

INTERNATIONAL
CENTER FOR
PUBLIC POLICY

—

WITHIN THE
PUBLIC FINANCE
RESEARCH CLUSTER

No Local Penalty: Proximity to a Planned Water-Reuse Scheme and Public Acceptance

Evidence from Barbados

Alberto Chong
Marco D'Errico

October 2026



ANDREW YOUNG SCHOOL
OF POLICY STUDIES

Tel: 404-413-0233

Website: pfrc.gsu.edu

Address:
55 Park Place NE
7th Floor
Atlanta, GA 30303

Mail:
Public Finance Research Cluster
P.O. Box 3992
Atlanta, GA 30302-3992

International Center for Public Policy Andrew Young School of Policy Studies

The Andrew Young School of Policy Studies was established at Georgia State University with the objective of promoting excellence in the design, implementation, and evaluation of public policy. In addition to four academic departments, including economics and public administration, the Andrew Young School houses nine leading research centers, including the International Center for Public Policy.

The mission of the International Center for Public Policy (ICePP) is to provide academic and professional training, applied research, and technical assistance in support of sound public policy and sustainable economic growth in developing and transitional economies.

ICePP is recognized worldwide for its efforts in support of economic and public policy reforms through technical assistance and training around the world. This reputation has been built serving a diverse client base, including the World Bank, the U.S. Agency for International Development (USAID), the United Nations Development Programme (UNDP), finance ministries, government organizations, legislative bodies, and private sector institutions.

The success of ICePP reflects the breadth and depth of its in-house technical expertise. The Andrew Young School's faculty are leading experts in economics and public policy and have authored books, published in major academic and technical journals, and have extensive experience in designing and implementing technical assistance and training programs. Andrew Young School faculty have been active in policy reform in over 70 countries around the world. Our technical assistance strategy is not merely to provide technical prescriptions for policy reform, but to engage in a collaborative effort with host governments and donor agencies to identify and analyze the issues at hand, arrive at policy solutions, and implement reforms.

ICePP specializes in four broad policy areas:

- Fiscal policy (e.g., tax reforms, public expenditure reviews)
- Fiscal decentralization (e.g., reform, intergovernmental transfer systems, urban finance)
- Budgeting and fiscal management (e.g., local, performance-based, capital, and multi-year budgeting)
- Economic analysis and revenue forecasting (e.g., micro-simulation, time series forecasting)

For more information about our technical assistance activities and training programs, please visit our website at icepp.gsu.edu or contact us at paulbenson@gsu.edu.

No Local Penalty: Proximity to a Planned Water-Reuse Scheme and Public Acceptance

Evidence from Barbados

Alberto Chong and Marco D'Errico*

October 2026

Abstract

Public acceptance is a potential constraint on water-reuse infrastructure, but much survey evidence elicits attitudes toward hypothetical or broadly framed reuse. Facility-siting research suggests that general support can fall when a project becomes local, while water-reuse research emphasizes trust, perceived risk, benefits, and context. We examine whether a local penalty appears in a knowledge–attitudes–practices survey of 1,069 households across 30 enumeration districts in Barbados. Some communities were purposively selected because they were proximate to a planned reclaimed-water scheme; comparison communities were drawn island-wide. We estimate conditional differences and assess sensitivity to covariate imbalance, geographic composition, and selection into a project-specific question. We find no evidence of a local penalty. The personal-use willingness gap is positive in every specification (0.11–0.20 standard deviations), although imprecisely estimated; the preferred estimate rules out a negative gap larger than about 0.08 standard deviations. The clearest difference is support for the local treatment-plant upgrade: among respondents aware of the upgrade, the standardized gap is 0.53 standard deviations, with Lee bounds of 0.37–0.68 under monotonic selection into the awareness-conditioned item. Abstract reuse beliefs and generic environmental and institutional attitudes are flat. Proximity raises subjective knowledge by 0.21 standard deviations but leaves objective knowledge unchanged, suggesting greater salience or familiarity. The evidence points to a local acceptance pattern specific to the concrete facility.

Keywords: water reuse, public acceptance, NIMBY, psychological distance, Barbados

JEL Codes: Q25, Q53, R52, D83, O13

* Chong (achong6@gsu.edu): Department of Economics, Georgia State University, Atlanta GA, USA and Department of Economics, Universidad del Pacífico, Lima, Peru; D'Errico (mderrico@gcfund.org) Independent Evaluation Office, Green Climate Fund, Songdo Business District, South Korea.

We are grateful to Michell Dong, Susumu Yoshida, and Luisa Zanforlin for comments and suggestions and to Young-Yun Choi for excellent research assistance. All remaining errors are ours.

1. Introduction

Water-scarce economies increasingly rely on treated-wastewater reuse to diversify supply, but engineering feasibility does not by itself determine whether reuse can be implemented. Research on public acceptance emphasizes perceived health and environmental risk, disgust, trust in water institutions, perceived benefits, and the characteristics of the water source, treatment technology, and end use (Fielding, Dolnicar and Schultz, 2019; Ross, Fielding and Louis, 2014; Al-Saidi, 2021). Much of the survey evidence, however, asks respondents about reuse in the abstract or about hypothetical uses. That does not make the evidence irrelevant to siting, but it leaves open a distinct question: does support change when reuse becomes a concrete facility in one's community?

Facility-siting research gives reason to expect a local penalty. Residents may support an infrastructure technology in principle while opposing a particular project because its costs are spatially concentrated, because it threatens valued places, or because they distrust the process through which the site was chosen. But the label “Not In My Backyard” (NIMBY) is not itself a satisfactory explanation. Scholars have criticized NIMBY as a pejorative and overly simple description of heterogeneous local objections, emphasizing place attachment, perceived impacts, procedural fairness, and institutional trust instead (Burningham, 2000; Wolsink, 2000; Devine-Wright, 2009, 2011). At the same time, experimental and theoretical work shows that self-interest and concentrated local costs can matter in siting decisions (Esaiasson, 2014; Foster and Warren, 2022). We therefore treat a proximity penalty as an empirical hypothesis, not as a maintained theory of local opposition.

Water-reuse infrastructure is a particularly useful setting for this question because the local balance of costs and benefits is ambiguous. A treatment-plant upgrade can impose construction, odor, traffic, or perceived health costs, but it can also improve wastewater management and generate locally relevant benefits through irrigation and groundwater recharge. Recent research on wastewater-treatment facilities finds that site-visit experience and public access can increase acceptance, while recent evidence from small communities finds that prior exposure to reuse is associated with lower perceived risk and greater acceptance (Liu et al., 2024; Wang et al., 2026). These findings suggest that making infrastructure concrete need not produce opposition; it may instead increase familiarity, perceived benefits, or confidence. The direction of the local gap is therefore genuinely ambiguous.

We test this question using a knowledge–attitudes–practices survey of 1,069 households across 30 enumeration districts in Barbados. Some communities were selected because of their proximity to a planned reclaimed-water scheme, making reuse a concrete local prospect; a comparison group was drawn from elsewhere on the island, where reuse remained a broader policy idea. The contrast is informative because it changes the salience and local relevance of the project, but it is not randomized. We therefore estimate conditional gaps and examine sensitivity to demographic imbalance, parish composition, and selection into the survey's project-specific question.

The analysis is organized around outcomes that range from local-facility-specific acceptance to more general attitudes. If proximity creates a local penalty, the most direct outcomes should become less favorable. If concreteness instead increases familiarity or perceived local benefits, project-specific support could rise while abstract beliefs remain unchanged. The design therefore asks not only whether proximate households are more or less supportive, but also whether any difference follows a gradient with the closeness of the outcome to the physical project.

Four findings emerge. First, we find no evidence of a local penalty. The personal willingness index is higher among proximate households in every specification, although no estimate is precise enough to establish a positive effect; the preferred confidence interval rules out a negative gap larger than about 0.08 standard deviations. Second, support for the local treatment-plant upgrade is substantially more intense among proximate respondents: 76 per cent strongly agree that the upgrade is a good idea, compared with 48 per cent of comparison respondents, a standardized gap of 0.53 standard deviations. This item was administered only to respondents already aware of the upgrade, so we report Lee bounds for the differential selection created by the survey's skip logic. Both bounds remain positive.

Third, the remaining outcomes are essentially flat. Abstract beliefs about the benefits of reuse, interest in a training program, stated participation, and seven broader environmental and institutional attitudes show no systematic proximity pattern. This concentration of the difference on the local facility is difficult to reconcile with a broad claim that proximate communities are simply more pro-environmental, more engaged, or more trusting. Fourth, proximity raises subjective knowledge by 0.21 standard deviations but leaves a ten-item objective knowledge index unchanged. The pattern is consistent with greater salience or familiarity without measurable factual

learning; it should not be interpreted as evidence that proximity or consultation actually increased knowledge.

The paper makes three contributions. First, it brings the abstract-versus-local distinction from facility-siting research into the water-reuse literature and shows that a planned local facility need not generate the negative proximity gap implied by a simple NIMBY account. Second, it shows that the local response is highly specific: the strongest difference occurs on the attitude that refers most directly to the facility, while general reuse beliefs remain unchanged. Third, it highlights an empirical complication created by conditional survey administration. The sharpest project-specific outcome is observed only among respondents aware of the upgrade; we make that selection explicit and use bounds to show how much the estimate could change under differential selection. Throughout, the paper treats these results as descriptive evidence about a particular stage of a particular siting process, not as a causal estimate of the effect of locating a reuse facility nearby.

2. Related Literature

Research on water-reuse acceptance has converged on a set of recurring influences: perceived health and environmental risk, disgust and contamination intuitions, trust in water institutions, perceived benefits, knowledge, social norms, and the source, treatment technology, and end use of the water (Po et al., 2003; Russell and Lux, 2009; Rozin et al., 2015; Wester et al., 2015; Ross et al., 2014; Fielding et al., 2019; Al-Saidi, 2021). Acceptance also varies systematically with the degree of human contact: support is generally higher for irrigation and other non-potable uses than for uses involving ingestion or close household contact. This literature is valuable for understanding why people accept or reject reuse, but it says less about whether acceptance changes when a scheme becomes physically local.

A small spatial literature begins to address that gap. Redman et al. (2019), for example, find differences in potable-reuse acceptance across urban, suburban, and rural residential identities in northern Nevada, while recent work on small communities emphasizes the roles of prior exposure, drought experience, perceived benefits and risks, trust, and knowledge (Wang et al., 2026). Research on existing wastewater-treatment facilities likewise suggests that direct experience can increase acceptance under some conditions (Liu et al., 2024). These studies establish that spatial context and experience matter, but they do not provide a clean test of whether living near a planned reuse facility creates a local acceptance penalty relative to otherwise broader public attitudes.

Facility-siting research often begins from the divergence between aggregate support and local response. The NIMBY label captures the intuition that residents may favor a socially useful facility in principle but resist locating it nearby because local costs are concentrated. Yet the label is contested. Burningham (2000) argues that researchers should not treat NIMBY as an explanation for local objections because it obscures heterogeneous concerns; Wolsink (2000) similarly questions simple proximity-based accounts and emphasizes institutional processes. Place-attachment research instead highlights the fit between a project, and the meanings residents attach to a location (Devine-Wright, 2009, 2011), while work on procedural justice and trust emphasizes how the fairness and credibility of the siting process shape acceptance. At the same time, Esaiasson (2014) finds evidence that self-interest can matter in reactions to facility siting, and Foster and Warren (2022) show formally how concentrated local costs can generate opposition when compensation and bargaining are imperfect. We therefore use “local penalty” as a narrow empirical hypothesis, not as a complete theory of NIMBYism. The relevant test is whether households in communities proximate to a planned reuse scheme are less favorable on outcomes that concern the project. A negative gap would be consistent with the classic backyard prediction; a zero or positive gap would show that proximity does not, in this setting, translate into lower stated acceptance. The survey does not observe protests, bargaining, procedural fairness, place attachment, or perceived local externalities, so the paper does not attempt to identify which underlying theory of local opposition is correct. Recent evidence from previously hosted infrastructure likewise shows that familiarity and local experience can be associated with greater acceptance (Dei et al., 2026).

A second perspective concerns what happens when an abstract technology becomes concrete. Construal-level theory argues that psychological distance changes how people mentally represent an object: more distant objects are represented more abstractly, whereas psychologically closer objects receive more concrete and feasibility-oriented consideration (Trope and Liberman, 2010). Related work on place and infrastructure suggests that local experience can change the meaning of a project, sometimes increasing acceptance when the project fits local identity or provides valued benefits (Devine-Wright, 2011). Recent evidence that site-visit experience can increase acceptance of wastewater-treatment facilities points in the same direction (Liu et al., 2024). These perspectives do not imply that proximity must increase acceptance. They imply instead that proximity may change which aspect of a project matters. A local facility should be more salient

than an abstract reuse policy, so any proximity difference may be largest for the most facility-specific outcome and smaller for general beliefs about reuse. Our outcome set is designed to examine this gradient descriptively. We also compare subjective and objective knowledge: if proximity mainly provides information, both should rise; if it primarily increases salience or familiarity, subjective knowledge may rise without a corresponding increase in factual knowledge.

The empirical analysis therefore distinguishes three questions. First, is there a local penalty on facility-specific acceptance? Second, if not, is any positive difference confined to the most concrete project-related outcome instead of general attitudes toward reuse? Third, does proximity appear to change information, familiarity, or salience? The answers are informative even without causal identification because the comparison shows whether the standard proximity prediction is visible in this setting and whether any difference is broad or project specific.

3. Setting, Data, and Design

Barbados is among the world's most water-scarce countries on a per-capita basis, with renewable internal freshwater resources well below the conventional threshold of 500 cubic meters per person per year for absolute water scarcity (World Bank, 2023). There is no significant perennial surface water; supply is drawn from a coral limestone aquifer exposed to over-abstraction and saline intrusion. The island is expanding wastewater treatment and building distribution for reclaimed water to be used in irrigation and aquifer recharge.

The survey analyzed here was fielded as the baseline of an evaluation of that program, and its sampling supplies our contrast. Communities were selected into the program group because of their proximity to the planned scheme: for their residents, reclaimed water is a facility that will be built nearby, with construction, consultation and physical infrastructure in prospect. The comparison group was drawn from communities elsewhere on the island, for whom reuse is an island-wide policy idea. The survey therefore provides a contrast between concrete local exposure and more general island-wide exposure, which is the distinction motivating the siting and construal literatures.

The survey was administered face-to-face using computer-assisted personal interviewing, which enforced the questionnaire's skip logic, with one adult answering for each household. The realized sample is 1,069 households across 30 enumeration districts in four parishes: 520 in the proximate group and 549 in the comparison group, with 15 enumeration districts in each. The file was audited

before analysis and contains no duplicate identifiers, universal recorded consent, internally consistent skip patterns and no contradictory multiple-response combinations. Standard errors cluster on the 30 enumeration districts throughout, with wild-cluster bootstrap p-values for headline coefficients (Cameron and Miller, 2015; Roodman et al., 2019).

One feature of the geography is consequential. The proximate group is concentrated overwhelmingly in a single parish, St. Michael, while two of the four parishes appear only in the comparison group. Proximity is therefore partly a cross-parish contrast, which means parish fixed effects absorb part of the very variation that defines exposure and will tend to attenuate any gap. We report estimates with and without them, and separately within St. Michael, where both groups are present.

We classify outcomes by how directly they refer to the local project. This is an organizing device, not a claim that the outcomes form a single psychological scale. The local treatment-plant item is the most direct measure of project-specific acceptance. The personal-use willingness index is a broader measure of individual willingness to use reclaimed water and is therefore informative but secondary, because the planned scheme supplies reclaimed water primarily for irrigation and groundwater recharge. Project-specific outcomes are support for the local treatment-plant upgrade, the personal-use willingness index formed as the mean of four items asking whether the respondent would use reclaimed water if it were reliable, safe, inexpensive, or delivered through a separate pipe and stated interest in a water-related training program. The first is a direct siting-attitude measure; the latter two capture individual engagement with reuse more generally.¹

Table 1 summarizes the realized sample and baseline balance between the proximate and comparison groups.

Table 1. Sample Composition and Balance

	Proximate	Comparison	Difference	p-value	Norm. diff.
Households	520	549	—	—	—
Enumeration districts	15	15	—	—	—
— Parish composition —					
St. Michael	497	388	—	—	—

¹ Notice that the corresponding Cronbach's $\alpha = 0.91$

St. George	23	39	—	—	—
St. James	0	39	—	—	—
St. Thomas	0	83	—	—	—
— Baseline characteristics —					
Female respondent	0.542	0.514	+0.029	0.295	+0.057
Age (years)	54.7	55.4	−0.66	0.568	−0.038
Post-secondary education or above	0.271	0.384	−0.113	0.042	−0.243
Adults in household	1.94	1.77	+0.170	0.042	+0.158
Any farming	0.138	0.142	−0.004	0.888	−0.010
Water interruption, past month	0.067	0.082	−0.015	0.511	−0.056

Notes: Standard errors clustered on 30 enumeration districts. The normalized difference is the mean difference scaled by the square root of the average of the two group variances. The groups differ on education and household adult count, motivating the covariate adjustment and entropy balancing. The education variable combines the survey's post-secondary and tertiary categories; 47 respondents reporting “other,” “prefer not to say,” or “don’t know” are coded zero. Using the survey's tertiary category alone gives a difference of −0.061 ($p = 0.152$) and a normalized difference of −0.157. Section 6.2 shows that the main estimates are insensitive to this definition.

General reuse and engagement outcomes concern reuse as a policy: whether reuse helps farmers, protects the ocean, or will be used by others, and the number of distinct substantive ways respondents can name for the public to participate in water governance. A separate diagnostic battery measures broader attitudes that are not specific to the reuse project: expectations of future water shortfalls, judgements that water is scarce and overused, belief that stresses to water resources exist, scepticism that climate change affects water, grievance about water-sector management, and the belief that infrastructure schemes mainly benefit the well-off. Since these outcomes are measured in the same cross-section, we use them as diagnostic benchmarks for whether the proximity gap extends beyond the project itself. Finally, we measure objective knowledge with a ten-item index of factual and recognition questions about water and reuse, and subjective knowledge with respondents' own ratings of how well informed they are. The contrast helps distinguish greater factual learning from greater salience or familiarity.

The item on support for the treatment-plant upgrade carries our largest estimate, but it was not asked to everyone. The 202 respondents who received it are exactly those who reported being aware of the upgrade: administration was conditional on awareness. Given that awareness could itself be related to proximity, conditioning on this item can induce selection into the observed

outcome. Two features make the selection problem assessable. First, awareness rates are similar across groups: 20.0 per cent of proximate households and 17.9 per cent of comparison households report awareness, a 2.4-percentage-point difference that is not statistically distinguishable from zero ($p = 0.41$ with parish fixed effects). Second, we compute Lee (2009) bounds for the differential selection that remains, trimming the more-selected group at the implied rate of 10.7 per cent.

The resulting bounds are reported below. It is important to take into consideration that the Lee exercise should be interpreted narrowly, as it addresses sensitivity to selection into the awareness-conditioned item under the monotonic-selection assumption. It does not eliminate the observational confounding created by purposive siting. The latter is addressed only through covariate adjustment, geographic comparisons, and the broader diagnostic battery.

4. Empirical Strategy

We estimate conditional gaps by ordinary least squares, regressing each standardized outcome on the proximity indicator with demographic controls and where useful parish fixed effects:

$$Y(i,p) = \alpha + \beta \text{Proximate}(i,p) + X(i,p)' \gamma + \mu(p) + \varepsilon(i,p) \quad (1)$$

For standardized outcomes, β is the difference between proximate and comparison households in standard-deviation units. Standard errors are clustered at the enumeration-district level, with wild-cluster bootstrap p-values reported for the headline specifications. Since proximity was assigned purposively, none of these adjustments converts the comparison into a causal design.

We use four complementary diagnostics. First, entropy balancing (Hainmueller, 2012) reweights the comparison group so that its means and variances match the proximate group on sex, age, education, farming status, and household adult count. Second, we report Oster's coefficient-stability statistic as a descriptive sensitivity measure, not as an identification test. Third, we estimate the gap within St. Michael, the only parish containing both groups, to remove the cross-parish component of the comparison. Fourth, we examine a set of broader environmental and institutional attitudes that are not specific to the reuse project. These outcomes are diagnostic, they are not causal controls, as they are measured in the same cross-section and as such, they cannot establish that the groups were identical before siting.

5. Results

5.1. Personal-use Willingness

The central result is that proximity does not appear to reduce support for reuse. On the main acceptance outcomes, the sign of the gap is never negative. On the personal-use willingness index, the estimate is positive in every specification: 0.195 standard deviations in the raw comparison, 0.172 with demographic controls, 0.123 with parish fixed effects, 0.109 after adding knowledge controls, 0.116 within St. Michael, and 0.166 under entropy balancing. The estimates are imprecise, with p-values between 0.09 and 0.32 and a wild-cluster bootstrap p-value of 0.27 for the parish-fixed-effects specification. The preferred estimate of 0.123 has a 95 per cent confidence interval of approximately $[-0.08, 0.32]$.

Thus, the data do not establish that proximity raises personal willingness, but they do rule out a negative association larger than about 0.08 standard deviations in that specification. The result is therefore most accurately described as evidence against a substantial local penalty on personal-use willingness, not evidence of a positive effect. Oster's δ is 4.28, indicating substantial coefficient stability relative to the observed covariates, but we treat this as a supplementary diagnostic.

Table 2 reports the estimates. The key point is the stability of the positive sign across specifications, combined with the absence of a statistically meaningful negative gap.

Table 2. Personal-use Willingness Gap Across Specifications

Specification	Gap (s.d.)	Std. error	p-value
(1) Raw difference	+0.195	(0.112)	0.093
(2) + demographic controls	+0.172	(0.109)	0.125
(3) + parish fixed effects	+0.123	(0.103)	0.245
(4) + objective and subjective knowledge	+0.109	(0.106)	0.316
(5) Within St. Michael only	+0.116	(0.111)	0.304
(6) Entropy-balanced	+0.166	(0.107)	0.129

Notes: Dependent variable is the standardized personal-use willingness index ($n = 962-990$). Cluster-robust standard errors on 30 enumeration districts. Wild-cluster bootstrap p-value for specification (3) is 0.266. Oster $\delta = 4.28$. Entropy balancing matches the comparison group to the proximate group on the means and variances of sex, age, education, farming and household adult count; post-balancing standardized differences are zero to four decimal places.

Figure 1 plots the personal-use willingness gap, which is positive in every specification but imprecisely estimated. Points are the estimates in Table 2 with 95 per cent confidence intervals.

The specifications are complementary ways of conditioning on observed geography and composition; none is interpreted as a formal bound.

Figure 1. The Willingness Gap Is Positive across Specifications but Imprecisely Estimated

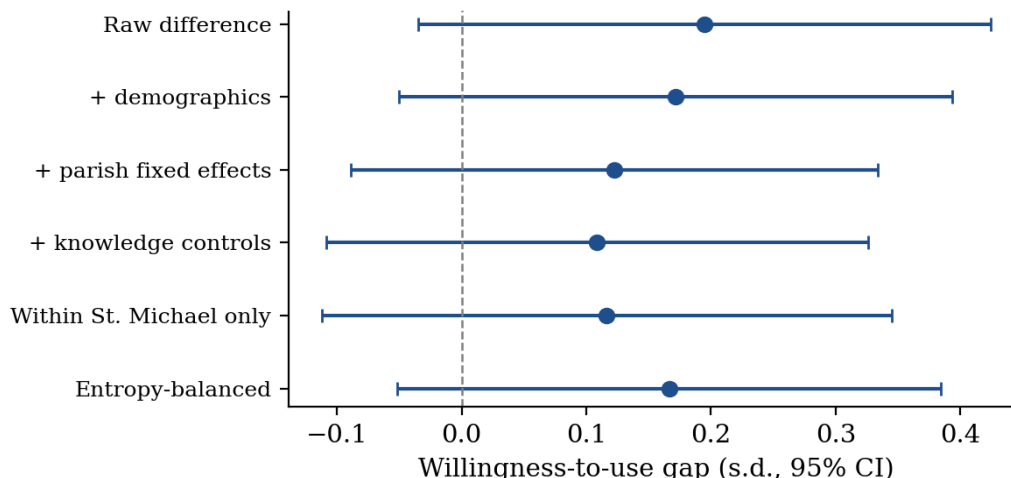


Figure 1. The personal-use willingness gap is positive across specifications but imprecisely estimated. Points are the estimates in Table 2 with 95 per cent confidence intervals. The specifications are complementary ways of conditioning on observed geography and composition; none is interpreted as a formal bound.

5.2. Local Treatment-Plant Support

The strongest difference is on support for the local treatment-plant upgrade. Among the respondents who were asked the item, 76 per cent of proximate respondents strongly agree that the upgrade is a good idea, compared with 48 per cent of comparison respondents. Any-degree support exceeds 90 per cent in both groups, so the difference is in the intensity of endorsement rather than the broad direction of opinion. The standardized gap is 0.531 (wild-cluster bootstrap $p = 0.005$), and 0.513 under entropy balancing. Given that the item was administered only to respondents aware of the upgrade, we use the Lee analysis described above. The awareness rates are 20.0 and 17.9 per cent, implying a trimming fraction of 10.7 per cent. Trimming the more-selected group from either tail produces bounds of [0.374, 0.677], both positive and substantial. See Figure 2. These bounds address the differential selection created by the questionnaire's skip logic; they do not turn the observational comparison into a causal estimate. The result therefore supports a narrower statement than “proximity increases support.” Among respondents who know about the local upgrade, those in proximate communities express substantially stronger endorsement. The

sample is small (182 respondents), and the outcome is conditional on awareness, so the estimate should not be generalized to the full population without qualification.²

Figure 2. Support for Local Treatment-Plant Upgrade

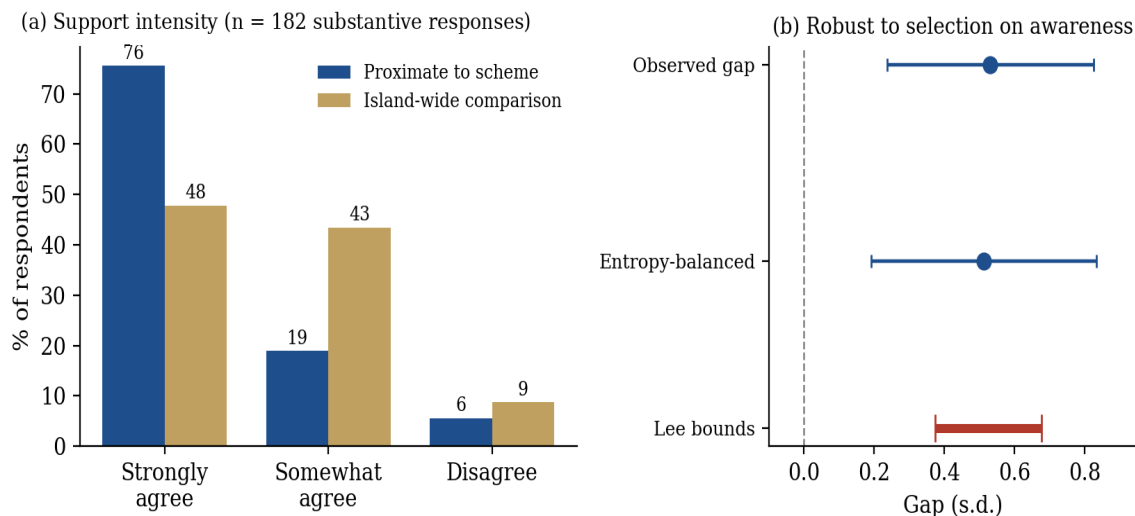


Figure 2. Support for the local treatment-plant upgrade. Panel (a) shows the distribution of substantive responses among the 182 respondents who answered the item substantively; support is high in both groups and differs in intensity. Panel (b) shows the estimated gap, the entropy-balanced estimate, and Lee bounds accounting for selection into the awareness-conditioned item.

5.3. Broader Attitudes and the Proximity Gradient

The remaining outcomes are close to zero (see Table 3 and Figure 3), and this concentration helps narrow the interpretation of the proximity gap. Abstract reuse beliefs do not differ: reuse helps farmers (-0.031), protects the ocean ($+0.033$), and will be used by others ($+0.001$). Nor do interest in a training program ($+0.023$) or the number of substantive ways respondents can name for the public to participate (-0.016).

Table 3. Core Outcomes and Diagnostic Measures

Outcome	Gap (s.d.)	Std. error	p-value	N
— Local facility / reuse-specific —				
Support for local plant upgrade	0.531	(0.144)	0.001	182
Personal-use willingness	0.123	(0.103)	0.245	989

² Please, also see Table A1 in the Appendix.

Interest in training program	0.023	(0.037)	0.544	1,068
— Abstract reuse beliefs —				
Names ways to participate	−0.016	(0.105)	0.877	1,068
Reuse protects the ocean	0.033	(0.091)	0.720	776
Reuse helps farmers	−0.031	(0.092)	0.739	945
People will drink reused water	0.001	(0.098)	0.995	922
— Knowledge —				
Subjective knowledge	0.212	(0.096)	0.035	1,028
Objective knowledge	0.004	(0.144)	0.978	1,068
— Extensive margin —				
Abstains on willingness items	−0.021	(0.046)	0.650	1,068

Notes: Each row is a separate regression with demographic controls and parish fixed effects, clustered on 30 enumeration districts. The ordering is suggestive; no difference between items is statistically significant.

Figure 3. Proximity Shifts Support for the Local Facility, with Little Evidence of Broader Attitudinal Differences

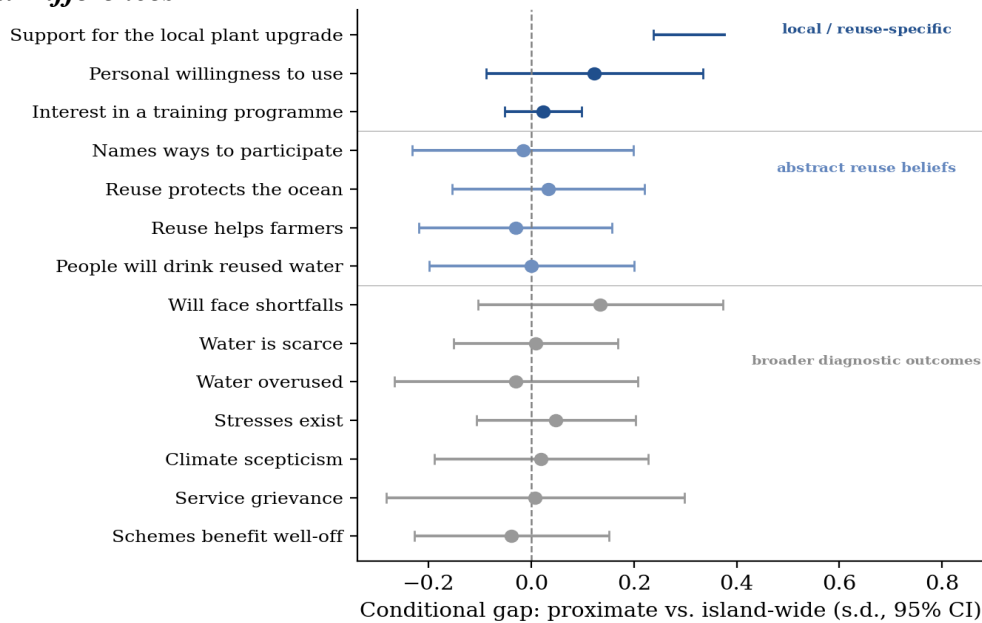


Figure 3. Conditional gaps across fourteen outcomes, ordered by conceptual proximity to the local project. Points are standardized OLS gaps (proximate minus comparison) with 95 per cent cluster-robust confidence intervals, controlling for demographics and parish fixed effects. The first three outcomes are local-facility or reuse-specific; abstract reuse beliefs and broader diagnostic attitudes follow. The broader diagnostic outcomes are plotted here but are not separately tabulated in Table 3. No outcome in the first group has a negative point estimate.

The broader environmental and institutional attitudes are similarly flat: expectations of future shortfalls (+0.134), judgements that water is scarce (+0.009) or overused (−0.030), belief in resource stresses (+0.048), climate scepticism (+0.019), service grievance (+0.008), and the belief that infrastructure schemes benefit the well-off (−0.039). None is statistically distinguishable from zero, and the point estimates do not move in a common direction.

The pattern narrows, but does not eliminate, compositional explanations. If proximate communities differed broadly in environmental orientation, engagement, or institutional attitudes, some of these outcomes might also be expected to move. They do not. The evidence is therefore more consistent with a project-specific difference than with a general shift in attitudes, while the observational design leaves open the possibility of unmeasured differences on dimensions we do not observe.

5.4. Knowledge and Salience

A natural interpretation of the project-specific difference is that proximity makes the scheme more salient. The survey provides a useful distinction between perceived and measured knowledge. Proximity raises subjective knowledge — respondents' own rating of how well informed they are about water reuse — by 0.212 standard deviations (wild-cluster bootstrap $p = 0.046$), but leaves objective knowledge, measured by a ten-item factual and recognition index, unchanged: the estimated gap is 0.004 standard deviations ($p = 0.98$). The objective-knowledge null is robust to four alternative scoring rules for the multiple-response items: the gap remains between −0.038 and +0.020, with p -values from 0.79 to 0.98. The subjective-knowledge gap is unchanged. Proximity therefore appears to increase perceived familiarity without producing measurable factual learning. This pattern is consistent with the idea that a concrete local project becomes more cognitively accessible without necessarily changing the underlying information set. It is not, however, a mediation test. The survey does not measure exposure to consultation, perceived benefits, trust, place attachment, or the project's local costs, and the cross-sectional design cannot establish a causal pathway from proximity to subjective knowledge and then to acceptance.

Figure 4 summarizes this distinction: proximity is associated with higher subjective knowledge, but not with higher objective knowledge.

Figure 4. Proximity Raises Subjective, Not Objective Knowledge

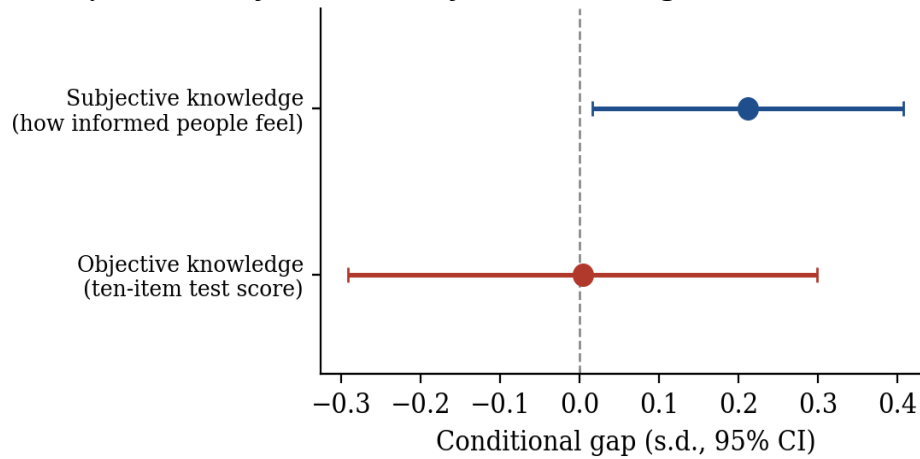


Figure 4. Proximity raises subjective, not objective, knowledge. Points are conditional gaps in standard deviations with 95 per cent cluster-robust confidence intervals, controlling for demographics and parish fixed effects.

6. Robustness

6.1. Geographic Composition

A main geographic concern is that proximity is entangled with parish. The proximate group is concentrated almost entirely in St. Michael, while two parishes appear only in the comparison group. We therefore do not treat any single geographic specification as definitive. The willingness gap is 0.195 in the raw comparison, 0.172 with demographic controls, 0.123 with parish fixed effects, and 0.116 within St. Michael. These estimates are similar in magnitude and all positive, although none is statistically distinguishable from zero. The plant-upgrade gap is 0.642 within St. Michael, so the main positive result is not driven by the cross-parish comparison. The evidence is therefore reassuring about geographic composition, but it does not eliminate unobserved within-parish differences.

6.2. Covariate Adjustment and Balancing

The baseline imbalance is concentrated in education and household adult count. The willingness and plant-upgrade estimates are stable to alternative definitions of education: the willingness gap changes little, and the plant-upgrade gap remains positive. Entropy balancing likewise leaves the main estimates close to their unweighted counterparts.

6.3. Item-level and Subgroup Analyses

The four willingness items show a similar positive pattern, with the largest gap on reliability (+0.151) and the smallest on delivery through a separate pipe (+0.073), but no difference across conditions is statistically significant. Subgroup estimates likewise provide no statistically significant heterogeneity, and the education split is sensitive to the definition of education. We therefore do not interpret either exercise as evidence of differential effects.³

6.4. Limitations

Four limitations are important to mention. First, siting was purposive, so the estimate is a conditional gap and not a treatment effect; unobserved differences between proximate and comparison communities may remain. The diagnostic battery and the geographic and balancing exercises narrow this concern but cannot eliminate it. Second, the design is a single cross-section, so we cannot determine whether the local-facility gap emerged after siting or predated it. Third, the survey captures a planned facility, not an operating one. Construction, odors, traffic, visible infrastructure, actual use of reclaimed water, or later experience could change attitudes. Finally, external validity is somewhat limited. Barbados is a small, water-scarce island, and the project supplies reclaimed water primarily for non-potable uses. The result should not be extrapolated to potable-reuse projects, facilities with salient local disamenities, or settings in which communities have already mobilized around a controversial siting decision.

7. Discussion

The most cautious interpretation is not that NIMBYism is absent, but that the simple proximity-penalty prediction does not fit this project at this stage. Four features of the setting could account for that pattern, and the survey cannot distinguish among them. First, the local cost-benefit structure may differ from the classic cases used to motivate NIMBY. Many siting controversies concern facilities whose principal local effects are perceived as nuisances or risks while their benefits are dispersed. The Barbados project instead upgrades an existing wastewater-treatment system and directs reclaimed water toward irrigation and groundwater recharge. The local balance may therefore be perceived as less one-sided than for facilities such as landfills, airports, or transmission infrastructure. This interpretation is consistent with the project-specific support we

³ The complete item-level estimates are reported in Appendix Table A2.

observe, but the survey does not directly measure perceived local costs and benefits. Second, visibility may matter. Much of the reclaimed water in this project is destined for non-potable uses and groundwater recharge, not for direct household consumption. The physical facility may therefore be concrete enough to increase salience without generating a persistent household-level nuisance. If local opposition requires visible or repeatedly experienced costs, the absence of such costs could explain why proximity does not reduce support. Our item-level willingness estimates are suggestive but do not identify this mechanism. Third, timing may matter. The scheme was planned but not yet operating when the survey was conducted. Respondents therefore faced an imminent prospect and not an operating facility whose construction, traffic, odors, or other local consequences could be observed. The positive local-facility gap may reflect an early-stage response that could change as the project becomes more tangible. The paper cannot tell us whether support would persist after construction or operation. The knowledge results point to a fourth, related possibility: proximity increased salience more than information. Respondents near the scheme felt better informed, but their objective knowledge did not increase. That pattern is consistent with concreteness making the project more cognitively accessible without changing the underlying information set. It also cautions against interpreting the positive local-facility gap as evidence that consultation has already educated residents. The mechanism remains open because the survey does not directly measure perceived benefits, trust, place attachment, procedural fairness, or local costs.

8. Conclusion

Siting a water-reuse facility near a community need not produce the local acceptance penalty that a simple backyard account would predict. In Barbados, households in proximate communities are not less supportive on either of the two main acceptance outcomes. On personal-use willingness, the preferred estimate is positive but imprecise and rules out a negative gap larger than about 0.08 standard deviations. The clearest difference is instead on the local treatment-plant upgrade: among respondents aware of the project, proximate households express substantially stronger endorsement, with a standardized gap of 0.53 standard deviations and positive Lee bounds. The pattern across the broader outcome set is equally important. Abstract beliefs about reuse, engagement intentions, and general environmental and institutional attitudes are essentially unchanged. The evidence therefore does not suggest that proximity creates a broad pro-reuse disposition. It suggests a more localized response in which the concrete facility becomes the object

of stronger endorsement. The knowledge results provide a useful qualification. Proximity increases subjective knowledge but not objective knowledge, consistent with greater salience or familiarity. We do not interpret this as a causal mechanism, and we cannot determine whether the positive local response would persist once the facility is constructed and operating.

The policy lesson of this research is that authorities should not assume that proximity to a planned non-potable reuse facility will automatically generate local opposition. But neither should the present evidence be read as proof that siting causes support. The result is a conditional descriptive comparison from an early stage of one project. Its value is to show that the local penalty is an empirical question, and that in this setting the strongest observed response is not opposition but more intense support for the concrete facility.

References

- Al-Saidi, M. (2021). From acceptance snapshots to the social acceptability process: Structuring knowledge on attitudes towards water reuse. *Frontiers in Environmental Science* 9, 633841.
- Burningham, K. (2000). Using the language of NIMBY: A topic for research, not an activity for researchers. *Local Environment* 5(1), 55–67.
- Cameron, A. C., and D. L. Miller (2015). A practitioner's guide to cluster-robust inference. *Journal of Human Resources* 50(2), 317–372.
- Dei, G., B. Mignacca, E. Iaccarino, and G. Locatelli (2026). In My Backyard or in My Country? Exploring the Social Acceptance of Controversial Infrastructure. *Journal of Management in Engineering* 42(1), 04025052.
- Devine-Wright, P. (2009). Rethinking NIMBYism: The role of place attachment and place identity in explaining place-protective action. *Journal of Community & Applied Social Psychology* 19(6), 426–441.
- Devine-Wright, P. (2011). Place attachment and public acceptance of renewable energy: A tidal energy case study. *Journal of Environmental Psychology* 31(4), 336–343.
- Esaiasson, P. (2014). NIMBYism – A re-examination of the phenomenon. *Social Science Research* 48, 185–195.
- Fielding, K. S., S. Dolnicar, and T. Schultz (2019). Public acceptance of recycled water. *International Journal of Water Resources Development* 35(4), 551–586.
- Foster, D., and J. Warren (2022). The NIMBY problem. *Journal of Theoretical Politics* 34(1), 145–172.
- Hainmueller, J. (2012). Entropy balancing for causal effects: A multivariate reweighting method to produce balanced samples in observational studies. *Political Analysis* 20(1), 25–46.
- Lee, D. S. (2009). Training, wages, and sample selection: Estimating sharp bounds on treatment effects. *Review of Economic Studies* 76(3), 1071–1102.
- Liu, M., Y. Song, and S. Shi (2024). Resolving the dilemma of wastewater treatment plants: An empirical study on public acceptance for publicly accessible WWTPs. *Journal of Cleaner Production* 475, 143674.
- Oster, E. (2019). Unobservable selection and coefficient stability: Theory and evidence. *Journal of Business & Economic Statistics* 37(2), 187–204.
- Po, M., J. D. Kaercher, and B. E. Nancarrow (2003). Literature review of factors influencing public perceptions of water reuse. CSIRO Land and Water Technical Report 54/03.
- Redman, S., K. J. Ormerod, and S. Kelley (2019). Reclaiming suburbia: Differences in local identity and public perceptions of potable water reuse. *Sustainability* 11(3), 564.
- Roodman, D., M. Ø. Nielsen, J. G. MacKinnon, and M. D. Webb (2019). Fast and wild: Bootstrap inference in Stata using boottest. *Stata Journal* 19(1), 4–60.

- Ross, V. L., K. S. Fielding, and W. R. Louis (2014). Social trust, risk perceptions and public acceptance of recycled water: Testing a social-psychological model. *Journal of Environmental Management* 137, 61–68.
- Rozin, P., B. Haddad, C. Nemeroff, and P. Slovic (2015). Psychological aspects of the rejection of recycled water: Contamination, purification and disgust. *Judgment and Decision Making* 10(1), 50–63.
- Russell, S., and C. Lux (2009). Getting over yuck: Moving from psychological to cultural and sociotechnical analyses of responses to water recycling. *Water Policy* 11(1), 21–35.
- Trope, Y., and N. Liberman (2010). Construal-level theory of psychological distance. *Psychological Review* 117(2), 440–463.
- Wang, Y., S. Mehrabi, and K. Ikuma (2026). Acceptance of water reuse adoption in small communities: Analysis of driving factors and policy preferences. *Environmental Research* 300, 124439.
- Wester, J., K. R. Timpano, D. Çek, D. Lieberman, S. C. Fieldstone, and K. Broad (2015). Psychological and social factors associated with wastewater reuse emotional discomfort. *Journal of Environmental Psychology* 42, 16–23.
- Wolsink, M. (2000). Wind power and the NIMBY-myth: Institutional capacity and the limited significance of public support. *Renewable Energy* 21(1), 49–64.
- World Bank (2023). Renewable internal freshwater resources per capita (cubic meters). *World Development Indicators*. Washington, DC.

Appendix. Supplementary Results

Table A1. Plant-upgrade Item: Selection and Bounds

Quantity	Proximate	Comparison	Difference
Aware of the upgrade (share)	0.200	0.179	+0.024 (p = 0.41)
Asked the upgrade item (n)	104	98	—
Answered substantively (n)	90	92	—
Strongly agree (share of answers)	0.76	0.48	+0.28
Standardized gap, parish FE	—	—	+0.531 (p = 0.001)
Standardized gap, entropy-balanced	—	—	+0.513 (p = 0.003)
Standardized gap, within St. Michael	—	—	+0.642 (p < 0.001)
Lee bounds (trimming 10.7%)	—	—	[+0.374, +0.677]

Notes: The item was administered only to respondents reporting awareness of the treatment-plant upgrade. Lee bounds address differential selection into this awareness-conditioned item under the monotonic-selection assumption; they do not address the non-random assignment of communities to proximity.

Table A2. Willingness Gap Item by Item

Would use reclaimed water if it were...	Gap (s.d.)	p-value	N
...reliable	+0.151	0.085	880
...safe	+0.118	0.201	892
...inexpensive	+0.134	0.143	890
...delivered through a separate pipe	+0.073	0.590	953

Notes: Each row is a separate regression with demographic controls and parish fixed effects, clustered on 30 enumeration districts. The ordering is suggestive; no difference between items is statistically significant.