



ECO-CORRECTIONAL FACILITY PRACTICES IN SUPPORTING GREEN PRISONS: A CIPP EVALUATION AT THE YOGYAKARTA CLASS IIA NARCOTICS CORRECTIONAL INSTITUTION

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ABSTRACT

Correctional institutions are resource-intensive, yet research on applying sustainability principles in Indonesian prisons remains limited. This study analyzes the condition of eco-correctional facilities and the feasibility of implementing them to support green prisons at the Yogyakarta Class IIA Narcotics Correctional Institution. A qualitative descriptive approach was used, drawing on in-depth interviews with six informants, observation, and document analysis. Data were analyzed using the Miles and Huberman model assisted by NVivo 12, mapped onto five green prison domains, and evaluated with the CIPP model and Bronfenbrenner's ecological systems theory. The results show that environmentally friendly practices have emerged bottom-up, notably a maggot-based integrated farming system that turns food waste into fish feed and fertilizer in a closed loop, conversion to LED lighting, and hazardous waste handling through a licensed third party. However, these practices are not institutionalized. The environmental program budget is zero, no written SOP exists, water volume is not measured, electricity spending exceeds its ceiling in 2024, waste separation is inconsistent, and tall vegetation was removed for security reasons. The eco-correctional facility concept is feasible but remains at a pioneering stage, requiring written policies, a dedicated budget, baseline monitoring, and greening designs compatible with narcotics-prison security.

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INTRODUCTION

The Indonesian correctional system stems from Sahardjo's (1963) idea that prisoners are not enemies of the state who must be avenged, but rather human beings who need to be rehabilitated and reintegrated into society. This idea is now emphasized in Law Number 22 of 2022 concerning Corrections (Republic of Indonesia, 2022), which positions prisons as institutions obligated to improve the quality of inmates and prevent recurrence of crimes. Globally, the *United Nations Standard Minimum Rules for the Treatment of Prisoners* (Nelson Mandela Rules), through accommodation provisions (Rules 12–17), require adequate ventilation, access to natural light, hygienic sanitation, and clean water (United Nations, 2015). These provisions demonstrate that the quality of the physical environment of prisons is both a fundamental right and a prerequisite for rehabilitating prisoners.

The same idea is reflected in the ten principles of correctional care. The sixth principle emphasizes that work given to inmates should not simply be a way to fill time, but rather be beneficial and support life in society. The tenth principle requires the provision of facilities and infrastructure that support rehabilitative, corrective, and educational functions (Sahardjo, 1963). In the context of climate change, these two principles can be interpreted in a new way. Inmates' work activities can be directed toward environmentally friendly practices that will provide them with resources after release, while prison facilities can be designed to conserve energy and water and manage waste responsibly.

On the other hand, prisons are resource-intensive facilities. High energy, water, and material consumption puts prisons at significant risk of environmental stress, particularly when occupancy exceeds capacity (Leal Filho et al., 2026). The concept of a *green prison* emerges as a response to this issue. International case studies demonstrate that energy efficiency, renewable energy utilization, water conservation, and waste management can reduce operational costs while supporting the physical, mental, and skills development of inmates (Leal Filho et al., 2026). Cross et al. (2017) also demonstrated that an integrative design process in correctional facilities in the United States reduced energy consumption and improved building functionality, safety, and inmate well-being. However, Jewkes and Moran (2015) caution against a paradox: the "green" discourse can turn into *greenwashing* if it is used solely to improve image or save costs without addressing fundamental issues such as overcapacity.

Leal Filho et al. (2026) grouped sustainability practices in correctional institutions into five interrelated domains. The *education for sustainability domain* encompasses training, workshops, and hands-on practice that enhances inmates' environmental knowledge and skills. The *sustainable infrastructure domain* encompasses environmentally friendly building

materials, thermal efficiency, natural lighting, air quality, and green spaces. The *water conservation domain* encompasses rainwater harvesting, water reuse, and water-saving technologies. The *energy efficiency domain* encompasses renewable energy, energy-efficient equipment, and consumption monitoring systems. The *waste management domain* encompasses waste reduction, reuse, recycling, and composting. Studies summarized within this framework also show that green spaces, good air quality, and natural lighting are associated with reduced violence and self-harm among inmates, thus establishing a rehabilitative dimension to environmental sustainability, not merely an ecological one (Leal Filho et al., 2026).

One concrete manifestation of the *waste management* and *sustainable infrastructure domain* is *integrated farming*, an integrated agricultural system that utilizes the byproducts of one activity as input for another, creating a closed loop. For example, kitchen waste is processed into maggot feed, maggots become fish feed, and fish pond water is reused to water plants. In this study, *integrated farming* is positioned as an operational example of the *green prison domains*, not as a standalone theory. This concept is relevant to prisons because it aligns with fostering inmates' independence and has the potential to reduce the costs of procuring feed and fertilizer.

Studies in Indonesia are still relatively limited. Bachri (2018) showed that the *green living concept* at Batam Class IIA Prison was implemented quite well through the involvement of officers and inmates in maintaining cleanliness and utilizing resources. In other public facilities, Risnawati et al. (2015) implemented the 1E4R (*Elimination, Reduce, Reuse, Recycle, Recovery*) strategy to formulate efficiency alternatives at Pertamina Hospital in Cirebon. Meanwhile, Imandeka et al. (2024) emphasized that technology-based prison transformation (*smart prison*) needs to be combined with sustainable solutions. Maulana (2026) also noted that prisons in Indonesia are beginning to move towards environmental friendliness, but their success depends on proper governance without compromising security.

Based on this review, two research gaps remain. First, studies in Indonesia are generally descriptive of hygiene practices or *green living* and have not systematically mapped prison practices into a comprehensive *green prison framework*. Second, no studies have examined how the characteristics of drug-specific prisons, with their high risk of smuggling, influence the implementation of sustainability principles. This research fills this gap by combining the five *green prison domains* from Leal Filho et al. (2026) —*education for sustainability, sustainable infrastructure, water conservation, energy efficiency, and waste management*—with the CIPP evaluation model and ecological systems theory.

Theoretically, this study uses ecological systems theory to understand the relationship between individual environments and sustainability practices in correctional institutions. This environment includes daily facilities, inmates' interactions with staff, institutional policies, and social values that influence environmental practices (Bronfenbrenner, 1977; Darling, 2007). A *social-ecological systems perspective* complements this framework by

explaining the relationships between actors, institutions, resources, and ecological conditions in environmental management (Agrawal, 2003; Ostrom, 2007; Partelow, 2018). Meanwhile, the concept of a *green prison* serves as a reference for identifying sustainability practices, such as energy efficiency, water conservation, waste management, and responsible resource utilization (Cross et al., 2017; Leal Filho et al., 2026).

To evaluate the implementation of this concept, this study uses the CIPP (*Context, Input, Process, Product*) model, which is oriented towards program improvement and decision-making (Stufflebeam, 1983). Context evaluation covers the needs and environmental conditions of the institution; input evaluation covers the availability of human resources, facilities, funding, and policies; process evaluation examines the implementation of environmentally friendly practices along with their supporting and inhibiting factors; while product evaluation identifies observable results of the practices. These four components are used to assess the actual conditions and feasibility of implementing *the eco-correctional facility concept* at the Class IIA Yogyakarta Narcotics Prison.

Previous research has addressed environmental sustainability in correctional facilities, including energy efficiency, building functionality, and the relationship between sustainability practices and inmates' lives (Cross et al., 2017; Jewkes & Moran, 2015; Leal Filho et al., 2026). These studies provide an important foundation for the development of the *green prison concept*. However, this study focuses on evaluating environmental practices in the context of correctional facilities in Indonesia, considering the interrelationships between ecological, institutional, and resource management conditions. The novelty of this study lies in the use of ecological and socio-ecological systems perspectives alongside the CIPP model to examine the conditions, resources, implementation processes, and outcomes of environmental sustainability practices in the Class IIA Yogyakarta Narcotics Prison. Therefore, this study aims to answer two questions: what is the state of implementation of *the eco-correctional facility concept* at the research site and its feasibility in terms of resource efficiency, environmental quality, and identified environmental practices.

METHOD

This study uses a descriptive qualitative approach to deeply and contextually understand how environmentally friendly practices are implemented and interpreted by actors within the prison (Creswell & Creswell, 2023). The study was conducted at the Class IIA Yogyakarta Narcotics Prison, Pakem District, Sleman Regency, Yogyakarta Special Region. Field data collection took place from July 3–20, 2026. This location was chosen because the occupancy rate of the narcotics prison is relatively more controlled compared to general prisons. Furthermore, this prison already has initial capital in the form of maggot cultivation, catfish and tilapia fisheries, agriculture, chicken farming, tempeh production, and an independent water source, but does not yet have a waste sorting system, energy audits, or a measurable environmental development program.

Informants were selected purposively based on their direct involvement in environmental-based programs. The informants consisted of six people as shown in Table 1. The identities of all informants were disguised using codes.

Table 1. Characteristics of Research Informants

Code	Position/Status	Criteria
WB-1 to WB-4	Inmates (4 people)	Participating in an environmental-based development program (maggot cultivation, fisheries, residential block cleanliness); prison term ≥ 1 year. WB-4 is responsible for monitoring cleanliness.
KS-1	Head of Work Facilities Subsection	Responsible for work facilities, infrastructure and physical condition of the building
KU-1	Head of Personnel and Financial Affairs	Manage budgets and operational policies related to energy efficiency and cleanliness

Source: Processed by researchers, 2026

Primary data were collected through flexible guided interviews, both individually and in groups, and direct observation using observation sheets (July 13, 2026) of residential blocks, workshops, agricultural land, and fish ponds. Secondary data were obtained from prison documents, namely the List of State Property for the building and construction category, Watkesrehab Form 13C (sanitation and environmental health report) for the period January–May 2026, electricity budget and realization data for 2021–2025, electricity usage data for January–June 2026, B3 waste manifest documents, and 2026 budget data. Data coding used the five-domain green prison framework and its indicators as shown in Table 2. The same framework was used to develop the interview guide and observation sheets. On the observation sheets, each indicator was recorded as "present" or "absent" along with notes on field conditions.

Table 2. Domain Framework and Green Prison Indicators

Domain	Indicator
<i>Education for Sustainability</i>	Environmental training; sustainability workshops; hands-on environmental practice; environmental awareness programs; community engagement
<i>Sustainable Infrastructure</i>	Environmentally friendly building materials; thermal efficiency; natural lighting; green spaces; air quality and ventilation
<i>Water Conservation</i>	Rainwater harvesting; water reuse; water-saving technologies; water consumption reduction; water quality management
<i>Energy Efficiency</i>	Renewable energy; reduced energy consumption; energy-efficient lighting and appliances; energy monitoring systems; building efficiency optimization

Domain	Indicator
Waste Management	Recycling programs; material reuse; waste reduction; organic waste composting; sustainable waste management systems

Source: Adapted from Leal Filho et al.'s (2026) *green prison framework* and adapted to the research focus.

Data analysis followed the Miles and Huberman model, which includes data collection, data reduction, data presentation, and conclusion drawing (Hardani et al., 2022). Interview, observation, and document data were organized and coded using NVivo 12 as an analysis tool. Coding was carried out based on the five *green prison domains*, while allowing for the emergence of additional themes from field findings. Next, the findings were interpreted using the CIPP (*Context, Input, Process, Product*) evaluation model and Bronfenbrenner's ecological systems theory. Context evaluation was used to identify environmental needs and problems; input evaluation examined resources, facilities, budgets, and policies; process evaluation examined the implementation of environmentally friendly practices along with supporting and inhibiting factors; while product evaluation identified demonstrable outcomes through interviews, observations, and documents. Ecological systems theory was used to interpret the interrelationships between facility conditions, relationships between actors, institutional policies, and the social context that influence the implementation of environmental practices.

the eco-correctional facility concept was conducted descriptively by comparing the conditions found in each domain with established indicators and available evidence. The analysis results were used to identify existing practices, aspects that were not yet available or managed, and needs for improvement. This study did not use numerical feasibility scores or categorical thresholds that were not supported by specific standards. Therefore, conclusions regarding feasibility were based on the alignment between actual conditions, field evidence, and the need to implement environmental sustainability principles.

Data validity was maintained through source and technical triangulation. Source triangulation was conducted by comparing information from inmates, prison officials, and relevant documents, while technical triangulation was conducted by comparing the results of interviews, observations, and documentation. Discrepancies between informants were not immediately eliminated but were analyzed to understand possible differences in experience, responsibility, or access to information. If discrepancies were found, researchers reviewed additional evidence from other informants, documents, or observations to clarify the context. Final conclusions were drawn based on mutually supporting evidence, while still noting any unconfirmed findings.

RESULTS AND DISCUSSION

Research Location Overview

The Class IIA Yogyakarta Narcotics Prison was established in 2007 and stands on 30,170 m² of *Sultan Ground*. The residential pavilions cover 10,045 m², while the courtyards and gardens cover 19,690 m². The prison has five residential blocks, each consisting of two-story pavilions. Its official capacity is 436 inmates, but as of July 2026, the prison was occupied by 645 male inmates, or approximately 148% of its capacity. The prison is staffed by 134 staff. Located within a 10 km radius of Mount Merapi, it is vulnerable to eruptions.

As a preliminary illustration, the results of the NVivo 12 *query coding matrix* (Table 3) show that *waste management* was the most frequently discussed domain by almost all informants, while *energy efficiency* was the least. This pattern is consistent with the prominence of the maggot cultivation system as the most familiar practice among both inmates and staff.

Table 3. Number of Coding References per Informant and Green Prison Domain

Informant	Education for Sustainability	Sustainable Infrastructure	Water Conservation	Energy Efficiency	Waste Management
KU-1	3	6	4	4	9
KS-1	3	4	7	2	10
WB-1	6	4	0	1	8
WB-2	2	0	4	1	1
WB-3	2	5	6	1	8
WB-4	5	6	5	3	10
Amount	21	25	26	12	46

Source: Matrix Coding Query NVivo 12, processed by researchers, 2026

Table 3 presents the distribution of coding references across the five *Green Prison domains*. The number of references indicates the frequency of coded data segments within each domain and is used to map the focus of information emerging in the research data. This number does not directly indicate the level of importance, effectiveness, or applicability of each domain. Therefore, interpretation of the coding results is carried out by examining the interview content, observational findings, and relevant institutional documents. Thus, the coding results serve as a tool to organize and explore data patterns, while conclusions are drawn based on qualitative interpretations of the evidence and research context.

Condition of Eco-Correctional Facilities in Five Domains of Green Prison

Education for Sustainability

Sustainability education has not yet been established as a standalone program. Environmental content emerged as a side effect of the independent Job Guidance (Bimker) program, which aims to provide job skills. Table 4 summarizes four training programs that have environmental content.

Table 4. Environmentally-Based Training at the Class IIA Yogyakarta Narcotics Prison

No	Types of Training	Start Walking	Nature of Learning	Partners
1	Maggot cultivation (organic waste processing)	± 2024	Hands-on practice, participants without prior knowledge	External parties

No	Types of Training	Start Walking	Nature of Learning	Partners
2	Agriculture (vegetables for kitchen needs)	Already running	Hands-on practice with informal guidance	Internal Bimker
3	Fisheries (catfish and tilapia)	± last 1 year	1 day theory, 2–3 days practice	Internal Bimker
4	AC maintenance and public speaking	Not mentioned	Materials and some practices	External partners

Source: Processed by researchers from interview results, 2026

KS-1 acknowledged that the activity was funded from training funds, not from the environmental development budget: *"So far, Bimker activities have only focused on training funds, not development funds. So far, it's just training."* (KS-1, interview, July 2026)

The training took place using a *learning-by-doing model*. Most participants had no prior knowledge, as WB-1 explained, "If they were completely unfamiliar with maggot cultivation outside, they would learn everything here." The fisheries training had a slightly clearer structure: *"We were given theory for one day, and then we practiced on the second or third day, such as checking the water, feeding properly, and sorting the fish."* (WB-2, interview July 2026)

The prison itself supports the idea of sustainability as part of its correctional goals, although this issue has not been prioritized over security. KS-1 stated, "If criminals can be made aware of the importance of protecting the environment, that would be more noble." This statement highlights the gap between field practices that have led to environmental education and institutional recognition that has not yet made it a separate program.

Despite the lack of formal programming, inmates reported changes in attitudes. WB-1 stated that leftover food "can be processed and reused, so it doesn't go to waste," and some informants intended to continue water- and electricity-saving practices after release. Observation sheets confirmed the absence of formal environmental training, sustainability workshops, and environmental media campaigns. Instead, hands-on environmental practices, such as gardening, were observed.

Sustainable Infrastructure

Based on State Property (BMN) data, the prison has 30 buildings. Twenty-nine are in good condition, and only one guard post is severely damaged (Table 5). The buildings are 17–18 years old, having been inaugurated in 2007–2008, making ongoing maintenance a necessity going forward. Inmates assessed that air circulation and natural lighting in the residential blocks were adequate. However, the building materials were not yet environmentally friendly. The most significant finding in this domain was the loss of tall vegetation due to security concerns. Tall trees were once used as markers for throwing prohibited items from outside the walls, while the pool area and trees in the center of the residential block were used to hide prohibited items:

Table 5. Condition of Buildings and Structures of Class IIA Yogyakarta Narcotics Prison

No	Building Category	Number of Units	Condition
1	Office buildings, clinics, places of worship, meeting halls	9	Good
2	Residential block for inmates	5	Good
3	guardhouse	6	5 good, 1 badly damaged
4	Workplace buildings, cooperatives and other buildings	6	Good
5	Permanent fence	4	Good

Source: Processed by researchers from the List of State-Owned Assets in the building and construction category, 2026

Based on the interview results, *"The plants used to be tall. It turned out that they became targets for outsiders to throw things at. So, finally the trees were cut down, replaced with gardens in front of the pavilion."* (KS-1, interview July 2026). KS-1 said this change occurred around 2019, while KU-1 mentioned 2020, emphasizing the misuse of the area within the block. These two statements likely describe adjacent stages of security policy, with the same core: tall vegetation was removed for security. As a result, the 19,690 m² yard is now dominated by cement pavement and low gardens. Inmates still hope for green space because "if it's shady, it's more comfortable" and can be a space for interaction, while understanding the security restrictions. *"Hopefully there will be green open space, because if it's shady, it's more comfortable, if it's hot, it's uncomfortable, it can also be a place to gather and share relationships, so you don't get bored."* (WB-1, interview July 2026). The observation sheet confirms this finding. Green space is listed as "existing," but with the caveat that it's "only a park, no large trees, and there is a field, but it's been cemented." The now-cemented tennis court was previously an area with trees over 10 meters tall.

Water Conservation

Clean water comes from prison-owned wells, so the 2026 water budget was Rp 0. Of the ten wells, only eight were used because two had high iron content. The Watkesrehab 13C form for the January–May 2026 period revealed two weaknesses in the recording. First, the volume of clean water for toilets and daily operations was never measured. Second, the volume of drinking water reported was exactly the same, at 30,000 m³ per month. This figure equates to approximately 1,550 liters per person per day, far exceeding the normal requirement, making it more like an administrative quota than a consumption measurement.

The largest water use comes from laundry and tempeh production. The fish pond also experiences weekly water loss due to evaporation and seepage through the pond walls. The prison does not yet have a rainwater harvesting or water recycling system, and watering the grounds is still done manually. Existing savings are operational and informal, such as scheduling pumps for early morning, turning them off outside of working hours to prevent fires, and an agreement among inmates to turn off the taps at 10:00 PM to allow other rooms to have water. KU-1 explained the pump scheduling strategy as follows: "We turn them on for activities this morning, so there's already water. Then, to reduce electricity consumption, we use the water reservoir below. So the water doesn't flow continuously." (KU-1, interview July 2026). This practice links water conservation with energy efficiency, but it is not written down as policy and was not mentioned by other informants. The absence of water conservation technology was also emphasized by KS-1, who stated that rainwater simply enters the pond "naturally" without any reservoir design. The level of awareness of water conservation in residential blocks also varies according to the length of time the residents have lived in the block: this is in line with the results of the interview with WB-3 "Those who have been living for a long time are usually aware, those who have just arrived are usually less so, because they have not prioritized other friends." (WB-3, group interview July 2026)

Energy Efficiency

Electricity spending increased from IDR 184.7 million in 2021 to IDR 351.7 million in 2024, exceeding the ceiling by 112.7%, then decreased to IDR 285.2 million in 2025 (Table 6). The ceiling exceedance in 2024 indicates that budget planning was not supported by accurate consumption projections. The 2026 ceiling was set at IDR 324 million. Electricity consumption from January to June 2026 remained relatively stable at around 14,252–17,186 kWh per month (Table 7).

Table 6. Electricity Bill Ceiling and Realization, 2021–2025

Year	Ceiling (Rp)	Realization (Rp)	Realization (%)
2021	252,000,000	184,669,772	73.3
2022	276,000,000	240,593,208	87.2
2023	306,000,000	305,415,411	99.8
2024	312,000,000	351,699,728	112.7
2025	300,000,000	285,158,374	95.1

Source: Processed by researchers from electricity budget data for Class IIA Narcotics Prison Yogyakarta, 2026

Table 7. Electricity Consumption January–June 2026 (kWh)

Jan	Feb	Mar	Apr	May	June	Average
17,027	15,640	14,252	16,614	16,434	17,186	16,192

Source: Processed by researchers from electricity usage data at the Class IIA Yogyakarta Narcotics Prison, 2026

The largest consumption comes from productive Bimker activities, such as welding, carpentry, and laundry. In residential blocks, personal electronics are not permitted, and block lights are scheduled to be on from 5:00 PM to 5:30 AM. The most concrete efficiency measure is converting all lighting to LED lamps, which, according to KU-1, has reduced bills by around Rp 5–6 million. However, this figure is an informant's estimate and cannot be verified with periodic billing data. Furthermore, discrepancies were found between regulations and practice. Water dispensers in blocks are actually prohibited, but they are still used because the hot water supply from the kitchen is insufficient. The prison also does not utilize renewable energy, does not have an energy monitoring system, and does not budget for green programs. WB-4 stated that efficiency programs were implemented during the previous prison warden's term, "but now I don't know how they work." *"To save energy, we used incandescent lamps, but now they have been replaced with LED lighting. So, bills have indeed decreased significantly."* (KU-1, interview July 2026)

Other technical decisions were also influenced by safety considerations. According to KU-1, the residential blocks were not equipped with fans not only for energy efficiency reasons but also to prevent misuse of electrical installations, considering that window ventilation was deemed sufficient. Furthermore, KS-1 mentioned that power outages from the PLN grid were quite frequent. The observation sheet distinguished two things: energy-efficient equipment (LEDs) was recorded as "present," while formal energy-saving policies and energy monitoring systems were recorded as "absent." This distinction confirms that the efficiencies were the result of operational practices and equipment investments, not planned policies.

Waste Management

This domain features the most innovative practices. Organic kitchen scraps are processed into maggot feed, maggots into catfish feed, and compost and fermented liquid are mixed into the soil as agricultural fertilizer. Based on the interview results, *"Yes, that's the final stage, we mix it with the soil... The final result is like that to make fertilizer. So, nothing from the waste is wasted."* (KS-1, interview July 2026)

Hazardous and toxic waste (approximately 2 kg per month) is managed formally through a waste manifest with a licensed transportation company. General waste is transported by a third party at a cost of approximately IDR 3.5 million per month, out of the IDR 54 million 2026 cleaning budget. Conversely, liquid waste is processed through a wastewater treatment plant (WWTP) based on an informal collaboration without a written agreement with the Sleman Regency Environmental Agency. The prison also lacks competent wastewater treatment personnel, and in 2022, local residents complained about the odor of wastewater. A summary of hazardous and toxic waste management is presented in Table 8.

Table 8. Summary of B3 Waste Management

Aspect	Information
Legal basis	Head of Bapedal Decree No. Kep-02/Bapedal/09/1995
Waste generator	Yogyakarta Class IIA Narcotics Prison
Carrier	Licensed B3 waste transport company
Volume of medical waste	± 2 kg per month
Processing status	Cooperation with licensed third parties (not independent processing)

Source: Processed by researchers from B3 waste manifest documents and Watkesrehab Form 13C, 2026

"The form of cooperation, although not written, yes... Because we don't have any employees who are proficient in waste processing. So we often go to the Environmental Agency to ask for solutions on how to make the water that comes out not so bad." (KU-1, interview July 2026). Information about waste sorting in residential blocks differed between informants. KU-1 stated that sorting was already underway, while KS-1 and the inmates stated that the waste was "all mixed together, there was no sorting." WB-4's statement, as a reminder of cleanliness, bridged this difference: sorting is indeed done at the source, but the waste is remixed during transport, "ending up at the landfill." He said, "even though it's separated from the block, it's still mixed again on the way." Thus, the difference in information is not a pure contradiction, but rather describes two different stages of a single process: sorting at the source is not followed by separate handling during transport. The observation sheet also noted a recycling program and a sustainable waste management system as "non-existent." WB-4 also reported that maggot cultivation is now "less effective" and that kitchen scraps are no longer transported regularly. This finding is important because it shows a gap between the program description conveyed by managers and daily operational conditions.

Synthesis: Integrated Farming as a Cross-Domain System

The findings in the waste management, sustainable infrastructure, and water conservation domains, which were initially presented separately, actually form an integrated agricultural system (Figure 1). In the waste management domain, the chain begins with processing kitchen waste into maggot feed. The maggots then become catfish feed, while the kaskot and its fermentation liquid are processed into agricultural fertilizer. In the sustainable infrastructure domain, this chain relies on fish ponds and agricultural land in the prison area. In the water conservation domain, pond water serves as a link between nodes because it is used for both fisheries and land irrigation. This pond also presents a challenge because its volume shrinks every week due to evaporation and wall seepage.

This system grew authentically from field needs, but has not been consciously managed as a documented, cross-sectoral program. Consequently, its potential as a leading model for green prisons has not received institutional recognition or a formal development

plan. WB-4's statement that maggot cultivation is currently less active indicates that this closed cycle is vulnerable to disruption if any of its links weaken.

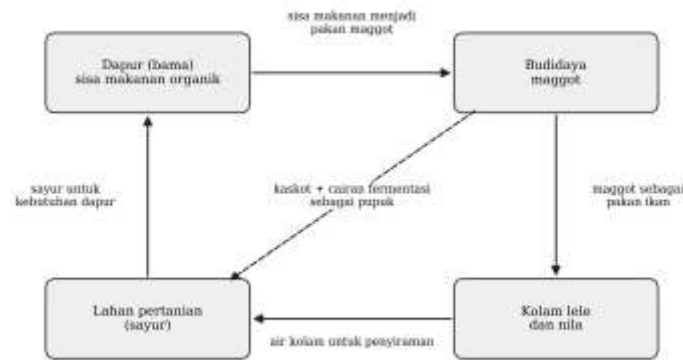


Figure 1. Integrated Farming Cycle at Yogyakarta Class IIA Narcotics Prison

Table 9 summarizes the conditions in the five domains. In general, existing practices are dominated by operational initiatives, while gaps lie in institutional aspects.

Table 9. Summary of Eco-Correctional Facility Conditions per Domain

Domain	Ongoing Practices	Major Gaps
<i>Education for Sustainability</i>	Vocational training for maggots, agriculture, and fisheries; changing the attitudes of inmates	Without a special curriculum and budget; without environmental campaign media
<i>Sustainable Infrastructure</i>	The building is generally in good condition; ventilation and natural lighting are adequate.	Tall vegetation removed for safety; materials not yet environmentally friendly
<i>Water Conservation</i>	Independent wells; pump scheduling; water saving agreements between inmates	Clean water volume is not measured; without rainwater harvesting and water recycling
<i>Energy Efficiency</i>	LED conversion; block light schedule; personal electronic device ban	Ceiling exceeded (2024); without audit, monitoring, and renewable energy
<i>Waste Management</i>	Maggot–catfish–fertilizer cycle; B3 waste through licensed parties	Inconsistent sorting; informal IPAL cooperation; decreased maggot activity

Source: Processed by researchers, 2026

Feasibility Evaluation with the CIPP Model

Context Evaluation

The context evaluation reveals a paradox. Institutional conditions that theoretically hinder sustainability coexist alongside informally emerging green initiatives. At the microsystem and mesosystem levels, occupancy rates of around 148% increase pressure on water, energy, and waste. This condition aligns with the nature of prisons as resource-

intensive facilities (Leal Filho et al., 2026). However, it is precisely at the level of daily interactions that the maggot system emerged as a response by officers and inmates to the volume of food waste. At the ecosystem and macrosystem levels, the direction is the opposite: policy support remains limited to food security, and the 2026 environmental development program item is valued at Rp 0. These findings reinforce Jewkes and Moran's (2015) argument that correctional policies tend to prioritize short-term efficiency. They also provide empirical evidence for their warning that green initiatives can thrive without addressing the root structural problem, namely overcapacity.

In the chronosystem dimension, changes in prisons are driven more by security considerations and operational needs than by sustainability planning. This is evident in the removal of tall vegetation since 2019/2020 and the unaudited increase in electricity spending. This finding distinguishes this study from Bachri (2018). Batam's Class IIA prison, despite having 1,207 inmates, was not reported to experience an explicit *trade-off* between security and greening. This means that the nature of narcotics prisons creates a structurally different implementation context than general prisons.

Input Evaluation

Input readiness is unequal. Hardware is relatively adequate, including wastewater treatment plants (WWTPs), water pumps, and comprehensive LED lighting, but renewable energy infrastructure is lacking. This position places prisons at a conventional efficiency stage, not yet at the energy transition stage associated with more mature *green prison* practices (Leal Filho et al., 2026). Institutional tools, including trained human resources, written standard operating procedures (SOPs), and dedicated budgets, are largely absent. The exceptions reinforce this pattern. Hazardous waste management is the only formally documented collaboration, mandated by regulations, while voluntary WWTP and agricultural partnerships continue without memorandums of understanding. In other words, institutionalization only occurs when regulatory compliance pressures *arise*.

Process Evaluation

Process evaluations indicate that implementation success is directly proportional to the level of control a single work unit has over the chain of activities. The maggot chain, fully managed by the Work Facilities Subsection, operates relatively consistently. In contrast, waste sorting in residential blocks, involving inmates, security officers, and external transporters, yields conflicting accounts. This pattern aligns with the *social-ecological systems framework*, which emphasizes that successful shared resource management depends on clear institutional arrangements between actors (Ostrom, 2007; Partelow, 2018). The discrepancies in accounts also reflect information gaps between levels. Administrative officials tend to describe the program as it was designed, while technical implementers, such as WB-4, describe the program as it occurred, including setbacks that did not reach policymakers. The loss of the energy efficiency program after the change in prison warden suggests that environmental initiatives remain embedded in individuals, not the system.

The infrastructure domain presents the most distinctive dilemma of this study. Green infrastructure principles advocate vegetation for thermal and psychological comfort (Leal Filho et al., 2026), but in drug prisons, any green element that reduces visibility is potentially exploited for smuggling. Therefore, the *green prison framework* from international literature needs to be adapted to the level of security risk. A more realistic strategy is to shift from vertical greening (tall trees) to horizontal, monitored greening, such as low gardens, potted plants, and the expansion of existing food plots.

Product Evaluation

The achieved products are tangible but partial. The most measurable products are the closed cycle of organic waste and the legality of B3 waste management. In the energy domain, savings from LED lights are not reflected in a macro-level reduction in electricity costs because costs continue to tend to increase, likely due to increased operational needs. In the water domain, conservation achievements are undetermined *due* to the lack of baseline data. This lack of data is not simply an administrative deficiency, but evidence that environmental monitoring instruments are not yet operational. In the infrastructure domain, there has been a decline in the reduction of green spaces with dense vegetation. In the education domain, products emerge at the individual level in the form of inmates' intentions to maintain environmentally friendly habits after release. This aligns with the argument that environment-based programs can foster ecological awareness (Jewkes & Moran, 2015), although these findings are based solely on self-reports.

Implications for Green Prison Development

The CIPP evaluation results can be translated into realistic development stages for a dedicated narcotics prison (Table 10). These stages are structured around the principle of prioritizing low-cost measures that strengthen institutionalization, then moving on to infrastructure investment. This sequence is important because the findings suggest that the primary problem is not the lack of practices, but rather the lack of systems to sustain those practices.

Table 10. Stages of Eco-Correctional Facility Development Based on Evaluation Results

Stage	Focus	Main Steps
Short-term	Institutionalization and baseline data	Developing SOPs for environmental management; recording monthly water and electricity consumption and waste volume; standardizing waste sorting from source to transport.
Medium term	Programs and partnerships	Institutionalize <i>integrated farming</i> as a cross-sector program; develop a curriculum <i>for education for sustainability</i> ; formalize cooperation on wastewater treatment plants and agricultural partnerships through a memorandum of understanding.

Stage	Focus	Main Steps
Long-term	Infrastructure and budget	Allocating a budget for environmental development; conducting regular energy audits; exploring solar panels and rainwater harvesting; developing horizontal greening that meets safety standards

Source: Processed by researchers, 2026

The four evaluation components revealed a similar pattern: *eco-correctional facility practices* are authentic and robust at the operational level, but fragile at the institutional level. Consequently, developing *green prisons* in Indonesian prisons cannot simply be achieved by adding physical facilities. Such development needs to be accompanied by institutionalization through written policies, budgets, and monitoring systems to ensure that existing practices are not interrupted by changes in leadership or key personnel. This study has limitations, including a limited number of informants, a short field period, and the absence of primary quantitative data on water consumption and waste volume.

CONCLUSION

The eco-correctional facility practice at Yogyakarta's Class IIA Narcotics Prison has been implemented across all five green prison domains and has grown from a bottom-up perspective, driven by operational needs. The most prominent achievement is the maggot-based integrated farming system that creates a closed cycle for organic waste, coupled with the conversion of lighting to LEDs, legal management of hazardous and toxic waste, and informal environmental education through vocational training. However, this practice is not supported by written policies, a dedicated budget, trained human resources, or baseline data monitoring. Furthermore, the greening principle clashes with the security needs of the narcotics prison. Thus, the eco-correctional facility concept is feasible for development, but is still in its infancy and not yet institutionally sustainable.

Based on these conclusions, prisons are advised to (1) develop environmental management SOPs and allocate environmental development budgets; (2) standardize waste sorting from source to final transportation; (3) institutionalize integrated farming as a cross-sector program; (4) record water, energy, and waste volume consumption periodically; (5) develop a scheduled sustainability education curriculum; (6) develop horizontal reforestation that still meets safety standards; and (7) formalize cooperation on liquid waste management and agricultural partnerships through a memorandum of understanding. Further research can compare narcotics prisons with general prisons or measure the impact of the program quantitatively.

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