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Theoretical approaches to food loss and waste studies: Scope, application, limitations and a way forward

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Abstract

The issue of food waste extends beyond the scientific community and requires comprehensive solutions. It is characterized as a 'Wicked Problem,' making it difficult to identify precise causes and their effects. No single theory fully explains the phenomenon of food waste generation and reduction. The Theory of Planned Behaviour (TPB), Actor-Network Theory (ANT), and Social Practice Theory (SPT) have largely shaped food waste studies. These theories address the psychological, behavioural, societal, and cultural factors influencing food waste. While these frameworks provide a structured understanding of food waste dynamics and potential solutions, their linear nature limits analysis of broader issues such as institutional failures and policy influences. To overcome their limitation, cross-disciplinary research and interdisciplinary approaches are necessary.

Keywords: Food loss, food waste, theory of planned behaviour, actor-network theory, social practice theory

Introduction

Food Loss and Waste (FLW) is a complex, multidimensional issue that intersects environmental, social, economic and ethical concerns. Environmentally, FLW contributes significantly to resource depletion, including water, land, and energy and is a major source of greenhouse gas emissions, exacerbating climate change. Socially, it highlights inefficiencies and inequities in food distribution and access, raising ethical questions about wasting food amidst global hunger. Economically, FLW represents a loss of value, increasing costs for producers and consumers alike. Thus, FLW is a sustainability challenge that requires integrated approaches addressing production, consumption, and policy dimensions to reduce its negative impacts on ecosystems, economies and societies worldwide ^[1]. Despite its scale and impact, FLW is under-studied, has data gaps, inconsistent definitions and a lack of standard measurements in many countries ^[2]. Understanding this phenomenon comprehensively requires interdisciplinary research and evidence-based interventions. Studying FLW typically involves a mix of methodological approaches depending on what the researcher wants to understand ^[3] has put forth various quantification approaches, and several context-specific qualitative studies have been conducted to study food waste. Those approaches can effectively answer 'How much' and 'What factors' contribute to food waste. On the other hand, to explore 'Why waste occurs', it is essential to adopt a theoretical framework that helps identify key variables and measure their relationships. A theoretical framework integrates the current information, concepts and theories and offers a lens through which the research challenge is viewed and aids in structuring the investigation. It directs the data analysis and interpretation of results, in addition to providing the study with a larger academic perspective ^[4].

This paper aims to review three primary theoretical frameworks that have been widely used to study the phenomenon of food loss and waste, presenting their extent of applicability and their limitations. The present study is based on secondary data drawn from the research articles, books and research reports and analysed through a semi-systematic literature review.

Review of theoretical frameworks in food waste studies

Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour (TPB), developed by Icek Ajzen in 1991 as an extension of the Theory of Reasoned Action (TRA), aims to predict human behaviour. TPB posits that behaviour is driven by intentions shaped by three factors: Attitudes, Subjective Norms, and Perceived Behavioural Control. *Attitudes* refer to motivational factors that influence behavior. Stronger intentions lead to a higher likelihood of action. *Subjective norm* reflects perceived social pressure to engage in or refrain from a behaviour, based on others' views. *Perceived behavioural control* indicates an individual's perception of the ease or difficulty of performing a behaviour, which is influenced by internal and external factors⁵. He says these factors might not always be thought about consciously, yet they support the decision-making process. The stronger a person's positive attitude toward a behaviour, their subjective norms, and their perceived behavioural control, the more likely they are to intend to carry out that behaviour.

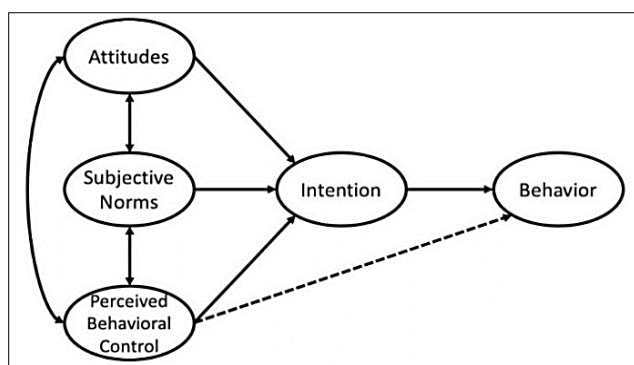


Fig 1: The theory of planned behaviour^[5]

Application: The Theory of Planned Behaviour (TPB) has been widely applied to predict and understand behaviors to create effective interventions. This model aids in identifying the elements that drive individuals to adopt eco-friendly practices, including composting and recycling^[6]. It can also examine health-related topics such as substance use, dietary habits, and technology adoption, among others^[7]. Furthermore, it is employed in exploring consumer behaviour^[8] and in the education sector. TPB is utilised for creating interventions that successfully facilitate behaviour change.

Application of TPB in FLW Studies: The application of the Theory of Planned Behavior (TPB) in research on food waste explores the factors that affect people's intentions to reduce waste and practice sustainability, especially regarding food buying and consumption. Studies indicate a strong connection between food waste and contextual elements such as personal motivations, financial attitudes, and social interactions^[8, 6] discovered that economic, socio-cultural, and environmental aspects significantly influence food waste behaviors. In terms of recycling food waste,^[9] from TPB lens found that public engagement is higher when local authorities offer the necessary motivation and opportunities to engage in community-related activities. Numerous studies highlight the usefulness of TPB in comprehending the cognitive, cultural, and social factors that affect food waste creation and reduction, particularly in

relation to attitudes, subjective norms, and perceived exertion of control.

Limitations:^[10] listed major limitations of TPB theory. Firstly, the Theory of Planned Behaviour (TPB) is capable of forecasting only a single behaviour at any given moment, even though various human actions can happen concurrently in intricate circumstances. The criticism also focuses on the failure to adequately tackle the intention-behaviour gap, which refers to the situation where individuals have strong intentions but fail to act on them. Third, the theory presupposes a straightforward and logical movement from intention to action and contends that individuals act rationally; however, numerous behaviours are shaped by emotional, habitual, or impulsive elements, which the TPB fails to sufficiently address. This theory does not adequately account for how external elements, such as economic conditions, institutions, affect changes in cognitive behaviour, making it challenging to analyse the interactions and decision-making of different stakeholders within a complex system of interrelated influences and conflicting interests.

Actor Network Theory (ANT)

ANT originated from research conducted in Britain and France concerning the sociology of science and technology during the 1980s. The key figures associated with this theory are Bruno Latour, Michel Callon, and John Law. ANT is grounded in an epistemological and ontological understanding that perceives the world as a web of interconnections called 'Networks'. This web encompasses individuals, objects, ideas, and concepts, all referred to as 'Actors' within a network^[11]. An Actor is defined as a source of action, be it a human or a non-human entity, possessing the capability to act. A crucial task of ANT is to identify the connections and relationships among these actors in the creation of a network. This theory posits that a social phenomenon emerges from a network comprised of both human and non-human actors.

Actor Network Theory suggests that no actor or actant exists in complete autonomy, as it is formed from various diverse components. These components include objects, technologies, the influence of other individuals, abstract concepts, and mental states, all of which collectively define the identity of an actor^[12]. Latour's principle, "when one acts, others proceed to action," illustrates this interdependence. ANT stresses symmetry, indicating that all actors are considered equally regarding their contributions to the network. Thus, ANT offers a dynamic view on how actions are executed and how transformations occur.

Application: Actor Network Theory is applied in fields like sociology, science and technology studies, political science, and management studies. It offers insights into public policy by examining the roles of administrators, legislators, activists, elected officials, and policy makers in their work.

It is commonly utilised in understanding the role of IT and technology in the advancement of healthcare systems. By utilising the ANT framework, the research demonstrated that technology is not just a tool but actively influences and is influenced by social dynamics within the healthcare environment. It provided a perspective to recognise how technology impacts and is affected by health system structures and practices, while examining the roles and

interactions of various stakeholders ^[11]. Recent advancements in the education sector have incorporated technologies into a range of teaching and learning approaches. ANT applied in this situation elucidates the intricate networks present in learning systems where educational resources and technologies possess the ability to determine the efficacy of the learning experience. Some studies utilized the ANT framework to explore sustainability. Researchers in this area sought to comprehend how power and influence are allocated among various stakeholders involved in sustainability initiatives. They examined the factors that influenced the sustainability agenda and how technologies and policies exerted authority over the human actors executing them ^[13].

Application of ANT in FLW studies: Actor Network Theory assists in comprehending the political and ecological factors that lead to certain phenomena. It examines how various actors are linked, disconnected, and reconnected within society and the environment they engage with ^[14]. It is noted that the entire waste issue is socially constructed, similar to environmental challenges, where underlying political and economic motivations are obscured. The ANT perspective offers insights into recognising the processes, practices, and discourses involved among actors across the supply chain.

Michel Callon's ANT framework has been effective in analysing the complexity and fluidity of alternative food systems in informal, low-income, and peri-urban areas of Latin America ^[15]. This framework helped researchers identify how power, identity, and material resources are negotiated at each stage by mapping the interdependencies and tensions among various actors in these systems. A study using ANT examined how social and material relationships influence university waste systems, highlighting the distributed and fragmented nature of the decision-making process ^[16]. The ANT thus shifts the conversation from a straightforward, linear perspective on causation to a multifaceted network of interactions and mediations. This framework encourages them to examine the complex relationships between physical resources, organisational structures, and symbolic interpretations, all of which influence and characterise the processes of food production and consumption.

Constraints: ANT is limited in evaluating power disparities and structural inequalities in food systems ^[17]. Highlight that ANT's flat ontology treats all participants equally, which hinders the analysis of power dynamics between different groups of stakeholders. In his study, the decentralized nature of informal systems and varying market demands complicate their examination with ANT. ANT effectively traces micro-level connections, but it struggles with larger systematic fragmentation. ANT overlooks everyday routines related to food practices and waste, as pointed out by ^[18], who argue that it misses crucial details in the social reproduction of these habits.

Social practice theory

In 'Dynamics of Social Practice: Everyday Life and How it Changes' ^[18], the authors explore the emergence of practice theories in social science, tracing their roots to thinkers like Wittgenstein and Heidegger, who implied various aspects of practice without addressing it directly. Next, John Dewey

and Charles Taylor positioned 'practice' as the key unit of analysis to study behaviourism. Further, Bourdieu's concept of 'habitus' integrates practical consciousness and rules of conduct, emphasizing that habitus is shaped by practice and oriented towards practical function. The 20th century saw a resurgence in practice theories, notably through Theodore Schatzki, who redefined social practices by highlighting the links between actions and their contexts. Following him, Andreas Reckwitz expanded on the dimensions of practice, focusing on routines, social structures, and the balance between individual agency and collective norms, thus enriching the understanding of practices in societal contexts. Taking this ahead, Elizabeth Shove significantly contributed to social practice theory, especially in environmental and consumption research. Her framework identifies three core elements of practice as shown in Figure (2):

- Materials (objects, technology, tools)
- Competence (skills and techniques)
- Meanings (norms, values, symbolic meanings)

She argues that practices evolve through the relationship between individual actions (agency) and social norms (structure).

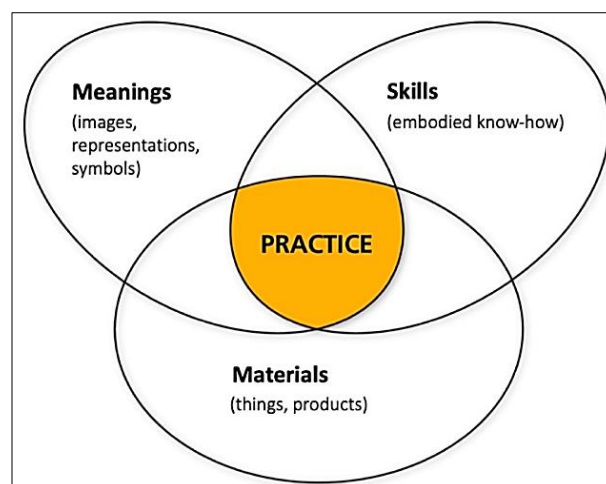


Fig 2: Tripartite Model of Social Practice Theory ^[18]

Application: SPT holds significant importance for research related to technology and energy, as it allows for a more in-depth exploration of how energy-related technologies integrate into daily routines ^[19]. He examined smartphones through SPT highlighting three components: material (the device), competence (how to use it), and meaning (social connections), and their role in social practices in enhancing smartphones significance and functionality. In the health sector, ^[20] studied oral health in preschool children in Perth, Western Australia, using social practice theory. He examined parents' knowledge about tooth brushing, necessary resources, and the importance of tooth brushing, revealing both enablers and barriers to children's oral health care. In an educational setting, SPT offers a powerful lens for understanding how educational behaviors, like teaching, learning, and classroom routines, are shaped ^[21]. In the domain of sustainable consumption, ^[22] suggest that unsustainable behavior results not just from individual failings but from the organisation of social life. In gender studies, West and Zimmerman's concept of 'Doing Gender' illustrates how gender identities are shaped and negotiated through everyday activities ^[23]. Judith Butler enhances this

by asserting that gender is performative, created through repeated actions. Feminist scholars examined the role of power in these practices.

Application of SPT in FLW Studies: The shift to practice-based approaches has significantly influenced food studies. Scholars argue that food behaviors cannot be understood solely through individual rational choice. Instead, eating, cooking, and shopping are seen as practices embedded in broader socio-material contexts^[24]. This reframing shifts the focus from “Why do individuals choose certain foods?” to “How are food practices reproduced and interconnected?”. Recent studies on food loss and waste emphasise how everyday routines drive waste generation and can also suggest potential solutions to address the issue. A recent study in the hospitality industry, using SPT, shows that embedded meanings (abundance norms), competencies (portion control), and materials (Kitchen layout) shape actors’ routines^[25]. Similarly, research on restaurant waste applied SPT to uncover causes like mismatched provisioning and disposal practices, advocating the importance of managers’ role in reconfiguring staff performance tools for waste reduction^[26].

Constraints: Although SPT provides valuable insights into the social organization and sustainability of behaviors, it often overlooks the larger institutional frameworks that influence, limit, and bolster these practices over time. A notable example drawn from the literature review is the retail industry’s cosmetic requirements for fruits and vegetables, which significantly contribute to food loss upstream at the farm and wholesale stages^[27]. Such standards are frequently codified within procurement policies and supported by risk-averse logistics throughout the supply chain. Furthermore, Shove herself observes, “New practices do not float freely; they emerge and endure within the context of infrastructures, regulations, and other long-standing institutions”. In developing nations, a lack of funding from government bodies, the absence of integrated supply chains, and inadequate processing facilities alongside poor stock management signify policy and institutional deficiencies^[28]. These deficiencies serve as a form of resistance, allowing unsustainable practices to persist and continue. Thus, grasping this aspect is crucial for creating an effective analytical tool to examine food loss and waste.

Conclusion and a way forward

An analysis of three key theoretical frameworks in food loss and waste research is presented, discussing their foundational concepts, relevance across fields, and limitations. Together, these theories offer diverse perspectives on human behaviour, socio-material contexts, and routines. The Theory of Planned Behaviour (TPB) focuses on individual cognitive influences; Actor-Network Theory (ANT) highlights the networks of human and non-human actors, emphasizing the role of technologies and infrastructure; and Social Practice Theory (SPT) views behaviour as a practice composed of meanings, materials, and skills. Despite their strengths, each framework has limitations. TPB often neglects socio-material contexts, ANT can be critiqued for its analytical vagueness, and SPT may overlook individual agency and emotional motivations. These limitations show that no single theory can fully

address the complexity of food loss and waste, consumption patterns, and sustainability transitions.

Recent research on sustainability issues increasingly supports the idea of theoretical integration. For example,²⁹ advocates for merging practice theory with institutional and governance viewpoints;^[30] stress the importance of integrating behavioural insights into practice-oriented initiatives; and³¹ illustrates the benefits of connecting socio-technical and practice-based frameworks. These cross-disciplinary efforts underscore that to fully grasp complex systems, one must draw insights from behavioural sciences, sociology, human geography, institutional theory, and science and technology studies. Such efforts allow for addressing multiple dimensions simultaneously, including production inefficiencies, consumer habits, and the regulatory framework, which no single discipline can fully capture.

Future research can progress by combining synthetic, interdisciplinary methods that strategically integrate TPB, ANT, SPT, and concepts from diverse fields. Merging TPB’s focus on cognitive processes with SPT’s emphasis on routines offers insights into why actions sometimes diverge from intentions and how new practices develop. Theories like institutional theory and organisational sociology can further support SPT and ANT by clarifying how rules, norms, path dependency, and organisational culture influence change, either by facilitating or obstructing it. This understanding is vital for examining institutional inertia in systems such as food distribution or municipal waste management. It is essential to apply multi-level and systems perspectives to frame food loss and waste within wider political, economic, and social contexts. Ultimately, embracing methodological pluralism is key to effective theoretical pluralism.

Benefits of cross-disciplinary approaches include fostering collaboration among institutions, promoting innovation, and enhancing intervention strategies. Engaging social scientists, economists, and engineers together leads to solutions that are technically feasible and socially acceptable. Such research supports circular economy models and policy designs aimed at minimizing food loss and waste. Therefore, collaborative efforts are essential for creating practical, context-specific, and sustainable solutions.

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References

1. Ishangulyyev R, Kim S, Lee S. Understanding food loss and waste-Why are we losing and wasting food? *Foods*. 2019;8(8):297. Available from: <https://www.mdpi.com/2304-8158/8/8/297>
2. Spang ES, Moreno LC, Pace SA, *et al.* Food loss and waste: Measurement, drivers, and solutions. *Annu Rev Environ Resour*. 2019;44(1):117-156. Available from: <https://www.annualreviews.org/doi/10.1146/annurev-environ-101718-033228>

3. Rodrigues M, Miguéis V. A literature review on the quantitative approaches to food waste: Descriptive, predictive, and prescriptive analyses. *Environ Sci Pollut Res.* 2025;32(36):21301-21337. Available from: <https://link.springer.com/10.1007/s11356-025-36937-9>
4. Maxwell JA. *Qualitative research design: An interactive approach*. 3rd ed. Los Angeles: Sage; 2013.
5. Ajzen I. *Attitudes, personality and behavior*. 2nd ed. Maidenhead: Open University Press; 2011.
6. Mondéjar-Jiménez JA, Ferrari G, Secondi L, Principato L. From the table to waste: An exploratory study on behaviour towards food waste of Spanish and Italian youths. *J Clean Prod.* 2016;138:8-18. Available from: <http://linkinghub.elsevier.com/retrieve/pii/S0959652616306862>
7. Anisman H, Kusnecov AW. Adopting healthy behaviors: Toward prevention and cures. In: *Cancer*. Elsevier; 2022. p. 369-400. Available from: <https://linkinghub.elsevier.com/retrieve/pii/B9780323919043000197>
8. Aktas E, Sahin H, Topaloglu Z, *et al.* A consumer behavioural approach to food waste. *J Enterp Inf Manag.* 2018;31(5):658-673. Available from: <https://www.emerald.com/insight/content/doi/10.1108/JEIM-03-2018-0051/full/html>
9. Karim Ghani WAWA, Rusli IF, Biak DRA, Idris A. Application of the theory of planned behaviour to study participation in source separation of food waste. *Waste Manag.* 2013;33(5):1276-1281. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0956053X12004588>
10. Chen XX, Slade E. Theory of planned behaviour: A review. *Theory Hub*; 2024. Available from: <https://open.ncl.ac.uk/theory-library/theory-of-planned-behaviour.pdf>
11. Cresswell KM, Worth A, Sheikh A. Actor-Network Theory and its role in understanding the implementation of information technology in healthcare. *BMC Med Inform Decis Mak.* 2010;10(1):67. Available from: <https://bmcmmedinformdecismak.biomedcentral.com/articles/10.1186/1472-6947-10-67>
12. Bencherki N. Actor-Network Theory. In: Scott CR, Barker JR, Kuhn T, Keyton J, Turner PK, Lewis LK, editors. *The International Encyclopedia of Organizational Communication*. Wiley; 2017. p. 1-13. Available from: <https://onlinelibrary.wiley.com/doi/10.1002/9781118955567.wbieoc002>
13. Uden L. Actor-Network Theory and learning. In: Seel NM, editor. *Encyclopedia of the Sciences of Learning*. Boston: Springer; 2012. p. 86-89. Available from: http://link.springer.com/10.1007/978-1-4419-1428-6_507
14. Rath S, Swain PK. The interface between political ecology and Actor-Network Theory: Exploring the reality of waste. *Rev Dev Change.* 2022;27(2):264-278. Available from: <https://journals.sagepub.com/doi/10.1177/09722661221122553>
15. Lizarralde G, Latorre S, Clavijo N, *et al.* The spaces in between: An actor-network analysis of alternative food systems in Latin America and the Caribbean. *Front Sustain Food Syst.* 2025;9:1460343. Available from: <https://www.frontiersin.org/articles/10.3389/fsufs.2025.1460343/full>
16. Méndez-Fajardo S, Gonzalez RA. Actor-Network Theory on waste management: A university case study. *Int J Actor-Netw Theory Technol Innov.* 2014;6(4):13-25. Available from: <https://services.igi-global.com/resolvedoi/resolve.aspx?doi=10.4018/ijantti.2014100102>
17. Watts N, Scales IR. Seeds, agricultural systems and socio-natures: Towards an Actor-Network Theory-informed political ecology of agriculture. *Geogr Compass.* 2015;9(5):225-236. Available from: <https://compass.onlinelibrary.wiley.com/doi/10.1111/gec3.12212>
18. Shove E, Pantzar M, Watson M. *The dynamics of social practice: Everyday life and how it changes*. Los Angeles: SAGE; 2012.
19. Mesenhöller M. Exploring the application of Social Practice Theory in technology-related research: A state-of-the-art literature review. *Energy Res Soc Sci.* 2025;126:104145. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S2214629625002269>
20. Durey A, Ward P, Haynes E, Baker SR, Calache H, Slack-Smith L. Applying Social Practice Theory to explore Australian preschool children's oral health. *JDR Clin Transl Res.* 2024;9(4):346-357. Available from: <https://journals.sagepub.com/doi/10.1177/23800844241235615>
21. Grootenboer P, Edwards-Groves C, Choy S, editors. *Practice theory perspectives on pedagogy and education: Praxis, diversity and contestation*. Singapore: Springer; 2017. Available from: <https://link.springer.com/10.1007/978-981-10-3130-4>
22. Evans D. *Food waste: Home consumption, material culture and everyday life*. London: Bloomsbury Academic; 2014.
23. Poggio B. Editorial: Outline of a theory of gender practices. *Gend Work Organ.* 2006;13(3):225-233. Available from: <https://onlinelibrary.wiley.com/doi/10.1111/j.1468-0432.2006.00305.x>
24. Warde A. Consumption and theories of practice. *J Consum Cult.* 2005;5(2):131-153. Available from: <http://journals.sagepub.com/doi/10.1177/14695405050503090>
25. Nand AA, Bhattacharya A, Prajogo D, Sohal A, De Vass T. Understanding food waste in the hospitality industry: A Social Practice Theory approach. *Int J Hosp Manag.* 2025;130:104232. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0278431925001550>
26. Munir K. Towards sustainable food waste management in restaurants: A case study applying Social Practice Theory. *Int J Gastron Food Sci.* 2025;42:101293. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S1878450X25001945>
27. Meena SR, Meena SD, Pratap S, Patidar R, Daultani Y. Strategic analysis of the Indian agri-food supply chain. *OPSEARCH.* 2019;56(3):965-982. Available from: <http://link.springer.com/10.1007/s12597-019-00380-5>

28. Deekonda S. Agri-food supply chains from circular economy perspective. In: Ramakrishna Y, Wahab SN, editors. *Advances in Finance, Accounting, and Economics*. IGI Global; 2023. p. 286-305. Available from: <https://services.igi-global.com/resolvedoi/resolve.aspx?doi=10.4018/978-1-6684-7664-2.ch014>
29. Hargreaves T. Practice-ing behaviour change: Applying Social Practice Theory to pro-environmental behaviour change. *J Consum Cult*. 2011;11(1):79-99. Available from: <https://journals.sagepub.com/doi/10.1177/1469540510390500>
30. Kurz T, Gardner B, Verplanken B, Abraham C. Habitual behaviors or patterns of practice? Explaining and changing repetitive climate-relevant actions. *WIREs Clim Change*. 2015;6(1):113-128. Available from: <https://wires.onlinelibrary.wiley.com/doi/10.1002/wcc.327>
31. Geels FW. Socio-technical transitions to sustainability: A review of criticisms and elaborations of the multi-level perspective. *Curr Opin Environ Sustain*. 2019;39:187-201. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S1877343519300375>