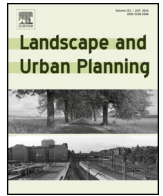




Contents lists available at [ScienceDirect](#)

Landscape and Urban Planning

journal homepage: www.elsevier.com/locate/landurbplan



Research paper

The ethics of working with wicked urban waste problems: The case of Singapore's Semakau Landfill

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HIGHLIGHTS

- The problem of waste has yet to be studied as a wicked problem.
- In the form of a landfill, waste is a spatial problem with many consequences.
- The Semakau Landfill is examined as an extreme solution to this problem.
- No ethical framework completely justifies this extreme solution.
- There is a need to consider the moral limit of solving a wicked problem.

ARTICLE INFO

Article history:

Received 29 January 2015
Received in revised form
16 November 2015
Accepted 29 March 2016
Available online xxx

Keywords:

Ethics
Wicked problems
Urban waste
Urban planning
Semakau Landfill
Singapore

ABSTRACT

Despite alarming predictions that global waste will nearly double to 2.2 billion annual tonnes by 2025, and despite the recognition that waste consumes space, the wicked problem of waste as well as its negative impacts have yet to be systematically examined in planning and environmental design. In urban waste management, the landfill is at once the most visible and spatial sign of this worsening problem. In this article, I examine the case of Singapore's offshore Semakau Landfill as an attempt in large-scale environmental modification—the creation of new land or terra nova in the sea—to accommodate waste. As an unprecedented case of environmental design for urban waste, this case brings up various ethical issues encountered in the framing, 'taming', and 'solution' of this wicked problem. Through this article, I respond to the call for greater insights and knowledge on working with wicked problem in socio-ecological systems today. I explain why ethics is necessary for a better understanding of the wicked problem of waste, which entails not only different adaptive strategies, but also commitments to large-scale environmental design projects. Because wicked problems often demand 'tragic solutions' that imply harm, I also apply different ethical frameworks to understand the implications of the Semakau Landfill as a 'tragic solution'. In all, I argue that the contemporary problem of waste is a wicked problem and how an ethical understanding of this problem can help to avoid the various moral pitfalls of this wicked problem.

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1. Introduction: urban waste—a wicked problem?

"For example, Corpus Christi, Texas, is about to open a 2,000-acre landfill ten miles outside the city, with projections that it won't be filled for one hundred years."

Despite alarming predictions that global waste will nearly double to 2.2 billion tonnes by 2025 (Hoorneweg & Bhada-Tata, 2012), and despite that almost all the cities in the world are struggling to meet their waste reduction targets (Ali, 2006), urban (i.e., munic-

ipal) waste has neither received as much attention as water or energy in city planning (Zaman & Lehmann, 2011), nor has commensurate attention been given to the manifold infrastructures required to contend with this mounting problem.

While the urban waste problem is expressed in the singular here, empirically it is an assemblage of different problems. Different approaches taken to tame (i.e., to better control) this problem presumed different formulations and have led to different consequences, which in turn educe new problems. For example, more venues for recycling have been introduced in order to reduce waste. But this increase in venues for recycling has been observed to lead paradoxically to an increase in resource consumption (Catlin & Wang, 2013). Conversely, to curtail consumption in order to reduce

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<http://dx.doi.org/10.1016/j.landurbplan.2016.03.017>

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waste production is likely to dampen economic growth. On the other hand, instead of reducing waste, waste is moved out of sight. But this results in waste being transported over greater distances (Gandy, 1994), which inadvertently demands more incineration plants and new landfills—all which tend to worsen pollution. Even in this limited example, urban waste simultaneously implicates problems associated with the ‘rebound effect’, economic growth, waste management technologies, and environmental pollution. To the extent that ‘taming’ the problem using these different approaches also alters the original problem, the urban waste problem begins to resemble a “wicked problem” (Rittel & Webber, 1973).

But can the urban waste problem then be characterized as a wicked problem? Beyond the ten characteristics used by Rittel and Webber (1973) to define a wicked problem, recent scholarship further suggests that wicked problems are problems where both definition and the solution to the problem are uncertain and controversial (Durant & Legge, 2006), and where solving the problem at one level exacerbates the problem at another level (Allenby & Sarewitz, 2011). Most importantly, wicked problems are defined precisely by how one looks at them (Termeer, Dewulf, Breeman, & Stiller, 2015), and where every ‘solution’ for a wicked problem is always open to further interrogation and adaptation (Head & Alford, 2015: 716). All these characteristics appear to apply to the urban waste problem. Furthermore, two characteristics of a “super wicked problem” (Levin, Cashore, Bernstein, & Auld, 2012) are also relevant: firstly, that time is running out on finding a sustainable solution for urban waste, and secondly, that by reacting to the most immediate or pressing issues of urban waste, planners also tend to discount the future irrationally. While it is difficult to say just how many of these characteristics will have to apply in order to qualify the urban waste problem as a wicked problem—after all, defining the problem is the problem! (Rittel & Webber, 1973)—the congruity of these characteristics to the urban waste problem is nonetheless telling. Therefore despite inherent openness and instabilities in any final or finite definition of the wicked problem, this congruity lends support to the view that urban waste could be characterized as a wicked problem.

Notwithstanding the lack of a stable and finite definition, the wicked urban waste problem appears to have found closure in the terminus of the (sanitary) landfill. In the landfill, waste and the remnants of waste are finally buried. Recent research suggests that even the ultimate remainder of waste—the landfill itself—can be rehabilitated into an eco-park (see Harnik et al., 2006). Yet the wicked urban waste problem is not so easily buried away. The landfill is not only a contentious space for waste, but it is also the locus of many ethical issues associated with waste. A landfill often rattles nearby residents; it behooves cautious yet artful landscape design as it also necessitates environmental monitoring far into the future. And because we exist in some kind of moral relationship with the natural environment (Light, 2000), where to site a landfill and what to do with a closed landfill involves more than economics and aesthetics—it ought to invoke ethical considerations as well.

In this paper, I examine the case of the Semakau Landfill in Singapore. The Semakau Landfill represents a case where the wicked urban waste problem appears to have been tamed through an act of environmental design. But the design, construction and operation of the offshore Semakau Landfill also implicated many ethical issues. And in referring to this case as ‘wicked’ in the context of ethics, the word ‘wicked’ prima facie should not be taken to connote moral wickedness. Instead, ‘wicked’ is the titular shorthand for the vicious, tricky and aggressive nature of wicked problems (Rittel & Webber, 1973). But dealing with such wicked problems can lead to questionable moral behaviors (Churchman, 1967; Rittel & Webber, 1973). For instance, a problem-solver selectively ‘tames’ only a part of a wicked problem but deceptively pretends that it was the whole (Churchman, 1967), or a problem-solver who delib-

erately treats a wicked problem as if it were a tame one (Rittel & Webber, 1973: 161). These examples then suggest that the ethics of wicked problem at least revolves around the question of how problem-solvers choose to respond to the wicked problem.

Since Churchman (1967) raised the plausibility of such ethical misadventures in wicked problems, interest on understanding ethics and the wicked problem has persisted. However, little work has been done to further explicate this relationship even when ethics is central to how planners as problem-solvers respond to a wicked problem. Recent work in this under-developed area includes efforts on extending Churchman’s original line of inquiry on the moral dimension of wicked problems (Wexler, 2009), and rethinking planning ethics in the context of wicked problem (Chan, 2014). As an unprecedented attempt at environmental design to tackle the urban waste problem, the Semakau Landfill then offers a case replete with further insights into the ethics of wicked problem.

1.1. The 40th anniversary of ‘wicked problem’: questions, significance and an ethic of gravitas on the wicked problem of urban waste

To be certain, recent literature on the ethics of siting hazardous waste facilities exists in planning (Basta, 2014; Boholm, 2004; Hermansson, 2007; Linnerooth-Bayer, 2005; Peterson & Hansson, 2004). But this literature tends to emphasize the environmental and social risks of hazardous waste facility siting—especially for nuclear or toxic chemical waste, rather than municipal or urban solid waste. On the other hand, this literature is also mostly prefaced on issues of NIMBY conflicts (see Hermansson, 2007) and therefore underscores the need for a fair and legitimate process to settle spatial disputes (Linnerooth-Bayer, 2005). In contrast to the moral discourse on waste (see Hawkins, 2006), this literature does not question the alarming phenomenon of rapidly growing urban waste. Furthermore, it has little to say on the ethical issues raised by the specific design features of waste facilities. In other words, this literature presumes that risky waste facilities are inevitable, and moreover, their designs are presumably general or under-specified. And attention mostly revolves around the question of how to think about the ethics of siting if and when these facilities have to be built. Importantly, this literature on a whole does not focus on the environmental impacts of operating these facilities, or what ought to be done with these facilities after they have been decommissioned.

In contrast, this article positions urban waste as the focal point of different spatiotemporal ethical issues. As a response to the call for greater insights and knowledge on working with wicked problems in socio-ecological systems on the 40th anniversary of the publication of “*Dilemmas in a general theory of planning*” (1973), this article aims to highlight the importance of ethics in working with wicked problems in the context of urban waste. To the extent that wicked problems have been recognized as a “sustained social reality” (Xiang, 2013: 2), there is a growing trend not only to accept, but also to adapt to the realities of wicked problems. In his editorial, Xiang (2013) suggests awareness, acceptance and adaptation as three contemporary responses to wicked problems today.

These responses fit well to the growing awareness on the problems of urban waste. Cities today have come to accept that waste – at least for the foreseeable future – is an unavoidable by-product of population growth and urban development. At the same time, there is no real or effective ‘solution’ for the problem of waste. Every ‘solution’ – or more accurately, a ‘fix’ – could be deemed as an adaptive strategy: merely adjusting our socio-technical systems in order to keep up with the problem of waste. Yet acceptance and adaptation in waste management are neither unobtrusive nor neutral. For designing waste management infrastructures – such as the landfill – entails many ethical considerations. Where to site the landfill,

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