

Evaluating the Environmentally Friendly Village (KRL) program for household waste reduction through a gender-responsive approach: Evidence from Bogor Regency, Indonesia

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ABSTRACT

The increasing generation of household waste and climate change pose significant challenges to sustainable environmental development. In response, the Bogor Regency Government established the Environmentally Friendly Village Program (Kampung Ramah Lingkungan/KRL) to promote community-based environmental management through a gender-responsive approach. This study evaluated KRL implementation and perceived household waste reduction in Bojonggede and Kedung Waringin Villages, Bogor Regency, using the Context, Input, Process, Product (CIPP) model integrated with a gender analysis framework based on Access, Participation, Control, and Benefit (APKM). A descriptive-evaluative qualitative approach was employed, with data collected through in-depth interviews, field observations, document analysis, and perception-based instruments. Data were analyzed using the Miles, Huberman, and Saldaña interactive model. Bojonggede demonstrated stronger implementation performance across CIPP components, with descriptive scores ranging from 2.50 to 3.00, compared with 1.75 to 2.33 in Kedung Waringin. These differences were associated with local governance, institutional capacity, community participation, resource availability, and continuity of program facilitation. Gender analysis revealed that women played substantial roles in waste banks, composting, community greening, and recycling, although access, participation, control, and benefits varied between villages. Respondents reported higher perceived household waste reduction in Bojonggede (approximately 55%) than in Kedung Waringin (31%). These estimates reflect respondents' perceptions rather than objectively measured changes in waste generation or disposal. The findings suggest that integrating CIPP and APKM provides a useful framework for descriptively evaluating program implementation and gender responsiveness in community-based environmental initiatives.

Keywords: *APKM; Bogor Regency; CIPP evaluation; community-based environmental management; Environmentally Friendly Village Program; gender responsiveness; household waste management*

INTRODUCTION

Household waste management remains a major challenge for sustainable environmental development, particularly in rapidly urbanizing areas. Population growth, urban expansion, changing consumption patterns, and increasing economic activity contribute to rising waste generation and place pressure on waste management systems. Inadequate waste management can cause soil, water, and air pollution and contribute to greenhouse gas emissions, particularly methane from decomposing organic waste. These impacts have implications for climate change mitigation, public health, and environmental sustainability (KLHK, 2023; World Bank, 2022; Priatna et al., 2025). Addressing these challenges requires source reduction, community participation, institutional capacity, and behavioral change rather than reliance solely on waste collection and disposal.

Indonesia faces substantial challenges in managing its increasing waste generation. Data from the National

Waste Management Information System (Sistem Informasi Pengelolaan Sampah Nasional/SIPSN) indicate that Indonesia generated more than 68 million tons of waste in 2023, with household waste constituting the largest reported source (KLHK, 2023). These conditions highlight the importance of waste reduction at source and community-based management. Waste management is not merely a technical or infrastructural issue; it is also influenced by household practices, social norms, community institutions, and local stakeholders' capacity to sustain collective environmental action (Nasdian, 2014; Priatna et al., 2025).

The social dimension of waste management is particularly relevant from a gender perspective. Women often play substantial roles in household consumption, waste separation, recycling, composting, and community environmental activities. Although previous studies have documented women's contributions to household and community-based waste management, these responsibilities may reflect a feminization of environmental responsibility when women are expected

to undertake environmental work without equitable access to resources, decision-making authority, or benefits (Pakasi et al., 2024; Nurfaizah et al., 2025). Consequently, gender responsiveness should not be assessed solely through women's participation in activities. It should also consider equitable access to information and resources, meaningful participation, influence over decisions, and benefits derived from environmental programs.

These issues are particularly relevant in Bogor Regency, a rapidly developing area within the Greater Jakarta Metropolitan Area (Jabodetabek). Population growth and residential expansion have increased pressure on local environmental management systems, including household waste management. Challenges include limitations in institutional capacity, infrastructure, financial resources, and community participation in waste reduction at source (BPS of Bogor Regency, 2023). In response, the Bogor Regency Government established the Environmentally Friendly Village Program (Kampung Ramah Lingkungan/KRL), a community-based initiative promoting household waste reduction, waste banks, composting, urban greening, and collective environmental action. The program operates within the broader policy context of the Climate Village Program (Program Kampung Iklim/PROKLIM), which encourages community participation in climate change adaptation and mitigation (KLHK, 2021; Priatna & Khan, 2024).

KRL implementation depends not only on environmental infrastructure and activities but also on local governance, institutional capacity, community engagement, resource availability, and continuity of program facilitation. These factors may vary among villages and influence implementation performance. Environmental sustainability and resilience are closely linked to local social and institutional capacity (Monk & Priatna, 2022). Therefore, evaluating KRL requires a framework that examines program conditions, implementation arrangements, processes, and outcomes rather than focusing exclusively on reported results. The Context, Input, Process, Product (CIPP) evaluation model provides a systematic approach to assessing these dimensions, including the needs and circumstances underlying a program, the resources and strategies supporting implementation, the implementation process, and its resulting outputs or outcomes.

However, conventional program evaluation may not adequately capture the gender responsiveness of environmental initiatives. Within KRL, women may be highly visible in waste banks, recycling, composting, and community greening while having limited access to resources or influence over strategic decisions. The Access, Participation, Control, and Benefit (APKM) framework complements CIPP by examining whether women and men have equitable access to program

information and resources, opportunities to participate, control over decisions and resources, and benefits from implementation. Integrating CIPP and APKM thus enables an assessment of both program performance and the distribution of gender-related opportunities and benefits.

This integrated perspective is consistent with Indonesia's gender mainstreaming and sustainable development policies. Presidential Instruction No. 9 of 2000 established gender mainstreaming as a strategy for integrating gender perspectives into national development (GoI, 2000). Subsequent policies and programs have further emphasized gender-responsive development, including women-friendly and child-caring villages and gender-responsive climate action. KRL can therefore be examined as both a community-based environmental initiative and a potential mechanism for promoting inclusive environmental governance and climate resilience. Its relevance also extends to the Sustainable Development Goals (SDGs), particularly SDG 5 (gender equality), SDG 11 (sustainable communities), SDG 12 (responsible consumption and production), and SDG 13 (climate action) (GoI, 2017).

Despite growing attention to community-based environmental management, gender participation, and climate-oriented village programs, an important research gap remains. Existing studies have generally examined waste banks, community participation, PROKLIM implementation, or women's involvement in environmental management as separate dimensions. Comparative empirical research integrating program implementation and gender responsiveness remains limited, particularly research examining context, inputs, processes, and products alongside access, participation, control, and benefits. Evidence explaining differences in implementation performance among KRL villages is also limited. Integrating CIPP and APKM offers a framework for connecting institutional and operational conditions with gender-related participation and benefit distribution.

This study addresses these gaps by evaluating KRL implementation in Bojonggede and Kedung Waringin Villages, Bogor Regency. The villages provide contrasting cases in terms of institutional conditions, community participation, and implementation capacity. The study integrates CIPP with APKM to assess program implementation and gender responsiveness while identifying factors associated with differences between the two villages. Rather than treating women's participation alone as evidence of success, it examines their access to relevant information and resources, meaningful involvement in implementation, influence over decision-making, and benefits from program activities (KLHK, 2016).

Accordingly, this study aims to evaluate the implementation of KRL in household waste management in Bojonggede and Kedung Waringin Villages using an integrated CIPP–APKM framework. Specifically, it seeks to: (1) evaluate the context, inputs, processes, and products of KRL implementation; (2) assess gender responsiveness through access, participation, control, and benefit; and (3) identify factors associated with differences in implementation between the villages. The findings are expected to provide empirical insights for strengthening community-based environmental governance and developing more inclusive and gender-responsive approaches to household waste management.

CONCEPTUAL FRAMEWORK

This study integrates the CIPP evaluation model with the APKM gender analysis framework to provide a multidimensional assessment of the KRL Program. The CIPP model provides the primary structure for evaluating program implementation, while APKM functions as a gender-responsive analytical lens applied across the four CIPP dimensions.

Within the proposed framework, the Context dimension examines the environmental problems, local needs, institutional conditions, policies, and availability of information relevant to KRL implementation, including whether women and men have equitable access to information and program opportunities. The Input dimension assesses the availability and allocation of human resources, infrastructure, funding, institutional support, and capacity-building opportunities, with particular attention to gender-equitable access and participation. The Process dimension evaluates program implementation, community engagement, coordination, monitoring, and decision-making, including the extent to which women participate meaningfully and exercise influence or control. The Product dimension examines the outputs and perceived outcomes of the program, including household waste management practices and environmental, social, and economic benefits, while considering whether these benefits are equitably distributed across gender groups.

The integrated framework therefore distinguishes between program implementation performance and gender responsiveness. A program may demonstrate strong implementation while still providing unequal access, participation, control, or benefits. Conversely, substantial women's participation does not necessarily indicate meaningful gender responsiveness if women have limited decision-making authority or access to program resources. The CIPP–APKM framework enables these dimensions to be examined simultaneously and provides a conceptual basis for evaluating community-based environmental and climate-related programs in other local contexts.

METHODS

Research Design and Approach

This study employed a comparative qualitative program evaluation design with a descriptive-evaluative approach to examine the implementation of the Environmentally Friendly Village Program (Kampung Ramah Lingkungan/KRL) in household waste management in Bogor Regency. A qualitative design was selected because the study sought to understand how the program was implemented, how stakeholders participated in program activities, how institutional and social conditions shaped implementation, and how gender relations influenced access, participation, control, and benefits within their natural social and institutional contexts (Fakih, 2013). In qualitative research, the researcher functions as the primary research instrument for understanding phenomena holistically within their natural settings (Moleong, 2018).

Program evaluation was structured using the Context, Input, Process, Product (CIPP) Evaluation Model developed by Stufflebeam and Shinkfield (2007). The CIPP model was used to examine four interrelated dimensions of KRL implementation. The Context component assessed the relevance of the program to local environmental needs, policies, and community conditions. The Input component examined the availability and adequacy of institutional capacity, human resources, infrastructure, funding, and other program resources. The Process component assessed program implementation, coordination, community participation, monitoring, and facilitation. The Product component examined program outputs and perceived outcomes, particularly those related to household waste management and community environmental activities (Figure 1).

To incorporate a gender-responsive perspective, the CIPP framework was complemented by the Access, Participation, Control, and Benefit (APKM) framework. APKM was applied as an analytical lens across the CIPP dimensions rather than as a separate evaluation model. Access referred to opportunities to obtain information, resources, training, and program facilities; Participation referred to involvement in program activities and implementation; Control referred to involvement and influence in decision-making and management; and Benefit referred to the environmental, social, and economic benefits experienced by women and the wider community.

The integration of the two frameworks was operationalized as follows: Context was primarily examined through Access; Input through Access and Participation; Process through Participation and Control; and Product through Benefit. This integration enabled the study to examine not only how the KRL Program was implemented but also whether women had

meaningful opportunities to access program resources, participate in activities, influence decisions, and obtain benefits from program implementation.

The study adopted a comparative case approach involving two KRL villages with contrasting implementation conditions. The comparison was intended to identify differences in program

implementation and the institutional and social factors associated with those differences. The numerical CIPP ratings were used only as a descriptive summary of triangulated evidence and were not treated as inferential statistical measurements or estimates of causal program effects.

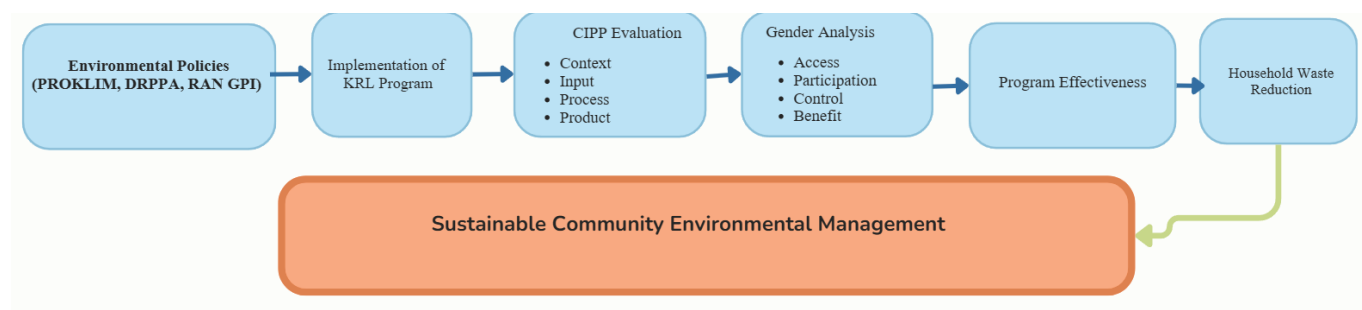


Figure 1. Conceptual model of sustainable community environmental management.

Research Location

The study was conducted in Bojonggede Village and Kedung Waringin Village, Bojonggede District, Bogor Regency, West Java, Indonesia. The two villages were purposively selected because both had implemented the KRL Program but exhibited differences in institutional capacity, community participation, resource availability, and continuity of program facilitation.

Bojonggede Village was selected as a case with relatively stronger KRL implementation, characterized by more developed institutional arrangements, continuing waste-bank activities, relatively strong community participation, and active involvement of women in community-based environmental activities. Kedung Waringin Village was selected as a contrasting case because it faced greater implementation constraints, including relatively limited institutional capacity, inadequate supporting infrastructure, lower community participation, and less continuous program facilitation.

The selection of contrasting cases enabled a comparative evaluation of KRL implementation under different institutional and social conditions. The comparison was not intended to statistically generalize the findings to all KRL villages but to identify contextual factors that may help explain differences in implementation performance.

In addition to the two focal case-study villages, a supplementary perception survey was conducted among 149 KRL managers from nine villages/urban villages in Bojonggede District. Because this survey covered a broader KRL population than the two focal cases, its results were used as contextual and supporting evidence rather than as the primary basis for comparing the two case-study villages.

Data collection was conducted from May to June 2026. Semi-structured interviews were conducted with

20 purposively selected key informants representing village government officials, KRL managers, environmental facilitators and volunteers, women community leaders, community members, and other relevant stakeholders.

Data Collection

Data were collected using four complementary methods: semi-structured interviews, field observations, document analysis, and a supplementary perception-based assessment. The use of multiple sources and methods enabled triangulation and strengthened the credibility of the findings (Moleong, 2018).

Semi-structured Interviews

Semi-structured interviews were conducted with 20 purposively selected informants who had direct knowledge of or involvement in KRL implementation. The informants represented village government officials, KRL managers, environmental facilitators and volunteers, women community leaders, community members, and other relevant stakeholders.

The interview guide was organized around the CIPP dimensions and APKM indicators. Questions addressed: (1) the environmental problems and needs underlying the KRL Program; (2) institutional arrangements, human resources, infrastructure, funding, and other inputs; (3) program implementation, coordination, participation, monitoring, and facilitation; (4) program outputs and perceived outcomes related to household waste management; and (5) women's access, participation, control, and benefits.

Field Observations

Field observations were conducted to document the actual implementation of KRL activities and the environmental management practices associated with the program. Observed activities included household waste segregation, waste-bank operations, composting, recycling, community greening, and other collective environmental activities.

Observations also considered the participation of women and men, the availability and use of program facilities, the functioning of waste-management infrastructure, and evidence of community involvement in program implementation and decision-making.

Document Analysis

Relevant documentary evidence was reviewed to corroborate interview and observation findings. Documents included local policies, KRL program guidelines, institutional decrees, activity reports, program records, photographs, and other relevant administrative and supporting documents.

Document analysis focused on program objectives, institutional arrangements, resource allocation, implementation activities, participation, monitoring, and reported program outputs and outcomes.

Supplementary Perception Survey

A supplementary perception questionnaire was administered to 149 KRL managers from nine villages/urban villages in Bojonggede District. The instrument was developed based on the CIPP indicators and included items concerning program context, inputs, implementation processes, products, women's participation and empowerment, government support, and program sustainability.

Responses were recorded using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The survey was used to provide complementary descriptive information concerning perceptions of KRL implementation and perceived household waste reduction. Because the survey respondents represented a broader population than the two focal case-study villages, these data were not used as the sole basis for the comparative evaluation of Bojonggede and Kedung Waringin.

Importantly, any reported percentage of household waste reduction derived from the questionnaire represents respondents' perceived reduction rather than objectively measured changes in household waste generation, collection, or disposal volume.

CIPP Evaluation and Scoring Procedure

The qualitative evidence obtained from interviews, observations, documents, and the supplementary

perception survey was synthesized using a separate CIPP evaluation rubric. Each indicator was assigned a three-point descriptive rating:

- 3 (Good): the indicator was available, functioning adequately or optimally, and consistent with program objectives;
- 2 (Fair): the indicator was available but implementation was incomplete or not yet optimal; and
- 1 (Poor): the indicator was absent or had not been adequately implemented.

The rating was not calculated as a statistical score derived solely from questionnaire responses. Instead, it represented a descriptive evaluative judgment based on triangulated evidence across the available data sources. Consequently, the CIPP ratings should be interpreted as comparative summaries of implementation conditions rather than measurements of statistical significance, effect size, or causal impact.

Data Analysis

Data analysis followed the interactive qualitative analysis model of Miles et al. (2014), consisting of data condensation, data display, and conclusion drawing and verification.

During data condensation, interview transcripts, field notes, documentary evidence, and relevant survey information were organized and coded according to the CIPP and APKM frameworks. The initial coding structure consisted of four CIPP dimensions—Context, Input, Process, and Product—and four gender dimensions—Access, Participation, Control, and Benefit.

For the Context dimension, analysis focused on local environmental needs, policy alignment, program objectives, and access to information. For Input, analysis examined institutional capacity, human resources, infrastructure, financial resources, training, and opportunities for participation. For Process, analysis examined implementation, coordination, community participation, decision-making, monitoring, and women's control or influence. For Product, analysis examined program outputs, perceived household waste reduction, environmental activities, and the distribution of benefits among women and the wider community.

Evidence from interviews, observations, documents, and the supplementary survey was then compared to identify areas of convergence and divergence. This process constituted source and methodological triangulation. Where evidence was consistent across sources, the findings were treated as having stronger support; discrepancies were examined in relation to differences in stakeholder perspectives, implementation conditions, or the type of evidence available.

The three-point CIPP rubric was subsequently applied to summarize the level of indicator achievement. The resulting scores were compared descriptively between Bojonggede and Kedung Waringin to identify differences in implementation conditions. The comparison focused on governance arrangements, institutional capacity, community participation, women's involvement, resource availability, infrastructure, and continuity of program facilitation.

The analysis did not use inferential statistical testing because the primary research design was qualitative and the perception survey served a supplementary descriptive function. Accordingly, differences between the two villages are interpreted as contextual and descriptive differences, rather than as statistically tested differences or evidence of causal program effects.

Trustworthiness and Triangulation

The credibility and trustworthiness of the findings were strengthened through source, methodological, and temporal triangulation (Sugiyono, 2022). Source triangulation involved comparing perspectives from village officials, KRL managers, facilitators, volunteers, women community leaders, and community members. Methodological triangulation involved comparing interview findings with field observations, documentary evidence, and supplementary perception data. Temporal triangulation considered information concerning program implementation and continuity across different periods of implementation where documentary or respondent evidence was available.

Triangulation was used not simply to establish agreement among data sources but also to identify and interpret discrepancies between stakeholder perspectives and documentary or observational evidence. The final interpretation was based on the convergence, consistency, and contextual explanation of evidence across the different sources and methods.

The resulting analysis provided a comparative assessment of KRL implementation while maintaining a distinction between descriptive program evaluation, perceived outcomes, and objectively measured environmental outcomes. This distinction is particularly important for interpreting household waste reduction, as the study did not directly measure changes in household waste volume or mass through systematic waste audits or weighing procedures.

RESULTS AND DISCUSSION

Overview of the Environmentally Friendly Village (KRL) Program

The Environmentally Friendly Village Program (Kampung Ramah Lingkungan/KRL) is a community-based environmental management initiative implemented by the Government of Bogor Regency to

encourage communities to address environmental problems at the local level. In the study sites, KRL activities focused primarily on household waste management, including waste segregation, waste-bank operations, composting, recycling, community greening, and environmental education. These activities reflect a broader shift from waste management based predominantly on collection and disposal toward source reduction and community-based environmental action (Afnan et al., 2025).

The community-based orientation of KRL is important because household waste management is not solely a technical issue. It is closely associated with individual and collective behavior, local institutions, community participation, innovation, and the capacity of different stakeholders to sustain environmental practices. This finding is consistent with Priatna et al. (2025), who emphasize that sustainable waste management requires an integrated perspective encompassing environmental, social, economic, behavioral, and governance dimensions. Their discussion of circular and equitable waste management further highlights the importance of behavioral change, local innovation, supportive government policy, and collaboration among multiple stakeholders. In this respect, the KRL approach provides an institutional platform through which household-level waste practices can be connected with collective environmental action.

The community-based character of KRL also highlights the importance of evaluating environmental programs within their local social and institutional contexts. Pramesti et al. (2020), in their evaluation of a community-based forest restoration program in Gunung Gede Pangrango National Park, demonstrated the applicability of the Context, Input, Process, and Product (CIPP) model for assessing community-based environmental programs. Their findings show that program performance needs to be examined not only in terms of intended outputs but also in relation to contextual conditions, the adequacy of inputs, implementation processes, and resulting products. This perspective is particularly relevant to KRL because the implementation of similar program structures may vary according to local institutional capacity, community participation, coordination, and availability of supporting resources.

The field findings indicate that KRL implementation was strongly dependent on the capacity of local actors to translate the program into sustained community activities. Village governments, KRL managers, environmental volunteers, women's groups, PKK members, youth organizations, and community members played different roles in organizing and maintaining environmental activities. The presence of local leadership and active community organizations was particularly important in maintaining waste-bank

activities, mobilizing residents, and sustaining environmental initiatives beyond individual program events. This observation is consistent with the broader environmental governance perspective that effective environmental initiatives require collaboration among government, communities, and other stakeholders (Rochmayanto, 2021). It is also consistent with Panderi et al. (2022), who emphasize the importance of community empowerment and the alignment of community development activities with environmental management objectives.

The two study villages illustrate this difference in implementation capacity. Bojonggede Village demonstrated relatively stronger and more sustained KRL implementation, particularly in institutional organization, community participation, waste-bank management, and women's involvement in environmental activities. The existence of more continuous program facilitation and active local actors enabled KRL activities to become more integrated into routine community practices. In contrast, Kedung Waringin Village experienced greater constraints, particularly in institutional capacity, continuity of facilitation, supporting resources, and community participation. These differences suggest that the formal adoption of KRL does not necessarily produce comparable implementation outcomes across villages. Rather, program performance is shaped by the interaction between the formal program design and the local institutional and social conditions in which it is implemented. This interpretation is consistent with the CIPP perspective demonstrated by Pramesti et al. (2020), in which contextual conditions, program inputs, implementation processes, and resulting products need to be considered together rather than assessed independently.

The findings also indicate that women constitute an important group of environmental actors within the KRL program. Women's involvement was particularly visible in household waste segregation, waste-bank activities, composting, recycling, greening activities, and environmental awareness initiatives. However, the existence of substantial women's participation should not automatically be interpreted as evidence of gender-responsive implementation (KEMEN PPPA, 2024). The more important question is whether women's involvement extends beyond the implementation of labor-intensive activities to include access to resources and information, participation in program planning, control over decisions and program resources, and benefits from program outcomes. This distinction provides the empirical rationale for applying the APKM framework in the subsequent analysis.

The role of women in KRL is also consistent with the broader understanding of environmental management as a social and behavioral process. Priatna et al. (2025)

emphasize that changing waste-management practices requires behavioral change and locally grounded innovation, while gender-responsive community action can provide an important social mechanism through which such changes are maintained at household and community levels. Nevertheless, assigning a disproportionate share of environmental responsibilities to women without corresponding decision-making authority or access to resources may reproduce rather than reduce gender inequalities. Therefore, women's involvement in KRL needs to be assessed in terms of the four APKM dimensions rather than participation alone.

The KRL Program also operates within the broader policy context of PROKLIM and Indonesia's climate-change mitigation and adaptation agenda. The environmental activities observed in the study villages—particularly waste reduction, recycling, composting, and greening—have relevance beyond local cleanliness because they contribute to resource efficiency and potentially reduce environmental pressures associated with waste generation. Priatna & Khan (2024) emphasize the importance of climate action and the role of local and educational institutions in supporting climate-change mitigation and the achievement of SDG 13. From this perspective, KRL can be understood as a local platform through which climate-related environmental objectives are translated into everyday community practices.

The contrasting experiences of Bojonggede and Kedung Waringin therefore provide an important basis for the subsequent CIPP evaluation. The comparison suggests that differences in KRL implementation cannot be explained solely by the existence of program guidelines or formal institutional arrangements. Instead, they are associated with the interaction of local governance, institutional capacity, leadership, community participation, resource availability, women's involvement, and continuity of facilitation. These dimensions are examined systematically in the following sections using the Context, Input, Process, and Product framework, with APKM providing the gender-responsive analytical lens.

Theoretical Implications

The findings provide empirical support for extending the use of the CIPP model in community-based environmental program evaluation by incorporating a gender-responsive perspective. The CIPP framework enables assessment of program conditions, resources, implementation, and outcomes, while APKM adds an explicit assessment of how women experience and influence these dimensions. The relevance of CIPP for community-based environmental programs is supported by Pramesti et al. (2020), who applied the model to evaluate a community-based forest restoration program and demonstrated its usefulness for examining

contextual conditions, program inputs, implementation processes, and program products.

The integration is particularly relevant because high levels of participation do not necessarily indicate equitable program implementation. A community may involve many women in operational activities while providing them with limited access to information, resources, or decision-making authority. The CIPP-APKM framework therefore provides a means of distinguishing program implementation performance from gender responsiveness, thereby offering a more nuanced basis for evaluating community-based environmental programs.

The findings also reinforce the importance of viewing environmental programs as socio-institutional interventions rather than purely technical initiatives. This interpretation is consistent with the environmental governance perspective emphasizing collaboration among government, private-sector, and community actors (Rochmayanto, 2021), as well as the community empowerment perspective of Panderi et al. (2022). It is also consistent with the integrated waste-management perspective of Priatna et al. (2025), which emphasizes the interaction among environmental conditions, social capacity, institutional arrangements, behavioral change, and collective action.

Practical Implications

The comparison between the two villages suggests that strengthening KRL implementation requires more than providing environmental facilities or establishing program structures. Priority should be given to continuity of facilitation, strengthening local institutional capacity, developing community leadership, ensuring access to resources, sustaining community participation, and creating meaningful opportunities for women to influence program decisions. The importance of strengthening community capacity and aligning local development activities with environmental objectives is also highlighted by Panderi et al. (2022).

The findings also suggest that KRL monitoring could be strengthened by incorporating gender-responsive indicators that distinguish between participation and decision-making authority. Monitoring should therefore assess not only the number of women involved in activities but also their access to information and resources, influence over decisions, and benefits obtained from the program. Such an approach would make the evaluation of KRL more consistent with the principles of inclusive environmental governance and with the broader emphasis on behavioral change, local innovation, and multi-stakeholder collaboration identified in the environmental literature (Rochmayanto, 2021; Priatna et al., 2025).

Context Evaluation

The Context evaluation indicates that the implementation of the Environmentally Friendly Village Program (Kampung Ramah Lingkungan/KRL) was better aligned with local needs and supported by stronger institutional conditions in Bojonggede Village than in Kedung Waringin Village. The differences were reflected in four interrelated aspects: the alignment of KRL objectives with community needs, community understanding of program objectives, institutional and policy support, and the commitment of village governments to integrating environmental management into local development planning.

In both villages, the KRL Program was intended to address household waste through a community-based approach, including waste segregation, waste-bank activities, composting, recycling, and environmental awareness. However, the field findings indicate that the relevance of these objectives was more clearly understood and translated into community action in Bojonggede. Higher participation in waste-management activities, more sustained waste-bank operations, and stronger involvement of women indicate that the program objectives were more effectively connected to local environmental concerns and community practices. In Kedung Waringin, by contrast, community understanding of the objectives and benefits of KRL remained more uneven, which was reflected in lower participation and less consistent implementation.

This finding is consistent with the Context dimension of the CIPP model, which assesses the needs, problems, opportunities, and contextual conditions that provide the basis for determining program objectives and priorities (Stufflebeam & Shinkfield, 2007). The relevance of CIPP for community-based environmental programs is also demonstrated by Pramesti et al. (2020), who applied the CIPP model to evaluate a community-based forest restoration program in Gunung Gede Pangrango National Park. Their study assessed the Context component as the basis for determining whether the program was appropriately positioned to address local environmental and community conditions. Thus, the present findings reinforce the importance of assessing not only whether a community environmental program exists, but also whether its objectives are understood as relevant by the communities expected to implement it.

The comparison between the two villages further indicates that program relevance alone is insufficient without enabling institutional conditions. Bojonggede demonstrated stronger support from village institutions, community organizations, environmental volunteers, and other local actors. This support facilitated the integration of KRL activities into routine community activities and local development initiatives. Kedung Waringin, in contrast, faced greater limitations in institutional capacity, continuity of facilitation, and

supporting resources. These findings suggest that differences in the Context component are not determined solely by the formal design of KRL but also by the extent to which local institutions recognize environmental management as a continuing community-development priority.

This interpretation is particularly relevant because Pramesti et al. (2020) show that CIPP can be used to connect the contextual basis of a community-based environmental program with subsequent decisions concerning program implementation and improvement. Their evaluation emphasizes that context provides the foundation for determining whether a program is appropriate and feasible within a particular environmental and social setting. In the present study, the stronger contextual conditions observed in Bojonggede therefore help explain why the same KRL policy framework produced more sustained community-level implementation than in Kedung Waringin.

From a gender perspective, the Context component was examined through the Access dimension of the Access, Participation, Control, and Benefit (APKM) framework. The findings indicate that women in Bojonggede had greater access to information, socialization activities, training, and KRL-related environmental initiatives than women in Kedung Waringin. Support from village government, environmental volunteers, and PKK members contributed to creating opportunities for women to become involved in waste-management and environmental activities. In Kedung Waringin, more limited access to information and capacity-building opportunities constrained women's understanding of the program and their ability to engage consistently in its activities.

The gender findings add an important dimension to the CIPP Context assessment. A program may have relevant environmental objectives and formal institutional support, but its contextual suitability may remain incomplete if important community groups do not have equitable access to information and opportunities to engage with the program. In this case, women's access represents not merely a participation issue but an initial condition that can influence subsequent participation, decision-making, and benefits. The CIPP-APKM integration therefore allows the evaluation to distinguish between whether the program is contextually relevant and whether the contextual conditions are equally accessible to different social groups.

The KRL Program is also positioned within broader national environmental and gender-related policy frameworks, including the Climate Village Program (PROKLIM), the Sustainable Development Goals (SDGs), the Women-Friendly and Child-Caring Village Program (DRPPA), and the National Action Plan on

Gender and Climate Change (RAN GPI). At the national level, household waste reduction is also consistent with Indonesia's waste-management framework (GoI, 2009). These policy linkages provide an important enabling context for KRL; however, the findings demonstrate that formal policy alignment does not automatically translate into equivalent implementation conditions at the village level.

At the local level, the existence of Bogor Regency policies and village-level institutional arrangements provided a formal basis for KRL implementation. Nevertheless, the comparison demonstrates that policy adoption and institutional establishment need to be distinguished from actual contextual readiness. Bojonggede showed stronger evidence of institutional commitment, particularly through the integration of environmental activities with community empowerment and local development planning. In Kedung Waringin, the weaker continuity of facilitation and more limited institutional and community capacity reduced the extent to which the formal program framework was translated into sustained local action.

The findings can therefore be interpreted through the perspective of community participation and local governance. Community participation is more likely to become sustained when residents are involved in processes that are relevant to their needs and supported by local institutions. Similarly, local governance requires more than formal authority; it depends on institutional capacity, coordination, leadership, and the ability of local actors to translate policy objectives into collective action. In the KRL context, these factors help explain why villages operating under the same broader program framework can demonstrate different levels of contextual readiness.

Overall, the Context evaluation indicates that Bojonggede possessed more favorable contextual conditions for KRL implementation than Kedung Waringin. The principal differences were not simply the existence of the KRL program or its formal objectives, but the extent to which those objectives were understood as relevant to local needs, supported by village institutions, incorporated into local development priorities, and made accessible to community members, particularly women. These contextual differences provide an important explanation for the subsequent variation observed in the Input, Process, and Product components of the CIPP evaluation.

Input Evaluation

The evaluation of the Input component indicates that Bojonggede Village had stronger resource readiness than Kedung Waringin Village to support the implementation of the Environmentally Friendly Village Program (Kampung Ramah Lingkungan/KRL). The differences were evident in four interrelated dimensions: human

resource capacity, environmental infrastructure, financial resources, and institutional support. These findings indicate that the availability and adequacy of program inputs are important conditions for translating KRL objectives into sustained community-level activities.

Within the CIPP framework, Input evaluation examines the resources, strategies, institutional arrangements, and alternative approaches available to support program implementation and achievement of its objectives (Stufflebeam & Shinkfield, 2007). This perspective is particularly relevant to the present study because the existence of a formally established KRL structure does not necessarily mean that the program possesses sufficient capacity to operate effectively. Pramesti et al. (2020), in their CIPP evaluation of a community-based forest restoration program in Gunung Gede Pangrango National Park, similarly found that the Input component concerned whether the resources and supporting conditions were sufficient to achieve program objectives. Their study concluded that program inputs were generally adequate while also identifying areas requiring further strengthening, particularly human-resource and institutional capacity.

Regarding human resources, both villages established KRL management structures through official village decrees involving program managers, environmental volunteers, and community groups. However, Bojonggede demonstrated stronger operational capacity, reflected in more active program management, more developed environmental volunteers, and more consistent training and facilitation. In contrast, Kedung Waringin continued to face challenges related to volunteer capacity development, leadership regeneration, and continuity of community facilitation. These findings suggest that a formal organizational structure represents only the basic input for program implementation; its effectiveness also depends on the competence, continuity, and motivation of the people responsible for translating program objectives into community action.

This finding is particularly consistent with Pramesti et al. (2020), whose CIPP evaluation of a community-based environmental program emphasized the importance of competent human resources and institutional arrangements in supporting program implementation. Their findings also identified the need for strengthening the capacity of accompanying officers and community groups as part of improving program inputs. In the KRL context, therefore, capacity building should not be understood as a one-time training activity but as a continuing process involving facilitation, leadership development, knowledge transfer, and regeneration of local environmental volunteers.

From a gender perspective, the Input component was examined through the Access and Participation dimensions of the APKM framework. The findings

indicate that women in Bojonggede had broader access to training, awareness activities, and capacity-building opportunities than women in Kedung Waringin. Moreover, women in Bojonggede participated more actively as environmental volunteers, waste-bank managers, and members of community organizations involved in KRL implementation. In Kedung Waringin, women's participation was more constrained by unequal access to training, facilitation, and capacity-building opportunities.

These findings indicate that gender responsiveness is partly determined by the distribution of program inputs. Human resources should therefore not be assessed only in terms of the total number of personnel or volunteers available, but also in terms of who has access to training, information, leadership opportunities, and organizational roles. The greater involvement of women in Bojonggede suggests that more equitable access to capacity-building opportunities can strengthen the human-resource base of community-based environmental programs. At the same time, participation should not be interpreted solely as evidence of gender equality, because the extent to which women can influence decisions and control resources is examined more fully under the Control dimension of APKM.

The availability and utilization of environmental infrastructure also emerged as an important input condition. Bojonggede possessed relatively more complete facilities, including an active waste bank, waste-processing facilities, 3R Transfer Stations (TPS 3R), composting facilities, and established community greening activities. In contrast, Kedung Waringin experienced greater limitations in both the availability and utilization of waste-management infrastructure. These differences indicate that infrastructure availability can create or constrain opportunities for households and community groups to translate environmental awareness into practical waste-management behavior.

However, the findings also suggest that infrastructure should not be interpreted as an independent determinant of program performance. Facilities can support program implementation only when accompanied by adequate human resources, management capacity, financing, and community participation. This interpretation is consistent with the CIPP approach of Pramesti et al. (2020), which evaluates inputs as a combination of resources and supporting conditions rather than as isolated physical facilities. Thus, the relatively stronger infrastructure in Bojonggede is meaningful because it was accompanied by more active local management and community engagement.

Regarding financial resources, the KRL Program in both villages was supported through village budgets (APBDes), community self-help contributions, and other community-based initiatives. Bojonggede, however,

benefited from stronger financial support associated with greater commitment from the village government and higher community participation. Nevertheless, both villages faced challenges in developing more sustainable financing mechanisms, particularly for maintaining and expanding waste-management infrastructure, strengthening community capacity, and supporting environmental innovation.

The financial findings demonstrate that the adequacy of inputs should be considered not only in terms of whether funding exists but also in terms of its continuity, allocation, and capacity to support priority program activities. Limited or irregular financing may reduce the sustainability of facilities, training, and facilitation even when the basic program structure has already been established. Consequently, sustainable financing should be viewed as part of the institutional capacity required to maintain KRL activities rather than simply as an administrative requirement.

The comparison also reveals that institutional support functions as a cross-cutting input connecting human resources, infrastructure, and financing. Bojonggede's stronger institutional commitment enabled available resources to be mobilized more consistently, whereas the more limited institutional capacity in Kedung Waringin reduced the continuity and utilization of available inputs. This suggests that the difference between the two villages was not simply a difference in the quantity of resources but also in their ability to organize, coordinate, and mobilize those resources toward common environmental objectives.

Overall, the Input evaluation demonstrates that Bojonggede possessed a more favorable combination of human, physical, financial, and institutional resources than Kedung Waringin. The findings therefore support the CIPP proposition that program implementation depends on the adequacy and appropriateness of inputs available to support program objectives. In the KRL context, strengthening inputs should focus not only on providing additional infrastructure or funding but also on continuous capacity building, institutional strengthening, leadership regeneration, sustainable financing, and equitable access to training and participation opportunities, particularly for women. These conditions provide the resource foundation for the subsequent Process component, where the extent to which these inputs are effectively mobilized and translated into program activities can be assessed.

Process Evaluation

The evaluation of the Process component indicates that the Environmentally Friendly Village Program (Kampung Ramah Lingkungan/KRL) was implemented more consistently in Bojonggede Village than in Kedung Waringin Village. The differences were reflected not simply in the number of activities

conducted, but in the continuity, quality, and inclusiveness of program implementation, particularly in community participation, facilitation, coordination, household waste-management practices, and women's involvement in implementation and decision-making. These findings indicate that the resources identified in the Input evaluation were more effectively translated into sustained community action in Bojonggede.

Within the CIPP framework, Process evaluation focuses on how a program is actually implemented, including monitoring activities, identifying implementation problems, and providing information for improving program delivery (Stufflebeam & Shinkfield, 2007). Pramesti et al. (2020), in their CIPP evaluation of a community-based forest restoration program in Gunung Gede Pangrango National Park, similarly found that the Process component provided important information about the quality of implementation and identified the need for stronger coordination with partners and adjustments to technical implementation. This perspective is relevant to KRL because the existence of program inputs and formal institutional arrangements does not automatically ensure consistent implementation at the community level.

The KRL Program was implemented through a participatory approach involving community awareness campaigns, environmental education, training, facilitation, and practical household waste-management activities based on the 5R principles (Rethink, Reduce, Reuse, Recycle, and Rot/Compost). The field findings indicate that these activities were more consistently implemented in Bojonggede. Sustained waste-bank operations, household waste segregation, composting, community greening, and collective gotong royong activities provided evidence that environmental practices had become more integrated into routine community activities. In Kedung Waringin, by contrast, implementation was less consistent because of lower community participation, limited facilitation, and weaker continuity of activities.

The comparison therefore suggests that continuity of implementation was a critical process variable. In Bojonggede, repeated awareness activities and ongoing facilitation helped reinforce residents' understanding of waste segregation and other household waste-management practices. Field observations indicated that waste segregation between organic and inorganic materials had been adopted in many neighborhood units, accompanied by composting and the use of compost for community greening. These practices suggest that facilitation was not limited to transferring information but contributed to the institutionalization of environmental practices within everyday community activities.

In Kedung Waringin, the weaker continuity of facilitation was associated with less consistent community

engagement. Interviews with environmental volunteers indicated that some residents continued to perceive waste management primarily as the responsibility of the government. This finding illustrates an important distinction between program implementation and behavioral internalization: conducting awareness activities does not necessarily produce sustained participation unless information is repeatedly reinforced and accompanied by opportunities for residents to practice and collectively manage environmental activities.

This interpretation is consistent with the community-empowerment perspective presented by Panderi et al. (2022), who emphasize the importance of aligning community activities with environmental management objectives and involving relevant stakeholders in the development of community-based initiatives. Their study demonstrates that community empowerment requires more than establishing activities; it requires processes that connect community conditions, participation, and environmental management objectives. In the KRL context, continuous facilitation and opportunities for collective action appear to have played a similar role in translating environmental objectives into community practices.

From a gender perspective, the Process component was examined through the Participation and Control dimensions of the Access, Participation, Control, and Benefit (APKM) framework. Women in Bojonggede participated not only as beneficiaries but also as environmental volunteers, waste-bank managers, coordinators of greening activities, and facilitators of environmental education. Their involvement indicates that women were actively engaged in the implementation process rather than merely being recipients of program activities.

Importantly, the findings also indicate differences in women's control over program-related decisions. In Bojonggede, women were involved in scheduling activities, managing waste-bank operations, organizing community initiatives, and developing waste-utilization activities with potential economic value. In Kedung Waringin, women's involvement remained more concentrated in operational activities, with relatively limited influence over strategic decisions. This distinction demonstrates that participation should not be measured solely by the number of women involved in activities. The quality of participation also depends on whether women have opportunities to influence how activities are organized, implemented, and managed.

The gender findings therefore strengthen the Process analysis by showing that women's participation can function at different levels of engagement. Operational participation may contribute to the implementation of environmental activities, while participation accompanied by decision-making authority can

contribute to institutional continuity and community ownership. Consequently, the APKM framework provides an important complement to CIPP by revealing dimensions of implementation quality that may not be captured by a conventional assessment of program activities alone.

The role of women in sustaining KRL activities is also consistent with the broader environmental governance perspective. Rochmayanto (2021) emphasizes that community participation is an important component of ecosystem restoration governance and argues that community involvement needs to be supported by institutional and economic arrangements that make participation sustainable. Although the context differs from household waste management, the underlying principle is relevant to KRL: community participation is more likely to be sustained when local actors have meaningful roles and when institutional arrangements provide incentives and support for continued engagement.

The findings further indicate that coordination and facilitation were important mechanisms linking program inputs to implementation outcomes. Bojonggede benefited from more continuous facilitation and more active coordination among village institutions, environmental volunteers, community groups, women, and other local actors. In Kedung Waringin, weaker continuity of facilitation reduced opportunities to maintain collective activities and reinforce household-level behavioral change. This finding is particularly relevant to the CIPP Process component because it demonstrates that adequate resources identified at the Input stage need to be actively coordinated and mobilized during implementation (Zhang et al., 2011).

Pramesti et al. (2020) similarly identified coordination with program partners as an area requiring improvement in the Process component of their community-based environmental program evaluation. The parallel is important because it demonstrates that coordination is not merely an administrative issue but a determinant of implementation quality. In the KRL Program, effective coordination among village government, KRL managers, volunteers, community groups, and women appears to have supported the continuity of activities in Bojonggede (Fakih, 2013).

The Process findings also reinforce the importance of viewing community-based environmental management as a socio-institutional process rather than as a collection of technical activities. Waste banks, composting facilities, greening activities, and household waste segregation can only be sustained when communities have sufficient knowledge, motivation, organizational support, and opportunities for collective action. Priatna et al. (2025) similarly emphasize that sustainable waste management requires behavioral change, local innovation, supportive

policy, and collaboration among multiple stakeholders. Thus, the stronger implementation observed in Bojonggede appears to reflect the interaction between technical practices and the social processes that support their continuity.

Overall, the Process evaluation indicates that Bojonggede demonstrated stronger implementation quality than Kedung Waringin, primarily because program activities were more continuous, facilitation was more sustained, community participation was stronger, and women were more actively involved in both implementation and decision-making. The findings therefore demonstrate that successful KRL implementation depends not simply on whether planned activities are conducted, but on whether they are continuous, participatory, coordinated, and progressively internalized by the community. These process conditions provide an important explanation for the differences subsequently observed in the Product component of the KRL evaluation.

Product Evaluation

The evaluation of the Product component indicates that the Environmentally Friendly Village Program (Kampung Ramah Lingkungan/KRL) generated positive perceived outcomes in household waste management practices, environmental awareness, behavioral change, residential environmental conditions, and women's involvement in community-based environmental management. However, the available evidence does not permit the direct attribution of measured changes in household waste generation to the KRL Program. The product findings should therefore be interpreted primarily in terms of perceived changes, observed practices, and community-level benefits, rather than as a quantitative estimate of program impact.

The perception survey indicated that respondents in Bojonggede reported a higher perceived reduction in household waste, averaging approximately 55%, compared with 31% in Kedung Waringin. These figures represent respondents' perceptions and should not be interpreted as objectively measured reductions in household waste volume. Nevertheless, the difference is consistent with the qualitative findings showing more established waste segregation, sustained waste-bank operations, composting, and community-based environmental activities in Bojonggede. The convergence between the perception survey and field observations provides supporting evidence that residents in Bojonggede perceived greater improvements in household waste management than those in Kedung Waringin, while the absence of direct waste-flow measurements limits the strength of conclusions regarding actual waste reduction.

This interpretation is consistent with the Product component of the CIPP Evaluation Model, which

assesses the extent to which a program produces intended and unintended outcomes and provides evidence for judging whether program objectives have been achieved (Stufflebeam & Shinkfield, 2007). Importantly, Product evaluation does not require outcomes to be reduced to a single quantitative indicator; rather, it can consider multiple forms of evidence concerning changes in program performance, participant capacity, and benefits. Pramesti et al. (2020), in their CIPP evaluation of a community-based forest restoration program published in the Indonesian Journal of Applied Environmental Studies, assessed the Product component through achievement of program targets, increased human-resource capacity, and the development of independent community-based enterprises. Their findings demonstrate the value of examining environmental program products through a combination of ecological, institutional, and socio-economic outcomes.

In Bojonggede, the perceived benefits of the KRL Program were reflected in more established household waste-segregation practices, sustained waste-bank operations, expanded composting activities, and stronger community participation in maintaining environmental cleanliness. These outcomes suggest that the program contributed to the institutionalization of waste-management practices beyond isolated program events. The continued operation of waste banks and composting activities indicates that some environmental practices had become embedded in routine community activities. In Kedung Waringin, residents had also begun to experience benefits from KRL activities, but these remained less consistently established because of institutional constraints, lower community participation, and limited continuity of facilitation.

The comparison between the two villages therefore suggests that Product outcomes were closely associated with the quality and continuity of implementation observed in the Context, Input, and Process evaluations. Bojonggede's stronger institutional support, more adequate resources, more continuous facilitation, and stronger community participation created conditions under which environmental practices could be maintained more consistently. Conversely, the weaker implementation conditions in Kedung Waringin were accompanied by less consistent behavioral and community-level outcomes. This pattern supports the logic of the CIPP model, in which product findings are interpreted in relation to the contextual conditions, resources, and implementation processes that preceded them.

From a gender perspective, the Product component was analyzed using the Benefit dimension of the Access, Participation, Control, and Benefit (APKM) framework. The findings indicate that women in Bojonggede experienced more tangible benefits from KRL activities

than women in Kedung Waringin. These benefits included increased environmental knowledge and capacity, experience in waste-bank management, compost production, and the utilization of recyclable materials for activities with potential income-generating value. The findings therefore suggest that KRL generated benefits extending beyond environmental management to include social and potentially economic dimensions of women's participation.

However, these benefits should be interpreted carefully. The available evidence demonstrates women's reported and observed involvement in activities that can generate social and economic benefits, but it does not establish the magnitude of household income changes attributable to KRL. Therefore, the findings support the conclusion that KRL created opportunities for women's capacity development and economic participation, rather than demonstrating a quantified income effect. This distinction is important for maintaining consistency between the evidence collected and the conclusions drawn from the Product evaluation.

The findings also demonstrate that participation and benefit are not necessarily equivalent. Women may participate extensively in waste-bank management, composting, recycling, and greening activities without necessarily receiving proportional economic or decision-making benefits. In Bojonggede, the combination of women's participation and greater involvement in managing environmental activities appears to have created broader opportunities for benefits to be realized. In Kedung Waringin, the more limited continuity of program activities constrained the extent to which such benefits could develop. The APKM framework therefore adds an important dimension to CIPP by distinguishing whether program products are distributed equitably among different groups.

The broader waste-management perspective presented by Priatna et al. (2025) also supports the interpretation of these findings. Their discussion emphasizes that sustainable waste management should be understood as an interconnected environmental, social, economic, behavioral, and governance issue, with behavioral change, local innovation, supportive policy, and multi-stakeholder collaboration playing important roles. In the KRL context, the observed continuation of waste banks, composting, recycling, and community environmental activities suggests that the program's products extend beyond immediate waste-handling activities toward changes in community practices and local environmental governance.

The findings further indicate that the sustainability of product outcomes remains an important concern in both villages. Environmental practices may weaken when facilitation, monitoring, financing, or institutional support declines. Consequently, the Product component should not be understood solely as the achievement of

short-term outputs but also in terms of whether positive changes can be maintained over time. In Bojonggede, sustained waste-bank operations and stronger institutional arrangements provide evidence of greater continuity of benefits. In Kedung Waringin, strengthening monitoring, facilitation, institutional capacity, and community participation will be important for consolidating the benefits that have already emerged.

These findings are consistent with the CIPP perspective demonstrated by Pramesti et al. (2020), in which a community-based environmental program was considered to have a good Product outcome based on achievement of targets, increased human-resource capacity, and the development of independent community enterprises. The parallel with the KRL findings is important because it demonstrates that environmental program outcomes can be assessed through a combination of environmental practices, community capacity, and socio-economic benefits, rather than relying exclusively on a single quantitative environmental indicator.

Nevertheless, the present study has an important limitation concerning the measurement of household waste reduction. Because the 55% and 31% figures are perception-based, future evaluations should complement perception surveys with direct measurements of household waste generation and diversion, such as periodic weighing of waste entering the residual-waste stream, records of waste-bank material recovery, and measurements of organic waste processed through composting. Such measurements would allow future studies to distinguish more clearly between perceived improvement and objectively measured waste reduction.

Overall, the Product evaluation indicates that the KRL Program was associated with more favorable perceived environmental, behavioral, institutional, and gender-related outcomes in Bojonggede than in Kedung Waringin. The stronger outcomes in Bojonggede were accompanied by more sustained waste-management practices, stronger community engagement, continuous facilitation, and greater involvement of women in environmental activities and decision-making. However, the findings should be interpreted as evidence of differences in perceived and observed program outcomes rather than as proof of causal program impact. Strengthening monitoring systems, sustainable financing, circular-economy innovations, community institutions, and gender-responsive benefit indicators will be important for consolidating and expanding KRL outcomes in both villages.

Comparative Summary of the CIPP Evaluation

The overall evaluation results indicate that Bojonggede Village demonstrated stronger implementation performance of the Environmentally Friendly Village Program (Kampung Ramah

Lingkungan/KRL) than Kedung Waringin Village across all four components of the Context, Input, Process, and Product (CIPP) evaluation model (Tables 1 and 2). Bojonggede Village was rated Good across all four components, whereas Kedung Waringin Village remained within the Fair category. These findings indicate that differences in KRL implementation performance were associated not only with the alignment of program objectives with local needs, but also with the availability of resources, the quality and continuity of implementation processes, and the capacity of the program to generate perceived benefits for the community.

In the Context component, Bojonggede Village demonstrated stronger alignment between KRL objectives and local environmental needs, supported by more favorable village-level policies and greater integration of the program into community-based environmental initiatives. In contrast, Kedung Waringin Village faced relatively greater contextual constraints, particularly in terms of institutional support and continuity of program development. These differences suggest that a supportive local context provides an important foundation for the implementation of community-based environmental programs.

The Input evaluation further showed that Bojonggede Village had stronger institutional and resource readiness. The village was supported by relatively more qualified and active human resources, better-developed environmental infrastructure, and stronger financial and institutional support. These resources provided a more favorable basis for translating program objectives into sustained activities. In Kedung Waringin Village, limitations in human resources, infrastructure, financing, and institutional support constrained the capacity to maintain program activities consistently (Suharto, 2014).

Differences in the Process component were reflected in the continuity and quality of program implementation. Bojonggede Village demonstrated more consistent implementation of household waste segregation, waste bank activities, composting, environmental education, community greening, and collective environmental actions (gotong royong). Community facilitation and coordination among village authorities, KRL managers, environmental volunteers, community organizations, and residents also appeared to be more continuous. In Kedung Waringin Village, implementation was less consistent, particularly where facilitation, participation, and institutional coordination were constrained.

The differences observed in Context, Input, and Process were also reflected in the Product component. Bojonggede Village reported higher perceived household waste reduction and more established waste management practices, together with perceived improvements in residential environmental conditions and greater opportunities for women's capacity

development and economic participation through waste bank and recycling-related activities. Kedung Waringin Village also demonstrated positive changes; however, these outcomes were less consistently established. Importantly, the reported difference in household waste reduction reflects respondents' perceptions rather than direct measurements of changes in household waste generation or waste diversion. Therefore, the Product findings should be interpreted as evidence of perceived program outcomes rather than as a direct estimate of the program's causal impact on household waste reduction.

From a gender perspective, the integrated CIPP-APKM assessment indicates that Bojonggede Village provided more favorable conditions for women in terms of Access, Participation, Control, and Benefit. Women were more visibly involved in environmental activities, including waste bank management, composting, recycling, environmental education, and community mobilization (Riawan et al., 2025). Their involvement also extended beyond participation to operational and decision-making roles. In Kedung Waringin Village, women's involvement was present but relatively more constrained by limitations in facilitation, institutional capacity, and continuity of activities. These findings indicate that stronger gender responsiveness was associated with broader participation and more visible contributions by women to KRL implementation. However, the study design does not establish a causal relationship between women's participation and program outcomes.

Taken together, the comparative CIPP assessment indicates that the difference between the two villages was not attributable to a single factor (Zhang et al., 2011). Rather, it reflected the interaction of local governance and leadership, institutional capacity, resource availability, community participation, women's engagement, and the continuity of community facilitation. These factors appear to reinforce one another: stronger governance can facilitate resource mobilization and coordination, adequate resources can support continuous implementation, and sustained facilitation can strengthen participation and institutionalization of environmentally responsible practices.

Overall, the findings indicate that the KRL Program was associated with positive developments in household waste management practices, environmental awareness, community participation, and women's engagement in environmental management in both study villages, with more favorable implementation and perceived outcomes in Bojonggede Village. Nevertheless, the evidence does not permit a causal assessment of the program's effectiveness in reducing household waste. Further strengthening is therefore needed, particularly through more systematic monitoring and evaluation, sustainable financing, stronger community institutions, continued

capacity building, circular-economy innovations, and greater inclusion of vulnerable groups. Future evaluations should also incorporate direct measurements of household waste generation and diversion to complement perception-based assessments and provide

stronger evidence of environmental outcomes.

A detailed comparative summary of the CIPP evaluation results for Bojonggede and Kedung Waringin Villages is presented in Tables 1 and 2.

Table 1. Descriptive CIPP evaluation scores for the KRL program in Bojonggede Village.

Evaluation Aspect	Score	Category	Evaluation Results	Main Problems
Context	3.00	Good	The objectives and policy framework of the KRL Program are clearly defined and well integrated with the Women-Friendly and Child-Caring Village Program (DRPPA) and community-based environmental management initiatives.	Public awareness and dissemination of the program have not yet reached all community members.
Input	2.75	Good	Human resources, infrastructure, and financial support are generally adequate and are strengthened by active community participation	Long-term financial sustainability of the program remains a challenge.
Process	3.00	Good	Community participation and women's involvement in environmental management activities are active and well established.	The participation of vulnerable groups has not yet been fully optimized.
Product	2.50	Good	The program outcomes were evident, particularly in household waste management practices and community behavioral change, although systematic documentation of quantitative waste reduction remained limited.	Long-term monitoring and the sustainability of program outcomes require further strengthening.

Note: Scores represent descriptive evaluation ratings based on triangulated evidence from interviews, observations, document analysis, and perception data. They are not inferential statistical estimates.

Source: Research Findings, 2026.

Table 2. Descriptive CIPP evaluation scores for the KRL Program in Kedung Waringin Village.

Evaluation Aspect	Score	Category	Evaluation Results	Main Problems
Context	2.33	Fair	The KRL Program is aligned with community environmental needs; however, public understanding of the program remains limited.	Program outreach and public awareness have not yet been fully optimized.
Input	1.75	Fair	Human resources, infrastructure, institutional capacity, and financial support remain limited.	Institutional capacity, supporting facilities, and sustainable program funding require further
Process	2.00	Fair	Environmental management and household waste reduction activities have been implemented; however, community participation remains uneven.	Community participation and the continuity of program facilitation require further improvement.
Product	2.00	Fair	The program has supported household waste reduction practices; however, sustainable behavioural change within the community has not yet been fully achieved.	The long-term impact and sustainability of program outcomes remain limited and require continuous strengthening.

Note: Scores represent descriptive evaluation ratings based on triangulated evidence from interviews, observations, document analysis, and perception data. They are not inferential statistical estimates.

Source: Research Findings, 2026.

Analysis of Factors Influencing Differences in KRL Program Implementation Performance

The comparative findings indicate that Bojonggede Village demonstrated stronger implementation performance than Kedung Waringin Village across all

four CIPP components. Rather than being explained by the presence or absence of the KRL Program itself, the differences appear to be associated with the interaction of governance and local leadership, community participation and women's empowerment, institutional

capacity and resource support, and community facilitation and program continuity. These factors are discussed below.

Governance and Local Leadership

Governance and local leadership emerged as important factors associated with differences in KRL implementation performance between the two villages. Bojonggede Village demonstrated stronger institutional commitment, coordination, and leadership support for KRL implementation. The village government, KRL managers, environmental volunteers, community organizations, and women's groups were actively involved in mobilizing residents and maintaining environmental activities. This institutional arrangement helped connect village-level support with community-based implementation.

In contrast, coordination among relevant actors in Kedung Waringin Village was relatively less consistent. Limited institutional continuity and weaker coordination reduced the capacity to maintain program activities and respond to implementation challenges. These findings are consistent with the broader public governance literature, which emphasizes the importance of institutional arrangements, coordination, and leadership in shaping the implementation of community-based programs (Dunn, 2003).

The comparison therefore suggests that local leadership is important not simply because it provides formal support, but because it helps translate policy commitments into operational coordination, resource mobilization, and sustained community engagement.

Community Participation and Women's Empowerment

Community participation was another important factor associated with the differences in implementation performance. Residents of Bojonggede Village demonstrated relatively higher participation in waste bank activities, household waste segregation, community greening, environmental education, and collective environmental actions (gotong royong). This participation was supported by repeated awareness activities, community facilitation, and an established culture of collective environmental action (Oakley, 1991).

The gender-responsive analysis further indicates that women played substantive roles in KRL implementation. In Bojonggede, women were involved not only as participants but also as environmental volunteers, waste bank managers, educators, and community mobilizers. Their roles therefore extended from participation to aspects of program management and decision-making. From the APKM perspective, this indicates relatively stronger opportunities for women to access program

resources, participate in activities, exercise control over selected implementation processes, and obtain benefits from their involvement.

However, women's participation should not automatically be interpreted as evidence of gender equality or program effectiveness. The APKM framework is useful precisely because it distinguishes participation from access, control, and benefit (Fakih, 2013). A gender-responsive KRL program requires not only women's presence in activities but also meaningful opportunities to influence decisions and obtain equitable benefits from program implementation.

Institutional Capacity and Resource Support

Institutional capacity and resource availability also differentiated the two villages. Bojonggede Village had a relatively stronger institutional structure, supported by active environmental volunteers, the Family Welfare Movement (PKK), community organizations, and sustained commitment from the village government (KEMEN PPPA, 2021). The availability and utilization of waste management facilities, waste banks, composting infrastructure, and financial resources further supported the continuity of program activities.

By comparison, Kedung Waringin Village experienced greater limitations in institutional capacity, infrastructure, and financial resources. These constraints reduced the capacity to maintain activities consistently and limited opportunities to expand community participation and environmental initiatives. The findings are consistent with public policy implementation literature, which emphasizes that institutional capacity and adequate resources are important conditions for translating policy objectives into sustained program implementation (Subarsono, 2006).

Importantly, the findings suggest that physical resources alone are insufficient. Infrastructure becomes more useful when accompanied by capable human resources, appropriate institutional arrangements, financing, and active community participation. This perspective aligns with Oakley (1991), who emphasizes the importance of participation in rural development projects. Thus, resource adequacy should be understood as a combination of physical, financial, human, and institutional capacity rather than simply the availability of facilities.

Community Facilitation and Program Sustainability

The continuity of community facilitation emerged as a further factor associated with differences between the two villages. Bojonggede Village benefited from relatively more continuous facilitation involving the village government, environmental volunteers, community organizations, and KRL managers. Continued

facilitation helped strengthen community knowledge and capacity, maintain participation, and support the institutionalization of waste management practices at the household and community levels.

In Kedung Waringin Village, facilitation was relatively more limited and less continuous. This condition reduced opportunities for repeated learning, problem-solving, community empowerment, and adaptation of program activities to changing local circumstances. As a result, some KRL activities were less consistently maintained.

These findings highlight that community facilitation should not be viewed merely as an initial activity for introducing the KRL Program. Rather, it functions as an ongoing mechanism for strengthening local capacity, maintaining participation, supporting behavioral change, and enabling communities to adapt program activities over time. Consequently, the continuity of facilitation is closely related to the longer-term institutionalization and sustainability of community-based environmental management (United Nation, 2015).

Synthesis of Factors Influencing Implementation Performance

Overall, the comparison between Bojonggede and Kedung Waringin indicates that differences in KRL implementation performance were associated with a mutually reinforcing set of governance, institutional, social, gender, and resource factors. Stronger local leadership and coordination supported resource mobilization and institutional capacity; adequate resources enabled more consistent implementation; continuous facilitation strengthened community participation and women's engagement; and sustained participation contributed to the institutionalization of household and community-level environmental practices.

The findings therefore suggest that strengthening KRL implementation requires an integrated approach rather than isolated interventions. Priority areas include strengthening village-level governance and leadership, developing institutional and human-resource capacity, ensuring equitable access to program resources, maintaining continuous community facilitation, strengthening women's meaningful participation and decision-making, and establishing sustainable financing and monitoring mechanisms. Such improvements could provide a stronger institutional foundation for maintaining and potentially scaling community-based environmental management initiatives in villages with comparable socio-environmental conditions.

Research Limitations

This study has several limitations. First, it was conducted in only two villages within Bogor Regency, limiting the generalizability of the findings. Second, the qualitative approach emphasizes an in-depth understanding of program implementation rather than statistical generalization. Third, the evaluation relied primarily on qualitative evidence and perception-based assessments. Future studies may employ mixed-method approaches involving larger samples and quantitative techniques to validate and expand the proposed evaluation framework.

CONCLUSION

This study indicates that the Environmentally Friendly Village Program (Kampung Ramah Lingkungan/KRL) contributed to the development of household waste management practices, community-based environmental initiatives, and environmental awareness in the study villages in Bogor Regency. The CIPP evaluation showed that Bojonggede Village demonstrated stronger implementation performance than Kedung Waringin Village across the Context, Input, Process, and Product components. Bojonggede was rated in the Good category across all four components, whereas Kedung Waringin remained in the Fair category. Bojonggede also reported a higher level of perceived household waste reduction than Kedung Waringin. However, these differences reflect respondents' perceptions rather than direct measurements of household waste generation or diversion and therefore should not be interpreted as evidence of a causal effect of the KRL Program on waste reduction.

The comparison suggests that differences in implementation performance were associated with the interaction of several factors, particularly local governance and leadership, institutional capacity, resource availability, community participation, continuous facilitation, and sustainable financial support. Bojonggede's relatively stronger institutional arrangements, more consistent community participation, and greater continuity of facilitation provided more favorable conditions for maintaining KRL activities and institutionalizing household and community-based environmental practices. These findings highlight that the implementation of community-based environmental programs depends not only on formal policy support, but also on the capacity of local institutions and stakeholders to mobilize resources, coordinate activities, sustain participation, and maintain facilitation over time.

From a gender perspective, the integration of the Access, Participation, Control, and Benefit (APKM) framework with the CIPP evaluation provided a more differentiated understanding of women's engagement in KRL implementation. Women were actively involved in

waste bank management, waste segregation, composting, recycling, environmental education, and community mobilization, particularly in Bojonggede Village. The findings indicate that gender responsiveness extends beyond women's participation to include equitable access to program resources and information, meaningful participation in implementation, opportunities to exercise influence in relevant decision-making processes, and access to benefits generated through environmental management activities. Nevertheless, the findings do not establish a causal relationship between women's participation and overall program outcomes.

Conceptually, this study contributes to the evaluation of community-based environmental programs by integrating the CIPP Evaluation Model with the APKM gender analysis framework. CIPP provides a structured assessment of program context, resource readiness, implementation processes, and outcomes, while APKM introduces an equity-oriented lens for examining women's access, participation, control, and benefits across these dimensions. The integrated CIPP-APKM approach therefore offers a more comprehensive framework for examining both program implementation performance and gender responsiveness, rather than treating women's participation as a standalone indicator of program success.

From a practical perspective, strengthening the KRL Program requires greater attention to institutional capacity, sustainable financing, continuous community facilitation, systematic monitoring and evaluation, women's meaningful participation in decision-making, and cross-sectoral collaboration. Future monitoring should complement perception-based assessments with direct measurements of household waste generation, waste segregation, waste-bank recovery, composting, and other forms of waste diversion. Such improvements would provide stronger evidence for assessing environmental outcomes and would support more adaptive and accountable program management. The approach is also relevant to the implementation of broader environmental and gender-related initiatives, including the Climate Village Program (PROKLIM), the Women-Friendly and Child-Caring Village Program (DRPPA), and the National Action Plan on Gender and Climate Change (RAN GPI).

The integrated CIPP-APKM framework may also be adapted for evaluating other community-based environmental governance initiatives, including climate adaptation, circular economy, community waste management, and gender-responsive environmental programs. However, its broader applicability should be examined through future mixed-method and comparative studies involving larger numbers of villages and diverse geographical and socio-institutional contexts. Such studies could further test the robustness of the framework and incorporate longitudinal and

objectively measured environmental indicators to strengthen assessment of program outcomes over time.

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