



Malaysians use 3 billion plastic shopping bags per year, so why is limiting or even banning their use still a grossly inadequate strategy?

Intuitively, it seems a good idea to charge Malaysian shoppers for the use of plastic shopping bags to reduce our nation's plastic wastes.

A [study published in Science](#) by Jambeck and his associates in 2015, for instance, estimated that, out of 192 coastal countries in the world, Malaysia is the eighth largest producer of mismanaged plastic wastes. (wastes that are not adequately disposed or recycled). This study estimated that in 2010 Malaysia had produced 0.94 million tons of mismanaged plastic wastes, of which 0.14 to 0.37 million tons may have been washed into the oceans. Thirteen percent of Malaysia's solid wastes are plastics, of which 55 percent are mismanaged.



Malaysia is the 8th larger producer of mismanaged plastic wastes in the world. It is estimated that between

0.14 to 0.37 million tons of our plastics may have been washed into the oceans. (c) aryfahmed @ fotolia.com

But how much of these mismanaged plastic wastes are from plastic shopping bags? Unfortunately, no rigorous study has been conducted to determine this amount - or even how many plastic shopping bags Malaysians use in a year. For the latter, [various estimates do exist](#), but they vary widely with one another, swinging from a total of 9 to 22 to even a whopping 55 billion plastic shopping bags per year.

That Malaysians use 55 or even 22 billion shopping bags in a year seems disproportionately very large, especially when you compare our use with other countries. All 27 countries in the European Union, with a combined population of about 500 million, used a total of 86 billion plastic shopping bags in 2010 - but Malaysia's population is only 6 percent of EU's. The problem with Malaysia's estimates is that most of them, if not all, were derived from informal observations at supermarkets.

So, how many plastic shopping bags do Malaysians use in a year? To answer this question, I used the internet to scour for data of plastic shopping bags use by various countries along with the countries' respective GDP (Gross Domestic Product) (Table 1). I figure that countries with a higher economic activity or growth would lead to a higher use of plastic shopping bags. Some countries, however, do have existing plastic shopping bags bans or charge, so to get a better representation between GDP and plastic shopping bags use, I did not consider countries that have some forms national plastic shopping bags bans or charge, such as Taiwan, Australia, UK, Canada, Ireland, Estonia, Bulgaria, UK, Germany, and Denmark.

Table 1. Number of plastic shopping bags (PSB, in billions) used per year by countries

Country	Year	PSB (billion)
Australia	2012	4.00
Austria	2010	0.36

Country	Year	PSB (billion)
Belgium	2010	1.03
Brazil	2012	12.00
Bulgaria	2010	1.80
Canada	2012	3.00
Cyprus	2010	0.14
Czech Republic	2010	3.07
Denmark	2010	0.01
Estonia	2010	0.62
EU-27	2010	86.40
Finland	2010	0.01
France	2010	5.02
Germany	2010	5.05
Greece	2010	2.67
Hong Kong	2012	9.80
Hungary	2010	4.63
Ireland	2012	0.07
Ireland	2010	0.07
Israel	2012	2.00
Italy	2010	10.52
Japan	2012	30.00
Latvia	2010	0.97
Lithuania	2010	1.43
Luxembourg	2010	0.01
Malta	2010	0.04
Morocco	2010	3.00
Netherlands	2010	1.15
New Zealand	2012	0.87
Norway	2012	1.00

Country	Year	PSB (billion)
Poland	2010	17.68
Portugal	2010	4.89
Romania	2010	5.00
Singapore	2013	3.00
Slovakia	2010	2.50
Slovenia	2010	0.95
South Africa	2012	8.00
Spain	2010	5.44
Sweden	2010	0.90
Taiwan	2012	5.80
UK	2010	9.69
US	2012	90.00

The result is what you see in Fig. 1. It turns out that there is a linear relationship, albeit a weak one, between GDP and plastic shopping bags use.

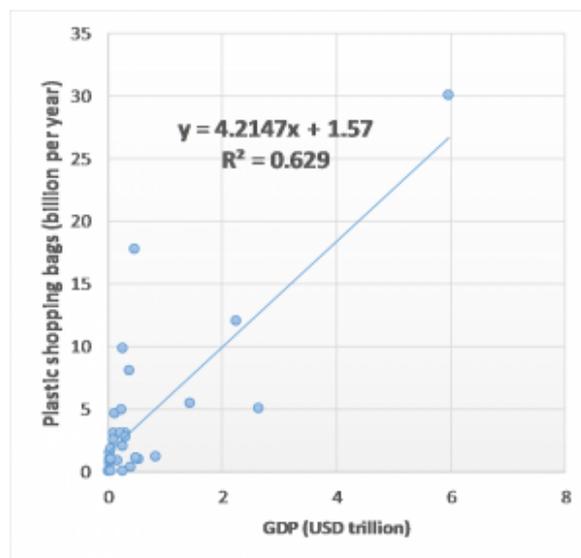


Fig. 1. Relationship between the annual number of plastic shopping bags used and gross domestic product (GDP) of countries.

Using the linear regression equation and Malaysia's mean GDP for the past five

years from 2011 to 2015, I estimate that Malaysians use a total of 3 billion plastic shopping bags, rounded to the nearest 1 billion, per year. This number is incidentally the same as for our immediate neighboring country, Singapore. But since Singapore has a smaller population than Malaysia, this means a Singaporean use nearly six times more plastic shopping bags per year than a Malaysian. However, Singapore is ten times more efficient in managing their plastic wastes compared to Malaysia. As stated earlier, 55 percent of Malaysia's plastic wastes are inadequately disposed or recycled, compared to Singapore's outstanding five percent. So, despite Singapore's greater use of plastic shopping bags per capita than Malaysia's, Singapore's mismanaged plastic wastes per capita are actually 28 times *lower* than that for Malaysia's.

Malaysia's nationwide [No Plastic Bag Campaign Day](#) every Saturday and similar such campaigns elsewhere in the country are unfortunately a knee-jerk response to our country's waste management problems. Limiting plastic shopping bags use will indeed reduce plastic wastes but one question we often neglect to ask is: "What is the alternative to plastic bags?" We still need to carry home our purchased items.

Research have shown that plastic bag alternatives such as paper bags and cotton tote bags are actually more environmentally unfriendly than plastic bags. One of the most comprehensive studies, published by the Australian government in 2007, showed that paper bags, because it is thicker than plastic, have a higher carbon footprint than plastic bags. Also because of paper's greater thickness and weight than plastic, paper take up more space in trucks and transport vehicles would burn more fuel transporting paper than plastic. A 2011 research by a British agency estimated that a paper bag has to be used by at least four times to equal the carbon footprint of that a conventional plastic bag.



Existing alternatives to plastic bags have far higher negative environmental impact than conventional plastic bags. Instead of paper or cotton tote bags, good alternatives are bags made from recycled plastics (photo from greenyatra.org).

Another alternative is the cotton tote bag but which fares even worse because cotton is a resource-hungry crop. Less than three percent of the world's cropland is cotton, but yet cotton accounts for about one-fifth of the global market of insecticides and one-tenth of pesticides. Moreover, to produce one kg of cotton requires 20,000 L of water. A cotton tote bag is estimated to require an average of at least 150 number of reuse to equal the environmental impact by a single plastic bag. This number of reuse is nearly 40 times higher than that for a paper bag.

In other words, replacing plastic shopping bags with existing alternatives may be a case of reducing one problem but greatly exacerbating another.

So, yes, charging for plastic shopping bags use is a good idea but only because it raises awareness among the public about our fragile environmental, but this strategy cannot stand alone. It cannot be the onus of the Malaysian public to fight the large amount of plastic wastes our country generates every year. To do this is to ignore the larger problem.

As stated earlier, Malaysia's has a large plastic disposal and recycling problem, where 55% of our plastic wastes are mismanaged. The key strategy is then to increase our recovery of plastic wastes through greater reuse of our plastics. Malaysia's economy, like any middle high income countries, is growing rapidly but this growth is not matched by greater effectiveness of managing our wastes.

Unfortunately, how much Malaysia recycles is also uncertain. Estimates vary from none (0 percent) to 17 percent. [A 2011 report](#) for the Malaysian Ministry of Housing and Local Government put our country's annual recycling rate at only 7 kg of wastes per capita. If this estimate is accurate, this means our country recycling rate is less than 2 percent, placing Malaysia at the lower end of the

countries in the world that practise nearly no waste recycling. Also consider the following: the average recycling rate of the top 20 countries with the highest recycling rate in the world is 35%, nearly 20 times higher than that for Malaysia's. Austria and Germany are two countries with the highest recycling rates in the world, both countries recycling about 62 percent of their wastes (Fig. 2). And again, our nearest neighbor, Singapore, has one up on us. Singapore is the fourth highest recyclers in the world, with an impressive recycling rate of 59 percent.

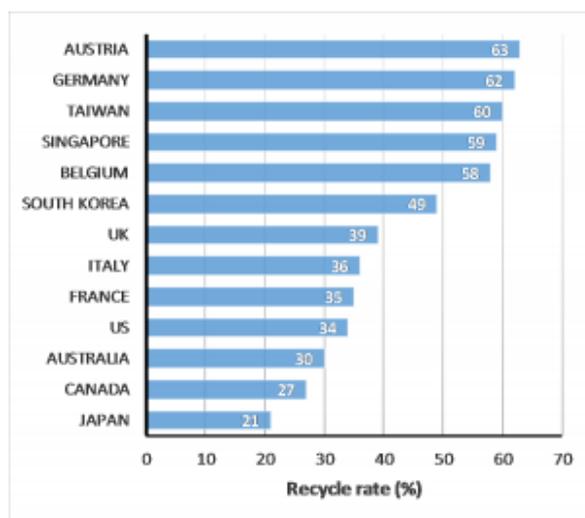


Fig. 2. Countries that most recycle their wastes (2015).

What then can Malaysia do?

Limiting plastic shopping bags through outright bans or charging for their use is vastly inadequate. Why? As mentioned previously, Malaysia generates about 0.94 million tons of mismanaged plastic wastes a year, and I estimated we use approximately 3 billion plastic shopping bags a year. A plastic shopping bag weighs between 4 to 7 g, so taking the upper limit of 7 g, this means 3 billion plastic shopping bags would weigh a total of 21,000 tons. So even if we cut down our plastic shopping bags use to completely none (*i.e.*, zero plastic shopping bags use), we would have only reduced our mismanaged plastic wastes by a maximum of only about 2 percent.

What Malaysia needs to do is then to greatly increase our recycling of plastic wastes. The same 2011 report for the Ministry of Housing and Local Government recommended the following for greater plastic wastes management in the

country:

1. More tax incentives be given for companies that undertake waste recycling management,
2. Members of the public be given rewards and redemption for turning in recyclable plastics,
3. Companies should be encouraged to buy back their plastics, such as buying back empty plastic bottles, containers, wrappings, and other forms of packaging,
4. Recycling infrastructure in the country should be improved, and
5. Innovation on the use and reuse of plastics should also be prioritized.



Our efforts ought to be diverted so that we instead recycle more of our plastic wastes, rather than just limiting our use of plastic shopping bags. (c) Aisyaqilumar @ fotolia.com

Unfortunately, recycling is not only unpopular but poorly implemented in Malaysia. Starting September 2016, for instance, households in Kuala Lumpur, Putrajaya, and several other states would have to separate their solid wastes into three categories: paper, plastics, and miscellaneous (which includes glass, metal, and organic wastes). Failure to do so risks a penalty of between RM50 to 500. This is a positive step in the right direction, but it suffers from poor implementation.



Despite good intentions, recycling of trash is poorly implemented in Malaysia. Malaysian households, despite mandatory instructions to separate their trash, still have their separated trash dumped together (photo from nst.com.my).

My family and I live in KL, and we have been separating our wastes as per given instructions since Day 1, but until today, our three plastic bags, each containing the separate groups of wastes, are still collected and dumped together. We are disheartened to see that despite our efforts to separate our wastes as instructed, our three bags are still treated as equal and dumped together.

So, Malaysia needs to identify and rigorously implement the most effective solutions to reduce our plastic wastes. Limiting the use of plastic shopping bags is a good start, but alone, it is grossly an inadequate strategy. Cliché it may be, our strategy can simply be summarized as this: *reduce, reuse, and recycle*.



Rather than focusing so much of our energies on limiting the use of plastic shopping bags, Malaysia needs instead to greatly increase the

recycling of our plastic wastes. (c)
aryfahmed @ fotolia.com

Update (2 Mar. 2017): A condensed form of this article was published today in the [New Straits Times](#) newspaper [link].

References

1. Are plastic-bag bans good for the climate? by Ben Adler, Jun 2, 2016 (<http://grist.org/climate-energy/are-plastic-bag-bans-good-for-the-climate/>)
2. Billions of plastic bags still being used (<http://www.thestar.com.my/metro/community/2016/08/22/billions-of-plastic-bags-still-being-used-six-years-have-gone-by-since-the-government-launched-the-n/#MhaHPEvvUByM2yww.99>)
3. Edwards, C. and Fry, J.M. 2011. Life cycle assessment of supermarket carrier bags: a review of the bags available in 2006. Report: SC030148. Environment Agency, Bristol.
4. Environment: Commission proposes to reduce the use of plastic bags (<https://www.euractiv.com/section/sustainable-dev/news/eu-to-halve-plastic-bag-use-by-2019/>)
5. Golden Ecosystem Sdn. Bhd. 2011. A study on plastic management in Peninsular Malaysia. Report for the National Solid Waste Management Department, Ministry of housing and Local Government Malaysia. Golden Ecosystem Sdn. Bhd., Petaling Jaya.
6. Jambeck, J.R., Andrady, A., Geyer, R., Narayan, R., Perryman, M., Siegler, T., Wilcox, C. and Lavender Law, K. 2015. Plastic waste inputs from land into the ocean, *Science*, 347: 768-771.
7. Managing KL's rubbish (<http://www.thestar.com.my/metro/community/2016/05/30/managing-kl-s-rubbish-residents-in-the-city-are-more-conscious-of-the-amount-of-waste-they-generate-a/>)
8. Miller, R.M. 2012. Plastic Shopping Bags: An Analysis of Policy Instruments for Plastic Bag Reduction. MSc. Sustainable Development Thesis. Universiteit Utrecht, Netherlands.
9. Recycling rates worldwide in 2015, by select country (<https://www.statista.com/statistics/516456/rate-of-recycling-worldwide-by-key-country/>)

10. The good and the bad of plastic bag bans: Research review (<https://journalistsresource.org/studies/environment/pollution-environment/plastic-bag-bans-grocery-shopping-environment>)