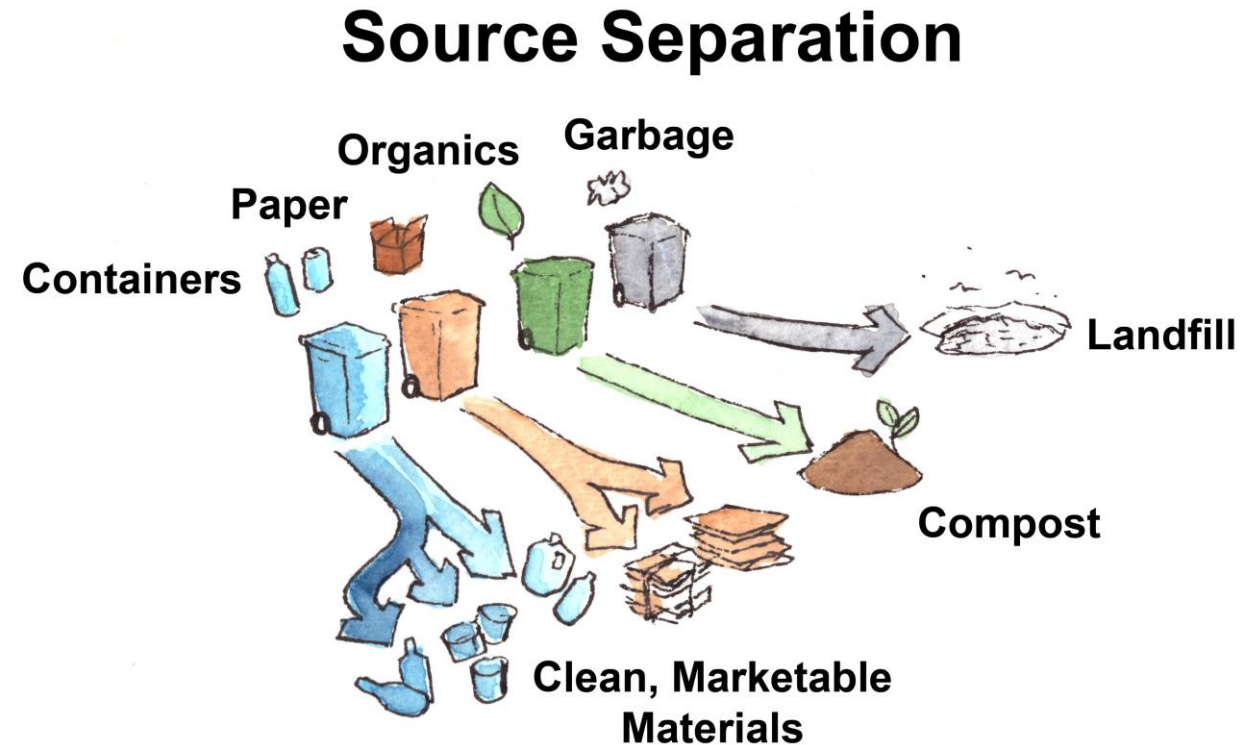# Lack of source separation

- diminishes the quality and uses of the endproduct
- adds risks and costs downstream
- generates psychological distance of people and their role in production, reuse and recycling

Size and weight

Primary

- fragments or particles that are already $\leq$ 5.0 mm before entering environment

Secondary

- created from fragmentation of larger plastic products

Surface area coverage more informative than weight

~ weight as a plastic bottle cap is enough shredded plastic to fill a porcelain soup spoon

Empirical evidence mounting for detrimental impacts of microplastics in soil food webs

- Contaminate edible fruits & vegetables
  - Example: carrots, apples
- Impair soil function
  - decrease resilience to drought
- Bioaccumulate in food chain, e.g., earthworms
  - Empty calories
  - Behavior

Climate change connection

- A common method to determine organic matter content cannot differentiate microplastics resulting in overestimates of carbon storage in soil
  - Loss by ignition
- Centralized network often requires long distances of hauling and burning of fossil fuels
  - Life cycle analysis
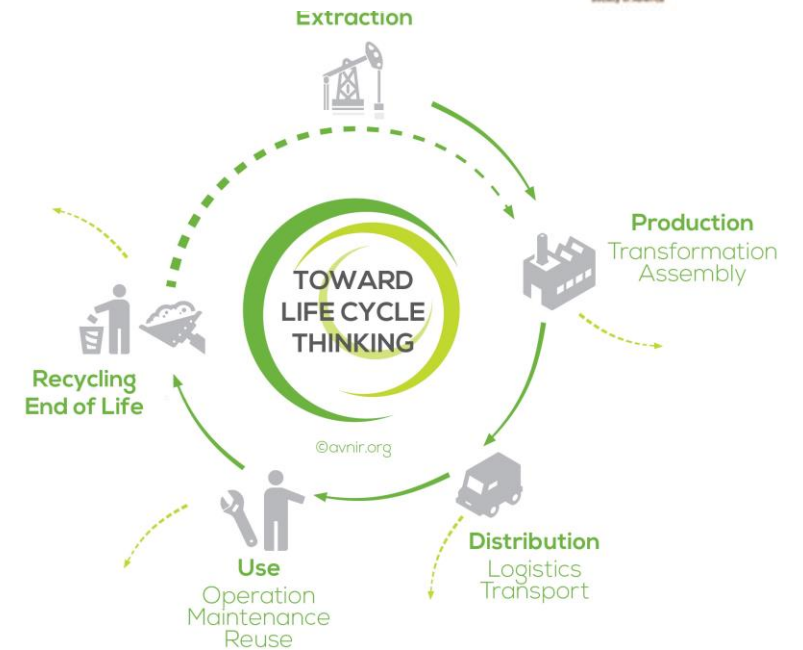
Conclusion

- There are good scientific reasons for the policies associated with hierarchy and source separation that relate to health and environment

- Effective solution requires a systems perspective