1: Good morning, my topic for today, if you can guess, is a circle, and market, so the economy. Thus, Circular Economy or CE for short. The reference paper is interesting because it is the first detailed, independent and comprehensive review of Singapore's approach to CE. We'll explore the research methodology, what the circular economy is, its definition, frameworks to assess it and its relevance to Singapore.

2: I'll start off with the Research Methodology of this paper: The authors used Dimension, a research data platform to explore connections and develop meaningful data. It employed bibliometric review as shown in graphical format here, followed by a snowball approach, which refers to identifying additional papers from an initial paper.

3: Our current economic model is a Linear Economy, which adopts a take-make-use-waste model and as you can see not stonks. This is because we are using up resources faster than the Earth can replenish them, leaving wealth to the lucky few but social and ecological devastation to the masses.

4: We discuss a lot about definitions in class, such as the anthropocene definition and it is the same here. So, what is the Circular Economy? It is linked to many schools of thought and concepts which can be seen here. The x-axis shows the concreteness ranging from tools to regulations while the y-axis shows the scope from a company to society.

5: I will use the definition referenced by the paper: In summary, it is a regenerative production-consumption system, maintain wastes and emissions under suitable values for planetary boundaries by closing the system and it is implemented at scale

6: To see where CE links with other concepts, I created a diagram here. CE is a subset of Sustainable Development. CE standards help to keep Planetary Boundaries in Check. It supports Sustainable Development which includes Economic, Social and Environment. SD helps us to achieve Sustainable Development goals.

7: There are some frameworks already present to assess product-level material efficiency and circularity, such as Life Cycle Carbon Footprint (LCCF), for an output in terms of CO2 emissions; Life Cycle Assessment (LCA), for a broader set of outputs related to environmental impact. However, note that these frameworks do not capture the Circularity of a City. We'll come back to frameworks again later.

8: Currently over 55% of the global population lives in cities, and this is expected to increase to 80% by 2050. Seven Asian countries alone will contribute to 45% of global GDP in 2050 (China, India, South Korea, Japan, Indonesia, Thailand and Malaysia) There is thus a need to develop more sustainable cities in Asia.

9: Next I'll be sharing 2 frameworks to help us move towards CE. The first is ReSolve. The "Regenerate" pillar seeks to restore natural capital, and increase the ecosystem's resilience. "Share" pillar through sharing schemes such as carpooling or exchange platforms. "Optimise"

Pillar, by increasing the performance and technology using big data, automation and removing waste in the production and supply chain.

10: The “Loop” Pillar has 4 objectives but in essence it is to close the loop and recycle stuff. The “Virtualise” pillar is about dematerialisation, for example for products, converting books to e-books and for services digitalising them such as online shopping. The last pillar, “Exchange” is in essence about innovation and new technologies, such as adopting multimodal transport or 3D printing.

11: The Circular City Analysis Framework (CCAF) was published in 2019 and is the most recent framework for implementing and tracking CEs. It has been applied to the city of Porto, Portugal. The CCAF is broken down into 27 different indicators, covering social, environmental and economic elements.

12: This brings us to our comparison of Singapore vs Porto, a city in Portugal. Due to limitations in data, only 19 of 27 indicators were compared because some data could not be found for Singapore. Bad: Can do more and improve in areas such as renewable energy penetration, green roofs and recycling rate. Good: Progressive Position in transport sector by public transport

13: Socially, accessibility to smartphones and digitalisation is high, and the percentage of students that quit basic education is low. However, there is a need to improve the balance between women and men in politics. A starting point would be for Singapore to allocate a CE budget to transition to CE.

14: One example mentioned in the paper is the Pneumatic Waste Conveyance System. It is an automated waste collection system that conveys waste via air suction. It helps to reduce odour and pest problems. Amid an ageing workforce, this is more manpower efficient, since there can be a centralised waste collection at district level such as Bidadari Town.

15: This paper was published in 2020. Since then, on the strategic front, Singapore launched the Singapore 2030 Green Plan. There have been many “tactical” moves to close the loop. This includes NewSand, NewOil, Tuas Nexus Plant, the Extended Producer Responsibility for E-waste and ground up initiatives such as the repurpose collective

16: Back in 2019, I wrote an essay on why Singapore should implement the Deposit Refund Scheme, which basically means you pay a deposit for a can of drink and get back the deposit when you return the can. I’m happy to see that in recent days, news broke that it will be happening soon. It is a system which can help boost local recycling rates,closing the loop if done right.

17: Here we see that CE can be mapped to various UN Sustainable Development Goals, reinforcing the idea that CE is a part of Sustainable Development to help us achieve a better environmental, economic and social world for all of us.There is also a need to further

understand what the circular city approach may hold for Singapore's systems such as food, energy and water.

18: To conclude, we have discussed how frameworks to track CE's targets are still in its infancy. In our classes, we have often discussed how models sometimes fail to capture the real world. It is clear from this paper that without proper metrics to quantify, it would be almost impossible to know how well we are doing, how to compare between cities and chart a way forward.

19: One takeaway from this paper is that the current CE literature mainly focuses on Europe. However, as seen in the earlier part of our slides where Asia will dominate global trade and the economy in the near future, it is important that work is also done in areas outside of Europe. Given that each city has different needs, development levels, cultural differences and much more, this makes each city unique in charting its own way ahead.

20: I would like to end off my presentation with 1 last meme. The journey towards a circular economy is not easy as seen from the picture on the right, but every bit counts (such as the excavator). Surely there are many who still don't support having more resources in our fight against climate change but with enough education, change will come, albeit gradually.

References

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