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Municipal Solid Waste Services before Prolonged Disruption in Myanmar: A Pre-2020 Snapshot of Service Access, Citizen Satisfaction and Willingness to Pay in Kayin State

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ABSTRACT: This study revisits the first author's earlier research on municipal solid waste management in Kayin State, Myanmar, to reconstruct a theoretically informed pre-disruption snapshot of citizen–service relationships in late 2019. The empirical material derives from a community survey of 457 respondents conducted in Hlaingbwe, Hpa-An, and Kawkaeyik townships between 23 October and 5 November 2019. The present article reappraises the published aggregate evidence through five analytical domains: service access and disposal practices, provider arrangements, institutional awareness, satisfaction, and willingness to pay for improved services. Approximately 82% of respondents received some form of waste collection, but access varied markedly across townships, and among respondents without collection approximately 79% reported burning their waste. Service delivery was institutionally heterogeneous, particularly in Hpa-An, where municipal, private, and community-based providers coexisted. Institutional awareness was weak: only about 19% knew of other services offered by Development Affairs Organisations, and approximately 94% were unaware of how garbage-collection revenues were used. Nevertheless, around 71% evaluated services as fair, satisfactory, or very satisfactory, and among this group approximately 57% were willing to pay more for improved services. The findings portray a pre-disruption municipal system that was operational but incomplete, combining substantial service reach with access gaps, low institutional legibility, and heterogeneous support for service improvement. The 2019 evidence is not treated as representative of contemporary Kayin State or as a longitudinal baseline; it provides a historically bounded reference point for future research on continuity and change in local public-service provision.

1. INTRODUCTION

Municipal solid waste management is among the most visible and demanding services that local governments in developing countries provide: it absorbs a substantial share of municipal budgets, requires daily operational performance across dispersed urban space, and touches every household directly (Guerrero et al., 2013; Kaza et al., 2018). Where collection systems fall short, the consequences are equally visible: uncollected waste in low-income settings is commonly dumped or burned, with attendant risks to air quality, public health, and the local environment (Kaza et al., 2018; Wiedinmyer et al., 2014). Recent reviews of developing regions in Asia and Africa continue to identify incomplete collection coverage, weak financing arrangements, and fragmented governance as persistent structural challenges (Zhang et al., 2024). Because waste services are simultaneously

technical, financial, and relational, scholars increasingly examine them not only as engineering systems but as sites where citizens experience, evaluate, and support—or decline to support—local public institutions (Van Ryzin, 2006; Joshi & Moore, 2004).

This citizen-facing dimension is comparatively underdocumented in Myanmar. Municipal services in most of the country are delivered by Development Affairs Organisations (DAOs), self-financing township-level bodies that constitute one of the few fully subnational tiers of Myanmar's governance system (Arnold et al., 2015). Existing studies of Myanmar's solid waste sector have concentrated on national policy status and the largest cities (Premakumara et al., 2017), on the economics of outsourcing collection services (The Asia Foundation, 2020), and, more recently, on the actor networks and social capital that sustain waste and recycling chains at township level (Nesheim et al., 2024). What remains scarce is systematic evidence on how ordinary urban residents in Myanmar's smaller state capitals and towns experienced municipal waste services: whether they received collection, from whom, what they knew about the institutions providing it, how satisfied they were, and whether they were prepared to pay for improvement. Such citizen-level evidence is rare for any period, and it is now effectively impossible to collect retrospectively for the years before 2020, because Myanmar entered a period of successive prolonged disruptions—including the COVID-19 pandemic and a changing institutional and operating environment from early 2021—that transformed the conditions under which local services operate.

This article addresses that gap through a theoretically informed secondary reappraisal of the author's previous research: a community survey of municipal solid waste services conducted in late 2019 in three townships of Kayin State—Hlaingbwe, Hpa-An, and Kawkaik—with the involvement of The Asia Foundation and collaborating local civil society organisations (The Asia Foundation, 2019). The original study was designed as a practice-oriented community assessment intended to inform local decision-makers, not as a theory-testing academic survey. The present article returns to that evidence with a different scholarly purpose. It reorganises the reported findings into five analytical domains (Section 4) and interprets them through contemporary scholarship on municipal service delivery, citizen satisfaction, institutional transparency, and willingness to pay for improved environmental services.

The central analytical puzzle that motivates the reappraisal is the coexistence, within the same survey, of patterns that standard accounts of service performance would not expect to find together. Organised collection reached most surveyed residents, and a clear majority evaluated services as at least fair; yet institutional awareness was strikingly weak—about four in five respondents did not know of other DAO services, and roughly 94% did not know how collection revenues were used—and willingness to pay for improvement was heterogeneous even among satisfied respondents. How could relatively substantial service reach and generally favourable service evaluations coexist with very limited institutional awareness and uneven willingness to pay? A second, descriptive pattern sharpens the governance stakes: where collection was absent, households overwhelmingly reported burning their waste. The article develops an interpretative framework, presented in Section 4, to make analytical sense of these patterns without overstating what aggregate descriptive evidence can show.

The article makes three contributions. Empirically, it reintroduces into the scholarly record relatively rare citizen-level aggregate evidence from three Kayin State townships collected immediately before the post-2020 disruption period. Conceptually, it integrates service access, provider arrangements, institutional awareness, satisfaction, and willingness to support improvement into a multidimensional account of the citizen–service relationship in a resource-constrained municipal setting. Historically, it repositions the 2019 survey as a documented pre-disruption snapshot: not a longitudinal baseline, since no directly comparable follow-up exists, but a historically bounded reference point against which future comparable research on continuity and change in Myanmar's local service provision can be oriented.

The remainder of the article proceeds as follows. Sections 2–5 set out the Myanmar and Kayin State context, the relevant literature, the conceptual framework, and the research objectives and questions. Section 6 describes the methodology of the secondary reappraisal, including its data-validation procedures. Section 7 reports the findings, Section 8 discusses them, and Sections 9 and 10 present limitations, future research directions, and conclusions.

2. MUNICIPAL SOLID WASTE GOVERNANCE IN MYANMAR AND KAYIN STATE

Municipal governance in Myanmar has an unusual institutional architecture. Outside the three largest cities, urban services are the responsibility of Development Affairs Organisations (DAOs), township-level bodies operating under state and region governments. DAOs are distinctive in two respects: they are among the most decentralised public organisations in Myanmar's otherwise centralised administrative system, and they are essentially self-financing, funding their operations from local

revenues—including licences, fees, and service charges such as garbage-collection fees—rather than from union-level budget transfers (Arnold et al., 2015). Solid waste collection is one of the most prominent DAO functions, alongside roads, drainage, water, and markets. This institutional design has two implications that matter for the present study. First, the financial sustainability of waste services depends significantly on local willingness to pay charges. Second, the visibility and accountability of the DAO to residents is a governance question in its own right: because DAOs both provide services and collect the associated revenues, citizens' knowledge of what DAOs do and how service charges are used forms part of the accountability relationship (Arnold et al., 2015).

Assessments of Myanmar's waste sector in the later 2010s described a system at a preliminary stage of development, marked by limited collection coverage, reliance on open dumping, weak regulatory frameworks, and constrained institutional and financial capacity, with responsibility for improvement resting largely on township- and city-level organisations (Premakumara et al., 2017). At the same time, provision was not exclusively municipal. In a number of townships, DAOs had contracted private operators for collection, and community-based arrangements filled gaps elsewhere (The Asia Foundation, 2020). Later research at township level has shown that waste management in Myanmar operates through locally differentiated networks of formal and informal actors, in which relationships and social capital shape how materials are collected, traded, and recycled (Nesheim et al., 2024). Township-level variation in provider arrangements is therefore an empirically documented feature of the sector, not an anomaly.

Kayin State, in Myanmar's southeast, illustrates these dynamics at modest urban scale. Its townships are small by regional standards: government data for 2016–17 estimated urban populations of 18,101 in Hlaingbwe, 54,860 in Hpa-An (the state capital), and 46,842 in Kawkeyik (The Asia Foundation, 2019). In these settings, the DAO is often the most tangible everyday interface between residents and subnational government. The 2019 community survey re-examined in this article was undertaken within a broader accountability-focused programme—the external source grant—that supported civil society engagement with subnational budget processes, and was approved by the Kayin State Minister of Planning, Finance and Development Affairs (The Asia Foundation, 2019). The three townships were selected in part because they exhibited different modes of service provision, spanning DAO, private, and community-based collection.

The timing of the survey gives the evidence a particular historical character. Data collection concluded in early November 2019, and the report was released in December 2019. Within months, Myanmar entered the COVID-19 pandemic, and from February 2021 a changed institutional and operating environment affected subnational administration, service delivery, and the feasibility of local research, including in Kayin State. This article makes no claims about how waste services in the three townships have fared since 2019; the aggregate survey evidence cannot support such claims. Rather, the post-2020 rupture is what converts an otherwise routine community assessment into a historically significant record: it documents local service conditions and citizen–service relationships immediately before the disruption period began.

3. LITERATURE REVIEW

3.1 MUNICIPAL SOLID WASTE MANAGEMENT IN DEVELOPING CITIES

A substantial literature documents the difficulties that cities in developing countries face in delivering adequate solid waste services. Guerrero et al. (2013), synthesising evidence from more than thirty urban areas across twenty-two developing countries, showed that performance is shaped by an interacting set of technical, financial, institutional, and social factors, including equipment and route planning, cost recovery, organisational capacity, and household behaviour. Global assessments estimate that low-income countries collect only a fraction of the waste they generate and that the great majority of what is uncollected is openly dumped or burned (Kaza et al., 2018). Open burning of domestic waste is, in turn, a globally significant source of particulate matter and hazardous air pollutants (Wiedinmyer et al., 2014); in low-income settings, where uncollected waste is frequently managed by households through burning, the two problems are closely linked (Kaza et al., 2018). Reviews of developing Asia confirm the persistence of these structural constraints—incomplete coverage, financing gaps, limited enforcement, and fragmented institutional responsibility—while emphasising that solutions must be adapted to local institutional contexts rather than transplanted from high-income systems (Zhang et al., 2024). Two implications from this literature frame the present study: collection coverage is a foundational but insufficient indicator of system performance, and household disposal behaviour must be read against the service environment in which households are located.

3.2 MULTI-ACTOR PROVISION AND CO-PRODUCTION OF LOCAL SERVICES

A second body of scholarship examines who provides local services. In many developing-country settings, public services are delivered not by a single municipal provider but by shifting combinations of state agencies, private contractors, community-based organisations, and informal workers. The co-production literature argues that such arrangements are not merely stop-gaps: citizens and non-state actors routinely contribute inputs that are integral to service delivery, and the interplay between state and non-state provision can be synergistic where institutional arrangements support it (Ostrom, 1996). Joshi and Moore (2004) describe “institutionalised co-production”—a regular, long-term relationship between state agencies and organised groups of citizens in which both make substantial resource contributions—as a durable feature of service delivery in environments where states lack the reach or resources to provide uniformly, noting that such hybrid arrangements raise distinctive questions of accountability: when provision is shared, responsibility becomes harder for citizens to read. In the waste sector specifically, research in Myanmar has documented dense interdependence between formal providers and informal collectors and traders, mediated by relationships and social capital (Nesheim et al., 2024), while economic analysis of DAO outsourcing indicates that private participation in Myanmar’s municipal waste collection was an emerging and documented practice before 2020, with a number of townships having adopted or considered contracting private operators (The Asia Foundation, 2020). This literature directs attention to provider arrangements as a variable in their own right—one that may differ across neighbouring townships and shape how citizens experience and evaluate services.

3.3 CITIZEN SATISFACTION WITH LOCAL PUBLIC SERVICES

How citizens evaluate public services is a long-standing concern of public administration research. The expectancy-disconfirmation tradition holds that satisfaction reflects the comparison between perceived performance and prior expectations rather than performance alone (Van Ryzin, 2006), and meta-analytic evidence confirms that this mechanism is robust across the studies and settings examined to date, although the range of public services on which it has been tested remains incomplete (Zhang et al., 2022). Two consequences follow for the interpretation of satisfaction data in low-capacity settings. First, favourable evaluations do not necessarily indicate objectively strong services; they may reflect modest expectations formed under conditions of limited prior provision. Second, satisfaction is analytically distinct from support for change: citizens may evaluate an existing service positively while declining to support its expansion or improved financing. Satisfaction measures from single-item surveys should therefore be treated as one component of a broader citizen–service relationship rather than a summary verdict on performance.

3.4 INSTITUTIONAL AWARENESS, TRANSPARENCY, AND THE LEGIBILITY OF SERVICES

A related strand of research examines what citizens know about the institutions that serve them. Transparency scholarship has shown that the disclosure of information about government decisions and finances shapes citizens’ trust in and evaluation of public organisations, though not always straightforwardly, and at times with weak or even negative effects (Grimmelikhuijsen et al., 2013). In decentralised and hybrid provision settings, the prior question is often more basic: whether citizens can identify who provides a service, on what schedule, with what responsibilities, and where the money goes. Where provision is shared among public, private, and community actors, this institutional legibility cannot be assumed (Joshi & Moore, 2004). For self-financing municipal bodies such as Myanmar’s DAOs, revenue transparency has a direct governance function, since the willingness of residents to pay charges is plausibly connected to their understanding of what the charges fund (Arnold et al., 2015). Yet citizen knowledge of municipal institutions is rarely measured in waste-management research, which tends to privilege technical and behavioural variables. The present study treats institutional awareness as a substantive dimension of the citizen–service relationship rather than as background noise.

3.5 WILLINGNESS TO PAY FOR IMPROVED WASTE SERVICES

A large empirical literature, much of it using contingent valuation, examines households’ willingness to pay (WTP) for improved solid waste services in developing countries. Studies consistently find substantial though far from universal WTP: in four major metropolitan cities in Ghana, just over half of households were willing to pay for improved collection, with WTP shaped by education, employment type, self-rated socioeconomic status, and service attributes such as collection frequency (Boateng et al., 2019); in Injibara, Ethiopia, about four-fifths of households expressed WTP, and satisfaction with the existing service was among the factors positively and significantly associated with it (Mulat et al., 2019); in Harar, Ethiopia, a double-bounded contingent valuation study found large-majority WTP, patterned by income and related household characteristics (Girma et al.,

2022). In Southeast Asia, Chalcharoenwattana and Pharino (2016) found that Thai urban households were willing to finance enhanced municipal recycling, with WTP varying across settlement types. Three lessons from this literature inform the present reappraisal. First, WTP is heterogeneous within and across communities, and socioeconomic covariates matter—which cautions against interpreting aggregate WTP percentages from surveys lacking income data. Second, WTP is related to, but not reducible to, satisfaction: satisfied households may be more willing to pay in some settings, yet satisfaction with the status quo can also reduce the perceived need for improvement. Third, stated WTP is sensitive to the information provided about what payment would fund, which connects WTP analytically to the transparency and awareness questions discussed above.

3.6 RESEARCH GAP

Bringing these strands together identifies the gap this article addresses. The technical literature on waste management in developing cities rarely incorporates citizen knowledge of institutions; the satisfaction and transparency literatures rarely engage with waste services in low-capacity settings; and the WTP literature typically measures payment intentions in isolation from provider arrangements and institutional awareness. Myanmar-specific research has examined policy status, outsourcing economics, and actor networks, but citizen-level evidence linking access, provider type, awareness, satisfaction, and WTP within the same communities is scarce—and for the pre-2020 period it can no longer be generated. The 2019 Kayin State survey, despite its practice-oriented origins and methodological limits, contains precisely this combination of measures. A structured secondary reappraisal is therefore warranted, both to integrate the evidence conceptually and to preserve it as a documented pre-disruption reference point.

4. CONCEPTUAL FRAMEWORK

The reappraisal is organised by an interpretative framework that links five domains of the citizen–service relationship. Service access and provider arrangements constitute the structural environment within which households encounter waste services: whether collection is available at all, and whether it is delivered by a municipal, private, or community-based provider. Citizen service experience comprises the operational texture of that encounter—collection frequency, scheduling, and convenience. Service evaluation is expressed as satisfaction, understood in expectancy-disconfirmation terms as a judgement relative to expectations rather than an absolute performance measure (Van Ryzin, 2006). Willingness to support improved services, expressed here as stated willingness to pay higher charges, represents the forward-looking, material dimension of citizen support. The framework orders these domains in an interpretative sequence (Figure 1):

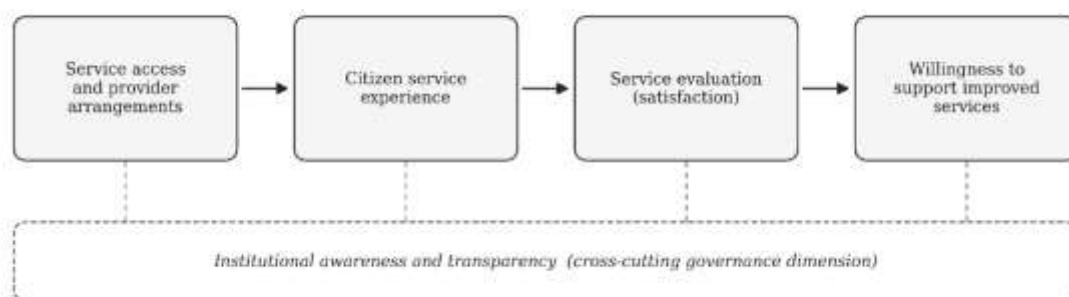


Figure 1. Interpretative framework of the citizen–service relationship. Arrows denote an interpretative sequence, not empirically tested causal pathways; institutional awareness and transparency operate as a cross-cutting governance dimension.

Institutional awareness and transparency are treated as a cross-cutting governance dimension rather than a stage in the sequence. Citizens’ knowledge of who provides services, on what schedule, with what responsibilities, and how revenues are used potentially conditions every link: it shapes what citizens expect, how they attribute performance, and whether additional payment appears credible and accountable (Grimmelikhuijsen et al., 2013; Joshi & Moore, 2004). For a self-financing provider such as a DAO, this cross-cutting dimension is not incidental but constitutive of the financing model (Arnold et al., 2015).

Two clarifications bound the framework’s status. First, the arrows represent an interpretative conceptual relationship, not empirically tested causal pathways; the available aggregate data cannot establish that access shapes experience, that experience

produces satisfaction, or that satisfaction generates willingness to pay. The framework is a lens for organising descriptive evidence and generating propositions for future respondent-level research. Second, the five domains were constructed for this article by grouping the original questionnaire items; they are analytical categories, not validated latent constructs, and no psychometric properties are claimed for them. Within this framework, the study also attends to a subsidiary descriptive pattern with environmental governance significance: where collection access is absent, household self-disposal—particularly burning—predominates. This pattern is examined as a strong descriptive coexistence rather than a demonstrated causal relationship.

5. RESEARCH OBJECTIVES AND RESEARCH QUESTIONS

5.1 OVERALL RESEARCH OBJECTIVE

To examine citizen experiences of municipal solid waste services in selected townships of Kayin State in 2019 as a pre-disruption snapshot of service access, disposal practices, institutional awareness, satisfaction, and willingness to support improved service provision in Myanmar.

5.2 SPECIFIC RESEARCH OBJECTIVES

RO1. To document the pre-disruption pattern of solid waste collection access and household disposal practices in Hlaingbwe, Hpa-An, and Kawkeyik townships in 2019.

RO2. To examine citizens' pre-disruption awareness of solid waste service provision, including collection schedules, service-provider responsibilities, and the use of service revenues.

RO3. To examine citizen satisfaction with existing solid waste collection services and willingness to pay for improved services within the 2019 institutional setting.

RO4. To identify descriptive differences in service access, provider arrangements, awareness, satisfaction, and willingness to pay across the three surveyed townships.

RO5. To interpret the 2019 findings as a pre-disruption snapshot of municipal service conditions and citizen–service relationships prior to the prolonged disruptions affecting Myanmar from 2020 onward.

5.3 RESEARCH QUESTIONS

Consistent with the descriptive and interpretative character of the evidence, the study poses five research questions:

RQ1. What was the extent of solid waste collection access in the three townships in late 2019, and how did households without access dispose of their waste?

RQ2. What combinations of municipal, private, and community-based provision characterised service delivery, and how did these arrangements differ across townships?

RQ3. What did citizens know about the institutional aspects of service provision—additional DAO services, collection schedules, revenue use, and disposal-site responsibilities?

RQ4. How did citizens evaluate existing services, and to what extent were positively evaluating citizens willing to pay more for improved services?

RQ5. How can the observed configuration of access, provider arrangements, awareness, satisfaction, and willingness to pay be interpreted as a pre-disruption snapshot of the citizen–service relationship in Kayin State?

6. METHODOLOGY

6.1 RESEARCH DESIGN AND RELATIONSHIP TO THE AUTHOR'S PREVIOUS WORK

This study constitutes a theoretically informed secondary reappraisal of the author's previous research on municipal solid waste management in Kayin State, Myanmar. The empirical foundation originates from the Solid Waste Management Community Survey in Kayin State (Selected Three Townships), undertaken in 2019 with the involvement of The Asia Foundation and collaborating local civil society organisations (The Asia Foundation, 2019). In the original research, Htin Aung Ling was responsible for analysis and reporting, while project management, research production, field coordination, and other functions

involved additional institutional and community partners. The original study was designed primarily as a practice-oriented community assessment rather than a theory-testing academic survey.

The present article returns to that earlier body of work for a substantively different scholarly purpose. It does not present the 2019 survey as newly collected evidence. Instead, it reorganises and interprets the previously reported evidence through contemporary scholarship on municipal service delivery, citizen satisfaction, institutional awareness, environmental governance, and willingness to pay for improved public services. The study is therefore a theoretically informed secondary analysis and reinterpretation of the author's earlier research and analysis, rather than a republication of the original community report.

The present analysis is based exclusively on evidence reported in the published community assessment. The original respondent-level dataset is no longer available to the authors, and no individual-level observations have been reconstructed from the published results; accordingly, the published report is treated as the primary documentary and empirical source for the present analysis, and all numerical evidence is retained as reported there, with source inconsistencies disclosed where identified.

The survey was conducted between 23 October and 5 November 2019 (the report's schedule page records interviews and data encoding continuing to 6 November), with data validation and analysis completed in November and the report released in December 2019. Its timing permits the evidence to be reconsidered as a historically bounded pre-disruption snapshot immediately before Myanmar entered a period of successive disruptions from 2020 onward. The study does not claim that the original survey anticipated later developments, nor does it use the 2019 observations to estimate contemporary conditions or infer causal effects of subsequent disruptions.

6.2 STUDY SETTING AND SAMPLE

The original survey was conducted in Hlaingbwe, Hpa-An, and Kawkayeik townships in Kayin State. Township selection considered geographical comparability, accessibility for survey collectors, and variation in modes of service provision, including Development Affairs Organisations (DAOs), private providers, and community-based organisations. The survey included 457 respondents: 120 in Hlaingbwe, 179 in Hpa-An, and 158 in Kawkayeik. The sample was broadly balanced by gender, with approximately 49% male and 51% female respondents overall. The original procedure specified a minimum of 20 respondents per ward and covered age categories from 17–26 years through 67–76 years and above. Relative to estimated 2016–17 urban populations, the samples corresponded to roughly 0.66% of urban residents in Hlaingbwe, 0.33% in Hpa-An, and 0.34% in Kawkayeik.

The original report described respondent selection as random within its community-assessment design, but it also acknowledged that the exercise was a pilot, that the sample was small relative to township populations, and that socioeconomic indicators such as income were not incorporated into the sampling framework. Accordingly, the present study does not claim statistical representativeness for Kayin State or Myanmar; findings are interpreted as evidence from the surveyed urban communities.

6.3 SURVEY INSTRUMENT AND ANALYTICAL DOMAINS

The original questionnaire comprised 16 principal questions covering receipt of garbage collection services, provider type, disposal practices when collection was unavailable, awareness of other services, preferred collection arrangements, collection schedules and frequency, convenience, knowledge of the use of service charges, satisfaction, willingness to pay additional charges for improved collection, awareness of garbage-pit maintenance, and observations of littering.

For the present analysis, these items were organised into five analytical domains: (1) service access and disposal practices; (2) service experience, including frequency, convenience, and preferences; (3) institutional awareness, including knowledge of services, schedules, revenue use, and disposal-site responsibilities; (4) citizen satisfaction; and (5) willingness to pay for service improvement. These categories are interpretative domains developed for the present article and are not presented as validated latent constructs or psychometric scales.

6.4 ANALYTICAL STRATEGY

Analysis proceeded in three stages. First, descriptive evidence was reconstructed from the original report and organised according to the five analytical domains, using a structured extraction dataset compiled from the published report. Frequencies and percentages were used to identify overall patterns. Second, cross-township descriptive comparison was undertaken across Hlaingbwe, Hpa-An, and Kawkayeik to identify heterogeneity across the five analytical domains. These comparisons are

descriptive and are not presented as statistically significant differences. Third, the observed patterns were interpreted using contemporary literature on municipal service delivery, environmental governance, citizen satisfaction, institutional awareness, and willingness to pay.

Two reporting conventions of the original report require emphasis. First, item percentages in the report are calculated on the basis of the responses received to each question rather than on a uniform sample base. Several items were answered by all 457 respondents, but others rest on smaller response bases—376 respondents for the service-provider item, 323 for the willingness-to-pay item filtered on positive service evaluation, and 71 and 24 for further filtered willingness-to-pay items, together with a contested base for the schedule-convenience item (Section 6.6). Response bases are therefore stated alongside findings wherever the original source reports them, percentages from differently based items are not combined, and no counts are inferred where a base is not stated. Second, overall three-township figures in the report are generally arithmetic averages of township-level percentages rather than pooled respondent-weighted statistics. Because township sample sizes differ (120, 179, and 158), an arithmetic average of township percentages does not necessarily equal the percentage of all 457 respondents. Where an overall figure is reported below, it reproduces the original report's published average and is identified as such; no pooled recalculation is attempted, since the subgroup denominators required for pooling are not always recoverable. For four reported averages, the published value does not exactly reproduce the arithmetic mean of the township percentages: the 32% overall figure for every-second-day collection (township mean 32.67%), the 77% overall preference for direct vehicle collection (76.33%), and the two 47% overall willingness-to-pay figures for the expenditure-aware and disposal-site-aware subgroups (46.33% in each case, using the report's narrative values). The original calculation method is unclear in each case, and these figures are reported with this caveat wherever they appear.

The conceptual sequence set out in Section 4 is used as an interpretative framework rather than a tested causal model. Because the currently available source contains aggregated results rather than complete respondent-level microdata, no independent regression, multivariate adjustment, or respondent-level significance testing is reported. Causal terms such as effect, determinant, or predictor are therefore avoided when describing the present findings.

6.5 TREATMENT OF WILLINGNESS-TO-PAY MEASURES

Particular caution was applied to willingness-to-pay evidence because the original report contains measures based on different respondent subsets. One item concerning willingness to pay after information about increased DAO expenditure was based on only 24 responses; for this item, the report's narrative and its accompanying chart also disagree on the Kawkayeik value (68% versus 69%), a discrepancy preserved and disclosed rather than resolved here, and its reported overall average of 47% is among the published averages that do not reproduce exactly from township values (Section 6.4). A broader analysis concerned 323 respondents whose service evaluations were fair, satisfied, or very satisfied; within this subgroup, an average of 57% were reported as willing to pay additional charges for improved services. A third item reported willingness to pay among the 71 respondents aware of the DAO's disposal-site maintenance role. Because the response bases and filtering logic differ, these measures were not combined or treated as equivalent. Greater interpretative weight is given to the 323-response measure, while the smaller items are treated as supplementary evidence and as sources of measurement uncertainty.

6.6 SOURCE VERIFICATION AND KNOWN INCONSISTENCIES

The reappraisal worked from two sources: the published 2019 report and a validated aggregate extraction dataset compiled from it, in which every recoverable figure was checked against the report's text and charts. The published report is treated throughout as the authoritative source of record; the extraction dataset served as a verification instrument, and the inconsistencies described below are internal to the published report itself rather than artefacts of extraction. This validation identified a set of internal inconsistencies in the original source, which are disclosed here and preserved in the analysis rather than silently corrected. In addition to the averaging issues noted in Section 6.4 and the willingness-to-pay discrepancy noted in Section 6.5, they are: (a) a denominator conflict for the schedule-convenience item, where the report narrative states that 91 respondents answered while the corresponding chart displays $n = 117$; (b) a satisfaction chart that displays two separate segments both labelled "Not Satisfied" in each township, which are retained as published rather than relabelled or combined, since the original coding scheme is unavailable; (c) minor rounding gaps, including service receipt and non-receipt summing to 99% (82% + 17%) and disposal-site lifespan categories summing to 97%; (d) a Kawkayeik revenue-awareness chart whose categories total 98%; and (e) a narrative-versus-chart conflict for the Kawkayeik share of respondents who were very much

satisfied, where the narrative states 1% but the chart does not display a separately labelled segment. These inconsistencies are characteristic of practice-oriented community reporting and do not undermine the broad descriptive patterns, but they do constrain fine-grained inference, and subgroup counts are not derived from percentages anywhere in this article.

6.7 TEMPORAL POSITIONING, PRIOR DISSEMINATION, AND RESEARCH TRANSPARENCY

The term pre-disruption snapshot is preferred to longitudinal baseline because the study does not contain a directly comparable post-2019 follow-up survey. Subsequent literature is used to contextualise the historical significance of the 2019 evidence, not to infer change attributable to later events.

The empirical material was previously disseminated through the author's earlier professional research work as a community-oriented report. The original document identifies Htin Aung Ling as responsible for analysis and reporting and acknowledges The Asia Foundation, project-management personnel, civil society organisations, and other contributors. The present manuscript therefore does not claim novelty on the basis that the descriptive observations were previously undisclosed. Its originality lies in academic reconceptualisation, cross-township synthesis, theoretical interpretation, and historical positioning of the 2019 evidence. The original report is fully cited and should be disclosed to the target journal in accordance with its related-material and prior-publication policies.

6.8 METHODOLOGICAL LIMITATIONS

The study is constrained by the pilot character of the original survey, the absence of detailed socioeconomic indicators, reliance on aggregated reported results, variation in response bases across some questions, the internal inconsistencies documented in Section 6.6, and the historical age of the evidence. These constraints limit generalisation and preclude respondent-level causal or multivariate inference. They do not, however, eliminate the value of the survey as a documented local record of citizen experiences at a specific pre-disruption moment.

7. RESULTS AND FINDINGS

7.1 RESPONDENT PROFILE AND PRE-DISRUPTION SERVICE CONTEXT

The survey captured 457 respondents across the three townships, with a broadly balanced gender distribution (49% male and 51% female overall; male shares of 42% in Hlaingbwe, 49% in Hpa-An, and 53% in Kawkayeik). The findings portray a municipal waste-service environment characterised by relatively extensive but incomplete collection coverage, marked variation in provider arrangements, limited citizen knowledge of institutional and operational aspects of service delivery, and generally favourable evaluations among many service users. These features form the empirical basis for interpreting the evidence as a pre-disruption snapshot of the citizen–service relationship. Table 1 summarises the sample and service-access evidence; Tables 2 and 3 summarise the awareness, service-experience, satisfaction, and willingness-to-pay evidence, with response bases and source caveats noted. Unless otherwise indicated, overall three-township percentages reported below are the original report's published averages of township percentages (see Section 6.4).

7.2 UNEVEN SERVICE ACCESS AND HOUSEHOLD SELF-DISPOSAL (RQ1)

Approximately 82% of respondents reported receiving some form of garbage collection service, while approximately 17% reported receiving no collection service; the two published figures sum to 99%, with the remaining percentage point unaccounted for, most likely through rounding or non-response. Coverage differed across townships: 93% in Hpa-An, 83% in Hlaingbwe, and 70% in Kawkayeik. Organised collection therefore reached most surveyed residents but was not universal, and the township gradient was substantial, with coverage in Kawkayeik more than twenty percentage points below Hpa-An.

Among respondents without collection service, an average of 79% reported burning their waste, including 86% in Hlaingbwe, 75% in Hpa-An, and 77% in Kawkayeik. The original report also identified ward-level concentrations of burning—wards 1 and 4 in Hlaingbwe, wards 5 and 8 in Hpa-An, and wards 1, 6, and 8 in Kawkayeik—although the denominators underlying these ward-level percentages are not separately stated in the source and they are therefore not analysed further here. The findings thus show the coexistence of substantial organised service reach with pockets of exclusion in which household self-disposal, particularly burning, predominated.

7.3 PROVIDER DIVERSITY (RQ2)

Among the 376 respondents who answered the provider question, DAOs were the principal provider overall, but service arrangements were not uniform. Hpa-An exhibited a particularly plural structure: among service recipients, 48.5% identified the DAO as provider, 36.53% private providers, and 14.97% community-based organisations. By contrast, DAO provision was nearly exclusive in Hlaingbwe (100%) and Kawkayeik (99%, with the remaining 1% unlabelled in the source chart). The report summarises overall DAO reliance as an 83% average across the three townships. This contrast indicates that pre-disruption local waste governance incorporated different combinations of public, private, and community provision within a single state, with the state capital exhibiting the most hybrid arrangement (Table 1).

Table 1. Survey sample, service access, provider arrangements, and disposal practices by township, 2019.

Indicator	Hlaingbwe	Hpa-An	Kawkayeik	Overall
Respondents (n)	120	179	158	457
Male / female (%)	42 / 58	49 / 51	53 / 47	49 / 51
Estimated urban population, 2016–17	18,101	54,860	46,842	—
Sample as share of urban population (%)	0.66	0.33	0.34	—
Receiving garbage collection (%)	83	93	70	82 ^a
Not receiving collection (%)	—	—	—	17 ^{a,b}
Provider among recipients (n = 376): DAO (%)	100	48.5	99 ^c	83 ^a
Private provider (%)	—	36.53	—	—
Community-based organisation (%)	—	14.97	—	—
Burning among respondents without collection (%)	86	75	77	79 ^a

Note. Overall figures are the report’s published arithmetic averages of township percentages, not pooled respondent-weighted shares (Section 6.4). Township-level non-receipt shares are not separately published. a Published average. b Receiving and not receiving sum to 99%; one percentage point is unaccounted for, most likely through rounding or non-response. c The remaining 1% is unlabelled in the source chart. Source: The Asia Foundation (2019).

7.4 LIMITED INSTITUTIONAL AWARENESS (RQ3)

Only approximately 19% of respondents knew of DAO services beyond routine household waste collection (13% in Hlaingbwe, 11% in Hpa-An, and 33% in Kawkayeik); the report notes that an average of 81% did not. Knowledge of collection schedules was also limited: approximately 25–29% of respondents per township affirmed that a regular provider schedule existed, and only about 18% overall reported knowing the collection schedule exactly, ranging from 3% in Hlaingbwe to 27% in Hpa-An and 25% in Kawkayeik. The information gap was most pronounced regarding service revenues: approximately 94% reported not knowing how DAO revenues from garbage collection were used for programmes or interventions, with township-level “knows” shares of only 6% in Hlaingbwe, 1% in Hpa-An, and 10% in Kawkayeik. Only around 16% were aware of the DAO’s role in maintaining garbage disposal sites (19%, 9%, and 20% by township), while 83% did not know the appropriate maintenance procedures or expected site lifespan.

Residents could thus receive a service routinely while remaining weakly informed about schedules, responsibilities, financing, and related municipal functions (Table 2); the interpretative significance of this gap is taken up in Section 8.4.

7.5 SERVICE FREQUENCY, CONVENIENCE, AND PREFERENCES

Approximately 32% of respondents across the three townships were reported as receiving collection every second day, although this ranged from 20% in Hlaingbwe to 32% in Hpa-An and 46% in Kawkayeik (as noted in Section 6.4, the published overall figure departs slightly from the arithmetic township mean). Around 77% preferred collection vehicles to come directly to their residential location (88%, 80%, and 61% by township), whereas a much smaller proportion—about 9%—preferred communal

bins or tanks nearby. Among respondents who knew their collection schedule, approximately 86% considered it convenient and about 13% considered it inconvenient, with township convenience shares of 100% in Hlaingbwe, 91% in Hpa-An, and 68% in Kawkayeik. The response base for this item is uncertain: the report narrative states that 91 respondents answered, while the corresponding chart displays $n = 117$ (Section 6.6). Whichever figure is correct, the base is a small subset of the sample—consistent with the low schedule awareness reported above—and the convenience measure accordingly requires cautious interpretation (Table 2).

Table 2. Institutional awareness and service experience by township, 2019 (% of $n = 457$ unless noted).

Indicator	Hlaingbwe	Hpa-An	Kawkayeik	Overall ^a
Aware of other DAO services	13	11	33	19
Reports that a regular provider schedule exists	29	27	25	—
Knows the exact collection schedule	3	27	25	18
Receiving collection every second day	20	32	46	32 ^b
Prefers vehicle collection direct to residence	88	80	61	77 ^b
Considers current schedule convenient ^c	100	91	68	86
Does not know how garbage-collection revenues are used	94	99	88 ^d	94
Aware that the DAO maintains garbage disposal sites	19	9	20	16
Observed careless littering	50	54	43	49

Note. a Published arithmetic averages of township percentages (Section 6.4). b The published average does not exactly reproduce the arithmetic township mean (Section 6.4). c Among respondents who knew the collection schedule; the response base is contested in the source (narrative $n = 91$; chart $n = 117$; Section 6.6). d Kawkayeik chart categories total 98% (Section 6.6). Source: The Asia Foundation (2019).

7.6 SATISFACTION AND WILLINGNESS TO PAY (RQ4)

Approximately 71% of respondents were reported as rating existing services as fair, satisfactory, or very satisfactory. This overall figure corresponds to the arithmetic average of the township-level positive-evaluation shares (approximately 79% in Hlaingbwe, 64% in Hpa-An, and 70% in Kawkayeik) rather than a verified pooled respondent percentage.¹ Township satisfaction profiles showed 55% satisfied and 8% very much satisfied in Hlaingbwe, 47% and 3% in Hpa-An, and 54% and 1% in Kawkayeik, with “fair” ratings of 14–16% in each township. Two features of the published satisfaction data warrant disclosure: the source chart presents two separate segments labelled “Not Satisfied” in each township, which are retained as published because the original coding distinction is unavailable; and non-trivial shares of respondents—18% in Hlaingbwe, 16% in Hpa-An, and 7% in Kawkayeik—were recorded as not willing to answer the satisfaction question.

Within the subgroup of 323 respondents whose evaluations were fair, satisfied, or very satisfied, approximately 57% indicated willingness to pay higher charges for improved services. Township-level willingness within this subgroup was 68% in Hlaingbwe, 43% in Hpa-An, and 59% in Kawkayeik. Positive evaluation did not translate automatically into willingness to pay: among the same broadly favourable evaluation group, 22% in Hlaingbwe, 41% in Hpa-An, and 25% in Kawkayeik were unwilling to pay additional charges, with the remainder giving no answer. The descriptive pattern therefore suggests heterogeneity in citizen support for financing improvement even among those who did not evaluate existing services negatively,

¹ The Kawkayeik positive-evaluation share of 70% is calculated from the chart categories (fair 16% plus satisfied 54%). The report narrative additionally states a 1% “very much satisfied” share for Kawkayeik that is not separately visible in the chart (Section 6.6, item e); including it would imply 71%. The chart-based value is used here, and the discrepancy is disclosed rather than resolved.

and this heterogeneity was most pronounced in Hpa-An—the township with the widest coverage and the most plural provider arrangements.

Two supplementary willingness-to-pay items reinforce this picture while illustrating the measurement uncertainty described in Sections 6.5 and 6.6. Among the 24 respondents asked about paying more after learning of increased DAO expenditure, reported willingness was 71% in Hlaingbwe, 0% in Hpa-An, and 68% in Kawkayeik according to the report narrative (the accompanying chart shows 69% for Kawkayeik), with a reported overall average of 47% (an average that does not reproduce exactly from the township values; Section 6.4). Among the 71 respondents aware of the DAO's disposal-site maintenance role, an average of 47% were reported willing to pay for improved services (65% in Hlaingbwe, 29% in Hpa-An, and 45% in Kawkayeik), with 53% in Hpa-An not willing; this average likewise does not reproduce exactly from the township values (Section 6.4). Table 3 assembles the satisfaction and willingness-to-pay evidence. Given the small and differently filtered response bases, these items are treated as supplementary evidence only; they are nonetheless notable for the consistently lower willingness recorded in Hpa-An across all three measures.

Table 3. Satisfaction and willingness to pay by township, 2019.

Indicator	Hlaingbwe	Hpa-An	Kawkayeik	Overall ^a
Satisfaction (% of township sample, n = 457)				
Very much satisfied	8	3	1 ^b	—
Satisfied	55	47	54	—
Fair	16	14	16	—
Not satisfied	3	30	23	—
Not willing to answer	18	16	7	—
Positive evaluation (fair, satisfied, or very much satisfied)	79	64	70 ^b	71
Willingness to pay among positive evaluators (n = 323, %)				
Willing to pay more	68	43	59	57
Not willing	22	41	25	—
No answer	10	16	16	—
Supplementary willingness-to-pay items (%)				
Willing to pay, expenditure-aware subgroup (n = 24)	71	0	68 ^c	47 ^d
Willing to pay, disposal-site-aware subgroup (n = 71)	65	29	45	47 ^d

Note. a Published arithmetic averages of township percentages (Section 6.4). b Narrative-versus-chart conflict in the source; the township positive-evaluation share for Kawkayeik is chart-based (see Section 6.6, item e, and the note to Section 7.6). c Report narrative value; the accompanying chart shows 69% (Section 6.5). d The published average does not exactly reproduce the arithmetic township mean (Section 6.4). Source: The Asia Foundation (2019).

7.7 ENVIRONMENTAL BEHAVIOUR

Approximately 49% of respondents reported observing careless littering in their environment (50% in Hlaingbwe, 54% in Hpa-An, and 43% in Kawkayeik). When considered alongside the prevalence of waste burning among respondents without collection, this finding indicates that local waste-management challenges extended beyond the technical operation of collection services to household disposal practices and public environmental behaviour.

7.8 SUMMARY OF THE DESCRIPTIVE CONFIGURATION (RQ5)

Read together, the results describe a configuration rather than a single headline finding: majority service coverage with a steep township gradient; near-exclusive municipal provision in two townships alongside hybrid public–private–community provision in the state capital; widespread burning among the service-excluded minority; consistently low institutional awareness across all townships; broadly favourable service evaluations; and willingness to pay that was substantial in aggregate but uneven across townships and not guaranteed even among satisfied respondents. This configuration constitutes the pre-disruption snapshot that the discussion now interprets.

8. DISCUSSION

8.1 AN OPERATIONAL BUT INCOMPLETE PRE-DISRUPTION SERVICE SYSTEM

The 2019 evidence portrays neither a wholly dysfunctional municipal waste system nor a comprehensively effective one. Most surveyed residents had access to organised collection and many evaluated services favourably, yet geographical gaps persisted, institutional awareness was weak, and households outside collection networks largely relied on burning. This combination suggests that municipal service capacity should not be evaluated through collection coverage alone. Operational reach can coexist with deficits in universality, information provision, citizen understanding, and environmentally appropriate disposal—a multidimensional pattern consistent with the broader finding that waste-system performance in developing cities reflects interacting technical, financial, institutional, and social factors rather than any single indicator (Guerrero et al., 2013; Zhang et al., 2024).

This interpretation is consistent with later Myanmar scholarship showing that waste management is organised through locally differentiated formal and informal actor relationships and that governance arrangements need to recognise local networks, responsibilities, and context (Nesheim et al., 2024). The Kayin evidence adds a citizen-facing perspective by documenting how such local service environments were experienced immediately before the subsequent disruption period.

8.2 SERVICE EXCLUSION AS AN ENVIRONMENTAL GOVERNANCE ISSUE

The high prevalence of burning among respondents without collection is one of the clearest empirical patterns. The cross-sectional aggregated evidence cannot establish that the absence of collection caused burning, but their strong coexistence indicates that household disposal behaviour must be interpreted in relation to the service environment. This coexistence mirrors the global pattern in which waste that is not collected in lower-income settings is predominantly dumped or burned (Kaza et al., 2018), and it matters for public health because open burning of domestic waste is a significant source of particulate matter and hazardous air pollutants (Wiedinmyer et al., 2014).

This has a practical implication: awareness campaigns against inappropriate disposal are unlikely to be sufficient where households lack credible collection alternatives. Environmental behaviour and municipal service accessibility should therefore be treated as interdependent components of waste governance rather than as separate policy problems.

8.3 PROVIDER PLURALISM AND DIFFERENTIATED LOCAL GOVERNANCE

Hpa-An's combination of DAO, private, and community-based provision indicates that municipal waste management had already developed beyond a single-provider model before 2020, consistent with documented DAO outsourcing practice elsewhere in Myanmar (The Asia Foundation, 2020) and with the co-production literature's expectation that hybrid state–non-state arrangements emerge where municipal reach is constrained (Ostrom, 1996; Joshi & Moore, 2004). However, the aggregated Kayin evidence does not permit a robust test of whether any provider type produced superior satisfaction or environmental outcomes. The contribution is therefore institutional: the pre-disruption starting conditions differed across townships, and future assessments of continuity, deterioration, or adaptation should not assume homogeneous municipal arrangements. It is nevertheless descriptively notable that Hpa-An—the township with the widest coverage and the most plural provision—also recorded the lowest willingness to pay and the highest unwillingness among satisfied respondents. The present data cannot adjudicate among possible explanations, which range from higher expectations in the state capital, through attribution difficulties in hybrid provision settings (Joshi & Moore, 2004), to the more mundane possibility that private and community-based customers in Hpa-An already paid different charges to different providers, so that reluctance reflected existing payment arrangements rather than attitudes towards improvement. The association is recorded here as a proposition for future respondent-level research rather than as a finding.

8.4 OPERATIONAL SERVICE PRESENCE VERSUS INSTITUTIONAL LEGIBILITY

Perhaps the most theoretically significant pattern is the coexistence of substantial service use with low institutional awareness. Most respondents received collection, yet few knew about additional DAO services, collection schedules, disposal-site responsibilities, or the use of service revenues. This suggests a distinction between operational service presence and institutional legibility: a service can be physically visible in everyday life while the organisation, financing, and responsibilities underpinning it remain poorly understood. The transparency literature indicates that what citizens know about public organisations shapes how they evaluate and trust them (Grimmelikhuijsen et al., 2013), and the DAO financing model makes this connection unusually direct, since the same organisation both delivers the service and collects the revenue whose use citizens overwhelmingly could not describe (Arnold et al., 2015).

The present evidence cannot demonstrate that institutional awareness caused satisfaction or willingness to pay, or their absence. Instead, it supports a proposition for future research: sustainable citizen–service relationships may depend not only on operational performance but also on the extent to which service arrangements are understandable to users. Communication about schedules, responsibilities, charges, expenditure, and improvements may therefore constitute part of service quality rather than merely an auxiliary public-relations function.

8.5 SATISFACTION AND WILLINGNESS TO PAY

The finding that approximately 57% of respondents with at least fair service evaluations were willing to pay more for improved services sits within the broad range reported for low- and middle-income settings (Boateng et al., 2019; Girma et al., 2022; Challcharoenwattana & Pharino, 2016). The comparison is only approximate, however, because the Kayin measure is conditioned on satisfaction: it was asked of respondents who had already evaluated services as at least fair, whereas most contingent valuation studies elicit willingness to pay across all households. External studies have also found willingness to pay patterned by service experience and socioeconomic conditions, and in some settings satisfaction with existing services has been positively associated with willingness to pay (Mulat et al., 2019).

The Kayin evidence should nevertheless be interpreted conservatively. The original survey lacks detailed socioeconomic measures, including income, and therefore cannot distinguish affordability constraints from perceived fairness, trust, provider differences, or satisfaction with the status quo—distinctions that the contingent valuation literature shows to matter (Boateng et al., 2019; Girma et al., 2022). Moreover, the substantial proportion of positively evaluating respondents who were unwilling to pay more shows that satisfaction cannot be equated with unconditional financial support; the expectancy-disconfirmation perspective is a reminder that favourable evaluations may partly reflect modest expectations rather than strong performance (Van Ryzin, 2006; Zhang et al., 2022). Willingness to pay is better understood as a complex judgement about the value, credibility, affordability, and expected consequences of service improvement. In a self-financing municipal system, the near-total opacity of revenue use documented in Section 7.4 is plausibly part of that credibility judgement, although the present data can only juxtapose the two patterns, not link them at respondent level.

8.6 A MULTIDIMENSIONAL CITIZEN–SERVICE RELATIONSHIP

Taken together, the findings support a multidimensional interpretation of municipal solid waste performance in which the dimensions of the citizen–service relationship do not move uniformly (Section 7.8). The interpretative sequence proposed in Section 4 organises this evidence without claiming causal demonstration. Its analytical value lies in what it renders visible: had the study examined coverage alone, satisfaction alone, or willingness to pay alone, the distinctive pre-disruption configuration—operational adequacy combined with institutional illegibility and conditional financial support—would not have been apparent.

8.7 THEORETICAL CONTRIBUTION

The reappraisal contributes to theory in three ways. First, it extends the citizen-satisfaction and transparency literatures into a setting they rarely reach: a self-financing municipal body in a low-capacity, hybrid-provision environment. The Kayin configuration suggests that in such settings, institutional legibility is not merely an antecedent of trust, as in the transparency literature (Grimmelikhuijsen et al., 2013), but a structural feature of the financing model itself, since revenue collection depends on residents' understanding of what charges fund (Arnold et al., 2015). Second, the study specifies willingness to pay as a relational rather than a purely economic judgement. The contingent valuation tradition models WTP primarily through household characteristics and service attributes (Boateng et al., 2019; Girma et al., 2022); the Kayin evidence, by juxtaposing

heterogeneous WTP with uniform institutional opacity and varied provider arrangements, motivates models in which the citizen–provider relationship—who provides, how visibly, and how accountably—is itself a variable. Third, the study illustrates the analytical utility of the pre-disruption snapshot as a category of evidence. Where prolonged disruption forecloses longitudinal designs, a rigorously bounded reappraisal of pre-disruption data can preserve a reference point for future comparison without overclaiming baseline status—an approach potentially applicable to other settings where crises have interrupted the continuity of local data collection.

8.8 PRACTICAL AND GOVERNANCE IMPLICATIONS

Three implications follow for municipal governance in comparable settings, offered as considerations rather than as evaluated prescriptions. First, collection coverage and household disposal behaviour should be addressed jointly; awareness initiatives against burning and littering cannot substitute for accessible collection where credible alternatives are absent (Section 8.2). Second, service communication should be considered part of municipal service provision rather than an optional supplement, particularly where citizens have limited knowledge of schedules, responsibilities, and revenue use; for self-financing providers, transparency about the use of service charges is directly connected to the financing base. Third, financing strategies should recognise heterogeneity in willingness to pay and avoid assuming either universal resistance or universal acceptance; credible, visible links between additional charges and observable service improvement may be especially important where institutional awareness is limited. For actors supporting local governance in Myanmar specifically, the 2019 evidence additionally suggests that township-level variation in provider arrangements is substantial enough that uniform state-level prescriptions are unlikely to fit all townships.

8.9 HISTORICAL SIGNIFICANCE OF THE 2019 SNAPSHOT

The age of the evidence is central to, rather than separate from, the contribution of the study. The survey documents local service conditions at a specific point immediately before Myanmar’s prolonged disruption period. It does not demonstrate what subsequently changed, and it cannot attribute later conditions to particular events. Its value is archival and comparative: it preserves evidence of what the citizen–service relationship looked like in selected Kayin urban communities before the later operating environment emerged. Future studies using comparable measures could therefore examine whether particular elements persisted, deteriorated, adapted, or were reconfigured. Until such comparable observations exist, the term snapshot remains methodologically preferable to baseline.

9. LIMITATIONS AND FUTURE RESEARCH

The findings are bounded by the pilot design of the original survey, its limited socioeconomic information, reliance on aggregated published results, unequal and sometimes conflicting response bases for particular questions, the internal source inconsistencies documented in Section 6.6, and the historical timing of the evidence. The findings cannot be generalised to contemporary Kayin State, to Myanmar as a whole, or to rural areas of the surveyed townships, and they do not support causal inference of any kind. The satisfaction and willingness-to-pay measures are single survey items rather than validated scales, and stated willingness to pay is not equivalent to actual payment behaviour. Overall three-township figures inherit the original report’s averaging convention and should not be read as pooled respondent percentages.

These constraints define a concrete agenda. If the original respondent-level records can be recovered, future analysis could examine associations among provider type, schedule awareness, satisfaction, and willingness to pay while controlling for available demographic characteristics—converting several of this article’s interpretative propositions into testable hypotheses. More importantly, a contemporary survey using comparable measures in the same townships, whenever conditions permit, would enable genuine temporal analysis of continuity and change in the citizen–service relationship across the disruption period; the present article specifies the 2019 configuration precisely so that such comparison becomes possible. Comparative research in other Myanmar states and regions, and in other settings where crises have interrupted local data continuity, could further test the utility of the pre-disruption snapshot approach. Finally, respondent-level research designs that measure institutional awareness alongside willingness to pay—still uncommon in the waste literature—could establish whether the legibility–support connection proposed here holds empirically.

10. CONCLUSION

This study has reappraised the author's earlier 2019 research on municipal solid waste management in Hlaingbwe, Hpa-An, and Kawkeyik as a pre-disruption snapshot of citizen–service relationships in Kayin State. The evidence shows a service system that was operational but incomplete: substantial though uneven collection coverage, widespread burning where collection was absent, provider arrangements ranging from near-exclusive municipal provision to hybrid public–private–community delivery, weak institutional awareness, generally favourable evaluations, and township-variable willingness to pay for improvement.

The central contribution is therefore not a claim about contemporary waste conditions, but a theoretically informed reconstruction of how the five domains examined here coexisted at a historically important pre-disruption moment. The findings suggest that municipal waste performance should be understood as a multidimensional citizen–service relationship rather than through collection coverage or satisfaction alone, and that institutional legibility deserves a more central place in the study of local environmental services—particularly where providers are self-financing. As a documented pre-disruption snapshot, the 2019 evidence provides a grounded reference point for future research examining continuity, adaptation, deterioration, or reconfiguration in local public-service provision in Myanmar.

DECLARATIONS

RELATIONSHIP TO PRIOR WORK

The empirical material analysed in this article was previously disseminated in a community-oriented report (The Asia Foundation, 2019), in which the author was responsible for analysis and reporting within a wider collaborative research process. The present article is a secondary academic reappraisal of that previously reported evidence; it reframes the research problem, reorganises the findings theoretically, conducts structured cross-township interpretation, and repositions the evidence historically. No new primary data were collected.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest relevant to this study.

PERMISSION AND AUTHORISATION

Formal authorisation has been requested from The Asia Foundation for the scholarly reinterpretation and secondary use of material contained in the original published report. The present study does not use or reproduce the original primary dataset; rather, it re-examines and theoretically reinterprets evidence reported in the published report for a new academic research purpose.

ETHICS

The original 2019 survey was a community assessment conducted with the approval of the Minister of Planning, Finance and Development Affairs of Kayin State (reference letter SaBaSa(Admin)/KaYa/2019-2020(514)). The present study analyses only published aggregate results and involved no new data collection from human participants; no new ethical approval was therefore required.

DATA AVAILABILITY

The primary source is the published community assessment report (The Asia Foundation, 2019), which was disseminated in physical print. The structured aggregate extraction dataset compiled for this reappraisal, which contains no respondent-level data, is available from the author on reasonable request.

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