

Applying Nudge Theory Strategies in Solid Waste Management

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Abstract

The current policies on Solid Waste Management (SWM) have little or no avenues to bring desirable changes for effective SWM since they demand multi-criteria evaluations and a high level of cognition. Applying means of behavioral sciences such as nudge instruments have found to alter human behavior in a desired direction. This study aimed to explore the application of nudge theory and associated instruments in reforming the policy domain of SWM sector. Emphasis was given on the producer-waste interphase where majority of the leverage points relevant to the decision making and behavior change existed. Based on observation and case studies in Nepal along with the review of nudge theory applications in other countries, it was found that applying nudge theory strategies can substantially contribute to reform SWM sector and provide an effective solution of SWM. The findings are expected to be beneficial to planners, policy makers and practitioners in SWM sector.

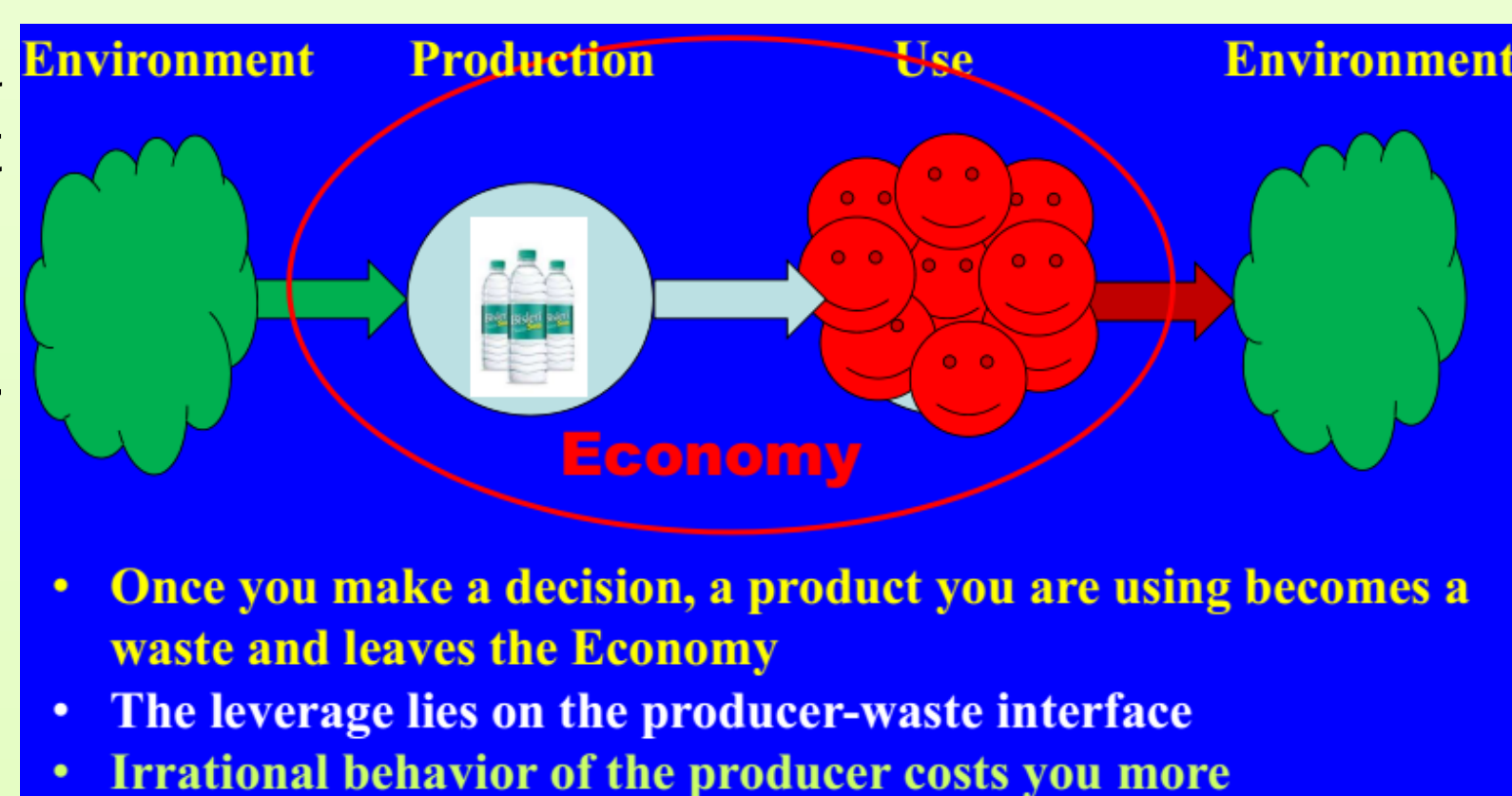
1 Introduction

• Solid Waste Management and Contemporary Issues

Kathmandu, one of the fastest growing metropolitan cities in South Asia (Bakrania, 2015) alone produces 660 g/capita/day of solid waste (Dangi et al., 2010) and more than 65% of the generated waste is organic (UNEP, 2001; Shakya and Khatiwada, 2017). Private companies and non-governmental organizations (NGOs) collect and transfer 30% of MSW, informal scavenging handles 10% of solid waste management (SWM), and the formal recycling is still non-existent in Kathmandu (Dangi et al., 2017). The effort of municipalities and private entrepreneurs alone will not be sufficient for effective SWM. Public participation and cooperation is crucial in this regard for which change in perception and behavior is a must.

• Leverage Points in Solid Waste Management Chain

Leverage points are places within a complex system where a small shift in one thing can produce big changes in everything (Meadows, 1999). Leverage points in SWM chain for managing waste in cost-effective and efficient ways and without causing adverse impact to the environment lie on the producer waste interfaces.



Irrational behavior of the producer costs more (Shakya and Khatiwada, 2017).

• Nudge Theory

Nudge theory states that behavior of individuals can be altered in a predictable way without forbidding any options or significantly changing their economic incentives (Thaler and Sunstein, 2008). In case of solid-waste, either in a work-place or residence, people would prefer to avoid complexity and apply no or little mental efforts in making a choice of disposal. In such instances, individuals are dictated by rule of thumb, mental short-cuts, biases or irrational choices (Lehner et al., 2016). Studies have shown that applying means based on behavioral sciences such as nudge instruments can influence the human behavior and the decision making process (Kallbekken and Sælen, 2013; Rivers et al., 2017). Humans have two systems of thinking: System 1 which is fast (automatic, intuitive) and System 2 which is slow (deliberate, conscious). The majority of governing policies in waste management targets System 2 for bringing desirable changes in human behavior, thus is ineffective. In contrast, nudge tools target System 1, therefore can bring desirable changes in human behavior (Lehner et al., 2016).

2 Materials and Methods

To explore the application of nudge theory and associated instruments in reforming the policy domain of SWM sector, emphasis has been given on the **producer-waste interphase** where majority of the leverage points relevant to the decision making and behavior change exist.

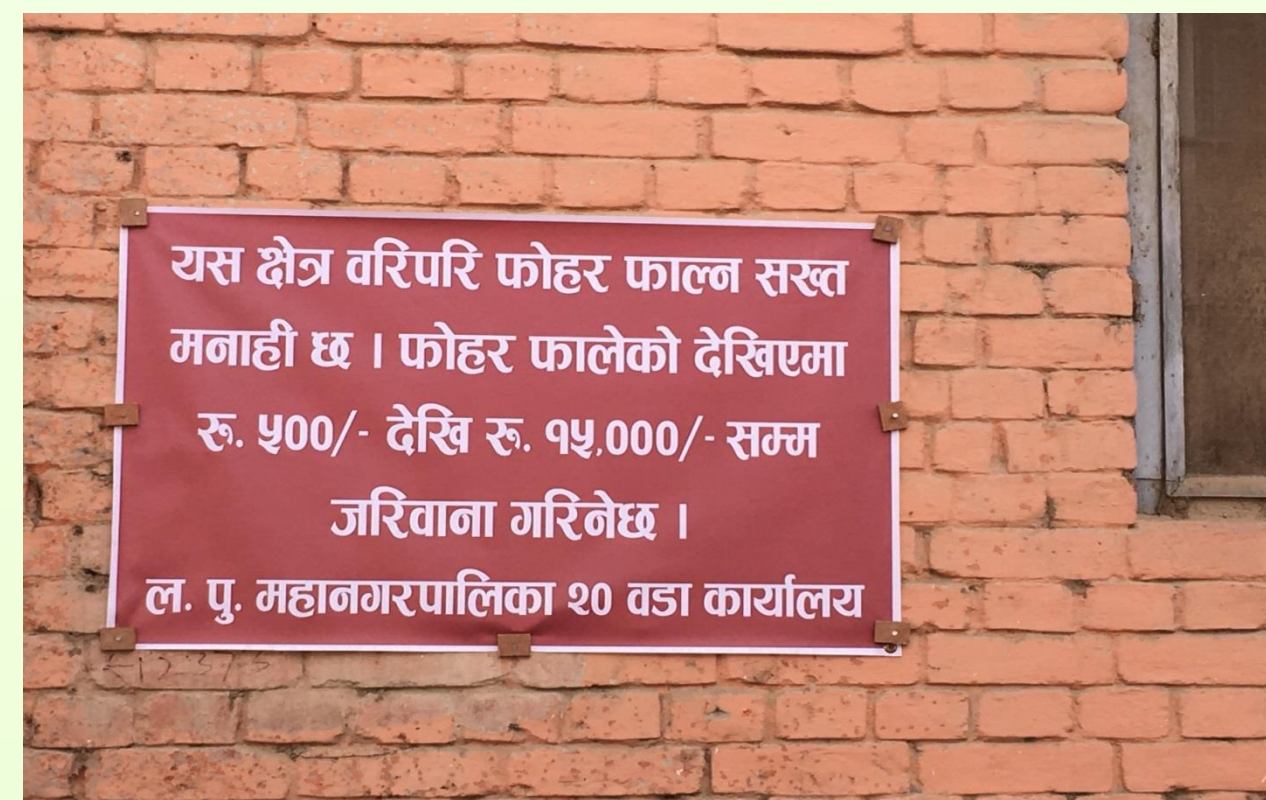
Some specific methodology includes:

- Review of articles and documents
- Observation and Collection of Nudging Instruments used
- Observation and Collection of Traditional Instruments applied

This poster is prepared utilizing the secondary information from various published articles and relevant documents. The information was also collected from different forms of nudging instruments practically used by the government and public authorities in SWM. The observation of notices in hoarding boards in the places where solid wastes are dumped in the city provided some materials to ponder over. This is how the idea was generated for the development of this poster.

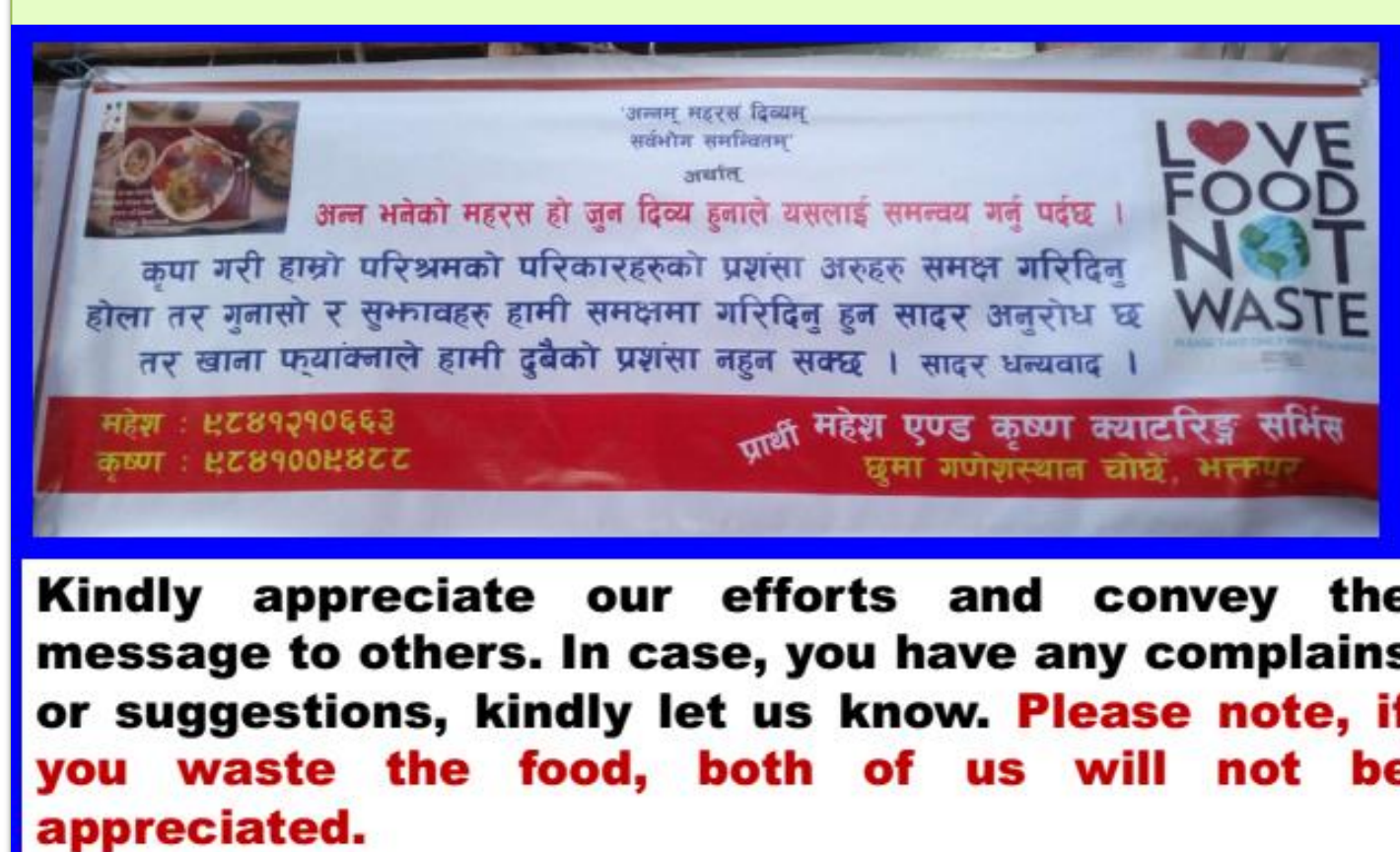
3 Results and Discussion

- **Coersive Policy Instruments:** This includes notice or warnings with obligatory, morally obliged, voluntary and hard words as seen on following pictures:



- **Nudge Theory:** Following table describes four types of mechanisms applicable to SWM which were also applied in other sectors (Lehner et. al., 2016) and the pictures below justify these four mechanism

Nudge mechanism	Application in SWM	Evidence of effectiveness
Simplification and framing of information	Provide information in persuasive way	Banner displayed in a social event ^a
Changes to physical environment	Design of the user-waste interface	Clearly labeled separate bins for disposal
Changes to default option	Segregation as opposed to disposal without segregation	Single sides vs. double sided printing
Use of social norms and belief system	Provide information so that the users are motivated not to litter on the designated places	Replacement of prohibition notice by pictures of god and goddess



4 Conclusions

For the public to cooperate with government and other private companies involved in SWM activities, a change in their behavior and attitude is crucial. Conventionally, the governments use direct methods such as command and control regulation to shape people's behavior which has not been very successful. In order to achieve the goal of behavior change, appropriate nudge tools need to be applied along with coercive instruments. It is evident through some examples that this approach is effective. There are possibilities of reforming the policy domain of SWM sector through wide application of nudge tools with a particular focus on producer-waste interphase.

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