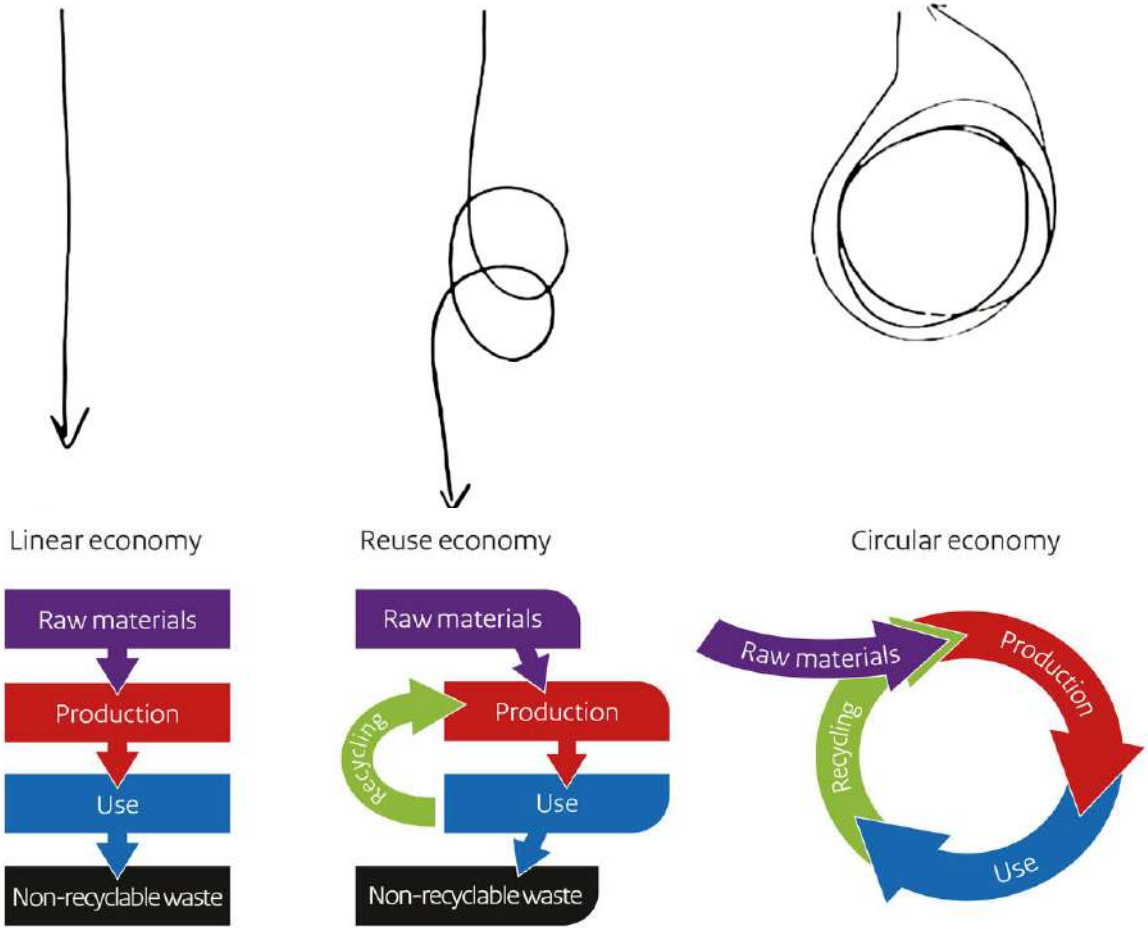
SPRECO ALIMENTARE

- ….
- …

Linear Economy

Recycling Economy

Circular Economy


Linear economy
Raw materials
Production
Use
Non-recyclable waste
Reuse economy
Raw materials
Production
Use
Non-recyclable waste
Recycling
Circular economy
Raw materials
Production
Use
Recycling

Circular economy …..finding a definition within many definitions

We know

The **circular economy** concept has gained momentum both among **scholars and practitioners**

We know

A concept with so much traction is usually employed by various stakeholders. **«CE Babble»**

We know

it means many **different things to different people**

The risk

significantly varying circular economy definitions may eventually result in **conceptual confusion** and in the **collapse of the concept**.

These can blur the concept since they frequently operate in significantly different worlds of thought

A concept with various understandings may remain in a deadlock due to permanent **conceptual contention**

Resources, Conservation & Recycling 127 (2017) 221–232

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journal homepage: www.elsevier.com/locate/resconrec

Review

Conceptualizing the circular economy: An analysis of 114 definitions

Julian Kirchherr*, Denise Reike, Marko Hekkert

Innovation Studies Group, Copernicus Institute of Sustainable Development, Utrecht University, The Netherlands

ARTICLE INFO

Keywords:
Circular economy
4R framework
Sustainable development
Definitions
Content analysis

ABSTRACT

The circular economy concept has gained momentum both among scholars and practitioners. However, critics claim that it means many different things to different people. This paper provides further evidence for these critics. The aim of this paper is to create transparency regarding the current understandings of the circular economy concept. For this purpose, we have gathered 114 circular economy definitions which were coded on 17 dimensions. Our findings indicate that the circular economy is most frequently depicted as a combination of reduce, reuse and recycle activities, whereas it is oftentimes not highlighted that CE necessitates a systemic shift. We further find that the definitions show few explicit linkages of the circular economy concept to sustainable development. The main aim of the circular economy is considered to be economic prosperity, followed by environmental quality; its impact on social equity and future generations is barely mentioned. Furthermore, neither business models nor consumers are frequently outlined as enablers of the circular economy. We critically discuss the various circular economy conceptualizations throughout this paper. Overall, we hope to contribute via this study towards the coherence of the circular economy concept; we presume that significantly varying circular economy definitions may eventually result in the collapse of the concept.

Definition gathering & analysis (peer reviewed and not)

*CE is an emergent framing around **waste and resource management** that aims to offer an alternative to prevalent linear **take-make-dispose practices** by promoting the notion of **waste** and **resource cycling.** Strategies such as, but not limited to, **reuse, recycling, and remanufacturing** operationalize this concept*

Blomsma & Brennan (2017, p. 603)

*A circular economy is a transformative economy redefining **production and consumption patterns**, inspired by **ecosystems principles** and **restorative by design**, which increases **resilience**, **eliminates waste** and creates **shared value** through an enhanced circulation of **material and immaterial flows***

Circular Academy (2017)

*A 'circular economy' (CE) is an approach that would transform the function of **resources i**n the economy. Waste from factories would become a valuable input to another process – and products could be **repaired, reused or upgraded instead of thrown away.***

Preston (2012, p. 1)

Le parole sono importanti!!!!!

https://www.youtube.com/watch?v=qtP3FWRo6Ow

Esercizio

COME EVITO CHE IL MIO PRODOTTO ESCA DAL SISTEMA?

Strumenti di co-evoluzione per la circolarità

Qualità di Sistema

I consumatori dovranno imparare a riconoscere quotidianamente la "qualità di sistema" ovvero,

"una definizione multiforme e multiscalare di qualità, olistica e dinamica, prodotta dal flusso rigenerativo di materia, energia e conoscenza, tra più sistemi" (Fassio, Tecco).

Il riconoscimento di una **qualità estesa al sistema** in relazione alla **responsabilità estesa del produttore**, non potrà che avere forti implicazioni rispetto alla funzione e **alle modalità di espressione della comunicazione** del prodotto, servizio, processo.

Strumenti di co-evoluzione per la circolarità

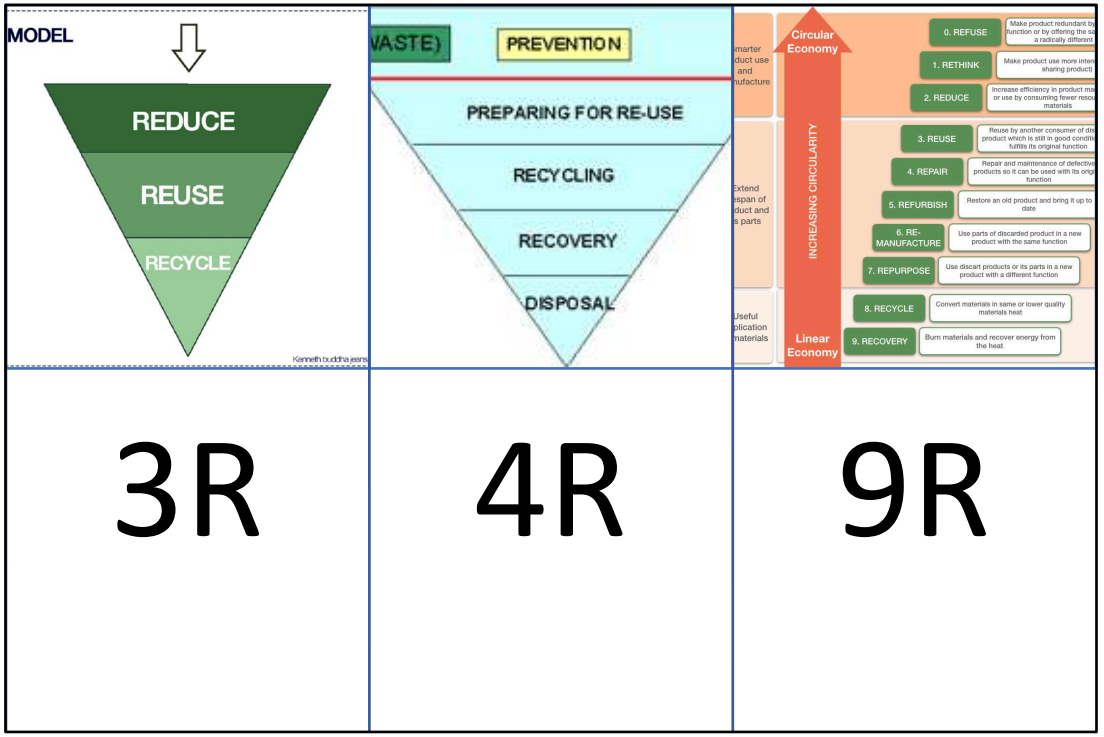
La comunicazione valoriale di sistema

Al consumatore vengono narrati in media solo alcuni attori e di solito quelli finali che hanno contribuito al prodotto e una selezione di valori che corrispondono ai fattori da enfatizzare e che arricchiscono la **brand identity dell'azienda che commercializza il risultato finale di questo processo relazionale.**

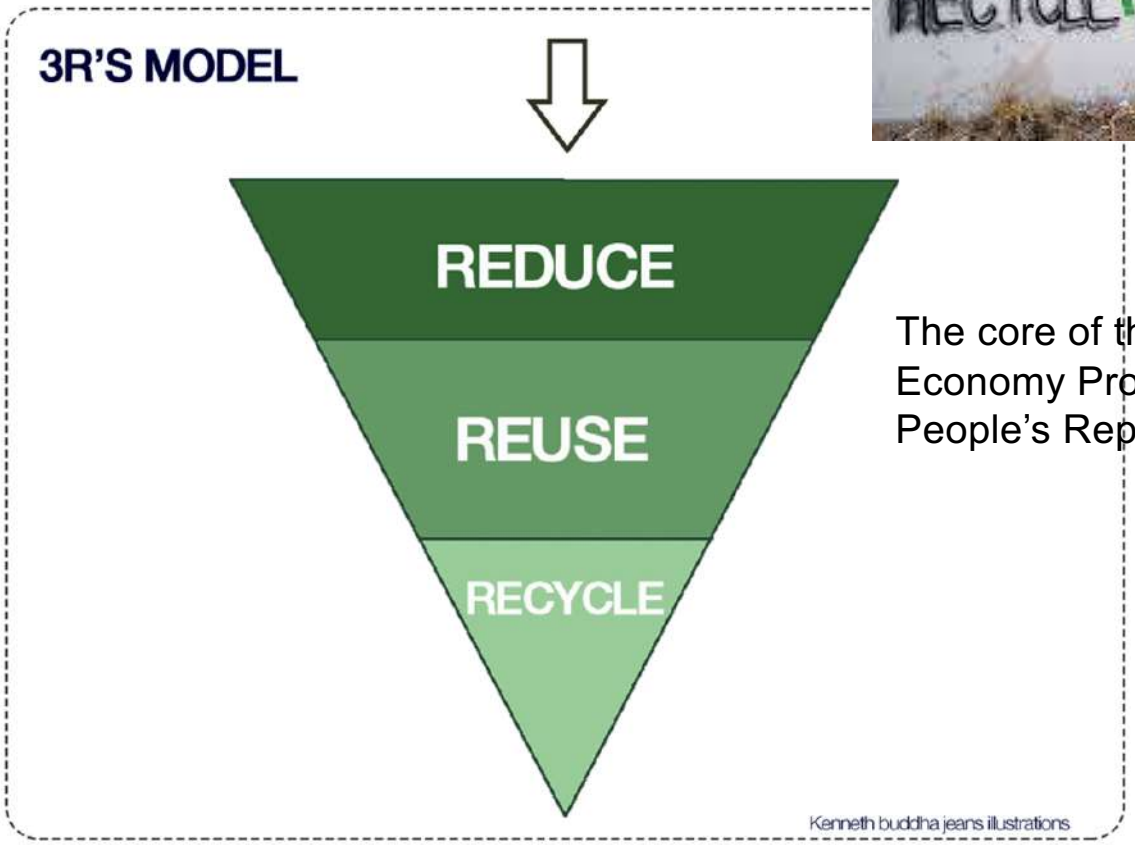
Nel modello circolare però, la comunicazione non è più unidirezionale.
L'interdipendenza tra gli attori, che prende forma tramite un flusso di materia ed energia, si traduce in una relazione inter-nodale di progressive **"simbiosi comunicative"** in cui **la qualità espressa da un attore si somma a quella degli altri**, per confluire in una serie di **"valori sostenibili"** radicati lungo tutta la filiera e il ciclo di vita del prodotto, **esprimendo e comunicando una qualità di sistema**.

Focus 1 on key-words used to define CE: R Framework + waste hierarchy

×□□W !"#$%&'()*+,-./0123456789:;□ÿ□□<=□>□□?@ABCDEFGHIJ□KLMN□O practitioners for decades (indicating that the allegedly novel idea of CE is grounded in established thinking)



3R Framework



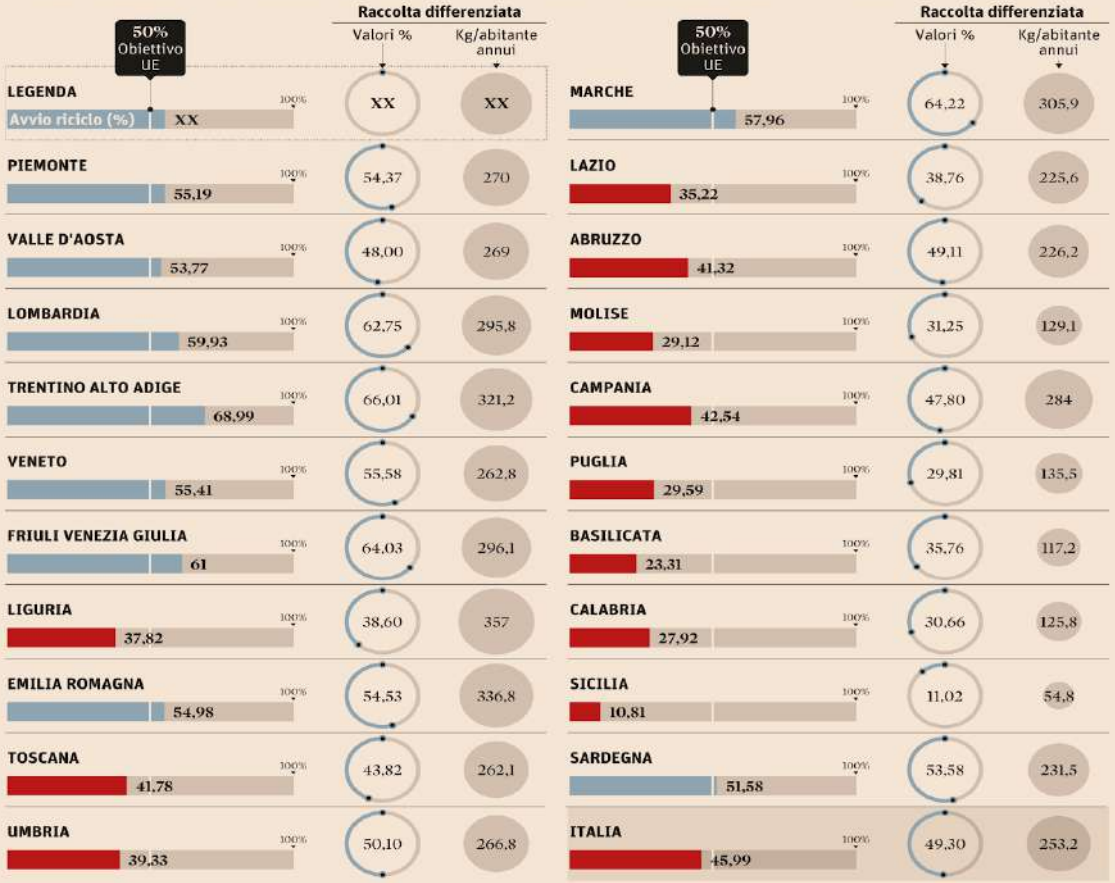
The core of the 2008 Circular Economy Promotion Law of the People's Republic of China (PRC)

4R Framework and the Waste Hierarchy (5 steps)

The European waste hierarchy refers to the 5 steps included in the article 4 of the **Waste Framework Directive 98/2008**

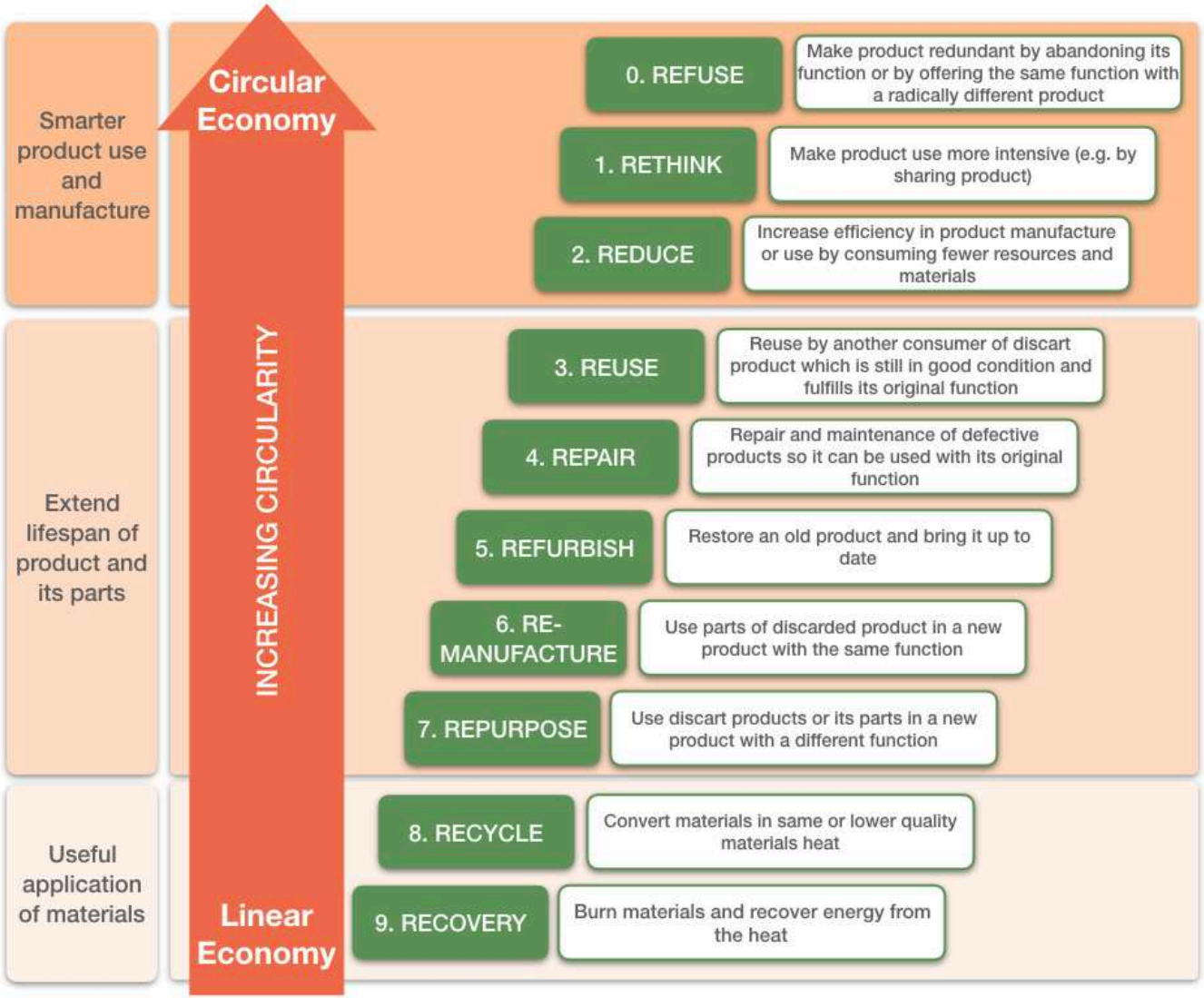
«*Member States shall take measures to encourage the options that deliver the best overall environmental outcome. This may require specific waste streams departing from the hierarchy where this is justified by life-cycle thinking on the overall impacts of the generation and management of such waste*»

La situazione aggiornata a fine 2015 nelle regioni della quota di avvio riciclo, di raccolta differenziata e di intercettazione di Rd pro capite



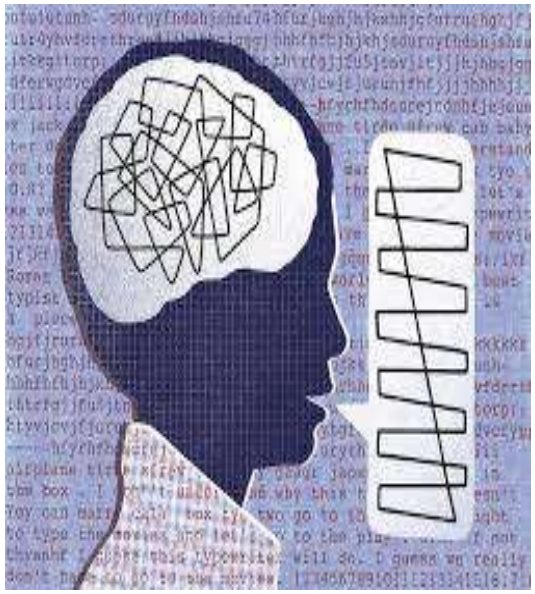
Fonte: Sesto Rapporto Anci-Conai su raccolta differenziata e riciclo dei rifiuti

9R Framework



Key-words used by definitions
CE lexicon and grammar

List of key terms and concept of CE



- By product
- End of waste
- Secondary raw material
- Waste is food
- Cycle & cyclicality
- Upcycling vs downcycling

“By-product”- EU-waste directive

- A substance or object, **resulting from a production process**, **the primary aim of which is not the production of that it**em, may be regarded as not being waste referred to in point (1) of Article 3 but as being a by-product only if the following conditions are met:

(a) further use of the substance or object is certain

(b) the substance or object can be used directly without any further processing other than normal industrial practice;

(c) the substance or object is produced as an integral part of a production process;

(d) further use is lawful, i.e. the substance or object fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.

There's A Cow In My Marshmallow!

Can you find the By-Products?

Hide & Hair

- Baseball Gloves
- Car Upholstery
- Drum Heads
- Leather Coats
- Violin Strings
- Shoes
- Felt Hats
- Luggage
- Wallets
- Leather Watchbands
- Rawhide Softballs

Glands & Organs

- Asphalt
- Cosmetics
- Fertilizer
- Insulation
- Medicines
- Paint
- Plastic
- Soap
- Tires

Bones & Horns

- Bone China
- Candies
- Chewing Gum
- Comb
- Ice Cream
- Knife Handles
- Lipstick
- Photo Film
- Piano Keys
- Vitamin Capsules
- Wallpaper Paste

Beef By-Products

From BONES, HORNS & HOOVES

Combs & Toothbrushes
Collagen Cold Cream
Bone Meal Fertilizer
Dog Biscuits
Pet Food Ingredients
Buttons
Piano Keys
Cellophane Wrap
Cellophane Tape
Bandage Strips
Emery Boards & Cloth
Neatsfoot Oil
Marshmallow
Glycerine
Bone Charcoal Pencils
Ice Cream
Bone China
Abrasives
Steel Ball Bearings
Phonograph Records
Gelatin Desserts
Crochet Needles
Adhesives
Dice
Syringes, Adhesive Tape
Shampoo & Conditioner
Collagen & Bone for Plastic Surgery
Rose Food
Wallpaper & Wall Paper Paste
Photographic Film
Gelatin Capsules

From HIDE & HAIR

Sports Equipment
Clothing
Saddles
Insulation
Hide Glue
Textiles
Paint & Plaster Binder
Asphalt Binder
Luggage
Rug Pads
Footwear
Artist's Brushes
Ointment Base
Upholstery
Felt
Rouge Base

From FATS & FATTY ACIDS

Explosives
Chewing Gum
Make-Up
Paints
Saddle Soap
Solvents
Industrial Oil & Lubricants
OLEO Margarine
Shoe Creme
Ceramics
Hand Soap
Medicines
Creams & Lotions
Dish Soap
Mink oil
Antifreeze
Tallow for Tanning
OLEO Shortening
Chemicals
Rubber Products
Crayons
Insecticide
Floor Wax
Cosmetics
Paraffin
Herbicides
Shaving Cream
Biodegradable Detergents
Protein Dog Food
Protein Hair Conditioner & Shampoo
Tires
Canoles
Dog Food
Chicken Feed

From INTESTINES

Sausage Casings
Instrument Strings
Surgical Sutures
Tennis Racquet Strings

From MANURE

Methane Gas
Fertilizer

“End of waste” EU-waste directive

Certain specified waste shall cease to be waste within the meaning of point (1) of Article 3 when it has undergone a recovery, including recycling, operation and complies with specific criteria to be developed in accordance with the following conditions:

(a) the substance or object is commonly used for specific purposes

(b) a market or demand exists for such a substance or object;

(c) the substance or object fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products; and

d) the use of the substance or object will not lead to overall adverse environmental or human health impacts.

Difference between EOW and by-product

EOW=
bene→rifiuto→recupero → bene

Art. 184 ter

SOTTOPRODOTTO=
bene →scarto (non disfarsi)→ bene

Art. 184 bis

Secondary Raw Material

- In a circular economy, waste that can be recycled is injected back into the economy as secondary raw materials.
- These materials can be traded and shipped just like primary raw materials but, at present, they still account for only a small proportion of the materials used in the EU.
- To increase the quantity and quality of these secondary raw materials, waste management must improve, for instance in terms of separate collection and sorting and recycling facilities

Definition of Secondary Raw Material according the Environmental Act 2006

- materials produced by a re-use, recycling, waste recovery operation
- identification of the origin, type and characteristics of the waste from which it can be produced
- identification of the reuse, recycling and recovery operations that produce them, with particular reference to the methods and conditions of their exercise
- materials that have an effective economic exchange value on the market
- materials whose environmental quality criteria, product requirements and other conditions necessary for placing on the market are specified (technical standards and standards that take into account the environmental risk and the health risk deriving from its use / transport

An example for End of Waste & secondary raw material

https://stream24.ilsole24ore.com/video/notizie/ecco-come-pannolino-si-trasforma-una-sedia-plastica/AEZgPFcG

In Italy, nappies, incontinents pads, sanitary pads are defined as PAP “Prodotti assorbenti della persona”

From a ton of diapers, net of waste, up to 150 kilos of cellulose, 75 kilos of plastic and just as many as super absorbent polymers can be obtained.

They constitute about 4% of solid urban waste: every year in Italy 900,000 tons of these products are disposed of in landfills. 30 million tons worldwide: a volume equal to 450 football fields or 60 times that of the Colosseum.

Fater with Contarina develop the first plant in the world with a cutting-edge technology. The plant started off experimentally in 2015 and was inaugurated, but not authorized - in 2017. On may 2019 The Minister of Environment, Sergio Costa has signed the decree "End of Waste" for the recycling of Pap

https://www.youtube.com/watch?v=drrpcvSsEPE

“dal letame nascono i fiori”
(De Andrè)

‘waste equals food’ as one of the 3 key principle of C2C*

UPCYCLING

“most recycling is actually downcycling; it reduces the quality of a material over time”. It is fundamental to rethink production/distribution and consumption processes prior to pursuing recycling and thus essentially a waste hierarchy.

*The others are ‘respect diversity’ and ‘use current solar income’

Cyclicality

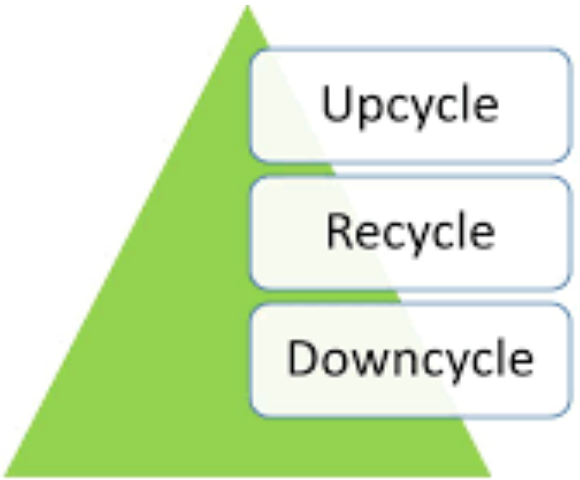
- **Definition** of **cyclicality**: the quality or state of something that occurs or moves in cycles

- Business cycles in circular economy: materials and energy remain available in the product life cycle and are re-used and recycled. Contrary to the linear economy, the circular system uses recycled materials to produce goods.

- The production and supply of goods is designed to minimize waste and, after consumption, to bring the materials back to manufactures to be reused.

Recycle

- Recycle means re-use of disposed materials and converting them into a new material or product.
- Water and energy is often used to convert the material into something new.
- The recycled material can keep the same value, or can be turned into a lower value material (**downcycle**) or into a higher value material (**upcycle**)

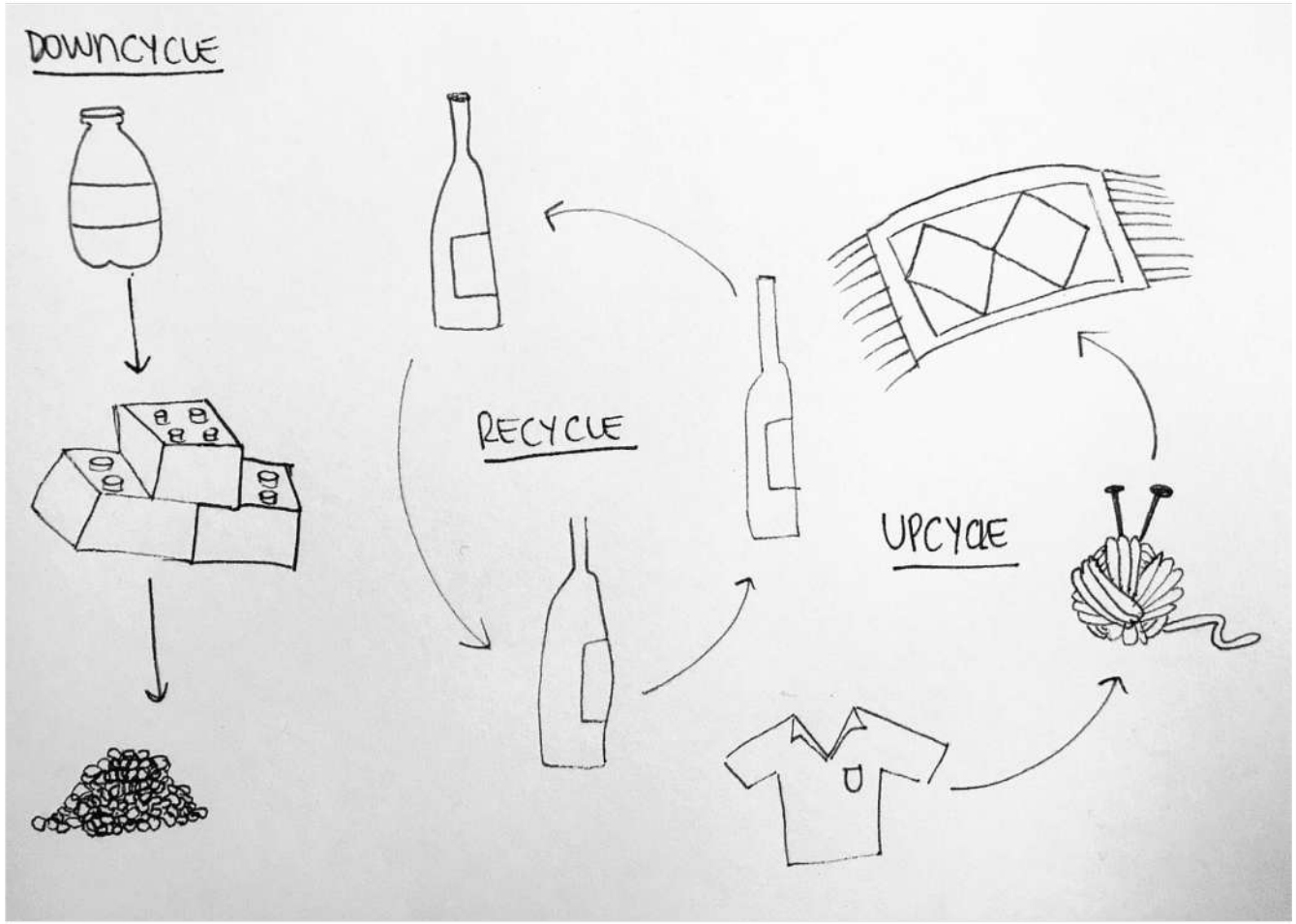


Downcycle

- Downcycle is converting high-value materials into low-value materials. For example quality writing paper or copy paper is recycled into lower value cardboard paper

Upcycle

- Upcycle is converting disposed material into something new with higher value.
- There are two kinds of up-cycling: material and functional.
- The former is about converting raw material into a new material of higher value, e.g. converting low-value plastic into high-value plastic. This kind of upcycling is challenging because the costs of upcycling a material often exceed the value of the upcycled material.
- The latter is about using and combining disposed materials in a new functional product, e.g. converting a plastic bottle into planters or smart phone holders.

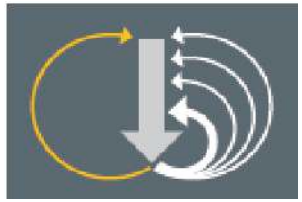

DOWNCYCLE
RECYCLE
UPCYCLE

Cycles and Eco-design

Just as identifying the end in a circle is impossible and each point may potentially represent the beginning, **closing production and consumption** cycles “from cradle to cradle” must ban the term garbage

A **new design (eco-design)** of processes with a view for **upcycling**, allows resources to preserve their status in the **value chain** without turning into waste, except perhaps after a very long run and with minimum impact on the environment

Ongoing **research for new materials and/or uses of existing ones**, is essential to this endeavor, capable of guaranteeing, over their full life cycle, **the maximum degree of quality associated to the different regenerative cycles**. The level of **ecoefficiency** of materials has turned into the go-to evaluating standard in choosing strategies that **do not cause irreversible damage to the characteristics and dynamics of the ecosystems involved.** No less important is a sustained policy of **system efficiency**, meaning how to achieve the required result with **the least use of resources and energy.**



internal cycle (short)

long cycle

cascade cycle

pure cycle

This is why the use of **energy from renewable sources** is more advisable to that of energy obtained from the combustion of fossil fuels that accelerate the planet’s entropic dynamics, thus generating waste that the system is unable to metabolize.**Eco-effectiveness**

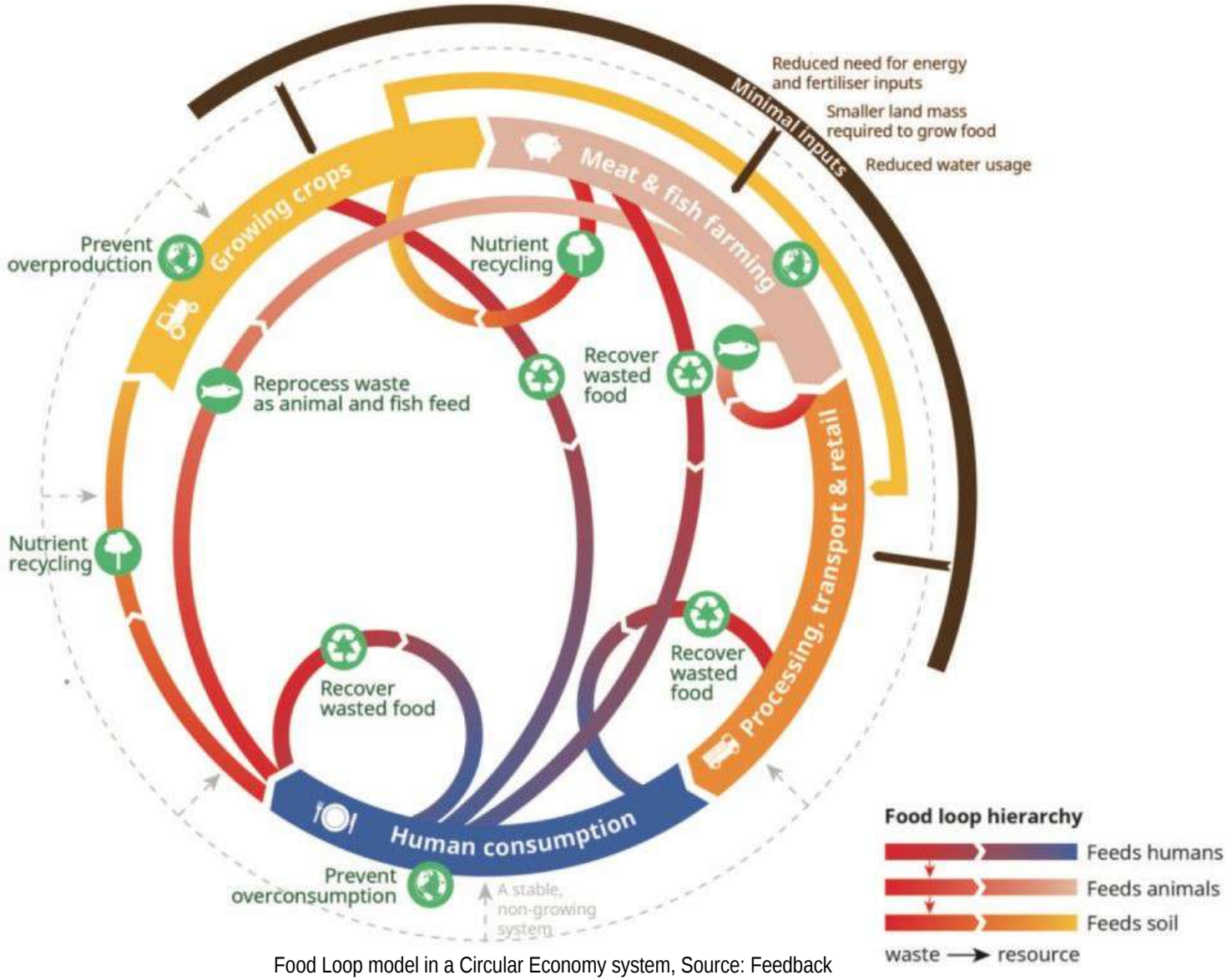
Closed loop/Single loop

Closed loop describes the production and consumption process whereby the disposed product returns to the manufacturer. These days we see a lot of so called ‘single product’ loops.

Here, for example, a printer cartridge returns to the original manufacturer who uses it to create a new printer cartridge. As people have thousands of products, it is not economical to bring every single product back to its original manufacturer.

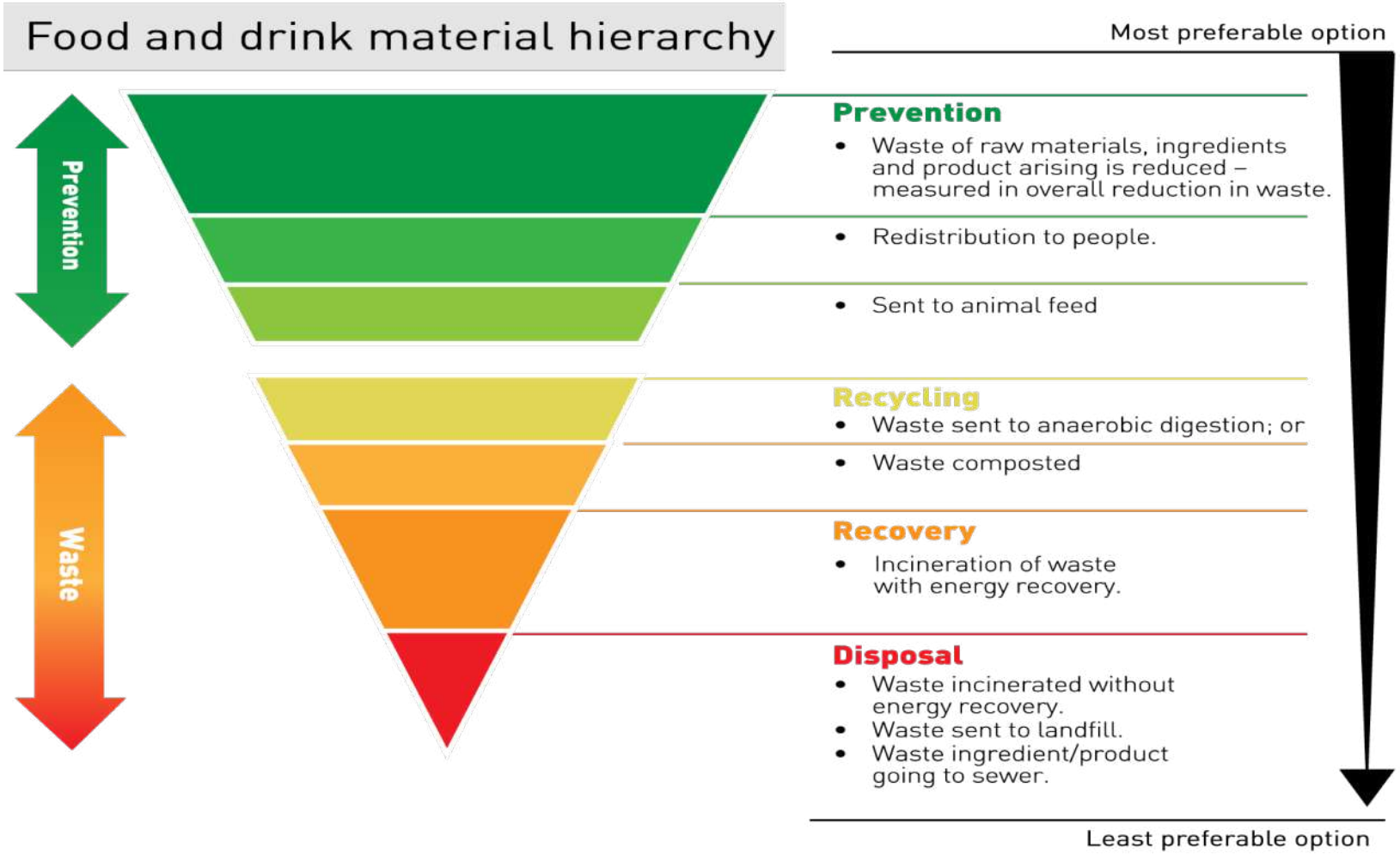
Closed loop/Network of closed loop

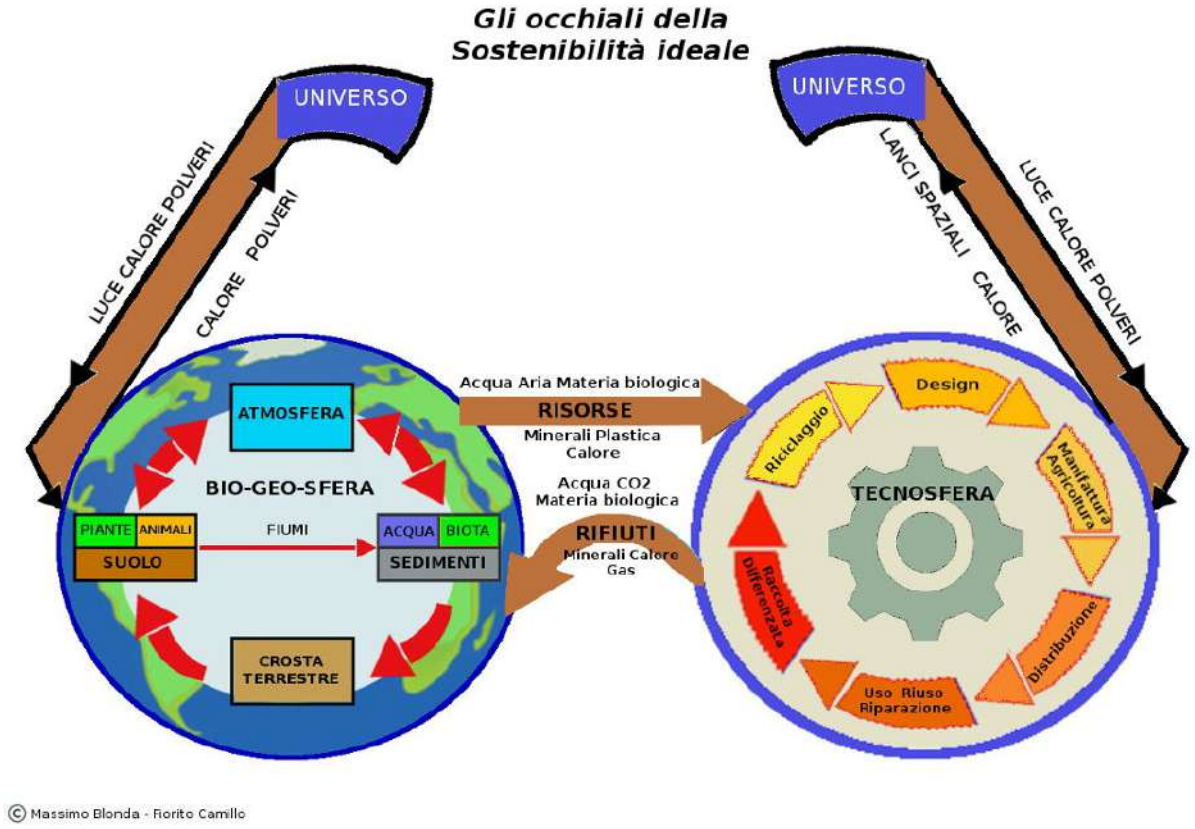
- Instead, the ‘single product’ recycle loops need to be combined and form a ‘**network of closed loops**’. It creates an ecosystem that brings disposed resources back to manufacturer who can use it.
- Kate Raworth describes this as an “interrelated network of industries where waste can be picked up by any industry and be used in different ways”.



Food Loop model in a Circular Economy system, Source: Feedback

Food and drink material hierarchy




Gli occhiali della
Sostenibilità ideale
UNIVERSO
LUCE CALORE POLVERI
CALORE POLVERI
UNIVERSO
LANCI SPAZIALI CALORE
LUCE CALORE POLVERI
ATMOSFERA
BIO-GEO-SFERA
PIANTE
ANIMALI
SUOLO
FIUMI
ACQUA
BIOTA
SEDIMENTI
CROSTA TERRESTRE
Acqua Aria Materia biologica
RISORSE
Minerali Plastica
Calore
Acqua CO2
Materia biologica
RIFIUTI
Minerali Calore
Gas
TECNOSFERA
Design
Riciclaggio
Manifattura
Agricoltura
Distribuzione
Uso Riuso
Riparazione
Raccolta
Differenziata
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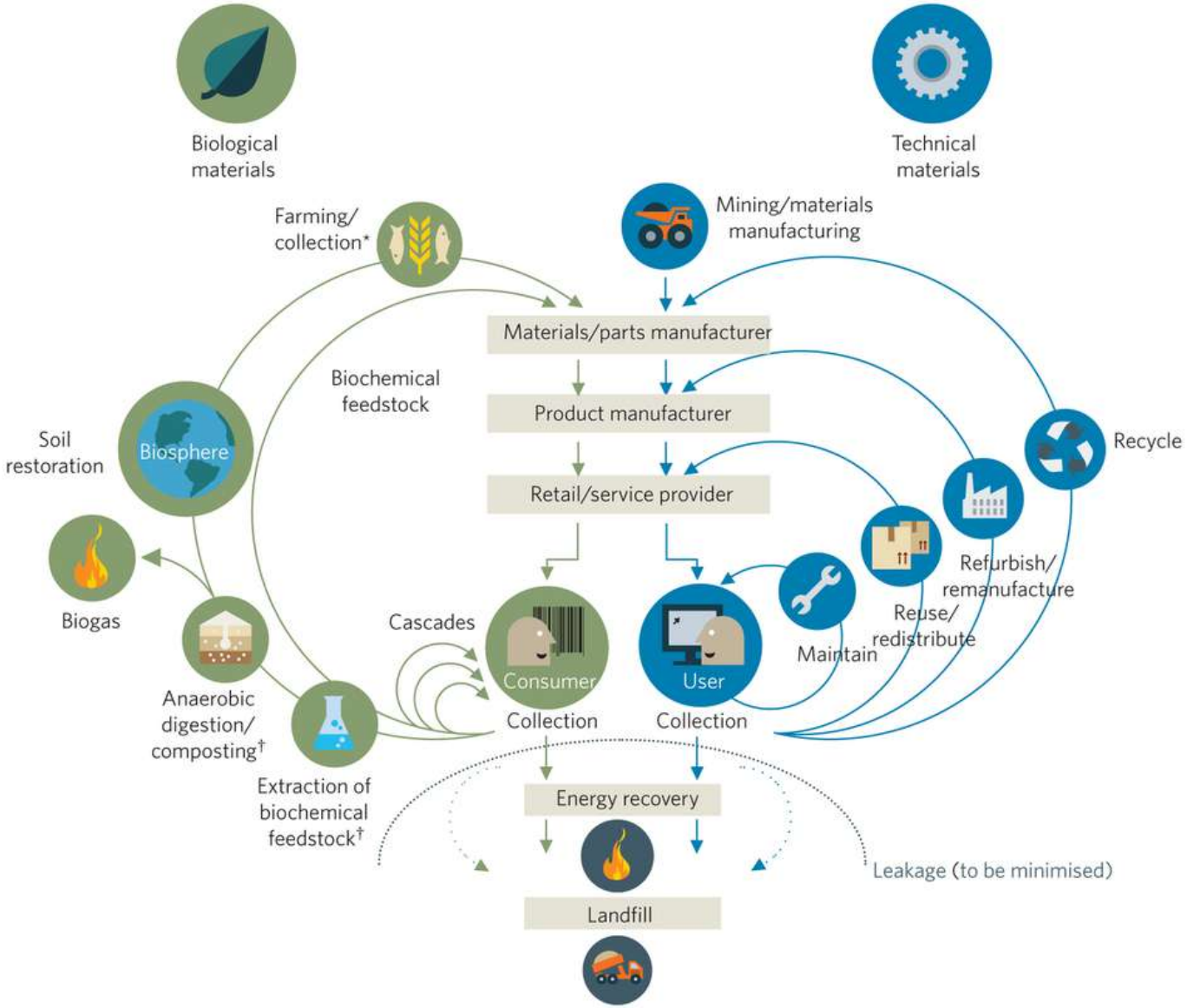
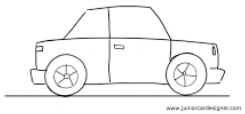
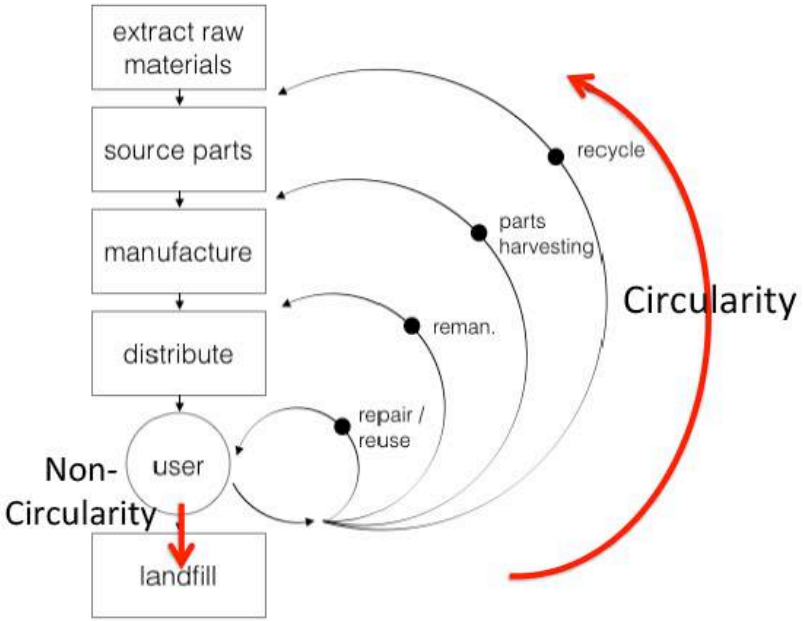
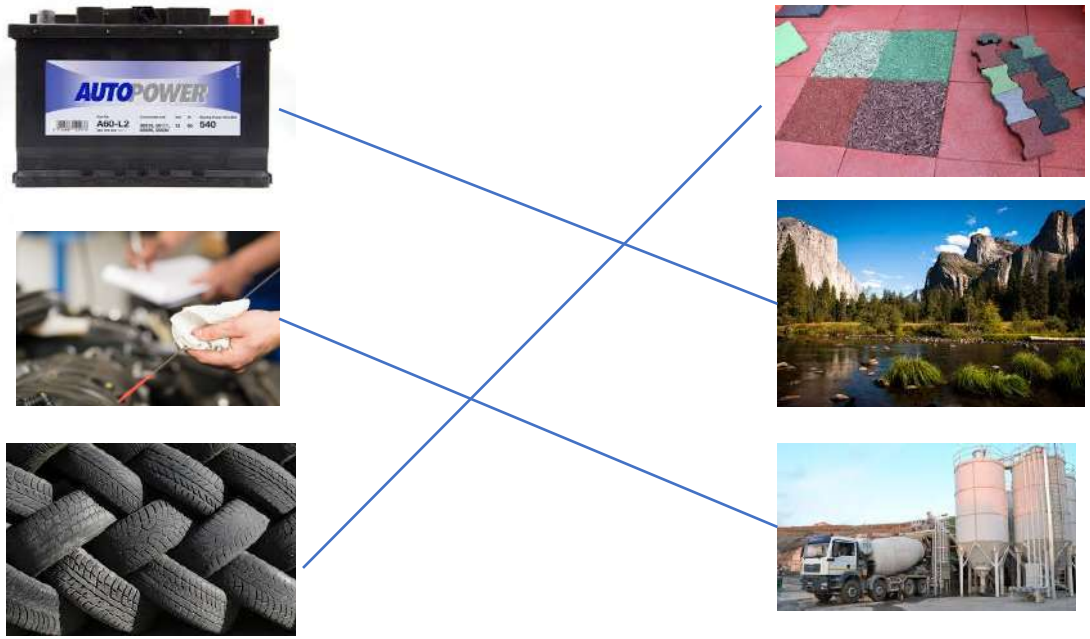

Biological materials
Technical materials
Farming/ collection*
Mining/materials manufacturing
Materials/parts manufacturer
Biochemical feedstock
Product manufacturer
Soil restoration
Biosphere
Retail/service provider
Recycle
Refurbish/ remanufacture
Reuse/ redistribute
Biogas
Cascades
Maintain
Consumer
User
Anaerobic digestion/ composting†
Collection
Collection
Extraction of biochemical feedstock†
Energy recovery
Leakage (to be minimised)
Landfill

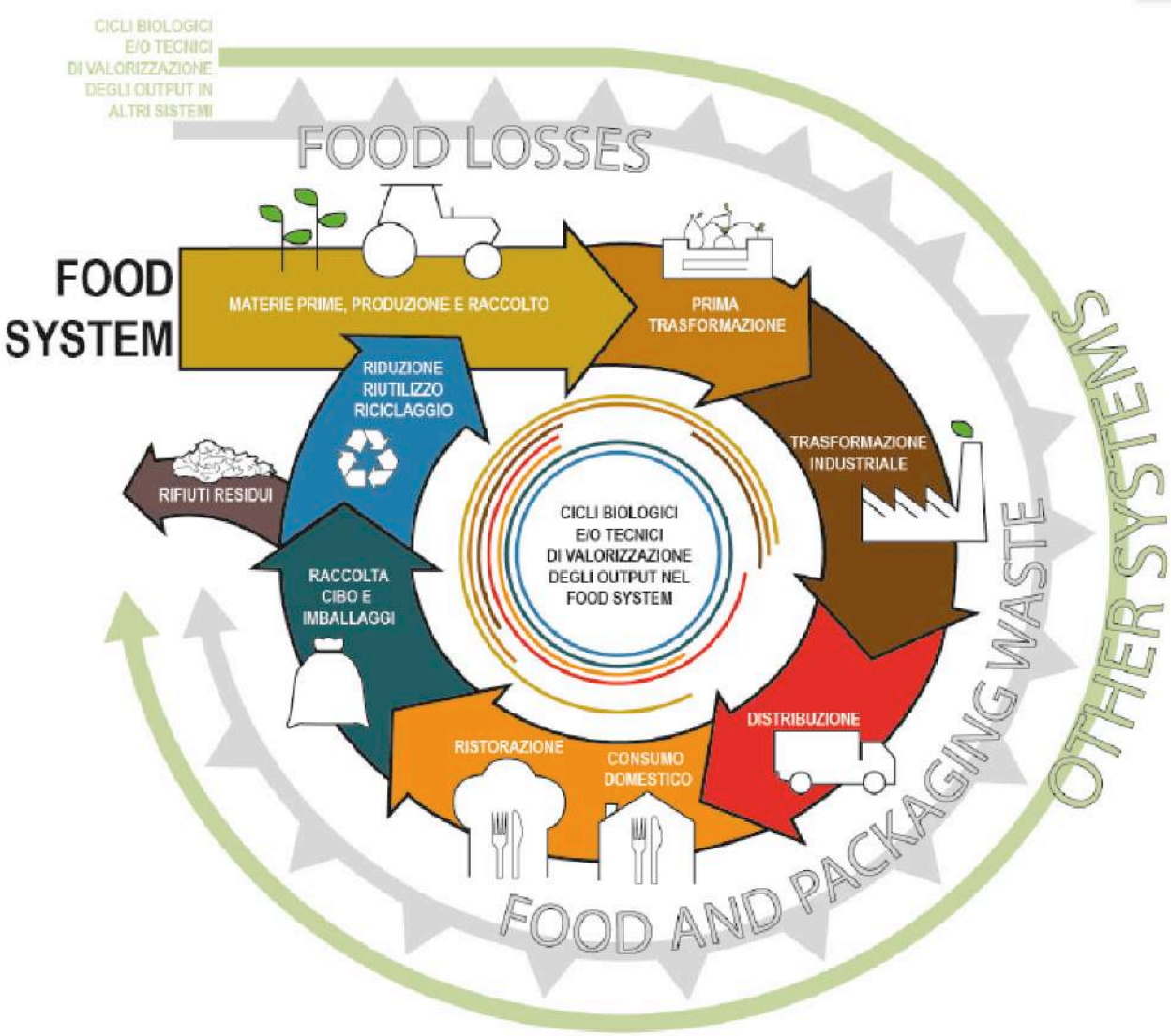




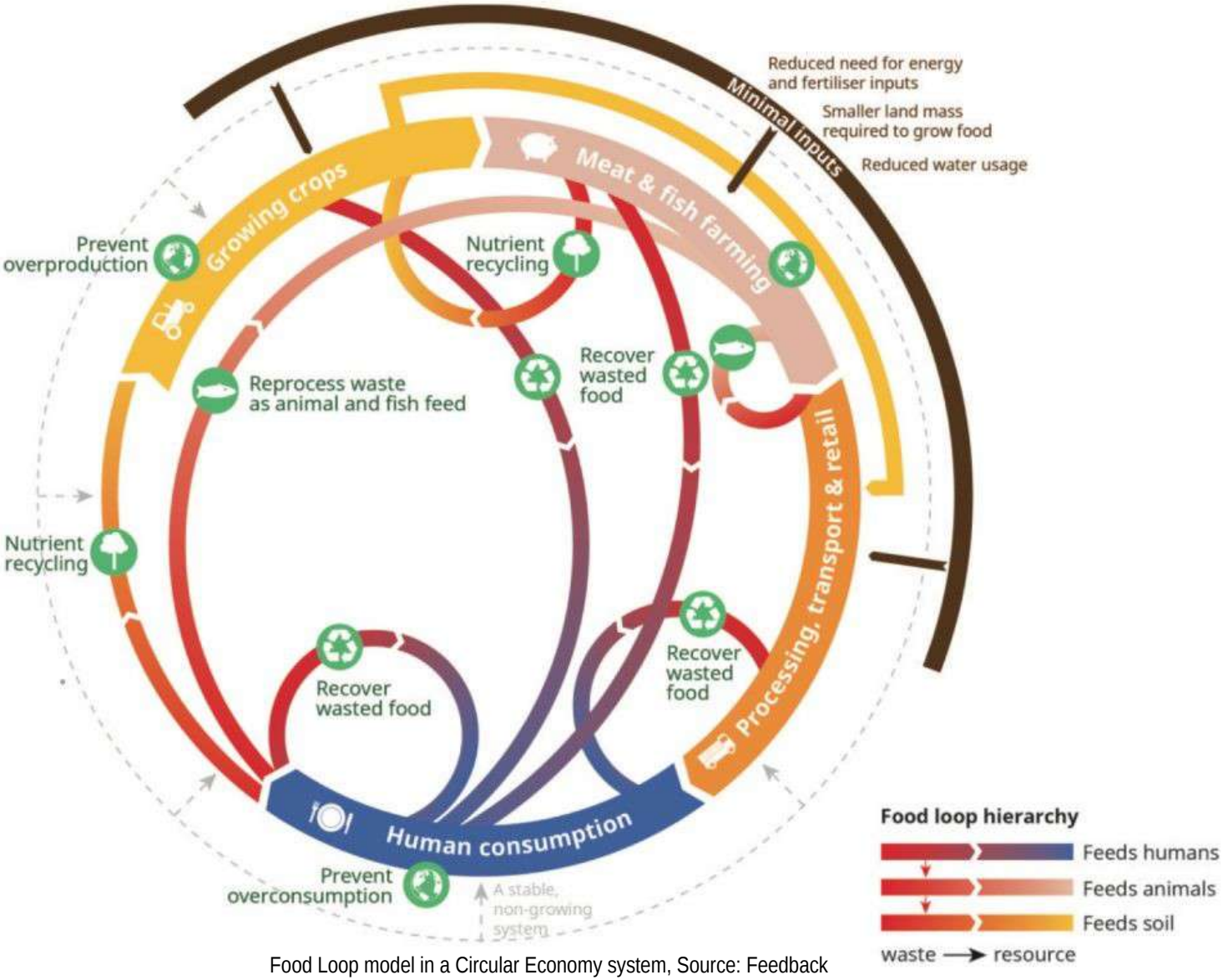
https://www.lifegate.it/persone/stile-di-vita/auto-riciclare

Since 1 January 2015, the European Union has established the obligation to recycle 95 percent of the total weight of a car (more precisely 85 percent as recycling and reuse and 10 percent as energy recovery)



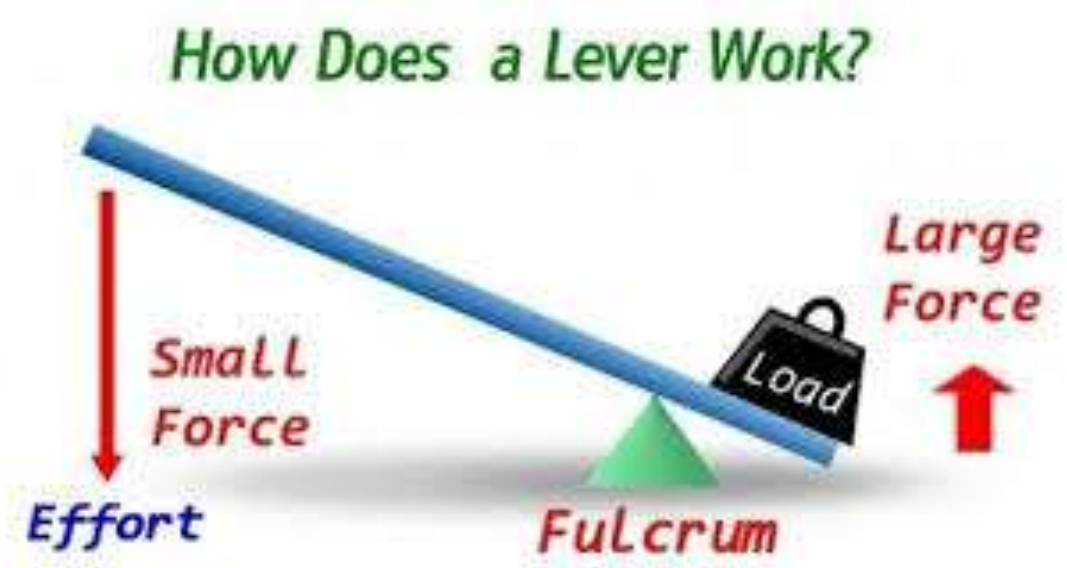


Elaborazione grafica a cura di Fassio, Tecco, 2018.



Food Loop model in a Circular Economy system, Source: Feedback

The leverage effect of food



Perché parlare di cibo e di economia circolare?

L'economia circolare affonda le sue **origini nella complessità delle dinamiche dei sistemi alimentari**, utilizzando il cibo come veicolo di significato. Non a caso viene utilizzato e ritorna continuamente lo slogan **"Waste is food"**, il rifiuto è cibo, che ci riporta immediatamente sia ai principi di funzionamento dei **cicli naturali,** della **rete alimentare,** del **sapere contadino.**

Il cibo è uno dei settori di possibile applicazione e sviluppo di questo nuovo modello di economia, basti pensare al ruolo che già oggi riveste, all'interno del pacchetto dell'economia circolare, il **tema dello spreco alimentare**. Ma non è un ambito qualunque, paragonabile agli altri. Attraverso il cibo passa non solo la nostra **alimentazione corporea,** ma anche la natura del nostro **rapporto con il mondo e con gli altri**, quella connessione con **l'ambiente e l'umanità** ben esplicitata nella *Laudato si'* di **Papa Francesco** in cui viene definito il concetto di **Ecologia Integrale**.

Il cibo è una **leva strategica**, un **acceleratore che tocca la quotidianità di tutti** quindi può incarnare i principi della circular economy, ma può anche **supportarla nell'individuare un binario di evoluzione teorico-pratica** e nel **calibrarne gli obiettivi.**

La circolarità nel cibo

la ***prospettiva*** *che offre il* ***cibo*** *appare come* ***buon un punto dal quale partire*** *per andare alla scoperta delle* ***radici del pensare circolare***

Pieter Bruegel il Vecchio, *La Mietitura*

Le origini del pensare circolare

Il pensare circolare ha trovato modo di maturare in seno alla **scienza della sostenibilità**, ambito d'integrazione dai **confini variabili** e di convergenza **interdisciplinare** di conoscenze ad ampio spettro **sulle interrelazioni materiali e immateriali** esistenti tra **sistemi naturali e sociali**.

Se nella fattispecie si guarda con più attenzione allo sviluppo **dei codici per decifrare la complessità dei sistemi alimentari**, scopriamo che l'origine del pensare circolare ha radici ben più profonde, che hanno scavato in diverse direzioni per raggiungere quella consapevolezza che abbiamo maturato **"dell'alimento umano quale fondamento della cultura e del sentimento"** (**Feuerbach**, 1971).

La **prospettiva** che offre il **cibo** appare quindi come **buon un punto dal quale partire** per andare alla scoperta delle radici del pensare circolare.

Il cibo, unità base di connessione

“Il cibo si trasforma in sangue, il sangue in cuore e cervello, in materia di pensieri e sentimenti” (**Feuerbach**, 1971). Ne deriva che l’**equilibrio** del nostro “essere” passa necessariamente dal dialogo che si crea tra la **mente e il corpo**, situazione che non è semplificabile in una rigida separazione cartesiana: nessuno dei due sistemi può, infatti, star bene da solo.

L’inscindibilità di questo dualismo (Nietzsche, 1976) individua nel **cibo il tramite attraverso cui inizia il processo di metabolizzazione della materia** nel corpo umano e la sua consequenziale trasformazione in **energia** per la vita.

Una **forza fisico-intellettuale** che dunque è connessa a una **corretta alimentazione**, così come la **qualità del cibo** che ingeriamo è collegata a sua volta alla **salute dell’ambiente e della società**.
Si tratta di un **dialogo tra le parti di un medesimo sistema.**

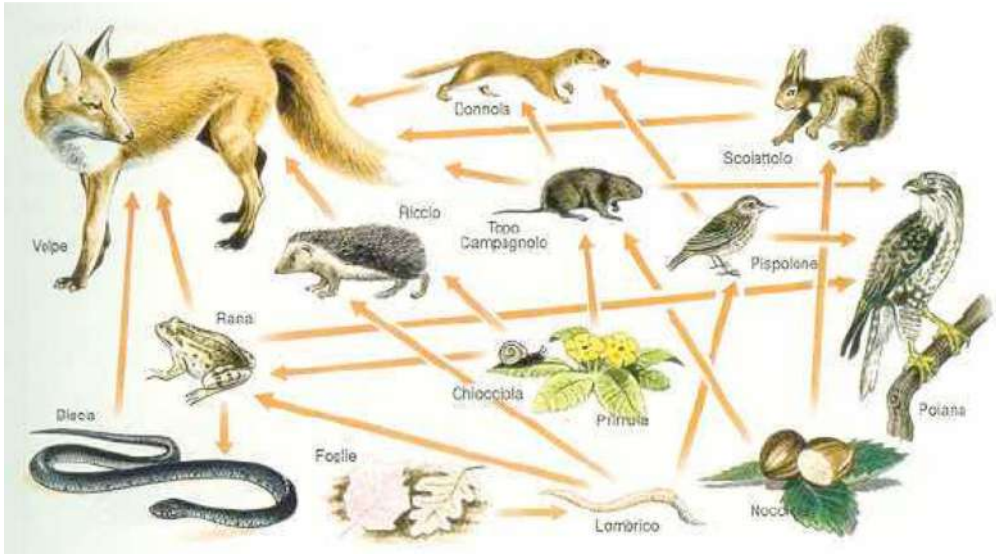
La circolarità si propone come una giusta **“dieta”** intesa nelle sue accezioni originarie: dal greco ***diaita*** (modo di vivere), dal latino ***dies*** (giorno) e ***diaeta*** (spazio della casa destinato all’accoglienza e alle relazioni) (Plinio il Giovane, 96/113).

Proprio nell’**economia domestica**, intesa come insieme di norme per la gestione della casa, la circolarità trova il suo spazio come atto di valorizzazione ogni parte di un prodotto edibile per ricombinarlo in maniera creativa nel pasto del giorno dopo (Grimaldi, 1993): un **“bricolage contadino”** (Lévi-Strauss, 1962).

Il cibo, unità base di connessione

Il successivo fiorire di ricerche rivolte all'analisi delle **comunità ecologiche** sfocia nel riconoscimento della **catena alimentare** (**Elton**, 1927), **flusso di materia ed energia tra i componenti (nodi) di un ecosistema** dove, attraverso l'atto di alimentarsi e l'applicazione della logica del "chi mangia chi", si crea uno **strumento per la comprensione della complessità delle interazioni fra le comunità di animali e di piante con l'ecosistema**, termine quest'ultimo, coniato dal botanico britannico **Arthur Clapham** nel 1930 (Willis, 1997).

Inoltre, si arriva a comprendere come queste **connessioni metaboliche** siano alla base di un **processo circolare di autopoiesi**, cioè di **ridefinizione e autoproduzione continua del sistema** e dei suoi attori, in un'ottica evolutiva di deriva naturale (**Maturana, Varela**, 1980).



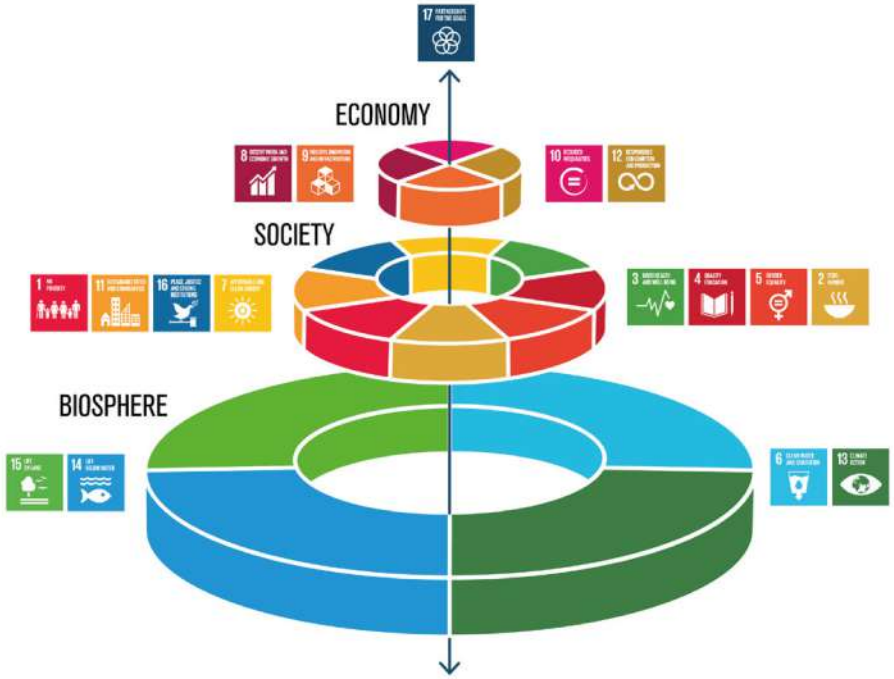
La rappresentazione dei sistemi viventi in nodi e relazioni interdipendenti, porta alla scoperta della **"rete della vita"** (Bruckner, 1767), **reti annidate dentro altre reti** (**Capra**, 1996), i cui attori sono gli organismi che si scambiano alimenti, in una relazione dove non conta esclusivamente la posizione di chi è "sopra" o "sotto" (Capra, Luisi, 2014), ma **sono determinanti i contenuti degli scambi e i loro intrecci** tra unità ecologiche micro e macro in ottica transcalare (**Odum**, 1971).

Sustainable Development Goals 2030

Una maggiore efficienza dei sistemi produttivi non può essere sufficiente al raggiungimento di un modello di produzione e consumo che si definisca **sostenibile**, **eco-efficace**, se non coniugato con **obiettivi di natura socio-economica**.

Questo è evidente quando guardiamo al cibo come uno **strumento per il raggiungimento dei SDGs (Sustainable Development Goals 2030 – Obiettivi di sviluppo sostenibile)**.

L'immagine della **"torta nuziale"** proposta da **Rockström** e **Sukhdev**, mostra come il cibo abbia la capacità di contribuire in maniera diretta e indiretta al raggiungimento di tutti i 17 obiettivi individuati dall'Agenda 2030, coerentemente con l'evoluzione di un **modello di sostenibilità che da antropocentrico diventa ecocentrico,** riconoscendo alla base della torta la dimensione della biosfera come quella che contiene e supporta il piano sociale ed economico.



Una serie di relazioni connettono i diversi SDGs attraverso il cibo.
Alcune sono più evidenti: l'approdo all'obiettivo 12, per esempio, relativo a produzione e consumo sostenibile, è direttamente legato alla creazione di una nuova relazione tra produttore e consumatore (SDG 17), alla riduzione della fame del mondo (SDG 2), alla salute e al benessere (SDG 3), che a loro volta sono condizionati dal raggiungimento degli obiettivi relativi alla dotazione di capitale naturale (SDGs 15, 14, 6, 13).

HOW FOOD CONNECTS ALL THE SDGs

Azote for Stockholm Resilience Centre
https://www.stockholmresilience.org/research/research-news/2016-06-14-how-food-connects-all-the-sdgs.html

David Hertz, quotation

Circular Economy for Food: case history list

37 companies were chosen, for a total of 40 case histories

It's an initial collection of experiences, witnesses and heralds of change, gathered together to reflect on the ongoing transition and to promote an exchange of knowledge, so that good practices can become a driving force for new initiatives

systems

MDPI

Article

Circular Economy for Food: A Systemic Interpretation of 40 Case Histories in the Food System in Their Relationships with SDGs †

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† A preliminary version of this paper was presented in Relating System Thinking and Design 2017, RSD6, Oslo, 18–20 October 2017 and published in the Conference Proceedings as Fassio F., Tecco, N. (2017). The Circular Economy for Food, a systemic interpretation of the circular economy through the holistic view of the Gastronomic Sciences. In Proceedings of the Relating Systems Thinking and Design (RSD6) 2017 Symposium, Oslo, Norway, 18–20 October 2017 (ISSN 2371-8404). The proceedings are published and available online as open access documents at https://systemic-design.net/rsd6/rsd6-proceedings/.

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Abstract: While the Circular Economy is widely championed by academics, companies, and politicians, its implementation is still an open issue. Its applications reveal a split between theory and practice. This break makes it difficult to pinpoint how coherent practices are with the original concept and how to understand the purpose of the actions and assess the results' effectiveness. This is immediate when we consider the complexity of food. This paper aims to provide further insight on the applications and spill over of the circular economy into the food system. Through the systemic analysis of case histories, the research evaluates the effects of 40 circular economy actions in their relationship with Sustainable Development Goals, by assessing how they have been able to integrate and balance the economic, social, and environmentally sustainable development's dimensions into the food system. What emerges is that food can be a fertile ground for the implementation of a circular economy's principle and could also provide support in understanding its evolution and adjusting its objectives accordingly. Food is strategic and could be a perfect field for testing a new approach to raw material and waste and for the development of a new context of inquiry, defined as "Circular Economy for Food".

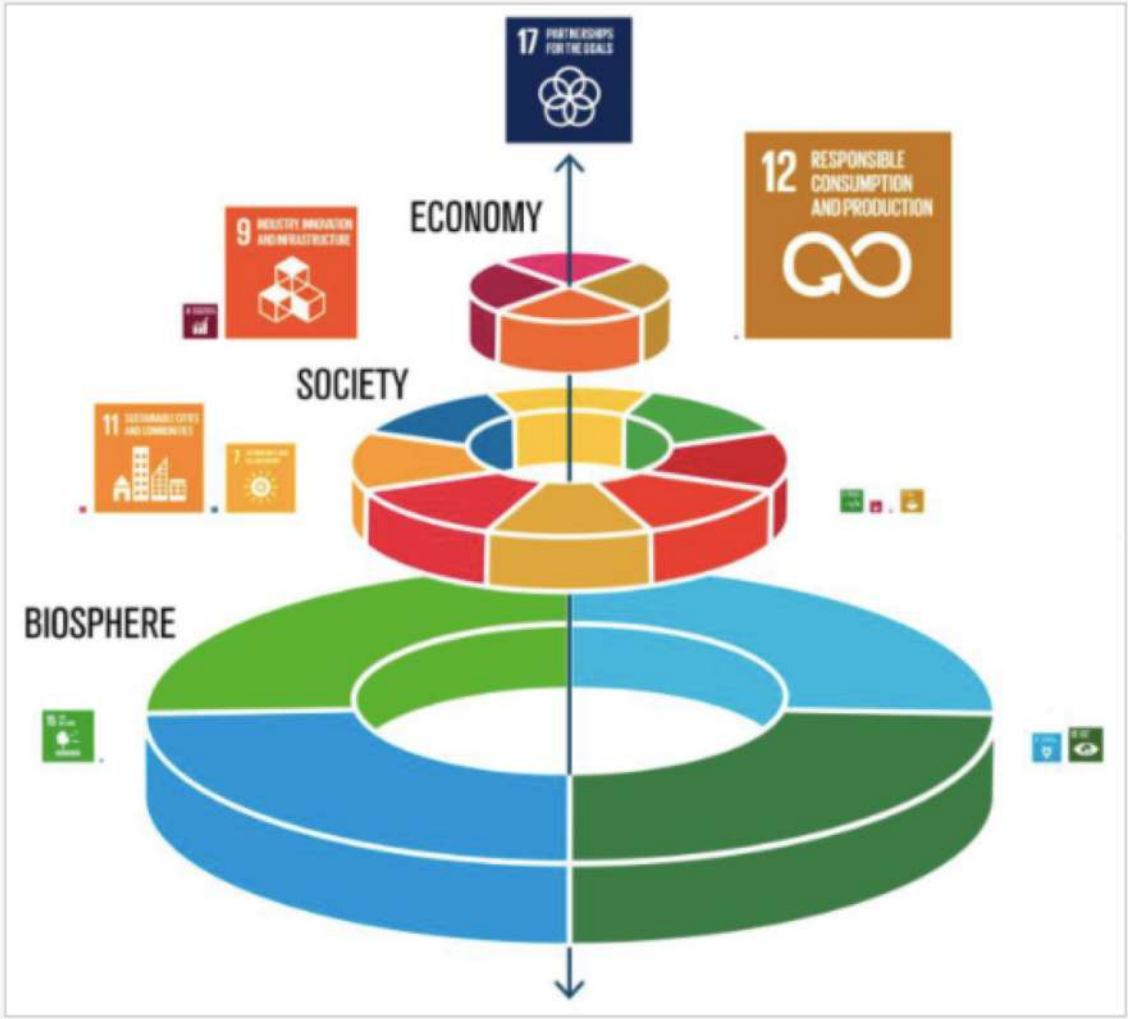
Keywords: circular economy; food system; sustainability; SDGs; system thinking; Agenda 2030

- The article evaluates the effects of **40 circular economy actions** in their relationship with **Sustainable Development Goals,** by assessing how they have been able to **integrate and balance the economic, social, and environmentally sustainable development's dimensions into the food system.**

- **In the specific case of food**, it is necessary to deepen and verify that **the application of the principles of the circular economy to food, contribute to the achievement of integrated sustainability objectives and food is used in its full potential to represent a transversal vector of sustainability for the achievement of the SDGs.**

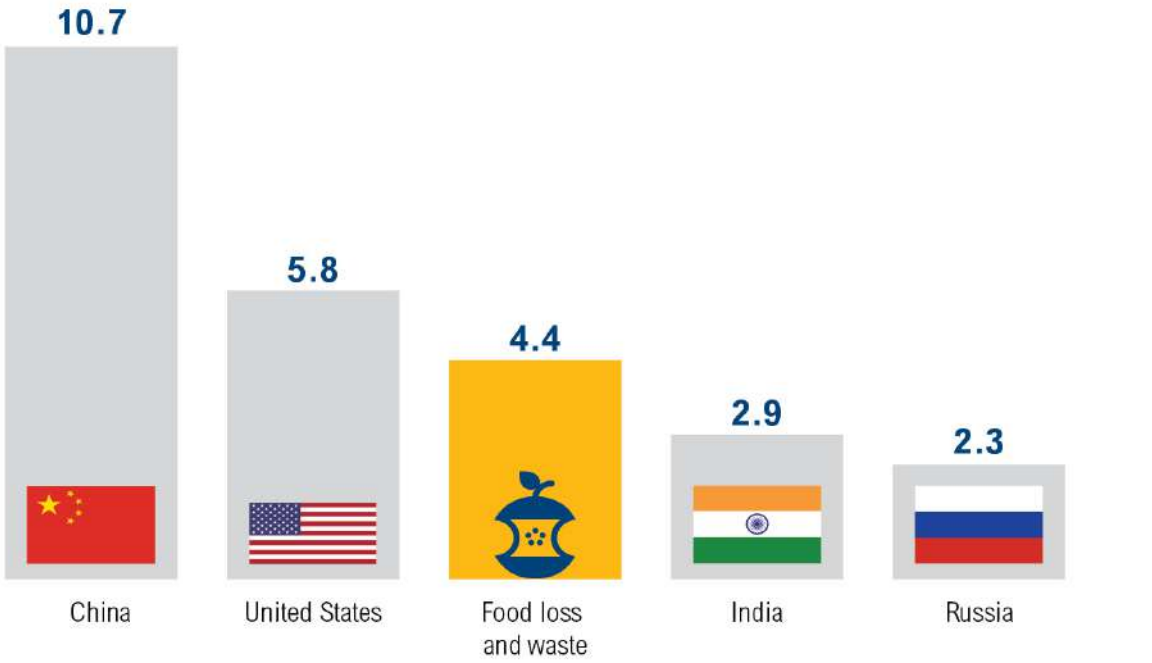
CASE HISTORIES																		
AGRINDUSTRIA							7.2 7.3					12.2 12.5				15.1 15.4 15.5		
AMETHYST		2.4				6.3 6.4	7.3		9.4 9.5									
AUTOGRILL						6.4	7.2 7.3				11.2 11.6							
BACARDI											11.6	12.4						17.14 17.16
BALADIN		2.3 2.4					7.2		9.2			12.2 12.5				15.1 15.4 15.5		
BARILLA									9.4 9.5			12.2 12.4				15.2		17.14 17.16
BIO-ON						6.3			9.1 9.4			12.4 12.5						
CARLSBERG ITALIA											11.2 11.6	12.4 12.5	13.3					17.14 17.16
CIR FOOD				4.7							11.6	12.5						
COMECO											11.6	12.2 12.5				15.2		17.14 17.16 17.17
THE FOOD AND RENEWABLE ENERGY COMMUNITY		2.3 2.4					7.2	8.2 8.3 8.4			11.6					15.1 15.4 15.5		17.14 17.16
COOP ITALIA	1.3	2.1									11.6	12.3						17.14 17.16
COSTA CROCIERE											11.2 11.6	12.4 12.6						17.14 17.16
COSTA GROUP								8.4				12.2 12.5						17.14 17.16
CUKI COFFESCO		2.1									11.6	12.3						17.17
DUEDILATTE			3.9						9.5 9.b			12.2 12.5						
ECOPLAN								8.4				12.2 12.5						
EDIZERO									9.2 9.4 9.5		11.6	12.2 12.5						17.14 17.16
FORTUM RECYCLING AND WASTE SOLUTIONS							7.2		9.1 9.2 9.4 9.5		11.3 11.6	12.2 12.5						17.17
ELIOR GROUP		2.1 2.4		4.7			7.2 7.3					12.3						
FATTORIA DELLA PIANA SOCIETA' COOPERATIVA		2.3 2.4					7.2	8.2 8.4 8.3			11.6	12.2 12.4 12.5						17.14 17.16
FERRERO			3.4						9.2 9.4 9.5			12.2 12.4 12.5						
FRUMAT									9.4 9.5			12.2 12.5				15.2		17.14 17.16
FUTURE POWER							7.2		9.2 9.4 9.5			12.2 12.5						
GROWING UNDERGROUND		2.4				6.4	7.2 7.3				11.3							
IKEA									9.4			12.2 12.4						17.14 17.16
KEO PROJECT									9.4			12.2 12.5						17.14 17.16
LAVAZZA COFFEE POD									9.4 9.5		11.6	12.2 12.4	13.3					
LAVAZZA CIRCULAR COFFEE		2.1	3.4								11.6	12.2 12.5						17.14 17.16
LUCART						6.3			9.1 9.4 9.5			12.4 12.5						17.14 17.16
LURISIA ACQUE MINERALI						6.4 6.6	7.3		9.1 9.2 9.4			12.4 12.5				15.1 15.4		
NOVAMONT BIOREFINERY								8.4	9.1 9.2 9.4 9.5		11.3	12.2				15.4 15.8 15.9		17.14 17.16
NOVAMONT MATER-BI BAGS									9.4 9.5		11.6	12.2	13.3					17.14 17.16
ORANGE FIBER								8.2 8.4	9.2 9.4 9.5			12.2 12.5				15.1 15.4 15.5		17.14 17.16
PALM									9.1 9.2 9.4			12.4 12.5	13.3			15.2		17.14 17.16
RICREA STEEL CAN COFFEE									9.4			12.2 12.5						17.17
RICREA FOR PACK TOMATOES			3.9						9.1 9.2 9.4 9.5			12.2 12.5						17.14 17.16 17.17
RILEGNO											11.6	12.2				15.1 15.2		17.14 17.16 17.17
SABOX									9.2 9.4		11.6	12.2 12.4 12.5				15.1 15.2		17.14 17.16
VERALLIA ITALIA							7.3		9.4			12.2 12.4 12.5				15.2		17.14 17.16

Figure 5. Contribution of the 40 case histories of circular economy into the food system on the SDGs by adopting the representation of the wedding cake [36].



L’ATTUALITA’ E COMPLESSITA’ DEL TEMA DELLO SPRECO ALIMENTARE

If Food Loss and Waste Were its own Country, it Would Be the Third-Largest Greenhouse Gas Emitter



* Figures reflect all six anthropogenic greenhouse gas emissions, including those from land use, land-use change, and forestry (LULUCF). Country data is for 2012 while the food loss and waste data is for 2011 (the most recent data available). To avoid double counting, the food loss and waste emissions figure should not be added to the country figures.

Source: CAIT. 2015; FAO. 2015. *Food wastage footprint & climate change*. Rome: FAO.

WORLD RESOURCES INSTITUTE

UNEP

Together with moving to more sustainable diets and reaching major improvement in food production practices, **reducing food waste** both in and out of the home is the **most significant demand-side measure for reducing the carbon impact of the food system**.

	Assumptions
Dietary shift	Reference (table 1); vegetarian: meat-based protein sources replaced by a mix of plant-based proteins and fruits and vegetables (eggs and dairy consumed); vegan: all animal-based protein sources replaced by a mix of plant-based proteins and fruits and vegetables (no eggs and dairy consumed); pescatarian: meat-based protein sources replaced by a mix of seafood and fruits and vegetables (eggs and dairy consumed)
Improved production practice (PROD)	Standard level of ambition for improved food production practices including closing of yield gaps between attained and attainable yields to about 75%;[184,211] rebalancing nitrogen and phosphorus fertiliser application between over and under-applying regions;[184] improving water management, including increasing basin efficiency, storage capacity, and better utilisation of rainwater;[211] and implementation of agricultural mitigation options that are economic at the projected social cost of carbon in 2050,[212] including changes in irrigation, cropping and fertilisation that reduce methane and nitrous oxide emissions for rice and other crops, as well as changes in manure management, feed conversion, and feed additives that reduce enteric fermentation in livestock[213]
Improved production practice (PROD+)	High level of ambition for improved food production practices on top of PROD scenario, including additional increases in agricultural yields that close yield gaps to 90%;[184] a 30% increase in nitrogen use efficiency,[214] and 50% recycling rates of phosphorus;[215] phase-out of first-generation biofuels, and implementation of all available bottom-up options for mitigating food-related greenhouse-gas emissions[213]
Reduced food waste and loss (halve waste)	Food losses and waste reduced by half, in line with Sustainable Development Goals target 12.3

Table 4: **Measures considered for reducing environmental effects of food production**

THE LANCET, JANUARY 2019 Food in the Anthropocene: the EAT –Lancet Commission on healthy diets from sustainable food systems, vol 393, p.470.

This universal goal for all humans is **within reach** but will require adoption of **scientific targets** by all sectors to stimulate a range of actions from **individuals and organisations** **working in all sectors** and **at all scales.**

LA PREVENZIONE E LA RIDUZIONE DELLO SPRECO ALIMENTARE COME STRUMENTO DI CONTRASTO AL SURRISCALDAMENTO GLOBALE

Perchè è così difficile non sprecare cibo?
Siamo affamati di spreco?

Francesco Tullio Altan per «Spri+Eco di e con Andrea Segrè e Massimo Cirri

https://www.youtube.com/watch?v=bNuCD3hxAyk

http://www.sanomangiare.it/affamati-di-spreco-un-lungometraggio-sullo-spreco-di-cibo-e-sul-freeganism/

0-3:24: situazione tipo al supermercato: “quando si mangia si mangia”, emorragia di sprechi nella filiera alimentare, frigo come magazzino

7:44-: freeganesimo, gerarchia dei rifiuti

11:15-: il collo di bottiglia della grande distribuzione, la stagionalità, se ci vedessero le nostre nonne

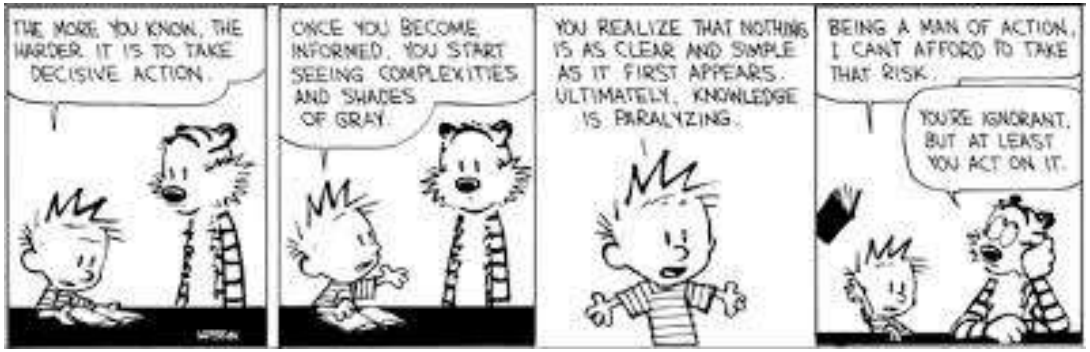
21:14-: ospiti a cena, e se poi non basta?
26:47

21:14-: la donazione delle eccedenze alimentari – dalla legge del Buon Samaritano alla Legge Gadda

34.19-: cosa e quanto buttiamo via?

41:00: collegamento fra eccedenza e fame, indiretto ma reale

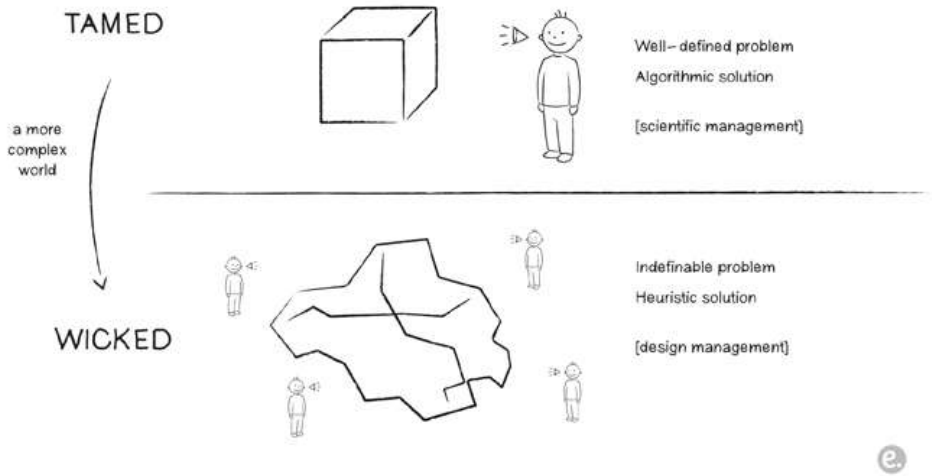
A PROBLEM WELL DEFINED IS A PROBLEM HALF SOLVED



FOOD WASTE

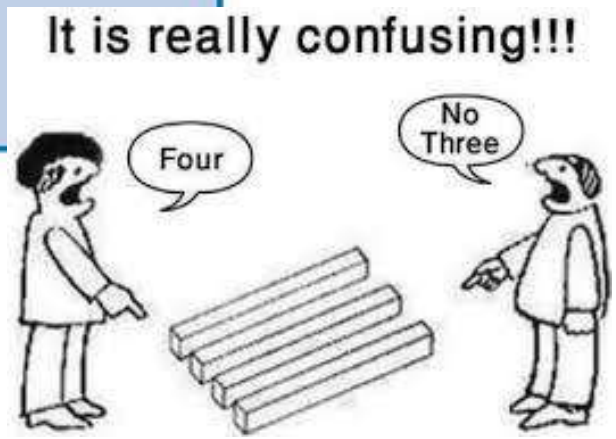
A WICKED PROBLEM

PROBLEMI IN CUI LA SOLUZIONE E' STRETTAMENTE DIPENDENTE DA COME DEFINISCO IL PROBLEMA



Characteristics of a "Wicked Problem"

- Difficult to clearly define
- Many interdependencies and often multicausal
- Attempts to address the problem often lead to unforeseen consequences
- Frequently not stable
- Usually no clear solution
- Socially complex
- Rarely is the responsibility of only one stakeholder
- Solutions involve changing behaviors
- Can be characterized by chronic policy failure

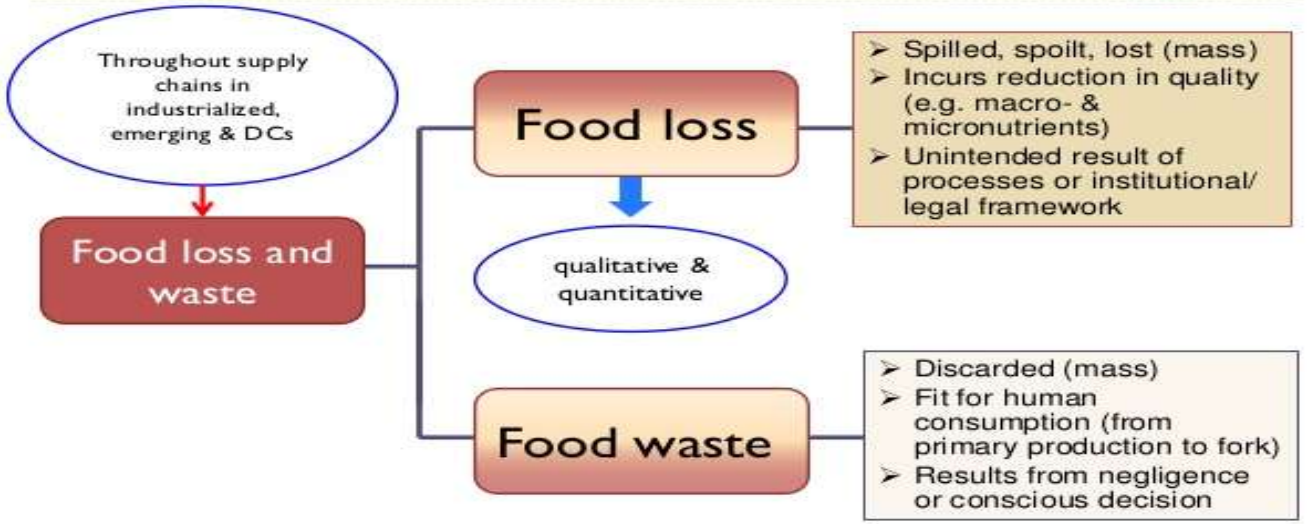


COME SI DEFINISCE LO SPRECO ALIMENTARE?


I COULDN'T REACH THE FRIDGE...
I SPENT TOO MUCH TIME IN THERE, INSTEAD!


FOOD
loss
waste
Inadequate processing and packaging
Capacity development, availability of raw materials and technologies, and access to modern energy and markets.
Lack of transportation and distribution systems
Capacity for transport, infrastructure and logistics.
Production and harvest waste
Effective planning, contractual agreements and networks for recovery of safe and nutritious food.
Wholesale and retail systems inefficiencies
Adequate planning, management, labelling, and marketing.
Inadequate storage facilities and techniques
Capacity development, access to energy, inputs, investments and market information.
Sustainable food systems provide safe and nutritious food for human consumption and contribute to climate resilience
Food loss measurement and prevention at local, national, regional and global level
Safe and nutritious food available for human consumption prevented from becoming waste and discard
Informed behaviour, sustainable consumption/production, partnerships
Hotels, restaurants, catering and households waste
Appropriate planning, consumer education, food utilisation.
Production and harvest losses
Sustainable technical, social, economic and environmental practices and training. Coherent investments for short, medium and long term returns.
Food waste and discards along supply chains
Prevent and reduce safe and nutritious food removal from supply chains. Reduced impact on climate change.
Food and Agriculture Organization of the United Nations
#foodwaste #foodloss
fao.org/platform-food-loss-waste

Efforts towards common terminology



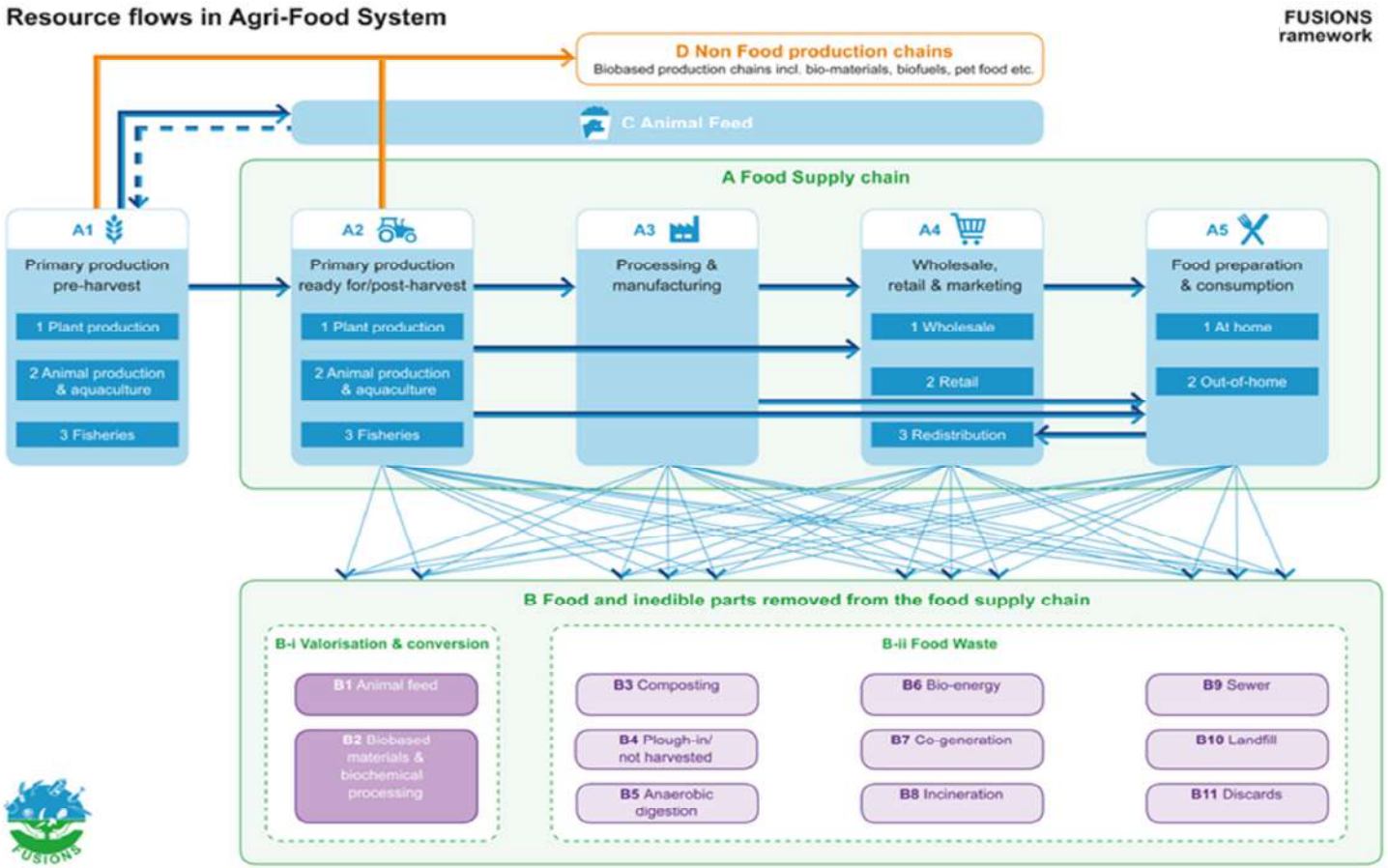
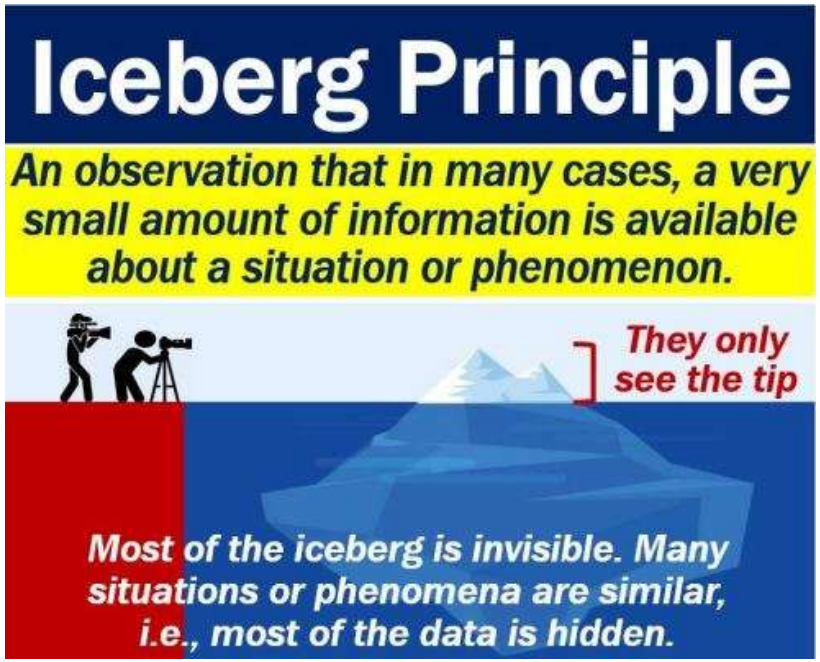


Figure 2 – The technical framework defining the Food supply chain and Food waste, on which the Manual builds[8].

QUANTO NE SAPPIAMO?



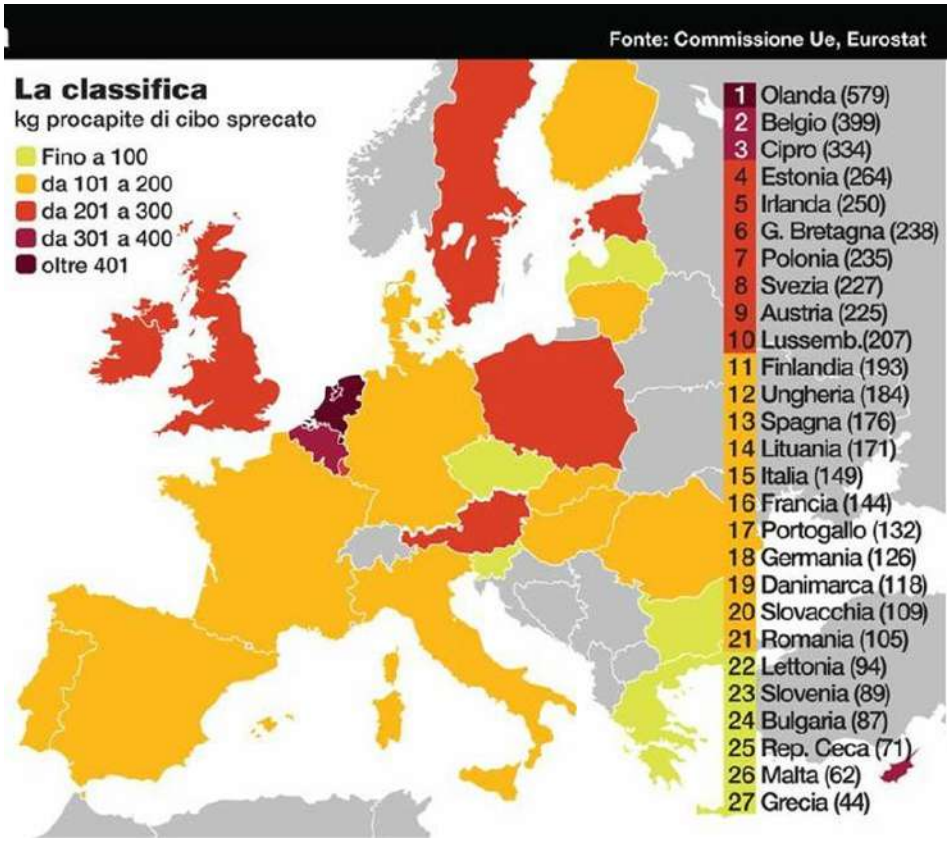
Food waste – latest estimate EU-28

EU-28 PRODUCES

88 MILLION TONNES of food waste per year

amounting to an estimated 143 BILLION EUROS

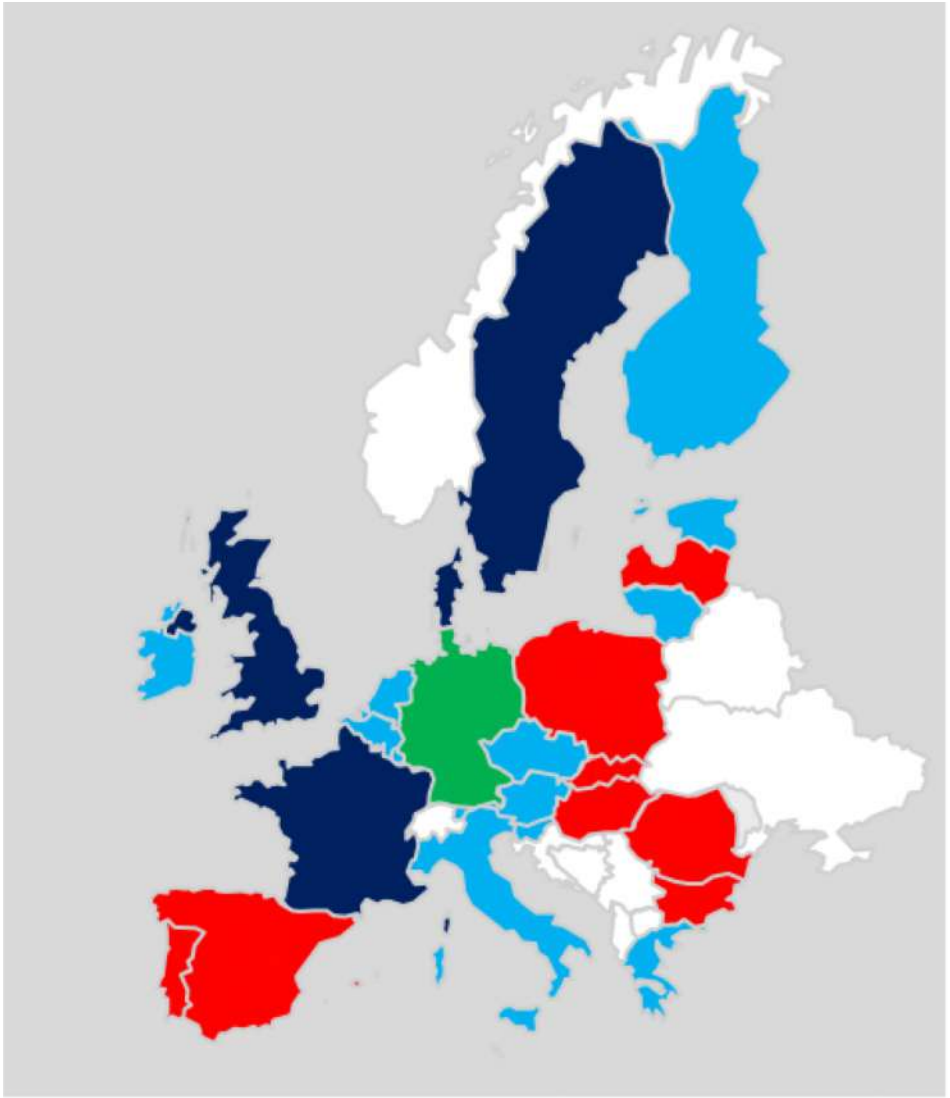
173 kg pro-capita food waste



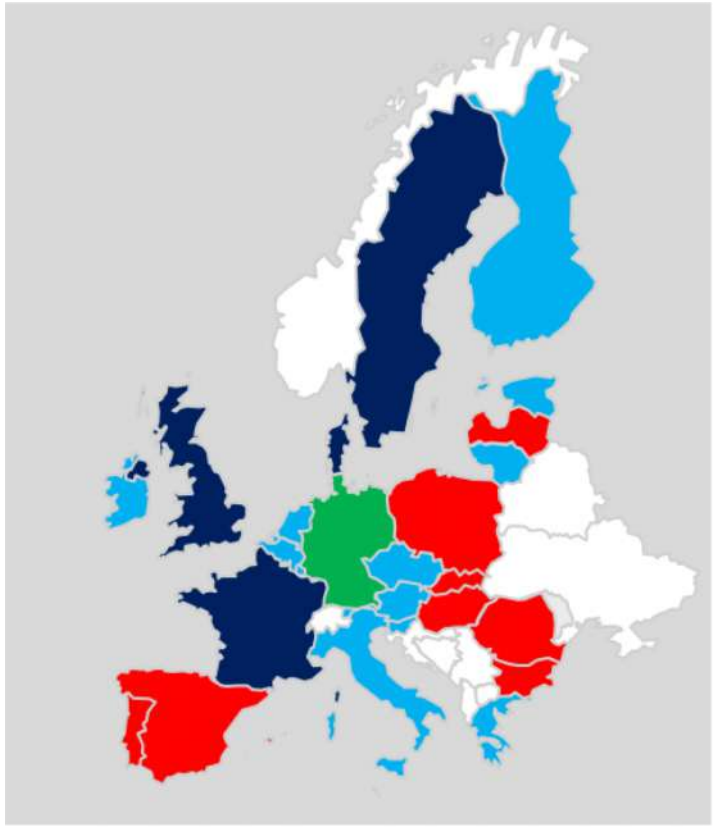
FOOD WASTE DATA QUALITY ACROSS EUROPE

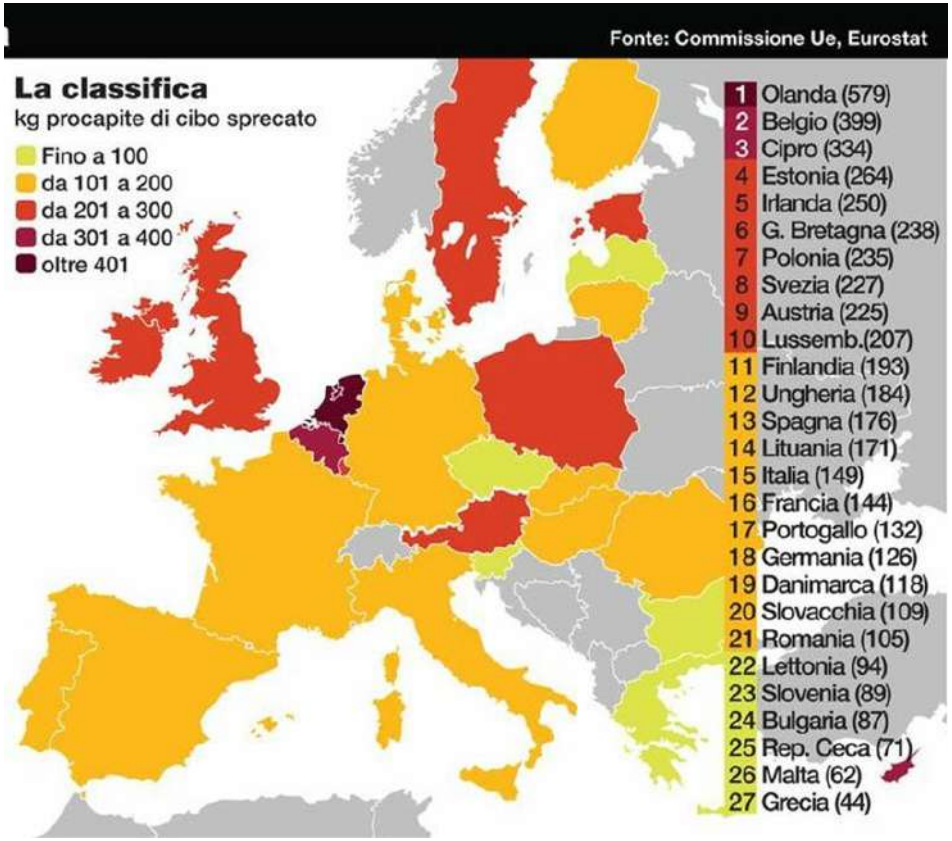
Data of not sufficient quality

Data of high quality



FUSION, 2016




Fonte: Commissione Ue, Eurostat
La classifica
kg procapite di cibo sprecato
Fino a 100
da 101 a 200
da 201 a 300
da 301 a 400
oltre 401
1 Olanda (579)
2 Belgio (399)
3 Cipro (334)
4 Estonia (264)
5 Irlanda (250)
6 G. Bretagna (238)
7 Polonia (235)
8 Svezia (227)
9 Austria (225)
10 Lussemb.(207)
11 Finlandia (193)
12 Ungheria (184)
13 Spagna (176)
14 Lituania (171)
15 Italia (149)
16 Francia (144)
17 Portogallo (132)
18 Germania (126)
19 Danimarca (118)
20 Slovacchia (109)
21 Romania (105)
22 Lettonia (94)
23 Slovenia (89)
24 Bulgaria (87)
25 Rep. Ceca (71)
26 Malta (62)
27 Grecia (44)

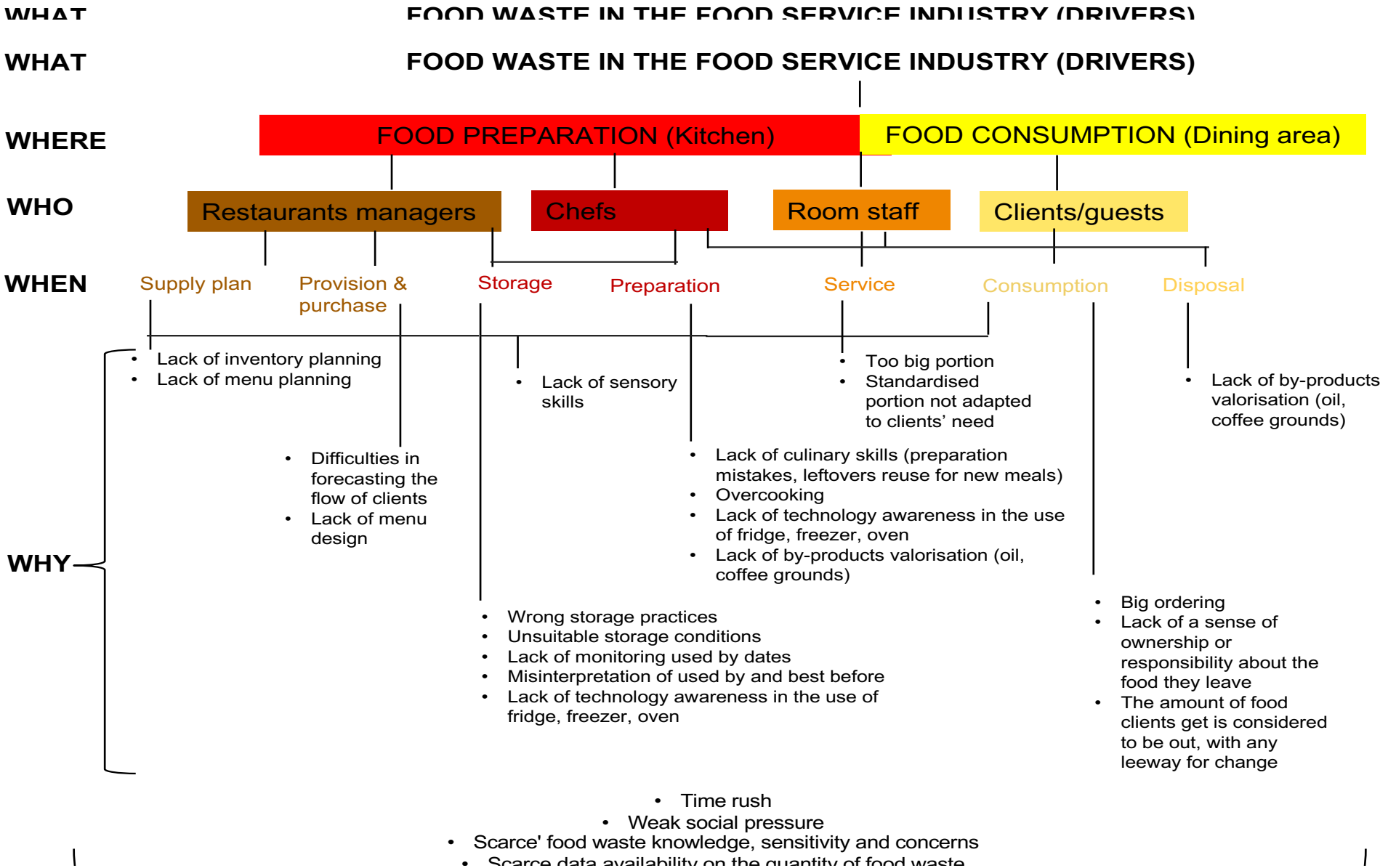

Data of not sufficient quality
Data of high quality

IDENTIFICHIAMO LE CAUSE

PENSIAMO AD UNA MENSA SCOLASTICA/AZIENDALE

1. QUALI SONO LE SITUAZIONI CHE PRODUCONO SPRECO ALIMENTARE? (LE FALLE DEL SECCHIO)?

FRAMMENTIAMO IL SISTEMA MENSA IN FASI RILEVANTI
(ACQUISTO, MAGAZZINO, PREPARAZIONE CONSUMO)


WHAT
FOOD WASTE IN THE FOOD SERVICE INDUSTRY (DRIVERS)
WHERE
FOOD PREPARATION (Kitchen)
FOOD CONSUMPTION (Dining area)
WHO
Restaurants managers
Chefs
Room staff
Clients/guests
WHEN
Supply plan
Provision & purchase
Storage
Preparation
Service
Consumption
Disposal
WHY
• Lack of inventory planning
• Lack of menu planning
• Difficulties in forecasting the flow of clients
• Lack of menu design
• Lack of sensory skills
• Wrong storage practices
• Unsuitable storage conditions
• Lack of monitoring used by dates
• Misinterpretation of used by and best before
• Lack of technology awareness in the use of fridge, freezer, oven
• Lack of culinary skills (preparation mistakes, leftovers reuse for new meals)
• Overcooking
• Lack of technology awareness in the use of fridge, freezer, oven
• Lack of by-products valorisation (oil, coffee grounds)
• Too big portion
• Standardised portion not adapted to clients' need
• Big ordering
• Lack of a sense of ownership or responsibility about the food they leave
• The amount of food clients get is considered to be out, with any leeway for change
• Lack of by-products valorisation (oil, coffee grounds)
• Time rush
• Weak social pressure
• Scarce' food waste knowledge, sensitivity and concerns
• Scarce data availability on the quantity of food waste

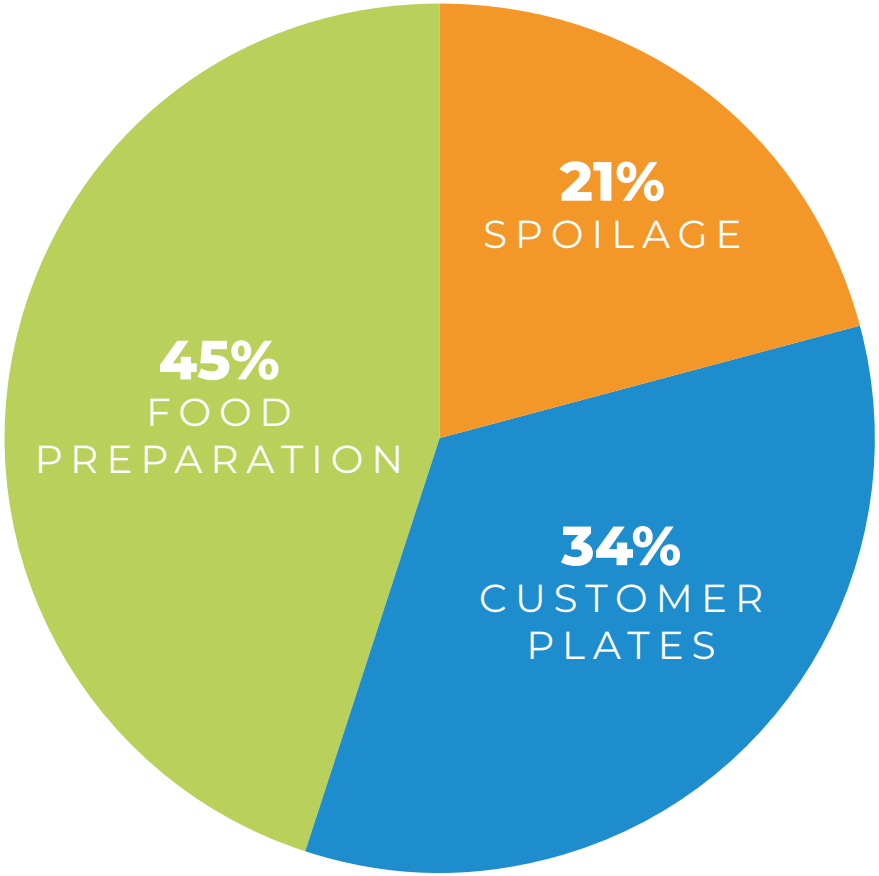
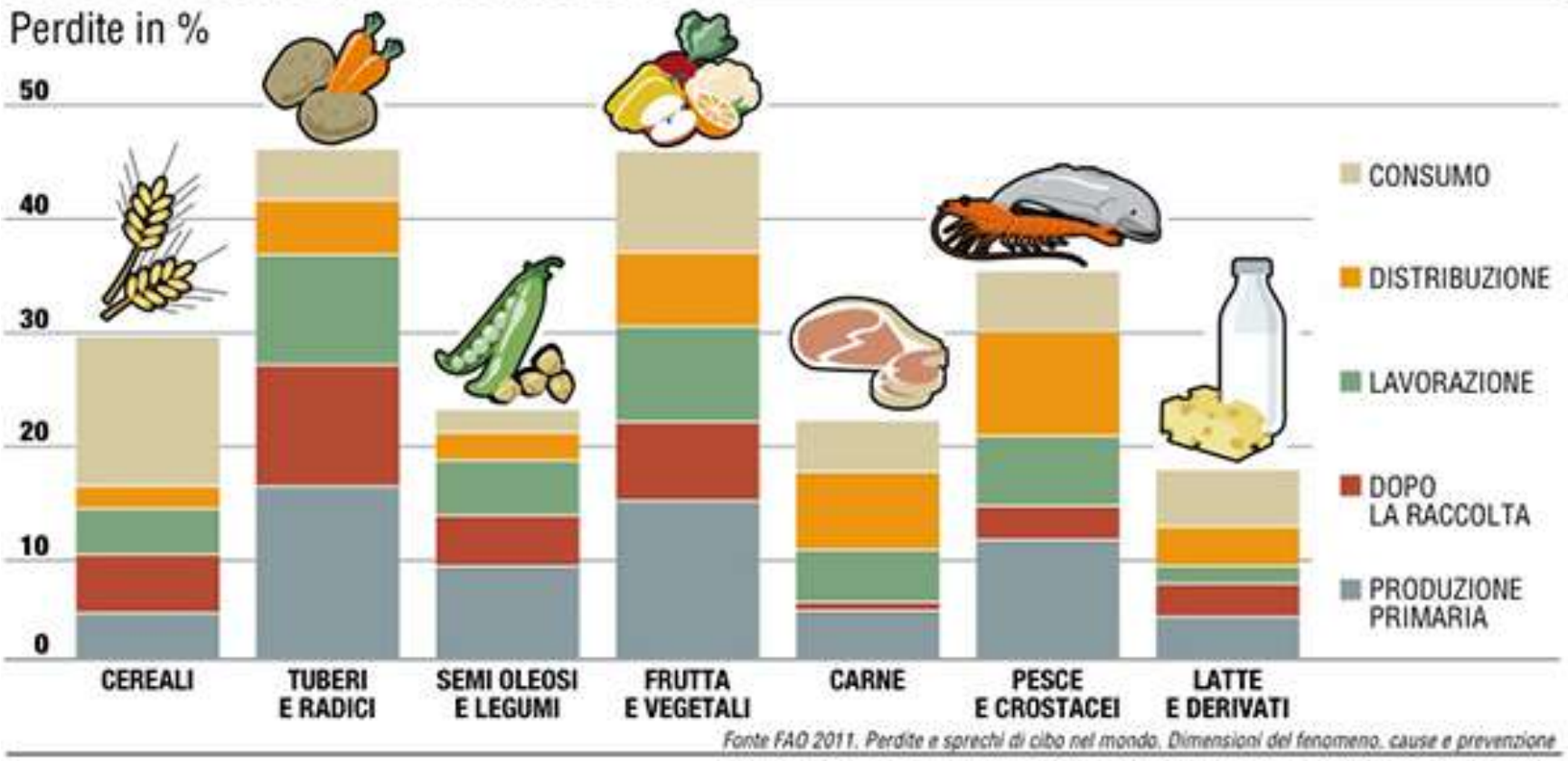


Figure 2. Incidence in % of the of the preparation phase, spoilage and customer leftover (Overview of Waste in the UK Hospitality and Food Service Sector, 2013) 2

GLI SPRECHI ALIMENTARI GLOBALI



Fonte FAO 2011. Perdite e sprechi di cibo nel mondo. Dimensioni del fenomeno, cause e prevenzione

Food is lost or wasted along the entire value chain

Production	Handling and Storage	Processing and Packaging	Distribution and Market	Consumption
During or immediately after harvesting on the farm	After leaving the farm for handling, storage, and transport	During industrial or domestic processing and/or packaging	During distribution to markets, including at wholesale and retail markets	In the home or business of the consumer, including restaurants and caterers





Source: WRI analysis based on FAO. 2011. *Global food losses and food waste – extent, causes and prevention.* Rome: UN FAO.

WORLD RESOURCES INSTITUTE

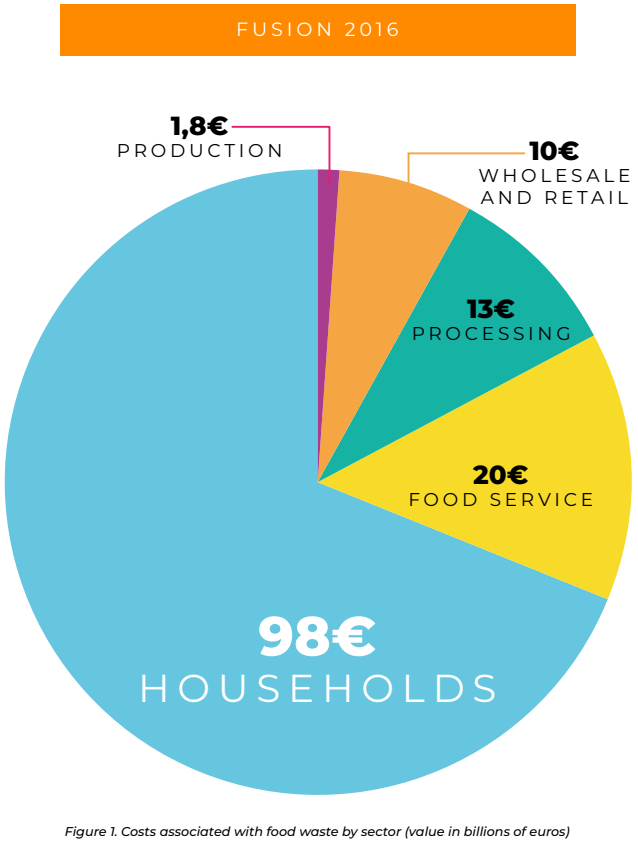
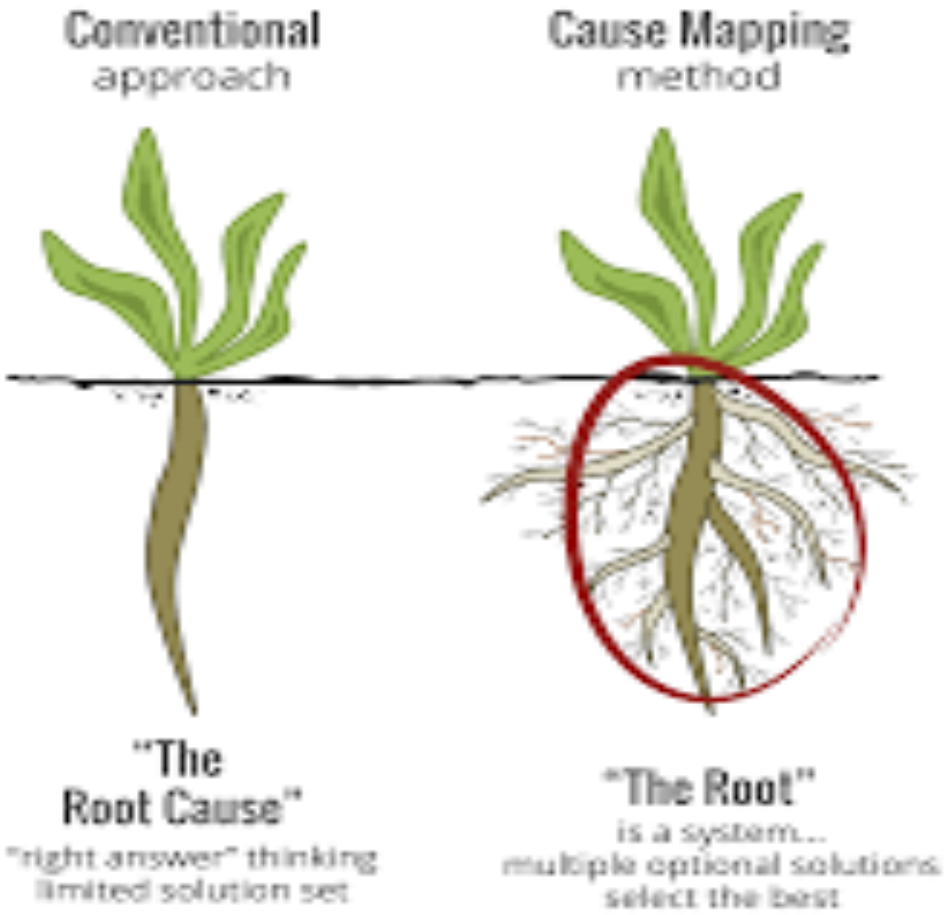
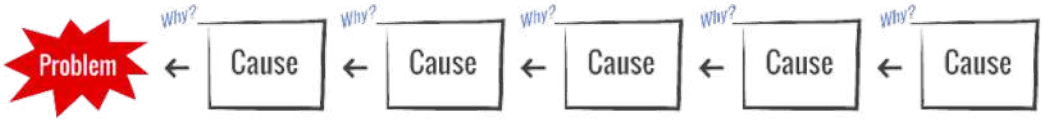


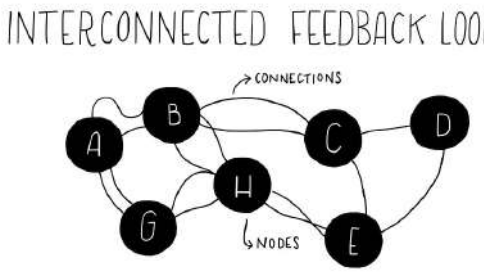
Figure 1. Costs associated with food waste by sector (value in billions of euros)

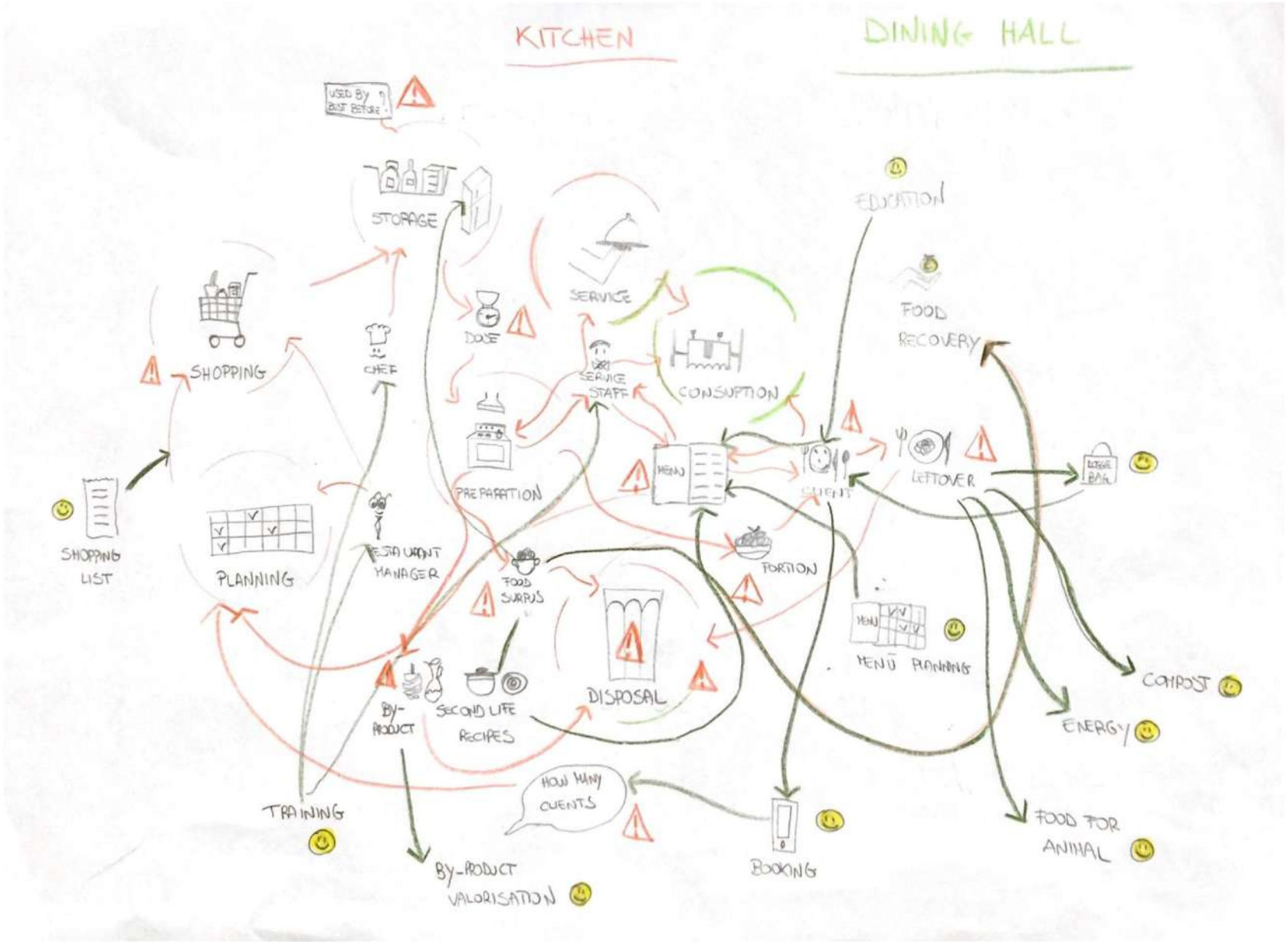

Conventional
approach
Cause Mapping
method
"The
Root Cause"
"right answer" thinking
limited solution set
"The Root"
is a system...
multiple optional solutions
select the best

PENSIAMO AD UNA MENSA SCOLASTICA/AZIENDALE

2. QUALI SONO LE RELAZIONI FRA LE CAUSE?

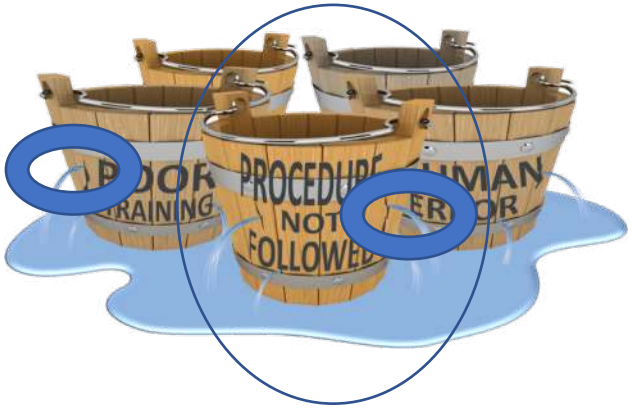


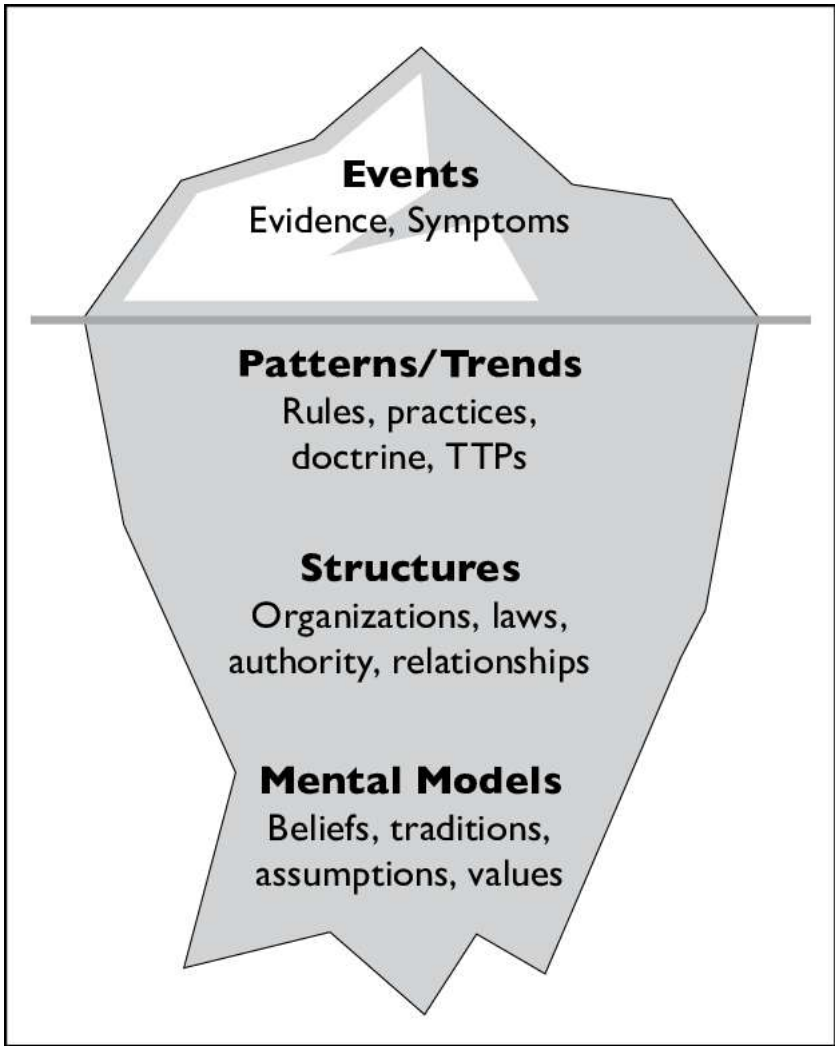



KITCHEN
DINING HALL
USED BY ? BEST BEFORE
STORAGE
SHOPPING
CHEF
DOSE
SERVICE
SERVICE STAFF
CONSUPTION
EDUCATION
FOOD RECOVERY
SHOPPING LIST
PLANNING
RESTAURANT MANAGER
PREPARATION
MENU
CLIENT
LEFTOVER
TAKE AWAY
FOOD SURPUS
PORTION
MENU PLANNING
BY-PRODUCT
SECOND LIFE RECIPES
DISPOSAL
COMPOST
ENERGY
HOW MANY CLIENTS
TRAINING
BOOKING
FOOD FOR ANIMAL
BY-PRODUCT VALORISATION

PENSIAMO AD UNA MENSA SCOLASTICA/AZIENDALE?

3. A QUALI CATEGORIE SONO ATTRIBUIBILI (COME DEFINISCO I SECCHI)?

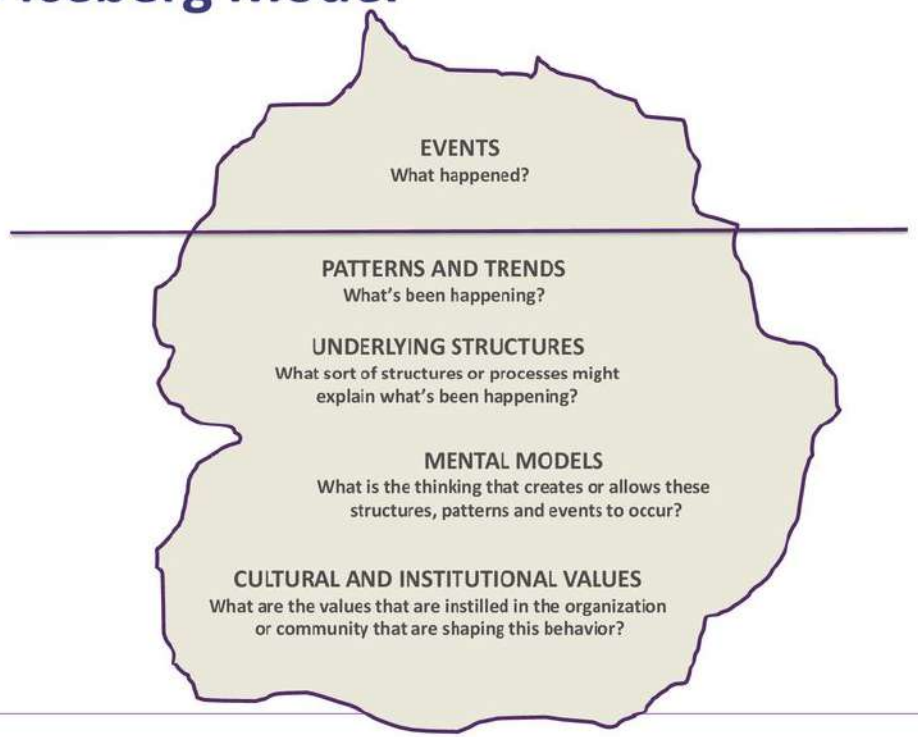



Events
Evidence, Symptoms
Patterns/Trends
Rules, practices,
doctrine, TTPs
Structures
Organizations, laws,
authority, relationships
Mental Models
Beliefs, traditions,
assumptions, values

THE ICEBERG OF FOOD WASTE CAUSES

SYSTEMS THINKING

The Iceberg Model



TOO BIG PORTION!

- **When I go eating out I cannot finish the food on my plate**
- **On the menu, there no customized portion and I'm so curios to taste many things**
- **Customers find satisfaction only with big portions**
- **When people go eating out wants to eat more**

Consumer research

WRAP has carried out extensive research in 2012-13 to identify **why** we waste food when we eat out in UK:

- Restaurants
- Pubs
- Quick service restaurants
- Hotels
- Staff restaurants
- Leisure venues.

The research also looked at **what** food we leave on our plates and **what can be done** to reduce the amount of food wasted.

Here's a summary of the way the research was carried out.

Stage one

An **on-line survey** of more than 5,000 adults to find out why people leave food when eating out. This was followed by 12 discussion groups. The groups involved **in-depth** discussions about food waste when eating out-of-home.

Stage two

Six discussion groups were held. Participants discussed what, if any, **messages** would encourage them to waste less food out-of-home.

Stage three

Nine discussion groups were held. The discussions explored messages which were included on **menus, table cards, place mats and drinks mats** to find out what food waste reduction messages might influence people and where these messages could be used to change food waste behaviour.

Why customers leave food on their plates - research findings

This section has details of the research findings.
More details are available in the research report and PowerPoint slide decks available via links on page 7.

- The majority of people don't want to think about food waste when having a meal out. Three-fifths of people surveyed in stage one agreed with the statement 'I don't want to think about leaving food when I eat out'.
- The main reason people gave for leaving food is that portion sizes are too big - 41%.
- People feel portion sizes are predetermined for them and not something they have control over.
- Chips, vegetables and salad (including garnishes) are the types of food most likely to be left on customers' plates. People consider some of this food to be 'plate fillers' rather than part of the meal they ordered. Some didn't even consider them to be food, especially salad garnishes.
- At a UK level 32% of people who left food, left chips or French fries. 18% left vegetables, 11% left meat/meat products and the same percentage left salad/coleslaw or potatoes.
- More people leave food on their plates in hotels, pubs and restaurants than other venues.
- People who leave food at the end of their meal are more likely to be women – 59% women, 41% men.
- Large portions of food are off putting to 44% of people.
- Having a meal out is often perceived as being a treat, an occasion for people to indulge and a time when they don't want to have to worry about leaving food.
- People who have eaten out for the 'experience' rather than simply to 're-fuel' are more likely to leave food at the end of their meal.
- People who leave food don't appear to feel a sense of ownership or responsibility over the food they leave. The amount of food they get is considered to be out of their control and a sizeable number of people won't ask for anything different.
- If eating more than one course, people will often leave part of their main dish and accompanying sides so they can eat a starter or pudding.

continued...

il posto è giusto



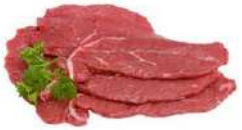










FRIGORIFERO: ogni cosa al proprio posto!

RIPIANO IN ALTO

Meno freddo (6-8°C)

Formaggi stagionati, confezioni sottovuoto, scatolame

RIPIANI CENTRALI

Temperatura intermedia (4-5°C)

Cibi cotti, avanzi, yogurt, latte, formaggi freschi. Anche le uova possono stare in questo ripiano: **mantienile sempre all'interno della loro confezione.**

RIPIANO BASSO

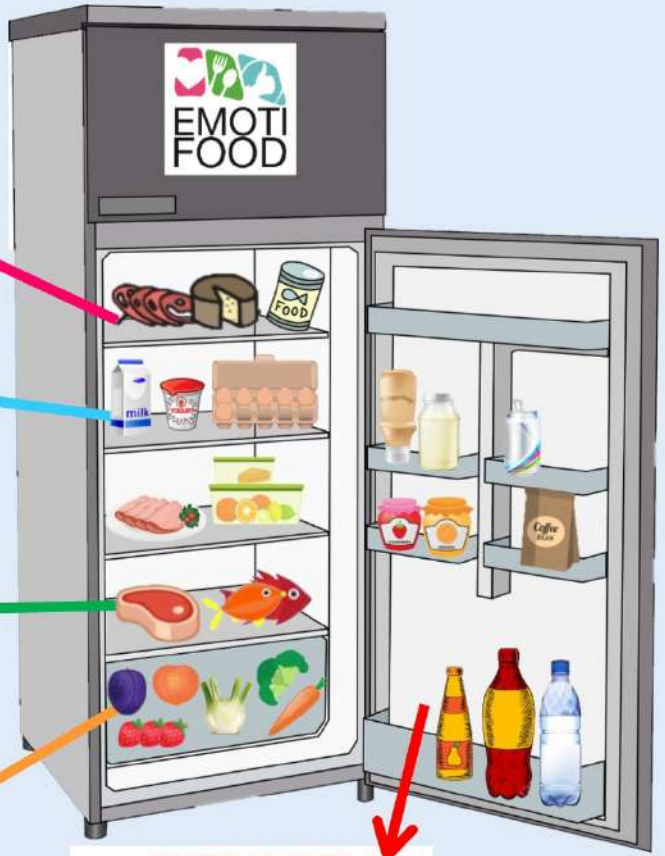
Più freddo

Carne cruda, pesce crudo o cotto. **Controlliamo l'integrità degli imballaggi e usiamo contenitori ermetici per evitare sgocciolamenti.**

CASSETTI

Temperatura più alta (6-10°C)

Dedicati a frutta e verdura fresche. **Meglio non lavarle prima di ritirarle: potremmo favorire la comparsa di muffe!**



CONTROPORTA

Zona "calda" (10-15°C)

Bibite, salse, olive, sottaceti, marmellate, caffe...**tutto ciò che ha la necessità solo di un po' di "fresco"!**

THINGS TO DO!

Verifica periodicamente la temperatura del tuo elettrodomestico!

Prima di fare una nuova spesa controlla cosa è rimasto nel frigorifero.

Controlla le date di scadenza e porta in avanti i cibi più vecchi.

in scadenza

Per evitare contaminazioni separa i cibi crudi da quelli cotti. Sono molto utili i contenitori ermetici in vetro o plastica.

Pulisci periodicamente i ripiani e le pareti per evitare la formazione di odori sgradevoli.

A warehouse to stock dead goods

https://www.youtube.com/watch?v=g-Am1qXgZT0
minute 1.24

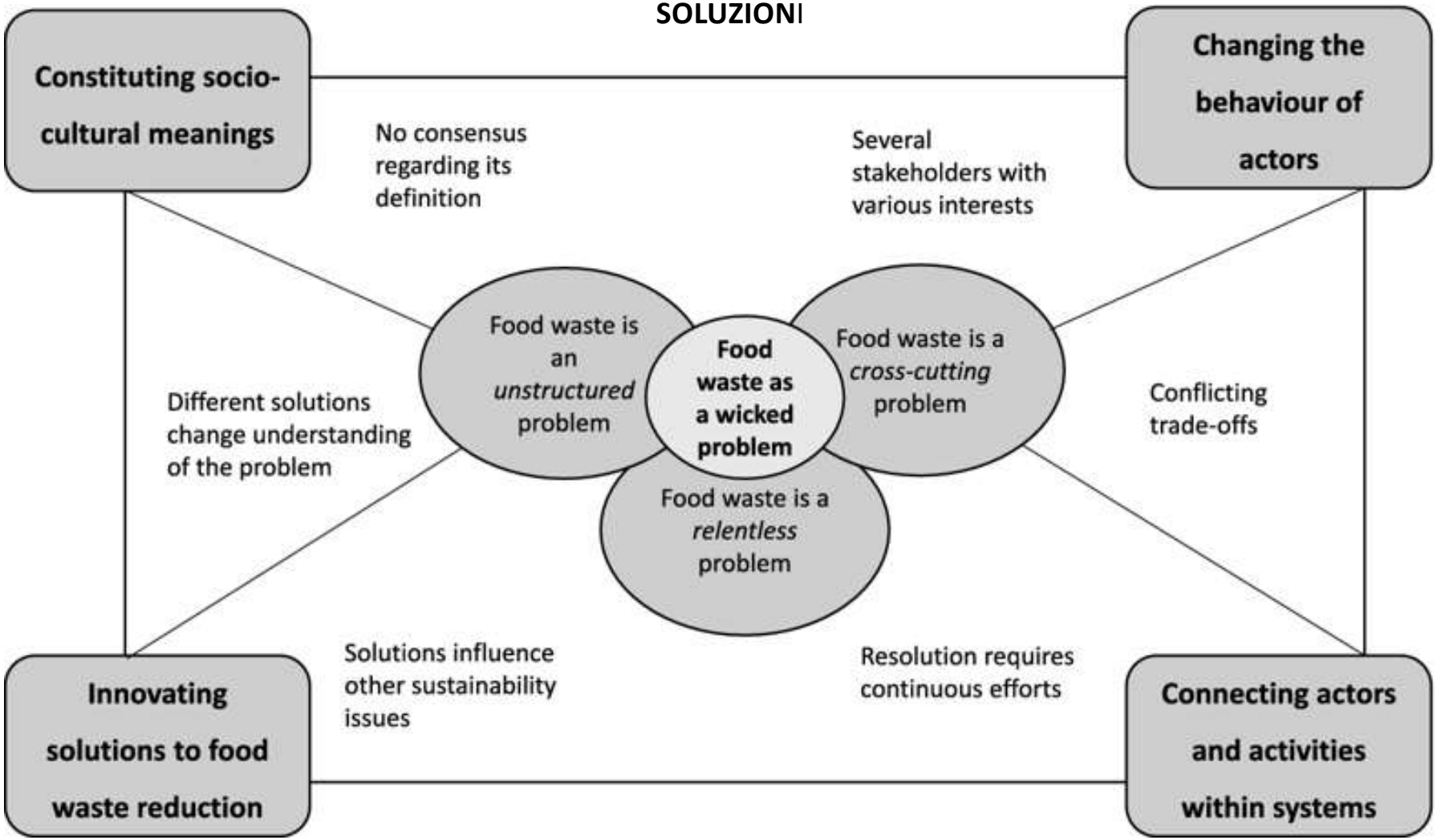
BLINDNESS OF THE SYSTEM

System blindness is akin to fridge blindness, common among people who can'f find a bottle of milk in the middle of the fridge because their preoccupied mind overlooks the obvious (Wayne Roberts)

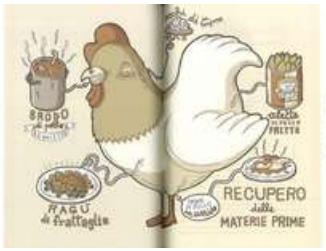
System blindness in a food context is due those not seeing that the food waste problem can be fixed by using food as a tool

FOOD IS A RESOURCE!

SOLUZIONI

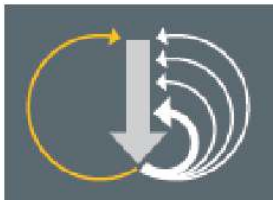


Narvanen et al., 2019



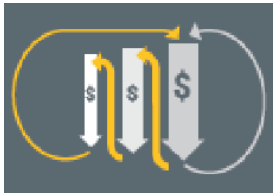
Second life recipes

Beer from fresh surplus bread waste
https://www.toastale.com



internal cycle (short)

cascade cycle



long cycle

pure cycle

Freeze surplus food
Doggie bag

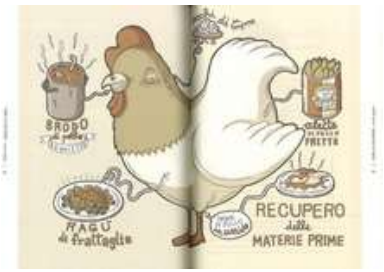
Just in time food assembly

The inner/internal/short cycle

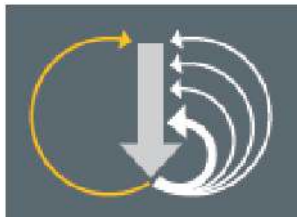
Within the techno-cycle there are different levels of reuse (butterfly diagram). The rule of thumb is that the smallest or inner circle is preferable to larger cycles, because these require less processing, labour, energy and new material to be of original value again (Ellen MacArthur Foundation, 2015a).

The different reuses within the techno-cycle are:

- Maintanance (& repair): Repair and maintenance during use to extend the lifespan.
- **Reuse/redistribution: Direct re-use by re-marketing a product.**
- Refurbish/Remanufacture: The thorough refurbishment and repair of a product by the manufacturer.
- Recycle: Retrieving parts or materials from the product for reuse.



Progettazione menu in chiave circolare
Aumentare parte edibile
Second life recipes



internal cycle (short)

Long-term cycles

For both the bio-cycle and the techno-cycle, the lifespan of a product must be made as long as possible. The lifespan of products can be extended by:

•Ensuring that a product is used longer, thereby ‘slowing down’ the process, for example by focusing on emotional attachment to a product, lasting fulfilment of a need and adaptability of the product, so that it can keep up with the times.

•To ensure that multiple consecutive cycles of direct reuse are followed, by facilitating the interchangeability of products and by properly maintaining products so that they can be used for a long time without repair

Freeze surplus food
Vacuum
Doggie bag
Essicazione
Donazione

long cycle

Re-use in cascades

Within the bio-cycle, reuse takes place in cascades. Cascading means ‘using (part of) a product for another application’. When a product is no longer able to perform its initial function, it is passed on for reuse. During cascading, usually the quality of the material is reduced and energy is consumed (Ellen Macarthur Foundation, 2013a).

Cascading differs from ordinary re-use and recycling in that it changes function and the extent to which the product is processed. A cotton T-shirt can serve as an example. When reused, a worn T-shirt is sold in a second-hand shop. When recycled, the T-shirt is shredded into cotton fibres, which are then spun into new yarn. Cascading
is the use of old T-shirts as cushion filling .

Beer from fresh surplus bread waste
https://www.toastale.com

cascade cycle

Pure flows

For both the bio-cycle and the techno-cycle, residual flows that are not contaminated with other materials are the easiest to collect and re-use. By ensuring that materials are easily separated from each other after use and that residual flows are collected in such a way that they are not contaminated with toxic substances, residual flows are the most useful (Ellen MacArthur Foundation, 2015a).

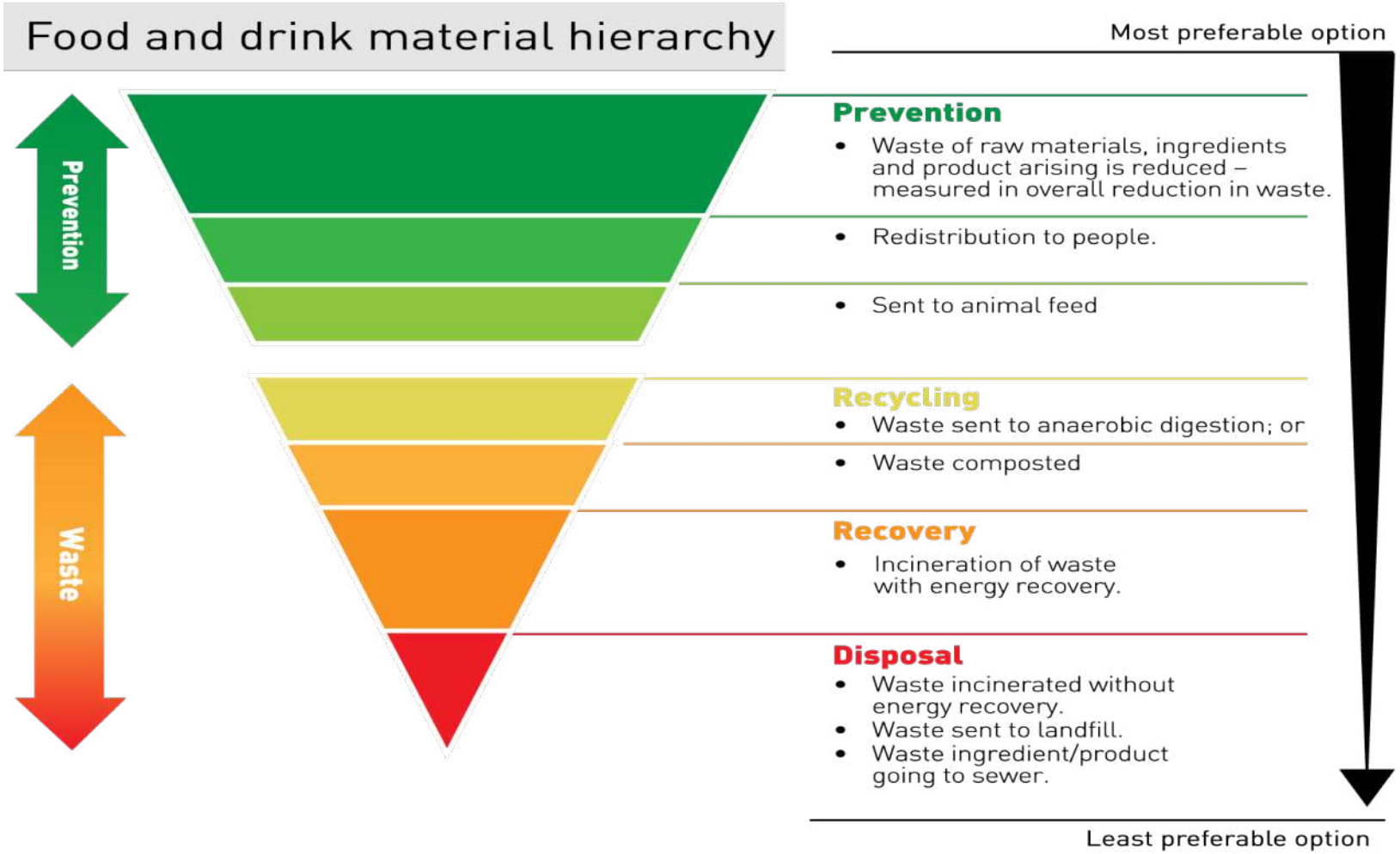
Within the bio-cycle, orange peels can serve as a good example. The company PeelPioneers collects orange peels from catering establishments and extracts essential oils from them. If there is food residue in the peelings, the essential oils are polluted and can no longer be used for cosmetics, so the value decreases. Within the techno-cycle, plastic toys can serve as a good example. If the toy is completely made of polyethylene, it can be completely melted down and reused.

If the toy also has polyester components, these must first be separated before the toy can be recycled at high quality (Peelpioneers, 2019).

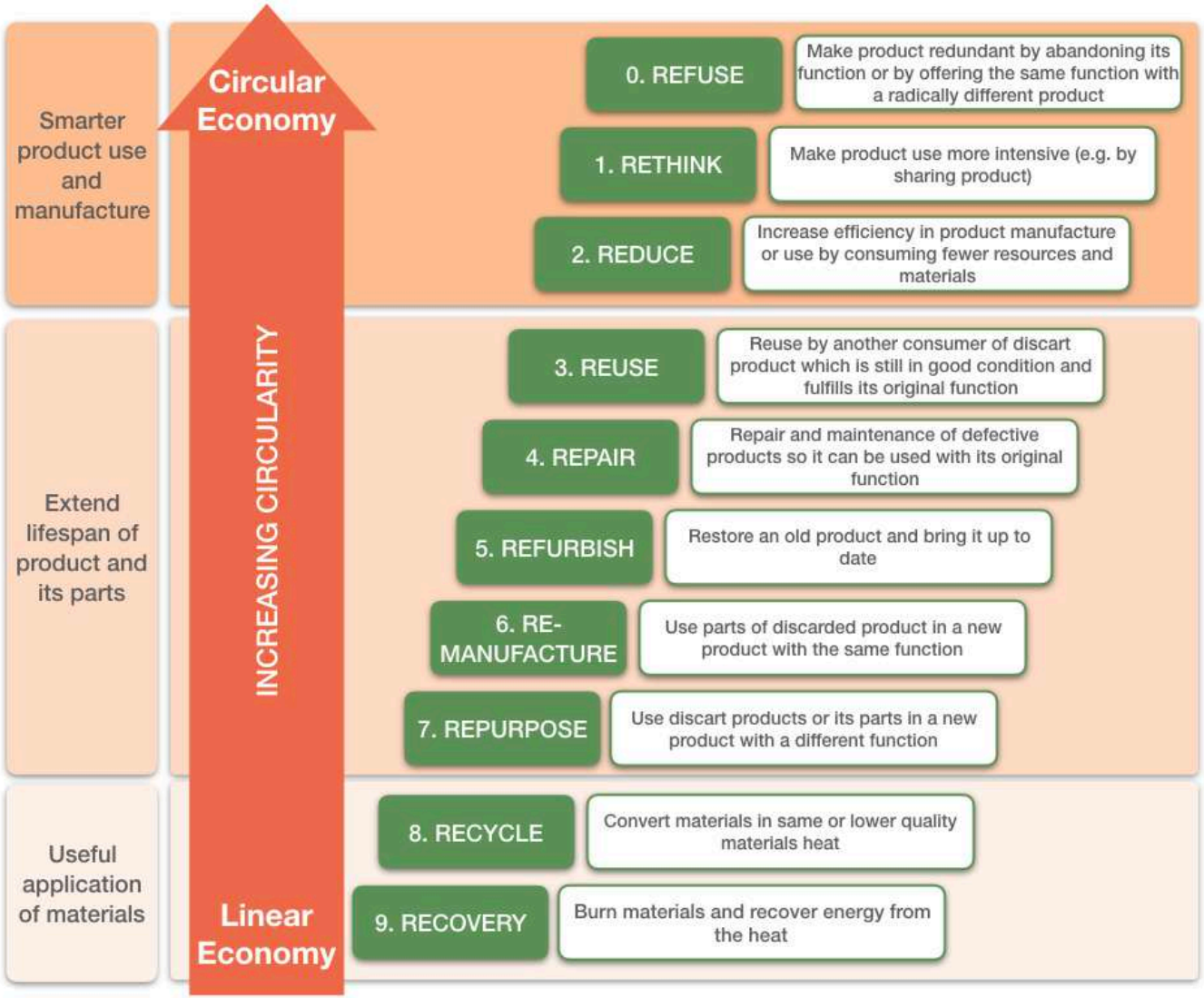
pure cycle

Just in time food assemby

Food and drink material hierarchy



9R Framework



Il Natale è:

- Un momento di piacere (28%)
- Un periodo di regali (19%)
- Un’occasione di spreco (23%)

Fonte Waste Watchers

Si calcola che circa **il 5% dei cibi che compriamo durante le feste di Natale non verrà consumato** e sarà buttato

Si getteranno via circa 500.000 tonnellate di cibo, che corrispondono a circa 80 euro per famiglia che andreanno in fumo inutilmente.

Grazie e auguri di Buon Natale!

Pensatemi quando fate la spesa e starete spadellando

Disponibile a gestire lamentele e reclami del parentame

Un’idea regalo

Bibliografia di riferimento-letture suggerite

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