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Environmental Legal Compliance and its Relationship with Perceived Operational Efficiency in Broiler Breeder Farms

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***Abstract*: Environmental legal compliance refers to adherence to applicable environmental laws and regulatory requirements. This study examined the relationship between environmental legal compliance and perceived operational efficiency outcomes in broiler breeder farm operations. Using a quantitative correlational design, data were gathered through structured Likert-scale survey instruments administered to key personnel across broiler breeder farms, measuring compliance implementation across major domains (air, water/wastewater, solid waste, hazardous/chemicals, permits/documentation/audits, and training/responsibilities/culture) and perceived efficiency outcomes (e.g., reduced disruptions, improved sanitation/ housekeeping, better coordination, and reduced downtime). Descriptive statistics and Pearson's correlation were used to determine the strength and direction of association between compliance and perceived operational efficiency outcomes. Findings provide practical insight that integrating environmental compliance into routine farm management is associated with stronger perceived operational control and stability, supporting more disciplined and resilient operations.**

***Keywords*: Environmental compliance, broiler breeder farms, perceived operational efficiency outcomes, waste management, water quality, air emissions, DENR regulations, Pearson correlation.**

1. Introduction

A. Background of Study

Broiler breeder farms are a critical foundation of the poultry value chain because they supply fertile hatching eggs and chicks that ultimately determine the stability of broiler production, market supply, and the affordability of chicken as a primary protein source for Filipino households; however, these farms also operate under increasing environmental accountability due to the potential impacts of manure/litter, wastewater, air emissions (odor, dust, ammonia), and chemical handling on surrounding communities and ecosystems, making environmental legal compliance (e.g., requirements aligned with the Philippine Clean Air Act, Clean Water Act, Ecological Solid Waste Management Act, and DENR-related permitting, monitoring, and documentation) an integral part of daily operations rather than a purely external obligation [1]. In practice, many farm stakeholders still view compliance as a cost center associated with infrastructure upgrades, monitoring, recordkeeping, and training raising a persistent operational question: does compliance merely add burden, or can it function as a management mechanism that strengthens operational discipline and efficiency by reducing disruptions, improving sanitation/housekeeping, increasing coordination, and minimizing downtime? Addressing this concern is especially relevant in Central Luzon, where large-scale, standardized broiler breeder operations are subject to routine environmental regulation and where consistent implementation across farms can be examined more systematically [2]. Thus, this study situates environmental legal compliance as the independent variable expressed through key domains air emissions/air quality, wastewater and water management, solid waste management, hazardous waste/chemical handling, permits/ documentation/audits, and training/responsibilities/ compliance culture—and examines how these domains relate to survey-based perceived operational efficiency outcomes, generating evidence that can help farm managers integrate compliance into routine control systems, inform regulators about the operational implications of enforcement, and support the poultry industry's broader goals of sustainability and competitiveness [3].

B. Review of Related Literature

Environmental compliance in poultry farming has been studied as both a regulatory requirement and a driver of efficiency. Researchers consistently show that compliance practices, when treated as more than just paperwork, can improve health, productivity, and sustainability. Beyond mere compliance paperwork, structured documentation and reporting systems can improve operational responsiveness and accountability. In a facility-management setting, manual reporting practices were shown to contribute to delays and inefficiencies; adopting digital reporting was recommended to streamline issue management and improve responsiveness—an approach conceptually aligned with strengthening environmental compliance documentation and audit readiness

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in farm operations [4].

1) Waste and Litter Management

Poultry farms produce significant amounts of manure and litter each day [5]. The waste management method not only influences the environment but also the flock. Inadequate litter management can lead to the accumulation of ammonia, which causes the weakening of birds, their susceptibility to diseases, and low fertility and hatch rates [6].

2) Water Quality Protection

Poultry water is the most essential nutrient of all, but it is commonly neglected until a problem arises. A water source that is unclean can swiftly transfer disease both to birds and people living nearby. Studies confirm that the compliance with water testing and sanitation standards is not merely a gesture; it is the guarantee that each drop taken by the flock is clear and safe. This gives the farmers more regular feed intake, healthier stomachs, and more efficient reproduction systems. On the other hand, the communities get cleaner drinking water and less exposure to diseases [7]. By adhering to these standards, not only is productivity maintained, but also the health of the public is safeguarded, emphasizing the interdependence of farms and communities on the same water source.

3) Air Emissions and Ventilation

If someone has been inside a poorly ventilated poultry house they would be able to understand the strength of the ammonia and dust present there. These emissions are not just irritants for the human nose, but they also make it difficult for the birds to breathe, reduce fertility, and raise the death rate [8]. Due to air quality regulations, farms must put in place better ventilation systems, which may seem a hefty investment at first, but in fact, it leads to healthier flocks. The study suggests that a cleaner air environment relieves the birds' lungs of the overwork, results in higher fertility, and thus, a safer working environment. Besides simply following rules, the point of these regulations is to be instrumental in the creation of a more favorable environment for birds as well as for humans [9].

4) Energy Use and Housing Systems

Heat stress is one of the major problems that can plague the tropics, and the effect of heat stress can be so extreme that fertility and hatch rates can drop drastically within a short period of time. To comply with the regulatory requirements, in most cases, farms decide to install tunnel ventilation systems, insulation, and smart climate-control devices that not only help stabilize the environment but also result in better outcomes being achieved. Besides, according to [10], these upgrades also lower emissions and improve bird welfare. So, during the hot period, farmers are less affected by the losses, and their production output remains more stable. A combination of these steps helps protect the environment and at the same time ensures that farm operations are always coming in steadily [11].

5) Economic Trade-offs

Farmers worry a lot about the compliance costs, among which are expenses for equipment, monitoring, and training, and these could be a tough nut to crack for small farms. However, the results indicate that the benefits exceed the costs in the long term [12]. The combination of lower mortality rates, increased hatch rates, and less penalties makes the farms more profitable. In addition, compliance gives confidence that there will be no diseases and fines which makes life more stable. It is not only about being safe from losses but also about having the capability to withstand adversity [13].

6) Philippine Context

Generally, poultry is one of the staple diets of Filipinos and a significant source of income. According to the Philippine Poultry Broiler Industry Roadmap [14], it is indicated that sustainability and competitiveness chiefly hinge on compliance. The document highlights waste management, water protection, and biosecurity as the primary areas that need to be addressed. For farmers, abiding by the rules is neither simply a matter of government regulation nor a formality, but it is more about the care and love for their community, the assurance of food security, and their continued existence as a strong industry, capable of facing the challenges of global competition [15]. The compliance matrix on the roadmap illustrates that it is merely one component of a more extensive, long-term vision for a sustainable and resilient poultry sector.A tertiary section heading

C. Research Problem

Around the world, the poultry sector depends on broiler breeder farms without which the entire life cycle of broiler chickens would be impossible. These farms produce fertile hatching eggs/chicks for broiler production which then grow and develop into broilers for sale both in homes and markets all over the Philippines. Food security, wages of farmers, and the price of chicken, an extremely cheap protein source for Filipino families, all depend on the effectiveness of these farms. Nevertheless, they are increasingly required to adhere to environmental standards concerning air pollution, biosecurity, water quality, and waste disposal and management.

The problem is that on the one hand, farmers can see the great benefits of regulatory compliance while on the other hand, they still perceive them as costs [10]. They question the real usefulness of rules in boosting productivity or cutting profits. At the same time, policymakers are looking for evidence of whether compliance can support sustainable development or if it only puts more pressure on small- and medium-sized farms.

D. Objectives of the Study

1) General Objective

This study aimed to determine the relationship between environmental legal compliance and perceived operational efficiency outcomes of broiler breeder farms in Central Luzon, Philippines.

2) Specific Objectives

Specifically, the study sought to:

1. Assess the level of environmental legal compliance of broiler breeder farms in terms of air emissions and air quality, wastewater and water management, solid waste management, hazardous waste and chemical handling, permits/documentation/audits, and training/ responsibilities/compliance culture.
2. Determine the level of perceived operational efficiency outcomes associated with environmental compliance (e.g., reduced disruptions, improved

sanitation/housekeeping, better coordination, and reduced downtime); and

3. Test the significant relationship between environmental legal compliance and perceived operational efficiency outcomes using Pearson's correlation coefficient at the 0.05 level of significance.

E. Significance of the Study

One of the factors which have made this research to be highly significant is its work through broiler breeder farms in the Philippines to reveal the impact of environmental law compliance on perceived operational efficiency outcomes. Compliance is oftentimes perceived as a burden. However, this research work vividly shows that instead, it could become a driver for sustainability, higher operational effectiveness, and the overall welfare of the community.

- *To farmers and farm managers:* The study demonstrates that stronger environmental compliance implementation is associated with better perceived operational efficiency outcomes, such as improved sanitation/housekeeping discipline, fewer disruptions, better coordination among functions, and reduced downtime. This evidence may encourage managers to view compliance not only as a regulatory requirement but also as a practical management approach that supports more controlled and stable day-to-day farm operations while reinforcing social and environmental responsibility.
- *To communities:* Through this study, it has been brought into the limelight that poultry production is carried out in neighborhoods where the residents share resources. By demonstrating the association between compliance and water quality improvement, air safety and reduction of pollution, the research henceforth proves that responsible farming practice is, at the same time, a community health and dignity safeguard. Compliance can therefore be viewed as an instrument through which agricultural success is not at the expense of population living near farms.
- *To policymakers and regulators:* The results of the study may be used as the foundation for forming effective and feasible policies. If it can be proved that adherence to regulations increases efficiency, then the regulators may position the environmental laws as instruments that not only restrict but also encourage and help industry grow sustainably. This step would assist in bridging the gap between policy and practice, thus providing regulations with momentum in the poultry sector.
- *To the poultry industry:* This research will aid local industry to become globally competitive. Armed with the proof that compliance goes hand in hand with perceived operational efficiency outcomes the study essentially acts as a backbone for the industry's core strategies - sustainability and resilience in the face of global problems.
- *To future researchers:* At the very least, this research work lays down a base not only for those scholars who are interested in the link between environmental responsibility and agricultural productivity but also for those who view compliance beyond a mere legal obligation, as a practical approach that brings about tangible benefits to farmers, families, and nature.

2. Methodology

A. Study Design

This study adopted a quantitative research approach utilizing a correlational design to examine the association between environmental legal compliance and perceived operational efficiency outcomes in broiler breeder farms without manipulating any conditions. The independent variable was environmental legal compliance, defined as the degree of adherence to applicable environmental laws and regulatory requirements (e.g., the Philippine Clean Air Act [RA 8749], Clean Water Act [RA 9275], Ecological Solid Waste Management Act [RA 9003], and relevant Department of Environment and Natural Resources [DENR] guidelines), measured using a structured Likert-scale compliance checklist across key domains (air emissions/air quality, wastewater and water management, solid waste management, hazardous waste/chemical handling, permits/documentation/audits, and training/responsibilities/compliance culture). The dependent variable for the present analysis was perceived operational efficiency outcomes, defined as survey-based ratings of operational benefits associated with compliance implementation (e.g., reduced disruptions, improved sanitation/housekeeping, better coordination, and reduced downtime), measured using a Likert-scale instrument and summarized as a composite score. Descriptive statistics (mean and standard deviation) were used to describe compliance and perceived operational efficiency levels, while Pearson's correlation coefficient was applied at the 0.05 level of significance to determine the strength and direction of the relationship between compliance and perceived operational efficiency outcomes.

B. Locale of the Study

The study was conducted in 11 broiler breeder farms operated by a single poultry integrator in Central Luzon, Philippines. The company name was kept confidential to uphold ethical standards and protect organizational privacy. These farms were strategically located across the region and served as a major source of breeder eggs and chicks for commercial broiler production. The locale was selected because the company's large-scale operations were considered representative of broiler breeder practices, the farms were subject to environmental laws and regulations enforced by the DENR and local government units (including RA 8749, RA 9275, and RA 9003), and the farms maintained standardized production systems that supported consistent data collection and comparison, while regional proximity also improved logistical feasibility.

C. Population and Sample of the Study

A total of 28 key personnel from 11 broiler breeder farms participated in the study, consisting of department managers

(n=3), section managers (n=7), supervisors (n=5), electricians/technical staff (n=9), and farm clerks (n=4). Purposive sampling was used to ensure that respondents had direct involvement in, or routine exposure to, environmental compliance implementation and day-to-day operational controls. Managers and supervisors were included because they oversee compliance execution, enforce procedures, and coordinate corrective actions; farm clerks were included because they handle routine record-keeping and documentation support related to permits, logs, and audit readiness; and electricians/technical staff were included because they directly maintain and monitor operational systems that affect compliance (e.g., ventilation and emission-related equipment, wastewater-related pumps/controls, and preventive maintenance activities) and can credibly describe on-site implementation of control measures. Representation was obtained from all participating farms, although the number of respondents per role varied by farm depending on personnel availability during data collection; this multi-role composition strengthened the validity of responses by capturing compliance implementation from both managerial and operational perspectives rather than relying on a single informant group.

D. Research Instrument and Validation

Two primary instruments were used to gather data aligned with the research objectives. Environmental legal compliance was measured through a structured compliance checklist developed from applicable Philippine environmental laws and DENR regulatory requirements, covering areas such as waste management practices, wastewater and water management controls, air emission control measures, the proper storage and disposal of hazardous materials, permits/documentation/audits, and training/responsibilities/compliance culture. Responses were rated using a five-point Likert scale ranging from "Not Compliant" to "Fully Compliant" to allow quantification of compliance levels. Perceived operational efficiency outcomes were measured using a structured Likert-scale questionnaire capturing respondents' ratings of operational benefits associated with compliance implementation (e.g., reduced disruptions, improved sanitation/housekeeping, better coordination, and reduced downtime), and results were summarized using a composite perceived operational efficiency outcomes score. For instrument validation, the checklist and questionnaire were reviewed by three independent experts—an Assistant Vice President in the poultry industry with over 20 years of experience, a General Manager with extensive broiler breeder operational expertise, and an Environmental Consultant with more than 20 years of environmental compliance experience—and their feedback was used to improve clarity, relevance, and accuracy of the items. The instruments were pilot-tested with 20 individuals who were not part of the main study, and reliability testing produced a Cronbach's alpha coefficient of 0.79, indicating strong internal consistency for the Likert-scale compliance tool.

E. Ethical Considerations for the Analysis of the Study

Ethical standards were observed throughout the conduct of the study to protect the rights, welfare, and privacy of all participants and the participating organization. Prior to data collection, permission to conduct the study was secured from company management, and confidentiality arrangements were implemented to ensure that the company name, farm identities, and any other identifying details remained undisclosed. All respondents were informed of the purpose of the study, the nature of their participation, and their right to decline or withdraw at any time without penalty, and only those who voluntarily agreed were included. Anonymity was maintained by using codes instead of names in questionnaires and datasets, and responses were treated with strict confidentiality. Collected documents and electronic files were stored securely using password-protected devices accessible only to the researcher, and results were reported in aggregate form to prevent identification of specific farms or individuals. The study also ensured that the data were used solely for academic purposes and handled in a manner consistent with applicable data privacy and ethical research principles.

F. Data Gathering Procedure

Data gathering was carried out in a structured manner to ensure accuracy, ethical compliance, and confidentiality. Formal permission was obtained from company management prior to data collection, and a confidentiality agreement was executed to ensure that the company name and identifying details remained undisclosed and that all information was used solely for academic purposes. After approval, coordination was conducted with farm managers to identify qualified respondents, and the environmental compliance questionnaires were distributed to and completed by managers, supervisors, farm clerks, and technical personnel. The perceived operational efficiency outcomes questionnaire was administered alongside the compliance instrument to capture respondents' ratings of operational benefits associated with compliance implementation (e.g., reduced disruptions, improved sanitation/housekeeping, better coordination, and reduced downtime). Respondents were informed of the study objectives and were assured of voluntary participation and anonymity. Throughout the process, confidentiality was maintained by coding responses to remove identifiers and storing electronic files securely in password-protected devices accessible only to the researcher.

G. Data Analysis

The collected data from the environmental compliance checklist and the perceived operational efficiency outcomes questionnaire were analyzed using SPSS. Descriptive statistics (mean and standard deviation) were computed to summarize the levels of environmental legal compliance and perceived operational efficiency outcomes (composite survey score) across the 11 broiler breeder farms. Pearson's correlation coefficient (r) was used to determine the strength and direction of the relationship between environmental legal compliance and perceived operational efficiency outcomes, with the level of significance set at 0.05.

3. Results and Discussion

In this section, all data gathered were discussed to address the questions associated with this study.

Table 1
Position/Role of respondents (n=28)

Category	Frequency	Percent (%)
Electrician/Technical Staff	9	32.14
Section Manager - AH	7	25.0
Supervisor/AH	5	17.86
Farm Clerk	4	14.29
Department Manager - AH	3	10.71

Table 2
Years of experience in poultry operations (n=28)

Category	Frequency	Percent (%)
< 1	4	14.29
1 - 3	4	14.29
4 - 7	9	32.14
8 - 10	7	25.0
> 10	4	14.29

Table 3
Years assigned in current farm (n=28)

Category	Frequency	Percent (%)
< 1	6	21.43
1 - 3	9	32.14
4 - 7	7	25.0
8 - 10	3	10.71
> 10	3	10.71

Table 4
Environmental compliance training (n=28)

Category	Frequency	Percent (%)
Yes	12	42.86
No	16	57.14

Of all 28 respondents, their work-related demographics, Table 1, were found to be 32.14% (n=9) Electrician/Technical Staff, 25.00% (n=7) Section Managers, 17.86% (n=5) Supervisors, 14.29% (n=4) Farm Clerks and 10.71% (n=3) Department Managers. This distribution indicates that the survey captured both operational decision-makers and technical/administrative personnel, which is useful for describing environmental compliance implementation from multiple perspectives within broiler breeder farm operations. In terms of their years of experience in poultry operations, Table 2, it was found out that most of the respondents have 4-7 years' experience which is 32.14% (n=9), followed by 25.00% (n=7) have 8–10 years' experience, 14.29% (n=4) have less than a year similarly to 1–3 years' experience and more than 10 years. This suggests that most participants have moderate to extensive exposure to poultry operations, supporting the credibility of responses related to farm compliance practices and daily operational realities. Aside from the years of experience of the respondents, the researchers also gathered the data on the respondents' length of years assigned to the current farm. Table 3 shows the number of years respondents have been assigned to their current farms. The largest group reported 32.14% (n=9) have 1–3 years, followed by 25.00% (n=7) have 4–7 years and 21.43% (n=6) have less than a year. Smaller proportions reported 10.71% (n=3) have 8–10 years and 10.71% have more than 10 years. This indicates that many respondents have enough on-site exposure to evaluate day-to-day compliance implementation, while a notable portion are relatively new and may reflect ongoing workforce movement and assignment rotation across farms. Furthermore, the researchers aimed to distinguish respondents' training profile, Table 4. The majority of respondents which is 57.14% (n=16) reported no environmental compliance training, while 42.86% (n= 12) of respondents reported receiving training. This suggests that while compliance tasks are being carried out at the farm level, there remains a training gap that may affect consistency, documentation quality, and uniform application of procedures—especially among staff who handle routine tasks and records.

A. Research Instrument and Validation

To describe compliance implementation, composite scores were computed by domain (Air; Water, Solid Waste; Hazardous/Chemicals; Permits/Documentation/Audits; and Training/Responsibilities/Culture). As shown in Table B, overall compliance across domains was high (M = 4.67, SD = 0.56). Among the domains, the highest mean scores were observed in Training, Responsibilities & Culture (M = 4.73, SD = 0.51) and Permits, Documentation & Audits (M = 4.73, SD = 0.67), indicating that respondents generally reported strong assignment of responsibilities, regular communication of policies, and availability of required compliance records. Compliance was also consistently high in Solid Waste Management (M = 4.67, SD = 0.6), Hazardous Waste & Chemical Handling (M = 4.65, SD = 0.67), and Wastewater & Water Management (M = 4.63, SD = 0.53), suggesting that routine practices (segregation, storage, handling, and water-related controls) are widely implemented. The lowest domain mean was still high—Air Emissions & Air Quality (M = 4.60, SD = 0.62)—implying that air related measures are generally practiced but show slightly more variability compared with other domains [16].

At the item level, the highest-rated indicators included updated environmental permits/clearances and regular generator maintenance (both M = 4.86), as well as improved staff discipline due to environmental training and improved housekeeping/sanitation supporting flock performance (both M = 4.82). These results indicate that respondents strongly recognize documentation and maintenance as key compliance components that support stable farm operations. In contrast, the lowest-rated item was prohibition and strict enforcement of burning of waste (M = 4.25, SD = 1.24), suggesting that while the practice is generally observed, enforcement consistency may vary across farms or situations. Other relatively lower (but still high) items included wastewater treatment system functionality (M = 4.43) and steady production target maintenance (M = 4.50), showing areas where improvements in systems reliability and performance stability could still be strengthened [16].

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
AIR_DOMAIN	28	2.25	5.00	4.5982	.62487
WATER_DOMAIN	28	2.40	5.00	4.6286	.53254
SOLIDWASTE_DOMAIN	28	2.00	5.00	4.6714	.60176
HAZCHEM_DOMAIN	28	1.50	5.00	4.6518	.67474
PERM_DOMAIN	28	1.60	5.00	4.7286	.67157
TRAIN_DOMAIN	28	2.60	5.00	4.7286	.51125
OVERALL_COMPLIANCE	28	2.06	5.00	4.6679	.56135
Valid N (listwise)	28				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
The farm implemented measures to reduce dust, odor, and emissions (e. g., ventilation management, litter management, housekeeping).	28	3	5	4.71	.659
Generators were maintained regularly to minimize smoke and excessive emissions.	28	2	5	4.86	.591
Burning of waste (e.g., plastics, litter, packaging) was prohibited and strictly enforced.	28	1	5	4.25	1.236
Complaints related to odor/smoke were recorded and addressed with corrective actions.	28	2	5	4.57	.742
Air-related monitoring/inspection records (internal or external) were maintained and updated.	28	2	5	4.68	.723
The farm implemented wastewater management practices to prevent contamination of canals, rivers, or groundwater.	28	1	5	4.64	.826
Wastewater treatment structures/systems (if present) were functional and properly maintained.	28	1	5	4.43	.959
Water discharge practices followed permit requirements/conditions (if applicable).	28	3	5	4.71	.600
Spills or overflows (if any) were documented and corrected promptly.	28	3	5	4.61	.567
Water use was monitored to reduce wastage (e.g., leak checks, waterline maintenance).	28	3	5	4.75	.518
Waste segregation (biodegradable, recyclable, residual) was consistently implemented on-site.	28	3	5	4.71	.535
Proper storage areas for solid waste were designated and labelled.	28	1	5	4.61	.875
Recyclable materials (e. g., cartons, plastics, metals) were collected and disposed through approved channels.	28	2	5	4.75	.645
Residual wastes were collected/disposed through authorized haulers or approved disposal methods.	28	3	5	4.57	.573
The farm-maintained cleanliness to prevent pest attraction and disease risks linked to waste accumulation.	28	1	5	4.71	.810
Used oil, chemical containers, batteries, and similar wastes were stored in a designated secured area.	28	1	5	4.79	.787
Hazardous materials/chemicals were properly labelled and stored to prevent leaks and exposure.	28	1	5	4.71	.854
Personnel used appropriate PPE when handling chemicals, disinfectants, fuels, or hazardous wastes.	28	3	5	4.54	.576
Hazardous waste disposal followed approved procedures (e. g., accredited transporters/handlers when applicable).	28	1	5	4.57	.836
Environmental permits/clearances relevant to farm operations were secured and kept updated (as applicable).	28	1	5	4.86	.756
Required compliance documents (monitoring reports, manifests, inspection records) were properly filed and available.	28	1	5	4.82	.772
Internal inspections/audits on environmental compliance were conducted on a regular schedule.	28	1	5	4.61	.875
Non-compliance findings (if any) were documented, corrected, and prevented from recurring.	28	3	5	4.61	.629
Responsibilities for environmental compliance were clearly assigned to specific personnel.	28	2	5	4.75	.701
Environmental compliance orientation/training was conducted for new and existing employees.	28	2	5	4.79	.630
Environmental policies/procedures (e.g., waste segregation, spill control) were communicated and posted where needed.	28	3	5	4.71	.535
Employees were encouraged to report environmental issues without fear of blame or punishment.	28	2	5	4.68	.670
Corrective and preventive actions were implemented after incidents, audit results, or management review.	28	3	5	4.75	.518
The farm coordinated with relevant offices (e.g., management/consultants) to strengthen compliance implementation.	28	3	5	4.71	.600
Valid N (listwise)	28				

B. Perceived Effects of Compliance on Operational Efficiency

The result shown in Table C presents the composite rating for Perceived Efficiency Outcomes, which yielded a high overall mean (M = 4.70, SD = 0.59). This indicates that respondents generally agreed that compliance activities reduce disruptions, support sanitation and biosecurity, reduce pest presence, improve maintenance-related uptime, strengthen staff discipline, and improve coordination among functions. Overall, the results show that respondents view environmental compliance not merely as a regulatory obligation but as a management approach that contributes to operational control and steady farm performance [17].

Table 3
Perceived operational efficiency outcomes

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
PERCEIVED_OUTCOME	28	2.20	5.00	4.6964	.58909
Valid N (listwise)	28				

C. Perceived Effects of Compliance on Operational Efficiency

Table 4
Pearson correlation between environmental legal compliance domains and perceived operational efficiency outcomes

Correlations

		AIR_DOMAIN	WATER_DOMAIN	SOLIDWASTE_DOMAIN	HAZCHEM_DOMAIN	PERM_DOMAIN	TRAIN_DOMAIN	OVERALL_COMPLIANCE	PERCEIVED_OUTCOME
AIR_DOMAIN	Pearson Correlation	1	.715**	.744**	.759**	.723**	.811**	.851**	.786**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000
	N	28	28	28	28	28	28	28	28
WATER_DOMAIN	Pearson Correlation	.715**	1	.858**	.874**	.847**	.857**	.918**	.891**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000
	N	28	28	28	28	28	28	28	28
SOLIDWASTE_DOMAIN	Pearson Correlation	.744**	.858**	1	.944**	.886**	.942**	.991**	.866**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000
	N	28	28	28	28	28	28	28	28
HAZCHEM_DOMAIN	Pearson Correlation	.759**	.874**	.944**	1	.912**	.891**	.963**	.852**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000
	N	28	28	28	28	28	28	28	28
PERM_DOMAIN	Pearson Correlation	.723**	.847**	.886**	.912**	1	.865**	.940**	.913**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000
	N	28	28	28	28	28	28	28	28
TRAIN_DOMAIN	Pearson Correlation	.811**	.857**	.942**	.891**	.865**	1	.955**	.914**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000
	N	28	28	28	28	28	28	28	28
OVERALL_COMPLIANCE	Pearson Correlation	.851**	.918**	.991**	.963**	.940**	.955**	1	.933**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000
	N	28	28	28	28	28	28	28	28
PERCEIVED_OUTCOME	Pearson Correlation	.786**	.891**	.866**	.852**	.913**	.914**	.933**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	
	N	28	28	28	28	28	28	28	28

**. Correlation is significant at the 0.01 level (2-tailed).

To examine the association between environmental legal compliance and perceived operational efficiency outcomes (composite survey score), Pearson correlation was computed between the compliance domain scores and the composite perceived operational efficiency outcomes score. The results revealed a very strong and statistically significant positive relationship between overall compliance and perceived operational efficiency outcomes ($r = 0.933$, $p < 0.001$), indicating that respondents who reported higher levels of compliance also tended to report stronger operational benefits. Similarly, strong positive correlations were observed across all compliance domains, particularly Training/Responsibilities/ Culture ($r = 0.914$, $p < 0.001$) and Permits/Documentation/ Audits ($r = 0.913$, $p < 0.001$), suggesting that a clearer compliance culture and stronger documentation systems are closely associated with better perceived operational stability and efficiency [18]. This interpretation is consistent with evidence from broiler hatchery operations showing that management and leadership practices can measurably influence operational performance. Transformational leadership has been reported to be positively and significantly associated with operational performance in broiler hatchery businesses ($r = 0.433$, $p = 0.007$), suggesting that motivation, employee development, and a shared vision can strengthen day-to-day efficiency and process quality [19]. In the same way, broiler breeder farms that embed compliance responsibilities through training and a strong compliance culture may experience more stable, coordinated operations and fewer disruptions. Overall, the findings indicate that stronger compliance implementation is aligned with improved perceived operational performance, as reflected in respondents' reports of fewer disruptions, improved sanitation/housekeeping, better coordination, and reduced downtime.

Table 5
Interpretation of score

Mean Range	Interpretation
4.21-5.00	Fully Compliant
3.41-4.20	Compliant
2.61-3.40	Moderately Compliant
1.81-2.60	Partially Compliant
1.00-1.80	Not Compliant

4. Results and Discussion

A. Summary of Findings

The purpose of this study was to assess the impact of environmental legal compliance on the perceived operational efficiency outcomes of the Broiler Breeder Farm. The results showed that the farm demonstrated a high level of environmental legal compliance. Compliance was found to be not only a regulatory obligation but also a management approach that contributes to improved operational control and stable farm performance. Furthermore, a very strong and statistically significant positive relationship was observed between overall compliance and perceived efficiency outcomes, indicating that higher levels of compliance tend to result in stronger operational benefits.

5. Conclusion

In conclusion, the findings indicate that environmental legal compliance is strongly and positively associated with perceived operational efficiency outcomes in broiler breeder farm operations. Respondents reporting higher compliance implementation also reported stronger operational benefits such as improved sanitation/housekeeping discipline, better coordination, reduced disruptions, and reduced downtime. Overall, integrating environmental compliance into routine farm management is associated with more controlled and stable operations that support efficient day-to-day farm performance

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