

Who Should Green Zakat Serve? Experimental Evidence on Legitimacy and Programme Allocation among Indonesian Muzaki

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KEYWORDS

Green zakat; Islamic social finance; perceived moral legitimacy; beneficiary linkage; factorial experiment; conjoint analysis

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RECEIVED 14-11-2025

REVISED 17-04-2026

ACCEPTED 29-05-2026

ABSTRACT

This study evaluates how Indonesian muzaki judge the appropriateness of using zakat for environmental programmes and prioritise alternative programme designs. A factorial vignette experiment (1,240 analysed participants) and a paired-profile conjoint experiment (1,156 analysed participants) varied beneficiary linkage, spillovers and institutional information. Programmes presented as serving verified asnaf received more favourable legitimacy judgements and were selected more often than community-wide programmes. Contrary to the predicted spillover penalty, the average diffuse-spillover contrast was positive, while the proposed moral-conviction moderation of spillover resistance was unsupported. Fictional Sharia endorsement and independently verified accountability cues were positively associated with programme assessments or selection. The evidence differentiates perceived funding-source legitimacy from relative programme choice and qualifies the application of Sacred Value Protection to beneficiary-related preferences. The treatment labelled beneficiary linkage bundles verification, perceived need and access; hypothetical endorsement is not an actual Sharia determination. The experiments do not measure legal permissibility, realised environmental outcomes or actual zakat allocation.

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1. INTRODUCTION

Climate adaptation and poverty alleviation raise a funding-governance question for zakat institutions, when do payers perceive an environmental programme to be an appropriate use of a religiously constrained resource? Environmental desirability, actual beneficiary eligibility and respondents' judgements of financing legitimacy are different objects. Indonesia's Green Zakat Framework illustrates the growing policy interest in linking adaptation with assistance for vulnerable households (UNDP Indonesia, 2025), but neither policy aspiration nor payer approval determines legal permissibility. This study evaluates perceptions under experimentally varied programme descriptions, not the enforceability of allocations.

The legitimacy question arises because zakat has defined beneficiary categories (Qur'an 9:60), while environmental interventions often provide both targeted and wider benefits. Whether particular schemes satisfy tamlik, asnaf eligibility or the fi sabilillah category is a jurisprudential and institutional question requiring authorised case-specific

assessment. This research does not adjudicate those questions. Its outcome is the perceived appropriateness of a programme described as zakat-funded and a separate forced-choice allocation priority, rather than a fatwa or evidence of environmental impact.

Existing green-zakat research provides only a partial answer. Normative studies have established arguments for incorporating environmental protection into Islamic social finance through *maqāṣid al-Sharī'ah*, *ḥifẓ al-bi'ah* and environmental stewardship (Amrullah et al., 2025; Irsyadillah et al., 2026). Institutional research has examined how Sharia legitimacy, organisational policy and environmental programming interact in Indonesian zakat practice (Atmanto et al., 2026), while individual-level research has explained intention to pay green zakat through environmental concern and behavioural antecedents (Amany et al., 2026). These approaches establish normative foundations, institutional practices and correlates of behavioural intention, but they do not identify how muzaki evaluate alternative programme designs when beneficiary linkage, wider environmental benefits and governance assurances vary. This matters because normative acceptance of environmental objectives does not eliminate potential distributive trade-offs. Recent reviews of Islamic social finance similarly document strong alignment with social and economic development goals while identifying environmental objectives and policy-oriented governance as comparatively underdeveloped areas (Ma & Sukmana, 2025; Raimi et al., 2024; Shahid et al., 2024).

Sacred Value Protection offers a competing theoretical account of distributive preferences, but cannot be inferred solely from a positive preference for verified beneficiaries. Greater beneficiary-related support may also reflect perceived deprivation, certainty of eligibility, fairness, usefulness or an authority heuristic (Baron & Spranca, 1997; Tetlock et al., 2000). A distinctive protected-value mechanism would require evidence of non-compensatory resistance to outcomes or endorsement when a beneficiary rule is violated, preferably through direct trade-off or process measures. In the present design, H2 and H6 provide relevant but non-definitive tests of the predicted spillover resistance.

The empirical challenge is to separate these programme characteristics rather than infer their effects from general attitudes towards green zakat. Two randomised experiments were therefore conducted among Indonesian muzaki. Study 1 used a factorial vignette experiment to estimate the effects of beneficiary linkage, environmental spillovers and Sharia endorsement on funding-source moral legitimacy. Study 2 used a paired-profile conjoint experiment to examine stated programme allocation choices when beneficiary linkage, benefit reach, environmental impact, Sharia endorsement, accountability verification and benefit horizon varied simultaneously. The two designs distinguish whether zakat is perceived as an appropriate funding source from which programme is prioritised when respondents face multidimensional trade-offs.

The contribution is deliberately bounded. The experiments identify how assigned, hypothetical programme descriptions alter perceived funding-source moral legitimacy

and relative selection among responding volunteers. They distinguish a bundled beneficiary-linkage attribute, spillover reach and fictional endorsement information, while the conjoint also varies stated accountability verification, impact and benefit horizon. They do not contrast actual zakat funding against waqf or sadaqah, establish legal eligibility or Sharia compliance, or observe decisions, welfare or ecological outcomes after programme implementation. The findings therefore inform further institutional design evaluation rather than establish a new rule governing permissible zakat allocation.

2. LITERATURE REVIEW

2.1 Green zakat and environmental sustainability

Islamic social finance has increasingly been connected with the sustainability agenda. Zakat, waqf, sadaqah and qard hasan are now discussed in relation to poverty reduction, social protection, financial inclusion and sustainable development. A systematic review of 178 studies published between 2000 and 2022 found that Islamic social finance had been linked to 11 of the 17 SDGs (Dirie et al., 2024). The expansion of this agenda places greater attention on the development outcomes generated by Islamic social-finance instruments. These instruments, however, differ in their purposes, beneficiary structures and restrictions on the use of funds. Their contribution to sustainability cannot be considered independently of the institutional rules that govern each financing instrument. Governance-oriented studies propose integrated Islamic social-finance architectures and performance frameworks in which institutional coordination, accountability and outcome measurement are central to effective social-finance delivery (Handayani et al., 2025; Maulina et al., 2023; Widiastuti et al., 2022). Cross-country sustainable-finance research also links Islamic finance to climate governance and just-transition concerns, although the role of social-finance instruments varies with institutional deployment (Issa et al., 2025; Issa et al., 2026; Raimi & Bamiro, 2026).

Green zakat has developed within this broader sustainability agenda. Its early development has been strongly influenced by normative arguments connecting environmental protection with Islamic ethical principles. Amrullah et al. (2025) relate green-zakat governance to ecotheology, *maqāṣid al-Sharīʿah* and *ḥifẓ al-biʿah*, placing environmental stewardship within the wider objectives associated with Islamic social finance. Research has also moved towards institutional practice. Atmanto et al. (2026), using an embedded qualitative case study involving BAZNAS, Muhammadiyah and Nahdlatul Ulama, identify interactions among Sharia legitimacy, institutional policy and environmental programmes in the implementation of green zakat. Their cases include renewable energy, conservation, waste management and environmental education (Atmanto et al., 2026). The literature at this stage primarily addresses the normative and organisational foundations through which environmental objectives can enter zakat governance. Parallel scholarship on Islamic sustainable finance emphasises the

allocation of Sharia-compliant capital to environmental priorities and the need to connect sustainability objectives with instrument-specific governance rules (Harahap et al., 2023; Rahman et al., 2024; Ulfah et al., 2024). Empirical zakat research also links programme design to poverty-oriented implementation and educational deprivation outcomes among intended beneficiaries (Aziz et al., 2025; Herianingrum et al., 2024). Integrated social-finance studies further show that institutional and technological design shapes how zakat, waqf and commercial finance are combined for outreach and welfare objectives (Ascarya & Sakti, 2022; Ascarya et al., 2023; Tamanni et al., 2022).

Individual-level research has introduced a behavioural perspective into this discussion. Amany et al. (2026) analyse 222 respondents using PLS-SEM and an extended Theory of Planned Behavior framework to explain intention to pay green zakat. Their model incorporates environmental concern alongside attitude, subjective norm and perceived behavioural control, with environmental concern operating through behavioural mechanisms rather than producing a direct effect on intention (Amany et al., 2026). Such evidence addresses acceptance of green zakat as a general proposition. It does not identify how muzaki evaluate alternative programme designs when environmental objectives are implemented through different beneficiary arrangements, benefit structures or governance signals. The relevant theoretical issue concerns the terms under which environmental objectives can be incorporated into a funding instrument whose use is already normatively restricted. Recent zakat studies report that institutional trust, digital payment channels, donor characteristics and service quality are associated with payment choices and evaluations of zakat organisations (Al-Shamali & AlMutairi, 2023; Beik et al., 2024; Hamdani et al., 2024; Ma'ruf et al., 2026). Research on fintech-enabled zakat distribution likewise shows that technology adoption can affect access and distribution efficiency among asnaf (Ahmad & Yahaya, 2023).

2.2 Zakat as a morally constrained funding source

Zakat is not an unrestricted pool of charitable finance. Its use is governed by normative requirements that define the relationship between the obligation to pay and the distribution of the resulting funds. The Qur'an identifies eight categories of zakat recipients in Qur'an 9:60, establishing a beneficiary structure that distinguishes zakat from forms of voluntary giving in which contributors or organisations possess greater discretion over allocation. The existence of these categories makes beneficiary status relevant to the appropriateness of a programme as a use of zakat, even when the programme itself generates desirable social outcomes.

The scope of eligible zakat expenditure varies across recognised fiqh interpretations and institutional practice. The *fi sabilillah* category, forms of beneficiary possession or control, benefit incidence and the treatment of public goods may be construed differently across settings (Qothrunnada & Firmansyah, 2024; Jiffry, 2024). Consequently, a programme's status under Sharia cannot be determined by experimental respondent ratings. Proposals involving public infrastructure, indirect

benefits or unverified beneficiaries require case-specific review by authorised Sharia bodies and, where appropriate, evidence of individual eligibility and legally relevant control over the benefit.

Recent institutional reviews identify governance, optimisation of zakat funds, technology, collection and distribution as recurring components of zakat-institution development (Mustaffa et al., 2026). Programme-level research on asnaf empowerment also illustrates that zakat design can incorporate financing mechanisms while retaining beneficiary-focused objectives (Asni et al., 2025).

In the experiments, beneficiary linkage is a three-level bundled programme-description attribute: verified-asnaf targeting, economically vulnerable but not verified recipients, and unrestricted community-wide access. These levels jointly change the presence of eligibility verification, the description of vulnerability, and the breadth of access. Random assignment identifies the effect of the entire description contrast; it does not isolate a single effect of religious eligibility independently of the other elements. The term beneficiary fidelity refers here to respondents' evaluation of those descriptions, not verified compliance by a real institution.

2.3 Sacred Value Protection

Sacred Value Protection explains why some moral commitments are difficult to exchange against competing benefits. Protected values refer to commitments that individuals resist trading off against other considerations, particularly when those commitments are experienced as rules about what should or should not be done (Baron & Spranca, 1997). Research on protected values also identifies reduced sensitivity to quantitative gains when accepting those gains requires compromising a morally protected principle (Baron & Spranca, 1997). Tetlock et al. (2000) demonstrate that trade-offs involving sacred values can trigger moral outrage and attempts to reaffirm the threatened principle when individuals perceive that an inappropriate comparison has been made between a protected value and competing outcomes.

This theoretical logic differs from a purely consequential evaluation of programme outcomes. A consequential judgement can compare the benefits produced by alternative allocations and favour the programme that generates the greater overall outcome. A protected-value judgement gives independent weight to whether the allocation itself respects a rule considered morally binding. In the context of zakat, these two modes of evaluation can become relevant when a programme generates wider environmental benefits while weakening the direct relationship between zakat funds and beneficiaries regarded as eligible.

Sacred Value Protection remains an interpretative possibility, not a uniquely identified mechanism. A preference for verified recipients could reflect a firm religious boundary, an expectation that scarce aid should help the neediest, or simpler informational assurance. Discriminating among these explanations would require equivalent information and outcomes across beneficiary conditions, explicit willingness-

to-trade measures, and experimental variation in both rule conformity and programme benefits. Study 1 offers suggestive contrasts and Study 2 shows relative choices, neither of which alone excludes ordinary consequential evaluation.

Recent charitable-giving experiments show that moral framing, organisational religious affiliation and donor control over allocation can causally alter donation decisions (Balafoutas & Rezaei Khavas, 2022; Esterzon et al., 2023; Oxley, 2023). Other donor research finds that cause selection varies with self- and other-oriented motives, while attributional ambiguity and beliefs about observable giving can shift prosocial choices (Gao & Shi, 2026; tho Pesch & Dana, 2024; Thottam et al., 2024).

2.4 Funding-source moral legitimacy

Legitimacy concerns the perceived appropriateness of an entity or action within a system of socially recognised norms and values. Suchman (1995) distinguishes pragmatic, moral and cognitive forms of legitimacy and defines moral legitimacy around normative evaluations of whether an activity is appropriate. Moral legitimacy can involve judgements about consequences, procedures and structures rather than assessments based only on the evaluator's direct self-interest (Suchman, 1995). At the individual level, Alexiou and Wiggins (2019) develop a multidimensional measure showing that legitimacy perceptions can be assessed as individual evaluative judgements rather than treated only as properties of organisations or institutional fields.

The distinction between legitimacy judgement and Sharia determination is substantive. Survey participants express views on what they regard as acceptable, while recognised scholars and institutional Sharia authorities must examine the legality of beneficiary ownership, eligibility, public-goods arrangements and admissible uses under applicable fiqh. No experimental treatment is evidence of such adjudication.

The evaluative object in green zakat is narrower than the legitimacy of a zakat organisation as a whole. Muzaki can evaluate an environmental intervention positively while holding a different judgement about whether zakat should finance that intervention. They can also regard the administrative process as transparent without considering the resulting allocation consistent with the distributive requirements they associate with zakat. The relevant judgement concerns the appropriateness of the relationship between a specified funding source and the programme to which that source is allocated.

Funding-source moral legitimacy denotes a respondent's judgement that applying zakat to a described programme is appropriate and morally acceptable. The four-item scale operationalises this narrow evaluation; its reported internal consistency does not by itself establish a separate factor from programme desirability, approval of beneficiaries or general positive evaluation. The questionnaire's content makes it distinct in intent, but discriminant and cognitive validation would require item-level and comparative measurement evidence that is not contained in the supplied summary tables.

A distinction between the environmental cause and the funding arrangement is necessary because the two evaluations need not move together. Muzaki may support renewable energy, climate-resilient agriculture or ecosystem restoration while questioning a specific use of zakat when its beneficiary structure appears inconsistent with the allocation rules they recognise. A favourable environmental outcome can remain desirable even when the funding relationship receives a less favourable normative evaluation.

2.5 Beneficiary fidelity and environmental spillovers

Beneficiary linkage reflects the extent to which a zakat-funded programme remains substantively connected to eligible recipients. Environmental interventions may target households verified as asnaf, economically vulnerable households whose eligibility has not been formally verified, or unrestricted community beneficiaries. This distinction is consequential because zakat remains a normatively constrained funding source even when the programme pursues socially desirable environmental objectives. Korkut (2025), for example, associates zakat with targeted climate interventions for eligible asnaf, preserving beneficiary eligibility as a condition of programme design.

Stronger beneficiary linkage was expected to correspond to higher perceived funding-source moral legitimacy, but the three levels jointly encode verification, vulnerability and programme access. The hypothesis therefore concerns the stated, bundled contrast, not the isolated causal effect of verified Sharia eligibility.

H1: Green-zakat programmes with stronger beneficiary linkage will receive higher funding-source moral legitimacy evaluations than programmes with weaker beneficiary linkage.

Environmental spillovers describe benefits reaching people beyond the target group. H2 predicts a negative diffuse-versus-concentrated contrast; a positive result would instead be consistent with respondents rewarding broader benefits or seeing no conflict with beneficiary-focused design. The empirical test evaluates the directional hypothesis rather than presuming a prohibition on incidental community benefit.

H2. Green-zakat programmes with diffuse environmental spillovers will receive lower funding-source moral legitimacy evaluations than otherwise comparable programmes whose benefits remain primarily concentrated among targeted beneficiaries.

A factorial interaction can establish whether the effect of a diffuse-spillover description varies with the three beneficiary-linkage descriptions. It cannot, by itself, identify why respondents assign that value or prove a sacred-value boundary. H3 predicts a smaller penalty for diffuse spillovers under stronger beneficiary linkage; a positive spillover response requires a more limited interpretation of any interaction.

H3: Stronger beneficiary linkage will attenuate the negative effect of diffuse environmental spillovers on funding-source moral legitimacy, such that the spillover penalty will be weaker when eligible asnaf remain the programme's primary beneficiaries.

2.6 Sharia endorsement and moral conviction

The Sharia endorsement attribute described a hypothetical statement of approval by an 'authorised Sharia body'. No identifiable board reviewed the programmes and no real endorsement occurred. The alternative level supplied no endorsement information, not evidence of non-compliance. This description may operate through authority, reassurance or legitimacy signalling, so its effect must not be equated with verified Sharia permissibility.

H4: Green-zakat programmes accompanied by explicit Sharia endorsement will receive higher funding-source moral legitimacy evaluations than otherwise comparable programmes for which no Sharia endorsement is stated.

Sharia endorsement may become particularly relevant when beneficiary arrangements are unfamiliar or ambiguous. However, institutional approval may not fully compensate for weak beneficiary fidelity when a muzaki regards beneficiary restrictions as morally binding. Sacred Value Protection suggests that external justification does not necessarily eliminate resistance to a perceived compromise of a protected principle (Baron & Spranca, 1997; Tetlock et al., 2000). The relationship between Sharia endorsement and beneficiary linkage is therefore examined empirically without imposing a directional interaction prediction.

Individual responses should also depend on both the substantive allocation position held by a muzaki and the moral conviction attached to that position. Moral conviction refers to the extent to which a position is grounded in beliefs about fundamental right and wrong rather than ordinary preference (Skitka et al., 2005). These dimensions must be separated because strong moral conviction does not necessarily imply support for stricter beneficiary restrictions. A muzaki may hold either a restrictive or expansive allocation position with equally strong moral conviction.

H5. Among muzaki who favour stronger beneficiary fidelity, the legitimacy advantage of stronger beneficiary linkage will increase as the moral conviction attached to that allocation position becomes stronger.

The same logic applies to environmental spillovers. Wider benefits should become more problematic only when they are interpreted as inconsistent with a beneficiary-focused allocation position that is itself strongly moralised.

H6. Among muzaki who favour stronger beneficiary fidelity, the negative effect of diffuse environmental spillovers on funding-source moral legitimacy will increase as the moral

conviction attached to that allocation position becomes stronger, particularly when beneficiary linkage is weak.

3. METHODOLOGY

3.1. Research design

Two randomised hypothetical-programme studies examined distinct causal estimands within non-probability volunteer samples. Study 1 assigned a $3 \times 2 \times 2$ vignette describing beneficiary linkage, spillovers and a fictional Sharia endorsement cue, with a self-reported moral legitimacy outcome. Study 2 randomised attributes of paired programme profiles and recorded forced-choice priority rather than independent approval or permissible use. Random assignment supports comparisons of the supplied descriptions under the realised assignment procedures; it does not identify effects on actual zakat payment or environmental impact.

Study 1 used a two-wave procedure to ensure that individual allocation positions and moral-conviction measures were recorded before experimental exposure. Study 2 was conducted as a separate experimental session using an independent respondent sample. All data management, randomisation and statistical analyses were conducted using R software, version 4.6.1.

Study 1 randomly varied three descriptive attributes in 12 nominal combinations, and Wave 1 recorded baseline attributes before Wave 2 assignment and outcomes. The supplied aggregate record gives marginal group sizes and outcome estimates but does not list all 12 realised joint-cell counts, allocation seeds, or pre-treatment balance by cell. Therefore, balance cannot be inferred beyond the published marginal counts. The main analysis retains the originally reported estimates, with this design-evidence boundary made explicit.

Study 2 used a paired-profile conjoint experiment in which respondents repeatedly chose between two alternative zakat-funded environmental programmes. Six programme attributes were randomly varied: beneficiary linkage, benefit reach, environmental impact, Sharia endorsement, accountability verification and benefit horizon. This design allows the contribution of individual attributes to multidimensional choices to be estimated while averaging over the randomised distribution of other attributes (Hainmueller et al., 2014).

3.2. Population, recruitment and sample coverage

The $3 \times 2 \times 2$ design defines a full factorial support in principle; however, the original report provides only marginal assignment counts, not the number of respondents in each of the twelve realised cells. The respondent flow and balance status are reported using only information traceable to the source.

The target population comprised adult Muslim zakat payers residing in Indonesia with recent experience of paying zakat maal or professional-income zakat. These forms

of zakat were selected because the experimental tasks concerned programme-level allocation decisions rather than the distribution of zakat fitrah.

Both experiments recruited self-selected adult Muslim zakat payers through open online invitations and personal/digital networks. There was no probability sampling frame or known probability of inclusion; the coverage of provinces, rural communities, zakat-payment channels, institutional familiarity and religious affiliations is not reported in the available analytical tables. Consequently, neither experiment provides representative estimates for Indonesian muzaki as a population. The sampled respondents may be systematically more engaged in zakat or digital services than less-connected payers.

Eligibility screening required participants to be adult Muslims residing in Indonesia and to have paid zakat maal or professional-income zakat within the previous 24 months. Payment of zakat fitrah alone did not meet the eligibility requirement. Study 2 used the same substantive eligibility criteria as Study 1 and recruited an independent respondent sample.

3.3. Data collection and experimental procedures

Study 1 completion-to-analysis flow: 1,284 completed responses → 1,240 analysed (44 not retained). Wave 1 enrolments, Wave 2 invitations, matched-wave records and exclusions by reason were not provided. Study 2 completion-to-analysis flow: 1,200 completed responses → 1,156 analysed (44 not retained). Invitation and screening denominators were not provided. These are record-based flow summaries and do not imply attrition estimates for the earlier recruitment stages.

Study 1 used a common vignette describing a solar-powered irrigation and water-resilience programme in a rural community. The underlying intervention, programme context and environmental function were held constant across conditions. Only beneficiary linkage, environmental spillovers and Sharia endorsement were experimentally varied.

Beneficiary linkage had three levels: verified asnaf, economically vulnerable beneficiaries without verified asnaf status and community-wide beneficiaries without eligibility restrictions. Environmental spillovers had two levels: benefits primarily concentrated among targeted beneficiaries and benefits extending substantially to the wider community. Sharia endorsement had two levels: explicit review and endorsement by an authorised Sharia body and no information regarding endorsement.

The term green zakat was omitted from the vignette so that responses were elicited by substantive programme characteristics rather than the programme label. Vignette wording was reviewed before administration for clarity, consistency and institutional plausibility.

The reported Study 1 flow comprised baseline assessment in Wave 1, a follow-up assignment in Wave 2 and 1,284 completed Study 1 questionnaires, of which 1,240 were included in analysis. Thus 44 completed records were not retained. The source does not provide counts initially invited to Wave 1, Wave 1 completions, Wave 2 invitations,

unmatched responders, attrition before completion, or the 44 exclusions by reason. The reported median interval between waves was 14 days (range 7–21). These absent counts preclude a full attrition assessment. No participant linkage identifiers are reported in the manuscript.

Study 1 recorded the funding-source legitimacy scale and allocation-support response before recognition and suspicion checks. Incorrect attribute recognition was not by itself an exclusion criterion in the stated procedure. The experiment describes fictional programme attributes, not audited beneficiary status or an actual endorsement. Questions used to assess respondent understanding and the exact exclusion rules are available only to the extent reproduced in the supplied text; no independent fieldwork logs accompany the article.

Study 2 used a practice task followed by eight forced paired-profile selections per respondent. Respondents were required to choose one of two hypothetical programmes; there was no 'both', 'neither' or 'do not use zakat' option. The corresponding outcome is therefore relative priority within the displayed pair, not absolute acceptance of either programme as permissible for zakat financing or willingness to pay.

The conjoint varied beneficiary linkage, benefit reach, environmental impact, the fictional Sharia endorsement cue, accountability verification described in the profile, and benefit horizon. The one-, three- and seven-year levels represented short, medium and longer programme-impact timeframes, not observed durations or experimentally validated optimal zakat disbursement periods. Information about endorsement and verification was hypothetical; 'no information' must not be recoded as evidence of absence or non-compliance.

Four contexts were rotated across tasks, with both profiles in each pair referring to the same programme context. The source states that some profile combinations were restricted as implausible but does not specify the prohibited cells, draw probabilities, realised joint attribute frequencies, randomisation seed or generator script. Therefore, the reported AMCEs apply to the implemented constrained choice design as represented in the source, rather than an independently reproducible unrestricted factorial distribution. Context and task-order sensitivity estimates cannot be inferred from overall balanced profile counts.

3.4. Measurement and operationalisation

Experimental attributes were randomised treatment variables, whereas respondent-level constructs were measured using seven-point response scales. Table 1 summarises the operationalisation of the principal variables and experimental attributes.

Table 1. Operationalisation of study variables and experimental attributes

Variable	Role	Operationalisation	Measurement	Source
Beneficiary linkage	Experimental attribute	Degree to which the programme's primary beneficiaries remained connected to recognised zakat recipients	3 levels: verified asnaf; vulnerable unverified; community-wide	Experimental manipulation
Environmental spillovers	Experimental attribute	Extent to which programme benefits extended beyond the primary beneficiary group	2 levels: concentrated; diffuse	Experimental manipulation
Sharia endorsement	Experimental attribute	Information indicating whether the programme received authorised Sharia review and endorsement	2 levels: explicit endorsement; no information	Experimental manipulation
Funding-source moral legitimacy	Primary outcome, Study 1	Normative judgement that using zakat to finance the programme constituted an appropriate and morally acceptable use of the fund	4 items, 7-point Likert scale	Informed by Suchman (1995); adapted from Alexiou and Wiggins (2019)
Zakat-allocation position	Pre-treatment individual measure	Degree to which respondents preferred zakat allocation to remain tied to recognised beneficiary categories	3 items, 7-point Likert scale; AP3 reverse-coded	Developed for the zakat-allocation context
Zakat-allocation moral conviction	Moderator	Strength with which an individual's position on zakat allocation was experienced as a matter of fundamental right and wrong	4 items, 7-point Likert scale	Adapted from Skitka et al. (2005)
Environmental moral conviction	Heterogeneity measure	Strength with which environmental protection was experienced as a moral issue	3 items, 7-point Likert scale	Adapted from moral-conviction measures
Allocation support	Secondary outcome, Study 1	Willingness to support allocation of zakat to the programme	Single item, 7-point scale	Developed for this study

Variable	Role	Operationalisation	Measurement	Source
Trade-off resistance	Robustness measure	Resistance to relaxing preferred zakat-allocation rules in exchange for additional programme benefits	Single item, 7-point scale	Developed for this study
Benefit reach	Conjoint attribute	Distribution of programme benefits within and beyond targeted beneficiaries	2 levels: targeted; targeted with wider spillovers	Experimental manipulation
Environmental impact	Conjoint attribute	Magnitude of expected ecological improvement	2 levels: moderate; high	Experimental manipulation
Accountability verification	Conjoint attribute	Source through which programme implementation and fund use were verified	3 levels: independent; organisation-reported; no information	Experimental manipulation
Benefit horizon	Conjoint attribute	Time until principal programme benefits were expected to materialise	3 levels: within 1 year; approximately 3 years; approximately 7 years	Experimental manipulation
Programme allocation choice	Primary outcome, Study 2	Whether a programme profile was selected for priority zakat funding within each paired comparison	Binary: selected = 1; not selected = 0	Experimental choice

Funding-source moral legitimacy was operationalised by four seven-point items referring to the perceived appropriateness of financing the hypothetical intervention with zakat. The source reports Cronbach's alpha but not factor loadings, comparative discriminant measures, cognitive interviews or item-level validity analyses against programme desirability. The measurement is consequently described as a reliably scored set of items in this sample, not as a fully established distinct scale.

Zakat-allocation position captured the substantive direction of respondents' views regarding beneficiary fidelity. AP3 was reverse-coded before calculating the composite score so that higher values consistently represented stronger beneficiary fidelity. Zakat-allocation moral conviction measured the moral strength attached to this allocation position, while environmental moral conviction captured the moral strength attached to environmental protection. Multi-item measures were calculated as the mean of their constituent items after any required reverse coding.

3.5. Data analysis

Study 1 reports HC3-robust factorial contrasts and Study 2 respondent-clustered linear-probability AMCEs. Planned beneficiary contrasts, interaction terms and conditional simple effects are distinct estimands. We report the source's numerical coefficients without reconstructing their unavailable covariance matrix. The conditional and marginal spillover coefficients are interpreted separately. For moderation, complete lower-order terms and centred-variable parameterisation are required to reproduce high-order conditional tests; the source tables do not include full design matrices or all such coefficients.

For Study 1, the main descriptive comparison averages legitimacy scores across levels of other factorial attributes. The reported diffuse-spillover contrast is a marginal mean difference across beneficiary conditions, whereas the negative community-wide spillover coefficient is the simple effect at the reference beneficiary category. The beneficiary $\times$ spillover terms quantify deviations from that reference simple effect; their interpretation differs from the marginal contrast. The author-provided aggregate results do not include the full twelve fitted cell means and their sampling covariances, so a complete conditional-effects grid with confidence intervals cannot be independently recreated.

$$E[Y_i | X_i] = \alpha + \beta_1 B_i + \beta_2 S_i + \beta_3 E_i + \beta_4 (B_i \times S_i) + \beta_5 (B_i \times E_i) + \varepsilon_i \quad (1)$$

Here, Y is perceived legitimacy; B , S and E denote beneficiary, spillover and endorsement descriptions. A complete factorial expansion must specify all applicable category indicators and higher-order interactions. Equation (1) is an explanatory compact form, not an independently reconstructed estimating command.

In Study 2, the AMCE for attribute level a against its reference describes the average difference in the probability that a profile is selected within a displayed pair, averaged over the realised constrained distribution of other attributes and opponents. Linear probability estimation used respondent-clustered standard errors for repeated tasks. The fitted joint randomisation probabilities, order/context fixed-effect structure and sensitivity specifications are not included in the summary tables, so conditional AMCEs and alternative weighting schemes cannot be independently verified.

$$AMCE(a, a_0) = E\{P(choice | A = a, Z) - P(choice | A = a_0, Z)\} \quad (2)$$

Expectation is taken over the feasible pairing and remaining-attribute distribution actually implemented, and not over unconstrained profiles if assignment exclusions apply.

The analysis distinguishes headline beneficiary contrasts and factorial attributes from higher-order interactions and heterogeneous effects. The provided record says a plan existed before estimation but supplies no time-stamped protocol or registration identifier. Consequently, secondary and exploratory findings, especially nominal p -values near 0.05, are treated as sensitive to multiple testing. No unreported family-wise

or false-discovery-rate adjusted p-values are inferred. A complete test inventory and reproducible corrections require original code and results.

$$\text{Simple spillover effect at beneficiary level } b = \beta S + \beta(B = b) \times S \quad (3)$$

The factorial comparison and conjoint contrast are defined as follows: conditional reference-cell effects are parameters of a fitted factorial model, while average marginal contrasts average over specified combinations. Without the full assignment probabilities and coefficient covariance matrix, marginal estimates and their uncertainty intervals cannot be reconstructed independently. Likewise, all conjoint AMCEs are conditional on the implemented feasible profile support.

3.6. Bias control, ethics and research integrity

Random assignment of hypothetical programme descriptions enables within-experiment comparisons, subject to the realised and incompletely described restrictions. Baseline moderators in Study 1 were reportedly measured before the treatment. However, cell-level balance, missingness, respondent recruitment, effects of wave attrition, perceived Sharia authority and comprehension of the funding restriction cannot be fully verified from the aggregate tables. These are limitations of the available experimental documentation, not evidence that assignment failed.

The source reports post-outcome comprehension checks, response-time monitoring and a practice task, but full question-level logic and the exclusions dataset are not available here. For Study 2, clustering by respondent addresses repeated responses but does not itself rule out task-order fatigue, programme-context differences or pairing-dependent responses. Because no respondent-level re-estimation can be performed from the supplied tables, no additional robustness tests are claimed.

The study's source text describes advance analytical planning; no independent public preregistration or dated protocol has been provided for inspection. The programme materials in Appendices B–E document listed levels, but not randomisation constraints, random seeds, matched-wave flow or the full realised conjoint joint distribution. Substantive conclusions are restricted accordingly. Reproducible assignment code, the anonymised analysis file, the analysis plan and model exports are appropriate supplementary evidence for editorial verification, subject to informed consent and data-protection requirements.

The signed author declaration affirms prior institutional human-research ethics approval, electronic consent and de-identification. Its accompanying materials do not identify the review committee, approval reference or date, or reproduce the full consent script. These particulars require confirmation through the editorial office. The study involved hypothetical programme descriptions; the author declaration does not

document any actual Sharia determination or external confirmation of beneficiary outcomes.

4. RESULTS

4.1. Study 1: Factorial vignette experiment

Study 1 analysed 1,240 eligible responses from 1,284 completed questionnaires across a $3 \times 2 \times 2$ vignette design. Funding-source moral legitimacy was rated on a seven-point scale ($M = 5.25$, $SD = 0.86$; Cronbach's $\alpha = .907$). Participants assigned to programmes identifying verified asnaf as primary beneficiaries gave higher legitimacy scores ($M = 5.82$) than those assigned to vulnerable but unverified beneficiaries ($M = 5.21$) or community-wide access ($M = 4.72$). Relative to the community-wide description, the verified-asnaf and vulnerable-unverified contrasts were positive (1.099 and 0.488, respectively; both $p < .001$), supporting H1 for the bundled beneficiary descriptions.

Contrary to H2, diffuse environmental spillovers were associated with a higher average legitimacy score than concentrated benefits (marginal contrast = 0.182, 95% CI [0.106, 0.258]). This pooled contrast differs from the non-significant conditional spillover effect in the community-wide reference category (-0.112 , 95% CI $[-0.241, 0.018]$). The verified-asnaf and vulnerable-unverified interaction coefficients were positive (0.526 and 0.360), indicating variation across beneficiary descriptions, but not the predicted general legitimacy penalty for wider benefits (H3: qualified). A fictional Sharia endorsement cue increased perceived legitimacy relative to no endorsement information (0.540, 95% CI [0.464, 0.616]), supporting H4 as an informational-cue effect only.

The reported verified-asnaf $\times$ allocation-position $\times$ moral-conviction coefficient was positive (0.101, 95% CI [0.031, 0.170]), providing limited evidence relevant to H5 without establishing its proposed psychological mechanism. The spillover $\times$ allocation-position $\times$ moral-conviction estimate did not meet the 5% threshold (0.051, $p = .058$); H6 was therefore not supported. Table 2 presents the principal marginal contrasts and conditional interaction terms.

Table 2. Principal factorial contrasts and moderation estimates (Study 1)

Effect	Estimate	Robust SE	95% CI	p
Verified asnaf vs community-wide	1.099	0.048	[1.005, 1.192]	< .001
Vulnerable unverified vs community-wide	0.488	0.047	[0.395, 0.581]	< .001
Diffuse vs concentrated spillovers	0.182	0.039	[0.106, 0.258]	< .001
Explicit Sharia endorsement	0.540	0.039	[0.464, 0.616]	< .001
Verified asnaf $\times$ diffuse spillovers	0.526	0.094	[0.342, 0.710]	< .001

Effect	Estimate	Robust SE	95% CI	p
Vulnerable unverified × diffuse spillovers	0.360	0.094	[0.176, 0.543]	< .001
Verified asnaf × allocation position × moral conviction	0.101	0.036	[0.031, 0.170]	0.005
Spillovers × allocation position × moral conviction	0.051	0.027	[-0.002, 0.103]	0.058

Note: The first four rows are marginal contrasts; the remaining rows are conditional interaction estimates with different reference settings. SE and 95% CIs reproduce the manuscript's reported HC3 results.

Allocation-support responses showed a similar ordering: verified-asnaf and vulnerable-unverified descriptions exceeded community-wide access by 0.892 and 0.365 points, respectively (both $p < .001$). Diffuse spillovers and the hypothetical endorsement cue were also positively associated with allocation support (0.166 and 0.454 points; both $p < .001$). These are stated evaluations of assigned programme descriptions, not observed disbursement or beneficiary outcomes.

4.2. Study 2: Paired-profile conjoint experiment

Study 2 retained 1,156 respondents from 1,200 completed questionnaires. Each respondent evaluated eight forced-choice programme pairs, producing 9,248 paired decisions and 18,496 displayed profiles; standard errors were clustered by respondent. Programme descriptions that prioritised verified asnaf were more likely to be selected than community-wide programmes (AMCE = 0.292, 95% CI [0.276, 0.308]). The vulnerable-unverified description also increased relative selection (AMCE = 0.119, 95% CI [0.103, 0.136]). These were the largest beneficiary-linkage contrasts.

Other attributes also influenced relative choices: independent accountability verification (AMCE = 0.173), hypothetical Sharia endorsement (0.159), high expected environmental impact (0.110), wider benefit reach (0.056), and organisation-reported verification (0.083) were positively associated with selection relative to their reference levels (all reported $p < .001$). Three-year and seven-year benefit horizons were preferred to a one-year horizon (AMCEs = 0.129 and 0.056). Table 3 reports all source-based principal AMCEs and their clustered uncertainty intervals.

Table 3. Average marginal component effects on relative programme selection (Study 2)

Attribute	Level relative to reference	AMCE	Clustered SE	95% CI	p
Beneficiary linkage	Verified asnaf vs community-wide	0.292	0.008	[0.276, 0.308]	< .001
	Vulnerable unverified vs community-wide	0.119	0.008	[0.103, 0.136]	< .001

Attribute	Level relative to reference	AMCE	Clustered SE	95% CI	p
Benefit reach	Wider spillovers vs targeted	0.056	0.007	[0.042, 0.069]	< .001
Environmental impact	High vs moderate	0.110	0.007	[0.096, 0.123]	< .001
Sharia endorsement	Explicit endorsement vs no information	0.159	0.007	[0.145, 0.172]	< .001
Accountability verification	Independent vs no information	0.173	0.008	[0.157, 0.189]	< .001
	Organisation-reported vs no information	0.083	0.008	[0.067, 0.099]	< .001
Benefit horizon	Approximately 3 years vs within 1 year	0.129	0.008	[0.112, 0.145]	< .001
	Approximately 7 years vs within 1 year	0.056	0.009	[0.039, 0.073]	< .001

Note: AMCE = average marginal component effect; 95% CIs and clustered SE are those reported for the implemented constrained conjoint design (1,156 respondent clusters).

In secondary heterogeneity analyses, the verified-asnaf contrast was stronger at higher allocation-position scores (interaction = 0.051, $p < .001$) and stronger beneficiary-focused moral conviction (interaction = 0.031, $p < .001$). Most reported attribute-by-attribute interactions were not significant; the vulnerable-unverified $\times$ allocation-position term (0.014, $p = .040$) is interpreted cautiously in view of multiple comparisons. The main conjoint findings concern hypothetical programme preferences rather than verified Sharia permissibility or realised social and environmental effects.

5. DISCUSSION

Both experiments show that the way a hypothetical programme describes its intended beneficiaries matters for respondents' moral evaluations and forced-choice priorities. The largest reported beneficiary contrasts favour programmes labelled for verified asnaf, but the three-level descriptions vary beneficiary verification, vulnerability and breadth of access together. The experiments therefore identify respondent reactions to those complete programme framings, not verified Sharia eligibility rules, realised impact or the prevalence of a universal religious doctrine among Indonesian muzaki.

This finding complements green-zakat and legitimacy research by focusing on the use of a normatively constrained funding source for particular programme designs (Amrullah et al., 2025; Suchman, 1995). Its distinct contribution is a pair of experimentally differentiated outcomes. That requires a separate legal review informed

by the relevant Sharia authority and the details of actual beneficiary rights and fund transfer.

The positive overall diffuse-spillover contrast contradicts H2, while the baseline community-wide simple effect is negative but not significant; heterogeneous simple effects reflect different beneficiary framings. This pattern can be explained by consequential preference for greater environmental reach, distributive targeting, reassurance from verification, or a combination. As H6 is unsupported, the experiments do not uniquely establish Sacred Value Protection as the operative psychological mechanism. Future tests should directly contrast non-compensatory principles with outcome-oriented utility under experimentally equivalent information.

The sacred-value account is best regarded as a qualified interpretative possibility. A beneficiary-focused preference by itself is compatible with ordinary poverty targeting, programme utility and authority signalling. The positive spillover contrast and absence of statistically established moralised spillover resistance weaken the stronger hypothesis of a protected exclusion boundary. Evidence of rule-based refusal despite large independently varied benefits would be more discriminating than beneficiary preference alone.

The Sharia information treatment represented a fictional statement of endorsement by an unspecified authorised body, contrasted with no information. The observed endorsement preference may reflect legitimacy, perceived institutional competence or general reassurance. It cannot be attributed to an identifiable board or treated as evidence that the evaluated interventions satisfy *fi sabilillah*, ownership/beneficiary-rights rules or actual Sharia audit requirements. Policy application would require independent assessment by authorised bodies and transparent publication of their grounds.

The conjoint results indicate that participants weighed beneficiary descriptions alongside anticipated environmental outcomes, endorsement information, accountability verification claims and benefit horizon. Because they made forced selections without an opt-out, each choice shows which presented profile was prioritised, even when neither profile might be accepted for actual zakat funding. Average conditional choices therefore cannot establish realised allocation, impact efficiency or endorsement of either instrument. Whether *waqf*, *sadaqah* or blended instruments would be preferred for broader-benefit projects remains an untested funding-source comparison.

The experiments do not randomise zakat versus *waqf* or *sadaqah*, do not measure real payment or beneficiary impact, and do not establish that longer-horizon environmental projects are legally fundable from zakat. These empirical boundaries are essential when translating stated preferences into programme proposals.

The finding is narrower than a general preference for green zakat. Respondents evaluated hypothetical use of zakat for contrasting programme attributes. Funding-source moral legitimacy captures perceived appropriateness of that proposed use. Cronbach's alpha supports internal consistency in the reported sample, but item-level

discriminant and content-validity evidence is insufficient to claim a newly validated distinct scale. A broader programme-desirability measure, named Sharia authorities and actual beneficiary allocations would help distinguish the interpretation in follow-up work.

The policy relevance is an agenda for evaluation, not proof of outcomes. Institutions considering climate-resilient livelihood, irrigation or coastal programmes could present clear descriptions of who is expected to benefit, what verification is proposed, the Sharia interpretation relied upon and how outcomes would be monitored. Independent Sharia review, documentation of asnaf rights and comparative assessment of waqf or sadaqah funding would be required before implementation. Prospective impact designs should observe actual recipient welfare, environmental performance and payment behaviour. None of those outcomes is measured by the present hypothetical experiments.

6. CONCLUSION

The experiments identify higher perceived legitimacy and greater relative selection for programme descriptions naming verified asnaf as primary beneficiaries. Wider stated spillovers do not show the predicted average legitimacy penalty; the proposed three-way moderation of spillover resistance is also unsupported. These results concern descriptions and forced-choice priorities among online volunteer participants. They cannot decide doctrinal zakat eligibility or confirm the effects of any programme on recipients or the environment.

The theoretical contribution is a disciplined distinction between funding-source moral legitimacy and general programme priority within green-zakat evaluation. The beneficiary-linkage contrasts are consistent with beneficiary-focused distributive preferences, but alternative utilitarian, targeting and authority-based explanations remain plausible. Sacred Value Protection should not be treated as uniquely identified without stronger evidence of non-compensatory moral resistance. The four-item legitimacy scale is internally consistent, but its independence from programme desirability is not established by the source diagnostics.

For practice, zakat institutions may consider beneficiary-specific designs and transparent description of hypothetical Sharia and accountability assurances as inputs to formal assessment; these suggestions are not proven programme interventions. Compliance with the eight asnaf categories, the treatment of public goods and ownership-related questions must be adjudicated by authorised authorities under applicable interpretations. Wider-benefit projects might also use waqf, sadaqah or other instruments, but the experiments did not compare funding sources.

Generalisation is limited by online volunteer recruitment, unavailable cell-level randomisation and attrition documentation, incomplete conjoint constraints and forced choices. More conclusive evidence requires de-identified assignment logs, dated protocols, a full item-validation assessment, joint attribute distributions, task/order sensitivities and ethics reference details, subject to institutional permissions. Future

studies should measure actual funding choices and beneficiary/environmental outcomes, vary real financing instruments and directly test the competing sacred-value and consequential explanations. The results identify experimentally elicited preferences, not population-wide permissibility or policy impacts.

The evidence supports two limited experimental estimands: (i) the effect of assigned vignette descriptions on perceived moral legitimacy and (ii) average relative choice differences for conjoint levels within the reported pairing system. Neither estimand identifies Sharia permissibility, changes in zakat collection, environmental performance, poverty reduction or actual allocations.

Author Contributions

A.M.A-M: Conceptualisation, Methodology, Investigation, Data Curation, Formal Analysis, Software, Writing – Original Draft.

A.R.A: Validation, Literature Review, Writing – Review and Editing, Writing – Original Draft.

Disclosure Statement

The authors declare no potential conflicts of interest concerning the research, authorship, and publication of this article. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Acknowledgement

The authors express their sincere appreciation to all muzaki who voluntarily participated in the experimental studies and shared their perspectives on green zakat, beneficiary eligibility, and programme allocation. Their participation provided valuable insights into the moral legitimacy and governance considerations surrounding environmentally oriented zakat programmes. The authors also acknowledge the constructive feedback provided by the editor and reviewers, which contributed to improving the scientific clarity and quality of this research.

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