

# URBAN LIVEABILITY FORUM

PRESENTS

## "MY RESOURCE. MY RESPONSIBILITY"

A knowledge series from the experts on effective management of resources to enhance urban Liveability during and post pandemic.

# MAKING OF A CIRCULAR CITY - PART I

by, Lara Emilia Teresa Maritano,

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*Fig. 1*

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### **Making of a Circular City - Part 1**

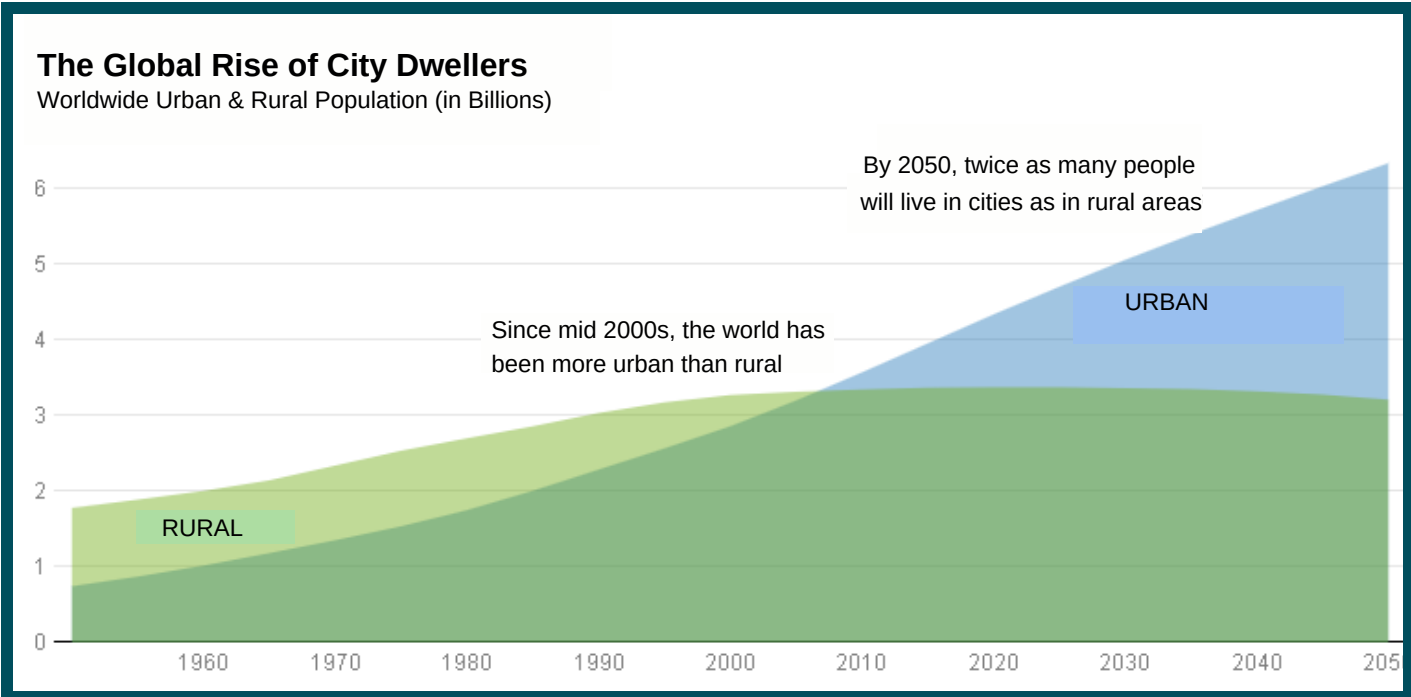
*by, Lara Emilia Teresa Maritano,*

### **Why Focus on Cities?**

About 55% of the world's population is estimated to be currently living in cities, and this percentage is expected to increase to 68% by 2050, with a growing trend of 7 out of 10 people as the population is expected to almost double, by then.

Living in a city today represents for many, a chance of a better lifestyle due to the job and business opportunities that it may offer, as well as great social life and a variety of entertainment, compared to more rural and less-populated areas.

At the same time, as the amount of city dwellers increases, so do the requests for goods and services to be produced in order to meet this new lifestyle. Therefore, cities and urban areas, even though they represent only 1.5% of the global land, are responsible for half of the world's production [2], 75% of the global natural resources use, 50% of the world's waste, and for 80% of the world's Greenhouse gas emissions [3].



Source: UN World Urbanization Prospects

Fig. 2

These are all symptoms of the current take-make-dispose lifestyle, typical of a linear economic model where resources are extracted, transformed into products, delivered to the end consumers, and then quickly disposed of, after a short life span. Hence our interest in cities, as they have been declared by many planetary agreements, as the areas of the planet with the most potential in achieving a sustainable development [4 & 5] and the climate targets of the SDGs [6].

### What is a Circular City?

A circular city is a city that embraces the principles of a circular economic model. This paradigm focuses on keeping products and materials on the market to exploit their purpose for as long as possible; it does so by following the 4 Rs principle: Reuse, Repair, Refurbish, and only then Recycle.

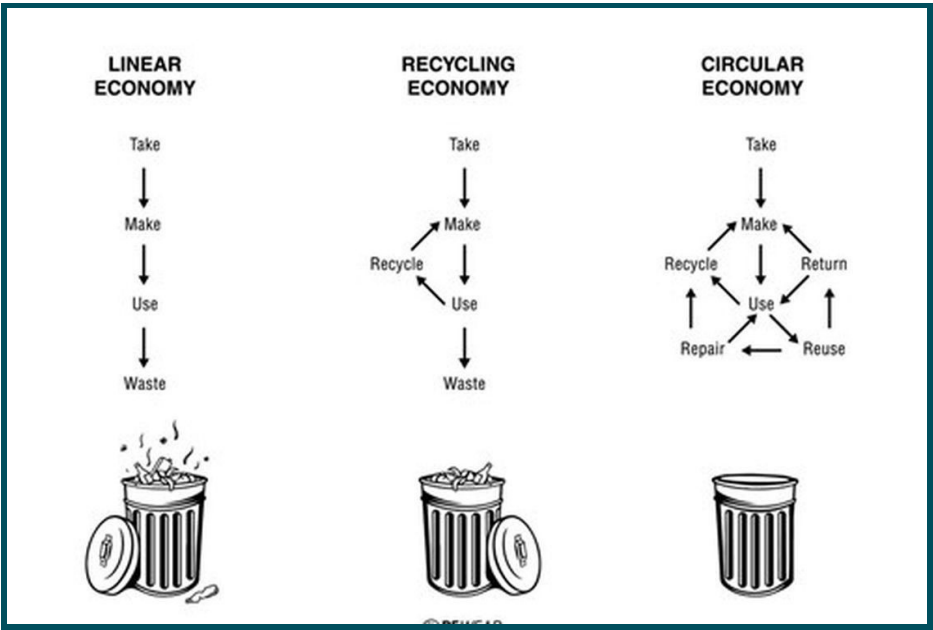


Fig. 3

In a circular city, this applies to the services that it offers as well therefore, it is fundamental that the local governments and authorities are the first ones to encourage and sustain this type of development.

## The Role of Local Governments & Authorities

With the greatest purchasing power, they are the first consumers of a city. Being under the public's magnifying glass, they have the possibility of setting a good example and allowing a smooth transition from a linear to a circular model with supportive policymaking, incentives, and Green Public Procurement (GPP).

This latter allows for purchasing of highly sustainable goods and services encouraging the demand of them, driving the city to become more resource-efficient. In the long run, this will result in a decoupling of :

- City growth and pollution
- Economic growth and consumption of finite resource such as fossil fuels

A great example that shows the impact and influence contracting authorities may have on the reduction of pollution in a city, or in an entire country, is the German's Environment Agency (UBA). In order to meet its 2030 goal of becoming a carbon-neutral agency[7] the UBA has included clear requirements and recommendations in its updated version of its environmental statement. The goal is to apply them in public agencies; so far, eleven (out of the 16) of Germany's federal states and the Federal Government itself have committed to pursuing them.

Therefore, the UBA has earned, the much-aspired EMAS (Europe's Eco-Management and Audit Scheme)[8] certification, which needs to be reconfirmed each year after a positive external examination of the meeting of the demanding environmental management EMAS requirements.[8]

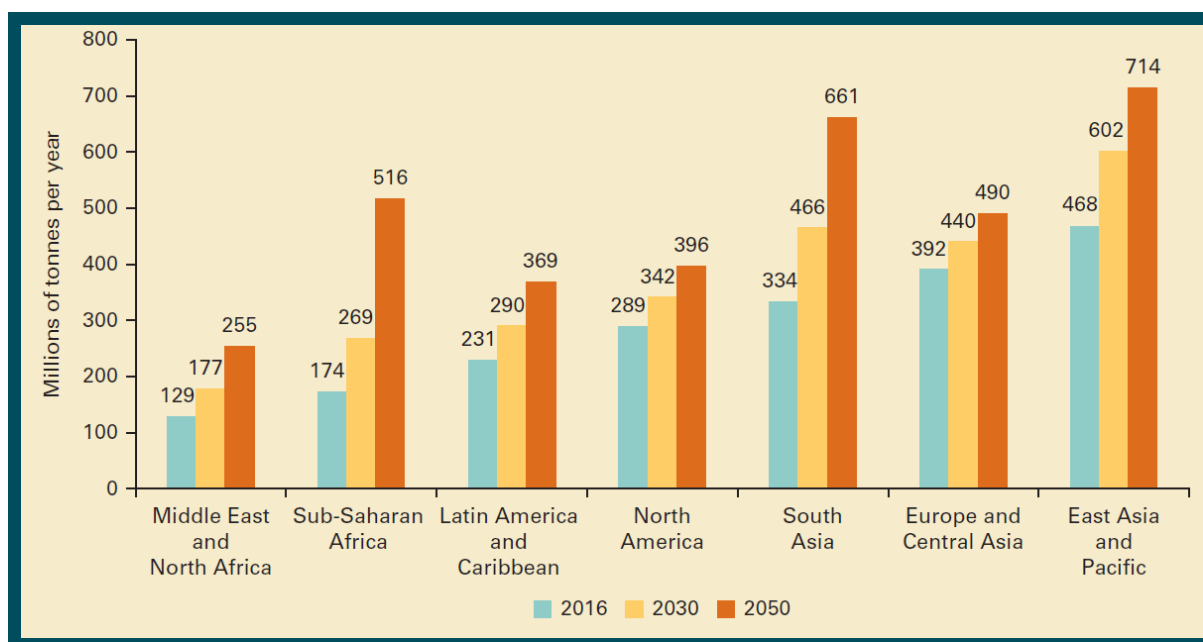
Consequently, the UBA, and the various public agencies across Germany, thanks to GPP, are now managing their everyday life paying close attention to their climate footprint; may it be by incentivizing the construction of plus-energy buildings[9] and electric mobility, dis-incentivizing property-owned vehicles, serving less meat at the office canteens, or procurement of supplies that bear certified ecolabels.



Fig. 4

## Waste Management & Sewage System

As mentioned in the introduction, cities are responsible for over 50% of the world's waste production, and this percentage, as shown in Figure 5, is expected to grow if we continue with a business-as-usual approach, by sustaining this level of consumption and disposal.



**Fig. 5** Projected waste generation, by region (millions of tons/year) (Silpa Kaza, 2018)

For this reason, cities need to come with an efficient and cost-effective system to be able to manage it, without polluting the environment. As stated from the European waste framework directive [10] waste prevention should always be the main priority (Figure 5). This may be done by using above-ground urban mining, for primary resource extraction, Extended Producer Responsibility schemes (EPR) [11] therefore incentivizing the 4Rs concept thanks to appropriate policy-making and timely-planned inspections throughout the entire supply and production chain of goods and services.



**Fig. 6**

Only when citizens have more real, concrete options on their consumptions and purchasing habits, may the local governments, (and only at this point) introduce a PAYT (pay as you throw) system [12]. When waste prevention is not done, the next step should be to ensure a 100% separate waste collection system [13], to then send the various

materials to the appropriate facilities to be reused, recycled, reintroduced into the market or, when not possible, to be combusted for energy use.

Respecting this step-by-step process in a waste management system is key to enable the application of a Circular model, as the waste system scheme used in a city, is the main tool to provide the city with the necessary material flow to create new products.

This is also called urban mining, meaning extracting primary resources from products that are already available in the city, by applying the 4Rs principle, therefore avoiding the extraction of virgin materials from the ground, and decoupling the city's development from the use of finite nonrenewable resources.

One of the greatest examples of creating a Zero Waste reality is the small town of Kamikatsu in Japan; the town has created a sorting facility where waste is divided into 45 different categories. Just to compare, the European Union has at the moment separate collection only for 5 different categories of household waste: plastics, glass, paper, metals, waste oils, planning in adding two more, textiles and organic waste by 2025.



There is differ while others are s categories. In Kamikatsu, after the separate collection, recycling providers pick-up the materials to create new ones. This has helped the town in meeting the challenge of achieving its goal to eliminate waste by 2020 without resorting to incinerators or landfills [14].

As for the sewage systems, these should help create a water recycling structure in buildings, connected to their water harvesting system to reintroduce kitchen, washing machine, and shower water for toilet flushing and in some cases for garden-watering. It is unbelievable that in today's modern society a valuable resource, such as potable water, it is still being used to flush toilets.

Circular cities use the best available technologies (BATs) and practices to filter-out from the waters pharmaceutical residues, antibiotics from animal husbandry, or chemicals displaying hormone-like effects. This allows reintroducing water in the city system to be used in various ways without going to waste. The Ecovilla in Costa Rica, a small community based on the principles of permaculture, has found ways to do exactly that: it uses a big biomass digester to process their sewage and black waters, which are then transformed into methane gas that can be reused or sold.

[1] (World Bank, 2020)

[2] (World Bank, 2021)

[3] (Ellen Mac Arthur Foundation, 2017)

[4] (ICESP- Italian Circular Economy Stakeholder Platform, 2019)

[5] Sustainable development: “development which meets the needs of current generations without compromising the ability of future generations to meet their own needs” (United Nations, 1987)

[6] The 17 Sustainable Development Goals from the UN’s 2030 Agenda

[7] UBA’s 2030 climate neutral goals include: “cutting its CO2 emissions by 70 per cent, doubling its production of renewable energy and reducing the emissions from its car fleet to zero” (Umweltbundesamt, 2019).

[8] (Umweltbundesamt, 2019)

[9] Plus-energy buildings are buildings with an energy performance that is so good, that the energy generated by the building is higher than the energy used by the building. This energy balance is mostly done on an annual basis. The energy generated often comes from PV panels or micro-wind generators (Kapsalaki, 2016). The surplus energy may be sold and exported to the grid, creating the possibility of a small income.

[10] (European Union, 2008)

[11] “Extended Producer Responsibility (EPR) is a policy approach under which producers are given a significant responsibility – financial and/or physical – for the treatment or disposal of post-consumer products. Assigning such responsibility could in principle provide incentives to prevent wastes at the source, promote product design for the environment and support the achievement of public recycling and materials management goals” (OECD, n.d.)

[12] PAYT system: the taxes and tariffs on waste services that each citizen must pay, is based on the quantity that they produce

[13] possibly underground to avoid unaesthetic waste accumulation outside of the garbage bins

[14] (Nippon.com, 2018)

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## ABOUT THE WRITER



### Lara Emilia Teresa Maritano

Circular Economy Expert & Researcher

The Circular Economy was for **Lara Maritano** love at first sight to the point that she started studying it on her own, long before her country, Italy, had any academic courses to offer.

One of her autonomous experiences led her to briefly collaborate with **ACEN** (African Circular Economy Network) where she contributed by retrieving data for the book **The Circular Economy and the Global South** (Patrick Schroder, et al., 2019).

Lara will soon be one of the first people in the history of her country to have a degree in Circular Economy, thanks to the **University of La Tuscia**, which created the first and currently only Master course in Italy on this topic.

In the meantime, in pursuit of domain knowledge, Lara also attended an entire semester abroad at the **University of Natural Resources and Life Sciences** in Vienna, and by moving then to Brussels-Belgium.

Here, she had the opportunity to work at the **European Commission** in the DG Environment, where she contributed to the preparation of the new Regulation on batteries.

Lara is currently writing her master thesis on The Creation of Circular Cities through Waste Prevention, in collaboration with **ENEA** (Italy's national agency on sustainability and new technologies) and **ICESP** (Italian Circular Economy Stakeholder Platform).

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