

## **Science**

### **Evaluating scenarios toward zero plastic pollution**

Godfrey, Linda  
Council for Scientific and Industrial Research  
Pretoria, 0001, South Africa  
Email: LGodfrey@csir.co.za

#### **Abstract**

Plastic pollution is a pervasive and growing problem. To estimate the effectiveness of interventions to reduce plastic pollution, we modeled stocks and flows of municipal solid waste and four sources of microplastics through the global plastic system for five scenarios between 2016 and 2040. Implementing all feasible interventions reduced plastic pollution by 40% from 2016 rates and 78% relative to 'business as usual' in 2040. Even with immediate and concerted action, 710 million metric tons of plastic waste cumulatively entered aquatic and terrestrial ecosystems. To avoid a massive build-up of plastic in the environment, coordinated global action is urgently needed to reduce plastic consumption, increase rates of reuse, waste collection and recycling, expand safe disposal systems and accelerate innovation in the plastic value chain.