

Capitalised Amenity Value of Urban Stream Rehabilitation in Perth, Australia

Polyakov, M.*, Zhang, F.*, Fogarty, J.* and Pandit, R.*

*School of Agricultural and Resource Economics, The University of Western Australia, Crawley, WA 6009, Australia

Keywords: economic valuation; urban stream rehabilitation; spatial hedonic model

Summary of key findings

This study estimates the value of amenity benefits generated by urban stream rehabilitation in Perth suburb of Lynwood using hedonic pricing method. We analysed property sales data from 1990 to 2013 in the six suburbs adjacent to the “living stream” restoration site. Given extensive earth works involved in the construction of living stream and time required for the vegetation to become established, the positive impact on property prices did not appear until about four years after the site was restored. After eight years of restoration the house prices increased by a range of \$17,000 (4%) to \$26,000 (6%) per median house, in addition to the general price trend in the area. Integrated cost-benefit analysis of this living stream project suggests the investment is worthwhile.

Background and relevance

Many urban streams have been cleared of native vegetation and converted to open drains. These drains are effective in flood mitigation, but have been designed without consideration of ecological and aesthetic functions. There is a growing recognition of the importance of these functions and work is being done to restore urban drains and create fully functioning wetland ecosystems (“living streams”). As such restoration involves substantial cost, it is important to know value of the benefits generated by “living streams”. However, no peer-reviewed study has explored amenity values of urban stream restoration in Australia. To fill the knowledge gap, this study takes one “living stream” project in the Perth suburb of Lynwood, Western Australia (called “Bannister Creek living stream”) as a case study to estimate the monetary value of the aesthetic benefits of the living stream and whether such a project worth investment. The Bannister Creek Living Stream project was initiated in response of the community to the pollution of the waterway. The main goal of the project was to convert the open drain section of Bannister Creek to a functioning ecosystem, while maintaining the function of conveying stormwater from the catchment to Canning River (Bannister Creek Catchment Group, 2010).

Results

We analyse the amenity value of the Bannister Creek living stream using hedonic pricing method. Hedonic pricing method assumes that a residential property is a differentiated good and that its value is a function of the characteristics of a property including structural attributes and neighbourhood, accessibility, or location specific characteristics (Rosen, 1974). We use the property sales data from 1990 to 2013 in the six suburbs adjacent to the living stream site. We assume that the properties within 200 m of the living stream are influenced by the living stream. Out of 16,553 sales observations in the six suburbs during the study period, 339 are within 200 m of living stream, including 175 sales after year 2000 when the project started.

We estimate two hedonic models. First is the hedonic model with temporal (year-quarter) and spatial (SA1) fixed effects. Due to multiple sales of individual properties during the study period, error terms of observations of these properties are correlated (Greene, 2002). Therefore the property-specific random effects are also considered in this model. Second model uses the repeated sales approach. Instead of group fixed effects, we use property-specific fixed effects, which allow using only observations for properties with more than one sale.

Given extensive earth works involved in the construction of living stream and time required for the vegetation to become established, the positive impact on property prices did not appear until about four years after the site was restored. After eight years of restoration the house prices increased by approximately (4.4%) per median house, in addition to the general price trend in the area. Using 7% discount rate, the benefit cost ratio of the living stream project is 2.5, which indicate the project is worthwhile when only amenity value is considered.

Discussion

This study estimated the amenity value of one urban stream rehabilitation projects, taking the Bannister Creek living stream project in Perth, WA as a case study. It is the first time that the economic value of amenity benefits of a living stream project has been quantitatively estimated in Australia. The value of living stream has been capitalised into the sale prices for those houses within 200 m of the living stream. The effects of living stream have been modelled using two different hedonic models: random effects and repeat sale models. For each of the hedonic model considered in this study, the value estimations of the living stream are consistent. From an integrated cost-benefit analysis of the Bannister Creek living stream project, the estimated amenity benefits for the community that have the living stream nearby in terms of increased house sale prices could easily outweigh the overall costs.

References

This is a style for references (9pt Arial).

Bannister Creek Catchment Group, 2010, Bannister Creek Reserve Living Stream. www.sercul.org.au/bccgproject.html, accessed: 6 March 2014.

Rosen, S., 1974, Hedonic prices and implicit markets - product differentiation in pure competition, *Journal of Political Economy* 82(1):34-55.

Greene, W., 2002, *Econometric Analysis*, Prentice-Hall, Englewood Cliffs, NJ.