Single-use plastic bags have ‘lower environmental footprint’ compared to paper and cotton bags in cities like Singapore: NTU study

By **localnewsingapore@gmail.com** - October 14, 2020

SINGAPORE: Scientists from Nanyang Technological University (NTU) have found that single-use plastic bags have “a lower environmental footprint” compared to single-use paper bags and multi-use cotton bags.

But the study came with the caveat that the findings applied only to Singapore, and possibly similar cities, where incineration was part of the city’s waste management structure.

In the study, the scientists conducted a life cycle analysis of five types of bags to evaluate the environmental impact associated with their production, distribution, transportation, waste collection, treatment and end-of-life disposal.

READ: IN FOCUS: ‘It is not easy, but it can be done’ – The challenges of raising Singapore’s recycling rate

The study found that reusable plastic bags made from polypropylene non-woven plastic were “the most eco-friendly option”, followed by single-use plastic bags, said NTU in a media release.

Using plastic bags “may be the best option that is currently available” in cities like Singapore, said Assistant Professor Grzegorz Lisak, director of the Residues & Resource Reclamation Centre at the Nanyang Environment and Water Institute (NEWRI), who led the research.

“Our main message is that reusable plastic bags are the best option, provided that they are re-used many times – over 50 times to be precise,” he added.

“However, one surprising conclusion is that, in our model, in a single-use case, plastic bags, if treated properly afterwards, are less environmentally detrimental than the other types of bags in this study.”

READ: Businesses using paper instead of plastic? Not necessarily better for the environment, experts say

READ: Commentary: A case for making plastic bags in Singapore ugly – or even embarrassing

The scientists found that the global warming potential of a single-use kraft paper bag was more than 80 times that of reusable plastic bags. Single-use plastic and reusable cotton bags that have been reused 50 times were found to have more than 10 times the global warming potential of reusable plastic bags that were reused 50 times.

According to the study, a reusable plastic bag would need to be reused four times to offset the emissions equivalent to that of the creation of one single-use plastic bag.

Cotton and kraft paper bags have relatively bigger environmental footprints because of their "greater contribution to global warming" and "eco-toxicity potential in their production", the study showed.

File photo of a kraft paper bag. (Photo: Pexels)

The production processes of cotton and kraft paper bags that consume "immense amounts of water and natural resources" are to blame for the relative negative environmental impacts, the study found.

"Hence, improving the production methods, optimising resource usage, and following sustainable practices could in future favour the usage of bags made from cotton and paper."

The study found that both single-use and reusable plastic bags were less environmentally harmful than paper and cotton bags in cities like Singapore. (Photo: NTU)

Adding that it is essential to evaluate the implications "case by case" for dealing with plastic waste, Asst Prof Lisak said: "In a well-structured closed metropolitan waste management system with incineration treatment, using plastic bags may be the best option that is currently available, provided that there is no significant leakage of waste into the environment."

MODEL'S APPLICABILITY

The NTU team stressed that its model applied specifically to Singapore and may be applicable in cities like Tokyo, Hong Kong and Dubai. This is due to the model's focus on

densely populated metropolitan areas that have waste management structures with similar end-of-life incineration facilities.

READ: The monstrous scale of plastic bag wastage in Singapore

For Singapore, the scientists recommended that reusable plastic bags be used "to the greatest extent possible" to reduce the consumption of single-use plastic bags. Reprocessing single-use plastic bags would be "a good policy goal" to cut down on their environmental impact, they said in the release.

Based on 2018 Singapore statistics, reducing the single-use plastic grocery bag consumption by half could prevent more than 10 million kg-CO_2 equivalent emissions in one year, said Asst Prof Lisak.

Moving forward, the team will be conducting further studies on plastic waste management, waste plastic upgrading and the development of new products, said NTU in the media release.

Source link