

THE ROLE OF CIRCULAR ECONOMY-BASED GREEN OFFICE IN IMPROVING EMPLOYEE PRODUCTIVITY AND WORKING COMFORT TO SUPPORT SDGs ACHIEVEMENT IN BANYUMAS REGENCY ENVIRONMENTAL SERVICE

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Abstract

Environmental sustainability issues encourage various agencies, including local governments, to adopt the green office concept as an efficiency strategy as well as an effort to support the Sustainable Development Goals (SDGs). This study aims to evaluate the implementation of a circular economy-based Green Office at the Banyumas Regency Environmental Service, and to analyze its impact on employee productivity and work comfort. Using a qualitative descriptive approach through case studies, data were collected through in-depth interviews, direct observation, and document analysis. The results of the study indicate that green office practices have been implemented quite optimally with an average fulfillment rate of 82.5%, including energy efficiency, waste management, document digitization, and environmentally friendly workspace arrangement. The findings show an increase in work comfort and operational efficiency, as well as a real contribution to achieving SDGs indicators such as reducing paper, electricity, and water consumption. This study integrates Work Environment Theory as a theoretical basis that explains the relationship between a healthy physical work environment and employee productive behavior. Although it has limitations in terms of location coverage and number of informants, the results of this study enrich the literature related to green offices in the public sector and provide an implementation model that can be replicated by other government agencies in realizing an efficient, participatory, and sustainable green bureaucracy.

Keywords: Green Office, Circular Economy, Employee Productivity, Work Comfort, SDGs

INTRODUCTION

Environmental sustainability issues are becoming increasingly urgent amidst the challenges of climate change and natural resource degradation. Various sectors, including government, have a crucial role in adopting environmentally friendly practices to reduce negative impacts on the planet. The concept of a green office or sustainable office has emerged as a proactive approach that encourages institutions to integrate sustainability principles into their daily operations. A green office is not just a trend, but a philosophy that aims to minimize the ecological footprint, increase the efficiency of resource use, and create a healthy and productive work environment for employees (OECD, 2011; Yudayana, 2016).

The implementation of a green office covers various aspects, from energy efficiency, water management, waste reduction, use of environmentally friendly materials, to sustainable procurement practices and improving indoor air quality (Suryandari, 2017). The benefits obtained from implementing a green office include savings in operational costs, improving the image of the institution, and increasing employee welfare and productivity (International Labour Organization [ILO], 2014). Employees who work in a healthier and more sustainable

environment tend to have higher levels of job satisfaction and lower absenteeism (Al-Douri & Al-Jabali, 2021).

As a government agency that has a direct mandate in environmental management and protection at the district level, the Banyumas Regency Environmental Service holds a strategic position to be a role model in implementing green offices. The application of green office principles based on a circular economy in this agency environment will not only strengthen the institutional mission to realize a sustainable environment, but also has the potential to become a best practice that can be replicated by other agencies in the Banyumas area. However, the implementation of green offices in bureaucratic environments often faces challenges such as budget constraints, lack of employee understanding, and resistance to changes in work habits (Rahman & Ahmad, 2018). Therefore, an in-depth observation of the Banyumas Regency Environmental Service is important to assess the extent to which green office principles have been implemented and their impact on employee productivity and work comfort.

A number of previous studies have discussed the implementation of green offices and their benefits, such as reduced energy consumption and increased resource efficiency. Research by Purnamasari et al. (2023) showed that the implementation of green offices can reduce electricity consumption by up to 25% and increase job satisfaction. Meanwhile, Ramadhani and Suryanto (2022) highlighted the success of circular economy-based waste management in reducing waste volume by up to 30%. However, most of these studies focus more on technical environmental aspects, while aspects of work productivity, employee comfort, and direct contribution to achieving the SDGs are still rarely discussed comprehensively, especially in the context of local government agencies. The limitations in integrating the green office approach and the circular economy framework are also gaps that have not been widely filled in the current literature.

The research gap arises at the point of integration between circular economy-based green office practices and their impact on non-environmental aspects such as organizational performance, productivity, and employee welfare. Previous studies tend to be based on a sectoral approach and have not examined the extent to which the synergy of these concepts can help government agencies realize the SDGs holistically. In addition, there has been no research that specifically examines the implementation of this concept in the Banyumas Regency Environmental Service, even though this agency has a strategic and ideal function as a laboratory for sustainable policies at the regional level.

Based on this background, this study aims to answer the main question: What is the role of Green Office based on circular economy in increasing employee productivity and work comfort and its contribution to achieving SDGs in the Banyumas Regency Environmental Service? The purpose of this study is to evaluate the implementation of green office principles in the context of circular economy, identify its influence on employee productivity and work comfort, and assess the contribution of these practices to efforts to achieve SDGs. The novelty of this study lies in the integrative approach that combines environmental, social, and institutional aspects simultaneously, with a focus on measuring the impact on employees and strengthening sustainable internal governance.

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

Work Environment Theory

This study is based on the Work Environment Theory developed by Kurt Lewin and expanded by contemporary researchers in the fields of organizational psychology and work behavior. This theory emphasizes that the work environment, both physical and psychological, directly affects employee behavior, motivation, productivity, and well-being (Lewin, 1951).

According to this theory, individual behavior is the result of the interaction between

people

(P) and their environment (E), or known as Lewin's classic formula:

$$B = f(P, E)$$

This means that Behavior (B) is a function of Person (P) and Environment (E). In the context of this study, the application of the green office principle is a form of optimizing the "environment" aspect that can affect employee work behavior, productivity, and comfort.

This theory is the basis for understanding how environmentally friendly and healthy workspace design (green office) can create a conducive work atmosphere that positively influences employee behavior and work performance (Oldham & Brass, 1979; Dul & Ceylan, 2011).

The implementation of green office acts as a positive environmental stimulus that impacts individual perception, cognition, and emotions, which ultimately encourages increased productivity and work comfort. This theory also supports the view that the work environment is not only a physical place to work, but also a strategic factor in shaping proactive, healthy, and efficient work behavior (Vischer, 2007).

In the conceptual framework of this study, green office is studied as an environmental intervention (E) that plays a role in increasing work comfort (psychological and physical), which in turn will contribute to employee work productivity (B). The work environment theory provides theoretical justification that healthy and environmentally friendly workspace arrangements play an important role in supporting individual success in public organizations such as the Environmental Service.

Green Office Concept

The green office concept is a strategic approach in office governance that emphasizes the application of sustainability principles in all aspects of office operations, with the aim of minimizing negative impacts on the environment and maximizing social and economic benefits (Ghazilla et al., 2013). This principle includes energy and water efficiency, responsible waste management, use of environmentally friendly materials, and improving indoor air quality. Green office not only targets environmentally friendly infrastructure and technology, but also demands changes in employee behavior and work culture towards a more sustainable lifestyle and work practices (Yudelton, 2008).

Studies show that energy efficiency implemented through the use of natural lighting, energy-efficient equipment, and good ventilation has an impact on reducing electricity consumption and operational costs (OECD, 2011). In addition, waste management based on the 3R principle (reduce, reuse, recycle) and the provision of green facilities such as office parks are also important indicators in achieving a green office (Hwang & Tan, 2012). This is especially relevant in public institutions such as the Environmental Service, which has a moral and institutional responsibility for environmental sustainability.

Employee Work Productivity

Employee work productivity can be interpreted as an individual's ability to complete work efficiently and effectively in achieving organizational goals (Griffin & Moorhead, 2014). Factors that influence productivity include individual competence, work motivation, time management, and work environment conditions. In the context of green office, improving the quality of the physical work environment—such as natural lighting, healthy air circulation, and a neat work environment—contributes positively to increased productivity because it supports cognitive function, reduces fatigue, and encourages a sense of ownership of the workspace (Davis et al., 2011).

Several studies have confirmed that significant increases in productivity occur when offices implement environmentally friendly and ergonomic designs, because these factors increase focus and reduce work discomfort (Heerwagen, 2000; Sassi, 2006). Therefore, green office is not only an environmental solution, but also a managerial strategy in increasing

organizational output.

Employee Work Comfort

Work comfort refers to the condition of the work environment that supports the physical and psychological well-being of employees in completing their tasks without significant disruption (Grandjean, 1988). Physical aspects of comfort include room temperature, lighting, noise, and workplace ergonomics. On the other hand, psychological comfort involves positive social interactions, a conducive work atmosphere, and support from leaders (Vischer, 2007).

A comfortable work environment has been shown to increase job satisfaction and reduce stress levels. In green office practice, this comfort is realized through the creation of a clean, beautiful, and healthy work space. Indoor plants, good lighting arrangements, and reducing the use of toxic chemicals provide a relaxing effect and improve employee psychological balance (Shibata & Suzuki, 2002).

The Relationship between Green Office, Productivity, and Work Comfort

Based on the theoretical framework that has been presented, there is a functional relationship between the implementation of a green office and increased productivity and work comfort. A study by Fisk (2000) revealed that good indoor air quality (IAQ) plays a major role in reducing symptoms of sick building syndrome, increasing critical thinking skills, and improving the general health of employees. Good ventilation, combined with natural lighting and ideal temperature settings, creates a work environment that stimulates performance (Seppänen et al., 2006).

Furthermore, Heerwagen (2000) explained that natural lighting can improve mood and affect employees' circadian rhythms, which have a direct impact on productivity and work comfort. In green office design, the selection of non-toxic building materials and ergonomic layouts help create a safe and pleasant environment. This not only affects physical comfort, but also psychological comfort, because a clean and tidy work environment helps reduce mental burden and work pressure.

Thus, the green office at the Banyumas Regency Environmental Service is not only a form of commitment to environmental preservation, but also a strategy to improve organizational performance through the creation of a workspace that supports employee welfare. This relationship shows that the ecological and productivity aspects of an organization can go hand in hand and reinforce each other, in line with the spirit of the Sustainable Development Goals (SDGs), especially goals 3 (good health and well-being), 8 (decent work and economic growth), and 11 (sustainable cities and communities) (UNDP, 2022).

RESEARCH METHODS

This study uses a qualitative descriptive approach with a case study design, which aims to explore and analyze in depth the implementation of a circular economy-based Green Office at the Banyumas Regency Environmental Service. This approach was chosen because it is appropriate to answer the research question regarding how green office practices contribute to increased employee productivity and work comfort and support the achievement of the Sustainable Development Goals (SDGs) (Creswell & Poth, 2018). The case study design allows researchers to gain a comprehensive contextual understanding of the phenomena studied in the natural environment of public institutions (Yin, 2018).

The subjects in this study were employees of the Banyumas Regency Environmental Service who were directly involved in administrative, operational, and decision-making processes in the office environment. The selection of informants was carried out purposively, with criteria such as having a minimum of two years of work experience, understanding green office policies and practices, and being willing to provide information openly (Patton, 2015). The total number of informants interviewed was eight people, consisting of structural officials, administrative staff, and office environmental cleaners.

The data collection techniques used in this study include: (1) in-depth interviews, (2) direct observation, and (3) documentation studies. Interviews were conducted in a semi-structured manner using guidelines developed based on green office implementation indicators and circular economy principles adopted from the OECD (2011) and Permen LHK No. P.52/MENLHK/SETJEN/KUM.1/9/2019. This instrument has gone through a content validation stage by two experts in the field of environment and public organization governance. Observations were made by observing employee daily activities, workspace management, energy use, and waste and water management practices. Meanwhile, documentation was used to review internal documents such as environmental policies, activity reports, and visual documentation related to green infrastructure (Bowen, 2009). Data were analyzed using thematic analysis techniques by following the stages developed by Braun and Clarke (2006): transcription of interview results, data coding, theme identification, and drawing conclusions. Data validity is maintained through source and method triangulation techniques (Carter et al., 2014), as well as member check techniques to ensure that the researcher's interpretation is in accordance with the reality understood by the informant. The analysis procedure is carried out sequentially and systematically to ensure data traceability (auditability) and reliability (dependability). This analysis aims to answer the main research questions and evaluate the relationship between the implementation of green offices with employee productivity and work comfort, as well as its contribution to efforts to achieve SDGs at the local level.

RESULTS AND DISCUSSION

Result

Implementation of Circular Economy-Based Green Office at the Environmental Agency of Banyumas Regency

The research findings indicate that the Environmental Agency (DLH) of Banyumas Regency has successfully implemented a Green Office initiative based on circular economy principles. This implementation covers six key aspects:

Table 1. Circular Economy-Based Green Office Practices at the Environmental Agency (DLH) of Banyumas Regency

Practice Aspect	Field Implementation	Achievement Indicator
Energy Management when	Use of LED lights, turning off air conditioners not in use	Achieved (85%)
Waste Management paper	Separation of organic and inorganic waste, recycling	Achieved (90%)
Water Usage	Installation of automatic faucets, rainwater harvesting system	Achieved (75%)
Office of	Space Arrangement of green open space, utilization	Achieved (80%)

Management	natural lighting	
Digital Documentation	Digital archiving and correspondence	Achieved (95%)
Education (70%) Socialization	& Internal campaigns about green office practices	Achieved
Total	–	Average (82.5%)

The average fulfillment rate of these indicators reached 82.5%, reflecting a high level of compliance with circular economy principles and the environmentally friendly office policy stated in Ministerial Regulation LHK No. P.52/MENLHK/SETJEN/KUM.1/9/2019. Field observations also confirm that these practices are not temporary projects but have been embedded into the organizational culture. This is supported by internal policies such as paper usage reduction and space efficiency through digital archiving and document downsizing.

Impact on Employee Productivity and Work Comfort

The green office implementation has had a significant positive impact on both the physical and psychological comfort of employees. Cleaner and better-ventilated office spaces with access to natural light have contributed to healthier working environments. Policies such as indoor smoking bans and indoor plant placement have improved indoor air quality and reduced the risk of respiratory illness.

Additionally, digital document management has streamlined administrative processes, making data retrieval faster and reducing paper clutter, which in turn lowers stress levels and improves task focus. Informant testimonials support these findings:

“With the green office program, the workspace is more comfortable, clean, and less stuffy. It motivates me to work better.” (Informant A)

“Documents used to pile up, but now everything is digital. It's easier to find data and less stressful.”

(Informant B)

These findings align with Kurt Lewin's Work Environment Theory (1951), which highlights the influence of physical work environments on employee behavior and productivity. Moreover, occupational safety and health (OSH) efforts are evident through the availability of personal protective equipment (PPE), fire extinguishers (APAR), and universal participation in BPJS Health and Employment insurance schemes, contributing to a sustainable and secure workplace.

Contribution to Sustainable Development Goals (SDGs)

The circular economy-based green office practices at DLH Banyumas contribute meaningfully to the achievement of several Sustainable Development Goals (SDGs), particularly:

1. SDG 6 (Clean Water and Sanitation): Achieved through water efficiency, with a 20% reduction in water use.
2. SDG 12 (Responsible Consumption and Production): Implemented via waste reduction, recycling efforts, and a 48% reduction in paper usage.
3. SDG 13 (Climate Action): Realized through energy efficiency and a 27% decrease in electricity consumption.
4. SDG 16 (Peace, Justice, and Strong Institutions): Supported by digitalization of public services and improved governance transparency.

The following table shows the measurable impacts of green office implementation on SDG indicators:

Table 2. Impact of Green Office Implementation on SDG

Indicators	SDG Indicator	Year 2023	Year 2024	Change (%)
Paper Consumption (reams)		1,200	624	-48%
Electricity Consumption (kWh)		21,000	15,330	-27%
Water Usage (m ³)		650	520	-20%
Plastic Waste (kg)		340	180	-47%

Furthermore, employee involvement in planning and evaluating the program reflects a strong sense of ownership and organizational commitment. This active participation is essential in sustaining environmentally responsible policies and embedding sustainability into daily office practices.

Employee Perception and Participation

In general, employee perception of the green office policy is highly positive. The majority reported a stronger sense of ownership toward the program, largely due to their involvement in the planning and evaluation processes. This active participation has become a key factor in ensuring the sustainability of the program's implementation.

"We are encouraged to give input during the monthly coordination meetings. That makes us feel valued and motivated to keep supporting the program."

(Informant C, Structural Official)

These findings demonstrate that the circular economy-based green office initiative not only improves operational efficiency but also has a tangible impact on employee comfort and organizational performance. Moreover, it contributes significantly to the achievement of Sustainable Development Goals (SDGs) at the local government level.

Discussion

The findings of this study demonstrate that the implementation of a Circular Economy- Based Green Office at the Environmental Agency (DLH) of Banyumas Regency has had a positive impact on employee productivity and workplace comfort, while also contributing to the achievement of the Sustainable Development Goals (SDGs). Practices such as energy efficiency, waste management, document digitalization, and the utilization of eco-friendly office spaces have proven effective in enhancing operational efficiency and creating a healthier, more supportive work environment. These findings reinforce the initial research question by showing that green office initiatives provide benefits not only from an ecological standpoint but also in terms of organizational performance and employee well-being.

The observed increase in employee productivity—evidenced by more efficient workflows and faster administrative processes—alongside improved workplace comfort, indicates that the green office approach extends beyond environmental symbolism. It also addresses psychological and ergonomic aspects of daily work. This aligns with the principles of the circular economy, which emphasize not only resource efficiency but also the sustainability of social and institutional systems (Kirchherr et al., 2017).

These findings are consistent with earlier research conducted by Kristina et al. (2020) on government agencies in Yogyakarta, which concluded that green office implementation significantly improved performance and bureaucratic efficiency. Additionally, research by Siregar and Maulida (2022) found that document digitalization and green work systems reduced employee stress and accelerated administrative decision-making.

A study by the OECD (2011) also supports these outcomes, noting that the application of circular economy principles in public office management enhances accountability, reduces operational costs, and fosters more inclusive and productive workspaces. Within the context of

the SDGs, this research adds empirical support to the role of the public sector—particularly environmental agencies—in advancing sustainable development through internal reform rooted in environmental responsibility.

Theoretically, this study contributes to the growing body of knowledge on circular economy implementation in the public sector, particularly in the context of green office practices. The model presented here may serve as a reference for other institutions seeking to integrate circular economy principles into their internal governance. It also reinforces the connection between green organizational design and improved human resource performance, enriching the discourse on environmentally-based public organization management.

Practically, these findings provide evidence that green office implementation is not merely a normative policy, but an effective strategy to improve bureaucratic efficiency, reduce operational burdens, and enhance employee job satisfaction. This forms a strong foundation for local governments to develop data-driven policies aimed at expanding green office practices to other public service units (OPDs).

CONCLUSION

This study critically and logically concludes that the implementation of a Circular Economy- Based Green Office at the Environmental Agency (DLH) of Banyumas Regency has made a tangible contribution to improving employee productivity and workplace comfort, while also supporting the achievement of the Sustainable Development Goals (SDGs) at the local level. Practices such as energy efficiency, waste reduction, administrative process digitalization, and the arrangement of environmentally friendly workspaces have not only enhanced operational efficiency but also created a healthier, more comfortable, and performance-supportive work environment.

This research advances scientific knowledge in two key areas. First, theoretically, it expands the literature on circular economy implementation within the public sector, particularly through the Green Office approach. Second, from a practical perspective, the study offers a replicable implementation model that other government agencies can adopt to promote efficient and sustainable green bureaucracy.

However, the study has several limitations, including its restricted geographical scope, a limited number of informants, and the absence of long-term quantitative impact measurement. Therefore, the generalization of findings should be approached cautiously and within similar contextual settings.

As a follow-up, further research using a mixed methods approach with a broader scope is needed to test the validity of these findings more comprehensively. This study also opens up opportunities for developing more systematic and integrated evaluation indicators for Green Office practices, aligned with local government policies within the broader framework of green economy and sustainable development.

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