

ENVISION

THE TRANSFORMATION:
INSIDE THE FORCES MAKING CITIES CLEANER, GREENER PLACES



THIS ISSUE

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Sustainable behaviour change: A framework for policymakers. CHECK OUT: Dr. Michael Braungart on doing "good" with C2C.



Food Reimagined

What enablers exist to reduce food waste in urbanising regions like Asia?

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Urban living generates high levels of food waste, and urbanisation is a global trend; according to the UN, 75 per cent of the population in industrialised countries now live in urban areas, and two-thirds of the world's population will live in cities by 2050. Yet, while food is in abundance, about 815 million people around the world are still malnourished, and redistribution of food resources is needed for our collective well-being. Food waste is also a significant issue, especially in growing cities.

With factors like these in mind—especially in the context of developing Asia—how can we alleviate pressure on the food supply chain and address the challenges of its societal and environmental impacts?

Solutions for complex issues like these need to be designed holistically. While technology is one approach, food waste reduction and remediation are, interestingly, at the crossroads of other aspects like animal nutrition, biomaterials, food safety and traceability, and more.



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Technology as a key lever

In urban areas, food waste is mainly generated at the distribution and consumption stages of the food chain (including in-home and out-of-home consumption). To improve, there are many ways to optimise the flow of materials, data, and information with the support of new technologies.

ScanTrust, one of ID Capital's investee companies, is an Internet-of-Packaging company that provides solutions for businesses to protect against counterfeits, enable supply chain traceability, and increase end-consumer engagement. It recently launched a foundation in Singapore, named the GoodChain, with blockchain partner BigChainDB.

It is the world's first decentralised product transparency platform for social impact. Through this initiative, brands may place their products onto the GoodChain (blockchain) and pledge to causes that they will commit to fulfilling, provided they receive sufficient consumer votes via donations—food wastage reduction is one of the areas on their social impact agenda.

PureSpace, a Korean winner of the StartupSG prize at Future Food Asia Awards 2019, is developing a solution for fresh produce all along the cold chain to increase their shelf life. It has developed a proprietary nano-catalyst technology to

completely decompose ethylene gas and airborne bacteria effectively and safely. Through a portable device, the solution can be deployed at multiple points on the supply chain.

In the US, C2Sense's patented gas-sensing technology can detect almost any compound. Through a data platform, customers can access information and recommendations quickly and easily. This includes applications such as food freshness markers to estimate remaining shelf life and reduce waste, to monitoring toxic gases to protect workers. Solutions like these may be ripe for adoption in advanced markets like Singapore, Seoul, or Tokyo.

Importance of infrastructure

We should not forget that technology cannot always be efficiently deployed when infrastructure is deficient. In China, India, and several other countries under pressure of rapid urbanisation, the need for integrated cold chains is insistent. For instance, India has around 31 million tonnes of cold store capacity and about 10,000 refrigerated trucks, which is drastically insufficient. If India had the same ratio of refrigerated vehicles to the value of its grocery market, as Britain does, it would have 18 times more refrigerated trucks than at present.

Likewise, in China, the warehouse capacity is on track, but the refrigerated truck fleet is estimated to be just 66,000—less than a fifth of the estimated needs. In these enormous Asian markets, it is vital to ensure that adequate infrastructure is in place to ensure food is not spoiled and wasted along the supply chain.

Incentivising behaviour

In addition to technology and infrastructure, another aspect required to tackle food waste is behavioural change. Today, however, directing edible castoffs to people in need will take you through a maze of logistical challenges. To overcome this, policymakers and business leaders could push for:

- Introduction of taxes or fees in order to modify behaviours,
- Making distribution specifications more flexible to facilitate the redistribution of "ugly" products, or products nearing their expiry dates,
- Fostering the development of infrastructure adapted to recycling through urban development regulations,
- Supporting urban agriculture and localised recycling of food waste, and
- Raising awareness, educating, and training the general public.



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One good example of behavioural change is the work of LightBlue Consulting, a Bangkok-based startup assisting hotel groups and restaurant chains like Hilton and Sodexo. Its first and most counter-intuitive finding was that saving money by saving food was not in everybody's direct interest. Realising that there could be multiple agendas, they have designed KPIs and incentives that resonate with each category of stakeholders.

For instance, an employee incentive on food wastage reduction and savings has been proven most efficient—almost 50 per cent of all food waste in collective catering is pre-consumer food waste. With about 15 to 25 per cent of the food budget wasted, it makes sense to start with a thorough audit of where, when, and how this food is lost, and employees often know where to make such interventions. Offering incentives creates favourable ground with employees and stresses the impact of food waste on the environment and on their local communities.

Alternatives for post-consumer food waste

Today, urban food waste is usually landfilled or incinerated, and nutrient recycling for use in agriculture is relatively rare. Does this need to be the case?

We should not forget that technology cannot always be efficiently deployed when infrastructure is deficient.

Many coffee lovers, for instance, have collected coffee grounds from city cafés, mixed them with straw and mushroom spores, and used them to grow organic mushrooms. The byproduct substrate would be repurposed as an organic fertiliser for local gardeners.

How can initiatives be scaled up in a land-scarce city, if no disused space is made available? Can this commendable activity compete amongst others with a higher added value per square foot? Could policymakers help to incentivise uptake of the practice?

Another potential solution is insect farming, applauded by many as a kind of silver bullet for food waste bioconversion. Industrious insects eat the waste, mate,

- 01 In the hotel industry, saving money by saving food can be made to be in everyone's interest.
- 02 The need for integrated cold chains is insistent in many countries.
- 03 About 15 to 25 per cent of a hotel's food budget is wasted, so it makes sense to start with a thorough audit.

and lay protein- and oil-rich eggs that are then harvested and purified for the feed, or food industry. There are enormous environmental benefits to this—it takes 100 times less land, 25 times less water, and nine times less feed to produce insect protein than beef, and the feed used can be food that is otherwise wasted.

In many markets, however, regulations are stringent to avoid waste contamination, while few countries allow the proteins and oils derived from post-consumer food waste to be directed to the food market, not to mention the general reluctance of the public to eat insect-produced food. Also, urban food waste is liquidous, thus appropriate only for certain types of insects, such as Black Soldier Flies that do not deliver the best yield.

Even when processes are designed on a pilot scale, it becomes a matter of reaching economies of scale to develop market prices for commoditised outputs such as feed and biofertilisers. Collecting food waste for small-scale insect farming factories can be economically inefficient. Likewise, developing value-added technologies is not justified for sub-scale local businesses, and large operations are usually not welcome by residents, owing to unpleasant odours and noises.

As alternatives, turning unconsumed foods and biowaste into compost, biogas, or agro-plastics are options—but these could collide with public health and safety requirements, hampering the recycling of biowaste for use in agriculture, energy, or green chemistry. Could enhanced standards, forward-looking regulations, business incentives, and zoning be implemented to assist in any of these areas?

Methods like these may have their challenges, but that does not mean it is impossible. Oslo, for example, is on its way to meet its 50 per cent food waste recycling target, now recycling 46.4 per cent—up from 34.8 per cent in 2010. For cities to become smarter, people are needed to implement technology, infrastructure, behaviour, policy, and innovation-driven solutions to impact food waste. Solutions like the ones discussed here may already be available, but require further support, integration, and incentives in order to scale up. ●