Te Whāriki Subdivision, Lincoln, Canterbury, New Zealand. The landscape performance of this subdivision development was assessed using the Landscape Architecture Foundation's Case Study Investigation evaluation framework, revealing its environmental, social and economic benefits (image by Guanyu Chen, April 2021).

LANDSCAPE REVIEW

Why landscape architects should embrace landscape performance evaluation: The 'market' perspective of landscape development

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This paper uses the lens of George Akerlof's 'market for lemons' theory to explore why it is necessary for landscape architects to adopt landscape performance evaluation. This theory, which addresses the degradation of product quality due to information asymmetry and a lack of information, is applied to landscape architecture to highlight similar underlying challenges in the discipline and the industry. The lack of practices assessing the actual performance of built landscape projects prevents landscape architects from explicitly and persuasively communicating their true value to clients, resulting in a 'market' saturated with low-investment projects that focus on low-value aspects of landscape architects' work – or 'lemons'. Here we argue that implementing performance evaluation can mitigate these issues by providing empirical evidence of project benefits, thereby reducing information asymmetry and increasing the information available, and fostering a market for high-quality landscape projects – or 'peaches'. We argue that by embracing performance evaluation, landscape architects can enhance the transparency of their projects' performance and contribute to the disciplinary rigour. This shift is crucial for the profession's growth and its ability to address contemporary environmental and socio-cultural challenges effectively.

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Introduction: The market for 'lemons'

In a well-known paper, 'The market for "lemons": quality uncertainty and the market mechanism', economist George Akerlof (1978) discussed the mechanism that leads to the degradation of the quality of goods in a market due to information asymmetry. He pointed out that in a poorly regulated market with information asymmetry, 'lemons' tend to dominate unless external interventions are introduced (Akerlof, 1978). This research achievement was awarded the Nobel Prize in Economic Sciences in 2001.

A 'lemon', in American slang, refers to a car that a buyer finds to be defective after purchasing it. In contrast, a car of high-quality is a 'peach'. In his paper, Akerlof (1978) uses the market for second-hand cars as an example to explain how information asymmetry affects the market. In a market with information asymmetry, buyers are unable to make a distinction between a 'peach' and a 'lemon'. Although sellers know whether they are selling a 'peach' or a 'lemon', due to the lack of widely recognised practices and techniques for evaluating a car, they cannot prove to their buyers that the higher-priced car is a 'peach'. Therefore, the buyers are only willing to pay the fair price of a 'lemon' to reduce the risk of overpaying. As a result, the sellers holding a 'peach' tend to leave the market, and 'lemon' sellers will take that share. This in turn will cause a decline in the average quality of cars in the market, as well as reducing the size of the market. With the decreasing average quality of cars in the market, the average cost that buyers are willing to pay will be lowered. This reinforcing feedback loop will eventually lead to the collapse of the market.

The 'soil' for 'lemon' landscapes

According to Akerlof (1978), the phenomenon of the 'market for lemons' exists in a wide range of immature markets, where information is asymmetrical between buyers and sellers. Coincidentally, landscape architecture is a field where information asymmetry is

playing a role in its 'market', posing challenges. According to Megan Barnes (2019), the program manager of the Landscape Architecture Foundation's Case Study Investigation Program, based in the United States, the landscape architecture profession is not 'adept' enough at reporting project performance and the benefits that its work can offer.

As Barnes (2019) explains, many landscape architects know that their project can achieve positive results at a general level, such as sequestering carbon, harvesting, cleaning and reusing stormwater, and reducing energy consumption, but they are often unable to answer questions about how much water has been collected, cleaned and reused, or to what extent the water quality has been improved as a result of their design interventions. The way landscape architects communicate the value of their works is often through describing 'features', rather than 'benefits'. Yet their clients, who are most often non-specialists, understand 'benefits' better than 'features'.

Similar to the market for second-hand cars, in the market for landscape architecture, the sellers (that is, landscape architects or their firms) understand the values that their work could deliver, but due to the lack of techniques, cost of the evaluation and other reasons, they have difficulty proving and communicating the value of their work to their clients. Clients, therefore, only set their sights on 'lemons' or low-value aspects of landscape architects' work.

It has been widely observed that built landscape architecture projects have rarely been evaluated to understand and demonstrate their benefits (Arnold, 2011; Bowring, 2020; Carmona and Sieh, 2005, 2008; Chen, Bowring and Davis, 2021, 2023; Doidge, 2001; Hiromoto, 2015; Laurian et al, 2010). Despite claims that various functional features form a part of their design interventions, most built projects have never provided any evidence to prove that their designs are really achieving the declared benefits. In New Zealand, even the projects that have received the New Zealand Institute of Landscape Architecture (NZILA) sustainability award, which are expected to demonstrate strong functional benefits, have seldom been evaluated systematically after their completion. As a result, in the publicly accessible materials of those projects, a typical way of communicating their design benefits is similar to describing their design intents – all the statements were about their *expected benefits*, but not the *evaluated actual effects* of their design interventions.

Waitangi Park, for example, was a recipient of the NZILA Sustainability Award of Excellence in 2008. It was one of the few award-winning New Zealand projects that have been assessed for their actual performance. Yet the evaluations did not assess its contribution in areas such as water conservation, biodiversity and reduction in energy consumption, even though Waitangi Park has a strong focus on sustainability and claims that the design contributes to all of these areas. A compelling way of communicating the values of such projects would be to support such functional claims with empirical evidence, but in all the publicly accessible documents and on relevant webpages, the contributions to sustainability are communicated in a similar way to describing design intents. It offered no empirical evidence proving the project's contribution to sustainability and, further, no data to show how much or to what extent it has contributed to sustainability.

This lack of empirical evidence is also a key driver leading to information asymmetry between landscape architects and their clients, users or any other interested groups. This driver tends to push 'peaches' out of the landscape architecture market and contribute to a collapse of the market. Without a doubt, the market for landscape architecture is a complex system, and many other forces are also driving the market. Many of those forces may be able to counteract the negative impacts that result from information asymmetry. Therefore, under the joint action of all the driving forces, the system of the market will eventually reach a balance and not necessarily lead to a market collapse as Akerlof's theoretical analysis suggested. However, according to Akerlof's theory and Barnes's observation, information asymmetry has to have, and has been having, negative impacts on the landscape architecture market.

In addition to information asymmetry, an even more problematic driver with negative effects on the landscape architecture market is a lack of information. In contrast to the scenario of information asymmetry, lack of information means that the 'sellers' (that is,

landscape architects or their firms) in the landscape architecture market do not even have a sense of whether their works are performing as they were expected to or not, other than that some generic research shows that they should, or landscape architects' experience tells them they should.

As Barnes (2019) explains, there are many claims in the industry that landscape interventions improve water and air quality, sequester carbon, improve safety, enhance social wellbeing and achieve other benefits. A substantial amount of research supports these claims. However, the research is seldom for specific built projects. Therefore, landscape architects, in many cases, have no sense of whether their design interventions are effective or not in the specific contexts of those projects. In a worst-case scenario, the projects could even have negative effects that go unnoticed.

Performance evaluation as a catalyst for a market for 'peaches'

As discussed, the main reasons that lead to the market for 'lemons' are information asymmetry and a lack of information. The most obvious solution is to evaluate completed projects to get more information about the performance and effectiveness of landscape interventions, and thus reduce information asymmetry and increase the information available. Although it is inevitable that information asymmetry will always exist to some extent, evaluating completed projects could help to minimise the negative impacts that result from it.

From a historical perspective, the growth of the landscape architecture profession and discipline has resulted in the emergence of issues about the lack of information. At the early age of the profession (from antiquity to the 1900s), 'landscape architecture' practices were often associated more with aesthetics, power showcasing, and culture, rather than functionality and sustainability. It is only since the 1960s that functionality and sustainability have gradually become among the main areas of focus for the discipline.

As the landscape architecture discipline is still young in the field of functionality and sustainability, it is natural that little attention has been paid to the actual performance of landscape projects. However, the discipline is maturing, especially in the 2020s, with landscape architecture now recognised and designated as a science, technology, engineering and mathematics (STEM) discipline (American Society of Landscape Architects, 2023; Brodka, 2023; Niland, 2023). In this context, it can be expected that increasingly more attention will be paid to investigating the actual performance of landscape practices, and in that way offering empirical evidence and helping to restore and preserve a market for 'peach' landscapes.

In addition to the macro perspective of the history of the discipline, viewing the issue from various micro-level angles contributes to an understanding of the barriers hindering the implementation of performance evaluations. For example, practical barriers identified include a lack of funding and motivation, the potential risks from negative evaluations, and insufficient knowledge and skills in conducting an evaluation (Arnold, 2011; Bordass, Leaman and Ruyssevelt, 2001; Hadjri and Crozier, 2009; Lackney, 2001; Marcus et al, 2008; Roberts et al, 2019; Zimmerman and Martin, 2001). However, recent research has also identified enablers that can help overcome these barriers (Chen et al, 2021). Exploring these enablers revealed promising pathways for creating a more supportive environment for evaluation practices in this evolving era of landscape architecture (ibid).

In essence, the landscape architecture profession is standing at a pivotal juncture, where landscape performance evaluation can reshape the 'market' dynamics. The term 'landscape performance evaluation' (lower case) here serves as an umbrella concept encompassing a range of evaluation activities that are typically conducted to investigate how landscape designs function in their built form, measure their success, learn from the past, inform future practices and provide evidence for value communication. This umbrella concept covers a wide range of practices, which include:

- Landscape Performance Evaluation, which is often used to denote the evaluations conducted following the Landscape Architecture Foundation's Case Study Investigation evaluation framework or other similar evaluation practices that adopt a holistic approach
- post-occupancy evaluation, which is commonly used in environmental design and planning disciplines to understand and evaluate how a built project functions in reality after it is constructed and occupied and/or how users engage with and value it
- other evaluation practices in the landscape architecture and allied fields, encompassing activities covered by terms that are less commonly used in practice and communication, such as environmental audit, environmental design evaluations and facility assessment.

By addressing information asymmetry and the lack of information through rigorous evaluation practices, landscape architects can enhance transparency and build trust with clients. This evolution towards a market for 'peaches' not only safeguards the profession's integrity but also positions it for sustained growth in an increasingly complex environment. As the discipline advances, embracing a culture of continuous evaluation will undoubtedly pave the way for a flourishing 'market' that recognises and rewards the true value of landscape solutions.

Limitations and contributions of the analogy

While this paper draws on the 'market for lemons' to highlight issues in the landscape architecture discipline and industry, it is important to acknowledge several limitations inherent in this analogy.

First, the comparison between the market for second-hand cars and the market for landscape architecture developments rests on a vast simplification. The 'market' for landscape architecture projects is significantly more complex, involving a broader range of stakeholders, contextual variables and intangible values that do not directly parallel the relatively straightforward transaction of purchasing a vehicle. While Akerlof's theory provides a useful framework for understanding the effects of information asymmetry, it does not account for the full spectrum of factors influencing the landscape architecture 'market'. Other factors, along with the mechanisms discussed in this paper, may collectively shape the 'market' dynamics of the industry. In using the analogy, this paper does not aim to exhaustively map the terrain of the 'market' dynamics but, rather, aims to provide a theoretical lens for understanding one aspect of the complex system. Future studies that further explore these dynamics and comprehensively map the terrain will be instrumental in building understanding of these dynamics.

Second, the application of economic theories to landscape architecture is relatively novel and, therefore, not yet fully integrated into the discipline's theory framework. Given this distance between economic theory and landscape architecture practice, some specific insights from studies on the 'market for lemons' may not be directly applicable or be able to solve the unique challenges facing landscape practitioners and researchers.

However, the concept of the 'market for lemons' addresses the fundamental underlying logic of the impacts of information asymmetry and a lack of information, which remains valuable in any context with products and clients. We believe, therefore, that such an analogy is valuable and can potentially provoke new thoughts and catalyse further conversations.

Overall, in this paper we have not intended to provide concrete solutions to or direct criticism of current practices within the landscape architecture discipline. Instead, our primary goal is to offer a new perspective on understanding the underlying logic of the landscape architecture 'market' and to emphasise the potential role of performance evaluation in enhancing transparency and disciplinary rigour. The analogy is intended to serve as a conceptual bridge to encourage fresh thinking and dialogue rather than providing a definitive guide to how to resolve the identified issues.

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