MARINE PLASTIC POLLUTION

Michael Meeks | April 18th, 2019

Background

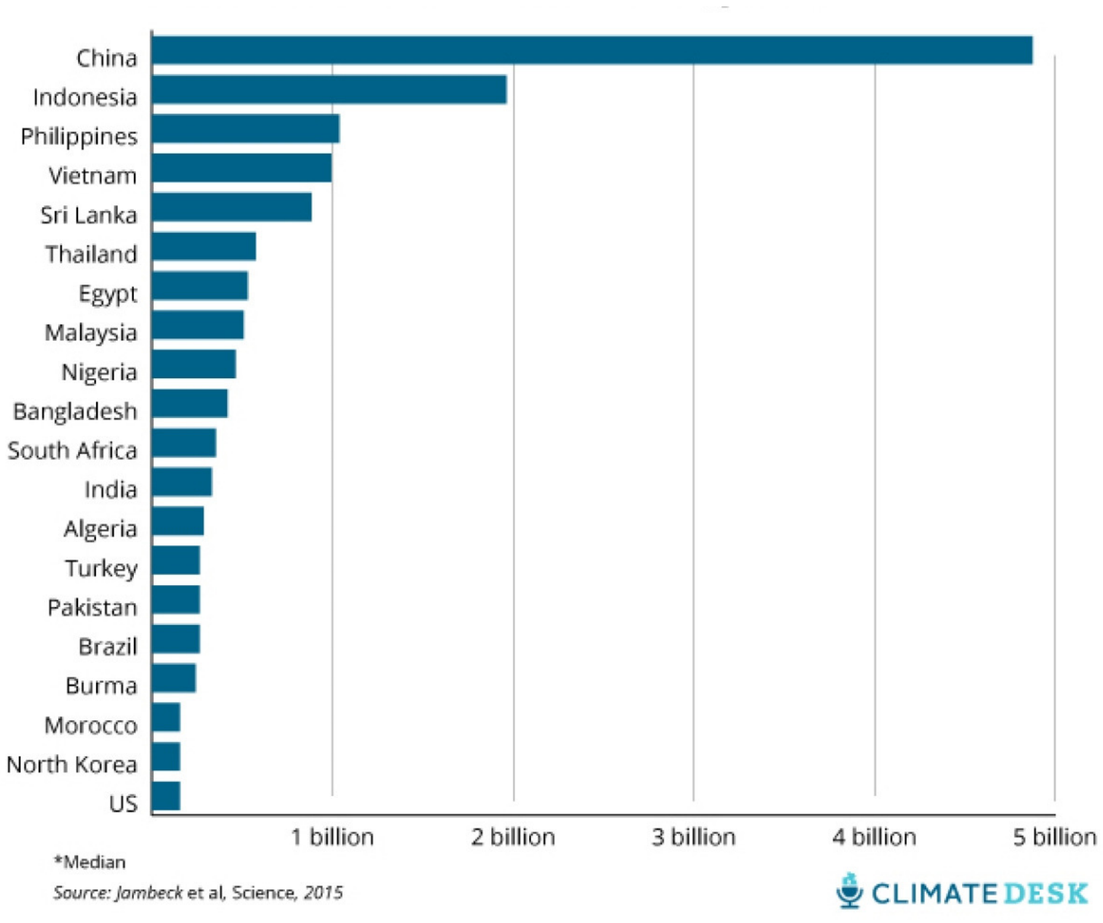
Plastic is everywhere. It is in cars, buildings, clothes, and almost all electronic devices. Even though these synthetic organic polymers have only existed for about a century, the United States alone was producing thirty million tons of plastic annually by 1988 (Derraik 842). Policy solutions exist to mitigate this looming environmental disaster, but assigning responsibility for ocean pollution is difficult and the prospect of global cooperation presents challenges.

Quick Facts

- Global plastic production is estimated at **280 million tons per year** (Koelmans et al. 5)
- Approximately **10 percent of all plastic** will eventually make it into the global ocean system (Koelmans et al. 5)
- Recreational fishing and boats are responsible for an estimated **52 percent of all trash dumped** in American waters

Who Is Contributing?

Pounds of plastic debris added to the ocean in 2010 by country



Why Plastic?

Plastics are lightweight, sturdy, durable, and relatively cheap; this makes them well-suited for a variety of products (Derraik 842). Their versatility has led to significant increases in usage over the past three decades (Derraik 842). Its buoyancy allows plastics to travel long distances underwater and, even after settling, they may remain intact for centuries (Derraik 842).

Common Polluters

- Commercial fishing ships, merchant ships, and recreational ships (Derraik 843)
- Densely populated urban areas (Derraik 843)
- Individuals leaving litter behind at the beach or riverfront (Derraik 843)

Implications

Environment

- Animals often get entangled in nets and fishing line which can hinder their mobility, keep them from eating, cause wounds, or lead to suffocation (Sheavly and Register 302-303)
- Debris can "abrade, scour, break, smother, and destroy" shorelines, coral reefs, and other delicate marine habitats (Sheavly and Register 303)

Human Health

- Microscopic fragments and plastic fibers have potential to end up in the human body (Sheavly and Register 303)
- The threat of plastic bioaccumulation in humans needs further research

Economy

- Plastic waste is a potentially dangerous eyesore on beaches
- Coastal communities rely on tourism as a key industry, and littered beaches stifle this business (Sheavly and Register 302)

Misconceptions and Challenges

The vastness of the oceans makes it easy to ignore, but time is running out to preserve its vital ecosystems. The most significant roadblocks to effective policy solutions are assigning responsibility, the lack of standardization in evaluating quantities of plastic pollution, and the need for further research. Because its sources are so widespread and often difficult to pinpoint, it is near-impossible to isolate the problem to any single geographic location. In addition, microplastics and microbeads, particles of plastic less than five millimeters in diameter, present unique challenges that require further research (Xanthos and Walker 2).

Responsibility

It's difficult to determine who should take action and, by extension, who should pay for mitigation (Koelmans et al. 7).

Quantification

Research typically varies in methods and units used for quantification, and it often focuses on only one region (Koelmans et al. 5).

Research

Prioritizing which areas of this field to research is difficult, as the risks of plastics in marine ecosystems are significant and many of its effects are still unknown (Koelmans et al. 5).

Policy Recommendations

Mandatory Plastic Education and Outreach Programs

Including ocean education in schools would **raise awareness** for this problem and **foster ocean-friendly practices** in students, even if their actions are indirect (Pettipas et al. 3). However, **it is difficult to provide incentive to schools** to include courses on the oceans, especially when postsecondary education does not prioritize this knowledge (Pettipas et al. 3). Opponents may suggest that **lack of education funding** makes it challenging to implement such programs.

Microplastic Regulation

Microplastics should be **included and banned in statutory law** regulating plastics. Opponents might suggest that, due to lack of research regarding both the policy itself and microplastics in general, **there is little incentive to impose regulations** (Xanthos and Walker 6). **Conducting additional research is necessary** to provide positive evidence that such policies are effective, which will likely result in more widespread bans.

Plastic Bag Ban

Total plastic bag bans have **proven effective in reducing plastic usage**. One such policy in China resulted in a **reduction in plastic bag use of between sixty and eighty percent** in Chinese supermarkets (Xanthos and Walker 3). Opponents may argue that **eliminating plastic bags will have negative economic impacts**. Additionally, the convenience of such single-use plastics will make the **average consumer hesitant to support a ban.**

Works Cited

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