

The Circular Economy and the Future of Plastics

International Cooperation on Plastics for Carbon Neutrality and
a Circular Economy

JejuPlus International Environment Forum 2024

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2:30 - 4:00 PM

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- ▶ I am a director and professor of organization development & knowledge management at the Schar School of Policy & Government, George Mason University, Arlington, Virginia, USA.
- ▶ One of the largest public universities in the United States with 40,000 + students from over 130 countries.
- ▶ We also have a campus in Korea called **Mason Korea** which opened ten years ago and provides undergraduate and graduate education.
- ▶ Thank you for inviting me to give this keynote. Due to schedule conflicts I am not able to be here and I appreciate the opportunity to present virtually.
- ▶ I know that people gathered here this afternoon are experts or familiar with plastic pollution and circular economy. My presentation will not be about the technical aspects of plastics reduction in circular economy but more about leadership qualities needed to create a robust circularity.

The Sustainable Circular Economy Transition

- ▶ I have been studying innovation for a long time in the information technology area and have created a concept called **Appreciative Intelligence**[®] which is behind the leadership qualities of visionaries in business and industry.
- ▶ Currently engaged in an international research project with Professor Hanna Lehtimäki (University of Eastern Finland) focused on circular economy and sustainability practices of organizations worldwide. We believe that Appreciative Intelligence, a key driver of innovation will help leverage circular economy
- ▶ Interviewed 40 senior leaders engaged in circular economy practices and strategies across six continents.

The Sustainable Circular Economy Transition (Cont'd)

- ▶ Preliminary findings: The capacity to reframe CE challenges into problem solving opportunities are behind the encouraging results of many circular economy startups and organizations.
- ▶ We are intentionally focusing on the leadership behavior and capabilities which is missing in sustainability & circular economy discourse.
- ▶ Individual agency in circular economy transition needs to be supported.
- ▶ Change in mindsets is necessary for sustainability transition.

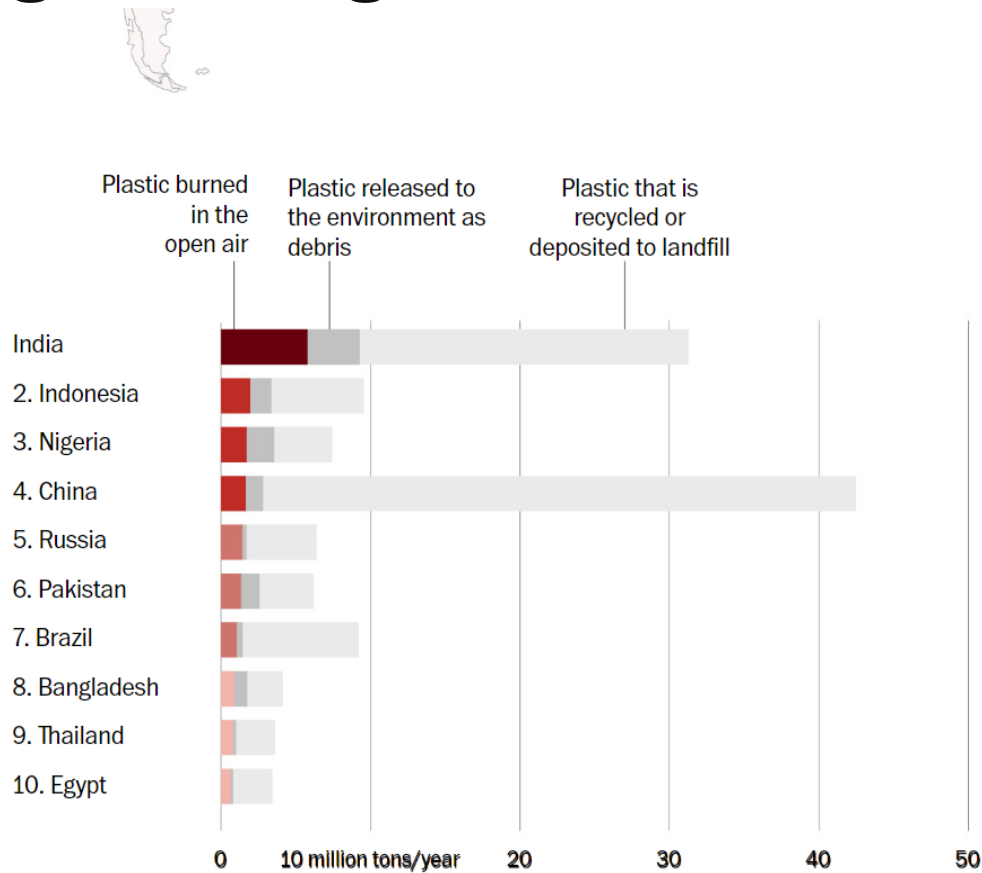
The Sustainable Circular Economy Transition (Cont'd)

- ▶ The know-how for creating circular economy is emerging in small pilot projects, startups, and a few large organizations.
- ▶ Some are in the conceptual domain and theoretically sound but longterm viability not known.
- ▶ The importance of seizing the opportunity and recognizing and developing leaders who can reframe and see possibilities.
- ▶ A unique leadership style with a high level of Appreciative Intelligence needed.
- ▶ Examples from plastics industry interviews follow.

The Circular Economy Status of Plastics

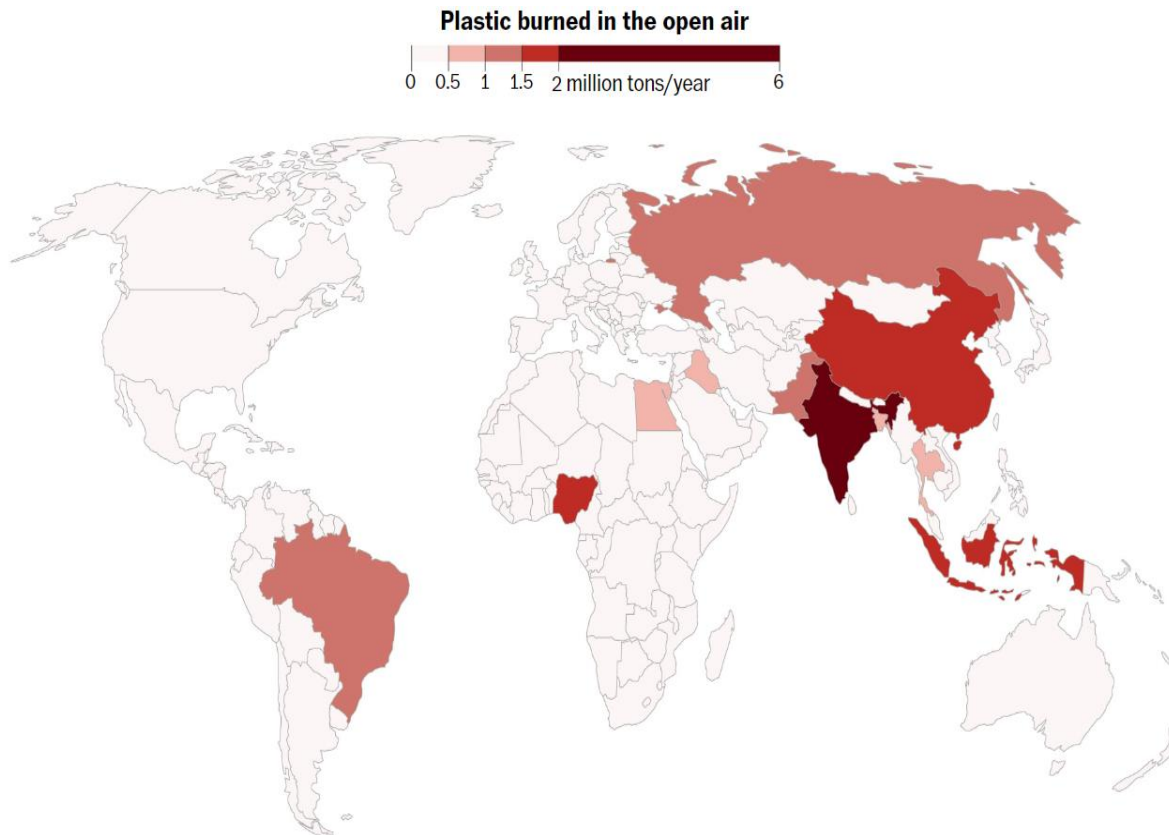
- ▶ A recent research published in the journal **Nature** (September 4, 2024 by Cottom, Cook & Velis) showed that the world produces 250 million tons of plastic waste in municipalities in one year (2020).
- ▶ 21% of all that plastic waste never makes it to a landfill or recycling plant.
- ▶ 57 % of it is burned in the open air, creating toxic air pollution.
- ▶ Uncollected and unmanaged plastic waste is the biggest contributor to plastic pollution and therefore innovations in new waste management is critical to address plastic pollution.

Several Countries in the Global South among the Largest Contributors



Source: "A local-to-global emissions inventory of macroplastic pollution", J.W.Cottom et al. Data for 2020.

Data from 500+ Municipalities Representing Over 12 Percent of the Global Population as of 2015



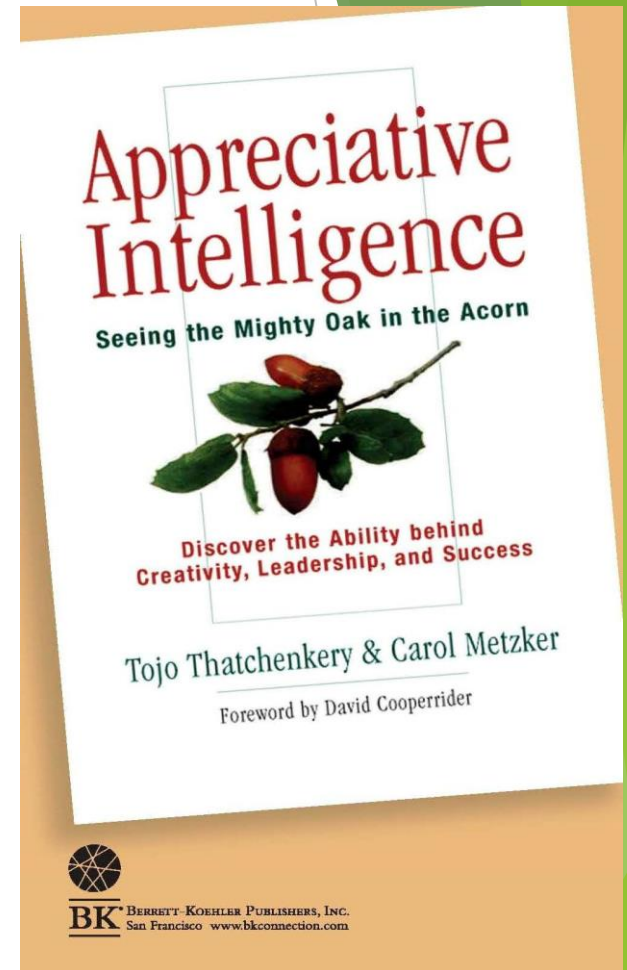
No municipal services to collect waste for 1.5 billion people and they bury their plastic waste, dump it in rivers or simply burn it.

**Top 20 cities
where plastic is burned in the open air**

City	Country	Plastic burned in the open air Thousand tons per year	Population Million
1. Lagos	Nigeria	159	11.8
2. Delhi	India	144	20.4
3. Luanda	Angola	125	10.2
4. Moscow	Russia	113	11.6
5. Al Qahirah	Egypt	105	10.4
6. Karachi	Pakistan	103	19.1
7. Adhamiya	Iraq	82	5.8
8. Lahore	Pakistan	73	12.0
9. Jakarta Raya	Indonesia	72	10.5
10. Johannesburg	South Africa	67	5.9
11. Faisalabad	Pakistan	65	9.7
12. Abidjan	Côte d'Ivoire	59	5.8
13. Kinshasa	D. R. of the Congo	58	10.5
14. Dar es Salaam	Tanzania	57	7.1
15. Mumbai	India	56	14.5
16. Bangalore	India	55	12.3
17. St. Petersburg	Russia	53	5.2
18. Al Iskandariyah	Egypt	50	6.3
19. Theran	Iran	49	6.9
20. Ad Daqahliyah	Egypt	47	7.0

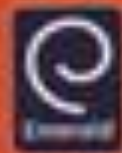
Let us now shift our discussion to the role of Appreciative Intelligence in addressing these challenges with plastics and creating a sustainable circular economy.

Appreciative Intelligence[®] is the ability to **reframe a situation** & recognize the positive possibilities embedded in it, and to act purposively to transform the potential to outcomes.



Positive Design and
Appreciative
Construction: From
Sustainable
Development to
Sustainable Value

Taja Thatchenkery
David L. Cooperrider
Michael Avital
Editors

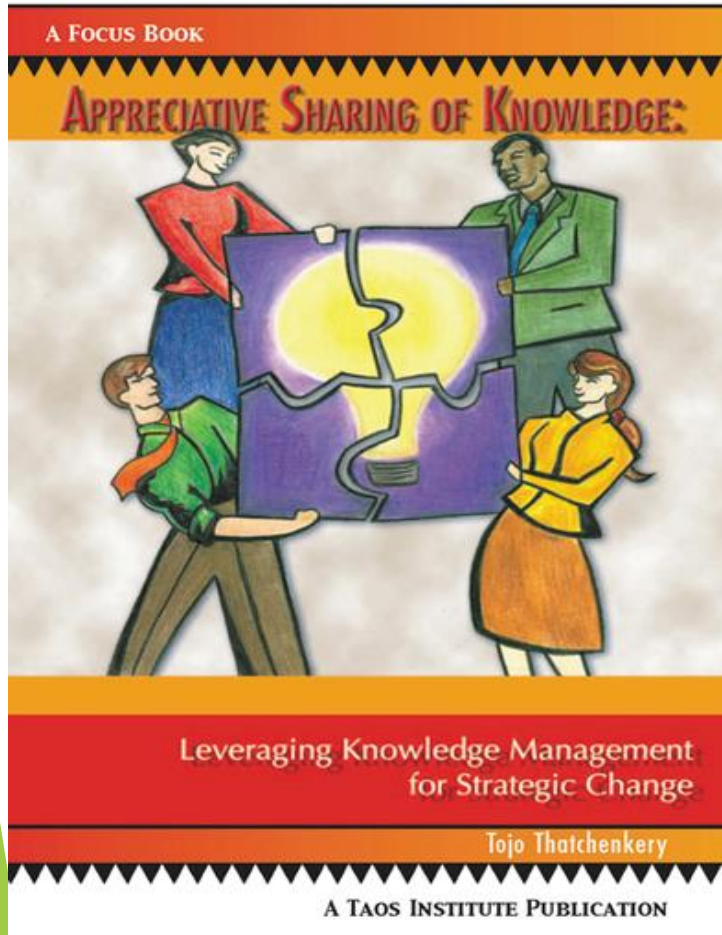


An example of using
Appreciative Intelligence
for creating circular
economy.

Reframing bottom-line
thinking into triple bottom
line mindset

Thatchenkery, T., Cooperrider, D., &
Avital, M. (2010). *Positive design and
appreciative construction: From
sustainable development to sustainable
value*. Bingley, U.K: Emerald.

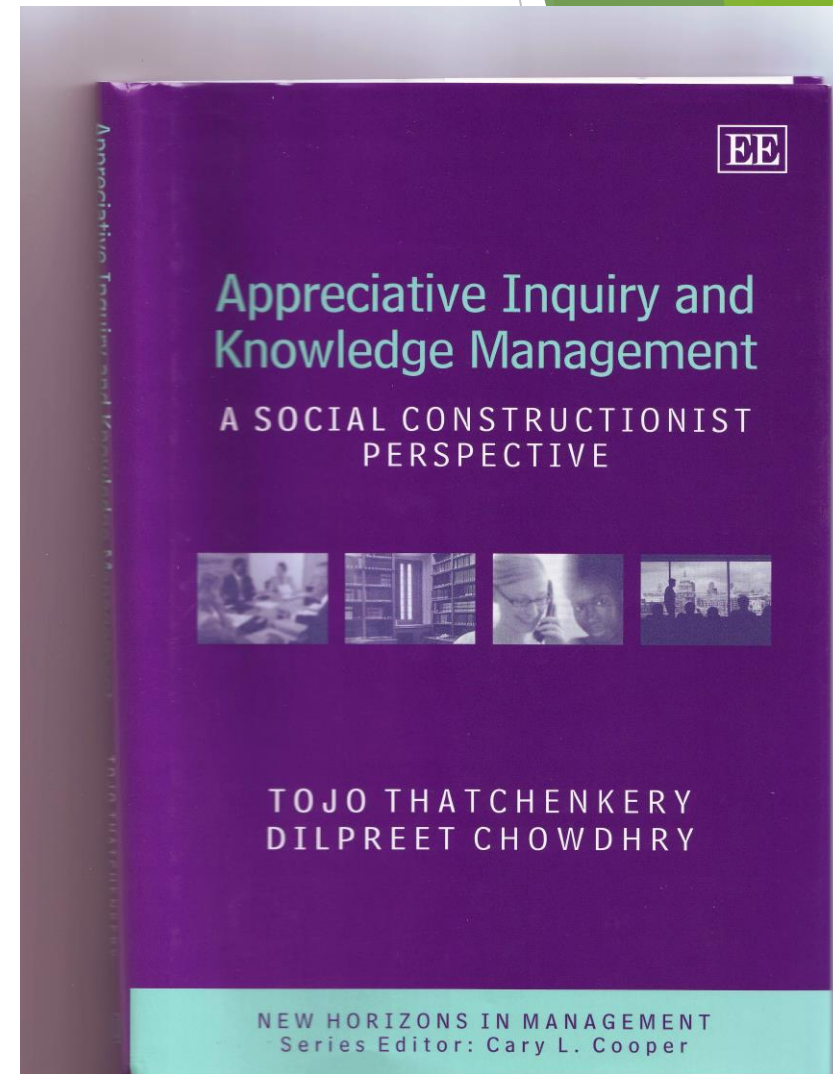
Using Appreciative Knowledge Management for Facilitating the Creation of Circular Economy



- ▶ Creating the best alignment between human and social capital.
- ▶ How do we help create a knowledge sharing culture in organizations and society to enhance circular economy?
- ▶ How do we integrate human centered design with knowledge management architecture for creating the optimum circular economy?

Appreciative Knowledge Management

- ▶ A new methodology that combines “communities of practice,” and postmodern understanding of the generative power of language that has direct relevance for knowledge sharing in the circular economy.



Three Components of Appreciative Intelligence®

- ▶ Reframing
- ▶ Appreciating the Positive
- ▶ **Acting now** to create the **future-present** (a form of communicative competence)

Traditional (Deficit) Approach to Circular Economy

- ▶ Identify problems and what is wrong
- ▶ Fix what is broken
- ▶ Framing: Why do people resist engaging in CE practices?
- ▶ Analyzing causes
- ▶ Looking at what is missing
- ▶ Focusing on what's urgent
- ▶ Limited by *learned helplessness*
- ▶ Driven by lessons from the past
- ▶ Analytical Intelligence-based

Appreciative Intelligence®-based Approach to Circular Economy

- ▶ Value and appreciate “what is”
- ▶ Build on what is working
- ▶ Framing: What needs to happen to get people to commit to CE?
- ▶ Envisioning what's possible
- ▶ Looking at what is present
- ▶ Focusing on what's important
- ▶ Leveraging *learned optimism*
- ▶ Driven by images of the future
- ▶ Appreciative Intelligence-based

Examples of Reframing for Circularity

- ▶ US **EPA**'s Extended Producer Responsibility (EPR) to get recycling rates to 50% by 2030. Reframing how recycling systems are funded and managed. Transferring responsibility for funding from communities to the companies that use these materials for their products and packaging.
- ▶ Each packaging producer pays a fee based on how much material they produce and how much it costs to collect, sort, and recycle that material.
- ▶ These fees are used to fund and expand recycling, supply recycled content, and identify and eliminate materials and packages that don't get recycled.
- ▶ EPR also incentivizes producers to remove packaging that is easily littered or can't be recycled by assessing additional fees.

Reframing, Seeing the Positive and Bringing the Future to the Present

Plastic Roads: MacRebur takes plastic products destined for landfill or incineration and uses them as binder extenders and/or modifiers in roads.

For each kilometre of road laid MacRebur uses up the equivalent weight of 740,541 plastic bags.

VolkerWesser, another construction company has designed a maintenance free **PlasticRoad**, estimated to last three times more than the typical roads, made of asphalt, which has a huge carbon footprint.



Reframing, Seeing the Positive and Bringing the Future to the Present

IMPAC-T: A fully recyclable, food-grade packaging concept, launched by **PFF Group**, a large UK independent food packaging manufacturers. IMPAC-T is recycled and reprocessed to be used repeatedly as food-grade packaging, leading to 46% carbon footprint reduction.



Reframing, Seeing the Positive and Bringing the Future to the Present

- ▶ **Robot sorting:** To avoid the physical risk associated with sorting dirty waste, companies such as Colorado, USA-based **AMP** using spider-shaped robot with computer vision for recognising recyclable objects based on shape, size, texture, colour, and even brand/logo. A similar company **Diwama** uses AI-based image recognition software to automate waste analysis and sorting.
- ▶ **Eastman** company's molecular recycling technology breaks down plastic waste to its molecular level for infinite recycling. They use Mass Balance, a data-driven method to ensure the content used on the front-end to make a product matches what is claimed as recycled content by brands on the back-end. The technology is in early stages and also controversial.
- ▶ **The Bubble Barrier:** 80% of the plastic waste reaching the sea comes through rivers. This Dutch project aim to stop it by filtering plastic from rivers before it reaches the sea. A tube on the riverbed pumps air upwards, creating a flow of bubbles that pushes waste to the surface and guides it into a riverside catchment system.

Reframing, Seeing the Positive and Bringing the Future to the Present

- ▶ **Eco-Bricks:** Empty plastic bottles are filled with clean, dried and single use plastics which serve as reusable building blocks for building purposes.
- ▶ **3D Printing Street Furniture:** This lab in Thessaloniki, second largest city in Greece, uses plastic waste from the Greek households and creates urban furniture for public city spaces.
- ▶ **Wasser 3.0:** To remove microplastic from drinking water, German company Wasser 3.0 created an innovative technology that injects silica solutions which creates plastic clumps in water, which is then removed and repurposed.
- ▶ **Topolytics:** Bigdata analytics firm in UK created a digital “waste map” which can trace the movement of plastic waste around the world.

Sustainability Related Publications by the Speaker

1. *Enablers of a circular economy: A strength-based stakeholder engagement approach.* By Lehtimaki & Kujala, & Thatchenkery (2023). Palgrave Macmillan, London: UK.
2. *Positive design and appreciative construction: From sustainable development to sustainable value.* By Thatchenkery, Cooperrider, & Avital (Eds.), 2011. Emerald. Bingley, U.K.
3. *Appreciative Intelligence: Seeing the Mighty Oak in the Acorn.* By Thatchenkery & Metzker (2006). San Francisco: Berrett-Koehler. Korean, Chinese, Italian, Portuguese, and Rumanian translations.
4. Valuing Innovation for Enhancing Commercialization and Sustainability in Multiple Domains. *International Journal of Entrepreneurship and Innovation Management*, 2019, 23, 5. Pp. 447-450. By Dey & Thatchenkery.
5. Generative Approaches for Managing Human Capital for Sustainable Growth. *International Journal of Human Resources Development and Management*, 2017, Vol. 17, Nos.1-2. By Dey & Thatchenkery.
6. Fostering entrepreneurship and innovation for sustainability. *International Journal of Entrepreneurship and Innovation Management*, 2016, Vol. 20, Nos. 5/6. By Sardana & Thatchenkery.
7. *Managing Complex Organizational Change: Action-oriented Approaches for Sustaining Positive Interventions.* By Sardana & Thatchenkery (Eds.), 2016. New Delhi: Bloomsbury.
8. Appreciative Intelligence and generativity: A case study of Rocky Flats Nuclear weapons facility cleanup. *Advances in Appreciative Inquiry*, 2013, 4, 409-432. By Thatchenkery & Firdida.

Conclusion

- ▶ Solving the massive environmental and sustainability challenges created by plastic requires a multi-level approach.
- ▶ Significant progress has been made at the technological and know-how level.
- ▶ An appreciative knowledge management architecture is needed so that best practices are shared freely worldwide among stakeholders, researchers, policy makers, and practitioners.
- ▶ At the individual level, a leadership style leveraging Appreciative Intelligence® components of reframing, seeing the positive, and bringing the future to the present will help launch new innovations.

THANK YOU!