

Analysis of Organizational Readiness for The Implementation of Environmental, Social and Governance (ESG) in The Development of Green Laboratories at Pertamina Central Hospital Jakarta

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Abstract

The transformation of the healthcare sector toward sustainability has become a strategic necessity due to the high emissions generated by healthcare service activities, particularly hospital laboratories. The integration of Environmental, Social, and Governance (ESG) principles through the development of green laboratories represents a key approach to achieving sustainable healthcare. This study aims to analyze the organizational readiness of Pertamina Central Hospital (RSPP) in implementing ESG, focusing on regulatory, human resource, and infrastructure aspects. This study employed a descriptive qualitative design. Data were collected through field observations, document reviews, in-depth interviews, and Focus Group Discussions (FGDs). Data analysis was conducted through data reduction, narrative and thematic presentation, and conclusion drawing, which were validated using source and method triangulation. The results indicate that regulatory support for green laboratories is available but incomplete. In the human resource aspect, occupational safety and environmental culture have been implemented; however, conceptual understanding of green laboratory principles has not been evenly distributed among staff. Supporting infrastructure is partially available, yet energy efficiency technologies and environmental sensor systems have not been fully implemented. The organizational readiness of RSPP in implementing ESG for green laboratory development has been partially established. Strengthening formal regulations, enhancing human resource capacity through structured training, and developing green technology-based infrastructure are required as sustainable

Keywords: ESG; green hospital; green laboratory and organizational readiness.

I. INTRODUCTION

The healthcare sector contributes approximately 4.6% to global greenhouse gas emissions, and this figure continues to rise with the development of medical technology and energy-intensive hospital operations. 1 Global reports indicate that healthcare laboratories contribute significantly to energy consumption due to the use of high-powered equipment, refrigeration, and hazardous chemical waste. This phenomenon has raised the international demand for strengthening the concept of sustainable healthcare through the integration of Environmental, Social, and Governance (ESG) into hospital governance. Pertamina Central Hospital Jakarta is a large hospital with a high level of service complexity.

As part of a state-owned enterprise (BUMN) hospital network, it has strong potential to become a model for sustainability implementation in Indonesia. The RSPP laboratory has a high test volume, resulting in high use of reagents, plastics, and energy. The discrepancy between sustainability targets and actual conditions is a crucial reason why a scientific review of organizational readiness is necessary, encompassing aspects of policy, human resources, and infrastructure. This study analyzes the organizational readiness of Pertamina Central Hospital in implementing the Environmental, Social, and Governance (ESG) principles in the development of Green Laboratory by emphasizing the process of identifying conditions that have and have not been met according to parameters, without using weighting, or numerical measurements or grading systems.

II. METHODS

This research is a qualitative descriptive study. To support the systematic data collection process, this study uses several instruments, namely observation sheets and document reviews, as well as interview sheets. There are three types of interview sheets: Interview Sheet A, which used to interview 4 sources, namely Laboratory Structural Employees, Laboratory Professional Staff, Laboratory Sr Officer, and Medical Laboratory Technologist, then Interview Sheet B to interview Laboratory Admin Staff, and Interview Sheet

C to interview Laboratory Cleaning Service. The research instrument was developed based on the Self-Assessment Instrument for Green Hospital Implementation in the 2018 Guidelines for Green Hospitals of the Ministry of Health of the Republic of Indonesia, as there are no specific national guidelines for Green Laboratories. Focus Group Discussions (FGDs) were conducted to obtain collective perspectives from the stakeholders involved, as well as to explore dynamics, identify common perceptions and differences in views, and validate initial findings from individual interviews. To increase data validity, the study used source triangulation, which compares data from various informants, and method triangulation, which compares data from observations and document reviews, interviews, and FGDs.

III. ANALYSIS RESULTS

From the Regulatory Aspect, The research results show that laboratories do not yet have a written policy specifically for Green Laboratories. Current implementation still refers to general Green Hospital, HSSE, ISO 15189, PPI, and K3 policies. This situation results in Green Laboratory implementation being partial, unstandardized, and not systematically measured. Although operational technical regulations are in place and well-functioning—such as SOPs for spill kits, waste management, PPE use, and MSDS/SDS guidelines—strategic regulations specifically governing Green Laboratories have not yet been established. This has led to a reliance on general policies and individual practices, resulting in implementation not yet being integrated into work unit policies. These findings align with those of Sutanto et al. (2020) and Sigalingging & Nadiroh (2021), who stated that many hospitals are in a transitional phase, where environmentally friendly concepts have been generally adopted but not yet translated into operational and specific work unit policies. Amelia & Ilyas (2025) emphasized that the absence of specific internal policies is a major obstacle to the sustainable implementation of green concepts in healthcare facilities.

From a human resources (HR) perspective, there are variations in understanding and engagement across professions. Environmentally friendly practices such as waste sorting, use of personal protective equipment (PPE), a culture of bringing tumblers, energy and water conservation, and adherence to occupational safety have been well-established as part of work routines and regulatory compliance. However, conceptual understanding of Green Laboratory remains fragmented and has not been widely internalized, particularly among non-technical staff. Green Laboratory workshops have been held, but only a small portion of staff has been involved, resulting in uneven knowledge transfer. Socialization efforts still emphasize technical operational aspects rather than building sustainability values. These findings align with WHO (2020), which emphasized that successful green healthcare implementation relies heavily on conceptual understanding of human resources, not just technical practices.

Sigalingging & Nadiroh (2021) and Perdini et al. (2024) stated that compliance-based implementation tends to be unsustainable if not accompanied by a value-based approach. From the aspect of infrastructure, safety and waste management, especially the existence of IPAL, TPS for B3 Waste, waste logbook system, spill kit, APAR, fire alarm, evacuation route, and emergency response system are already in place and running well. This shows strong structural and technical readiness in risk control and occupational safety. However, there are still limitations in the supporting facilities of the Green Laboratory, such as: The unavailability of chemical gas detectors, The non-implementation of sensor-based technology for energy and water efficiency, The energy saving concept in the BSC is not optimal, and the lack of visual educational media (posters, flyers, signage) WHO (2021; 2023) emphasizes that the Green Laboratory not only requires a safety system, but also the integration of energy efficiency technology, water, and innovation-based environmental risk mitigation.

IV. CONCLUSION

The implementation of Green Laboratory in hospital laboratories has demonstrated readiness in terms of technical operations and occupational safety, but it lacks specific strategic policies, equitable human resource understanding, and the integration of sustainable infrastructure innovations. This situation places laboratories at a partial stage. Strategic steps are needed, encompassing regulatory aspects, human resources, infrastructure, and observation and evaluation systems, to ensure sustainable, measurable, and well-

documented Green Laboratory implementation. From the Regulatory Aspect, Hospitals should formulate and establish a formal, written Green Laboratory policy, which includes energy and water efficiency policies as an integral part of the sustainability strategy. This policy needs to be strengthened through the issuance of a Decree (SK) on Green Laboratory Implementation, Green Laboratory operational guidelines, and the establishment of a Green Laboratory Team SK as a dedicated organizational structure responsible for program planning, implementation, monitoring, and evaluation.

In addition, it is necessary to develop specific Standard Operating Procedures (SOPs) for energy and water efficiency at the laboratory level, so that energy and water saving practices are not merely recommendations, but become institutional obligations that are standardized, measurable, and can be evaluated periodically. In terms of human resources, a comprehensive Green Laboratory workshop involving all levels of the profession, including technical, non-technical, and support staff, is required. The workshop will focus not only on technical operational aspects but also on strengthening conceptual understanding, sustainability values, and an environmentally friendly organizational culture. Furthermore, it is necessary to conduct ongoing and structured outreach on Green Laboratory, including regular training, internal educational media, and the integration of Green Laboratory materials into HR competency development programs.

This approach is expected to encourage the internalization of sustainability values, so that Green Laboratory implementation is not merely compliance-based but develops into a work culture embedded within the organizational system. In terms of infrastructure, it is necessary to strengthen environmentally friendly infrastructure through the development of energy-efficient central AC systems, optimizing energy efficiency in Biological Safety Cabinets (BSC), and installing BSC stickers as an educational medium for energy-efficient work behavior. In addition, it is recommended to install chemical hazard posters and waste sorting posters as part of strengthening the visual culture of the Green Laboratory, so that safety and environmental information is not only a technical document, but is also easily understood by all laboratory users. Sustainable technology development is also needed through the installation of automatic sensor lights, water-saving sensor faucets, and chemical gas detectors as environmental and occupational safety risk mitigation systems. Furthermore, a review of lighting measurements in substandard rooms is necessary to ensure optimal comfort, safety, and energy efficiency.

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