

# The need to reduce food packaging: a system approach

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## ABSTRACT

Food packaging plays an important role in modern mainstream food systems. The food sector represents the largest single-use packaging market within the global plastics industry (Rundh, 2005) and almost 95 percent of the plastic packaging becomes waste just after a single use (WEF, 2016).

The disposability of food packaging is causing several negative environmental impacts, such as ocean pollution (Sheavly & Register, 2007; Thompson, Swan, Moore, & Vom Saal, 2009), freshwater and land contamination (Geyer, Jambeck, & Law, 2017; Wagner et al., 2014). Moreover, plastic packaging contributes to the depletion of fossil fuel resources and projections show that by 2050 the plastics sector will account for 20 percent of the total oil consumption and for 15 percent of the global annual carbon budget (WEF, 2016).

There is an extensive literature which analyses packaging in different sectors, however a more holistic system research is missing. Current solutions to reduce the impacts of food packaging focus on waste management practices, with emphasis on recycling schemes (Al-Salem, Lettieri, & Baeyens, 2009; Arena, Mastellone, & Perugini, 2003; Eriksen, Christiansen, Daugaard, & Astrup, 2019) and on the discovery of eco-friendly biomass based materials (Ainara et al., 2019; Madival, Auras, Singh, & Narayan, 2009; Siracusa, Rocculi, Romani, & Dalla Rosa, 2008). Whilst useful, these solutions overlook the importance of a systemic understanding of the problem. Current approaches address the packaging symptoms rather than seeking to tackle the root of the issue.

For this reasons, this research applies a system approach to better understand the systemic cause of the food packaging problem. Specifically, system thinking methods and system dynamics modelling are used to explore the drivers of the use of food packaging in the mainstream food system in Australia. Why does the current food system rely heavily on food packaging?

This presentation will explore from a system perspective the role that packaging plays in the modern society. Albeit the main function of packaging remains to protect food from pathogens, over time, the role of food packaging evolved, assuming other important roles. For example, packaging became a product that has to respond to the demand of time-pressed consumers in urban areas (Emblem, 2012). Moreover, globalization led to longer food supply chains (Sodano, 2008) and packaging became a fundamental vehicle for the expansion of the current global food market (Regmi & Gehlhar, 2001).

In this session the preliminary insights of the dynamic hypothesis built during the study will be discussed. Our dynamic hypothesis is presented as a Causal Loop Diagram (CLD) that has been developed from the literature review and from secondary data. The presentation will highlight the analysis of the behavior over time of the variables that, since the 1960s, led to an increase of the use of packaging in modern food systems. Moreover, this session will introduce the participants to the methods used to collect the empirical data needed to validate the CLD. Semi-structured interviews with experts are being undertaken and a Dynamic Thinking Coding Scheme has been chosen to analyze, validate and complete the system studied.

Within the complex system developed, the main sub-systems explored will be: the use of packaging in modern family dynamics and the use of packaging within the global food market. Within the family sub-system variables such as income, time and new family composition will be discussed in order to understand their influence on the use of packaged food. The second sub-system focuses on a more macroscopic level, analyzing how free trade, the expansion of transnational corporations and the concentration of the retailing environment led to an increase in the need of packaging.

This study reviews the technologies, regulations and policies related to reducing food packaging in Australia. It considers why current solutions are failing and why systemic solutions need to be found and addressed. The ultimate goal of this research is to empirically test a range of policy

options that could allow a shift towards a reduction of packaging use in mainstream food systems.

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