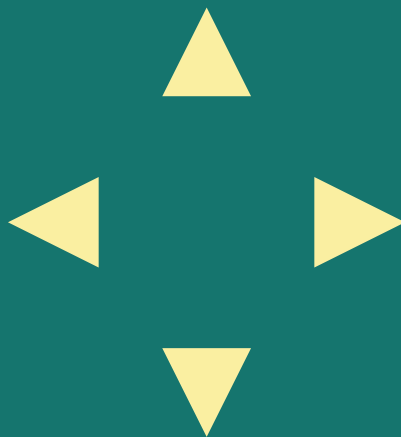


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RULES-IN-FORM AND RULES-IN-USE AS A DUAL-PROCESS ACCOUNT OF INSTITUTIONAL ACTION IN BULGARIAN REGULATORY GOVERNANCE

ABSTRACT

This study examines why formally valid regulatory regimes often perform weakly in practice. It argues that the deeper problem lies in the gap between contemporary better regulation methodologies and the institutional environment in which public administration and regulated businesses actually operate. This analysis applies the distinction between rules-in-form and rules-in-use to Bulgarian regulatory governance, drawing on bounded rationality, dual-process reasoning, transaction costs, information asymmetry, and regulatory capture. Empirically, it uses three surveys conducted in 2026 among regulatory experts, public administration officials, and business respondents. The findings show systematic underestimation of administrative burden, limited use of alternatives to regulation, weak cost-benefit analysis, unintended incentives for circumvention, and an underdeveloped incentive environment for compliance. The study

concludes that regulatory quality does not result from more detailed rules alone. It requires institutional capacity to translate written provisions into working rules-in-use through clearer rules, lower compliance costs, safeguards against capture, and institutional learning.

KEYWORDS: regulatory quality; rules-in-use; institutional formalism; regulatory capture; compliance costs

JEL: K23, D02, D72, H11, L51

INTRODUCTION

Public debate often conveys the impression that governance problems can be solved through new legislation. A problem is identified, a rule is created, a procedure is added, and behavior is expected to adjust to the new legal framework. Within this logic, the adoption of a legal act begins to appear as the substantive part of the policy decision, while questions of implementation, compliance costs, trust, and actual behavioral responses are pushed into the background. This apparently rational sequence reveals a recurring weakness of contemporary regulatory regimes. Instead of analyzing how rules operate in practice, governments often seek a rapid regulatory response.

This tendency can be characterized as a rule-making reflex. It appears when a complex social or economic problem is almost automatically translated into a new rule, a new regime, or a new administrative requirement. Such an approach assumes that both those subject to regulation and public institutions possess sufficient information, analytical capacity, and organizational

discipline to convert regulatory intent into predictable practical outcomes. However, while institutions structure human interaction through rules that reduce uncertainty, they do not automatically guarantee effectiveness (North, 1990, p. 6). The central question, therefore, is not only whether a rule exists as a formal text, but whether it becomes a rule-in-use, that is, a shared practical understanding around which behavior is actually organized (Ostrom, 2005, pp. 18-20).

Regulatory processes are often designed as if public institutions and regulated economic actors operated continuously in the analytical mode of System 2¹. In practice, however, institutional environments often favor decisions characteristic of System 1. They are fast, defensible, routine, and oriented toward risk reduction. Applied to regulation, this means that better regulation methodologies may require analytical behavior, while their practical implementation is often shaped by rapid institutional reactions, procedural defensiveness, and formal execution.

Real regulatory environments rarely confirm the assumption of a smooth transition from a written rule to the intended behavior. Businesses do not operate under conditions of full information, and regulatory compliance is not costless. Their responses are shaped not only by the content of rules, but also by incomplete knowledge, uncertainty about subsequent enforcement, the likelihood of actual inspection or control, and compliance costs. This is consistent with Herbert Simon's argument that rationality is inherently constrained by fragmentary knowledge of consequences and by the limited range of alternatives that reaches the decision-maker's awareness (Simon, 1997, pp. 92-94). North similarly links weak and costly enforcement to historical stagnation and contemporary underdevelopment (North, 1990, p. 54). Rules are therefore neither perceived nor applied automatically. They are interpreted through the costs, incentives, expectations, and institutional signals created by the environment in which they operate. The gap between a rule as written and a rule as practiced is therefore not an exception but a structural feature of regulatory systems.

The same logic applies to public institutions. Public administration also does not operate under conditions of full information, sufficient time, and unlimited analytical capacity. It works under pressure from deadlines, political demands, limited expertise, organizational inertia, and public accountability. Under these conditions, formal procedure can displace substantive judgement about the causes, alternatives, costs, and probable behavioral effects of regulation. The rule-making process can then produce rules that are legally sound but function poorly within the institutional environment in which they are expected to operate.

The core issue addressed in this study is not the legal soundness of a given rule, but whether it has been designed with an understanding of actual behavior, trust in institutions, compliance costs, and the limits of administrative capacity. Rules do not operate in a vacuum. They operate within a specific historical, institutional, and social environment in which their formal existence alone does not guarantee practical effectiveness. When this connection is absent, regulation may begin to function more as a system for certifying that procedures have been completed than as a mechanism for orienting economic behavior. Even a well-conceived rule can then remain a weak rule-in-use.

From this perspective, the study examines the gap between rules-in-form and rules-in-use in the Bulgarian regulatory environment. The theoretical framework links institutional analysis, behavioral economics, and the political economy of regulation in order to explain why formally

¹ The concepts "System 1" and "System 2" are used here as an analogy to Kahneman's dual-process model of cognition. System 1 denotes a fast, automatic, and low-effort mode of operation, while System 2 denotes a slower, deliberate, and analytically demanding mode. The analogy does not imply that institutions think in a psychological sense. Rather, it describes two distinguishable modes of institutional behavior: one reactive and procedurally oriented, the other analytical and focused on the real-world effects of rules.

existing rules often fail to produce the expected economic and social effects. The empirical analysis draws on data from three surveys conducted in 2026 among regulatory experts, public administration officials, and business respondents. These data make it possible to assess whether the weaknesses of regulation reflect isolated administrative deficits or form part of a deeper institutional pattern.

The structure of the study follows this analytical logic. It first presents the theoretical framework, then examines empirical evidence on administrative burden, incentives to circumvent rules, administrative capacity, and the broader incentive environment shaping regulatory behavior. The discussion interprets the results in the specific Bulgarian context of vertical distrust, institutional formalism, and the asymmetric influence of well-organized small groups. The conclusion explains why regulatory quality depends not on the quantity of written rules but on the capacity of the institutional environment to convert rules into working rules-in-use.

1. LITERATURE REVIEW

1.1. Rules-in-form and rules-in-use

A central step in this study is to shift the focus from the formal content of legal acts to the way rules guide economic behavior in practice. This shift is grounded in legal theory and the sociology of law. Kolev distinguishes between the static and dynamic functions of law. The static function concerns the consolidation of existing social relations into legal institutions, while the dynamic function concerns the means through which social relations are shaped and regulated (Kolev, 2015, p. 110). A similar logic is found in Naumova's discussion, through Roscoe Pound, of the distinction between law in books and law in action. This distinction directs attention beyond the statutory text itself and toward its operation in the social environment (Naumova, 2012, p. 19). Dimov develops a related point, arguing that a legal rule operates only hypothetically and begins to operate in reality only when the conduct of the person to whom it is addressed becomes a fact (Dimov, 2017, p. 19).

Ostrom defines rules as prescriptions that specify which actions or outcomes are required, prohibited, or permitted (Ostrom, Gardner, & Walker, 1994, p. 38). What is decisive in this definition is not only the prescription itself, but also the possibility of enforcement and the shared understanding among participants of what the rule actually requires. The question of regulatory quality therefore turns not only on whether a rule is formally established. What matters more is whether it becomes a rule around which behavior is actually organized (Ostrom, 2005, pp. 18-20).

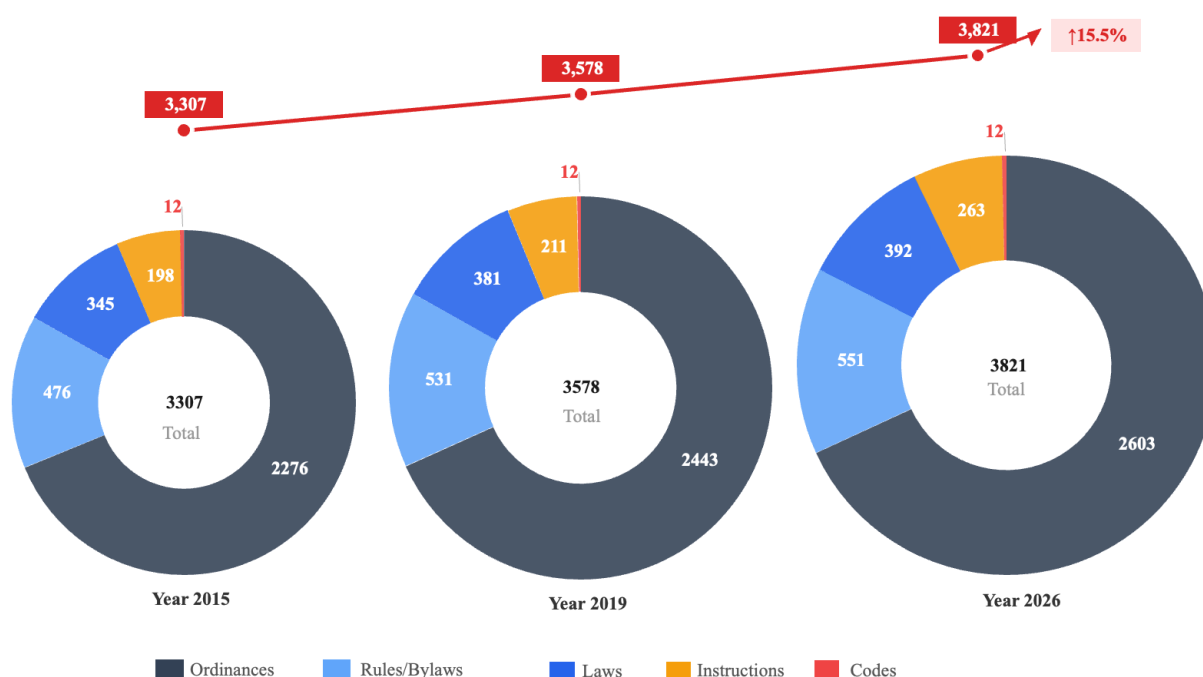
This point leads directly to Ostrom's distinction between working rules, rules-in-form, and rules-in-use. Working rules are the set of rules to which participants would refer if asked to explain and justify their actions to other participants (Ostrom, 2005, p. 19). Rules-in-form are formally recorded prescriptions. Rules-in-use denote the rules to which participants actually orient their behavior. In an open society governed by the rule of law, rules-in-form and rules-in-use tend to coincide. In systems not governed by the rule of law, however, central laws and considerable enforcement efforts may exist, while individuals generally attempt to evade rather than obey the law (Ostrom, 2005, p. 20). The problem therefore lies not simply in the number or formal completeness of norms, but in the gap between the written rule and the rule that actually organizes behavior. This gap becomes more pronounced when there is no shared understanding of the rule's content. As Vincent Ostrom argues, if no shared meaning exists when a rule is formulated, confusion will arise about which actions are required, permitted, or forbidden (V. Ostrom, 1980, p. 342, as cited in Ostrom, 2005, p. 20). Regulatory quality therefore depends not on the mechanical introduction of a central model, but on the

correspondence between the rule, its environment, and the structure of interaction (Ostrom, 1990, p. 14).

In the Bulgarian academic literature on public policy, this distinction has been articulated by Petrov and Tanev (2018), who describe what they term the 'iron rule' of the policy process: “every action that is carried out (by people) is not exactly what was planned (also by people), and what was planned is not exactly what was desired (by the same people)” (Petrov & Tanev, 2018, p. 142, translation by the author). Their formulation describes, in the language of policy analysis, the same gap between rule-in-form and rule-in-use that this study examines empirically in the Bulgarian regulatory context.

For Bulgaria, this distinction carries particular weight. The country has a substantial and growing body of legal acts, as illustrated in Figure 1. The central question, however, is not whether sufficient rules exist, but whether they are converted into practical expectations. What matters is how a rule is understood, monitored, sanctioned, and interpreted within a specific institutional environment. The distinction between rules-in-form and rules-in-use is therefore the starting point for the analysis of regulatory quality.

Figure 1. Growth of the national regulatory corpus: 2015, 2019, and 2026.



Source: Author's calculation based on the Ciela legal information system data, January 2026.

1.2. Bounded rationality and institutional System 1

The gap between rules-in-form and rules-in-use is directly linked to how economic actors and public administration make decisions in practice. The classical model of homo economicus assumes an actor endowed with full information, capable of foreseeing the consequences of every action and consistently maximizing expected utility. This model is analytically convenient, but it offers a poor description of behavior in an actual institutional environment. In practice, decisions are made under incomplete knowledge, limited attention, uncertainty, and information-processing costs.

Herbert Simon was among the first to subject this assumption to sustained scrutiny. For Simon, rationality in the strict sense would require "a complete knowledge and anticipation of the consequences that will follow on each choice", whereas in reality "knowledge of consequences is always fragmentary" (Simon, 1997, p. 93). In actual behavior, only a small fraction of the possible alternatives ever comes to the decision-maker's awareness, and even those that do are evaluated under incomplete information about their consequences² (Simon, 1997, p. 94). Simon's broader point is that actual behavior departs from the model of objective rationality because it is impossible for individuals to know all alternatives or all their consequences (Simon, 1997, p. 77). It follows that neither regulated economic actors nor public administration can be assumed to operate under conditions of full rationality. They act within constraints of information, time, attention, capacity, and risk.

This logic has direct implications for regulation. If those subject to rules act under bounded rationality, their behavior cannot be understood as the result of a complete calculation of all legal, economic, and organizational consequences. They perceive the regulatory environment through a limited set of signals, including visible administrative burden, procedural complexity, the likelihood of inspection or control, compliance costs, and accumulated experience from previous interactions with institutions. This does not mean that their behavior is irrational. It means that it is adaptive under constrained conditions.

The same logic applies to public administration. Regulatory decision-making also takes place under limited attention, incomplete evidence, time pressure, political demands, and organizational risk. Under such conditions, public administration does not necessarily search for the optimal regulatory solution. Whereas the economic model assumes a maximizer who "selects the best from among all those available", Simon's administrator "satisfices" and looks for a course of action that is "satisfactory or 'good enough'" (Simon, 1997, p. 119). In regulatory governance, this can produce an institutional tendency to rely on familiar instruments, established procedures, and formally defensible solutions. This tendency provides the behavioral foundation of institutional System 1, understood here as a mode of public action that is fast, routine, procedurally defensible, and oriented toward reducing organizational risk.

Kahneman and Tversky's prospect theory adds an important dimension to this framework. People evaluate outcomes not in absolute terms but relative to a reference point that often coincides with the status quo. In their formulation, "losses loom larger than gains" and "the value function is steeper for losses than for gains" (Kahneman & Tversky, 1979, p. 279). Regulation that requires changes to established practices and creates additional compliance costs may therefore be perceived as a loss, even when its long-term benefits appear clear from the perspective of the rule-making institution.

Kahneman's dual-process model makes it possible to specify the mechanism behind these behavioral responses more precisely. System 1 "operates automatically and quickly, with little or no effort and no sense of voluntary control", while System 2 is associated with effortful mental activities, including complex computations (Kahneman, 2012, p. 26). Errors can be limited "only by the enhanced monitoring and effortful activity of System 2" (Kahneman, 2012, p. 36). This distinction allows bounded rationality to be understood not only as a deficit of information but also as a tension between automatic and analytical modes of judgement.

In this study, System 1 and System 2 are used not only as psychological categories of individual cognition but also as an analytical metaphor for two modes of institutional action. Institutional

² Simon's example concerning old maids, cats, mice, bees, and the clover harvest illustrates the practical impossibility of tracing all remote and indirect consequences of a decision. It is used here only to clarify the limits of exhaustive rational calculation and the relevance of bounded rationality for administrative decision-making (Simon, 1997, pp. 94-95).

System 1 denotes a fast, reactive, routine, and procedurally defensible regulatory response. Institutional System 2 denotes a slower mode of action based on the comparison of alternatives, realistic cost analysis, assessment of behavioral effects, and ex post learning. The metaphor is useful because it shows that both regulated economic actors and public administration may operate under cognitive and organizational constraints.

Institutions often design rules as if those subject to them acted continuously in a System 2 mode. In reality, regulated economic actors frequently respond in a mode closer to System 1. They orient themselves by immediate costs, visible requirements, the likelihood of sanctions, and the practical complexity of procedures. When rules are excessively complex, unstable, or difficult to understand, the response of regulated economic actors is not always based on analytical assessment. More often, it takes the form of minimal compliance, selective adaptation, or the search for procedural loopholes.

The same logic applies to public administration. Under conditions of limited time, incomplete data, political pressure, and organizational inertia, public administration may also fall back on fast, reactive, and procedurally defensible decisions. The formal framework of better regulation assumes a mode of work close to System 2, yet in practice it often remains shaped by institutional System 1. Methodologies and procedures may therefore exist formally without producing the expected analytical quality.

Institutional System 1 appears when the difficult questions of causes, alternatives, costs, and behavior are replaced by the simpler question of how to produce a quick and visible regulatory response. This is the institutional rule-making reflex. Complex problems are simplified, indirect consequences are underestimated, and rules are created as if their formal validity were sufficient to secure actual compliance. Institutional System 2 requires the opposite. It involves the comparison of alternatives, realistic analysis of administrative burden and compliance costs, attention to actual behavior, and mechanisms for institutional learning. The formal existence of impact assessment methodologies is therefore insufficient when those methodologies require System 2 but are implemented in a System 1 mode.

1.3. Uncertainty, transaction costs, and the risk of regulatory capture

Regulation has a dual institutional character. In some cases, it reduces uncertainty and makes market exchange possible, especially when information is unevenly distributed or transaction costs are high. In other cases, regulatory rules can be complicated, captured, or used strategically by well-organized small groups. Regulation does not arise simply because the state wishes to create rules. It also emerges when market exchange itself encounters persistent constraints, including information asymmetry, abuses of market power, cartel behavior, and consumers' inability to verify the quality of the goods or services offered.

A classic illustration of this problem is George Akerlof's analysis of the used car market. In his model, the seller knows the actual quality of the car, while the buyer cannot reliably distinguish a high-quality car from a defective one. Akerlof refers to the defective car as "the 'lemon' ... the American slang term for a car that turns out to be defective after purchase" (Akerlof, 1970, p. 489). This asymmetry changes the logic of exchange. Since buyers cannot verify quality in advance, they offer a price that reflects the average expected quality in the market. That price is too low for owners of genuinely high-quality cars, who therefore withdraw from exchange.

Akerlof's central result is that "there tends to be a reduction in the average quality of goods and also in the size of the market" (Akerlof, 1970, p. 488). At the limit, the market may collapse entirely, so that "no goods will be traded at any price level" (Akerlof, 1970, p. 490). The

example shows why information asymmetry is not merely a communication problem. It changes the structure of incentives and can make mutually beneficial exchange impossible.

The market mechanism does not always contain sufficient internal corrective capacity to overcome this dynamic. Akerlof therefore argues that “numerous institutions arise to counteract the effects of quality uncertainty” (Akerlof, 1970, p. 499). Guarantees, brand names, and mandatory disclosure requirements act as quality signals. They help buyers form more reliable expectations and provide a basis for redress when the expected quality is not delivered (Akerlof, 1970, pp. 499-500). At a broader institutional level, certification, standards of origin, and transparency requirements in regulation perform a similar function. They do not eliminate the information imbalance entirely, but they can reduce it to a level at which exchange remains possible. In this sense, regulation is not simply an external constraint on the market. It can also be a condition for the market’s functioning.

It does not follow, however, that every form of state intervention successfully addresses information asymmetry. Bulgarian practice contains regimes in which the state creates a formal quality mark without eliminating the underlying uncertainty. The star categorization of food and entertainment establishments offers a clear example. Instead of focusing on substantive issues of food safety, sanitary requirements, reliability of information, and traceability of responsibility, the state categorizes economic activity into more than thirty types of establishments, including *mekicharnitsa*, a small establishment specializing in *mekitsi* making, *bistro*, and other similar venues. This may create an administrative symbol of quality that can mislead consumers without reducing the underlying information imbalance. What is at stake here is not a substantive quality regime, but a regime of designation in which the administrative label substitutes for real quality assurance. It does not eliminate information asymmetry, but conceals it behind an administrative symbol inherited from the communist period.

If regulation may be necessary, its costs must also be considered. Coase shows that the market mechanism does not function without costs. To carry out a transaction, a suitable partner must be found, information must be exchanged, negotiations must be conducted, the contract must be formalized, and execution must be monitored. These are transaction costs, and they are not zero. Markets can therefore be understood as institutions that facilitate exchange by reducing the cost of carrying out transactions (Coase, 1988, p. 7). Williamson develops this framework further by emphasizing that comparisons should be made not with ideal constructs but with actually feasible alternatives, each of which is imperfect (Williamson, 1991, p. 270). Clear and predictable rules, including property rules, can therefore reduce transaction costs. Complex, opaque, and unstable rules, by contrast, increase these costs and distribute them unevenly, particularly for smaller economic actors.

At this point, the political economy dimension of regulation becomes central. Olson shows that the capacity for organized action is unevenly distributed. Small groups receiving concentrated benefits have a much stronger incentive to coordinate than large groups whose interests are dispersed across many people. His argument is that rational, self-interested individuals will not normally act to achieve a common group interest when the group is large, unless coercion or a separate individual incentive changes the calculation (Olson, 1971, p. 2). This explains why large groups with dispersed interests face greater collective action problems than small groups with concentrated benefits. Olson’s broader conclusion is that larger groups are less capable of advancing their common interests (Olson, 1971, p. 36).

This logic explains the durability of regimes that grant special economic advantages to limited and well-organized groups. Benefits are concentrated and easily defended, while costs are dispersed across many citizens or economic actors. For each affected individual, the personal cost may appear low, but the aggregate social cost remains substantial. Tullock adds the next important element. Once an institutional possibility for securing a stable rent exists, resources

begin to be invested not in creating new wealth but in defending an already established advantage. Such expenditures represent social waste because they are directed toward obtaining or preventing transfers of wealth rather than increasing wealth itself (Tullock, 1967, p. 228). The underlying problem is therefore not only the transfer itself, but the resources spent in attempts to obtain or prevent such transfers (Tullock, 1967, p. 231).

Stigler gives this logic its classic political economy formulation by arguing that “as a rule, regulation is acquired by the industry and is designed and operated primarily for its benefit” (Stigler, 1971, p. 3). Peltzman builds on this framework but qualifies it. In his model, the regulator does not simply serve a captured industry. Rather, the regulator acts as a political broker who must assemble a winning coalition under competing pressures. Two implications follow. First, even the favored group cannot extract everything that the political process could in principle grant it. As Peltzman argues, “this winning group will not obtain even a gross gain through political action as great as is within the power of the political process to grant it” (Peltzman, 1976, p. 221). Second, “political entrepreneurship will produce a coalition which admits members of the losing group into the charmed circle” (Peltzman, 1976, p. 222). Capture in Peltzman’s framework is therefore partial and negotiated. A successfully sustained rent is rarely presented as a rent. It is framed in the language of necessity, and political compromise transforms a special economic advantage into the apparent defense of the public interest.

Bulgarian practice offers several cases in which this logic is sufficiently clear. These cases can be grouped into three categories according to the dominant mechanism of institutional deformation.

The first category covers regimes of regulatory capture in which mandatory intermediation is legally entrenched in favor of a limited and well-organized professional group. The most visible example is the regime of notarial involvement in the transfer of ownership of motor vehicles. In Estonia, the Estonian Transport Administration provides an e-service environment in which vehicle transactions include ownership transfer for the sale and purchase of a vehicle (Estonian Transport Administration, n.d.). In Bulgaria, the transfer of ownership of motor vehicles continues to require notarial involvement, even though a technological alternative has already been demonstrated. This contrast is difficult to explain by technical lag alone. It reveals an institutional arrangement in which the form of legal certainty also functions as a protected economic advantage for a small group. A similar logic can be observed in restrictions in pharmaceutical legislation, as well as in regimes for taxi services, where market entry restrictions are legitimized through the language of public safety but may also protect existing positions from competition. The mechanism corresponds to the logic described by Olson, Tullock, and Stigler, since it combines a protected economic advantage for a small group with a dispersed social cost.

The second category covers cases of misdirected regulation, in which the rule targets the visible symbol of the problem rather than its real causes. The 2012 to 2013 ban on cigarette tubes is a clear example. Instead of directing control at specific violations of the tax and excise regime, the state banned a legal product as a category. The publicly visible image of the problem displaced analysis of the mechanism that produced it. The result was a new burden on the legal sector without convincing evidence that illegal trade had been eliminated. The star categorization of food establishments follows a similar logic. It creates an administrative symbol of quality without necessarily removing the actual information asymmetry between consumers and service providers. In both cases, regulation operates as institutional System 1. It responds to the visible demand for action but does not rest on a sufficiently realistic analysis of causes, incentives, and probable behavioral effects.

The third category covers cases in which regulation itself creates conditions for a shift toward informality. This occurs when compliance costs exceed an acceptable threshold for a significant

portion of those subject to regulation. The mechanism appears particularly clearly in labor-intensive activities with low value added, seasonal activity, narrow margins, and limited capacity to absorb fixed administrative and social security costs. In parts of construction, agriculture, and household services, formal compliance with requirements can raise the cost of labor to a level at which informality begins to look like a predictable adaptation to a specific structure of costs and incentives, rather than merely an individual violation. A similar mechanism can be observed where requirements impose a disproportionate administrative burden on small producers or smaller economic actors despite low actual fiscal risk. In such cases, regulation does not strengthen the formal environment but weakens the incentives for participation in it.

The three categories illustrate different manifestations of the same problem. In the first, the rule protects a concentrated economic advantage. In the second, it responds to a visible symbol rather than to the actual cause. In the third, it raises compliance costs to a level at which compliance itself becomes less likely. What unites them is that regulation ceases to reduce uncertainty and to orient economic behavior in a predictable manner. Instead, it creates new costs, incentives for circumvention, and opportunities for strategic adaptation.

A central conclusion emerges from this analysis. Information asymmetry and transaction costs explain why regulation may be necessary. The same conditions, however, also show why it can be distorted. When information, influence, and the capacity for organized action are unevenly distributed, rules can be captured, complicated, and used strategically. Regulation therefore has a dual character. It can reduce uncertainty and facilitate market exchange, but it can also create new compliance costs, entry barriers, and conditions for regulatory capture. In the first case, the rule supports exchange. In the second, it protects established positions.

1.4. Horizontal trust, vertical distrust, and rules-in-use in Bulgaria

Sustained compliance with rules cannot be reduced to sanctions and control. In Ostrom's institutional analysis, trust and reciprocity are among the conditions under which formal rules can become working rules-in-use. Particularly important for the Bulgarian context is Ostrom's discussion of Koford's findings on trust and reciprocity (Koford, 2003, as cited in Ostrom, 2005, p. 74).

In the study presented by Ostrom, Koford uses two experimental approaches that allow horizontal and vertical trust to be compared. The first is the horizontal trust game, in which two participants of equal status exchange resources under full anonymity. In this version, 44 of the 47 participants acting as investors sent money. This result is comparable to American samples, where 30 of 32 investors did the same (Ostrom, 2005, p. 74). These data indicate that the capacity for horizontal trust among Bulgarian participants is high and does not differ substantially from results observed in Western market societies.

The second approach is the vertical trust game, in which participants occupy asymmetric positions of employer and worker. In Western samples, higher wages typically generate higher effort as a form of reciprocity (Fehr, Kirchsteiger, & Riedl, 1993, p. 443, as cited in Ostrom, 2005, p. 73). Among Bulgarian students, however, the result differs. A substantial number of effort choices are concentrated at the minimum level, and the mean effort remains low (Koford, 2003, p. 17, as cited in Ostrom, 2005, p. 74). Moreover, the wage level is not associated with the level of effort. This means that the reciprocity observed in the horizontal context weakens substantially under hierarchical relations.

In the analysis presented by Ostrom, this asymmetry is explained through the historical legacy of Bulgaria and, more broadly, of the Balkans. According to this interpretation, long Ottoman

rule, followed by decades of Soviet-type communist rule, contributed to durable distrust of the state and hierarchical authority. In such an environment, non-compliance with rules is not perceived solely as a violation. It can also be associated with disagreement, caution, strategic adaptation, or resistance to authority that is not seen as fair and predictable. People learn to trust their equals more than those in positions of power. When participants are placed in the roles of employers and workers, horizontal solidarity weakens and behavioral patterns differ sharply from those observed in the horizontal trust game (Ostrom, 2005, pp. 74-75).

These observations have direct relevance for the analysis of regulation in Bulgaria. They show that the problem is not a general inability to trust, but the weakness of vertical trust in institutions and hierarchical authority. Low trust between citizens and the state, and between businesses and regulators, should not be explained solely by an individual propensity for opportunism. It can also be understood as a historically formed response to an institutional environment in which authority is often perceived as distant, unpredictable, or unjust. Under such conditions, stricter control does not always lead to higher compliance. It may instead produce formal execution, selective adaptation, and institutional navigation. Selective adaptation refers to behavior in which economic actors do not reject the rules entirely but choose different degrees of compliance with specific requirements. Institutional navigation refers to behavior in which economic actors orient themselves not only by the content of the legal rule, but also by practical experience of how institutions interpret, apply, delay, control, or disregard that rule. When rules are perceived as legitimate, fair, and predictable, economic actors have a stronger incentive to comply with them even under limited control. When rules are not perceived in this way, coercion can rarely substitute for absent trust.

1.5. Institutional inertia, path dependence, and learning

Douglass North defines institutions as “the rules of the game in a society or, more formally, ... the humanly devised constraints that shape human interaction” (North, 1990, p. 3). He emphasizes that their primary role is to establish “a stable (but not necessarily efficient) structure to human interaction” (North, 1990, p. 6). The qualification “but not necessarily efficient” is decisive for the analysis. It explains why regulatory regimes built around the interests of narrow groups, or shaped by authoritarian institutional legacies, can remain stable and be routinely reproduced even after formal political change.

The mechanism behind this durability is path dependence. Organizations that emerge within a given institutional system develop interests and skills tied to its maintenance. This generates increasing returns and practical lock-in to the established trajectory (North, 1990, pp. 7, 92-95). If access to administrative decisions depends on personal contacts and informal intermediaries, economic actors develop skills for institutional navigation rather than productive innovation. Change is difficult because vested interests form around an informal and unproductive status quo vulnerable to corruption and oriented toward its preservation. North emphasizes that “the inability of societies to develop effective, low-cost enforcement of contracts is the most important source of both historical stagnation and contemporary underdevelopment” (North, 1990, p. 54). Low-cost and predictable enforcement of rules is therefore a condition not only for legal certainty but also for an environment in which innovation can develop.

Acemoglu and Robinson’s distinction between inclusive and extractive institutions extends this argument to the distribution of power. Inclusive economic institutions “allow and encourage participation by the great mass of people in economic activities that make best use of their talents and skills” (Acemoglu & Robinson, 2012, p. 74), while extractive institutions are “designed to extract incomes and wealth from one subset of society to benefit a different subset” (Acemoglu & Robinson, 2012, p. 76). Political institutions, in turn, “determine who has power in society and to what ends that power can be used” (Acemoglu & Robinson, 2012, p. 80).

This distinction matters because it allows regulation to be understood not only as an administrative technique but also as an expression of institutional power. Bulgaria is a member state of the European Union, with transposed legislation, market institutions, and formal guarantees of regulatory independence. The question is therefore not whether formal institutions exist, but whether they function as inclusive institutions in specific regulatory regimes. When regulatory requirements continue to redistribute advantages in favor of well-positioned small groups despite formal reforms and largely unrealized programs for reducing administrative burden, an extractive logic may be preserved within an apparently inclusive institutional environment. The capture logic described by Stigler, the collective action mechanism described by Olson, the path dependence analyzed by North, and the concentration of political and legislative power in particular sectors can therefore reinforce one another, even within an environment of formal European integration. Reform under such conditions requires not only legal rules that are better drafted but also broader institutional participation and mechanisms that make capture more difficult, more costly, and more visible (Acemoglu & Robinson, 2012, pp. 80-81).

Mokyr adds knowledge and innovation as central conditions for productive economic development. In his view, technological progress provides society with a “free lunch” because it allows output to grow without a proportional increase in the resources expended (Mokyr, 1990, p. 3). The condition for realizing this potential, however, is not merely technological. “Technology is knowledge, even if not all knowledge is technological; living standards today are higher because we know more” (Mokyr, 2002, p. 2). What matters is whether the institutional environment allows knowledge to be accumulated, disseminated, and converted into productive techniques.

This perspective is directly linked to regulatory quality. When rules raise the cost of trial and error, penalize deviation from established practices, and protect entrenched positions from new competition, they constrain precisely the kind of economic initiative on which long term economic progress depends. Mokyr emphasizes that “institutions determine the structure of incentives and penalties faced by those proposing new techniques to be put to economic use” (Mokyr, 2002, p. 18). Regulation can therefore create an environment for institutional learning and innovation, but it can also become a mechanism for protecting existing rents.

In this respect, Mokyr’s argument approaches the political economy of regulation. When rules protect those who have already secured established positions rather than those offering better solutions, the mechanism comes close to regulatory capture. Mokyr formulates this directly when he writes that institutional forces “protect entrenched vested interests that might incur losses if innovations were introduced” (Mokyr, 1990, p. 12). Regulatory quality therefore depends not only on the legal form of the rule. It also depends on whether the institutional environment directs knowledge toward innovation, learning, and productive development, or toward the protection of the status quo.

The theoretical approaches reviewed here define regulation as an institutional process rather than a self-sufficient legal text. Ostrom and North show that rules operate effectively only when they become practical expectations within a specific environment. Simon and Kahneman explain why neither economic actors nor public administration can be regarded as continuously operating in a mode of full analytical rationality. Akerlof, Coase, and Williamson show that regulation can reduce uncertainty but also generate new costs. Olson, Tullock, Stigler, and Peltzman reveal the risk that rules and the costs they entail may be captured by well-organized small groups. North, Acemoglu, Robinson, and Mokyr show that sustainable regulatory quality depends on an institutional environment that fosters learning, adaptation, and the productive use of knowledge. On this basis, the central thesis of the study is that weaknesses in regulation

arise when methodologies assume institutional System 2, while actual practice remains shaped by institutional System 1.

2. METHODOLOGY

The empirical analysis is based on three surveys, organized as separate research modules. They were conducted in early 2026 and cover a total of 190 respondents with different institutional profiles in Bulgaria. The three groups were selected to provide complementary perspectives on the same set of phenomena. The first captures how regulation is designed. The second examines how it is applied within public administration. The third shows how it is perceived by the regulated economic actors to whom it applies. The three cross sectional modules are designed to capture converging perceptions across institutional vantage points. The analysis interprets agreement between modules as empirical convergence consistent with the theoretical framework, not as evidence of a causal mechanism.

The expert module includes 23 specialists in regulation and public policy, reached through the Institute of Public Administration. The sample is mixed, comprising 56.5% civil servants and 43.5% external consultants, experts from non-governmental organizations, or representatives of academia. Most respondents have practical experience in conducting impact assessments. The predominant areas of expertise are economics and finance (43.5%), social sciences (26.1%), and law (21.7%).

The administrative module includes 143 civil servants reached through the same channel. Participants come from three types of structures, including central administration (64.3%), territorial administration (27.3%), and independent regulatory bodies (8.4%). Almost half work daily on issues related to digitalization and new technologies, including artificial intelligence, while around a third do so occasionally. This profile adds analytical relevance to their responses, because a significant share of the sample is directly engaged with regulatory and technological issues in daily administrative work.

The business module includes 24 business respondents, identified and contacted with the assistance of the Ministry of Labor and Social Policy among enterprises actively engaged in corporate social responsibility. The small size of this sample should be taken into account when interpreting the results. The data are indicative rather than statistically representative of business as a whole. Their analytical value derives from the profile of the group rather than from its size. Enterprises with active corporate social responsibility practice should, as a rule, be more inclined toward voluntary compliance, public legitimacy, and engagement with institutions. The attitudes recorded among them therefore have conservative diagnostic value. If even within this group there is an orientation toward minimal compliance when mandatory requirements are introduced, alongside a low assessment of state support, this points to a deeper problem in the incentive environment rather than to an individual propensity for non-compliance.

The survey items were assessed on a five-point agreement scale. The reported mean scores therefore indicate the average position of respondents on this scale. The quantitative results are interpreted together with selected qualitative responses, which are used not as independent representative evidence but as illustrative material clarifying the mechanisms suggested by the survey data. The comparison between modules is cautious, since some questions are not identical across groups but are treated as substantive analogues where they address the same regulatory mechanism.

The results were analyzed along four analytical axes. The first covers administrative burden, compliance costs, and rule ambiguity. The second traces unintended incentives for circumvention or minimal compliance. The third examines administrative capacity and the

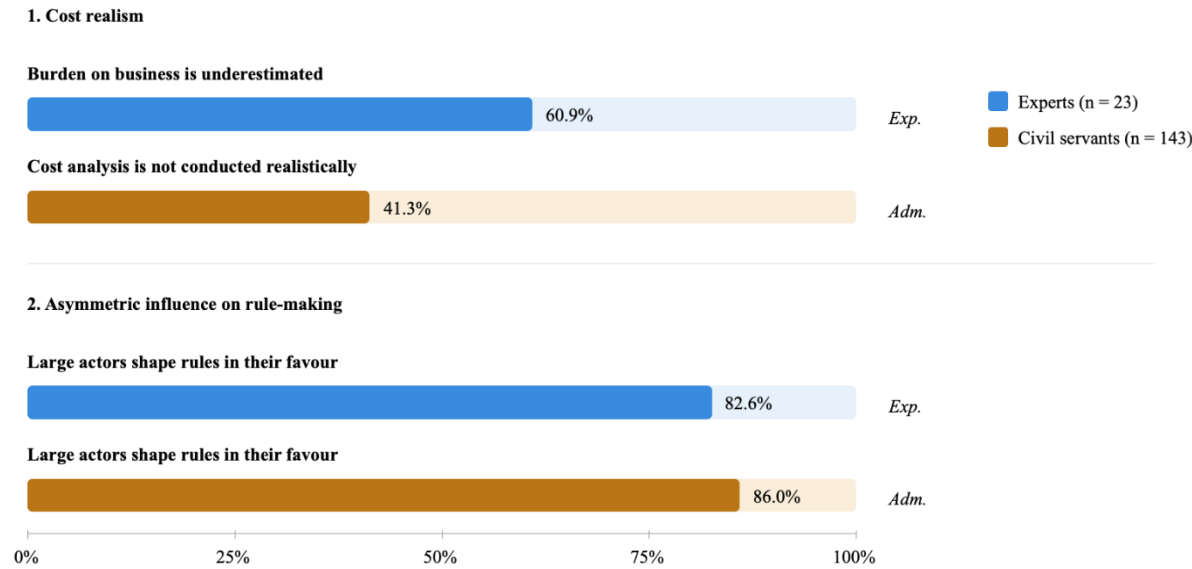
incomplete activation of institutional System 2. The fourth concerns the incentive environment and the willingness to act beyond minimum requirements.

3. RESULTS

3.1. Administrative burden, compliance costs, and rule ambiguity

The first analytical axis concerns the conditions under which formal rules become difficult to understand, apply, and follow in practice. It brings together the perceived burden of regulation, the realism of cost analysis, and the stability and clarity of regulatory rules. Figure 2 presents two pairs of comparable statements from the expert and administrative modules. The first pair concerns cost realism and is discussed in this section. The second pair concern asymmetric influence in rule-making and is developed in the following section, where the analysis turns to unintended incentives and strategic adaptation.

Figure 2. Convergence between the expert and administrative modules: cost realism and asymmetric influence on rule-making



Source: Author's calculation based on survey data, 2026. The questions are not formulated identically across the two modules but were selected as the closest substantive analogues for purposes of comparison.

The first pair concerns the realism of cost analysis. On the expert side, 60.9% agree that the current institutional culture underestimates the regulatory and administrative burden on business, with a mean score of 3.74 out of 5. On the administrative side, when civil servants are asked whether a realistic, rather than merely formal, analysis of business costs is conducted before new regulatory requirements are introduced, 41.3% disagree, with a mean score of 2.83. Only about a quarter respond affirmatively, while the remainder take a neutral position. The two groups speak from different institutional positions but point in the same direction. Actual compliance costs often remain insufficiently visible in the rule-making process, and the formal existence of methodological requirements has not yet been embedded in stable organizational practice. This finding is consistent with earlier Bulgarian empirical research on regulatory impact assessment. In a pilot analysis of 61 impact assessments, Kalfova found that an evaluation method was specified in only 2% of cases, that costs were monetized in only 3% of cases, and that benefits were not monetized in any of the assessments. A clear definition of the underlying problem was present in only 52% of the reviewed assessments (Kalfova, 2018, pp. 116-119). These results indicate that the procedural completion of impact assessment forms does not, in practice, generate the analytical content formally required by the methodology.

The qualitative responses illustrate this clearly. One response identifies “lobbying pressure and the underestimation of compliance costs and the distortion of incentives in the economy” as a leading weakness in the preparation of rules. This is important because administrative burden is not presented merely as an operational inconvenience. It appears as part of a broader weakness in the way rules are prepared, justified, and connected to their likely economic effects.

A second weakness concerns the stability and clarity of the rules themselves. A total of 56.6% of civil servants state that frequent changes in policy and legislation hinder the consistent application of rules, with a mean score of 3.57. The same share reports a need for additional clarification because businesses do not understand precisely what is required of them under new rules, with a mean score of 3.72. The coincidence of these two shares should not be interpreted mechanically, but it does point to a common problem. Rules are perceived as both unstable and insufficiently understandable.

Taken together, these results show that some difficulties with compliance cannot be explained solely by opportunism among economic actors. They are also linked to institutional complexity that increases cognitive load and hampers voluntary compliance. This picture corresponds to Simon’s logic of behavior under bounded rationality and incomplete knowledge. Businesses do not react to rules as fully informed maximizers. They respond through limited information, practical experience, expected costs, and uncertainty about how the rule will actually be applied.

3.2. Unintended incentives to circumvent rules

The second analytical axis shifts from the burden and clarity of rules to the behavioral responses that weak rule design may generate. The central issue is not only whether businesses comply or fail to comply. The deeper question is whether the rule itself creates incentives for minimal compliance, strategic adaptation, or circumvention.

A particularly important finding concerns the quality of rule design. A total of 65.2% of experts agree that legal acts introducing regulatory regimes are often drafted in ways that create unintended incentives to circumvent the law, with a mean score of 3.74. Only 17.4% disagree, while the same share takes a neutral position. This assessment locates the problem not only in the intentions of businesses, but also in the construction of the rules themselves. If a rule is designed without sufficient attention to incentives, costs, ambiguity, and likely behavioral responses, it can create the very forms of adaptation that it later attempts to control.

The administrative module shows how this weakness is recognized in practice. A total of 57.3% of civil servants agree that businesses seek ways to circumvent rules by exploiting gaps and “grey zones” in legislation, with a mean score of 3.77. Experts identify a problem in the way rules are designed, while public administration reports parallel observations about the behavior of economic actors. The two modules speak from different institutional positions, and the convergence between them is what the empirical design captures. This does not establish strict causation. It is consistent with the thesis that a poorly constructed rule can create conditions for rational adaptation beyond its original intent, but the two-module design documents converging perceptions across institutional vantage points rather than a causal mechanism. In this sense, circumvention should not be read only as individual dishonesty. It can also be understood as a predictable response to an institutional environment in which rules are complex, unstable, costly, or open to strategic interpretation.

The second pair of statements in Figure 2 captures the strongest convergence between the two modules. On the question of whether large market actors succeed in influencing rules in their favor at the expense of smaller firms, agreement is expressed by 82.6% of experts and 86.0% of civil servants. This proximity does not demonstrate the presence of regulatory capture, but it is a strong empirical indication of recognized asymmetry in the rule-making process. It is

consistent with the analyses of Stigler and Olson, according to which concentrated interests are better positioned to influence rules than the dispersed majority.

This asymmetry is analytically important because it connects the design of rules with unequal capacity for strategic adaptation. Larger and better organized firms are more capable of influencing, interpreting, or navigating complex regulatory requirements, while smaller firms are more likely to experience the same rules as cost, uncertainty, or administrative burden. Regulation therefore does not simply impose obligations uniformly. It can redistribute practical advantages through the very way in which rules are drafted, clarified, applied, and revised.

In the qualitative responses, this dynamic is described concretely. The unintentional creation of a shadow economy is linked simultaneously to an excessively rapid regulatory response, a formal approach to impact assessments, and lobbying pressure during the drafting of rules. One response captures this point especially clearly, noting that “when business has the sense that rules can be ‘arranged’, complying with them looks like naivety rather than a competitive advantage”.

This observation is important because it shifts the explanation of non-compliance away from individual dishonesty and toward the way in which rules structure behavior. Through the dual-process model, it can be interpreted as a manifestation of institutional System 1 in rule-making. Rules are designed to produce a quick, visible, and procedurally defensible response, often without sufficient attention to their behavioral effects in the environment in which they are applied.

In addition, the data show that 62.2% of civil servants believe that firms aim to meet only the minimum required standards, with a mean score of 3.84. This statement does not capture active circumvention of rules, but rather threshold adaptation to the required minimum. Together, the results outline a spectrum of behavioral responses to weakly constructed regulation: formal compliance with minimum requirements, exploitation of gaps and ambiguities, and strategic influence over the content or application of rules. The broader implication is that regulation designed without realistic attention to costs, clarity, incentives, and asymmetries of influence may produce the very behavior it seeks to prevent.

3.3. Administrative capacity and incompletely activated institutional System 2

The assessment of institutional resources completes the picture. Only 43.4% of civil servants agree that public administration has sufficient human resources and budgetary capacity to ensure effective control over rule compliance. Disagreement is expressed by 25.9%, while 30.8% take a neutral position, with a mean score of 3.26. This combination does not point to institutional collapse, but neither does it indicate robust capacity. Rather, it reveals an environment in which implementation capacity exists only in part and remains uneven and uncertain.

The result concerning the capacity to regulate technologically complex sectors is particularly important. A total of 41.3% of civil servants disagree with the statement that their administration has the necessary expertise to regulate artificial intelligence systems effectively, with a mean score of only 2.83. In the qualitative responses, this weakness is articulated clearly. One respondent notes that “the regulatory framework, whatever it may be, is always outdated in relation to high-technology sectors”, while another states that “without narrowly specialized knowledge, experience, and expertise, it is not possible”. These responses reveal not only a shortage of resources but also a deeper institutional problem. Institutional System 2 remains incompletely activated not only because of a lack of will but also because of the difficulty of securing the necessary analytical capacity under existing conditions.

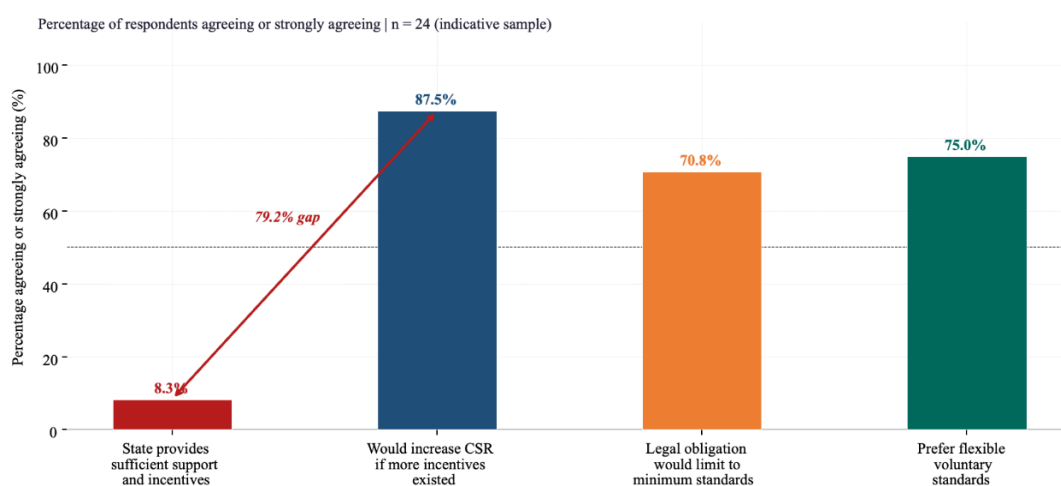
Taken together, these results do not describe only separate procedural weaknesses. They show why the analytical mode of public administration remains incompletely deployed. Methodologies for assessment, impact analysis, and control formally exist, but their practical application often remains shaped by reactivity, limited capacity, and procedural defensiveness. The underestimation of administrative burden, unrealistic or often absent cost-benefit analysis, the unintended creation of conditions for circumventing rules, and the limited capacity to regulate technologically complex sectors all point to incompletely activated institutional System 2. Methodologies remain at the level of formal requirements when the institutional environment does not provide the time, knowledge, consistency, and organizational memory necessary for their actual application.

3.4. Incentive environment and willingness to act beyond minimum requirements

Behind the issue of administrative capacity lies a broader question concerning the type of behavior that the regulatory environment itself encourages. If public administration struggles to sustain an analytical mode of action, it is even less likely to create conditions under which those subject to rules have reason to go beyond minimum compliance. The focus is therefore not limited to incentives in a narrow sense, but extends to the broader incentive environment. This includes benefits, costs, sanctions, rewards, the likelihood of inspection or control, administrative burden, and expectations about how rules will actually be applied.

The business survey adds an important corrective to the standard administrative intuition that stricter rules automatically produce higher compliance. In the expert module, 73.9% of specialists agree that sanctions are perceived as the principal instrument of rule-makers, leading to the underestimation of softer instruments, incentives, and alternatives to a sanction-based approach, with a mean score of 4.13. From the perspective of businesses, data from the survey of attitudes toward corporate social responsibility show a clear gap between willingness to undertake more voluntary initiatives and the perception of actual public support (Figure 3).

Figure 3. Incentive environment among enterprises with active corporate social responsibility practice.



Note: Sample consists of CSR-active firms identified with the support of the Ministry of Labour and Social Policy. Results are indicative due to small sample size.

Source: Author's calculation based on survey data, 2026.

Given the small size of the sample, the results are indicative, but the profile of enterprises with active corporate social responsibility (CSR) practice gives the findings particular analytical weight. A total of 87.5% of these enterprises report that they would expand their initiatives if more incentives and support from the state were available. At the same time, only 8.3% agree

that such support actually exists. This means that the problem is not a lack of willingness for voluntary engagement, but a weakness in the publicly constructed incentive environment.

It is also notable that 70.8% of the same group agree that turning corporate social responsibility into a legal obligation would limit initiatives to the minimum requirements. This result supports the central thesis of the study. When voluntary behavior is replaced by a binding legal obligation without an appropriate incentive environment, threshold adaptation to the minimum is triggered rather than higher commitment. Regulation may thus formally extend the scope of requirements while, in practice, weakening the willingness to act beyond the obligatory minimum.

4. DISCUSSION

4.1. Institutional formalism as a durable distortion of regulation

The data do not point to isolated administrative weaknesses. They reveal a recurring pattern in which rules are produced and procedures are executed, while the connection to actual behavior often remains weak. The underestimation of administrative burden, the unintended creation of conditions for circumvention, weakened analytical discipline, and limited expert capacity are not merely technical imperfections. They point to a deeper institutional logic in which the formal justification of decisions often outpaces the real capacity of institutions to create working rules-in-use.

This logic can be characterized as institutional formalism. It appears when a rule exists as a valid legal text but does not become a stable practical expectation. It also appears when methodological requirements are completed procedurally without producing real analytical discipline. The same mechanism is visible when compliance with rules is reduced to minimal fulfilment of visible and verifiable requirements. Under such conditions, the system does not collapse. It stabilizes around limited effectiveness. This corresponds to North's understanding that institutions can establish "a stable (but not necessarily efficient) structure to human interaction" (North, 1990, p. 6). A regulatory regime can continue without visible crisis, yet without producing the expected behavioral effect. In such an environment, economic actors do not adapt to the declared aim of the rule but to the way in which the rule actually operates in institutional practice.

This pattern is not unique to the present study. Earlier Bulgarian research on regulatory impact assessment documented the same institutional dynamic in detail. Kalfova concludes that the impact assessments prepared in the first year after the 2016 reform "remain rather a form of legislative motives than the application of an information-based method for analysis" (Kalfova, 2018, p. 120). She also documents that the procedural elements of the methodology are completed in the vast majority of cases (the zero alternative/do nothing option, for instance, is defined in 100% of the assessments because it is explicitly required by regulation), while substantive analytical content remains weak or absent, with an evaluation method specified in only 2% of cases and monetary valuation of benefits in none (Kalfova, 2018, pp. 116-119). Read together with the present findings, this earlier evidence suggests that institutional formalism has been a durable feature of the Bulgarian regulatory environment rather than a recent phenomenon.

4.2. The dual-process logic of institutional action

The distinction between System 1 and System 2 has twofold significance for the analysis. For regulated economic actors, the complexity of the regulatory environment encourages strategies for reducing effort, risk, and compliance costs. Such strategies include minimal compliance, the search for loopholes, the use of procedural ambiguities, and the shifting of responsibility.

Within public administration, the pressure for a fast and visible response encourages institutional System 1. It appears in procedural defensiveness, rule-making activity without sufficient behavioral analysis, and formal justification in place of substantive judgement about the consequences of rules.

This interpretation does not imply that institutions think in a psychological sense. The dual-process model is used here as an analytical metaphor for distinguishing two modes of institutional action. The empirical results show that better regulation methodologies assume institutional System 2, while their practical application often remains constrained by institutional System 1.

Ostrom, Gardner, and Walker show that institutional failure is not inevitable. It depends on the way interaction is organized, on the possibility of communication, and on the capacity to establish working rules and strategies (Ostrom, Gardner, & Walker, 1994, p. 5). Overcoming this problem does not require the mechanical multiplication of rules. It requires better organization of the processes through which rules are created, monitored, applied, and corrected. This is where the transition from institutional System 1 to institutional System 2 begins.

4.3. Vertical distrust and the persistence of rent-seeking

The conclusion concerning weaker vertical trust in relations between citizens and the state, and between businesses and regulators, gives the analysis of regulatory capture a specifically Bulgarian dimension. The problem cannot be reduced to a low general propensity to trust. What matters more is that trust weakens precisely in relations with authority, control, and institutional hierarchy. Under such conditions, regimes that present concentrated economic advantages as legal certainty, professional standards, or public necessity encounter broad public resistance only with difficulty.

This feature can be explained through Bulgaria's historically accumulated experience with authority, which is often perceived as distant, unpredictable, and accessible through informal practices. In such an environment, citizens and economic actors are more likely to develop strategies of cautious accommodation than a stable expectation of impersonal, equal, and predictable application of rules. This does not mean that such patterns are unchangeable. It does mean, however, that the reform of regulatory processes cannot rely solely on new legislation. It must take into account accumulated distrust of hierarchical authority and durable practices of orientation in an unpredictable institutional environment. The capture logic described by Stigler, reinforced by Olson's analysis of collective action, becomes particularly persistent in such an environment. Small and well-organized groups have a stronger incentive to defend a specific economic advantage, while the costs of that advantage are distributed across many citizens and economic actors. For each affected actor, the individual loss often appears too small to justify organized opposition. In aggregate, however, the social cost can be substantial. The asymmetry between concentrated benefit and dispersed burden is therefore not a chance deviation but a structurally predictable result of the uneven capacity for organized action.

It is precisely here that vertical distrust reinforces the logic of rent-seeking. When citizens and businesses do not expect institutions to act consistently, impartially, and with regard for aggregate costs, mobilization against ostensibly technical regimes remains weak. The protected economic advantage is presented as an element of order, security, or professional control, while its cost remains dispersed and barely visible. Regulation may thus cease to reduce uncertainty and instead begin to stabilize inefficiencies that are rational for a small organized group but costly for society as a whole.

The notarial regime for the transfer of ownership of motor vehicles illustrates this mechanism. Mandatory intermediation is justified through legal certainty and the protection of civil interests, but at the same time it entrenches a stable economic advantage for a limited professional group. In this sense, the regime can be considered not only an instrument of certification and legal protection but also an institutional mechanism through which a protected economic advantage is sustained. In Tullock's logic, resources invested in acquiring, preserving, or defending such an advantage represent social waste, since they do not create new wealth but serve to maintain an already established position (Tullock, 1967, p. 228). Regulation thus ceases to operate primarily as a means of reducing uncertainty and begins to function as a mechanism for stabilizing inefficiency.

A second documented Bulgarian case illustrating the same mechanism comes from the milk production sector. In a detailed study of Ordinance No. 2 of 23 February 2017 on the specific requirements for the production of raw cows' milk, Kotseva-Tikova (2019) shows how the regulation expanded the number of obligatory testing indicators from three to five, introduced an additional 'veterinary' qualification for accredited laboratories, and added registration requirements that effectively monopolized the laboratory testing market. The Commission for Protection of Competition, in its Decision No. 562 of 17 May 2018, confirmed that the regulatory framework 'restricts competition by creating legal uncertainty' regarding the requirements that laboratories must meet (Kotseva-Tikova, 2019, p. 74). This case shows the same logic at work in a different sector: a regulation formally justified by EU food safety requirements operates, in practice, as a barrier to entry that protects a narrow group of incumbent service providers.

Acemoglu and Robinson's distinction between inclusive and extractive institutions places this logic in a broader institutional context. When political and economic power are concentrated in limited groups, path dependence becomes more durable, and change cannot be achieved through new legislation alone. What is required is broader effective participation, limits on arbitrariness, and mechanisms that make institutional capture more difficult, more costly, and more visible (Acemoglu & Robinson, 2012, pp. 80-81).

4.4. Polycentricity as a Structural Alternative to Institutional Formalism

Ostrom offers an alternative through the logic of polycentric governance. When power is distributed across multiple centers of decision making, the monopoly over information is harder to maintain, control becomes broader, and the concentration of regulatory powers in a single institutional center becomes less likely. Conversely, in a highly centralized environment, rules can more easily become stable channels for redistributing advantages to well-positioned groups (Ostrom, 1990, p. 14).

This logic links Ostrom with North and Stigler. Distributed governance can simultaneously constrain the institutional inertia described by North and make regulatory capture more difficult. Polycentricity expands the institutional channels through which information about the operation of rules can be gathered. It allows comparison between different solutions and reduces dependence on a single administrative centre. In this sense, polycentricity is not merely an organizational model but a mechanism for institutional learning.

The Estonian example, already considered as a contrast to mandatory intermediation, indicates a further point. The Estonian Transport Administration provides an e-service environment in which vehicle transactions include ownership transfer for the sale and purchase of a vehicle (Estonian Transport Administration, n.d.). When an administrative process is reorganized through a digital channel with low transaction costs, regulation begins to facilitate exchange rather than entrench protected intermediation.

For Bulgaria, this means that improving the quality of the regulatory framework cannot be limited to the adoption of new legislation. What is required is a change in the way institutions are organized, supported by stronger accountability mechanisms, broader participation by affected parties, transparency in the rule-making process, real tracking of effects, and the possibility of correction. Only under such conditions can rules be transformed from formal prescriptions into working rules-in-use.

In this context, polycentricity is a structural alternative to institutional formalism. It does not automatically guarantee high-quality regulation, but it creates better conditions for the transition from the rule-making reflex to institutional System 2. Through broader feedback, comparison between alternative courses of action, alternative service channels, and a wider distribution of knowledge, regulation can begin to produce not merely rule-making activity but genuine institutional adaptability.

4.5. Alternative interpretations and the explanatory scope of the framework

Two alternative readings of the same empirical findings should be considered. The first locates the central problem in the accumulated burden of the regulatory framework. In its more radical deregulatory version, articulated most clearly in recent European policy literature, including the 2025 manifesto Deregulation, not Simplification published by the 4liberty.eu network and the Friedrich Naumann Foundation, the weakness of European and Bulgarian regulation lies in the accumulated volume of rules (Vlachynský, 2025). According to this view, the volume of EU legislation has increased by 729% since the Maastricht Treaty, while procedural simplification is no longer sufficient. The proposed response is binding net reduction, including a 1% annual cut in the legislative stock, universal sunset clauses and conditionality of EU funds on national deregulatory performance. The European Commission's own simplification agenda responds to similar pressures but defines the problem differently: not primarily as the quantity of rules, but as accumulated complexity, administrative burden and difficulties in implementation (European Commission, 2025). These two positions converge on the diagnosis that the regulatory framework requires reform, but they diverge on whether the binding constraint lies mainly in the volume of rules or in the complexity and implementation of existing rules. The second interpretation explains the findings mainly through corruption in the narrow sense. It treats regulatory capture as a matter of illicit exchanges between individual officials and individual firms. Both interpretations are plausible and receive partial support from the survey data, especially from responses concerning rule instability and asymmetric influence.

However, neither interpretation explains the full pattern observed across the two empirical modules. The regulatory stock argument cannot explain why the strongest convergence between experts and civil servants concerns asymmetric influence, with 82.6% and 86.0% respectively, rather than the volume of rules itself. If the accumulated volume of rules were the main binding constraint, one would expect comparably strong convergence on regulatory burden and cost realism. Yet convergence on the cost realism axis is substantially weaker. Moreover, the proposed remedy of net reduction operates primarily on rules in form, whereas the empirical findings suggest that the binding constraint lies in the conversion of rules in form into rules in use. The regulatory stock could be reduced by 1% annually and still leave intact the underlying asymmetry of influence, the institutional formalism of cost analysis and the only partially mobilized administrative capacity.

The narrow corruption thesis also has limited explanatory reach. It cannot account for the fact that civil servants themselves report that businesses adapt to gaps and grey zones in the rules. Such behavior does not require corruption. It requires ambiguity, uneven enforcement and rational adaptation to the expected operation of the institutional environment. This is where the

rules in form and rules in use framework has broader explanatory scope. Rules may exist in any quantity, comply formally with methodological requirements and still fail to operate as shared working norms if the institutional environment does not convert them into rules in use. The framework therefore does not exclude overregulation or corruption as contributing factors. Rather, it places them within a broader account of how regulatory quality is produced, weakened or displaced in practice.

CONCLUSION

The principal problem in many regulatory regimes is not simply that rules are sometimes unclear, incomplete, or legally unsound. The deeper problem is that the rule-making process itself often operates as institutional System 1. It responds quickly, produces a visible regulatory response, and assumes that the formal adoption of a rule has completed the substantive part of the policy decision. The analysis of actual behavior is then replaced by a procedurally defensible regulatory response. This is the rule-making reflex.

This reflex is particularly problematic because contemporary better regulation methodologies assume a mode of work close to System 2. They require the comparison of alternatives, realistic analysis of costs and benefits, assessment of administrative burden, participation by affected parties, ex post evaluation, and institutional learning. In practice, however, these instruments are often applied in a System 1 mode. The external form of analysis is preserved, but its capacity to discipline decision making weakens. The rule exists, but it does not always become a rule-in-use. The weakness of regulation is therefore not merely legal. It is institutional and behavioral.

The empirical data support this interpretation clearly. The underestimation of administrative burden, reflected in 60.9% agreement among experts, the insufficient use of alternatives to regulation, also at 60.9% agreement, the recognition of unintentionally created conditions for circumventing the law at 65.2% agreement, and weak confidence in realistic cost analysis, expressed through 41.3% disagreement in the administrative module, are not isolated technical imperfections. To this picture should be added the weakness of the incentive environment, visible in only 8.3% agreement that public support for CSR initiatives actually exists. These results do not point to separate procedural weaknesses but to a durable pattern of institutional behavior. Within this pattern, institutions reproduce familiar solutions, organizational risk is minimized, and the difficult analysis of actual behavior is replaced by more easily defensible formal execution.

The Bulgarian context amplifies this problem because regulation does not operate in a socially neutral environment, but in one marked by historically accumulated vertical distrust between citizens and the state, and between businesses and regulators. Under such conditions, stricter control does not always lead to higher compliance. It often produces more concealed formalism, selective adaptation, and institutional navigation. Behavior is then shaped not only by the rule as a legal text, but also by how that rule actually operates as an institutional regime. When rules are perceived as unpredictable, burdensome, or shaped by more strongly organized interests, minimal compliance and the search for “grey zones” are not deviations from the system but rational adaptations to it.

The logic of Olson, Tullock, and Stigler has significant analytical value at this point. The persistence of regimes such as mandatory notarial intermediation in vehicle transactions can be explained by the structural asymmetry between concentrated benefits and dispersed costs. This persistence is not necessarily due to higher social efficiency, but to an institutionally entrenched rent defended through the language of legal certainty. Regulation may thus cease to be an instrument for reducing uncertainty and become a mechanism for stabilizing inefficiency.

The principal conclusion of the study follows from this analysis. The quality of regulation is not determined by the number of legal rules or by the formal complexity of procedures. It depends on the capacity of the institutional environment to convert rules in form into rules in use. This requires clarity, applicability, predictability, low compliance costs, limits on special economic advantages, and real mechanisms for institutional learning. It also requires a polycentric organization of regulatory processes, in which knowledge, control, and feedback do not remain concentrated in a single center but are distributed among public institutions, expert communities, civil society organizations, and economic actors.

This conclusion has direct implications for the current European policy debate. Calls for radical deregulation (Vlachynský, 2025) and calls for procedural simplification through legislative packages such as the European Commission's omnibus initiatives (European Commission, 2025) appear as opposing strategies. The present analysis suggests that both, taken alone, are insufficient. Without a parallel effort to convert rules in form into rules in use, neither volumetric reduction nor procedural streamlining will produce sustainable improvements in regulatory quality.

The required change therefore goes beyond replacing weaker legal texts with better ones. The more substantive transition is from the rule making reflex to institutional System 2. This means that regulation should not be understood as a quick response to market or social distortions through a new legal text, but as an institutional process that can be tested, adapted, and corrected, and that takes account of actual behavior. Only then can the rule become a working rule. Otherwise, the operating mode of governance will continue to stabilize inefficiency, and rulemaking activity will reproduce institutional formalism under the appearance of good governance.

ENDNOTES

1. The concepts “System 1” and “System 2” are used here as an analogy to Kahneman’s dual-process model of cognition. System 1 denotes a fast, automatic, and low-effort mode of operation, while System 2 denotes a slower, deliberate, and analytically demanding mode. The analogy does not imply that institutions think in a psychological sense. Rather, it describes two distinguishable modes of institutional behavior: one reactive and procedurally oriented, the other analytical and focused on the real-world effects of rules.
2. Simon’s example concerning old maids, cats, mice, bees, and the clover harvest illustrates the practical impossibility of tracing all remote and indirect consequences of a decision. It is used here only to clarify the limits of exhaustive rational calculation and the relevance of bounded rationality for administrative decision-making.

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THE FUTURE OF REGIONAL DEVELOPMENT IN BULGARIA POST-2027: TOWARDS A NEW PLANNING PARADIGM AND THE GENUINE IMPLEMENTATION OF THE PLACE-BASED APPROACH

ABSTRACT

This article examines the imperative for a fundamental paradigm and institutional shift in Bulgaria's regional policy ahead of the EU Multi-Annual Financial Framework for 2028–2034. The core thesis posits that the country requires a comprehensive transformation of its regional planning model - shifting from sectoral programming and absorption-oriented project execution to the genuine implementation of a place-based approach. Employing qualitative institutional, documentary, and comparative analysis, the paper identifies the primary limitations of the current model: project-financial dependency, weak regional

governance, formalistic tool integration, and fragmented planning links. The conclusion outlines a conceptual framework for reform aligned with the 4-region NUTS 2 re-demarcation from 2027. It advocates for fiscal decentralization via autonomous regional funds, strategic empowerment of Regional Development Councils, and the scaling of Community-Led Local Development (CLLD). Future regional policy effectiveness must be evaluated through qualitative service access metrics rather than quantitative funding absorption.

KEYWORDS: regional development; cohesion policy; place-based approach; territorial planning

JEL: R58; R11; O18

INTRODUCTION

Regional development occupies a central position in contemporary European and national policies, as it links economic competitiveness, social cohesion, territorial justice, and quality of life. Within the European Union, this issue is traditionally addressed through cohesion policy instruments, which aim to reduce disparities between regions and support more balanced and sustainable development. For Bulgaria, as a member state with pronounced inter-regional and intra-regional imbalances, European funds and regional development programs hold particular significance both as a financial resource and as a framework for planning and managing territorial processes. Furthermore, regional development is a set of legislative and administrative actions by public authorities to overcome regional disparities in the country. It is also defined as an organized activity of society aimed at the development of the well-being of economic agents based on an increase in the efficiency of social production and as a process

of interaction between natural, geographical, economic, social, and historical values and resources available in a region (Tsonkov, N., Petrov, K.,2023).

Despite the experience accumulated across several programming periods, regional development in Bulgaria continues to be characterized by persistent structural challenges. Prominent among these are demographic polarization, the concentration of economic activity in a limited number of urban centers, uneven access to services, infrastructure, and employment, as well as varying institutional capacity at national and local levels. These processes call into question the effectiveness of the previous regional planning model, particularly when it is reduced primarily to the preparation of strategic documents, programming financial resources, and executing individual projects. In the context of dynamic global changes, the only persistent trend in the country remains the deepening of inequalities between regions in terms of their economic potential. As Petrov and Tsonkov (2024) argue, overcoming these deficits requires true good governance, which cannot be achieved without genuine decentralization – the transfer of power, resources, and autonomy from the central to the lower levels of government

Concurrently, the period post-2027 represents a critical milestone for rethinking the Bulgarian model of regional development. The expected new Multi-Annual Financial Framework of the European Union and the debate on the future of cohesion policy place an increasingly strong emphasis on results, territorial orientation, institutional efficiency, and adaptation to novel challenges, including demographic shifts, the climate transition, digitalization, economic transformation, and growing spatial inequalities. The adoption of the new National Concept for Regional and Spatial Development for the 2026–2040 period is also anticipated, while the new redrawing of NUTS 2 territorial units – establishing four planning regions – will take effect from the beginning of 2027.

In this context, Bulgaria faces a strategic choice: whether to continue reproducing an inertial model of programming and funding absorption, or to utilize the next programming period as an opportunity for a deeper transformation in how regional development is conceptualized and managed. Nationally, this issue is crucial because during the current 2021–2027 programming period, Bulgaria introduced a more explicit formal framework for an integrated territorial approach "on paper" through the "Development of Regions" Program 2021–2027, to be executed via Integrated Territorial Investments (ITI); however, their implementation is only just beginning. It can be summarized that while the formal prerequisites for a more integrated approach already exist, the question remains to what extent they lead to a real shift in governance practice regarding regional development.

The core thesis of this article is that Bulgaria requires a transition toward a new planning paradigm based on the genuine implementation of the place-based approach. This implies that regional policies should be formulated not merely on the basis of administrative boundaries and sectoral priorities, but through a deeper understanding of the specific potentials, limitations, trajectories, and institutional capacities of individual territories. Such a shift requires a stronger link between strategic and spatial planning, better coordination between national and local levels, and a clearer alignment between financial instruments and measurable outcomes for the territories. Particularly considering the escalating responsibilities placed on local authorities to absorb the continually rising expenses of local government expenditures in the function of environmental protection involve the allocation of financial resources to address environmental challenges, promote sustainability, and preserve natural resources within a specific jurisdiction. These expenditures reflect the commitment of local governments to mitigate environmental risks, conserve biodiversity, and ensure the well-being of their communities in an ecologically responsible manner. The analysis of local government expenditures on environmental protection provides insights into the priority placed on environmental sustainability and the allocation of resources for various environmental initiatives. It sheds light on the financial

commitment dedicated to activities such as waste management, pollution control, conservation of natural habitats, promotion of renewable energy sources, and implementation of environmental policies and regulations (Veleva, R., 2023).

1. LITERATURE REVIEW

1.1. Cohesion Policy and the Changing Understanding of Regional Development

Historically, regional development in the European Union has been strongly shaped by cohesion policy, which serves as one of the primary instruments for reducing economic, social, and territorial disparities among regions. Over time, however, the understanding of regional development has expanded significantly. It is no longer interpreted solely as a compensatory mechanism for supporting lagging regions through infrastructure investments and financial transfers; rather, it is viewed as a complex field of public policy linked to competitiveness, institutional capacity, innovation, social inclusion, demographic adaptation, the climate transition, and enhanced territorial governance. The need for such a broader understanding is also visible in studies addressing global challenges to regional policy. Regional development increasingly operates under conditions of non-linear dynamics, external dependencies, and unstable trends. Recent analysis points to the persistent deepening of inequalities between regions and districts in terms of economic potential, which requires methodological approaches capable of diagnosing variable and rarely stable territorial processes (Tsonkov, N., Petrov, K, 2024).

This broader understanding is particularly visible in the debate regarding the future of cohesion policy post-2027. The Ninth Report on Economic, Social and Territorial Cohesion highlights that while convergence progress has been achieved in several parts of the Union, regional disparities remain persistent and are likely to be further influenced by structural transformations such as demographic shifts, digitalization, the climate transition, and economic restructuring (European Commission, 2024). The report also reaffirms the importance of core cohesion policy principles, including the place-based approach and the principle of partnership. The work of the High-Level Group on the Future of Cohesion Policy further reinforces this direction. Its final report argues that future cohesion policy must retain its focus on economic, social, and territorial cohesion, while simultaneously becoming more effective, strategic, and better adapted to the diversity of regional contexts (High-Level Group on the Future of Cohesion Policy, 2024). This is especially vital for Bulgaria, where the post-2027 period should not be viewed merely as a new administrative cycle, but as an opportunity to rethink the national model of regional development and its capacity to generate genuine territorial change.

1.2. The Place-Based Approach as a Conceptual Framework

The internal logic and efficacy of regional policy as an instrument for socio-economic cohesion have been the subject of a long-standing doctrinal clash in spatial economics. This debate centers on the dichotomy between the space-neutral (people-based) and the place-based approach. The space-neutral paradigm, rooted in neoclassical economic theory and New Economic Geography, postulates that public interventions should focus exclusively on individuals (people) rather than specific territories. The leading argument here is that economic growth is inherently spatially unequal and tends to naturally concentrate in areas with a high density of economic activity due to agglomeration effects. According to the landmark World Development Report by the World Bank (2009), the most effective way to combat spatial inequalities is not the artificial subsidization of lagging regions, but the promotion of market integration, geographical labor mobility, and investments in universal human systems such as education, healthcare, and social protection. Within this logic, it is assumed that the market will

self-correct disparities by drawing surplus labor from the periphery to advanced centers where productivity is higher.

However, the practical application of the space-neutral approach in catching-up countries with fragile institutional environments and deep centralization reveals severe flaws. In reality, policies directed solely at individuals without considering the geographical context become a mechanism for subsidizing further polar concentration. Allocating funds on a per capita basis (linked strictly to population numbers) naturally favors large urban agglomerations that already possess scale and market advantages. Concurrently, promoting passive spatial mobility without alternatives for local development deprives peripheral and shrinking regions of their most valuable capital - the young and educated population. This process locks in a vicious cycle of depopulation, loss of critical economic mass, and institutional degradation, wherein market self-regulation proves to be a theoretical chimera.

In reaction to these failures, the independent report by Fabrizio Barca, prepared at the request of the European Commission (Barca, 2009), executed a fundamental turn, establishing the place-based approach as the leading paradigm for EU Cohesion Policy. Today, the place-based approach occupies a central position in contemporary regional development debates. Its core premise is that territories are neither neutral spaces for the allocation of economic activity nor passive recipients of public policies. Instead, they represent complex socio-economic and institutional systems with specific development trajectories, resources, constraints, functional linkages, and governance capacities. Consequently, effective regional development policies cannot be constructed solely through universal sectoral measures or standardized instruments; they must be grounded in a deeper understanding of the specific territorial context.

The Barca report stands as one of the foundational contributions to this debate. Barca (2009) defines a place-based policy as a long-term strategy aimed at addressing persistent underutilization of potential and reducing social exclusion in specific places through integrated interventions and multi-level governance. The significance of this contribution lies in its rejection of both entirely place-neutral policies and fragmented localism. Instead, the place-based approach combines strategic direction from higher levels of governance with local knowledge, participation, and institutional mobilization.

Philip McCann (McCann, 2015) further develops this framework, linking it to the concept of smart specialization. He emphasizes that modern regional policy must be strictly oriented toward measurable territorial outcomes, which are achievable only if investments correspond to the unique technological, industrial, and social profile of the region. The place-based approach does not deny the necessity of spatial mobility or investments in human capital; it insists that these investments must be institutionally contextualized (Tomaney, 2010). Educational and infrastructure programs should be planned in a manner that strengthens local economic ecosystems, creating conditions to retain and attract value within the region itself, rather than facilitating its ultimate drainage.

Ignoring these principles leads to severe political and structural upheavals. In his study on "the revenge of the places that don't matter," Andrés Rodríguez-Pose (Rodríguez-Pose, 2018) demonstrates that decades of spatially blind planning and the concentration of public resources in global urban centers have birthed widespread economic stagnation in the geographical periphery. These left-behind territories lose their economic viability, transforming into zones of persistent functional deficits. The lack of a critical mass of human resources and business activity blocks market mechanisms, fostering a deep sense of institutional and social neglect among the local population. These economic deserts subsequently transform into hotbeds of populism and political instability, threatening the overall cohesion of states and the European Union itself.

In the contemporary international context, this theoretical consensus finds expression in the latest recommendations and strategic documents of the Organization for Economic Co-operation and Development (OECD, 2023, 2025). The OECD argues that building territorial resilience in the face of global megatrends requires a transition toward governance based on "functional regions." Functional spaces transcend narrow administrative boundaries and reflect real economic relationships, labor markets, and daily population commuting. Managing these spaces is possible only through genuine fiscal empowerment and the sharing of sovereignty across the governance vertical. Similarly, the European Territorial Reference Framework of ESPON (ESPON, 2019) emphasizes the need for integrated spatial strategies to counteract polar concentration. The theoretical review clearly demonstrates that the transition toward smart, sustainable, and balanced development in the new 2028–2034 programming period is conceptually conditional upon the capacity of states to shift from formal administration to genuine place-based planning supported by financial autonomy.

1.3. Integrated Territorial Development and Multi-Level Governance

The place-based approach implies a shift not only in policy content but also in the mode of governance. Integrated territorial development requires coordination across sectoral interventions, alignment between strategic and spatial planning, and interaction among national, regional, and local actors. Therefore, multi-level governance is not an additional administrative element but a fundamental prerequisite for an effective regional policy. In this sense, territorial instruments such as Integrated Territorial Investments (ITI), Community-Led Local Development (CLLD), functional area approaches, and territorial strategies can be viewed as practical manifestations of place-based logic. Their objective is not merely to allocate funding across territories, but to create coherence between needs, potentials, actors, and interventions. When applied effectively, these instruments can help overcome the fragmentation of sectoral policies and strengthen the link between strategic objectives and territorial impact. This approach corresponds with the new trends in OECD regional policy, which emphasize the need for differentiated responses depending on the specific territorial scale, distinguishing between metropolitan areas, rural regions close to cities, and remote rural regions. As Garcilazo and Oliveira Martins (2021) argue, designing place-based policies is too complex task to be fully centralized, making decentralization and multi-level governance essential components for success.

However, the literature indicates that integrated territorial instruments do not automatically produce integrated development. Their effectiveness depends on institutional capacity, the quality of partnerships, clarity of responsibilities, the ability to coordinate financial sources, and the availability of reliable monitoring and evaluation mechanisms. Without these conditions, integration may remain formal and procedural, while actual execution continues to follow a project-based and absorption-oriented logic. This distinction is crucial for the Bulgarian case. The adoption of territorial instruments does not automatically mean that a genuine place-based model has been established. The fundamental question is whether these instruments alter the logic of planning and execution, or whether they simply fit into the existing administrative and project-financial model without changing its core characteristics.

2.4. The Bulgarian Context: Formal Instruments and Implementation Deficits

In Bulgaria, the challenge does not lie in a lack of strategic documents or public policy instruments. On the contrary, the country possesses a relatively dense formal framework for regional and local planning. It includes national strategic documents, integrated territorial strategies for the development of NUTS 2 planning regions, plans for the integrated

development of municipalities (PIRO), various sectoral programs, Integrated Territorial Investments (ITI) via the “Development of Regions” Program 2021–2027, and Community-Led Local Development (CLLD) strategies funded by European funds.

This indicates that at the level of strategic documents, the connection between regional and spatial development is recognized, although its practical application remains a challenge. Numerous Bulgarian publications focus precisely on the missing link between socio-economic and spatial planning (Ivanov & Naydenov, 2017, 2019) and the challenges facing regional development in Bulgaria (Naydenov et al., 2021) since the previous programming period. A significant portion of them can be summarized by the conclusion that the issue in regional development is not the absence of formal instruments, but rather their limited capacity to function as an integrated system for managing territorial change.

These limitations of a purely sectoral approach are well-documented internationally. Research by Awotwe (2026) indicates that rural policies focused solely on individual sectors, such as agriculture and resource industries, have proven ineffective at sustaining rural economies in the long term. True place-based economic development requires moving beyond this sectoral focus, as it limits the effective implementation of strategies needed to build competitive and sustainable regional economies. This argument is further supported by Borisov, Petrov and Tsonkov (2024), who emphasize that regional development policy should not be reduced to the direct distribution of resources, but should function primarily as a mechanism for coordinating sectoral policies and directing them toward regional problems. They also identify the lack of own financial resources at the level of planning regions and the strong centralization of municipal revenues as significant constraints on effective regional development.

The limitation manifests across several dimensions, such as: a weak link between strategic planning and actual investment programming; limited capacity and functions of the regional level to act as a strategic space between national policies and local needs; the risk of territorial instruments being utilized as mere procedures for selecting project ideas rather than mechanisms for building territorial synergy; and an underdeveloped toolkit for evaluating the real territorial impact of European funding. In this sense, the Bulgarian model reflects the divergence between the formal adoption of European concepts and their substantive application within national institutional and governance practices. Place-based development requires more than the existence of strategic documents and financial instruments. It presupposes the ability to differentiate between types of territories, comprehend their specific trajectories, coordinate interventions across sectors and levels, and evaluate whether public policies generate actual territorial change. The place-based approach should not be viewed merely as a European buzzword, but as a viable foundation for a new planning paradigm. Such a paradigm would shift the emphasis from formal programming and fund absorption toward territorial differentiation, integrated interventions, institutional coordination, and measurable impact.

2. METHODOLOGY

The purpose of the article is to reveal the main limitations of the current regional development model in Bulgaria and to formulate conceptual guidelines for its reassessment post-2027. The primary questions raised are: what are the main limitations of the current regional development model in Bulgaria, and what changes are necessary after 2027 to transition toward a more effective, territorially sensitive, and place-based oriented planning paradigm?

The conclusions and theses articulated in the text are based on a qualitative methodological approach encompassing a literature review, documentary analysis of European and national strategic documents, critical institutional analysis, and conceptual synthesis, alongside the author's extensive experience in regional development and participation in drafting numerous

strategic documents related to socio-economic development and spatial planning. The scope of the analysis is confined to the programming and institutional framework of regional development in Bulgaria within the context of the future cohesion policy of the European Union. The expected contribution of the article lies in deriving key principles for a new regional planning paradigm in Bulgaria post-2027. These principles include territorial differentiation, integration of interventions, institutional coordination, enhanced local and regional capacity, and a transition from formal strategic planning to policies oriented toward real territorial impact.

3. THE BULGARIAN MODEL OF REGIONAL DEVELOPMENT: LIMITATIONS AND CONTRADICTIONS

The current model of regional development in Bulgaria demonstrates that the country possesses a relatively developed formal framework for strategic planning, programming, and the implementation of regional and local development policies. This includes regulatory provisions in the field of regional development, national strategic documents, integrated territorial strategies for the development of NUTS 2 planning regions, municipal integrated development plans (PIRO), sectoral programs, as well as instruments for Integrated Territorial Investments (ITI) and Community-Led Local Development (CLLD) funded by European Union funds. Notably, during the 2021–2027 programming period, the "Development of Regions" Program introduces a more visible territorial logic through the application of integrated territorial development instruments. The program directs investments toward integrated urban and regional development, linking funding to territorial strategies and enhancing the role of Regional Development Councils (RDCs) in the preliminary selection of project ideas. This represents a significant formal change compared to more sector-oriented intervention models.

Nevertheless, the core issue is not the availability of instruments, but rather the manner in which they function as a system. The first key finding is that the Bulgarian model of regional development remains heavily dependent on a project-financial logic. In practice, regional development is frequently conceptualized through the prism of accessing funding rather than the long-term transformation of territories. This leads to a situation where strategic documents are often perceived merely as a prerequisite for application rather than as a genuine tool for development management. Consequently, the link between identified territorial problems, strategic goals, financial resources, and real effects on the regions remains insufficiently strong.

The second finding relates to the weak institutionalization of the regional level. In the Bulgarian model, the region exists as a statistical, planning, and administrative-functional category, yet it struggles to become a real subject of policy. Integrated territorial strategies for the development of NUTS 2 regions and Regional Development Councils create opportunities for clearer territorial coordination. Under the framework of the "Development of Regions" Program (PRR) 2021–2027, Regional Development Councils hold functions related to the preliminary selection of project ideas, which formally strengthens the role of the regional level. However, the effectiveness of this model depends on institutional capacity, a clear distribution of responsibilities, stable partnership mechanisms, and the active participation of local and regional actors. When these conditions are underdeveloped, the regional level remains intermediary and procedural rather than strategic and managerial.

The third finding is that integrated territorial instruments are at risk of being applied in a rather formalistic manner, rather than bringing about a real shift in the approach to planning and policy execution. The integrated approach implies combining different sectoral interventions within a shared territorial logic. In Bulgarian practice, Integrated Territorial Investment (ITI) concepts are supposed to unite project ideas which, in combination with each other or with other investments in a given territory, lead to the achievement of a specific objective corresponding to the integrated territorial strategies. Nonetheless, a risk is already manifesting that ITIs are

turning into a mechanism for aggregating separate project ideas, lacking a sufficiently strong link between them and without a clearly measurable impact on a specific territory.

The fourth finding is associated with the insufficient connection between strategic, spatial, and financial planning. Regional development cannot be effective if strategic documents, spatial planning, investment programming, and sectoral policies operate in parallel rather than in an integrated fashion. In Bulgaria, a mismatch is frequently observed between formulated goals for territorial development and the actual mechanisms for financing and execution. This weakens the ability of public policies to influence the spatial organization of economic activities, access to services, mobility, infrastructure, and the quality of life in different types of territories.

The fifth finding is that the current model struggles to account for the diverse development trajectories of territories. Bulgarian regions and municipalities differ substantially in terms of demographic dynamics, economic structure, accessibility, institutional capacity, social capital, and opportunities for adaptation to external changes. Despite this, policies and funding requirements utilize similar criteria without a sufficiently robust territorial differentiation. This limits their capacity to address both the problems of peripheral and depopulating areas and the challenges facing growing urban centers and their functional zones.

Table 1. Main limitations of the current regional development model in Bulgaria

Limitation	Manifestation	Implication for the post-2027 period
Project-financial logic	Strategic documents are often linked primarily to access to funding	Risk of reproducing the absorption-oriented model
Weak regional level	Limited capacity for coordination and strategic decision-making	Difficulty in implementing genuine territorial approaches
Formal integration	Integrated tools may aggregate projects without territorial synergy	Limited transformative impact
Fragmented planning	Weak connection between strategic, spatial and financial planning	Reduced policy effectiveness
Insufficient territorial differentiation	Similar instruments are applied to different types of territories	Limited relevance of interventions to local needs

Source: Own elaboration

In summary, Bulgaria faces the risk of entering the post-2027 period with updated programming documents but without any substantial change in its regional development model. The fundamental challenge is not merely technical or financial, but paradigmatic. It lies in the necessity to rethink regional development as a process of managing territorial change, rather than just a system for programming, applying for, and executing projects. From this perspective, the genuine implementation of the place-based approach implies four key changes:

1. Strategic planning must be grounded in a better understanding of specific territorial contexts.
2. The regional level must be granted a clearer analytical, coordinating, and managerial role.
3. Financial instruments must be more closely aligned with territorial strategies rather than solely with administratively defined priorities.
4. Monitoring and evaluation must shift their focus from the mere fulfilment of indicators and fund absorption to the real impact exerted on territories.

4 DISCUSSION. TOWARDS A NEW PARADIGM OF PLACE-BASED REGIONAL PLANNING AFTER 2027

The principles proposed in this section should not be interpreted as isolated normative recommendations, but as an attempt to adapt and operationalize key debates in contemporary regional policy literature to the Bulgarian post-2027 context. The emphasis on territorial differentiation corresponds to the place-based policy literature and to the typology of metropolitan, intermediate, and remote rural regions proposed by Garcilazo and Oliveira Martins. The focus on institutional coordination and decentralization is consistent with studies on multi-level governance and administrative capacity in EU Cohesion Policy. At the same time, the Bulgarian case also serves as a counterpoint to these debates, since the country has formally introduced integrated territorial instruments but has not yet developed sufficiently strong regional governance structures, autonomous regional resources, or impact-oriented evaluation mechanisms.

The results of the literature review and the diagnostic assessment of the current situation indicate that the primary challenge facing regional development in Bulgaria post-2027 cannot be reduced solely to the preparation of new programming documents or to adaptation to the future regulations of the European Union's cohesion policy. The more fundamental question relates to the necessity for a shift in the manner in which regional development is conceptualized, planned, managed, and evaluated. In this sense, the next programming period should be viewed not merely as an administrative and financial cycle, but as an opportunity to transition toward a new paradigm of territorially sensitive planning.

The concept of a “new paradigm” within the context of this publication signifies a transition from a model dominated by sectoral programming, project logic, and formal strategic planning, to a model based on territorial differentiation, integration, institutional coordination, and an orientation toward real impact. This does not imply the rejection of existing instruments, but rather their reassessment and enhanced linkage within a system capable of managing the diverse development trajectories of territories.

The place-based approach provides the conceptual foundation for such a shift. Its value lies not merely in recognizing the differences between territories, but in requiring that policies be constructed upon a sophisticated understanding of these disparities. This encompasses not only socio-economic indicators, but also institutional capacity, the quality of partnerships, spatial dependencies, access to services, mobility, demographic trends, and the potential for local initiative. In this sense, the place-based approach is not simply the “localization” of national policies, but a fundamentally different logic of public management.

For Bulgaria, this holds particular significance due to the acute territorial polarization and the distinct nature of regional challenges. Some territories are faced with complex processes of demographic shrinkage, economic peripheralization, and restricted access to services. Others are part of expanding urban and functional zones where the primary issues relate to pressure on infrastructure, the housing market, mobility, public spaces, and the quality of the environment. A third group of territories possesses potential for development through specific natural, cultural, economic, or logistical resources but requires better connectivity, capacity, and institutional support. Treating these distinct territorial types uniformly results in policies with severely limited effectiveness.

Hence, the new paradigm of regional development must be constructed around five leading principles:

- **Principle of Territorial Differentiation:** This presupposes that policies are adapted to different types of territories rather than being applied through universal instruments and

criteria. This requires a finer typology of regional and local problems, superior territorial data, and a clearer link between analysis and the choice of interventions.

- **Integration:** Regional development cannot be the result of artificially isolated sectoral projects when the problems of territories are interconnected. Demographic decline, access to services, economic activity, transport connectivity, the housing environment, education, and the quality of public management cannot be considered separately. Therefore, regional development instruments should encourage combinations of interventions that generate territorial synergy rather than a mere aggregation of eligible projects.
- **Institutional Coordination:** A genuine place-based approach requires interaction among national, regional, and local levels. In Bulgaria, this means overcoming the weak link between national programs, regional priorities, and municipal strategies. The regional level, through Regional Development Councils, must be strengthened not merely procedurally, but analytically and managerially as a space for coordination, negotiation of priorities, and tracking territorial outcomes. Such coordination is conceptually supported by the principle that modern economic and territorial systems naturally function beyond narrow political-administrative boundaries, necessitating integrated sub-national management frameworks (Mazur & Kubai, 2019).

In this regard, institutional coordination also necessitates a critical evaluation of the country's current administrative-territorial division. The modern fragmentation into 28 districts (NUTS 3 level) shows signs of exhaustion, with numerous territories facing severe demographic collapses and lacking the necessary critical mass of resources to generate endogenous growth. As a strategic alternative for the future model, the conceptual consolidation of the intermediate governance level into a smaller number of functional macro-regions, finding conceptual support in the historical administrative model of 1987, can be considered. Such a macro-regional level would respond more adequately to the requirements for managing "functional regions," uniting real economic linkages and labor markets.

However, the strategic empowerment of Regional Development Councils remains conceptually incomplete without ensuring real fiscal sovereignty. To transform the regional level from a formal coordinator into an autonomous subject of governance, the new paradigm requires functioning mechanisms for financial decentralization. A viable practical instrument in this direction is the reallocation of a fixed share of direct taxes (e.g., 2% of the Personal Income Tax), to be accumulated in targeted Regional Development Funds. This autonomous fiscal resource would enable the backing of independent regional programs and investments of shared interest among municipalities, aligning fully with the debates on the future of cohesion policy.

- **Orientation toward Impact:** Previous practice has frequently placed a heavy emphasis on financial execution, the number of projects, and the formal achievement of indicators. The new model must place a stronger emphasis on how interventions alter the real situation within territories: do they improve access to services, create conditions for economic activity, restrict spatial isolation, enhance the quality of life, and strengthen local capacity?
- **Integration between Strategic and Spatial Planning:** Regional development has spatial consequences and cannot be effective if planned solely through programming documents detached from the physical and functional organization of the territory. The Bulgarian framework already contains documents that formally link regional and spatial development, including the National Concept for Regional and Spatial Development 2026–2040 and the integrated territorial strategies for regional development. The challenge is to prevent this connection from remaining merely at the level of strategic

text and to transform it into a practical mechanism for the selection, coordination, financing, and evaluation of interventions. The future model should combine socio-economic analysis, spatial structure, functional relationships, investment priorities, and mechanisms for execution. In this context, transport connectivity plays a fundamental role in the physical and economic integration of these new functional macro-regions. As Tsonkov and Dimitrov (2024) highlight, building adequate transport infrastructure is an essential prerequisite for the success of the new planning regionalization in Bulgaria and for generating real territorial synergy.

Table 2. From absorption-oriented to place-based regional development model

Current dominant logic	New place-based logic
Focus on funding absorption	Focus on territorial impact
Sectoral programming	Integrated territorial interventions
Formal strategic documents	Strategies as tools for managing change
Administrative regions	Functional and context-sensitive territories
Standardized instruments	Differentiated territorial responses
Output indicators	Outcome and impact-oriented evaluation
Procedural coordination	Real multilevel governance

Source: Own elaboration

The opportunity for such a shift post-2027 depends not only on the European framework but also on the national institutional choice. If Bulgaria continues to perceive cohesion policy primarily as a source of funding, the risk is the reproduction of the current model under new programming titles and adapted procedures. If, however, the next period is utilized for a deeper rethinking of the relationship between territory, institutions, and development, cohesion policy can be transformed into an instrument for the real transformation of regional planning.

Consequently, the fundamental question is not whether Bulgaria will possess regional development programs post-2027, but whether these programs will be part of a new logic of governance. A real place-based approach requires a shift in mindset: from "what funds can be absorbed" to "what change must be achieved in a specific territory." This presupposes a re-evaluation of the role of PIRO, ITI, and Regional Development Councils: moving from formal or procedural elements in the system to instruments for the selection, coordination, and tracking of real territorial results.

To ensure that these instruments do not replicate the model of top-down administrative programming, the methodological integration of the Community-Led Local Development (CLLD) approach at the regional level is required. The successful experience of applying CLLD on a micro-scale (via Local Action Groups - LAGs) can be scaled up in the drafting and execution of regional strategies. Such a sharing of managerial powers will guarantee the mandatory and authentic inclusion of local stakeholders: business, the civil sector, and the academic community, linking public investments to specific territorial capital and the actual needs of the regional labor market. This mechanism is of paramount importance for Bulgaria's rural territories, where overcoming demographic shrinkage and fragmented structural funding requires comprehensive integration perspectives capable of blending local community initiatives with wider agricultural and regional funds (Borisov et al., 2024).

CONCLUSIONS

This article argues that Bulgaria's post-2027 regional development model requires a transition from absorption-oriented programming toward a genuine place-based planning paradigm. The analysis shows that the main weakness of the current system lies not in the absence of strategic documents or territorial instruments, but in their limited ability to generate integrated, territorially differentiated, and impact-oriented development outcomes.

A new planning paradigm should therefore be based on territorial differentiation, stronger institutional coordination, decentralization, integration between strategic and spatial planning, and evaluation focused on real territorial change. Instruments such as PIRO, ITI, CLLD, and Regional Development Councils should be transformed from procedural elements into mechanisms for diagnosing territorial problems, coordinating interventions, and monitoring outcomes in terms of accessibility, service provision, local capacity, demographic resilience, and quality of life.

The post-2027 period represents a critical opportunity for such a shift. If Bulgaria continues to treat cohesion policy primarily as a source of funding, the existing model is likely to be reproduced under new programming terminology. If, however, the country uses the next period to reform the relationship between territory, institutions, and development, cohesion policy can become a real instrument for the transformation of regional planning.

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INDUSTRIAL PARKS AS INSTRUMENTS OF REGIONAL DEVELOPMENT POLICY IN BULGARIA

ABSTRACT

This study examines the role of industrial parks as instruments of regional development policy in Bulgaria. The growing importance of industrial infrastructure is closely linked to contemporary challenges associated with regional disparities, territorial cohesion, investment attraction, and sustainable economic development. Despite the increasing policy relevance of industrial parks, relatively limited academic attention has been devoted to their role as instruments of regional development policy in Bulgaria. This research addresses this gap and contributes to the growing discussion on industrial infrastructure as a tool for balanced territorial development.

The paper analyzes the relationship between industrial park development, regional economic performance, investment attraction, and employment dynamics within the context of regional disparities in Bulgaria. The research applies qualitative policy analysis combined with comparative regional analysis and secondary statistical data analysis.

The findings indicate that industrial parks support economic activity, investment attraction, and regional competitiveness; however, their effectiveness depends significantly on infrastructure accessibility, labor market conditions, institutional capacity, governance quality, and broader regional development factors. The study contributes to the existing literature by examining industrial parks not only as investment promotion mechanisms but also as instruments supporting

territorial cohesion and balanced regional development. The Bulgarian case provides additional evidence regarding the opportunities and limitations of industrial parks as tools for addressing regional economic disparities in emerging European economies.

KEYWORDS: industrial parks; regional development; regional policy; economic disparities; Bulgaria

JEL: R11, R58, O18, L52

INTRODUCTION

Regional disparities remain among the most significant socio-economic challenges in Bulgaria. Economic activity, industrial production, investment concentration, and innovation capacity are unevenly distributed across the country, with a substantial concentration in Sofia and several major urban centers. The continuing deepening of the socio-economic differences between the different regions of the country shows that the well-developed administrative-territorial units are limited compared to the lagging regions in the country (Ivanov, M. 2021). Peripheral and economically weaker regions continue to experience structural problems including demographic decline, labor shortages, low investment activity, and insufficient infrastructure. Furthermore, the influence of climate change and its effects on the development of peripheral and less developed regions are gaining increasing importance, as climate change, given its multifaceted nature by amplifying existing vulnerabilities. This necessitates the incorporation of environmental dimensions into strategic assessments for security sector reform, both in the

security sector and in the field of regional development, particularly regarding the planning process for industrial parks. Regions experiencing severe climate events are increasingly susceptible to conflicts driven by resource depletion and intensified competition for scarce resources. It is important to note that low-income nations and those with significant income disparities are most adversely impacted by extreme weather phenomena, particularly in the long term. This disparity makes it more difficult for socially disadvantaged groups to adapt, thereby exacerbating social inequality in the regions and, concurrently, acts as a prerequisite for the development of industrial infrastructure and the attraction of investment in underdeveloped regions (Ivanov, M. et. al, 2025). Also attention should also be paid to natural resource management plays a crucial role in regional development as it affects the social, economic and environmental aspects of the region. Effective management of natural resources can contribute to the sustainable development of a region by ensuring the long-term availability of resources and by protecting the environment. An important aspect is promoting sustainable practices in the use of natural resources (Naydenov, Kl., 2024). The ongoing development of industrial parks can also be examined from the perspective of implementing green economy principles, as the green economy combines economic growth with the sustainable management of natural resources, aims to achieve social inclusion and combat climate change. It seeks innovations and solutions that reduce negative environmental impacts while providing economic benefits (Zhechkova, N., Naydenov, Kl., 2025) and economic growth. Economic growth is presupposed by the action of many different in nature, origin and type of factors, by some previously formed, objectively set or subjectively consciously provoked conditions. Their manifestation is differentiation in strength, degree and direction of impact on the economy and closely interrelated. By acting as causes or drivers of growth, they can actually both stimulate and localize, constrain macroeconomic activity, so as to predetermine cyclicity in the economy. These conditions and factors operate jointly and in combination; they form a single system rather than a mechanical assembly. It is very important for the modern and especially for the broader view of growth that some conditions and factors can be predicted, guided and indirectly controlled, while others are unpredictable (Berberova-Valcheva, T., Petrov, K., 2023).

Within this context, industrial parks have increasingly emerged as instruments of regional development policy. The development of industrial infrastructure is viewed as a mechanism for attracting investments, stimulating industrial activity, improving regional competitiveness, and generating employment opportunities. Industrial parks also facilitate business operations through infrastructure readiness, logistical connectivity, and administrative support.

The growing importance of industrial parks in Bulgaria is closely connected to broader European and national policy priorities related to territorial cohesion, industrial modernization, economic resilience, and sustainable regional development. European Union cohesion policy and national strategic frameworks increasingly emphasize the role of industrial infrastructure in promoting balanced territorial development and reducing regional economic disparities.

Despite the increasing policy focus on industrial parks, limited academic attention has been devoted to their effectiveness as instruments of regional development policy in Bulgaria. Existing studies frequently focus on investment promotion or infrastructure development without sufficiently examining their broader territorial and socio-economic implications.

The main research question addressed in this study is the following: How do industrial parks contribute to the implementation of regional development policy objectives in Bulgaria?

The objective of the study is to assess the role of industrial parks within Bulgaria's regional development policy framework and to evaluate their contribution to regional economic development and territorial cohesion. The study applies a mixed analytical approach combining qualitative policy analysis, comparative regional analysis, and secondary statistical data analysis.

1. LITERATURE REVIEW

1.1 Regional Development and Territorial Disparities

Regional development has long been associated with the uneven spatial distribution of economic activity, infrastructure, investment, and human capital. Economic growth is rarely territorially balanced, as capital, labor, and innovation tend to concentrate in regions with stronger economic fundamentals, better connectivity, and higher institutional capacity.

Perroux (1955) develops the concept of growth poles, arguing that economic development emerges around dynamic economic centers capable of generating spillover effects to surrounding regions. Similarly, cumulative causation theories explain how economically advanced regions continuously strengthen their competitive advantages, while lagging regions experience structural disadvantages and slower economic growth.

In Bulgaria, regional disparities remain particularly visible following the transition to a market economy and the country's integration into the European Union. Economic activity, investment, and industrial production remain concentrated in Sofia and several large urban centers, while peripheral regions continue to face demographic decline and lower investment intensity.

1.2 Industrial Parks as Instruments of Regional Development

Industrial parks represent organized industrial territories equipped with technical and transport infrastructure designed to support business activity and investment attraction. The literature identifies several advantages associated with industrial parks:

- concentration of industrial activity;
- reduced investment costs;
- improved logistical efficiency;
- infrastructure readiness;
- attraction of domestic and foreign investment.

Industrial parks may also contribute to local economic development through indirect spillover effects such as supplier network formation, labor market expansion, and infrastructure improvements.

However, the effectiveness of industrial parks depends on regional conditions including transport accessibility, labor availability, governance quality, institutional coordination, and market proximity.

In the Bulgarian context, industrial parks have gained increasing strategic importance during the past decade. Nevertheless, academic research on their role as instruments of regional development policy remains relatively limited.

2. POLICY AND REGULATORY FRAMEWORK IN BULGARIA

2.1 Regional Development Policy in Bulgaria

Regional development policy in Bulgaria has undergone substantial transformation following the country's accession to the European Union. Contemporary regional policy increasingly focuses on reducing territorial disparities, improving regional competitiveness, and supporting balanced socio-economic development.

European Union cohesion policy represents one of the principal drivers of regional development interventions in Bulgaria. Through operational programs, territorial investment instruments, and infrastructure financing mechanisms, regional policy seeks to support economic modernization and territorial cohesion.

Industrial parks are increasingly perceived as strategic territorial instruments capable of supporting broader regional development objectives.

2.2 Legal and Institutional Framework of Industrial Parks

The adoption of the Law on Industrial Parks established a legal framework regulating the establishment, management, development, and operation of industrial parks in Bulgaria.

The law defines industrial parks as territorially organized areas intended for industrial activities, logistics, technological development, and accompanying economic services.

Several public actors participate in industrial park development, including the Ministry of Economy and Industry, the National Company Industrial Zones, municipal authorities, and regional administrations.

The National Company Industrial Zones plays a central role in the planning and management of state-supported industrial zones and industrial parks.

Recent academic research has increasingly examined the relationship between industrial policy, institutional transformation, and industrial park development (Stein, 2020). The role of industrial parks in supporting sustainable regional development has also attracted growing scholarly attention (Borodavkina & Mukovnina, 2021). These studies reflect the increasing recognition of industrial parks as components of broader economic and territorial development policies.

2.3 Industrial Parks and European Regional Policy

The development of industrial parks in Bulgaria is closely linked to broader European regional and industrial policy objectives related to industrial modernization, green transition, digitalization, and territorial resilience.

Industrial infrastructure projects are frequently supported through European structural and investment funds and the National Recovery and Resilience Plan.

Industrial parks are viewed as platforms for attracting high-value manufacturing activities, technological investment, and sustainable industrial development.

Recent academic research has increasingly examined the role of industrial parks within the broader context of sustainable territorial development and European industrial policy. Issues related to sustainability, territorial cohesion, and regional competitiveness have received growing scholarly attention in studies of industrial park development across Europe (Bogren et al., 2025). Furthermore, the integration of environmental and resource-efficiency considerations into industrial park planning has become an increasingly important component of contemporary policy frameworks (Kleshchov, 2024). These developments reflect the evolving role of industrial parks as instruments supporting both economic growth and long-term territorial resilience.

2.4 Challenges in the Bulgarian Context

Several structural challenges continue to limit the effectiveness of industrial parks in Bulgaria. The majority of successful industrial parks are concentrated in economically stronger regions with developed transport corridors, larger labor markets, and higher investment attractiveness.

Peripheral regions frequently encounter difficulties related to inadequate transport connectivity, demographic decline, labor shortages, and limited investor interest.

Consequently, industrial parks should not be viewed as isolated policy instruments but rather as components of broader territorial development strategies.

Recent studies on regional development in Bulgaria have also emphasized the importance of integrated territorial approaches when addressing regional disparities and development challenges. Research has highlighted the growing significance of sustainable regional development, territorial competitiveness, and the adaptation of regional policies to contemporary economic and environmental transformations (Petrov & Tsonkov, 2022; Tsonkov & Petrov, 2024). Furthermore, the need for coordinated policy measures combining infrastructure development, investment support, and local capacity building has been increasingly recognized, particularly in rural and peripheral regions (Borisov, Petrov, & Tsonkov, 2024). These perspectives further support the view that industrial parks should be incorporated into broader regional development frameworks rather than implemented as standalone policy instruments.

3. METHODOLOGY

3.1 Research Approach

This study applies a mixed analytical approach combining qualitative policy analysis, comparative regional analysis, and secondary statistical data analysis.

The qualitative component focuses on the examination of strategic policy documents, legislative frameworks, and institutional mechanisms related to industrial park development in Bulgaria.

The quantitative component is based on comparative analysis of regional economic indicators associated with industrial development, investment activity, and labor market dynamics.

3.2 Research Objective

The main objective of this study is to assess the role of industrial parks within Bulgaria's regional development policy framework and to evaluate their contribution to regional economic development and territorial cohesion. The research seeks to examine the relationship between industrial park development, investment attraction, employment generation, and regional competitiveness. Particular attention is given to the extent to which industrial parks can contribute to reducing regional disparities and supporting balanced territorial development in the Bulgarian context.

3.3 Research Methods

The study applies policy analysis, comparative regional analysis, and secondary statistical analysis. The qualitative classifications presented in the comparative tables are based on the author's synthesis of regional statistical indicators, investment activity, infrastructure

accessibility, and industrial concentration data obtained from NSI and Ministry of Economy and Industry sources.

3.4 Data Sources

The study utilizes data from the National Statistical Institute, Eurostat, Ministry of Economy and Industry, National Company Industrial Zones, OECD, World Bank, and European Commission sources.

3.5 Analytical Indicators

The main analytical indicators include regional GDP, employment levels, unemployment rates, foreign direct investment, industrial production, business activity, infrastructure accessibility, and demographic dynamics.

3.6 Territorial Scope of the Analysis

The analysis focuses on selected Bulgarian regions including Sofia, Plovdiv, Burgas, Ruse, and Vidin. These regions are selected due to their differing economic structures, infrastructure conditions, investment intensity, and levels of industrial concentration.

3.7 Research Limitations

The study acknowledges limitations related to data availability, regional comparability, and the difficulty of isolating industrial park effects from broader regional economic processes.

4. RESULTS

4.1 Spatial Distribution of Industrial Parks in Bulgaria

The spatial distribution of industrial parks demonstrates significant territorial concentration. The most developed industrial zones are concentrated in Sofia, Plovdiv, Burgas, Varna, and Stara Zagora regions.

Peripheral regions continue to experience lower investment intensity and weaker industrial development. According to NSI regional labor market data, the unemployment rate in Northwestern Bulgaria remains significantly higher than in Southwestern Bulgaria, illustrating persistent territorial disparities between economically dynamic and peripheral regions.

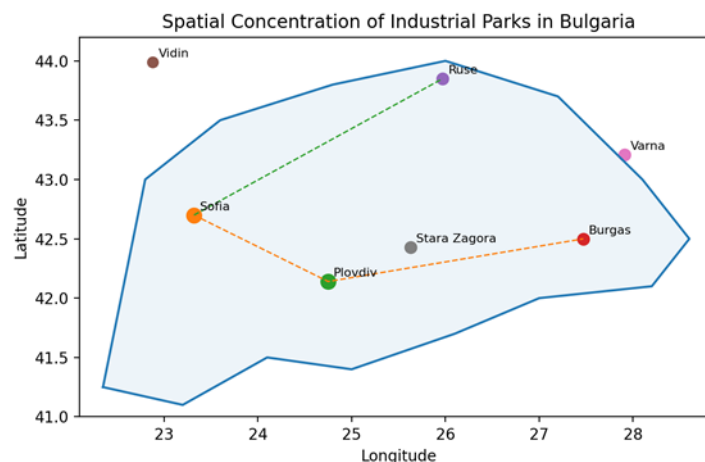
The spatial distribution of industrial parks in Bulgaria demonstrates a clear concentration along major transport and economic corridors, particularly in the Sofia-Plovdiv-Burgas axis. Peripheral regions in Northwestern Bulgaria continue to demonstrate substantially lower levels of industrial concentration and investment intensity.

Table 1. Regional Distribution of Industrial Parks in Bulgaria

Region	Number of Industrial Parks	Main Economic Sectors	Infrastructure Accessibility	Development Intensity
Sofia	High	Manufacturing, logistics, technology	Very High	Very High
Plovdiv	High	Automotive, manufacturing, logistics	High	High
Burgas	Medium	Logistics, transport, manufacturing	High	Medium
Ruse	Medium	Manufacturing, river logistics	Medium	Medium
Vidin	Low	Light industry, logistics	Low	Low

Source: Own elaboration based on NSI and Ministry of Economy and Industry data.

The distribution presented in Table 1 demonstrates a clear spatial concentration of industrial parks in Bulgaria's most economically developed regions. Sofia and Plovdiv exhibit the highest levels of industrial park development, which corresponds with their stronger economic performance, higher investment attractiveness, and better transport connectivity. In contrast, regions such as Vidin continue to demonstrate limited industrial concentration despite their strategic geographic location. This pattern suggests that the development of industrial parks is strongly influenced by existing regional advantages, including infrastructure quality, labor market size, and institutional capacity. Consequently, industrial parks appear to support and reinforce existing economic dynamics, while their capacity to independently generate regional convergence remains limited.

Figure 1. Spatial Concentration of Industrial Parks in Bulgaria

Source: Own elaboration based on Ministry of Economy and Industry and NSI regional data.

4.2 Industrial Parks and Investment Attraction

Industrial parks contribute positively to investment attraction through infrastructure readiness, transport accessibility, simplified administrative procedures, and concentration of industrial activities.

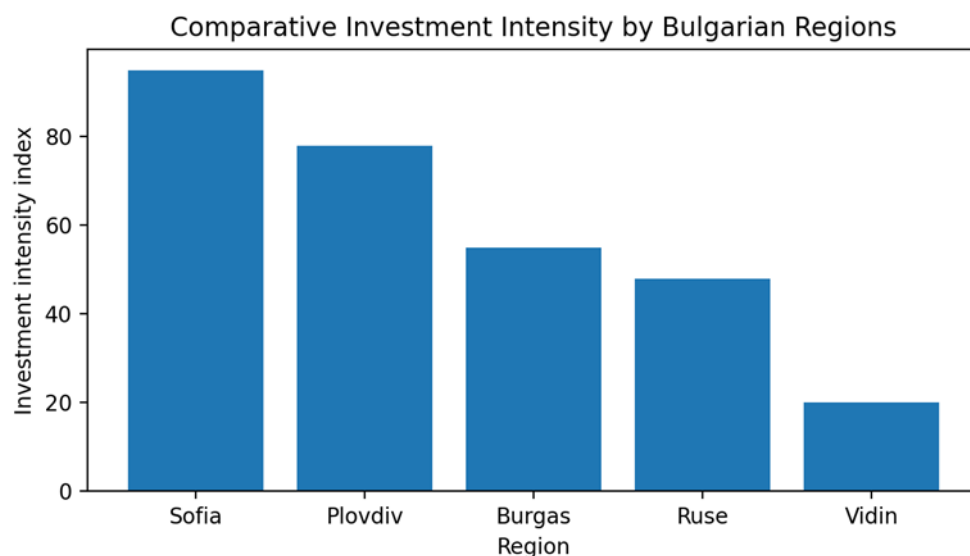
The strongest investment results are observed in industrial zones located near major transport corridors and urban economic centers. Industrial regions around Sofia and Plovdiv continue to attract the largest concentration of manufacturing and logistics investments due to infrastructure accessibility, labor market concentration, and proximity to national and international transport corridors.

Table 2. Comparative Regional Economic Indicators

Region	GDP per Capita	Unemployment Rate	Investment Activity	Industrial Concentration
Sofia	Above national average	Approx. 2%	Very High	High
Plovdiv	High	Moderate	High	High
Burgas	Moderate	Moderate	Medium	Medium
Ruse	Moderate	Moderate	Medium	Medium
Vidin	Among the lowest in Bulgaria	Above 11%	Low	Low

Source: Own elaboration based on NSI regional statistics.

The comparative indicators presented in Table 2 reveal a clear association between industrial park development and regional economic performance. Regions characterized by higher investment activity and stronger industrial concentration also demonstrate more developed industrial park ecosystems. The case of Sofia and Plovdiv illustrates how transport accessibility, labor market availability, and business agglomeration effects may contribute to attracting industrial investment. At the same time, the relatively weaker performance of peripheral regions such as Vidin highlights the limitations of industrial parks as standalone development instruments. Their effectiveness remains closely linked to broader regional economic conditions and supporting infrastructure.

Figure 2. Comparative Investment Intensity Index by Bulgarian regions

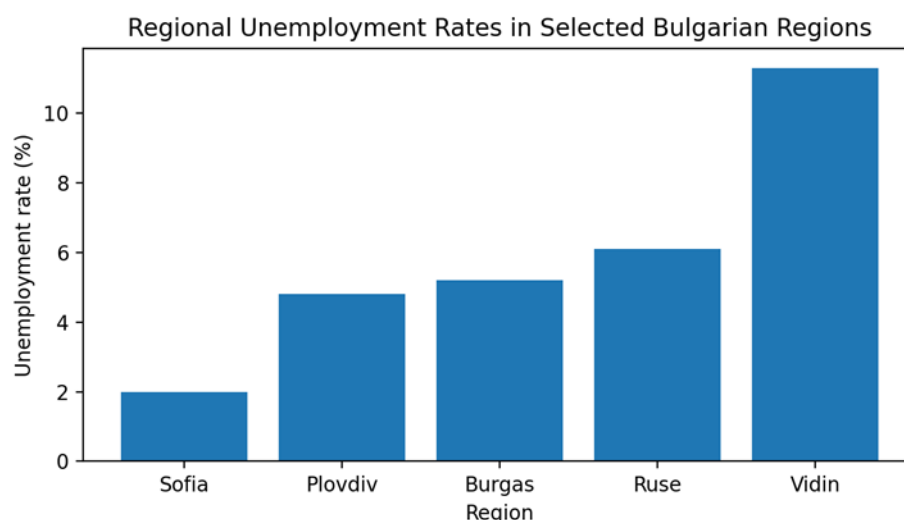
Source: Own elaboration based on regional economic data.

4.3 Employment and Regional Economic Effects

Industrial parks contribute to regional labor market development through employment generation and industrial diversification.

At the same time, labor shortages, demographic decline, and population aging increasingly affect industrial development sustainability. NSI demographic statistics demonstrate continued population decline and aging trends in peripheral regions, particularly in Northwestern Bulgaria, which negatively affect long-term labor market capacity and industrial competitiveness.

Figure 3. Regional Unemployment Rates in Selected Bulgarian Regions



Source: Own elaboration based on NSI labor market statistics.

Table 3. Main Structural Challenges Affecting Industrial Park Development

Challenge	Impact on Regional Development
Transport infrastructure disparities	Limits investment attractiveness
Demographic decline	Reduces labor availability
Labor shortages	Restricts industrial expansion
Institutional fragmentation	Slows project implementation
Uneven investment concentration	Reinforces territorial disparities
Energy and logistics costs	Increases operational uncertainty

Source: Own elaboration.

4.4 Regional Disparities and Territorial Cohesion

The analysis demonstrates that industrial parks possess the potential to support regional development; however, their territorial impact remains uneven. Economically stronger regions continue to attract the majority of industrial investments, while weaker regions face structural barriers limiting their competitiveness.

This creates a policy paradox: regions with the greatest need for industrial investments often possess the weakest investment attractiveness, while regions already characterized by higher competitiveness continue to accumulate additional economic advantages.

Table 4. Comparative Characteristics of Selected Industrial Parks

Industrial Park	Region	Main Sectors	Strategic Advantages	Main Challenges
Trakia Economic Zone	Plovdiv	Automotive, manufacturing	Strong logistics and industrial ecosystem	Labor shortages
Industrial Park Sofia-Bozhorishte	Sofia Region	Manufacturing, logistics	Proximity to Sofia and transport corridors	High operational costs
Industrial Park Burgas	Burgas	Logistics and transport	Port connectivity	Competition for investments
Industrial Zone Ruse	Ruse	Manufacturing and logistics	Danube corridor access	Demographic pressures
Industrial Zone Vidin	Vidin	Light industry	Strategic border location	Weak labor market

Source: Own elaboration based on regional development data.

The comparison of selected industrial parks further illustrates the uneven territorial effects of industrial development in Bulgaria. Industrial parks located in economically dynamic regions tend to benefit from stronger business ecosystems, better infrastructure, and greater labor market availability. Conversely, industrial parks in peripheral regions often face structural constraints that reduce their capacity to attract investment and generate long-term economic spillover effects. These findings suggest that industrial parks can support regional development objectives, but their contribution to territorial cohesion depends on complementary measures addressing infrastructure deficits, demographic challenges, and institutional capacity at the regional level.

4.5 Key Challenges and Structural Limitations

Several structural challenges continue to limit the effectiveness of industrial parks in Bulgaria, including infrastructure disparities, demographic decline, institutional fragmentation, uneven investment concentration, and global economic uncertainty. These challenges demonstrate that industrial parks require complementary regional, transport, education, and labor market policies in order to generate sustainable territorial impact.

5. DISCUSSION

The findings of the study indicate that industrial parks represent increasingly important instruments within Bulgaria's regional development policy framework; however, their territorial impact remains uneven and strongly dependent on broader regional economic conditions.

This conclusion corresponds with recent international research emphasizing the growing importance of industrial parks as instruments supporting regional economic development and territorial competitiveness. Previous studies have highlighted their potential contribution to sustainable regional development, investment attraction, and economic resilience, while also emphasizing the importance of broader institutional and territorial conditions for their effective development and operation (Borodavkina & Mukovnina, 2021; Lee et al., 2023).

A key conclusion emerging from the analysis is that industrial parks function most effectively in regions already characterized by relatively strong economic fundamentals, developed transport infrastructure, labor market concentration, and higher institutional capacity. This finding corresponds with broader European regional development trends, where industrial and innovation-oriented investments tend to concentrate in economically dynamic metropolitan and transport-connected territories.

Within the context of European Union regional policy, industrial parks are increasingly integrated into broader territorial development and cohesion strategies aimed at improving regional competitiveness, industrial modernization, and economic resilience. Similar approaches can be observed across several Central and Eastern European countries, including Poland, the Czech Republic, Hungary, and Slovakia, where industrial zones and special economic areas have played an important role in attracting foreign direct investments and supporting export-oriented manufacturing sectors.

However, comparative experience from Central and Eastern Europe also demonstrates that industrial infrastructure alone is insufficient to reduce long-term territorial disparities. In many cases, economically advanced regions continue to accumulate investment advantages due to stronger connectivity, better workforce availability, and more developed institutional ecosystems. This pattern is also clearly visible in Bulgaria, where regions such as Sofia and

Plovdiv demonstrate substantially stronger industrial dynamics compared to peripheral regions in Northwestern Bulgaria.

Similar observations have been reported in studies examining industrial parks and territorial development in Europe. Recent research has increasingly suggested that industrial parks are more effective when integrated into broader regional development strategies addressing infrastructure quality, innovation capacity, environmental sustainability, and institutional coordination (Bogren et al., 2025; Kleshchov, 2024). The Bulgarian experience presented in this study appears consistent with these broader European trends.

The findings therefore support the theoretical assumptions of agglomeration economics and growth pole theory. Economic activity tends to concentrate spatially around territories possessing cumulative development advantages. Industrial parks may accelerate regional development processes, but they do not independently eliminate structural regional inequalities.

At the same time, the study demonstrates that industrial parks can generate positive regional spillover effects when integrated into broader place-based development strategies. Such effects include infrastructure modernization, labor market activation, local supplier network formation, and increased municipal economic activity.

The analysis also highlights the importance of governance quality and institutional coordination. Successful industrial parks are typically associated with stronger cooperation between municipalities, national institutions, infrastructure operators, investors, and educational institutions. Fragmented governance structures and administrative inefficiencies may significantly reduce the effectiveness of industrial development initiatives.

The importance of institutional capacity and policy coordination has also been emphasized in the broader literature on industrial policy and industrial park development. Recent research has increasingly examined the relationship between institutional transformation, industrial policy, and industrial park development (Stein, 2020). This perspective is consistent with the findings of the present study, which highlight the significance of governance quality and institutional coordination in shaping the effectiveness of industrial parks as instruments of regional development.

Overall, the study confirms that industrial parks can contribute positively to regional competitiveness and economic development in Bulgaria, but their effectiveness remains conditional upon broader territorial, institutional, and socio-economic factors.

5.1 Comparative Perspective within Central and Eastern Europe

The experience of Central and Eastern European countries demonstrates that industrial parks and special economic zones can significantly contribute to industrial modernization and export-oriented growth when integrated into broader national industrial strategies.

Poland, the Czech Republic, Hungary, and Slovakia have successfully utilized industrial zones and industrial clusters to attract foreign direct investments, particularly in automotive manufacturing, logistics, and high-value industrial production. These countries benefited from strong transport infrastructure, integration into European supply chains, and targeted industrial policy incentives.

At the same time, regional disparities within these countries remain substantial, particularly between metropolitan growth centers and peripheral territories. This demonstrates that industrial infrastructure alone cannot fully compensate for structural territorial inequalities.

The Bulgarian case reflects similar dynamics. Industrial parks located within economically dynamic regions such as Sofia and Plovdiv demonstrate substantially stronger investment

performance compared to peripheral territories. Consequently, Bulgarian regional policy should combine industrial infrastructure development with broader territorial cohesion measures.

5.2 Theoretical Implications

The findings of the study support several major theoretical approaches within regional economics and territorial development.

First, the results confirm the assumptions of growth pole theory developed by Perroux (1955). Industrial and investment activity tends to concentrate around economically dynamic territories capable of generating cumulative regional advantages and spillover effects.

Second, the study supports agglomeration theory and New Economic Geography approaches associated with Krugman (1991). Regions possessing stronger infrastructure accessibility, labor market concentration, and economic density demonstrate greater capacity to attract industrial investments and economic activity.

Third, the analysis confirms the importance of cluster-based regional development emphasized by Porter (1990). Industrial parks function most effectively when integrated into broader industrial ecosystems characterized by institutional cooperation, supply-chain integration, and regional specialization.

Finally, the findings correspond with contemporary place-based development approaches within European regional policy. Effective territorial development requires differentiated policy instruments adapted to the specific economic, demographic, and institutional characteristics of each region.

5.3 Policy Recommendations

The findings of the study demonstrate that industrial parks should be integrated into broader territorial development strategies rather than treated as isolated infrastructure projects. Several policy measures may improve the effectiveness of industrial parks as instruments of regional development policy in Bulgaria:

- Strengthening transport and logistical infrastructure in peripheral regions;
- Expanding workforce qualification and vocational education programs;
- Increasing targeted investment incentives for economically weaker territories;
- Supporting innovation-oriented industrial ecosystems;
- Improving institutional coordination between national and regional authorities;
- Integrating industrial parks into smart specialization and green transition strategies;
- Enhancing digital and energy infrastructure supporting industrial competitiveness.

5.4 Research Limitations and Future Research Directions

Several limitations should be acknowledged. First, the availability of region-specific statistical data directly related to industrial parks remains limited. In many cases, industrial park effects cannot be fully isolated from broader regional economic processes.

Second, the study does not apply longitudinal econometric analysis capable of measuring causal relationships between industrial park development and regional economic growth.

Third, territorial heterogeneity across Bulgarian regions creates difficulties in direct regional comparison due to differences in demographic structure, infrastructure accessibility, institutional capacity, and economic specialization.

Future research may focus on econometric analysis of industrial park effects, GIS-based territorial analysis, comparative studies between Central and Eastern European countries, industrial resilience and green transition, and smart specialization and regional innovation ecosystems.

CONCLUSIONS

Industrial parks have become increasingly important instruments within Bulgaria's regional development policy framework. The study demonstrates that industrial parks can contribute positively to regional economic development by improving infrastructure readiness, facilitating investment processes, supporting industrial activity, and generating employment opportunities.

At the same time, the analysis reveals that the effectiveness of industrial parks varies considerably across Bulgarian regions. The findings indicate that industrial parks alone cannot eliminate regional disparities. Their territorial impact depends on broader socio-economic conditions and complementary regional development measures.

The research demonstrates that industrial infrastructure is most effective when integrated into broader territorial development strategies combining transport connectivity, workforce qualification, innovation policy, institutional coordination, and targeted regional investment support.

Comparative analysis with Central and Eastern European countries further confirms that industrial parks can support regional competitiveness and export-oriented industrial growth; however, they cannot independently compensate for structural territorial inequalities.

Overall, industrial parks represent valuable instruments of regional development policy in Bulgaria, particularly when implemented within integrated territorial development frameworks capable of addressing long-term regional economic disparities and strengthening regional resilience.

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REGIONAL DEVELOPMENT IN FOCUS: ANALYSIS OF THE LEADING PARTIES' PROGRAMS IN BULGARIA 2026 PARLAMENTARY ELECTIONS

ABSTRACT

Bulgaria has held 8 early elections for a National Assembly in the last 5 years. This political instability is affecting the effectiveness of public governance and the country's regional development. The study aims to compare the election programs of the political formations that entered the new parliament. The analysis assesses the extent to which the programs prioritize regional development. The paper outlines the relationship between a full-mandate parliamentary governance and the implementation of effective regional policy. Parliamentary election programs of six parties are evaluated with the OECD criteria for the implementation of regional policy. The results show the place regional development has in the political vision of the new legislative authority in the country. A limitation of the analysis turned out to be the weak applicability of the methodology used to election programs. The main conclusion is that regional policy is clearly and comprehensively represented in the parties' proposals for the

development of different sectors. A need is outlined for the development of a more precise tool for analyzing political documents on regional topics.

KEYWORDS: regional development; regional policy; Bulgaria; political parties; election programs

JEL: H11, O20, R58

INTRODUCTION

Bulgaria has been in a political crisis since 2021, which has resulted in eight parliamentary elections (Vinarov, 2025). During the same period, the country has had seven caretaker governments and only three regular ones. This period coincides with the European Union's multiannual financial framework for 2021-2027 (Laffan, De Feo, 2020). The investments and projects that Bulgaria can implement with funds from the structural and cohesion funds require consistent policy, continuity of governance, and inter-institutional cooperation. Constant changes strongly hamper these processes in the legislative and executive authorities. The period 2021-2026 also coincides with the planning, development, negotiation and implementation of the Recovery and Resilience Plan for Bulgaria. This is an investment instrument of the European Union to support member countries after the COVID-19 crisis (Ceron, 2023). Investments under this plan differ from those available through the structural funds because they require legislative reforms in previously agreed areas. A recent study shows that in different EU countries, "the divergence between the parties that designed the plans and those tasked with implementing them underscores the importance of adaptability in ensuring the

success of the NRRPs” /National Recovery and Resilience Plans/ (Borghetto, Quaglia, Guardiancich, 2026, p. 88). In Bulgaria, with 3 regular and 7 caretaker governments during the development and implementation of this plan, the challenges ahead of a possible success are enormous. Pastarmadzhieva and Angelova (2021) examine the association between governmental strategies and measures, on the one hand, and societal trust in political elites, on the other. They conclude that "not only the measures resulted in trust, but trust is relevant for the effectiveness of the measures" (Pastarmadzhieva & Angelova, 2021, p. 22). From that perspective, political parties' programs serve as an essential link between declared policy measures and societal expectations.

In this study, the analysis focuses on the election programs of the five political parties that achieved parliamentary representation in the eighth early parliamentary elections held on April 19, 2026. The subject of the study is the place of the policies and measures in the field of regional development that the parties prioritize for the new parliamentary mandate (April 2026 - April 2030). The purpose of the analysis is to determine whether there is a regional focus in the visions of the political parties granted the right to participate in legislative power.

The main limitation is that the study examines only the election programs for the April 19, 2026, parliamentary elections. The programs are compared by their regional policy focus at the subnational level. The content analysis did not consider geostrategic regional issues. The hypothesis tested here is that parties have a limited regional approach in their election proposals.

1. METHODOLOGY

Several considerations drive the methodological approach. “Regional development policy, because of its degree of development, is a policy that covers several fields of activity, which means that a large number of institutional actors are involved in its design and implementation” (Tsonkov, Petrov, 2025, p. 200). First, the ongoing political process in the country was analyzed for the period May 2021 - May 2026. This was a time of political instability, leading to a dysfunctional legislature. Second, from a regional studies perspective, basic factors are defined for the successful implementation of regional policy. The empirical part is a content analysis of six election programs. They are examined with OECD criteria for regional policy development. The chosen approach is used to avoid subjectivity in the assessment. The OECD's ten criteria for regional policy development are as follows (OECD, 2023):

1. Regional development strategy (approach) that creates conditions for all regions to contribute to the country's economic performance, national well-being, environmental sustainability, socio-economic stability, and the overcoming of regional inequalities. This strategic approach includes integrating sectoral policies and investments to support regional development and using the specific advantages of each region. The well-being of people in the regions, especially the various vulnerable groups. Support for the regions to develop their strengths and attract investors, talent, young people, and businesses.
2. Territorial scale(s) for policy action, which include creating better conditions for decentralization at the local level. This also includes ensuring that small towns and rural areas are included in the focus of national and regional territorial development policies.
3. Co-working with local authorities for policy making with regional specifics and stakeholders.
4. Resilience and sustainability. This includes indicators for the development of a carbon-neutral economy, a green transition, including investments in a circular economy. Another emphasis is access to digital infrastructure at all levels, including in rural areas. This category also includes support for regions in demographic transition. This includes proposals to provide

services needed for the ageing population in some towns and villages, and to address the pressure from an increased population in large cities. Building policies that lead regions into the future, rather than deepening the gap.

5. Data-driven regional policy planning, based on dynamic quantitative and qualitative data from the regions themselves through geo-statistics, big data, etc.

6. Multi-level governance, which includes effective interaction between authorities at national, regional and local levels for the benefit of developed policies. This also includes better inter-sectoral coordination in the implementation of strategies, investments, and projects such as more active bottom-up interaction in the management of regional problems.

7. Administrative capacity and their staff in terms of regional planning, regulations, program and project management, public procurement and public-private partnership, finance and budgeting, infrastructure investments, data management, working with stakeholders, building partnerships, monitoring and evaluation of activities in the field of regional development.

8. Financial resources for regional development. Financial resources for regional development. This includes recommendations for better coordination between national and regional goals in budget planning. Prioritization of regional infrastructure projects in the national budget. Targeting funds to specific regions and regional themes through dedicated funds and broadening the sources of funding for regional policies and development.

9. Integrity in Dissemination and Transparency. Better interaction between national, regional and local authorities to raise awareness of opportunities, promote results, reduce uncertainty and risks for successful regional policies.

10. Monitoring, control, and efficiency mechanisms that allow regular measurement of regional development outcomes. This indicator for regional policy is most useful with the recommendation that it is important to measure coherence between individual policies in the context of regional objectives.

2. ANALYTICAL FRAMEWORK

2.1. Political parties and the role of their programs

Political programs are a fundamental element of political parties. They express their ideology, principles and philosophy and “reflect the vision of political entities regarding the role of the state in economic life, the scope of functions of regulatory institutions, the understanding of the degree of permissible state intervention in the form of restrictions and support for the business” (Nusheva, 2022, p. 18). Political parties are “define as public political organizations whose goals are to express the will of citizens, participation in the political process and state governance” (Asenov, 2011, p. 293). Programs express the nature and goals of the proposed policy. Programs explain how parties intend to use state power, but they also outline sectoral policy priorities. Generally, parties develop a long-term program for the country's development with a horizon of more than 15 years or more than 3 governing terms. In this way, even the longest-term sectoral reforms can be implemented. Parties should also regularly develop election programs that outline their goals for one governing term. Such a program is expected to follow the long-term party program.

Parties also develop a governing program in accordance with the country's current Administration Law. Such a program can be prepared when they win the elections, but also earlier. Some parties prefer to have their own governing program to use in subsequent coalition

negotiations. Other parties make hybrid programs. Then their election program is titled 'governing'. There is also a marketing effect that indicates that this party sees its place in power.

Not all parties follow these alphabetical rules when organizing party documents. In some cases, they do not have time for this. In other cases, they do not develop the necessary culture for the purpose. When a party is new, established before elections, it does not have time to prepare comprehensive party programs. It usually proposes a longer pre-election program that provides a guideline for this party's longer-term intentions. One of the first checks whether parties approach elections responsibly and professionally is the development of an election program. All the parties we are considering here have such documents.

In Bulgaria, in the preliminary elections held on April 19, 2026, the five political formations that found a place in the new parliament are: Coalition "Progressive Bulgaria", Coalition GERB-SDF, Coalition "We Continue the Change - Democratic Bulgaria", Political Party "Movement for Rights and Freedoms", and Political Party "Vazrazhdane". The parties are listed in the text according to their current electoral weight (CEC, 2026).

A series of anti-government protests after 2020 triggered a transformation of the Bulgarian political system (Tachev, 2024, p. 66). Actually, most of the parties analyzed here are new, established shortly before or even after 2021, and achieved parliamentary presence during this short but politically turbulent period. As Asenov (2021) analyses, the Bulgarian political parties and political representativeness are in crisis due to complex deficits in the relationship between citizens and political elites.

As a result, the country moved between the 45th and 52nd parliaments in six years. One plan for the legislative activity of the National Assembly is for a period of six months, from January to June and from July to December, respectively. Four of the parliaments from the period under review do not have a full six-month legislative cycle. In these conditions, it is very difficult to implement a sustainable regional policy to overcome inequalities and balance regional development in the country. In the described conditions, there is no predictability in the legislative process.

2.2. Factors of a working regional policy and the legislative authorities' role

Regional policy at the subnational level can be considered at the micro, meso and macro levels. At the micro level, this primarily involves activities within the scope of the Ministry of Regional Development. At the meso level, regional policy is also the implementation and management of EU-funded projects. European funds and projects are the most direct expression of the regional policy and objectives of the EU in terms of the balanced development of the different regions of the union. National governments play a leading role in achieving this balanced development within each member state's territory. Regional policy entails a comprehensive state strategy to overcome inequalities and develop the country.

"In the process of regional development management, it is important to formulate goals and priorities that are tailored to the specific needs and internal potential of each region. A fundamental issue that deserves attention is how the state regional development policy would support the competitive advantages of the regional economy "(Vasileva, 2025, p. 36). The essence of that approach "means supporting and prioritizing the development of regions and administrative units that can become locomotives of progress and development" (Georgieva, 2022, p. 58). At the macro level, regional policy is more than the work of a ministry, the overall management of European funds, or a strategy for the development of regions. It is about

balanced territorial development, not only at the regional level, but in each town and village. Such development is a subject of policies in all sectors and spheres. This is the implementation of sectoral policies that also take into account territorial effects, so that there is no opposition between sectors. "Territorial development in Bulgaria seems to be related to the state's desire to achieve a balance of interests" (Petrov, 2019, p. 47). Inter-sectoral synchronization is required. "In the institutional and spatial aspects, regional level analyses are important for the assessment of regional development and the implementation of regional policies" (Tsonkov, Petrov, 2025, p. 198). More data-based governance and management is the new mainstream planning approach, enabling the foreseen differences in the territorial effects of a given policy.

Only regular governments can propose a full mandate for the country's development. Over the analyzed 5-year period, the country had 3 regular governments and 7 caretaker governments. In such circumstances, even if political parties have regional policies in their programs, there has been no time to implement them. That is why, because "the regional development policy is a long-term, cross-sectoral, multi-level policy that aims to improve the contribution of all regions to national performance and reduce inequalities between places and between people by promoting long-term sustainable development in all regions through strategic and targeted public policy, investment and service provision measures that are tailored to the specific needs and opportunities of regions and their inhabitants" (OECD, 2023). At the same time, the implementation of public policies and programs requires evaluation based on previous results, adjustment to current societal expectations and regional development needs, and alignment with political possibilities (Nikolov, Tanakov, Bakardziev, 2018, p. 32).

On the one hand, in this paper, the intentions of political parties are monitored for the future realization of policies. It has to be taken into account that "the public policy is the decision made, not the intention or promise to do something, i.e. its implementation is evaluated" (Veleva, 2024, p. 21). On the other hand, the members of parliament are elected from electoral districts, most of which coincide with the so-called 3rd-level regions (NUTS 3). The administrative districts are, at the same time, the 3rd-level regions for regional planning and also multi-mandate electoral regions for political elections and public policy development. The deputies from these districts are interested in prioritizing local and regional problems that they can link to the parties' election programs.

3. RESULTS

In the April 19, 2026, parliamentary elections, the Progressive Bulgaria Coalition won an absolute majority with 131 seats. The GERB-SDS coalition came in second with 39 seats. The third was the We Continue Change - Democratic Bulgaria coalition with 37 MPs. However, this coalition split into two parliamentary groups - one of the Democratic Bulgaria coalition with 21 seats in parliament and one of the We Continue Change party with 16 representatives in the legislative body. The fourth in terms of votes is the DPS party with 21 MPs. The fifth is the Vazrazhdane political party with 16 MPs (CEC, 2026). Following the split of one coalition, there are six formations in parliament, whose programs are analyzed here.

It turned out to be very difficult to precisely determine whether an election program has a regional and territorial focus using the OECD criteria. They seem more applicable to the evaluation of government strategic documents. They are not entirely suitable for election programs because these programs contain more ideological and political presumptions, not good governance principles. However, the results here are presented in a manner consistent with the OECD criteria and by party.

Table 1. Results of the comparative analysis of six election programs from the preliminary parliamentary elections in Bulgaria (19/04/2026) based on the OECD criteria for regional policy development

OECD criteria	PB	GERB	DPS	DB	PP	Vazrazhdane
1. Regional development strategy (approach)	yes	yes	yes	yes	partly	no
2. Territorial scale(s) for policy action	yes	yes	yes	yes	partly	no
3. Co-working with local authorities for policy making with regional specifics	partly	partly	yes	partly	partly	no
4. Resilience and sustainability	yes	partly	no	yes	yes	yes
5. Data-driven regional policy planning	yes	yes	yes	yes	no	no
6. Multi-level governance	partly	partly	partly	yes	partly	no
7. Administrative, strategic and technical capacity	yes	partly	no	yes	yes	partly
8. Financial resources for regional development	partly	yes	yes	yes	partly	partly
9. Integrity in Dissemination and Transparency	yes	yes	yes	yes	partly	partly
10. Monitoring & control of an efficiency mechanism and an efficiency mechanism	yes	yes	yes	yes	yes	partly

Source: author's results

Legend:

PB – Coalition “Progressive Bulgaria”

GERB – Coalition “GERB-SDF”, only the program of the leader of the political party GERB is presented

DPS – Party “Movement for Rights and Freedoms”

DB – Coalition “Democratic Bulgaria”

PP – Party “Continuing Change”

Coalition “Continuing Change – Democratic Bulgaria” is divided into two parliamentary groups in the new National Assembly, as defined in the table according to their current place in the structure of the National Assembly.

Vazrazhdane – Party “Vazrazhdane”

Progressive Bulgaria aims to develop the country into a "regional hub for innovation and technology". GERB brings to the forefront the "reindustrialization of the regions". DPS advocates "a new model of regional policy, which includes modern digital analysis of resources" with a multi-sectoral approach. The political party "We continue the change" talk about "unlocking the growth of the regions". The coalition "Democratic Bulgaria" stands behind the idea of a "strong regions, sustainable communities and true decentralization". The Vazrazhdane Party proposes a targeted state policy for “development of the regional economy and overcoming regional imbalances”. These formulations are the titles of special sections in the electoral programs devoted to regional policy.

However, regional policy and development are not only narrowly limited and isolated, and therefore, this analysis attempts to derive regionally significant proposals from other sectoral topics in the monitored programs.

The comparative analysis shows that all parties have a strategic vision for more developed regions. An example of this to the greatest extent is the infrastructure, transport and industrial ideas. Most of them have a strong commitment to territorial development with special proposals for the lagging regions. They are declaring their intention to direct industrial zones, lead tourist infrastructure development, and digitalize less developed regions. However, political parties' readiness to work with local authorities for regional development is more limited. Their ideas have a regional scope, but are centralized as policies and investments. Decentralization of municipalities, including financially, is not among the leading priorities of most parties. All parties support regional initiatives to strengthen resilience to crises and promote sustainable development. Such are the proposals for restoring irrigation systems, ensuring energy security, and promoting sustainable green public transport. Most parties have identified the implementation of monitoring systems and the measurement of various indicators of policy effectiveness. They emphasize new technologies, intelligent systems, big data, and artificial intelligence as tools to improve visibility, traceability, and policy outcomes.

Centralized regional development remains the leading approach in most of the programs. The monitored programs rarely consider local government and civil society participation as a factor in the proposed regional policy. Most parties have ideas for administrative reform. One direction for change is to reduce the number of civil servants, but there are also ideas for merging and closing governing structures, such as ministries and agencies. The other direction focuses on the digitalization of administrative services. Financial resources for regional development are expected to be provided by European funds. This is understood from the fact that the proposals addressed to the regions overlap to a high degree with European priorities and programs. In the election programs, measures for better monitoring and publicity are not in focus, but there is a serious commitment to the fight against corruption, a better regulatory framework, and the pursuit of results.

4. DISCUSSION

Many differences are not taken into account because the OECD criteria cannot be applied to election programs. A closer reading reveals a different weight given to the regional focus in the individual programs. Progressive Bulgaria Party and GERB prioritize general socio-economic development over regional development in their program approach. We continue the change, and DPS pay more attention to the role of regions and to the adaptation of policies through the leading goal of improving regional welfare, opportunities, and quality of life. Their proposals have a different philosophy, but are strongly tied to more opportunities for the regions. Democratic Bulgaria's party program has a different ideological foundation, grounded in initiatives from the regions themselves, but also pays great attention to regional development across policy sectors and cross-sectoral priorities. Vazrazhdane Party offers the least focused regional policy, but in its sectoral policy proposals, it includes several measures to develop regions.

The analysis allows it to be summarized that each party is focused on regional development, both sectorally and cross-sectorally. This is good news on the threshold of the new European funding period 2028-2034. The ruling party, Progressive Bulgaria, which won a full majority in parliament, can count on understanding and support on a number of regional issues, because they are also a priority for the opposition parties. At the same time, the new electoral situation allows the ruling party a full mandate, which regional development greatly needs.

If the programs are not viewed through an ideological filter but only pragmatically, similar priorities will be found in each. The analyzed documents contain proposals for industrial zones, the digitalization of economic activities and administrative services, access to services across all parts of a region, and transport connectivity to larger cities with social infrastructure. The priority for all is also large infrastructure projects, regional employment, the qualification of young people, and social integration of the elderly. In agriculture, irrigation is becoming a priority for political parties, including improving the functioning of agricultural holdings. The demographic crisis is less in focus in the programs than expected. Better transport accessibility to national resorts and tourist sites is a common priority in most programs. The emphasis is on developing a regional and local tourist product. For the energy sector, a wider range of proposals is included, mostly focused on energy sustainability and independence. Municipal financial decentralization is timidly stated in some programs but has not been widely developed with concrete proposals and specific measures.

The results lead to the conclusion that regional policy cannot be considered solely functional or a second-level policy governance. Regional policy is not a collection of technocratic decisions; it has ideological prerequisites, without which it cannot be analyzed, evaluated, or understood. The strong alignment of regional priorities across the different programs shows that the difference will lie in the political approach used to resolve these regional issues. The hypothesis that the parties do not prioritize regional problems in their programs was not confirmed. On the contrary, it turned out that there is a separate regional focus in the election programs. In addition, solutions to regional problems are sought through the different sectoral policies.

CONCLUSION

These OECD regional policy development criteria enable testing a new approach to evaluating election programs. The result is partial, insofar as the parameters of the analytical tool used do not apply to political documents, but rather to strategic ones. The work for finding a regional development-related method for an evaluation of political programs has to continue because regions are often also electoral districts. The same territory is a place for socio-economic planning and political campaigns. Although regional science has a serious interest in engaging more methodologically with political science, there are few tools for measuring political programs against regional development criteria.

Therefore, there remains a need for a more effective interdisciplinary analysis of regional issues and approaches in election programs. For a start, the very attention to these issues is a good basis for accumulating more and more in-depth analytical results. The debate on the need for a regional perspective and on examples of political priorities could help future candidates for parliament when presenting their election programs in their constituencies.

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TERTIARY INSTITUTIONS AND FLOOD GOVERNANCE IN LOKOJA METROPOLIS

ABSTRACT

The increasing rate of flooding across the globe has arguably compelled governments to intensify efforts toward addressing the challenge using flood governance. While the government is expected to provide direction in flood governance, it cannot singlehandedly effectively solve this problem given its multifaceted nature. Therefore, this study seeks to examine the role of tertiary institutions in flood governance in Lokoja Metropolis. It adopted mixed methods together with Chi-square and Statistical Package for Social Sciences for its data collection and analysis. The findings of the study revealed that the tertiary institutions have contributed significantly to generation of knowledge and awareness creation through various activities such as conducting on-site studies in flood-prone communities, gathering data on rainfall and river levels; and organizing seminars and workshops on flood risks and safety measures in Lokoja Metropolis but their efforts toward provision of relief materials/services to flood victims are not impressive. The study concluded that tertiary institutions have contributed significantly in flood governance in Lokoja Metropolis and recommended that tertiary institutions should collaborate with their alumni to set up a Foundation that will regularly raise funds for provision of relief materials etc.

KEYWORDS: tertiary institutions; flood governance; knowledge generation; relief materials

INTRODUCTION

Problem of under reported news about the consequences of climate related events in Africa is arguably persisting but the ineffective coping measures in developing countries on account of poor resources is more concerning (CRED, 2015; Reinhardt, Fu & Balikuddembe 2019); exposing the place of flooding as the most wide-spreading climate event in Africa. It poses a serious threat to sustainable development goals especially in Sub-Saharan parts of the continent (Adedeji, Odufuwa & Adebayo 2012; Olanrewaju et al.2019). Nigeria is not as exception as many communities are faced with perennial flooding related challenges especially during rainy season. It is revealed that 20% of the country's population is vulnerable to flooding (Etuonovbe 2011; Njoku, Efiang & Ayara 2020; Abimbola et al. 2020).

Kogi state presents a good picture of the disastrous nature of flooding in Nigeria; showing the meeting point of Niger and Benue rivers next to its capital city overflow; flooding the river catchment areas of the state especially Lokoja metropolis. As at 2018, flood related deaths and displacements stand at 250 and 85, 000 respectively among other damages amounting to huge sums of money in dollar terms (National emergency Management Agency; Oyedele et al.; the Federal Government of Nigeria with technical Support from the World Bank, EU, UN, and Other Partners in Nche, 2024). The incidence in September, 2019 was very impactful; submerging 150 communities and that of 2022 which affected nine local government areas

including Lokoja that borders the Niger and Benue rivers; fueling the submission of flooding as a humanitarian tragedy, as its effects on health and livelihood of the people are unquantifiable (Onyedinefu 2022; Davies 2022; Nche 2024).

The above underscores the conundrum nature of the incidence as well as the suitability of flood governance involving not just the political authorities but also other stakeholders such as civil society organization, community members and academic institutions among others. “It is widely recognized that structural measures alone cannot manage increasing flood risk, although conventional structural measures, such as dykes and dams, continue to play a key role of mitigating damage. The integrated approach includes land use regulation, infiltration and retarding facilities in urban areas, non-structural measures, and emergency response in addition to structural measures. A conventional flood risk management (FRM) approach, which has been developed based on mainly civil engineering, hydrology, and other related engineering, covers mainly engineering solutions including embankments, dykes, and dams” (Associated Program on Flood Management; Jha; WMO in Ishiwatari, 2019: 2). This informed the resolve of many countries to adopt integrated approach involving several stakeholders such as national and sub-national governments, civil society organizations, academia, private sector organizations and local communities (Ishiwatari, 2019).

Meanwhile, both public and private sectors have a responsibility in flood governance such as provision of humanitarian aid to victims. For instance, in the United State at the federal level, there are Department of Homeland Security, Department of Housing and Urban Development, and Department of Health and Human Services among others. To be sure, FEMA distributes humanitarian aid such money from its Disaster Relief Fund. State and local authorities are not left out as there are also local departments of emergency management, a long-term recovery authority/committee usually led by a government agency that responds to climate issues. On the other hand, private sector also plays an important role by raising funds from private business and individuals for disaster recovery. Beyond this, insurance organizations provide insurance coverage before climate related events and compensation for loss. A wide range of corporate and nonprofit organizations assist in disaster-relief activities, from partnering with community organizations to rebuild a neighborhood to providing immediate economic support for households and families. Nonprofits are also essential in providing direct services such as housing support, health services, financial counseling to affected constituents (Chandra, Moen & Sellers, 2016).

However, higher learning institution arguably remains one of the critical stakeholders in flood governance; focusing majorly on awareness creation and resilience capacity building among others. Tertiary institutions play a pivotal role in shaping knowledge; offering evidence driven solutions and innovation to promote the achievement of Sustainable Development Goals (including addressing climate issues) through rigorous research (Bhowmik et al. 2017; Leal Filho et al. 2018; Albareda-Tiana et al. 2020). Collaboration with tertiary institutions offers an opportunity for achieving sustainable development (Trencher et al, 2014) through flood governance. In 2021, Bindura University of Science Education, Mashonaland Central Zimbabwe had collaboration with the country’s Ministry of Environment to address climate related issues. The University played a leading role carrying out studies on climate change. World Wide Fund for nature (a nongovernmental organization) has on several occasions seen partnering with several universities to solve climate challenges through flood governance approaches (Dzvimbo, Mashizha, Zhanda & Mawonde, 2022).

The Triple Helix innovation model further exposes the place of tertiary institutions in flood governance as it basically explains the relationships between university, government and industry in meeting the demands of organizational innovation in a knowledge-based society.

Innovation which is conceptualized as reconfiguration of elements into a more productive combination requires a critical role of the university since innovation goes beyond new product development by the industries (Etzkowitz, 2008). The boundaries between public and private, science and technology, university and industry are in flux. Universities and firms are assuming tasks that were formerly the province of the other sectors. Shaping these relations is increasingly a subject of science and technology policies at different levels. University, industry and government relations can be considered as a triple helix of evolving networks of communication (Etzkowitz & Leydesdorff, 1997). University could educate, conduct studies and assemble stakeholders to share experiences, enhance the knowledge base and facilitate improved decision-making for policy and practice as university is the center of excellence regarding research and dissemination of research findings to the public (Anwarul & Shaw, 2015).

Flooding across the globe has become a national disaster, impacting greatly on socio-economic development of countries amidst various strategies implemented by political authorities to address it. This necessitated several studies interrogating the intricacies of flooding as well as adaptive/resilient mechanisms adopted over the years. For instance, there were exogenous factors in collective policy learning for flood governance in Netherlands; and social learning and collective action in flood hazard management in Canada (Douwe, de Voogt & James 2019; Emdad, Abul, Jobaed & Mahed, 2025). There is an increasing acknowledgement in studies on learning in policy system which involves collective players responsible for policymaking; showing the impactful state of endogenous factors (leadership, resources and collaboration) and exogenous factors (societal disruptions such as climate events, policy reforms in related sectors, and impact of broader political and economic systems) (Bennett & Howlett, 1992; Heikkila & Gerlak, 2013; Nilsson, 2006; Sabatier, 1988; Williams, 2009).

There are other studies carried out to unpack flood risk governance, climate change adaptation as well as resilience especially in urban areas across the globe (Prabhakar et al. 2009; Hughes 2013; Anguelovski et al. 2014; Bahadur & Tanner 2014; Blok 2016; Chu et al. 2016; Rumbach 2016; Allen et al. 2017; Garschagen and Marks 2019; Joshi 2021) but the uncommon increase in detrimental effects of climate change on property and livelihood has necessitated the inclusion of social learning within the academic and policy environments; providing an opportunity for changing the narrative (Choudhury et al., 2021a; Imperiale & Vanclay, 2021; Lejano et al., 2021).

As relevant as the above studies appear in filling the existing scholarly gap on flood governance; it suffices to observe that the role of higher institutions in ensuring flood governance especially in Nigeria remains insufficiently addressed. Supporting this submission, Morrison et al in Dordi, Henstra & Thislethwaite (2022) argues that a systematic review recently conducted reveals that studies on flood governance are still scanty. This submission is found in relatively newly written studies published since 2008; underscoring that most papers are on specific areas of flood governance such as determinants of flood risk perception (Lechowska, 2018) and strategies to flood vulnerability assessment (Rehman et al, 2019); while other studies focused on individual countries such as recent ones on Ghana and United State (Tyler et al; Mensah & Ahadzie in Dordi et al, 2022). This explains the novelty and relevance of this study designed to interrogate tertiary institutions and flood governance in Lokoja Metropolis with its research questions as follows:

- i. Have tertiary institutions contributed significantly to knowledge generation against flooding in Lokoja metropolis?
- ii. Have tertiary institutions assisted significantly in creating awareness for flood adaptation/resilience in Lokoja metropolis?

iii. Have tertiary institutions contributed significantly to providing relief materials/services for flood victims in Lokoja metropolis?

1. LITERATURE REVIEW

1.1 TERTIARY INSTITUTIONS

Tertiary institutions include diverse academic establishments of higher learning such as colleges of education, polytechnics and universities, which are small parts of larger society organized with a view to conducting researchers and providing teaching and community services (Ogunode & Ayeni, 2024). It could also be conceptualized as a part of the general society, comprising people of different backgrounds, values and culture among others (Ogunode & Odo, 2023). Tertiary institutions are responsible for producing manpower for national development which underscores the intensive teaching, research and community services (Akin-Ibidiran, Ogunode & Ibidiran John, 2022).

The above explains the critical role tertiary institutions not just in development of knowledge economy but overall development of a country; justifying the huge investment in education precisely higher institutions of learning by responsible governments across countries. This arguably informed the submission of Ogunode, Edinoh & Okoli (2023) that tertiary institution is a deliberately designed system of education for the complete development of people as well as transformation of society, using teaching, research and community service. Tertiary institutions are established in Nigeria as agents of societal development; underscoring their objectives which include providing affordable and accessible quality education both formally and informally based on the needs and aspirations of Nigerian citizens, training high-level manpower, providing quality counseling on career and lifelong learning programs among others; thereby contributing to national development (National Policy on Education, 2013).

1.2 FLOOD GOVERNANCE

20th century witnessed a “welfare state strategy” adopted to address flood issues; where political authorities implemented control measures aimed at separating people from water and providing relief materials to victims of flood (Bergsma, 2019). However, the cost implication of rehabilitating and changing flood control measures among others has made governments to give more attention to flood governance, doing away with the traditional welfare state strategy (Begum et al, 2007; Klijn et al, 2012; Thieken et al, 2016). Flood governance emphasizes the inclusion of other relevant stakeholders such as non-governmental organizations, developers and property owners among others (Johnson & Priest, 2008; Tippet & Griffiths, 2007). To be sure, flood governance suggests for the implementation of wider approaches to minimize vulnerability of populace, infrastructure and property to flooding (Hegger et al, 2018a).

Some countries such as Scotland, England, United States, Netherlands, Germany, China and India have implemented principles of flood management (Begg et al, 2015; Butler & Pidgeon, 2011; Klijn et al, 2008; Jong & van den Brink, 2013; van Buuren et al, 2016; Cook et al, 2016; Bergsma, 2019; Sayers et al, 2013) but there are challenges arising from the implementation of these principles, and they include divergent and competing interests among stakeholders; situating flood governance policy objectives within the existing laws and institutional culture; and effective and efficient allocation of resources (Dieperink et al, 2016, Priest et al, 2016). These challenges explain the reason for paradigm shift from flood management to flood governance; underscoring the arrangements put in place aimed at coordinating actions of

government and societal actors to attain purposeful objectives (Peters, 2014; Thistlethwaite & Henstra, 2019).

Flood governance is conceptually viewed as an assemblage of actors, organizations, resources and discourses in the management of flooding (Hegger et al, 2018b). It could also be viewed as a collaborate effort by various stakeholders aimed at developing and implementing strategies to manage flood. Comparative analysis of flood governance across countries has been effective in determining the capacity of actors to work together; the interplay of policy instruments; and the strategies adopted by different institutions; coordinating agencies, intergovernmental relations among others; shaping interaction among actors and fueling cohesion across various sectors (Kaufmann & Wiering, 2017; Liefierink et al, 2018; van Doorn-Hoekveld et al, 2016).

1.3 TERTIARY INSTITUTIONS AND FLOOD GOVERNANCE: ESTABLISHING THE LINK

Education as well as academia is a foundation for sustainable development across the globe (Pappas, 2012); due to the place of higher learning in the promotion of Sustainable Development Goals precisely in the aspect of climate change (King 2011; Kupika, Mbereko & Chinokwetu 2020; Leal Filho et al. 2018; Mawonde & Togo 2019; UNESCO 2014). The importance of education as a fundamental human right is reinforced in constitutional provisions of several countries (Lee, 2020); giving more strength to Sustainable Development Goal4 which envisions equitable education across the world; supporting lifelong learning prospects without any form of discrimination (Kwauk 2020; Mashizha & Dzvimbo 2018; Mawonde & Togo 2019). This explains the emphasis by United Nations Department of Economic and Social Affairs on collaborations among states, citizens and private sector organization in implementing development programs (UN 2016; Jomo et al. 2016). Accordingly, teaching, research and innovation by higher education institutions are critical in driving the implementation of Sustainable Development Goals to address climate challenges such as flooding (Dzvimbo, Mashizha, Zhanda & Mawonde, 2022).

While the importance of higher education institutions in ensuring the achievement of Sustainable Development Goals as they concern flood governance is shown in studies (Bhowmik, Selim & Hug, 2017; Albareda-Tiana et al, 2020; and Kupika et al, 2020); they have been commended for playing a fundamental role in advancing political transformation, awareness campaign and capability to place the globe on a sustainable path (World Commission on Environment and Development in Dzvimbo, Mashizha, Zhanda & Mawonde, 2022). To be sure, universities are not only strong institutions expected to be accountable to the public but also capable of advancing sustainable development (Brennan, King & Lebeau 2004) which underscores their role in promoting the achievement of Sustainable Development Goals as part of the criteria for recent ranking of universities (De la Poza et al, 2021).

African Union Agenda 2026 shows the importance of education in promoting sustainable development and raising awareness against climate related events such as flooding (African Union Commission, 2015). Sendai Framework for Disaster Risk Reduction 2025-2030 is fundamental for climate events; advocating for drastic reduction of global disaster mortality, direct economic damages and disruption of basic services among others (Pearson & Pelling, 2015). There is an increasing conversation on importance of education in addressing climate challenges across the globe. For instance, Hyogo Framework of Action of 2005-2015 concentrated on building resilience against climate change globally using the instrumentality of education; challenging the role of higher learning institutions in providing flood governance for sustainable development through sharing of knowledge, research, innovation, awareness campaign and community participation (UNISDR Hyogo Framework for Action, 2007;

Tanesab 2020). Therefore, it could be contended that the major objective of Hyogo Framework of Action is to push higher institutions of learning to consistently contribute their quota in promoting the achievement of Sustainable Development Goals through research and implementing climate management curriculum.

2. STUDY AREA

This study is limited to Lokoja Metropolis of Lokoja Local Government Area in Kogi State which includes Ganaja, Otokiti, Lokongoma, Shettima, Adankolo, Zone 8, Felele, Zango, and Army Barracks etc. These communities were selected as a result of their experience of high incidence of flooding. The tertiary institutions used in the study are Federal University Lokoja and Kogi State Polytechnic.

3. METHODS

The paper adopted mixed methods aimed at investigating the role of tertiary institutions in flood governance in Lokoja Metropolis. The mixed methods integrated quantitative data generated through structured questionnaire and secondary data gathered through journal articles, books, newspaper and government official publications.

The total population for the study is 978,433 (Human Resource Unit 2026; Establishment Office 2026; Macrotrends, 2026), covering residents and leaders of the communities, officials of Kogi State Ministry of Environment, Town Planning and Development Board, National Emergency Management Agency together with the public servants in Federal University Lokoja and Kogi State Polytechnic. The study utilized structured questionnaire as its major instrument for data collection while Cronbach's alpha was used for reliability testing to strengthen the Likert-scale instrument utilized. To be sure, Cronbach's alpha is a statistical coefficient used to measure the reliability or internal consistency of a set of survey items. Furthermore, it reveals the level of closeness of group of questions, thereby ensuring they consistently measure the same underlying construct. Pilot testing was adopted for reliability of the instruments as it suggests that a small-scale trial run of a planned larger instruments, carried out to examine whether the full instruments are practicable and how they should be designed and administered. Chi-square and Statistical Package for Social Sciences were employed for data analysis. Out of the total population, 400 were selected as sample size which was determined using Taro Yamane formula. The sample size consisted of lecturers/researchers in faculties of social sciences, environmental sciences and management science; and administrative staff in planning units of Federal University Lokoja and Kogi State Polytechnic; officials of Kogi State Ministry of Environment, Town Planning and Development Board, National Emergency Management Agency; residents living in flood affected neighborhoods; community leaders, local associations; landlords; and local opinion leaders. The justification for the selection was hinged on their level of relevance to the issue.

The process of secondary data for the study commenced with search statement (tertiary institutions and flood governance). In the course of the review, it was shown in some studies that flood governance was used as flood management and disaster management while tertiary institutions were viewed as higher learning institutions.

To ensure quality of this paper, articles suspected to be published in predatory journals were discarded. For emphasis, predatory journal is conceived as an academic publication outlet which exploits an open-access model with a view to making monetary gains with little or no regard for rigor in reviewing papers submitted for publication. Disruption in academic publishing arena is linked to rising level of predatory publication outlets as well as their

unethical conduct exhibited to entice scholars patronize them and join their editorial board (Ojala, Reynolds & Johnson, 2020). Consequently, the review was tailored more towards high ranking journals especially those indexed in SCOPUS and Web of Science such as Emerald, Thompson Reuters and Taylor and Francis.

Based on the above perspective, 245 articles were selected out of which 107 were considered relevant using formal inclusion and exclusion criteria together with a two-stage process. This underscores the opinion of scholars that studies interrogating issues outside the scope of the study being carried out should be discarded (Demartini; Centobelli, Cerchione & Esposito in Ofoma & Barnabas, 2025). The relevance of the selected papers was established by their titles and abstracts but those which did not show adequate relevance by their titles and abstracts were read.

4. DATA PRESENTATION AND ANALYSIS

This section of the study focused on presentation and analysis of data generated from field survey as regards to role of tertiary institutions in flood governance in Lokoja Metropolis.

The sample size for the study was determined using Taro Yamane's formula given as follows:

where: n = sample size to be determined

N = Total population of the study

e = error margin (0.05)

I = constant

The calculation looks thus:

$$\begin{aligned}
 n &= \frac{978,433}{1 + 978,433 (0.05)^2} \\
 &= \frac{978,433}{1 + 978,433 (0.0025)} \\
 &= \frac{978,433}{1 + 2,446.0825} \\
 &= \frac{978,433}{2,447.0825} \\
 n &= 400
 \end{aligned}$$

Table 1. Questionnaire Distribution and Return Rate by Areas in Lokoja Metropolis

S/N	Areas in Lokoja Metropolis	Distributed Questionnaire	Returned Questionnaire	Percentage (%) of Returned Questionnaire
1	Ganaja	39	31	7.75%
2	Otokiti	37	33	8.25%
3	Lokongoma	45	42	10.50%
4	Shettima	36	33	8.25%
5	Adankolo	51	49	12.25%
6	Zone 8	43	43	10.76%
7	Felele	50	45	11.25%
8	Zango	40	38	9.50%
9	Army Barracks	39	37	9.25%
10	Others	20	20	5%
Total		400	371	92.75%

Source: Field survey, 2026

The result in the above table 1 indicates that 400 (100%) copies of questionnaire were distributed to the study participants, out of which 371 (92.75%) copies were successfully returned in the following order. Ganaja 31 (7.75%); Otokiti 33 (8.25%); Lokongoma 42 (10.50%); Shettima 33 (8.25%); Adankolo 49 (12.25%); Zone 8 43 (10.76%); Felele 45 (11.25%); Zango 38 (9.50%); Army Barracks 37 (9.25%); and Others 20 (5%). The significant return rate is attributed to the sensitization provided by the researcher and his assistants to the participants.

Table 2. Distribution of Respondents by Age

S/N	Option	No of Respondents	Percentage (%)
1	18- 30	130	35.04%
2	31 – 50	180	48.52%
3	51 above	61	16.44%
Total		371	100%

Source: Field survey, 2026

The result in the above table 2 shows that 130 (35.04%) of the respondents fall within the age bracket of 18-30 years; 180 (48.52%) of the respondents are between the age bracket of 31-50 years while the remaining 61(16.44%) of the respondents are 51 years and above. In cap, respondents who fall within the age range of 31-50 obtained the highest score in the distribution but one of the positive implications is that most of the respondents are within the productive age bracket and therefore better positioned to provide the required information.

Table 3. Distribution of Respondents by Sex

S/N	Gender	No of Respondents	Percentage (%)
1	Male	161	43.39%
2	Female	210	56.60%
Total		371	100%

Source: Field survey, 2026

The foregoing finding in table 3 demonstrates that 161(43.39%) of the respondents are male while 210 (56.60%) of the respondents are female. This suggests that more females participated in the exercise than males.

Table 4. Distribution of Respondents by Highest Educational Qualifications

S/N	Option	No of Respondents	Percentage (%)
1	No formal education	6	1.62%
2	FSLC	12	3.23%
3	SSCE	50	13.48%
4	Diploma/NCE	30	8.09%
5	B.Sc./HND	150	40.43%
6	MSc/MPA/MBA	65	17.52%
7	PhD	58	15.63%
Total		371	100%

Source: Field survey, 2026

From the above result in table 4, it is revealed that 6 (1.62%) of the respondents have no formal education; 12 (3.23%) of the respondents hold FSLC; 50 (13.48%) of the respondents possess SSCE; 30 (8.09%) of the respondents hold Diploma/NCE; 150 (40.43%) of the respondents possess B.Sc./HND; 65 (17.52%) of the respondents hold MSc/MPA/MBA; while 58 (15.63%) of the respondents possess PhD. The result suggests that participants with B.Sc./HND have the highest score. On the whole, it shows that a significant number of the participants are educated and that is traceable to the involvement of public and civil servants especially academic and

non-academic staff of Federal University Lokoja and Kogi State Polytechnic as participants. The implication is that most of the participants could be objective in providing information.

Table 5. Distribution of Respondents by Occupation

S/N	Option	No of Respondents	Percentage (%)
1	Civil/Public Servant	120	32.34%
2	Student	46	12.40%
3	Trader	166	44.74%
4	Farmer	36	9.71%
5	Others	3	0.81%
Total		371	100%

Source: Field survey, 2026

The result in the above table 5 reveals that 120 (32.34%) of the respondents are civil/public servants; 46 (12.40%) of the respondents are students; 166 (44.74%) of the respondents are traders; 36 (9.71%) of the respondents are farmers; while 3 (0.81%) of the respondents belong to others. This is a reflection of the fact that traders are more than other categories of participants; and they are part of the mostly affected victims of flooding in Lokoja Metropolis.

Table 6. Have tertiary institutions contributed significantly to knowledge generation against flooding in Lokoja metropolis?

VARIABLE	SA	A	N	D	SD	TOTAL
Tertiary institutions conduct on-site studies in flood-prone communities at Lokoja Metropolis	148 (39.9%)	102 (27.5%)	17 (4.6%)	66 (17.8%)	38 (10.2%)	371 (100%)
Tertiary institutions gather data on rainfall, river levels, drainage conditions, and flood frequency at Lokoja Metropolis	108 (29.1%)	100 (27.0%)	27 (7.3%)	77 (20.8%)	59 (15.9%)	371 (100%)
Tertiary institutions publish research findings in journals, books, and reports on flooding at Lokoja Metropolis	194 (53.3%)	82 (22.1%)	37 (10.0%)	40 (10.8%)	18 (4.9%)	371 (100%)
Total	450	284	81	183	115	1113

Source: Field Survey, 2026

The result in the above table 6 shows that 148 (39.9%) of the respondents had a strong view that tertiary institutions conduct on-site studies in flood-prone communities in Lokoja Metropolis, 102 (27.5%) of the participants agreed with the issue while 17 (4.6%) of them demonstrated indifference. However, 66 (17.8%) of the respondents disagreed with the issue and 38 (10.2%) of them strongly disagreed. Similarly, 108 (29.1%) of the participants were strongly convinced that tertiary institutions gather data on rainfall, river levels, drainage conditions, and flood frequency at Lokoja Metropolis, 100 (27.0%) of the respondents subscribed to the issue while 27 (7.3%) of them were neutral. Meanwhile, 77 (20.8%) of the respondents disagreed as well as 59 (15.9%) of them that disagreed strongly. There was also a significant acceptance that tertiary institutions publish research findings in journals, books, and reports on flooding at Lokoja Metropolis. For this, 194 (53.3%) of the participants had a strong opinion on the issue and 82 (22.1%) of them agreed while 37 (10.0%) of them demonstrated neutrality. However, 40 (10.8%) of the respondents had a contrary view as well as 18 (4.9%) of them who disagreed strongly. On the whole, it could be observed that tertiary institutions have contributed to knowledge generation against flooding in Lokoja metropolis as larger number of the study participants subscribed to that.

Table 7. Have tertiary institutions assisted significantly in creating awareness for flood adaptation/resilience in Lokoja metropolis?

VARIABLE	SA	A	N	D	SD	TOTAL
Tertiary institutions organize seminars, workshops, and public lectures on flood risks and safety measures in Lokoja Metropolis	94 (25.3%)	92 (24.8%)	26 (7.1%)	80 (21.6%)	79 (21.3%)	371 (100%)
Tertiary institutions run campus-wide campaigns using posters, flyers, and town hall meetings in Lokoja Metropolis	87 (23.5%)	82 (22.1%)	19 (5.1%)	92 (24.8%)	91 (24.5%)	371 (100%)
Tertiary institutions mark global events such as World Environment Day to amplify awareness in Lokoja Metropolis	78 (21.3%)	82 (22.1%)	35 (9.4%)	87 (23.5%)	89 (24.0%)	371 (100%)
Total	259	256	80	259	259	1113

Source: Field Survey, 2026

The foregoing result in table 7 reveals that 94 (25.3%) of the respondents had a strong view that tertiary institutions organize seminars, workshops, and public lectures on flood risks and safety measures in Lokoja Metropolis, 92 (24.8%) of them expressed the same view while 26 (7.1%) of them were neutral. However, 80 (21.6%) of the participants had a contrary view together with 79 (21.3%) of them who strongly disagreed. On the idea of tertiary institutions running campus-wide campaigns using posters, flyers, and town hall meetings in Lokoja Metropolis, 87 (23.5%) of the respondents strongly concurred, 82 (22.1%) of the participants agreed while 19 (5.1%) of them demonstrated neutrality. On the other hand, 92 (24.8%) of the respondents disagreed with the assertion and 91 (24.5%) of the respondents also had strong contrary view. Regarding the issue of tertiary institutions marking global events such as World Environment Day to amplify awareness in Lokoja Metropolis, 78 (21.3%) of the respondents demonstrated a strong view supporting the assertion likewise 82 (22.1%) of the respondents who expressed their agreement while 35 (9.4%) of them were indifferent. Conversely, 87 (23.5%) of the respondents had a divergent view and the same as 89 (24.0%) of them who strongly disagreed. By implication, slightly higher number of respondents had a contrary view that tertiary institutions assisted in creating awareness for flood adaptation/resilience in Lokoja metropolis.

Table 8. Have tertiary institutions contributed significantly to providing relief materials/services for flood victims in Lokoja metropolis?

VARIABLE	SA	A	N	D	SD	TOTAL
Tertiary institutions provide relief items such as non-perishable food, clean water, clothing and bedding, hygiene kits and organize campus-wide fundraising for victims of flooding in Lokoja Metropolis	71 (19.1%)	75 (20.2%)	5 (1.3%)	109 (29.4%)	111 (29.9%)	371 (100%)
Tertiary institutions convert lecture halls, hostels, or sports centers into emergency shelters for victims of flooding in Lokoja Metropolis.	23 (6.2%)	29 (7.8%)	13 (3.5%)	110 (29.6%)	196 (52.8%)	371 (100%)
Tertiary institutions deploy campus health professionals to provide first aid and basic treatment to victims of flooding in Lokoja	59 (15.9%)	73 (19.7%)	23 (6.2%)	80 (21.6%)	136 (36.7%)	371 (100%)
Total	153	177	41	299	443	1113

Source: Field Survey, 2026

The finding in the above table 8 suggests that 71 (19.1%) of the respondents strongly agreed that tertiary institutions provide relief items such as non-perishable food, clean water, clothing and bedding, hygiene kits and organize campus-wide fundraising for victims of flooding in Lokoja Metropolis, 75 (20.2%) of the respondents also agreed while 5 (1.3%) of them were neutral. Nevertheless, 109 (29.4%) of the respondents had an opposing view together with 111 (29.9%) of them who strongly disagreed. For tertiary institutions converting lecture halls,

hostels, or sports centers into emergency shelters for victims of flooding in Lokoja Metropolis, 23 (6.2%) of the respondents expressed strong agreement and 29 (7.8%) of the participants also agreed while 13 (3.5%) of them showed indifference. However, 110 (29.6%) of the participants had a different view together with 196 (52.8%) of them who strongly disagreed with the issue. In light of tertiary institutions deploying campus health professionals to provide first aid and basic treatment to victims of flooding in Lokoja, 59 (15.9%) of the respondents expressed strong conviction, 73 (19.7%) of the participants also agreed while 23 (6.2%) of them were indifferent. Contrastingly, 80 (21.6%) of the participants had a divergent opinion and also 136 (36.7%) of them who demonstrated strong disagreement. Therefore, it could be inferred that tertiary institutions have not significantly contributed to providing relief materials/services for flood victims in Lokoja metropolis.

5. TEST OF HYPOTHESES

Chi-square together with Statistical Package for Social Sciences was adopted to test the null hypotheses for this paper. The choice of these tools was based on their relevance to the issue under investigation. For emphasis, the decision rule is stated as follows: Reject the null hypothesis if $p\text{-value} \leq 0.05$ at 0.05 level of significance.

Hypothesis one

There is no significant relationship between knowledge generation by higher institutions and flood control in Lokoja Metropolis

Knowledge generation and flooding in Lokoja Metropolis

	Observed N	Expected N	Residual
Strongly Agreed	450	222.6	227.4
Agreed	284	222.6	61.4
Neutral	81	222.6	-141.6
Disagreed	183	222.6	-39.6
Strongly Disagreed	115	222.6	-107.6
Total	1113		

Test Statistics

	Knowledge generation and flood control in Lokoja Metropolis
Chi-Square	398.370 ^a
Df	4
Asymp. Sig.	.000

Chi-square=398.370

p-value=0.0004

Decisions

Since P-value $0.0004 < 0.05$, hence, null hypothesis is rejected. Accordingly, the study holds that there is a significant relationship between knowledge generation by higher institutions and flood control in Lokoja Metropolis, reinforcing the views of larger number of the participants.

Hypothesis Two

There is no significant relationship between awareness creation by higher institutions and flood adaptation/resilience in Lokoja Metropolis

Awareness Creation and flood adaptation/resilience in Lokoja Metropolis

	Observed N	Expected N	Residual
Strongly Agreed	259	222.6	36.4
Agreed	256	222.6	33.4
Neutral	80	222.6	-142.6
Disagreed	319	222.6	96.4
Strongly Disagreed	199	222.6	-23.6
Total	1113		

Test Statistics

	Awareness Creation and flood adaptation/resilience in Lokoja Metropolis
Chi-Square	146.564 ^a
Df	4
Asymp. Sig.	.000

Chi-square=146.564

p-value=0.0004

Decisions

Since P-value $0.0004 < 0.05$, hence, null hypothesis is rejected. Consequently, the study posits that there is a significant relationship between awareness creation by higher institutions and flood adaptation/resilience in Lokoja Metropolis, typifying the opinions of some of the respondents.

Hypothesis Three

There is no significant relationship between the provision of material relief materials/services by higher institutions and flooding in Lokoja Metropolis

Provision of relief materials/Services and flooding in Lokoja Metropolis

	Observed N	Expected N	Residual
Strongly Agreed	153	222.6	-69.6
Agreed	177	222.6	-45.6
Neutral	41	222.6	-181.6
Disagreed	299	222.6	76.4
Strongly Disagreed	443	222.6	220.4
Total	1113		

Test Statistics

	Relief materials/services and flooding in Lokoja Metropolis
Chi-Square	423.698 ^a
df	4
Asymp. Sig.	.000

Chi-square=423.698

p-value=0.0004

Decisions

Since $P\text{-value } 0.0004 < 0.05$, hence, the null hypothesis is rejected. Drawing on this, the study holds that there is insignificant relationship between the provision of material relief services by higher institutions and flooding in Lokoja Metropolis, reinforcing the views of some of the respondents.

6. DISCUSSION

The findings of the study suggest that tertiary institutions have contributed significantly to knowledge generation against flooding in Lokoja Metropolis. This slightly aligns with the opinion of Wang et al (2019) on the increasing recognition of importance of knowledge in managing climate change. The application of indigenous knowledge in flood management by local communities is specifically done for forecasting, response and recovery from floods. In African setting, community members are arguably knowledgeable about patterns of weather which they use in predicting impending flooding. Studies on clouds and trees and behavior of some animals show that local knowledge could contribute to predicting floods (Munsaka & Dube, 2018). Predictions could equally be made on the basis of behavior of local flora (Hooli, 2016). Many communities in Nigeria have employed their indigenous knowledge to manage climate events in their areas. For instance, Itshekiris, Ijaws and Ilajes have special local meteorological knowledge which helps them in predicting both short and long term flooding (Fabiya & Oloukoi, 2013).

While there is a strong argument establishing the relevance of scientific knowledge in controlling flooding, the debate that indigenous knowledge is unsustainable and incapable of providing significant assistance during intensive disaster conditions is still going on (Mavhura et al., 2013); reinforcing the need for scientific knowledge provided by tertiary institutions in flood governance. That is why Echendu (2024) observes that the combination of indigenous and scientific knowledge could contextually be more sustainable, leveraging the fundamental attributes and benefits of the two approaches. His study reveals the efficacy of the combination of the methods in Port Harcourt city in Nigeria. There is need for combination of indigenous and scientific knowledge in managing modern disaster (Mavhura et al., 2013; Bongo et al., 2017).

The findings of the study also indicate that tertiary institutions have assisted in creating awareness for flood adaptation/resilience in Lokoja Metropolis. The submission by Park & Kwon (2024) supports the foregoing result that people who have the poorest flood safety awareness are more vulnerable to flooding and have poor resilience capacity. Knowledge of vulnerability and exposure could improve awareness, promoting the people's preparedness to adopt preventive measures and support in identifying more workable mitigation mechanisms (Kellens et al., 2013). Awareness about available structural and non-structural strategies enable the people to understand potential protection and residual risk aimed at improving resilience against flooding (Ding et al. in Razavi-Termeh et al., 2025). People leaving in flood-prone communities should be sensitized on their level vulnerability so as to ensue the efficacy of strategies against flooding (Egli, 2002). The sensitization could be done through flood hazard maps, flood marks on building, individual experience of flood and signs in trees (Egli, in Kreibich 2005; Hagemeyer-Klose & Wagner, 2009; Houston et al., 2019).

Conversely, Scolobig et al. (2012) observe that acquisition of knowledge of level of flood vulnerability of an individual or group through awareness campaign is inadequate in identifying measures for adaptation or resilience. In contrast, Bwambale et al., (2020) submits that the inaccessibility of information to flood-prone community residents compels them to develop traditional knowledge through quotidian interactions with their environment and associated

elements. This traditional knowledge which has been in practice equips the local dwellers for flood resilience. The adaptation or resilience strategies by community dwellers could be obtained through formal education or traditional knowledge, strengthening the need for more formal education or official information (Echendu, 2024).

Unlike the foregoing findings, this particular result suggests that tertiary institutions have insignificantly contributed to providing relief materials/services for flood victims in Lokoja metropolis. The relief could come in form of water, shelter, food and healthcare designed for victims of disaster which are usually made available for them at internally displaced camps in order to protect human lives from large-scale mortality and reduce the period of displacement with its accompanied suffering and trauma (Chan 1995; Neto 2001; Sanyal & Lu 2005). Relief operations such as supplies, transportation and distribution of aids as well as long-term assistance provided for flood victims to improve their socio-economic well-being (Richard, 2010) are grossly inadequate as there is an increasing demand for humanitarian relief on account of rising climate events with their impact without corresponding access to funding. These account for the uncertainties in supplies and participation of multiple actors with varying objectives and complex operations (Tierney 1985; Portsea 1992; McEntire 1997; Neto 2001; Paul 2003; Huan et al. 2009; Richard 2010; Van Wassenhove Martinez 2010; and Zhou et al. 2011). It is argued that relief materials and services among other necessary operations in flood governance in Africa have been largely ineffective. The relief materials are largely provided after the flooding season and victims abandoned to their fate (Alabi, 2024).

CONCLUSION

This study sought to interrogate the contributions of tertiary institutions to flood governance in Lokoja Metropolis. For emphasis, the tertiary institutions investigated in the paper are those within the study area which are Federal University Lokoja and Kogi State Polytechnic. The empirical findings of the study reveal that the institutions have contributed significantly to generation of knowledge and awareness creation through various activities such as conducting on-site studies in flood-prone communities, gathering data on rainfall and river levels; and organizing seminars and workshops on flood risks and safety measures in Lokoja Metropolis. However, the findings also suggest that their contributions to provision of relief materials/services to flood victims are not impressive. This was established through activities such as provision of campus-wide fundraising, non-perishable food, clothing and conversion of lecture halls and hostels into emergency shelters for flood victims. Based on the above findings, the study holds that tertiary institutions have contributed significantly to flood governance in Lokoja Metropolis but more needs to be done especially in the aspect of provision of relief materials/services for the victims of flood. Arising from this conclusion, the study makes the following recommendations to strengthen the capacity of tertiary institutions to contribute optimally to flood governance in Lokoja Metropolis and the country at large:

- a. Tertiary institutions need to collaborate with their alumni aimed at setting up a Foundation that will regularly raise funds for provision of relief materials/services. The Foundation should also develop effective mechanism for management and delivery of the materials/services to the flood victims.
- b. Tertiary institutions should work in synergy with Kogi State Ministry of Environment; and Town Planning and Development Board towards reviewing environmental planning and translating scientific findings into policies of government concerning Lokoja Metropolis. To achieve this, tertiary institutions and governments should adopt collaborative governance model by integrating researchers directly into policy design. Successful frameworks involve joint research funding personnel exchange programs

and institutionalized science advisory boards aimed at bridging the gap between academic data and policies.

- c. Tertiary institutions should provide special grants for studies on climate events with a view to encouraging their lecturers to conduct ground-breaking research that will provide lasting solution(s) to flooding in the area and country as a whole.

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PROPOSING A MEASUREMENT SCALE OF THE STAKEHOLDERS' BASED SUSTAINABLE VALUE: A QUALITATIVE APPROACH

ABSTRACT

Given the limited reserves of fossil energy, the increasing consumption level of energy, and the problem of climate change, renewable energies are the best alternatives to other fossil energies. The number of ventures operating in the renewable energy sector has increased, there are approximately 160 active enterprises in 2019 (GIZ, 2019).

Usually, there is a constant tension between running an economically viable business and remaining faithful to environmental ideals. This research aims to examine how these challenges are achieved in different entrepreneurial firms by proposing a new construct labelled Stakeholders' based Sustainable Value. This study also aims to provide a measurement scale of the value that emerged from ventures in the renewable energy sector. We use a qualitative approach, which consists of 25 in-depth interviews, thematic analysis and Q sort technique. The Q-sort technique is used to evaluate the content validity of the construct. 56 items were retained after the process of qualitative purification. Results show that the SSV (Stakeholders' based Sustainable Value) is a multidimensional construct where enterprise value added and stakeholder value added are two sub-dimensions. This research is among the first studies that propose a valid measure of value creation in sustainable sectors like solar energy.

KEYWORDS: sustainable development; entrepreneurship; value creation; stakeholders; renewable energy

JEL: M13, Q2

INTRODUCTION

Developing a renewable energy sector in a country have a positive impact on its sustainability and provide a wide variety of socioeconomic benefits, contribute to the diversification of energy supply, enhances regional and rural development, and creates an opportunity for job creation (Del Rio and Burguillo, 2009). In Tunisia, the number of ventures operating in the renewable energy sector has increased and there are approximately 160 active enterprises in 2019 were 86% are installers (GIZ, 2019).

Sustainable development appears today as a new logic of economic and social development. It should authorize the institution of a just balance between the social context and economic growth which satisfies the needs of every generation without compromising the capacity of future generations to satisfy their needs. Therefore, it was defined by the Brundtland Commission in 1987 as: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (Brundtland Commission, 1987, p. 37). Fraiman et al. (2005) recognize that, although the term

«sustainability» contains the balance between ecological, social and economic aspects, the environmental aspect is the important basis of sustainability.

In the literature review, research has dealt with value creation in a sustainable entrepreneurial context, on the one hand and the stakeholder theory on the other. However, little attention is placed on conceptualizing and measuring value creation as related to stakeholder management in a sustainable context. Leading enterprises are more in pressure to report their organizational performance beyond economic level. While there are some applied methods in practice like TBL report, Global reporting initiative (GRI) and Sustainable Balanced Scorecard (SBSC), there is no consensus about a common reporting standard.

In their study, Acosta-Prado and al. (2022) aim to analyze the impact of the three dimensions of sustainable value creation on the organizational performance of Colombian companies operating in the industrial sector. The results show an important and positive contribution of the social, economic and ecological dimensions on the creation of sustainable value and the organizational performance.

However, previous research failed to present an integrative concept which relates the entrepreneurship value creation to the stakeholder management and a measurement scale for this concept. We try to overcome this gap in the literature and we propose, the SSV construct which (stakeholders' based sustainable value) highlights the importance of considering the stakeholders' interests on the venture and therefore, the benefits to be gained from a successful project. Hence the construct is proposed on the basis of an extended literature review and semi structured interviews with entrepreneurs in solar energy sector. The purpose of this paper is to present the different steps which are followed to propose the SSV measurement scale and notably the content analysis and the content validity with the Q-sort technique.

1. LITERATURE REVIEW

Little attempts have been made in the literature in order to measure sustainable value creation.

Although it is still in its early stages, the current state of research quantifying stakeholder-based sustainable value shows a promising methodology. SIBIŃSKA and KRAWIEC (2023) present a measurement of shared value creation concept using the Delphi Method. The construct sustains that the venture is a multi-purpose system that create multiple values; the four dimensions of the construct are social value creation, environmental value creation, economic value creation and innovation value creation.

Porter and Kramer (2006) stated that the scope of shared value encompass the economic value and the social value, however, Sinthupundaja and al. (2020) broaden the scope of shared value for social entrepreneurship to enclose economic, social and environmental value and proposed that: "shared value refers to value creation for mutual benefits among an enterprise, society and the environment, including economic, social and environmental value. "(Sinthupundaja and al., 2020, p. 2). The environmental value was proposed by due to the ecological requirement, the climate change and the need to solve ecological problems.

Hossain et al. (2024) present a construct named corporate shared prosperity. The model composed with 16 items and five dimensions (stakeholder development, social well-being, infrastructure development, equality and non-discrimination, organizational stability) the dimensions were derived from systematic literature review, statistic analysis and focus group expert's verification. The reliability and validity of the construct were verified through exploratory factor analysis and confirmatory composite analysis. The construct is based on the stakeholder theory which recognizes that companies attain sustainable success by generating value for employee, customers, suppliers and communities (Mahajan et al., 2023).

1.1. Corporate sustainability

At a business level, sustainability is often viewed as similar to eco-efficiency, but the focus on this only aspect is not sufficient (Dyllick and Hockerts, 2002).

Dyllick and Hockerts (2002) transpose the definition of sustainable development at the business level and claim that corporate sustainability is defined as: “meeting the needs of a firm’s direct and indirect stakeholders such as (shareholders, employees, client, pressure groups, communities, etc.), without compromising its ability to meet the needs of future stakeholders as well” (Dyllick and Hockerts, 2002, p. 131). In the case of corporate sustainability, we usually talk about economic capital, human capital and natural capital. Dyllick and Hockerts (2002) propose a model of corporate sustainability, which is often considered as eco-efficiency by enterprises. The model integrates six criteria which managers of sustainable businesses need to satisfy, especially eco-efficiency, socio-efficiency, eco-effectiveness, socio-effectiveness, sufficiency and ecological equity.

1.2. Sustainable entrepreneurship

The concept of entrepreneurship evolves, and it is not only a quest for economic success. Through his entrepreneurial behavior, the sustainable entrepreneur can manage the triple bottom line by reaching the equilibrium between the economic health, the social equity and the environmental resilience related to his enterprise (Kuckertz and Wagner, 2010). Successful entrepreneurs are those that can create, at the same time, social, ecological and economic objectives and then pursue the triple bottom line (Choi and Gray, 2008).

According to Watson and al. (2023), Sustainable businesses can contribute to sustainable development by seeking synergies between social aspects, environment and economics in order to turn market failures into business opportunities. However, Institutional conditions often hinder sustainable entrepreneurs. By using crowd sourcing approach, the authors explore how policy can support sustainable ventures. Dean and McMullen (2007) also used the Market imperfection to explain how sustainable entrepreneurs can seize opportunities arising from market imperfection, but they limit their attention to environmental issues.

Parrish (2007) proposed that: « Sustainability entrepreneurship is the process of creating new enterprises that survive and thrive by contributing to human well-being and the functioning of ecological systems» (Parrish, 2007, p. 1).

Sustainable entrepreneurship, as presented by Parrish (2007), is defined as entrepreneurship which combines environmental and social dimensions. The success of the sustainability-driven enterprise depends on the entrepreneur values and motives. Therefore, it is worth to note that some entrepreneurs are driven by sustainable motives and they have to conciliate between the motivation to reach the objectives of the sustainable development and the success of the enterprise in the market.

However, Cohen and Winn (2007) propose that sustainable entrepreneurs can resolve environmental problems with innovative solutions. Innovations probably come from entrepreneurs who can identify opportunities and therefore gain benefits while simultaneously addressing ecological and social issues reaching the triple bottom line. According to Venkataramen (1997): « Entrepreneurship as a scholarly field seeks to understand how opportunities to bring into existence « future » goods and services are discovered, created, and exploited, by whom, and with what consequences » (Venkataramen, 1997, p. 120). Taking this conception, Cohen and Winn (2007) expand the definition of Venkataramen (1997) and add environmental consequences to the initial definition. They, therefore, propose that sustainable entrepreneurship is: «How opportunities to bring into existence future goods and services are

discovered, created, and exploited, by whom, and with what economic, psychological, social, and environmental consequences » (Cohen and Winn, 2007, p. 35).

Following the call of Venkataramen (1997) to broaden the scope of the entrepreneurship dependent variable, Cohen et al. (2008) develop a classification of the dependent variables which widely supports the area of entrepreneurship research. They proceed by creating a broad typology of entrepreneurship dependent variables to contain an economic, environmental and social value, and they try to consider all the important outcomes in entrepreneurship research. The typology reflects the triple bottom line concept where the economic, social and environmental motives define seven sets of entrepreneurial motivations and related objectives as well as seven areas of value creation: the economic performance, promise, perpetuity, socio-efficiency, eco-efficiency, stewardship and sustainability.

The sustainable entrepreneurship or sustainability entrepreneurship is different from corporate social responsibility, eco-efficiency and eco-effectiveness. It includes economic, social and environmental dimensions in a single venture. Based on the model of corporate sustainability presented by Dyllick and Hockert (2002) as well as the McDonough and Braungart's (2002) research of the triple top line, Young and Tilley (2006) propose a model of sustainability entrepreneurship which moves the business plan beyond the objectives of eco-efficiency and socio-efficiency. They consider sustainable entrepreneurship as: «An organization that has sustainability at the center of its structure, operations and management: in essence, an organization that is moving beyond the requirement to demonstrate efficiency in its drive to be sustainable » (Young and Tilley, 2006, p. 402).

1.3. Value creation and Stakeholders

When talking about values, enterprises must take into consideration that they have responsibilities toward their stakeholders (Elkington, 1997). Lepak et al. (2007) propose that value is created across a hierarchy of stakeholders. Also, Schlange (2006) proposes that the objectives of sustainability in a business setting have to be balanced to moderate various stakeholders' interests, including "the ecological environment". Cohen et al. (2008) state that "Evidence is building that there is a significant need (and opportunity) to consider the environment as a critical stakeholder in business practice". (Cohen et al. 2008, p. 115). Therefore, the ecological environment is considered as a stakeholder for the venture. The stakeholder theory highlights the idea that enterprises have responsibility to act in the benefit of the society and the environment and not just their own interests (Zhou and Wei, 2023).

Decisions and actions of managers should affect stakeholders in addition to considering shareholder interests (Khomba, Kangaude-Ulaya, Hanif, 2013).

Schlange (2009) seeks to identify the most important stakeholders who are involved in the early stage of sustainability venture creation, which is opportunity recognition. To do this, he based his study on the entrepreneurial cognition theory and the model of stakeholder identification and salience by Mitchell et al. (1997). Schlange (2009) concludes that sustainability-oriented entrepreneurs tend to be more "comprehensive" and future-oriented when they observe stakeholders. Moreover, the author maintains "legitimacy" and substitutes the attributes "power" and "urgency" of the stakeholder identification and salience model of Mitchell et al. (1997) with "philosophy" and "impact". The two latter are, in his view, more appropriate for the context of sustainability-oriented ventures. Indeed, "philosophy" means that an entrepreneur tends to build a relationship with stakeholders which share partly the same value system with him. "Impact" means that entrepreneur selects stakeholders who are probably to induce a future change in the society through economic, social and ecological systems. "Legitimacy" refers to compliance of stakeholders with the social rules.

Schlange (2009) expands the definition of corporate sustainability presented by Dyllick and Hockerts (2002) to the value creation context and states that: “Sustainability driving entrepreneurship is oriented toward the creation of sustainable values in the most general sense. This comprises the furthering of long-term survival on all relevant levels: that is, the firm and its stakeholders, society and last, but not least, humanity as a whole. As a requirement for a sustainability-driven venture, value creation in this regard is based on the principle of meeting the needs of present stakeholders without compromising the ability to meet the needs of future stakeholders” (Schlange, 2009, p. 18).

When reviewing the notion of corporate sustainability presented by Dyllick and Hockerts (2002) as well as the expansion of this notion by Schlange (2009) to Sustainability driving entrepreneurship, we can conclude that the notion of stakeholder is important when talking about sustainability and value generation.

Freudenreich et al. (2020) proposed a conceptual framework of stakeholder value creation where value creation is considered from the business model and the stakeholder value perspectives. It organizes the relationships between the company and its stakeholders through five dimensions of the business model. The dimensions identify the fundamental activities of value creation and the mutual value exchanges between the company and its stakeholders. The retained dimensions of the stakeholder value creation framework are customer dimension, business partner dimension, employee dimension, Societal stakeholder dimension and the financial dimension

1.4. Stakeholder management and CSP measurement

Freeman and al. (2000) propose that an enterprise can have a leading role in enhancing the ecological environment. Enterprises must create value for different stakeholders such as employee, customer, supplier, and investors, considering the environmental issue (Buysse and Verbeke, 2003).

Stakeholder management has not been frequently measured in the literature (Hillman and Keim, 2001). Nonetheless, one of the most used measures of stakeholder management is the Kinder, Lydenburg, Domini (KLD) index. This index is used as a measure of stakeholder performance (Hillman and Keim, 2001). It is also usually used as a measure of corporate social performance. Sharfman (1996) tested the construct validity of the KLD and found that it is the best measure of corporate social performance (CSP).

Hillman and Keim (2001) adapted the KLD to exclude issue outside the primary stakeholder areas of corporate social performance. Therefore, the adapted KLD captures basic stakeholder management. The excluded subjects are used to form the social issue participation variable.

The authors screened items based on their direct relation with primary stakeholders. These items arise from the five categories of KLD: community relation, employee relations, diversity issue, product issue, and environment issue. They affected items from diversity issue and employee relations to the employee's group of stakeholders, they classed the items from community relations and product issues into the customer's group of stakeholders, and they affected the items of the environmental relations, diversity issues, and community relations into the community group of stakeholders. They also, affected the items related to military contracting, production of alcohol or tobacco, involvement in the gambling industry, participation in nuclear energy, and others into the social issue participating (SIP). Therefore, dimensions of stakeholder management as proposed by Hillman and Keim (2001) are the product, environment, employee relations, diversity, and community. These dimensions emphasize key stakeholder relations (Waddock and Graves, 1997a).

Agle et al. (1999) affirm that these dimensions reflect the stakeholder orientation towards social performance (Waddock and Graves, 1997a) and highlight the stakeholder view of the firm. They are judged as the most critical dimensions by rating panels (Waddock and Graves, 1997a, 1997b). Coombs and Gilley (2005) used five dimensions of KLD which best reflect the stakeholder management view of the organization (community relation, diversity, employee relations, environmental impact and product safety/quality (customer related)). However, Agle and al. (1999) shorten the dimensions into four by combining employee relations and the treatment of women and minorities into one category.

Waddock and Grave (1997) affirm that there is a problem of measurement of corporate social performance because it is a multidimensional construct which encompasses different behaviors and managerial decisions. Behavior related to input like an investment in green technology and environmental strategies; Behavior related to internal process such as customer relationship and decisions concerning the nature of the product manufacturing; Behavior related to output such as community relation. Moreover, these behaviors happen in industries with different characteristics. Therefore, there is a need for a multidimensional measure of the corporate social performance, which can capture all the issues, decisions, and behaviors of the concept. The measure also needs to be applied to a wide range of industries (Waddock and Grave, 1997).

Enterprises deal with explicit as well as implicit costs. The explicit costs are related to the payment of shareholders, and implicit costs are associated with stakeholders (Waddock and Grave, 1997). From a stakeholder perspective, enterprises which aim to decrease their inherent costs by acting as irresponsible towards stakeholders are likely to increase their explicit costs. This leads to lower competing performance (Waddock and Grave, 1997).

Better employee relationships have positive consequences on overall morale and satisfaction, therefore, on productivity (Moskowitz, 1972; McGuire et al., 1988). Moreover, an enterprise which has a favorable working climate can easily recruit qualified and experienced employees, which enhances its performance (Moskowitz, 1972). Such socially based objectives lead to positive financial outcomes.

2. METHODOLOGY

Because of the scarcity of works dealing with sustainable entrepreneurship (Parrish, 2007; Choi and Gray, 2008), we chose to conduct a qualitative analysis which consists of in-depth interviews and documentary research. Exploratory research has been undertaken to generate a pool of items which measure the SSV construct. Therefore, the content analysis consists of documentary research and 25 semi-structured interviews with business leaders and officials who experienced the development stages of the project in the field of renewable energies and energy efficiency in Tunisia.

Companies subject to the study operate in the field of renewable energies including solar photovoltaic such as installations, manufacturing of solar panels, installation and/or production of solar water heaters. In addition to these main activities, there are companies which sell energy efficiency products or provide consulting and energy auditing.

2.1. Sample description

Exploratory research has been undertaken to test the relevance of the model and to generate a pool of items which measure the SSV construct. Therefore, the basic sources of items are in-depth interviews with professionals in the renewable energy sector. The respondents were contacted face to face in their offices, mainly after having an appointment. One interview was

done by telephone after the first contact in the EnerSol WSEF 2014 forum and one through the internet. Besides semi-structured interviews, we did some informal discussions and an informal interview with the president of the national trade union of the renewable energies.

Moreover, we attended the following conferences where the respondents are contacted, and interviews have been administered:

- Enterprise exposition (Salon de l'entreprise) which took place in Sfax on 20 and 21 November 2013
- The World Sustainable Energy Forum and exposition 'Ener Sol WSEF 2014' which took place in the UTICA on 7-11 the November 2014
- The international conference on renewable energy development and application for a sustainable agriculture REAGRI which took place in Tunis on the 2-3-4 December 2014
- MEDIBAT which took place in Sfax- Tunis on 04 to 07 March 2015

The following table presents the sample characteristics. The interviews have two objectives. The first one is to readjust the process model of value creation and to substantiate the SSV concept.

Table 1. The sample characteristics

	Used in	Interviewee position	Gender	Interviews' approximate time spent
Enterprise 1 AEP	process	Technical employee/staff	Male	5 min
Enterprise 2 VoltaPv	Process/SSV	The entrepreneur	Male	0 h 43 min
Enterprise 3 Afrisolar	Process/SSV	Technical director	Male	0 h 17 min
Enterprise 4 APER	Process/SSV	The entrepreneur	Male	0 h30 min (app)
Enterprise 5 ATER	Process/SSV	The entrepreneur	Male	0 h 17 min
Enterprise 6 ATS	Process/SSV	Commercial employee	Male	0 h 15 min (app)
Enterprise 7 Aurasol	Process/SSV	Marketing manager	Female	0 h 45 min (app)
Enterprise 8 BSI	Process/SSV	Director	Male	0 h 49 min
		An executive	Female	0 h 3 min
Enterprise 9 Ecowatt	Process/SSV	The entrepreneur	Male	0 h 45 min (app)
Enterprise 10 Energy Système Solaire	Process/SSV	The entrepreneur	Male	0 h 29 min
Enterprise 11 FBE	Process/SSV	The entrepreneur	Male	0 h30 min (app)
Enterprise 12 Gamco	Process/SSV	The entrepreneur	Male	0 h 28 min
Enterprise 13 Kasdeoui/unité de fabrication	Process/SSV	The entrepreneur	Male	1 h 09 min
Enterprise 14 ETI Enabled Technology Industry	Process/SSV	The entrepreneur	Male	0 h 29 min
Enterprise 15	Process/SSV	Regional Manager	Male	0 h 14 min

	Used in	Interviewee position	Gender	Interviews' approximate time spent
Mime				
Enterprise 16 GPC (Geen Power Company)	Process/SSV	The entrepreneur (director)	Male	0 h 24 min
Enterprise 17 PES	Process/SSV	The entrepreneur	Male	0 h 31 min
Enterprise 18 SDR	Process/SSV	The entrepreneur	Male	0 h 43 min
Enterprise 19 SDS	Process	-The entrepreneur -Commercial manager	Male	0 h 7 min
Enterprise 20 SolarFm	Process/SSV	-Technical and sale executive	Male	2 h 16 min 1 h 34 min
		-The entrepreneur intervention	Male	0 h 42 min (at 1 h 34 min)
Enterprise 21 Solaria	Process/SSV	-The entrepreneur	Male	
Enterprise 22 Sotume (SOTEEP)	Process/SSV	-The entrepreneur -The co entrepreneur intervention	Male	0 h 35 min 0 h 10 min (At 0h 25min)
Enterprise 23 Spectra	Process/SSV	-Director	Male	0 h 44 min
Enterprise 24 Sunsol	Process/SSV	The entrepreneur	Male	0 h 17 min
Enterprise 25 Sunway	Process/SSV	-associate manager	Male	0h 39 min

Source: Own

2.2. The Interview and the content analysis procedure

Our research is mainly based on a back and forth process between literature and the field study. This approach is called abductive. The aim of the confrontation between literature and the field study is to enrich well-defined concepts from the field study. This approach enables us to combine the benefits of the deduction and induction approaches.

Table 2. Interview Guide

Themes /categories		Sub-themes /subcategories	Questions
Part 1	Entrepreneur's personal factors	Entrepreneur's background	-Introduce yourself, please - When did you launch the project? - Is that your own project?
		Motivations	-Why did you choose this sector? - What are your main reasons for creating the company?
	The entrepreneurship process	Stages of the entrepreneurial process	-What is the main speciality of the company -Introduce the history of the company: source of the idea, the main stages of development -What are the problems you encountered? -What are the most significant events in the life of society -For this activity, how many projects have you done, and what is the installation capacity for each project? - Tell us about the characteristics of the products you installed, is there any innovations, and what are your sources of supply?
		Company's Stakeholders	-Introduce your team (position, qualifications) -What are your sources of funding? -Any state subsidy? Is it sufficient and advantageous in your view? -Tell us about the demand (customers) and supply (competitors) side
Part 2	Value creation	Economic value	-Is your business performing and successful? - What is your added value as compared to your competitor's? -If you have the opportunity to go through the same experience again, what do you change and what do you maintain?
		Sustainable value	-In the specific case of Solar energy ventures, do you think you are creating sustainable value, and what are its components? -How do you measure the value (benefits) created by your venture (economic, social, environmental sides)/ what are your added value from the economic, social and ecological sides?

Source: Own

The research about sustainable value is designed as follows:

- 1- Literature review
- 2- Semi-structured interviews
- 3- First floating reading and transcribing of some interviews (Value takes different forms and meanings according to respondents)
- 4- Back to the literature and deepening of the sustainable value concept
- 5- Proposing definition of the value concept as SSV (stakeholders' based sustainable value)
- 6- Interviews transcription
- 7- Content analysis for the substantiation of the SSV concept
- 8- Adjusting the proposed definition
- 9- Proposal of a preliminary scale of the SSV concept

Barden (1983) proposes a detailed approach to content analysis according to three steps:

- The pre-analytical step: brief reading, documents choice, formulation of hypotheses and objectives, indicators elaboration, material preparation,
- The material exploitation: coding
- Result treatments, inferences, and interpretation.

Firstly, we proceed by the transcription of interviews. We tried to be faithful to the interviewee discourse. In the categorization phase, we used the semantic unit of analysis, which corresponds to an idea. As it is proposed by Bardin (1983), the criteria of categorization are always semantic and may correspond to a sentence, word, or group of words. Our categories are basically emergent, indeed while we tried first to be faithful to the literature; categories emerged as we advance in the analysis to highlight all aspects of value. The process of categorization and dimension identification was conducted using an abductive logic, moving back to the literature deemed relevant to verify the theoretical roots of our concepts and dimensions. Finally, we exploited the written material by using data coding and categorizing the unit into categories.

Following the claim of Bardin (1983) in order to assess the content validity, the categorization has been made at different times by the same researcher. Moreover, a part of the corpus has been subject to categorization by two other researchers. This step has been done to assess the objectivity. In this paper we focus on substantiating the SSV concept and proposing a preliminary measurement scale of the construct.

3. RESULTS

3.1. Definition of SSV

We found through the discussion that the value affects not only the result of the entrepreneurial activity exercise but also it is manifested throughout the implementation phase and the development of the activity. The values are the benefits provided to the company and the different elements in interaction with the company. That is why we talk about the added value for the stakeholders of the company.

Several aspects of the value have been identified at the stage of the implementation of opportunity. Indeed, the value appears as a result of the entrepreneur's behaviors and actions as a response to interactions with the external and internal elements of the environments.

The value concerns not only the result of the entrepreneurial activity, but it is manifested throughout the implementation phase and development of the business. Values are the benefits to the company and the different actors which interact with the company. That is why we talk about added value for the stakeholders of the company. Hence, the company can generate value for itself and its various stakeholders throughout the entrepreneurial process despite the complex reality and the difficulties encountered.

We define the sustainable value based on the stakeholders (Stakeholders' based sustainable value) as follows:

The ability of the entrepreneur to create value for the enterprise and its main stakeholders given the economic, social, psychological and environmental aspects as a manifestation of the effective exercise of the activity and given the complexity of the reality and the difficulties encountered throughout the entrepreneurial process.

3.2. Content analysis for SSV

3.2.1. The thematic analysis and items generation procedure

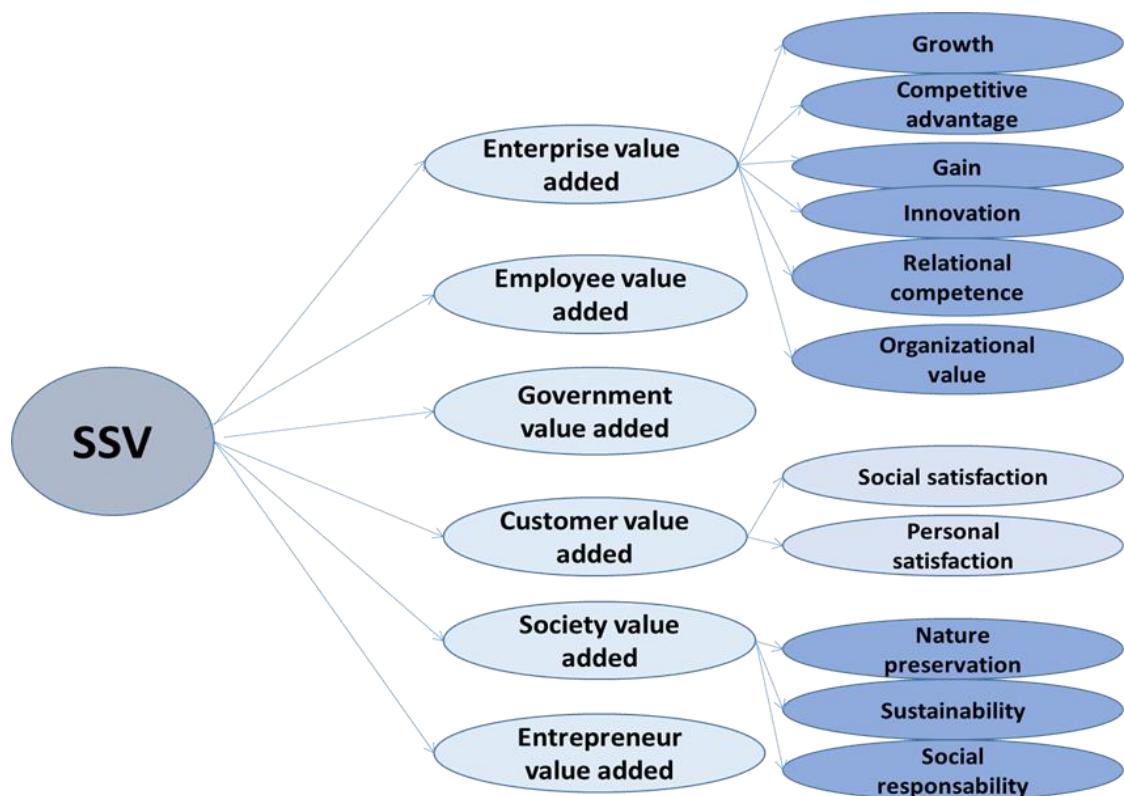
As long as we advance in the analysis, we found that the value is deeply stakeholders' oriented. Moreover, we noted that the value has different destinations. Indeed, different advantages concern the enterprise and its shareholders but also other stakeholders. This is also consistent with sustainable development and corporate sustainability research in that social and environmental side are also important beside the economic one and that the venture must

generate economic, social and ecological benefits to be a sustainable venture notably in the case where it is in a sustainable and environmental field like solar energy one. Therefore, another consideration was taken into account, which consists of assigning value in terms of who is the receiver of value.

Firstly, we propose a pool of items for the SSV scale. Indeed, the first categorization enables us to identify the dimensions and sub-dimensions. After the codification process, the first group of items has been generated as a result of the inference process; the items generated are mainly drowning from the field study. In this stage, we refer to three academicians to assess the good formulation and the understanding of the enunciations. We also aimed to reduce the number of items by removing blurred, redundant and not appropriate formulations (DeVellis 1991, Diamantopoulos and Winkelhofer, 2001). However, the number of items still important. Therefore, we refer to frequency analysis to maintain the most recurrent dimensions, to lower the number of items and to retain items which refer to the most cited verbatim.

The SSV construct is multidimensional were enterprise value added, employee value added, government value added, customer value added, society value added and entrepreneur value added are the dimensions of the construct.

Figure 1. The SSV primary construct Model resulted from the content analysis



Source: Own

3.2.2. SSV qualitative measurement scale purification process: pretest process and content validity assessment

After the item generation procedure, we proceed by the qualitative measurement purification process in terms of the pretest and the content validity phases. We propose the Q-sort technique.

3.2.2.1. The pretest phase

An initial pool of items was generated according to the inference process and based on the frequency analysis of citations and ideas.

However, a pretest phase was done to reduce the original number of items after the generation process. This phase was done with the collaboration of three academic researchers to identify redundant items, and it was done simultaneously with the frequency analysis. The frequency analysis results in 106 items, which will be subject to content validity with expert judges.

3.2.2.2. The content validity

Straub et al. (2004) propose that the content validity is: “The degree to which items in an instrument reflect the content universe to which the instrument will be generalized. This validity is generally established through literature reviews and expert judges or panels” (Straub et al., 2004, p. 424).

This stage follows the generation of items, and it is important notably for formative constructs (Petter et al. 2007).

According to Straub et al. (2004), content validity is “an issue of representation. The essential question posed by this validity is: Does the instrumentation (e.g., questionnaire items) pull in a representative manner from all of the ways that could be used to measure the content of a given construct”. (Cronbach, 1971; Kerlinger, 1964; Straub et al., 2004; p. 10).

Moreover, following Churchill (1979), Stratman and Roth (2002, p. 618) propose that a scale of items has content validity if it forms a “representative sample of the theoretical domain of the construct.”

Different techniques were used to evaluate the content validity of a construct such as extensive literature review; expert panels or judges, CVR validity ratios (Lawshe, 1975); Q-sorting (Straub et al., 2004). In this study, we tried to use these techniques to evaluate if the items pull in a representative way to measure the concept’s content (Cronbach, 1971, Kerlinger, 1964, Straub et al. 2004).

The content validity phase has two main objectives. On the one hand, we aim to reduce the number of items generated, which was too long. In the other hand, we aim to assess the reliability of the proposed index. That is if the items are in their correct destinations. Moreover, the judges were asked to evaluate if the items are understandable and well formulated.

Therefore 11 judges (academic researchers, professors, and professionals) were requested to respond to a questionnaire were different items, and their respective destinations (dimensions/ sub-dimensions) are present. We provide a short description of each dimension, and the judges are asked to read the definitions and to indicate if the item is essential or not necessary. Two other columns were added. In the first one, the judge was asked if the item needs to be reformulated. The second one indicates if the item should be reclassified in another category (dimensions/ sub-dimensions).

Therefore, the first two columns allow us to calculate the CVR ratio. The CVR procedure coupled with the Q-sort technique allows reducing the number of items (we are notably based on the result of the Q-sort technique). Moreover, reformulation of some items was done according to the judgment of experts that are involved in this research.

Four items were added as a result of two judges’ recommendations. However, they are finally removed from the final items’ pool retained because of their low CVR ratios.

For the first stage of items sorting by the expert judges, we use the Q-sort technique to assess if the items are in their correct destinations. Indeed, in this stage, only nine responses which were involved in the CVR procedure are used. The sample of expert judges involved is composed of eight academic researchers and one customer.

The first three judges (round 1) were asked to sort the items in their appropriate categories without having a priori knowledge about the classification that we have done.

Therefore, we note that the procedure was difficult and the number of non-response was high. Therefore, we tried to alleviate the task by presenting the classification of items according to their respective dimensions and sub-dimensions, and we asked the judges to note if the item is misclassified (round 2 and 3). In this stage, we use Perreault and Leigh (1989) inter-Judge agreement score as well as Moore and Benbasat item placement ratio (hit ratio).

We present the item sort responses by the expert judges (The first stage of the Q-sort technique) where three rounds are identified. Each one concerns a sample of three expert judges. The green cells indicate a perfect accord; the yellow cells indicate a random error, and the red cells indicate a systematic error.

3.2.2.3. The Q-sort technique

The second stage: After the specification of the construct as a reflective-formative hierarchical component model and its consideration in a nomological network.

This second stage of the content validity concerns the 67 items retained by the first stage of content validity, and it focuses on the stakeholders' (internal and external) perspective.

In this stage, the items are randomized and recorded. The new codes better reflect the sub-dimensions and dimensions retained. Some changes have been made after the first stage of items' reduction. Indeed, Social satisfaction and Personal satisfaction have been merged into one sub-dimension that we called "Customer Value Added" and "Customer satisfaction" has been identified. Moreover, Social responsibility has been recalled "Society Value Added" and Protection of nature has been recalled, "Environment Value Added." "Employee satisfaction" was even identified as a reflective side of the "Employee Value Added" sub-dimension.

Another sample of judges is involved. Hence the panel of judges is composed of experts in the solar energy that are professional as well as the primary external stakeholders that are the customers of photovoltaic and thermic solar panels. Indeed, the sample is composed of 13 expert judges: 9 professionals in the solar energy field, two experts (a certified public accountant and engineering) and two customers.

We use a questionnaire where we proposed different definitions of sub-dimensions. Each item and category is translated in Arabic and therefore offered in French and Arabic language to ensure that it is well understood.

Following Moore and Benbasat (1991), the procedure consists of sorting the items into separate categories according to differences and similarities. Moreover, after examining the placement of items, the ambiguous and misworded items could be eliminated or rephrased.

This step aims to demonstrate convergent validity as well as discriminant validity of items. Firstly, a high inter-judge agreement indicates a high item placement ratio. The item which is consistently placed in a specific dimension demonstrates convergent validity with this dimension and discriminant validity with the others. Moreover, the high item-placement ratio indicates that the proposed measurement scale is reliable, and the generated items are valid. Therefore, a high item placement ratio indicates that the scale has high construct validity, and it is likely to be reliable (Stratman and Roth, 2002). However, this procedure is qualitative rather than quantitative (Moore and Benbasat, 1991).

As it is adopted by Stratman and Roth (2002) and Moore and Benbasat (1991), a minimum of 70% is acceptable for the items placement ratios. Therefore, we present the item sort responses by the expert judges (The second stage) where we consider both Enterprise value-added and Stakeholders value added. The green cells indicate a perfect accord; the yellow cells indicate a random error, and the red cells indicate systematic error dimensions.

Table 3. Color Key

Color key		Perfect agreement
		Random Error
		Systematic Error

Source: Own

$$\text{Perreault and Leigh (Ir)} = \sqrt{\left(A - \frac{1}{k}\right) \left(\frac{k}{k-1}\right)}.$$

k= number of dimensions.

A=propensity of agreement between judges = (number of agreements between judges / total number of items).

Perfect agreement between judges is realized when Ir=1; the minimum required is 65% for the Inter-judge (Ir) ratio (Moore and Benbasat, 1991).

In order to manage the high number of items and to distinguish between them, we use keys. The Code keys of Sub-dimensions are presented as follows:

Table 4. Code Key Sub-dimension

Code key of Sub-dimension	<u>Enterprise value Added</u>	
	Competitive Advantage	AC
	Innovation	Innov
	Relational Competency	CR
	Organizational Value	VO
	Economic performance	
	Growth	Croiss
	Profitability/Gain	Rent
	<u>Stakeholders Value Added</u>	
	Customer Value Added	CLT
	Employee Value Added	EMP
	Society Value Added	SOC
	Environment Value Added	ENV
	Government Value Added	ETAT
	Social performance	
	Customer Satisfaction	SATISClit
	Employee Satisfaction	SATISEmp
	Sustainable Development	DD
	Entrepreneur Satisfaction	SATISEnt

Source: Own

The Perreault and Leigh Inter-judge (Ir) agreement ratio, as well as the hit-ratio are calculated. Most of “Ir” scores exceed the minimum required of 65% for expert pairs except of (1-13), (2-13), (3-13), (4-13), (5-13), (6-13), (8-13), (10-13), (11-12), (11-13), (12-13). We note that the latter results are a little bit lower than 65%, and they are related to the expert 12 and 13, which are customers. Therefore, the perception of the customers is quite different from that of professionals. However, we can conclude that the items are valid and reliable.

In this round, all items and all sub-dimensions are involved, and the judges are called to classify each item into its specific destination. The number of sub-dimensions is high (15), which can explain the hard task of the judges and therefore, the low item-placement ratios (hit ratios)

score, which indicates 56.39%. This result can be a consequence of the confusion of experts because of the high number of sub-dimensions presented in a first step. Therefore, we proposed another classification where the items referring to a specific dimension are randomized and sorted according to the relevant sub-dimensions.

a. The Enterprise Value Added (EVA): Round 4-1 (A.1)

We present three tables dealing with the Enterprise Value Added sub-dimensions. The first one concerns the items sort responses for the items generated to measure the EVA, the second table presents the Perreault and Leigh Inter-Judge (Ir) agreement scores, and the third one deals with Moore and Benbasat items placement ratio.

Table 5. Item sort responses for (EVA) dimension by the expert judges (The second stage)

Valeur ajoutée pour l'entreprise	Experts													
Items	Key	1	2	3	4	5	6	7	8	9	10	11	12	13
5- nous confrontons la concurrence par la qualité de nos produits	AC	AC	AC	AC		AC	AC	AC	Innov	AC	AC	AC	AC	AC
29-nous travaillons en équipe (discussion, partage d'information)	VO	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR	VO
23- nos fournisseurs nous proposent une meilleure qualité du produit	CR	AC	AC	AC	AC	AC	AC	VO	AC	AC	AC	AC	AC	CR
7- nous confrontons la concurrence par la qualité de notre service après-vente	AC	AC	AC	AC	VO	AC	AC	VO/AC	VO	AC	AC	AC	AC	AC
25- nos fournisseurs nous supportent financièrement (meilleurs prix, facilités)	CR	CR	AC	CR	VO	CR	AC	VO	AC	CR	CR	CR	AC	CR
22- en cas de réclamation, notre fournisseur nous permet un gain de temps	CR	CR	VO	VO	AC	VO	AC	VO	CR	VO	VO	VO	VO	
27-nos employés ont de l'expérience	VO	AC	AC	AC	AC	AC	CR	CR	CR	AC	AC	CR	CR	VO
6-nous confrontons la concurrence par la qualité de nos services (étude, installations)	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC
11- nous faisons une veille sur toutes nouveautés sur le marché (suivre les nouveautés dans le domaine pour être à jour)	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov
28-nos employés sont qualifiés (diplômés)	VO	AC	VO	AC	AC	VO	CR	AC	VO	AC	AC	AC	CR	VO
20- nous cherchons un gain mutuel avec nos partenaires	CR	CR	VO	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR
8- nous confrontons la concurrence par nos prix	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC
21- nos fournisseurs nous proposent une meilleure garantie (durée, fiabilité)	CR	AC	CR	AC	AC	CR	AC	AC	AC	AC	VO	CR	CR	CR
9- nous disposons d'un savoir-faire dans le domaine des énergies renouvelables	AC	Innov	Innov	CR	Innov	AC	Innov	AC	Innov	Innov	AC	Innov	Innov	AC
24- nous essayons de maintenir une bonne relation avec nos fournisseurs	CR	VO	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR
12- nous introduisons des améliorations sur les technologies existantes	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov
10- nous veillons à préserver une bonne réputation	AC	AC	VO	AC	AC	AC	AC	AC	AC		AC	VO	AC	AC
26- nos fournisseurs nous conseillent et nous octroient une information nécessaire	CR	CR	CR	CR	AC	CR	VO	CR	CR	AC	CR	CR	VO	CR
13- nous proposons des solutions innovantes	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov	Innov

Source: Own

The table 6 shows some disagreements between four couples of judges (2-4); (2-7); (6-13) and (9-13) where the minimum score of 65% is not obtained. However, for the other judge pairs, the scores deviate between (66, 2%) and (96, 4%).

Table 6. Perreault and Leigh Inter-judge (Ir) agreement scores (EVA)

Pairs judge	Ir	Pairs judge	Ir
1-2	0.713	4-11	0.662
1-3	0.888	4-12	0.662
1-4	0.760	4-13	0.477
1-5	0.805	5-6	0.713
1-6	0.760	5-7	0.760
1-7	0.713	5-8	0.662
1-8	0.760	5-9	0.805
1-9	0.848	5-10	0.927
1-10	0.848	5-11	0.848
1-11	0.805	5-12	0.805
1-12	0.713	5-13	0.848
1-13	0.713	6-7	0.713
2-3	0.760	6-8	0.805
2-4	0.606	6-9	0.760
2-5	0.848	6-10	0.713
2-6	0.713	6-11	0.760
2-7	0.606	6-12	0.927
2-8	0.713	6-13	0.606
2-9	0.760	7-8	0.713
2-10	0.760	7-9	0.713
2-11	0.848	7-10	0.805
2-12	0.805	7-11	0.760
2-13	0.662	7-12	0.713
3-4	0.760	7-13	0.662
3-5	0.888	8-9	0.662
3-6	0.760	8-10	0.662
3-7	0.805	8-11	0.713
3-8	0.713	8-12	0.760
3-9	0.964	8-13	0.662
3-10	0.927	9-10	0.848
3-11	0.848	9-11	0.848
3-12	0.760	9-12	0.760
3-13	0.713	9-13	0.606
4-5	0.662	10-11	0.848
4-6	0.760	10-12	0.760
4-7	0.713	10-13	0.760
4-8	0.760	11-12	0.848
4-9	0.805	11-13	0.713
4-10	0.713	12-13	0.662

Source: Own

Table 7. Item sort responses (Hit-ratios) for EVA dimension

Sub-dimensions	Actual classification					% Hits
	AC	Innov	VO	CR	Total	
AC	61	9	4	1	75	81.333%
Innov		39			39	100%
VO	14		6	19	39	15.384%
CR	26		15	49	90	54.444%
Total	101	48	25	69	243	
% hits	60.396%	81.25%	24%	71.014%		
Total item Placements= 155/243=63.786% hit ratio						

According to the previous table, the hit-ratios score is about 63.786%, which is a little less than 70% required. Among 243 items placements, 155 items were placed in their correct places. 14 items are misclassified into the competitive advantage sub-dimension and 19 into the relationship capacity sub-dimension rather than the organizational value sub-dimension. Moreover, 26 items are misclassified into the competitive advantage sub-dimension and 15 items into the organizational value sub-dimension rather than the relationship capacity sub-dimension. This misclassification highlights the possibility of confusion between the competitive advantages, the relationship capacity, and the organizational value sub-dimensions. Therefore, we try to revisit some off-target items.

When examining the items related to the VO sub-dimension, we found that:

- The item “29: “we work as a team (discussion, information sharing)” has a systematic error. Indeed, twelve experts have classified the item into the relationship competency, and only one put the item into the right destination.
- The item 27: «our employees are experienced » is misclassified by 7 experts into the AC sub-dimension and by 5 experts into the CR sub-dimension.
- The item 28: «our employees are qualified (graduates) » is misclassified by 7 experts into the AC sub-dimension and by 2 experts into the CR sub-dimension.

We think that if the AC sub-dimension had a formative specification, the classification of the last two items 27 and 28 will be correct in such a way that they cause a competitive advantage. However, we considered the organizational value sub-dimension with a reflective specification and when taking into account the 19 misclassifications into the relationship capacity sub-dimension, we deduced that the experts don't differentiate between the two sub-dimensions and have misunderstood the organizational value which deals with internal relationships between employees instead of external relationship of company with external actors (relationship capacity).

Therefore, we decide to merge the two sub-dimensions into one sub-dimension which we labeled: organizational competency.

When examining the items related to the VO sub-dimension, we found that:

- The item 23: «our suppliers offer us better product quality » presents a systematic error because 11 experts misclassify the item into the AC sub-dimension and one expert classifies it into the VO sub-dimension.
- The item 22: «in the case of a complaint, our supplier saves us time » presents a systematic error because 8 experts put it into the VO sub-dimension and 2 experts place it into the AC sub-dimension.
- The item 21: «our suppliers offer us a better guarantee (duration, reliability) » presents a systematic error because 7 experts classify the item into the AC sub-dimension and one expert into the VO sub-dimension.

A deeper look of the items 21, 22, and 23 reveals that the misclassification of the items into the AC sub-dimension is related to a misunderstanding and confusion about the nature of specification of the sub-construct. Indeed, the formative specification of the AC sub-dimension in such a way that the product quality, warranty, and delay time provoke the competitive advantage. However, we are concerned with a reflective specification of the sub-dimension. Considering 10 misclassifications of the three items into the VO sub-dimension, we decide to merge the two sub-dimensions CR and VO into the one sub-dimension which we labeled: organizational competency.

- The item 9: « we have expertise in the field of renewable energy» represents a systematic error because 8 experts misclassify the item into the innovation sub-dimension and one expert misclassify into the CR sub-dimension; therefore, we decide to remove the item 9.

b. The Enterprise Value Added (EVA): Round 4-1 Adjusted (A.2)

The round 1 Adjusted of the EVA dimension concerns the combination of the organizational value and the relationship competency sub-dimensions into one sub-dimension.

The item sort responses for the EVA construct are illustrated as follows:

Table 8. Item sort responses for EVA dimension (Round 4-1 adjusted)

Valeur ajoutée pour l'entreprise	Experts													
Items	Key	1	2	3	4	5	6	7	8	9	10	11	12	13
5- nous confrontons la concurrence par la qualité de nos produits	AC	AC	AC	AC		AC	AC	AC	Innov	AC	AC	AC	AC	AC
29-nous travaillons en équipe (discussion, partage d'information)	VO/CR	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR	VO
23- nos fournisseurs nous proposent une meilleure qualité du produit	CR/VO	AC	AC	AC	AC	AC	AC	VO	AC	AC	AC	AC	AC	CR
7- nous confrontons la concurrence par la qualité de notre service après-vente	AC	AC	AC	AC	VO	AC	AC	VO/AC	VO	AC	AC	AC	AC	AC
25- nos fournisseurs nous supportent financièrement (meilleurs prix, facilités)	CR /VO	CR	AC	CR	VO	CR	AC	VO	AC	CR	CR	CR	AC	CR
22- en cas de réclamation, notre fournisseur nous permet un gain de temps	CR	CR	VO	VO	AC	VO	AC	VO	CR	VO	VO	VO	VO	
27-nos employés ont de l'expérience	VO/CR	AC	AC	AC	AC	AC	CR	CR	CR	AC	AC	CR	CR	VO
6-nous confrontons la concurrence par la qualité de nos services (étude, installations)	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC
11- nous faisons une veille sur toutes nouveautés sur le marché (suivre les nouveautés dans le domaine pour être à jour)	Innov	Inno v	Inno v	Inno v	Inno v	Inno v	Inno v	Inno v	Innov	Inno v	Inno v	Inno v	Inno v	Inno v
28-nos employés sont qualifiés (diplômés)	VO/CR	AC	VO	AC	AC	VO	CR	AC	VO	AC	AC	AC	CR	VO
20- nous cherchons un gain mutuel avec nos partenaires	CR/VO	CR	VO	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR
8- nous confrontons la concurrence par nos prix	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC	AC
21- nos fournisseurs nous proposent une meilleure garantie (durée, fiabilité)	CR	AC	CR	AC	AC	CR	AC	AC	AC	AC	VO	CR	CR	CR
9- nous disposons d'un savoir-faire dans le domaine des énergies renouvelables	AC	Inno v	Inno v	CR	Inno v	AC	Inno v	AC	Innov	Inno v	AC	Inno v	Inno v	AC
24- nous essayons de maintenir une bonne relation avec nos fournisseurs	CR/VO	VO	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR	CR
12- nous introduisons des améliorations sur les technologies existantes	Innov	Inno v	Inno v	Inno v	Inno v	Inno v	Inno v	Inno v	Innov	Inno v	Inno v	Inno v	Inno v	Inno v
10- nous veillons à préserver une bonne réputation	AC	AC	VO	AC	AC	AC	AC	AC	AC		AC	VO	AC	AC
26- nos fournisseurs nous conseillent et nous octroient une information nécessaire	CR/VO	CR	CR	CR	AC	CR	VO	CR	CR	AC	CR	CR	VO	CR
13- nous proposons des solutions innovantes	Innov	Inno v	Inno v	Inno v	Inno v	Inno v	Inno v	Inno v	Innov	Inno v	Inno v	Inno v	Inno v	Inno v

Source: Own

Table 9. Perreault and Leigh Inter-judge (Ir) agreement scores of EVA dimension (Round 4-1 adjusted)

Pairs judge	Ir	Pairs judge	Ir
1-2	0.777	4-11	0.668
1-3	0.917	4-12	0.606
1-4	0.827	4-13	0.538
1-5	0.873	5-6	0.777
1-6	0.827	5-7	0.777
1-7	0.827	5-8	0.725
1-8	0.777	5-9	0.777
1-9	0.917	5-10	0.959
1-10	0.917	5-11	0.827
1-11	0.827	5-12	0.873
1-12	0.827	5-13	0.917
1-13	0.777	6-7	0.725
2-3	0.777	6-8	0.873
2-4	0.606	6-9	0.725
2-5	0.873	6-10	0.725
2-6	0.827	6-11	0.777
2-7	0.606	6-12	0.917
2-8	0.777	6-13	0.777
2-9	0.777	7-8	0.725
2-10	0.873	7-9	0.725
2-11	0.873	7-10	0.827
2-12	0.917	7-11	0.777
2-13	0.777	7-12	0.777
3-4	0.777	7-13	0.873
3-5	0.873	8-9	0.668
3-6	0.725	8-10	0.668
3-7	0.827	8-11	0.725
3-8	0.725	8-12	0.873
3-9	0.873	8-13	0.725
3-10	0.917	9-10	0.827
3-11	0.827	9-11	0.827
3-12	0.725	9-12	0.725
3-13	0.777	9-13	0.668
4-5	0.668	10-11	0.873
4-6	0.725	10-12	0.827
4-7	0.668	10-13	0.873
4-8	0.725	11-12	0.873
4-9	0.827	11-13	0.827
4-10	0.725	12-13	0.873

Source: Own

The readjustment enhances the Ir scores, as it is shown in the above table.

Therefore, merging the two sub-dimensions ameliorates the reliability and the validity of the organizational competency sub-dimension (VO-CR) and therefore to enhance the Enterprise Value Added (EVA) reliability and validity.

Table 10. Item Placement ratios (hit ratios) for the EVA dimension (Round 4-1 adjusted)

Sub-dimensions	Actual classification				
	AC	Innov	VO-CR	Total	% Hits
AC	61	9	5	75	81.333%
Innov		39		39	100%
VO-CR	40		91	131	69.465%
Total	101	48	96	245	
% hits	60.396%	81.25%	94.791%		
Total item Placements= 191/245=77.959% hit ratio					

Source: Own

The hit ratio obtained is (77.959%). It is largely superior to the original hit rate of (63.786%) before the combination operation.

The new hit score (77.959%) is superior to the minimum score requested (70%). Moreover, the new hit ratios (69.465%) and (94.791%) related to the merged VO and CR sub-dimensions largely exceed the originals hit ratios (15.384%; 54.444%) and (24%; 71.014%). Furthermore, considering the new significant Ir scores obtained, we deduce that the content validity is achieved for the (EVA) dimension.

c. The Stakeholders Value Added (SVA): Round 4-2 (B. 1)

In the first place we present the item sort responses for the Stakeholders Value Added dimension and the Perreault and Leigh Inter-judge (Ir) agreement scores.

Table 11. Item sort responses for SVA dimension (Round 4-2)

Valeur ajoutée pour les parties prenantes		Experts												
Items	Key	1	2	3	4	5	6	7	8	9	10	11	12	13
59- nous proposons des produits écologiques qui préservent la planète contre le réchauffement climatique en diminuant l'utilisation des énergies fossiles	ENV	ENV	ENV	ENV	ENV	ENV	ENV	ENV	ENV	ENV	ENV	ENV	ENV	ENV
39 - la subvention est suffisante pour les clients	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT
58- nous sommes une entreprise citoyenne (vie associative, aides...)	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC
41-nous proposons des facilités de paiement et/ou réductions pour les clients	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT
67-nous participons à la diminution de l'importation des énergies fossiles ce qui stabilise les prix et améliore le budget de l'Etat	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT
43-nos produits permettent aux clients de réduire leurs consommations énergétiques et de faire une économie d'énergie	CLT	CLT	CLT	CLT	ETAT	CLT	ETAT	CLT	ETAT	CLT	CLT	CLT	CLT	CLT
44-nos produits permettent aux clients de gagner sur le plan d'indépendance énergétique	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT
56-nous créons de l'emploi	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC
45-nous expliquons et nous convainquons les clients des caractéristiques, du fonctionnement et des avantages (gains d'argent, qualité) de nos produits	CLT	CLT	CLT	CLT	CLT	CLT	EMP	CLT	CLT	CLT	CLT	CLT	CLT	CLT
10-nous sensibilisons nos clients à réduire leurs consommations énergétiques	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT
65-nous aidons l'Etat à gagner des points carbone et à avoir des subventions de l'étranger	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT
53-nous encourageons nos employés par la mise en place de quelques actions sociales (crédits, primes d'entrée scolaire...)	EMP	SOC	EMP	EMP	EMP	EMP	EMP	EMP	SOC	EMP	SOC	EMP	SOC	EMP
63-nos produits peuvent aider l'Etat pour diminuer son déficit énergétique	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT
54-nous maintenons une bonne relation avec nos employés	EMP	EMP	SOC	EMP	EMP	SOC	EMP	SOC	EMP	EMP	SOC	SOC	SOC	EMP
42-les produits que nous proposons sont utiles et répondent aux besoins des clients (échauffement d'eau, pompage, éclairage...)	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT
60-nous réduisons la pollution (émission de CO2 et du gaz à effet de serre, pollution sonore) à travers nos produits/services	ENV	ENV	ENV	ENV	ENV	ENV	ENV	ENV	SOC	SOC	ENV	ENV	ENV	ENV
40-nos produits sont rentables pour les clients (diminutions de dépenses, retour sur investissement satisfaisant)	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT
55-nous encourageons le produit local, même s'il coûte plus cher	SOC	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	SOC	ETAT	ETAT	ETAT	ETAT	SOC
38-les programmes (subvention et crédit) mis en place par l'Etat facilitent et encouragent l'achat de nos produits	CLT	CLT	CLT	CLT	ETAT	SOC	ETAT	CLT	SOC	ETAT	SOC	SOC	ETAT	SOC
64-nous participons à alléger la charge de la subvention dédiée à l'énergie fossile à travers nos installations	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	SOC	ETAT	ETAT	ETAT	ETAT	ETAT
48- l'enseigne de notre entreprise est un gage de confiance et de fiabilité dans un environnement où l'origine du produit est parfois douteuse	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT
57- nous avons formé plusieurs ingénieurs et techniciens qui travaillent aujourd'hui dans ce domaine	SOC	EMP	EMP	EMP	EMP	EMP	EMP	EMP	EMP	EMP	EMP	EMP	EMP	EMP
66-nous participons au développement économique du pays	ETAT	ETAT	SOC	SOC	ETAT	ETAT	SOC	ETAT	ETAT	SOC	SOC	ETAT	SOC	ETAT
46-nos certifications sont des gages de confiance pour les clients	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT

Source: Own

Table 12. Perreault and Leigh Inter-judge (Ir) agreement scores SVA dimension (Round 4-2)

Pairs judge	Ir	Pairs judge	Ir
1-2	0.918	4-11	0.889
1-3	0.918	4-12	0.889
1-4	0.918	4-13	0.918
1-5	0.859	5-6	0.797
1-6	0.859	5-7	0.918
1-7	0.918	5-8	0.728
1-8	0.829	5-9	0.889
1-9	0.889	5-10	0.889
1-10	0.918	5-11	0.946
1-11	0.889	5-12	0.859
1-12	0.918	5-13	0.889
1-13	0.918	6-7	0.829
2-3	0.946	6-8	0.763
2-4	0.889	6-9	0.918
2-5	0.889	6-10	0.859
2-6	0.889	6-11	0.829
2-7	0.946	6-12	0.889
2-8	0.728	6-13	0.859
2-9	0.918	7-8	0.763
2-10	0.946	7-9	0.859
2-11	0.918	7-10	0.889
2-12	0.946	7-11	0.946
2-13	0.889	7-12	0.889
3-4	0.889	7-13	0.889
3-5	0.859	8-9	0.797
3-6	0.889	8-10	0.797
3-7	0.918	8-11	0.797
3-8	0.763	8-12	0.763
3-9	0.918	8-13	0.859
3-10	0.889	9-10	0.889
3-11	0.889	9-11	0.859
3-12	0.889	9-12	0.918
3-13	0.889	9-13	0.889
4-5	0.859	10-11	0.918
4-6	0.946	10-12	0.973
4-7	0.889	10-13	0.889
4-8	0.829	11-12	0.889
4-9	0.918	11-13	0.918
4-10	0.859	12-13	0.859

Source: Own

The above table shows that all Ir values are higher than the minimum required of (65%). Hence, the scores vary between (0.728) and (0.946), and all expert pairs are in agreement. Thus the items are trustworthy and credible.

Table 13. Item Placement ratios (hit ratios) for the SVA dimension (Round 4-2)

	Actual classification						
	CLT	EMP	SOC	ENV	ETAT	Total	% Hits
CLT	125	1	5		7	138	90.579%
EMP		16	10			26	61.538%
SOC		12	28		11	51	54.901%
ENV			2	24		26	92.307%
ETAT			7		58	65	89.230%
Total	125	29	52	24	76	306	
% Hits	100%	55.172%	53.846%	100%	76.315%		
Total item Placements= 251/306=82.026% hit ratio							

Source: Own

According to the above, the global hit ratio is (82.026%), which is higher than the minimum score requested (75%). Among 306 item placements, 251 were placed in the target. A deeper examination of each sub-dimensions hit ratio shows that there are unsatisfactory hit ratios (54.901%; 61.538%) which are related to the “Society value added” and “Employee value-added” sub-dimensions. Indeed, 10 items are misclassified into the “Society value added” rather than the “Employee value added.” Moreover, 12 items are misclassified into the “Employee value added,” and 11 items are misclassified into the “Government value added” rather than the “Society value-added” sub-component.

Therefore, according to the hit-ratio scores and the item sort responses, we proceed as follows:

- The item 38: « The government's programs (subsidies and loans) make it easier and more attractive to purchase our products. » has a systematic error and 9 experts reclassify it into two different sub-dimensions « Society value added” and “Government value-added » instead of « Customer value-added » therefore, we decide to remove it from the analysis.
- The item 55: « We encourage local products, even if they are more expensive. » has been classified by 11 experts into « Government value-added » instead of « Society value added », hence the item is reclassified into the « Government value-added » sub-dimension.
- The item 57: “We have trained several engineers and technicians who are now working in this field. », has been classified by 12 experts into “Employee value added” instead of a “Society value added” sub-dimension, therefore we replaced the item into the “Employee value added” sub-dimension.

We note that there is a confusion between the two sub-dimensions “Society value added” and “Employee value added,” therefore we decide to merge the two sub-dimensions into one sub-dimension labeled “Social value added.”

d. The Stakeholders Value Added (SVA): Round 4-2 adjusted (B.2)

The round 2 Adjusted of the SVA dimension concerns the combination of the Society value, and the Employee value added sub-dimensions into one sub-dimension.

The item sort responses for the SVA construct are illustrated as follows:

Table 14. Item sort responses for SVA dimension (Round 4-2) adjusted

Valeur ajoutée pour les parties prenantes		Experts												
Items	Key	1	2	3	4	5	6	7	8	9	10	11	12	13
59- nous proposons des produits écologiques qui préservent la planète contre le réchauffement climatique en diminuant l'utilisation des énergies fossiles	ENV	ENV	ENV	ENV	ENV	ENV	ENV	ENV	ENV	ENV	ENV	ENV	ENV	ENV
39 - la subvention est suffisante pour les clients	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT
58- nous sommes une entreprise citoyenne (vie associative, aides...)	SOC/EMP	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC
41-nous proposons des facilités de paiement et/ou réductions pour les clients	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT
67-nous participons à la diminution de l'importation des énergies fossiles ce qui stabilise les prix et améliore le budget de l'Etat	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT
43-nos produits permettent aux clients de réduire leurs consommations énergétiques et de faire une économie d'énergie	CLT	CLT	CLT	CLT	ETAT	CLT	ETAT	CLT	ETAT	CLT	CLT	CLT	CLT	CLT
44-nos produits permettent aux clients de gagner sur le plan d'indépendance énergétique	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT
56-nous créons de l'emploi	SOC/EMP	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC	SOC
45-nous expliquons et nous convainquons les clients des caractéristiques, du fonctionnement et des avantages (gains d'argent, qualité) de nos produits	CLT	CLT	CLT	CLT	CLT	CLT	EMP	CLT	CLT	CLT	CLT	CLT	CLT	CLT
10-nous sensibilisons nos clients à réduire leurs consommations énergétiques	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT
65-nous aidons l'Etat à gagner des points carbone et à avoir des subventions de l'étranger	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT
53-nous encourageons nos employés par la mise en place de quelques actions sociales (crédits, primes d'entrée scolaire...)	SOC/EMP	SOC	EMP	EMP	EMP	EMP	EMP	EMP	SOC	EMP	SOC	EMP	SOC	EMP
63-nos produits peuvent aider l'Etat pour diminuer son déficit énergétique	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT
54-nous maintenons une bonne relation avec nos employés	SOC/EMP	EMP	SOC	EMP	EMP	SOC	EMP	SOC	EMP	EMP	SOC	SOC	SOC	EMP
42-les produits que nous proposons sont utiles et répondent aux besoins des clients (échauffement d'eau, pompage, éclairage...)	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT
60-nous réduisons la pollution (émission de CO2 et du gaz à effet de serre, pollution sonore) à travers nos produits/services	ENV	ENV	ENV	ENV	ENV	ENV	ENV	ENV	SOC	SOC	ENV	ENV	ENV	ENV
40-nos produits sont rentables pour les clients (diminutions de dépenses, retour sur investissement satisfaisant)	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT
55-nous encourageons le produit local, même s'il coûte plus cher	SOC/EMP	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	SOC	ETAT	ETAT	ETAT	ETAT	SOC
38-les programmes (subvention et crédit) mis en place par l'Etat facilitent et encouragent l'achat de nos produits	CLT	CLT	CLT	CLT	ETAT	SOC	ETAT	CLT	SOC	ETAT	SOC	SOC	ETAT	SOC
64-nous participons à alléger la charge de la subvention dédiée à l'énergie fossile à travers nos installations	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	ETAT	SOC	ETAT	ETAT	ETAT	ETAT	ETAT
48- l'enseigne de notre entreprise est un gage de confiance et de fiabilité dans un environnement où l'origine du produit est parfois douteuse	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT
57- nous avons formé plusieurs ingénieurs et techniciens qui travaillent aujourd'hui dans ce domaine	SOC/EMP	EMP	EMP	EMP	EMP	EMP	EMP	EMP	EMP	EMP	EMP	EMP	EMP	EMP
66-nous participons au développement économique du pays	ETAT	ETAT	SOC	SOC	ETAT	ETAT	SOC	ETAT	ETAT	SOC	SOC	ETAT	SOC	ETAT
46-nos certifications sont des gages de confiance pour les clients	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT

Source: Own

Table 15. Perreault and Leigh Inter-judge (Ir) agreement scores of SVA dimension (Round 4-2) adjusted

Pairs judge	Ir	Pairs judge	Ir
1-2	0.971	4-11	0.912
1-3	0.942	4-12	0.942
1-4	0.942	4-13	0.912
1-5	0.912	5-6	0.816
1-6	0.881	5-7	0.942
1-7	0.971	5-8	0.849
1-8	0.816	5-9	0.849
1-9	0.912	5-10	0.912
1-10	0.942	5-11	0.971
1-11	0.942	5-12	0.881
1-12	0.912	5-13	0.912
1-13	0.942	6-7	0.849
2-3	0.971	6-8	0.781
2-4	0.912	6-9	0.912
2-5	0.881	6-10	0.912
2-6	0.912	6-11	0.849
2-7	0.942	6-12	0.942
2-8	0.781	6-13	0.849
2-9	0.942	7-8	0.816
2-10	0.971	7-9	0.881
2-11	0.912	7-10	0.912
2-12	0.971	7-11	0.942
2-13	0.912	7-12	0.912
3-4	0.881	7-13	0.912
3-5	0.881	8-9	0.816
3-6	0.881	8-10	0.816
3-7	0.942	8-11	0.881
3-8	0.781	8-12	0.781
3-9	0.942	8-13	0.881
3-10	0.942	9-10	0.942
3-11	0.912	9-11	0.881
3-12	0.942	9-12	0.971
3-13	0.881	9-13	0.881
4-5	0.881	10-11	0.942
4-6	0.942	10-12	0.971
4-7	0.912	10-13	0.942
4-8	0.849	11-12	0.912
4-9	0.912	11-13	0.942
4-10	0.912	12-13	0.912

Source: Own

The majority of the “Ir” scores in the above table (Table 15: Perreault and Leigh Inter-judge (Ir) agreement scores of SVA dimension (Round 4-2) adjusted) are enhanced. Merging the two sub-dimensions ameliorates the reliability and the validity of the society and employee value added sub-dimension (EMP-SOC) and therefore enhances the Stakeholders Value Added (SVA) reliability and validity.

Table 16. Item Placement ratios (hit ratios) for the SVA dimension (Round 4-2) adjusted

	Actual classification					
	CLT	EMP/SOC	ENV	ETAT	Total	%Hits
CLT	125	6		7	138	90.579%
EMP/SOC		66		11	77	85.714%
ENV		2	24		26	92.307%
ETAT		7		58	65	89.230%
Total	125	81	24	76	306	
%Hits	100%	81.481%	100%	76.315%		
Total item Placements= 273/306=89.215% hit ratio						

Source: Own

The hit ratio obtained is (89.215%). It is superior to the original hit rate of (82.026%) before the combination operation. The new hit score (89.215%) is superior to the minimum score requested (70%). Furthermore, the new hit ratios (85.714%) and (81.481%) related to the merged EMP and SOC sub-dimensions widely exceed the originals hit ratios (61.538%; 54.901%) and (55.172%; 53.846%). Moreover, considering the new “Ir” scores obtained, we deduce that the content validity is achieved for the (SVA) dimension.

After the achievement of the Q sort technique, we propose that the two formative second-order dimensions: the “Enterprise value added” and the “Stakeholders Value Added” form the third order hierarchical component model labeled the “Stakeholders’ based sustainable value.”

The second order dimension ‘Stakeholders Value Added’ is formed by Customer value added, Government value added, Environmental value-added, Social (Employee and Society) value added.

Innovation, competitive advantage, organizational competence and relational value, are likely to form and cause the Enterprise value added. Hence, the Enterprise value added is a formative second-order model.

These dimensions (innovation, competitive advantage, organizational competence and organizational value), are reflective. Therefore, they represent the first order reflective dimensions forming the second order formative dimension that is “The Enterprise value added.”

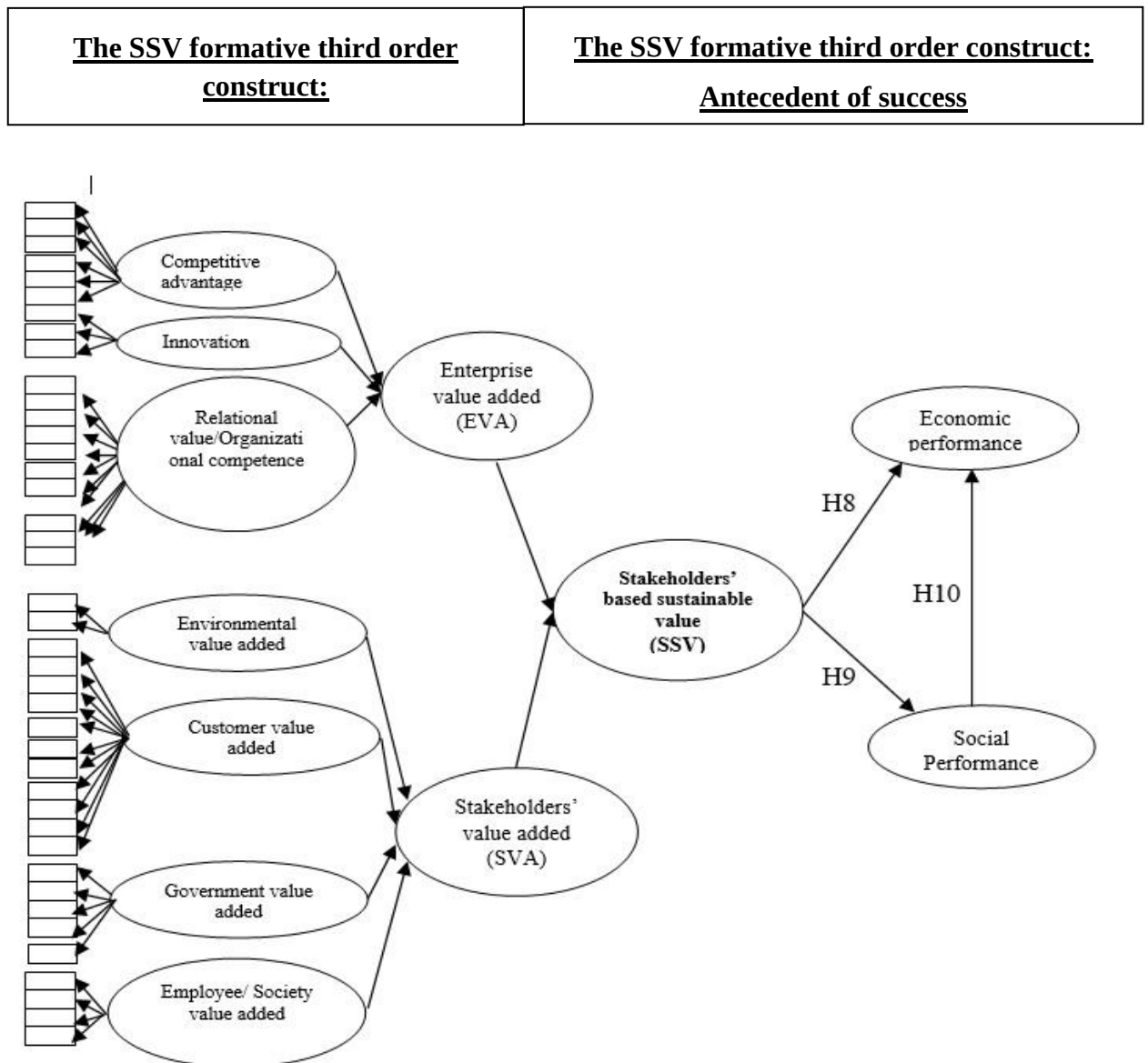
Concerning the structural model, the following hypothesis are presented

H1: Stakeholders’ based sustainable value (Enterprise value-added and Stakeholders value added) positively impacts economic performance.

H2: Stakeholders’ based sustainable value (Enterprise value-added and Stakeholders value added) positively impacts social performance.

H3: Social performance positively impacts Economic performance.

Figure 2. The SSV measurement and structural models



Source: Own

CONCLUSION

Given the limited reserves of fossil energy, the increasing consumption level of energy and the problem of climate change, the need for green energies is emerging and a better understanding of the process of sustainable initiatives is required. The development of renewable energy technologies as well as the passage towards renewable energies production will not happen without the involvement of entrepreneurs. However, ecological and sustainable entrepreneurship in the field of renewable energy is not widely explored in the literature and still at an early age (Kirkwood and Walton, 2010).

In this paper, a qualitative research is presented by conducting semi-structured interviews with entrepreneurs in solar energies ventures. Following abductive research approach, we propose an emerging concept which is specific to the case of the entrepreneurial initiative in a sustainable area. The concept is labeled “Stakeholders’ based Sustainable Value” (SSV) and it is based on the value creation, sustainable development and stakeholder management literature. Another qualitative phase using CVR and Q-sort methods assesses the content validity of the proposed construct. The content validity of our third-order reflective formative measurement

scale is approved. In this stage, 56 items were retained. However, our measurement model is still raw; further research is needed to assess its reliability and validity. In the future publications we intend to propose a psychometric analysis in order to assess the reliability as well as the construct validity of SSV by means of an exploratory and a confirmatory factor analysis using a sample of 133 enterprises in the solar energy sector in Tunisia. We propose a new construct reflecting a global view of value that links the economic and financial perspectives to the social and ecological aspects. This construct is specific to the case of entrepreneurial initiative in a sustainable area, notably the solar energy sector. This research is among the first studies that propose a valid measure of value creation in sustainable sectors like solar energy.

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ANALYZING AND RESOLVING THE CONSEQUENCES OF TOURIST INFLUXES ON ENVIRONMENTAL METRICS AT A TOURIST DESTINATION

ABSTRACT

The primary objective of this paper is to examine the impacts of tourist influxes on environmental metrics and to develop strategies for enhancing sustainability awareness among tourists, thereby minimizing the adverse effects of tourist influxes. The tourist data were collected from: 1) the portals of the Ministry of Tourism of India, to obtain arrival data for the past eight years; and 2) an environmental sustainability questionnaire designed to gather tourists' demographic profiles, resource consumption, waste generation, and behavioral or knowledge-related data in Agra; 3) The designed SWOT questionnaire to get the rankings of SWOT groups and factors. This data is used to analyze resource consumption and waste generation patterns using explanatory analysis, the correlation between the demographic and behavior and knowledge to understand their sustainability awareness level, and use TOWS analysis to design strategies for reducing the negative consequences of tourist influxes. The results show that age group is a strong predictor for water consumption, energy consumption, and waste generation. The large effect size, R² values, and VIF analysis indicated excellent fit and strong predictive performance. The awareness questionnaire analysis showed a gap between the behavioral factors and the knowledge level. Fifteen strategies are designed to improve the sustainability awareness of tourists coming to Agra. This study will enable destination managers to better understand tourists' waste reduction and resource consumption behaviors, and to make long-term oriented decisions to conserve the tourist destinations for future generations same as earlier generations.

KEYWORDS: tourist influxes; environmental metrics; environmental sustainability awareness; explanatory analytics; TOWS analysis.

JEL: Z32, Q56, Q01, C83

INTRODUCTION

Tourism is widely recognized as a high-energy and water resource-demanding activity. Tourists often consume significantly more energy and water per day than residents, with usage patterns in recreational activities, transportation, and accommodations creating substantial ecological footprints (Belsoy, Korir & Yego, 2012), which harm the environment (Bhat et al., 2014; Villanthenkodath, Mahalik & Arafath, 2022; and Adebayo et al., 2023).

One main threat of tourism growth is increasing pressure on freshwater resources, thereby increasing water scarcity (Veldkamp et al., 2017). The flexible travel access, leading to an increase in the number of tourists, sharpens the vulnerability of the destination towards water insufficiency (Stoyanova, 2025). For example, water use on a per-guest-night basis is found to differ substantially, with water usage being highest (Becken, 2014). Tourists consume plenty of water in activities like ski tourism, winter tourism, using spas, swimming pools, or wellness areas (Gössling, 2002). Maintaining hotel gardens, developing tourism infrastructure, and producing food and fuel place a demand on freshwater resources (Gössling et al., 2012).

Secondly, tourist growth acts as a driver for increased energy consumption to support increased demand for hospitality, leisure activities, transportation, and infrastructure (Nepal, Al Irsyad & Nepal, 2019; Raihan et al., 2023). Furthermore, economic expansion drives energy usage through tourism expansion, and tourist activities (Pablo-Romero, Sánchez-Braza & García-Soto, 2023).

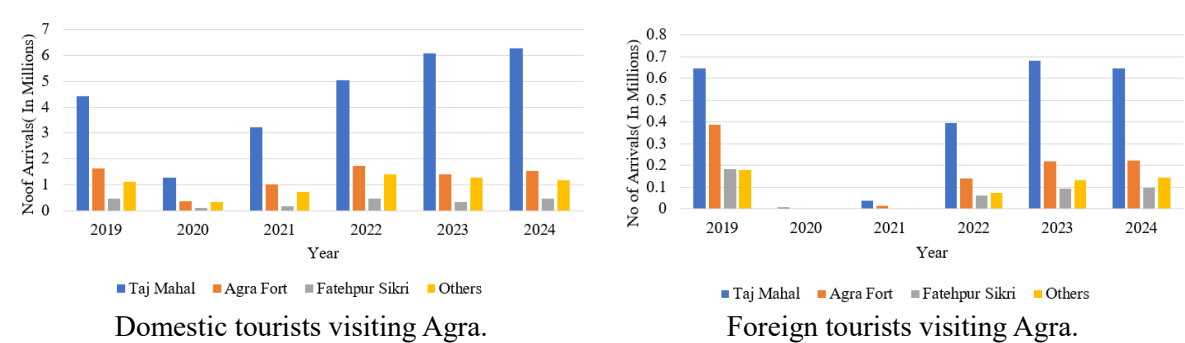
Thirdly, tourist arrivals also contribute substantially to solid waste generation (Diaz-Farina, Díaz-Hernández & Padrón-Fumero, 2020). The impact of this waste generation is large and increasing (Murava & Korobeinykova, 2016), which in some regions is double that of a resident (Shamshiry et al., 2011). Plastic pollution remains a major global environmental concern, forming a significant share of plastic debris. Managing this plastic waste, particularly during periods of increased tourist arrivals, has become very challenging (Senarathna & Mahagamage, 2025). Thus the need is to analyze the impact of tourist arrival at a destination to maintain its sustainability.

1. Vulnerabilities of tourism in Agra city

India is a globally renowned tourist destination due to its prominent attractions such as the Taj Mahal, the Himalayan ranges, and the royal palaces of Rajasthan. According to the India Tourism Data Compendium (2025), India recorded 20.94 million foreign tourist arrivals in 2024, an 8.84% increase from the previous year, and domestic tourists increased by 17.51% in 2024.

Agra, a city in India, is widely recognized as one of the most artistically inspiring cities around the world and is a perfect example of authenticity. It is a significant tourist destination as it houses UNESCO World Heritage sites: The Taj Mahal, Agra Fort, and Fatehpur Sikri. Every year, many domestic as well as international tourists visit this historically important destination (Figure 1).

Figure 1. Tourist arrivals in Agra

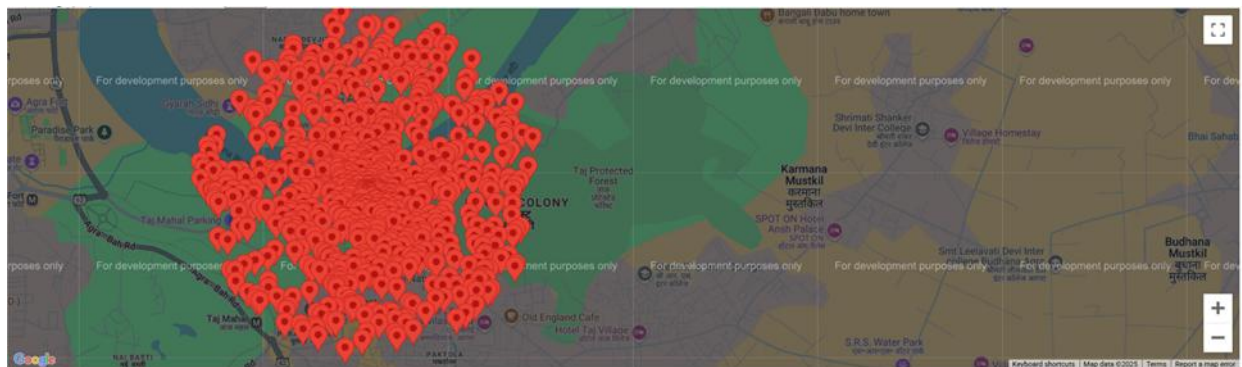


Source: India Tourism Data Compendium, 2025

In Agra, high arrival rates lead to key vulnerabilities including environmental degradation (such as excessive air pollution, waste generation, unsustainable pressure on water, sanitation, and

accommodation facilities, and resource depletion (Sharma & Bisht, 2019; and Srivastava & Srivastava, 2020)), infrastructure strain, overcrowding, severe traffic congestion, social disruption, and inefficient management (Lal et al., 2016; Guttikunda et al., 2019; Yadav & Gangal, 2024; and Yadav & Prakash, 2025). A structured survey was conducted by the authors of this paper to assess the spatial concentration of tourist activity. Consequently, the collected data contributed to identifying patterns of overtourism at the Taj Mahal, as shown in Figure 2 (self-observation, in January 2024). Such impacts can cause the loss of authenticity and imply a significant risk to the future attractiveness of the destination, therefore putting it at existential risk (Peeters et al., 2018). Thus, preventing long-term sustainability of tourism in Agra requires immediate and coordinated efforts for better management.

Figure 2. Overtourism surrounding the Taj Mahal, Agra



Source: self-created

The goal of this study is to analyze the consequences of tourist influxes at Agra and to generate strategies for increasing environmental sustainability awareness among tourists to minimize the negative consequences of tourist influxes. The research questions addressed in this study are as follows:

RQ1: What are the dominant patterns of resource consumption and waste generation exhibited by tourists, and how do these patterns relate to the demographics and behavior of tourists?

RQ2: Are tourists aware of environmental sustainability, and do tourists' knowledge of environmental sustainability align with their actual behaviors?

RQ3: What measures can be taken to increase environmental sustainability awareness of tourists?

A methodological framework for performing a cohort study and explanatory data analytics is developed to answer these research questions by determining resource consumption and waste generation patterns and analyzing the environmental sustainability awareness level of tourists. This is done by integrating statistical techniques with SWOT analysis to analyze sustainability behavior and awareness level of tourist and to design strategies for reducing negative consequences of tourist influxes.

The presentation of the study is organized in the following manner. In the second section, the role of tourist influxes on environmental metrics is reviewed. The third section outlines the development steps of the methodology. The fourth section presents the results and discussion. In the fifth section, the conclusion is reported.

2. LITERATURE REVIEW

A significant amount of work has been done by researchers to understand the resource consumption and waste generation patterns. Gonzalez-Perez, Martín, Martínez & Pachón (2023) determined water consumption patterns of tourists and showed that overnight stays not recorded in the official statistics affect the real impact of tourism on the environment. MacAskill, Becken & Coghlan (2023) argued that hotels overconsume resources like electricity, gas, and water. By taking quantitative resource consumption and occupancy data from hotels, it was shown that guest numbers are significantly correlated with water consumption. Water challenges in areas facing overtourism are detailed by Lanquar (2025), and strategies to ensure sustainable tourism are designed.

Tourism growth has resulted in increased energy consumption. Nepal, Al Irsyad & Nepal (2019) assessed the short-run and long-run relationships between tourist arrivals, emissions, and energy consumption in tourist accommodations in Nepal. Using time-series econometrics, it was shown that energy consumption is affected by tourist arrivals. Zhang & Zhang (2020), Khan & Hou (2021), Rauf et al. (2021), Pata & Balsalobre-Lorente (2022), Pablo-Romero, Sánchez-Braza & García-Soto (2023), and Satrovic & Adedoyin (2023) presented methods to examine the relationships between tourism energy consumption, destination management, and sustainable tourism. Strategies for sustainable energy consumption were designed to reduce energy-related problems due to tourism. Díaz Pérez et al. (2022) detailed how overtourism impacts energy consumption and concluded that the reason for increased energy consumption is overnight stay.

Tourism growth also contributes significantly to waste generation (Diaz-Farina, Díaz-Hernández & Padrón-Fumero, 2020). Iuras, Raiter, Korobeinykova & Poberezhna (2020) detailed the impact of factors responsible for generating waste within tourist destinations by using regression analysis and also predicted the amount of waste generation due to tourist activities. Martins & Cró (2021) estimated the impact of tourist activities on solid waste generation and concluded that tourist activities are responsible for almost 42% to 47% of solid waste generation in Madeira. Wang, Filimonau & Li (2021) used an exploratory survey to determine the amount of food wasted by tourists in Lhasa, China. The role of food consumption-related factors and various socio-demographic factors was discussed. Nayanarangani, Mudiyansele & Himalika (2022) quantified and characterized waste types in major tourist destinations of Sri Lanka and concluded that solid waste generation in touristic locations depends on the season and the prevailing environmental legislation of the country. The correlations between plastic waste and the tourism industry were established by de Oliveira, Sampaio & Sampaio (2023), Pandey, Dhiman, Chopra & Adlakha (2023), Yuxi, Filimonau, Ling-en & Linsheng (2023), Al Muqsit, Setiadi & Lo (2024), and Arbulú, Rey-Maqueira & Sastre (2024). Chhikara et al. (2025) described the solid waste management issues of rural areas, considering accommodation choices, tourist demographics, and consumption patterns as key factors that increase different types of waste.

Analyzing the influence of tourist influxes on environmental sustainability in terms of demographics and behavior can also provide useful understandings, as discussed by researchers. By analyzing trends based on age, gender, travel purpose, and stay duration, valuable insights can be gained to offer responsible tourism (Jain & Sharma, 2021). Rodríguez, Jacob & Florido (2020) showed that older tourists have a higher pro-environmental attitude in hotel establishments than younger ones, with most of these tourists realizing the importance of the hotel to have an energy-saving policy. Adam (2022) characterized tourists' behavioral response to single-use plastic waste by using unique environmental values and socio-demographic and travel characteristics, including age, gender, education, tourist type, and

repeat visit status. Uçgun & Narcı (2022) investigated the role of tourists' sex, age, education, and income level on tourists' sustainability consciousness to understand their perspective on sustainable tourism practices in accommodation facilities. Forleo & Bredice (2025) investigated the knowledge, opinions, and behavior among the Italian GenZ in relation to coastal and marine tourism as well as the environment. Findings showed that the area of residence and gender significantly affected the respondents' knowledge of marine sustainability.

Torres-Bagur, Ribas & Vila-Subirós (2020) analyzed water-saving practices among guests at various accommodation types in a river basin and showed that these differences are due to visit purpose, geographic origin, and accommodation type. Gabarda-Mallorquí, Garcia, Fraguell & Ribas (2021) showed that stay duration significantly and positively influenced water conservation habits. Casado-Díaz, Sancho-Esper, Rodriguez-Sanchez & Sellers-Rubio (2023), in a hotel, examined guests' water conservation behavior when they are on vacation and showed significant gender differences with specific factors affecting the water conservation behavior of guests. The impact of environmental concerns on water conservation behaviors among Gen Z tourists in Iranian desert regions was examined by Torabi, Hall, Azarniou & Borzu (2025).

The literature review reveals that prior research has addressed the environmental impacts of tourism growth with respect to a single environmental metric, which may miss some valuable insights. Moreover, the differential impacts of tourist flows, combined with limited attention to environmental awareness factors, represent key areas of under-exploration. This study aims to address these gaps by modeling the relationship between tourists' demographic and behavioral factors and environmental metrics using a mixed-method approach.

3. RESEARCH DESIGN

This study combines multivariate analysis with TOWS analysis to achieve the research study goal. A team of experts was formed in this study to interpret the data and design the questionnaire and policies for enhancing the validity and reliability of research findings. The criteria to choose experts were their experience, domain knowledge, availability, and compatibility. The background of the experts is given below:

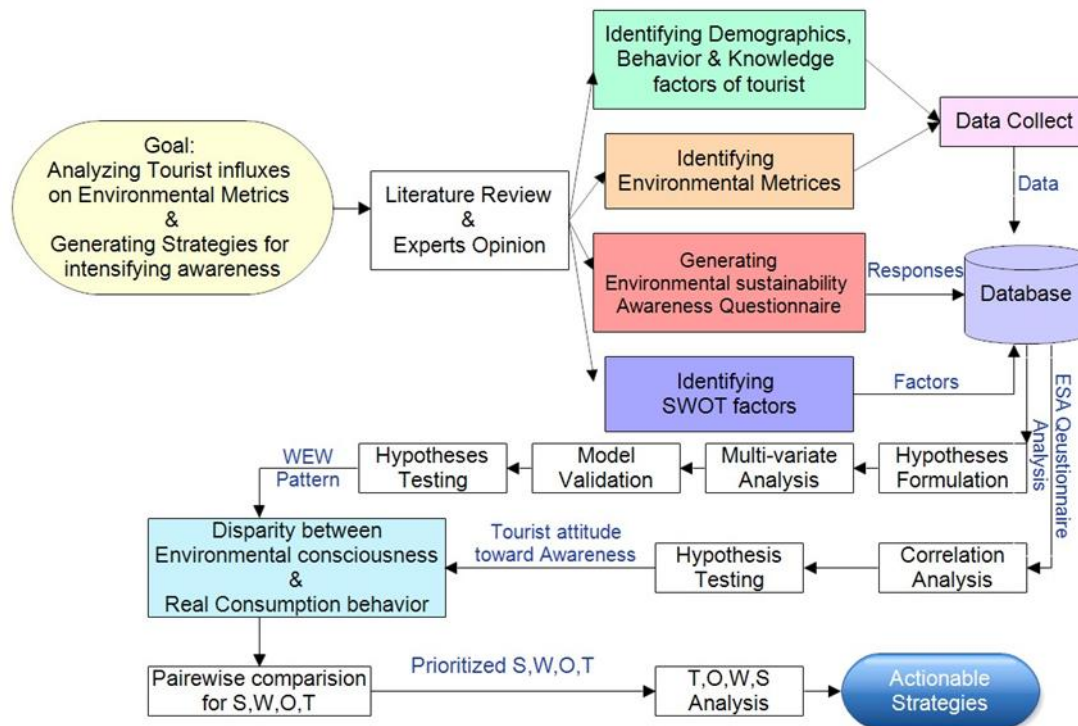
- Three tourism experts with tourism management degrees are from the Heritage Institute of Hotel & Tourism, Agra. These experts helped in approving tourist demographic and behavioral data, collecting data for the study, designing the questionnaire, and developing policies.
- Two environmental experts are professors in the Department of Botany and Chemistry, Dayalbagh Educational Institute, Agra, who helped in verifying environmental metrics and generating an awareness questionnaire.

The methodological framework consists of the following phases (Figure 3).

A. Collecting Data

The relevant demographic and behavioral factors are identified by the literature review. The tourist influx data is gathered from India Tourism Data Compendium Key Highlights. (2025). The sample is limited to the annual time-series statistics, spanning 08 years (from 2017 to 2024) to produce a variety of datasets that highlight patterns and effects related to tourist influxes in Agra.

Figure 3. The conceptual framework.



Source: Own

An Environmental Sustainability Awareness (ESA) questionnaire is prepared to determine the awareness level of tourists. The questionnaire is generated using the Delphi method (Skulmoski, Hartman & Krahn, 2007). The stability in reviewing the responses reached in the third round of the Delphi exercise. A structure survey was conducted to get the questionnaire filled out. Tourists visiting the Taj Mahal and Agra Fort were approached and invited to participate in this survey by filling out a Google form. This methodological approach facilitated direct engagement with tourists. The respondents in this study are tourists (government employees, businessmen, university students, and holidaymakers) who came to Agra for travel purposes.

Out of the 240 individuals, 209 provided complete responses. Some individuals declined to participate due to personal reasons, and a few hotels did not permit the survey to be conducted on their premises. Despite these challenges, the survey achieved a high response rate, and the data collected offer valuable insights into tourist awareness towards sustainability. 7 hotels (two 5-star, three 2-star, and three budget hotels) were selected at random to get the questionnaire filled. The sample size of 209 is considered adequate based on guidelines by Tabachnick and Fidell (1991) and Hogarty et al. (2005).

B. Formulating hypotheses

The selection of common predictors was based on their direct and observable influence on resource consumption behaviors during tourism activities. These variables are consistently available across all records and provide a standardized basis for comparison across models.

Directional hypotheses for each dependent variable—water consumption, energy consumption, and waste generation (WEW)—based on tourist demographic and behavioral factors (age-group, gender, visit intent, stay duration, and awareness) as independent variables are formulated to provide more precise and focused predictions. Each research hypothesis (RH) includes the expected direction of the effect based on prior literature.

RH1: There is a directional difference in mean energy consumption across groups defined by visit intent, stay duration, age group, or gender.

RH1A: Tourists staying longer consume more energy than those with shorter stays.

RH1B: Tourists visiting for leisure and business purposes consume more energy than those visiting for other reasons.

RH1C: Older age groups consume more energy due to higher activity levels.

RH1D: Female tourists consume more energy than male tourists.

RH2: There is a directional difference in mean water consumption across groups defined by visit intent, stay duration, age group, or gender.

RH2A: Tourists with longer stays consume more water than those staying for shorter durations.

RH2B: Leisure and business tourists consume more water than eco-friendly tourists.

RH2C: Older and younger tourists (more active or outdoor-oriented) use more water than adults.

RH2D: Female tourists consume more water than male tourists.

RH3: There is a directional difference in mean waste generation across groups defined by visit intent, stay duration, age group, or gender.

RH3A: Tourists with longer stays generate more waste.

RH3B: Leisure tourists generate more waste compared to business tourists.

RH3C: Older tourists generate more waste than younger tourists.

RH3D: Female tourists generate more waste than male tourists.

RH4: Tourists with low environmental awareness show higher waste generation.

C. Multi-variate analysis

Multiple regression models are developed to identify significant predictors that result in resource depletion and waste generation. The formulated regression models are:

$$Y_{EC} = \beta_{01} + \beta_{11}X_{Age} + \beta_{21}X_{gender} + \beta_{31}X_{PV} + \beta_{41}X_{LS} + \varepsilon_1 \quad (1)$$

$$Y_{WC} = \beta_{02} + \beta_{12}X_{Age} + \beta_{22}X_{gender} + \beta_{32}X_{PV} + \beta_{42}X_{LS} + \varepsilon_2 \quad (2)$$

$$Y_{WG} = \beta_{03} + \beta_{13}X_{Age} + \beta_{23}X_{gender} + \beta_{33}X_{PV} + \beta_{43}X_{LS} + \varepsilon_3 \quad (3)$$

Where

Y_{EC} : energy consumption model, Y_{WC} : water consumption model, Y_{WG} : waste generation model,

X_{Age} : age group, X_{gender} : gender, X_{PV} : visit intent, X_{LS} : stay duration,

β_{ij} : regression coefficients for each dependent variable ($i=1, \dots, 4$, $j=1, \dots, 3$), β_{0j} : intercept, and

ε_j : error terms.

One-hot encoding is used to convert the categorical variables (visit intent, age group, and gender) into numerical forms. The model can now be formulated as

$$Y_j = \beta_{0j} + \sum_{i=1}^4 \beta_{ij} X_i + \varepsilon_j \quad (4)$$

The ordinary least squares method is utilized to estimate the regression coefficients β_{ij} :

$$SSE = \sum_{i=1}^4 (Y_i - \hat{Y}_i)^2 \quad (5)$$

where Y_i are actual observed values, and $\hat{Y}$ are predicted values.

Formula (6) is utilized to compute the estimated regression coefficients.

$$\beta_{ij} = (X^T X)^{-1} X^T Y \quad (6)$$

Where the matrix of independent variables is represented as X , and the vector of dependent variables is Y .

To check that the model is statistically significant, the F-test is performed using formula (7) as

$$F = \frac{(\text{ExplainedVariance})/p}{(\text{UnexplainedVariance})/(n-p-1)} \quad (7)$$

Where p : number of predictors and n : number of observations

For each regression coefficient β_{ij} :

$$H_0: \beta_{ij} = 0 \text{ (No effect)} \quad (8)$$

$$H_1: \beta_{ij} \neq 0 \text{ (Significant effect)} \quad (9)$$

t-statistic is utilized to determine the substantial impact of WEW.

$$t = \frac{\beta_{ij}}{SE(\beta_{ij})} \quad (10)$$

$$\text{and } SE(\beta_{ij}) = \sqrt{\text{Variance}(\beta_{ij})} \quad (11)$$

A p-value < 0.05 for β_{ij} shows that the variable β_{ij} is significant. The accuracy of the model is evaluated by computing R^2 and Adjusted R^2 values and mean square error. The models are validated using the 5-fold cross-validation method and VIF analysis.

C. Analyzing the ESA questionnaire

The ESA questionnaire consists of three sections. The demographic information of tourists is provided in section 1 to show the socioeconomic variation that may impact their knowledge and behavior. Section 2 contains questions related to evaluating the knowledge of environmental sustainability of tourists, and questions about assessing their behavior towards sustainability are included in Section 3 (Table 1).

Table 1. The ESA questionnaire.

Sect.No	Questionnaires Items	Questions
2.	Environmental sustainability knowledge	I prefer guided tours and nature walks.
		I am aware that sustainable development demands reducing all sorts of waste.
		I am familiar with local environmental guidelines.
		I understand the importance of protecting local heritage.
		I understand the meaning of environmental signage at the destination.
		I understand overcrowding, pollution, and habitat destruction are common problems at destinations.
		I know responsible waste disposal practices.
		I know that plastic pollution is a global problem.
		I am aware of the rules in protected areas.
		I understand visitor capacity management.
3.	Environmental sustainability behavior	I use reusable plastic items like plastic bags, bottles, and cutlery.
		I avoid single-use plastic items.
		I go through the environmental information before visiting the destination.
		I use public or eco-friendly transportation.
		I prefer responsible waste disposal practices.
		I avoid visiting sites during peak tourist seasons.
		I participate in volunteer sustainable tourism programs.
		I adhere to rules in protected areas.
		I purchase local, eco-friendly products.
		I prefer staying in accommodations with a green certificate.
		I avoid overconsumption of resources.

Source: Own

To evaluate the content validity, items are developed from literature reviews (Adam, 2022; Jain & Sharma, 2021) and reviewed by experts to ensure relevance to sustainable metrics, demographics, and behavioral factors. Kaiser–Meyer–Olkin (KMO) test is used to measure sampling adequacy. Descriptive statistics provides a summary of the questionnaire items. Hypothesis (RH4) is tested using ANOVA to establish statistical significance between groups.

The reliability of the questionnaire is determined using Cronbach’s Alpha (α) value (Cronbach, 1951), given by formula (12), where k is the number of items in the scale, σ_i^2 is the variance of each item, and σ_t^2 is the variance of the total scores. The questionnaire items are reliable if the α value > 0.7 . Reliability analysis is done using SPSS.

Table 2. Description of SWOT factors

Strengths: <i>The strengths of tourists can transform tourism from an extractive industry into a regenerative force, leading to responsible tourism.</i>	Weaknesses: <i>Addressing weaknesses of tourists enhances visitor satisfaction and supports sustainable, long-term tourism growth.</i>
<i>f₁</i> . Age: Age groups allow for a diversified market. Baby Boomers appeal for steady, high-value income, and Gen Z rely on innovation, digital engagement, and long-term sustainable growth	<i>f₁₁</i> . Overconsumption of resources: Tourists often put immense pressure on local water, energy, and land resources, causing scarcities for residents.
<i>f₂</i> . Curiosity: Desire for novelty, knowledge, and emotional fulfilment through exploration by traveling to new destination	<i>f₁₂</i> . Infrastructure vandalism: Involves intentional destruction and disfigurement of facilities, historical monuments, and natural sites by tourists.
<i>f₃</i> . Tech-savvy: Using digital platforms for planning, booking, and sharing experiences.	<i>f₁₃</i> . Overtourism behaviors: Influx of tourists causes overcrowding and strains local infrastructure, resulting in a diminished experience for both visitors and residents.
<i>f₄</i> . Experience-driven tourism: Transforming travelers from passive observers into active participants, fostering visitor loyalty.	<i>f₁₄</i> . Generational gaps in technology: While smart technologies are desired, different generations have different weak points, which may enable finding issues with the reliability of apps and virtual experiences.
<i>f₅</i> . Adaptability: Enable tourists to navigate unfamiliar cultural environments, manage unexpected disruption, and foster emotional resilience.	<i>f₁₅</i> . Demand variability: Different demographic groups have highly diverse needs and expectations, making it difficult to create a single, efficient, and sustainable tourism management strategy.
<i>f₆</i> . Education: A significant portion of tourists are highly educated, which enables them to enhance their traveling experience through skill acquisition, personal growth, and cultural immersion.	<i>f₁₆</i> . Waste generation: Tourists generate excessive waste, which causes ecological damage through improper disposal, straining, and exceeding local infrastructure capacity.
Opportunities: <i>Opportunities can transform travel into a force for good and ensure that travel growth does not deplete natural resources.</i>	Threats: <i>Overcoming threats strengthens destination resilience, ensuring long-term sustainability, economic stability, and enhanced safety for tourists and residents.</i>
<i>f₇</i> . Travel education: Travel education, a <i>living textbook</i> , provides immersive experiential learning, fostering cultural empathy, and building global awareness.	<i>f₁₇</i> . Cultural insensitivity: Includes irresponsible interaction, such as disrespecting sacred sites or disrupting local customs, which leads to the creation of inaccurate and stereotypical representations of host cultures.
<i>f₈</i> . Personalized travel experience: Offering bespoke itineraries and integrated trip planning using AI based on individual user behaviors.	<i>f₁₈</i> . Overtourism impacts: High concentrations of visitors cause severe overtourism, leading to overcrowding, destruction of historical sites, pollution, and environmental degradation.
<i>f₉</i> . Informative activity-based travel: Focusing on the sequences of activities (e.g., work, shopping, leisure) rather than isolated trips, allowing specialized, high-demand, and local tourism development.	<i>f₁₉</i> . Resource depletion: High consumption of amenities and natural resources places a strain on local infrastructure and community stability.
<i>f₁₀</i> . Motivation-driven trips: Motivation-driven trips, including incentive travel and personalized experiences, boost employee performance, improve loyalty, and enhance overall well-being.	<i>f₂₀</i> . Vandalism: Degrades aesthetic appeal, harming cultural assets, and creating a sense of insecurity.

Source: Own

The pairwise comparison method is used to prioritize the SWOT groups and factors. The global weights are calculated using the principle of hierarchy (Saaty, 2008). The expert team designed 15 strategies (A_i, i=1,...,15) (Table 3) under four conceptually distinct strategic groups (SO, WO, ST, WT) using TOWS analysis (Singh & Singh, 2018).

Table 3. Designed Strategies.

S.No.	Strategies
A ₁	Grow ethical awareness of responsible tourism.
A ₂	Encourage to focus on slow travel.
A ₃	Educate tourists to respectfully engage with locals.
A ₄	Implement signboards for energy and water consumption.
A ₅	Encourage informative travel.
A ₆	Encourage tourists to visit lesser-known destinations.
A ₇	Develop age-group-based strategies.
A ₈	Create new tourist attractions.
A ₉	Encourage following the leave no <i>trace</i> principles.
A ₁₀	Avoid overcrowding at the tourist hotspots.
A ₁₁	Organize pre-visit education campaigns at tourist accommodations.
A ₁₂	Encourage eco-friendly alternatives.
A ₁₃	Use social media for conservation awareness.
A ₁₄	Balancing immediate needs with long-term scarcity through technology
A ₁₅	Implement visitors dispersion model to reduce the overtourism impact

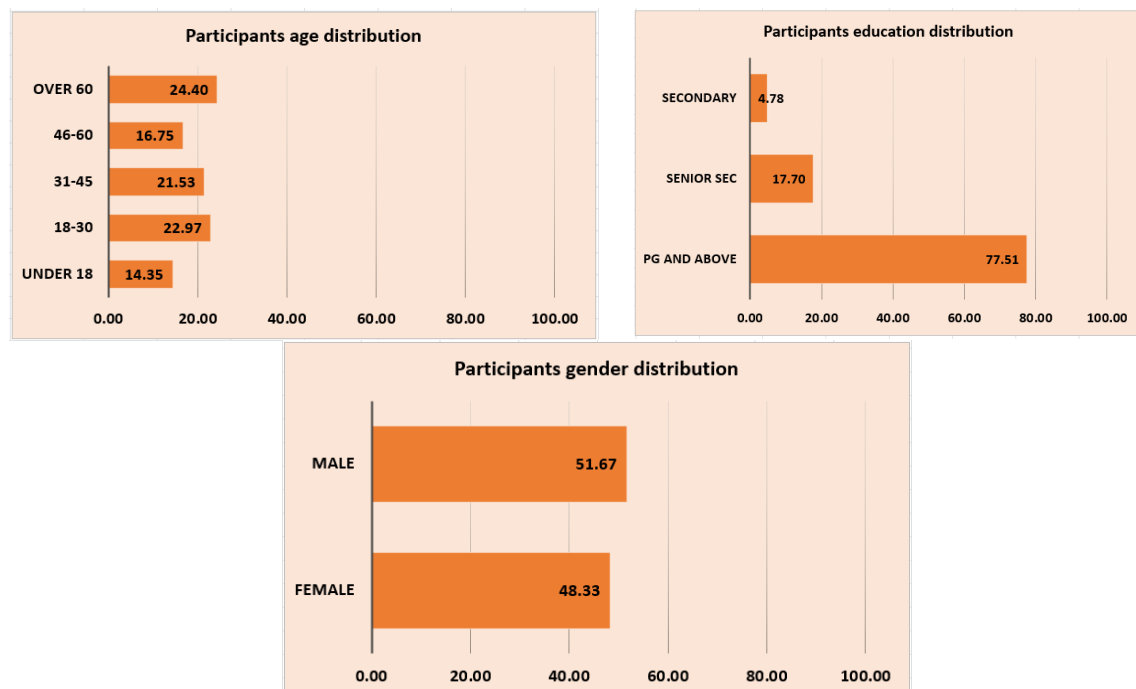
Source: Own

3. Results and Discussion

a. Demographic analysis of tourists

Survey responses were processed to obtain descriptive analysis. Figure 4 presents the demographic background of the tourist respondents.

Figure 4. Demographics of respondents.

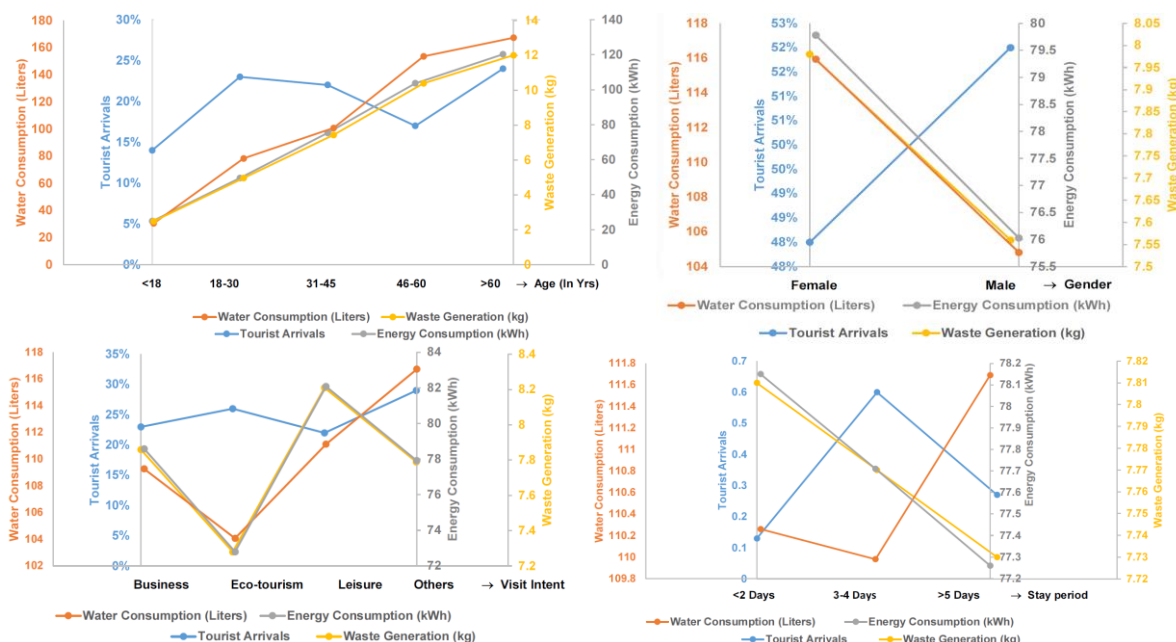


Source: Own

Analyzing this data, heterogeneity of tourist behavior and demographics was observed (Figure 5). For the factor visit intent, the largest share of tourists (29%) came for purposes of eco-tourism (26%), followed by business (23%), and leisure (22%), indicating a trend towards

increased demand for eco-friendly travel. The per capita water and energy consumption and waste generation patterns of tourists preferring eco-tourism were lowest (1034.36 per liter, 72.91 per kWh, and 7.29 per kg, respectively), and the highest consumption and waste generation patterns were observed for tourists coming for business purposes (110.94 per liter) and for tourists coming for leisure purposes (82.67 per kWh and 8.27 per kg, respectively). This shows that the eco-tourism visitors understand their responsibility towards the environment.

Figure 5. Resource consumption and waste generation patterns of tourist's influxes



Source: Own

When it comes to the age group, the highest share was held by tourists aged 60 and above (24%), followed by tourists aged 18–30 (23%), with the lowest share being from the under-18 age group (14%), demonstrating a prevalence of older and young adult tourists. The water and energy consumption and waste generation patterns were highest for tourists aged 60 and above (165.47 per liter, 120.20 per kWh, and 12.02 per kg respectively) and quite low for tourists aged between 18-30 (77.44 per liter, 49.51 per kWh, and 4.95 per kg respectively). In terms of gender, the pattern is almost balanced, with 52% of males and 48% females. Females were consuming more water and energy and generating more waste (115.93 per liter, 79.78 per kWh, and 7.98 per kg, respectively) than males. For stay duration, most of the tourists (58%) spent 3–4 days, followed by 28% spending over 5 days, and a merely 14% spending less than 2 days, indicating a liking for moderate-duration stays, probably due to the number of places to visit and visit intent. Tourists staying for less than 2 days consumed more water and energy and generated more waste (112.97 per liter, 80.07 per kWh, and 8.01 per kg, respectively).

Table 4 shows the statistical breakdown of the demographics and behavior of tourists. The mean values signify that middle-aged tourists (MAge= 3.1388) have a moderate stay duration (MLS= 2.144) as they travel for leisure purposes (MPV= 2.565). The factors with the highest variability are age group (SD = 1.392) and visit intent (SD = 1.134), reflecting the necessity to accommodate the varying demands of a diverse range of tourists. Gender had the lowest variability (SD = 0.501 and var = 0.251), indicating a largely balanced distribution of male and female travelers.

Table 4. Summary Statistics of tourist data.

Statistics	Tourist demographic and behavioral factors				Water Consum (Liters)	Energy Consum (kWh)	Waste Generation (kg)
	Visit intent	Age Group	Gender	Stay duration			
Mean	2.5646	3.1388	1.5167	2.1435	110.1914	77.8421	7.7617
Std Error	0.0784	0.0963	0.0346	0.0439	4.4217	2.4391	0.2437
Median	3	3	2	2	103	80	8
Mode	4	5	2	2	78	105	5.6
SD	1.1338	1.3919	0.5009	0.6343	63.9242	35.2622	3.5238
Sample Var	1.2855	1.9374	0.2509	0.4024	4086.3093	1243.4221	12.4172
Count	209	209	209	209	209	209	209

Source: Own

b. Testing the hypothesis

Two-way ANOVA is performed to test the hypotheses (Table 5). Visit intent, age group, stay duration, and gender are extremely significant variables in terms of WEW. These are significantly influenced by any one factor (likely gender or stay duration, $F = 254.20$, $p \approx 0$), explaining most of the variation, while the other factor (likely age group or visit intent, $F = 24.83$, $p \approx 0$) shows a borderline effect, suggesting potential differences that warrant further investigation. The interaction between the two factors (e.g., age group and gender or visit intent and stay duration) shows a statistically significant effect on the WEW ($F = 5.95$, $p \approx 0$, $F > F_{crit} = 2.29$), with an SS of 1,458.47 and MS of 243.08 across 6 degrees of freedom. This indicates that the impact of one factor on WEW depends on the level of the other, suggesting that specific combinations (e.g., young males or long-stay tourists) produce unique sustainability outcomes. Targeted interventions addressing these interactions, such as tailored campaigns for high-impact groups, are essential for improving environmental metrics. This reveals that different mixes of factors drive separate patterns of resource use. The analysis shows that the group of tourist demographic and behavioral factors increases the WEW. Hence, there is a directional difference in the mean resource consumption and mean waste generation as represented by directional hypotheses RH1, RH2, and RH3 (as also depicted in the column of p-value (= 0.00)).

Table 5. ANOVA outcomes.

Source of Variation	SS	Df	MS	F	P-value	Fcrit
Sample	3085.99	3	1028.67	24.83	0.00	2.80
Columns	959764.60	2	479882.29	254.20	0.00	3.01
Interaction	1458.47	6	243.08	5.95	0.00	2.29
Within	30071.85	540	51.404872			

Source: Own

c. Multivariate analysis

Multiple regression analysis is performed using formulas (1) - (3) shows the summary of these models in Table 6. The energy consumption and waste generation models exhibit high predictive accuracy ($R^2 > 0.91$), while the water consumption model shows moderate performance ($R^2 = 0.54$).

The generated YEC, YWC, and YWG models exhibit extreme effect sizes (Cohen, 1988), i.e., the independent variables (age-group, gender, visit intent, and stay duration) highly contribute to the dependent variables YEC and YWG ($f^2 > 11$). The large effect size ($f^2 = 1.195$) for YWC indicates water consumption may be influenced by additional factors (e.g., accommodation facilities, or tourist activities like bathing or laundry).

Table 6. Statistical model summary.

Model Summary ^b												
Model*	R	R ²	Adj R change	MSE	RMSE	Std. error of the Est	Change statistics R ² change	F change	df1	df2	Cohen f ² Effect Size	Sig. F change
Y _{EC}	0.9576	0.9170	0.9153	104.0562	10.2008	1.1216	0.9170	538.3136	4	203	11.042	0.000
Y _{WC}	0.7379	0.5445	0.5352	1898.481	43.5716	4.7908	0.5445	58.2756	4	203	1.195	0.000
Y _{WG}	0.9576	0.9111	0.9153	1.0406	1.0201	0.1122	0.9170	538.3136	4	203	11.043	0.000
DTRM	0.9195	0.8456	0.8061	164.9415	12.843	9.9933	0.8456	143.5667	4	203	10.321	0.000
RFRM	0.9327	0.8698	0.8366	139.0164	11.7905	9.9933	0.8698	143.5667	4	203	10.589	0.000

*DTRM: decision tree regression model, RFRM: random forest regression model (p threshold value <0.05)

^a Predictors (Independent variable): age group, gender, visit intent, stay duration

^b Dependent variable: energy consumption, water consumption, waste generation

Source: Own

The prediction capacity of the YEC model is highly accurate ($R = 0.9576$ and $R^2 = 0.9170$). This suggests that predictors account for 91.70% of the variance in energy consumption. Relatively low values of MSE and RMSE (104.05 and 10.20, respectively) prove the reliability of the model. The $R (=0.7379)$ and $R^2 (= 0.5445)$ values of the YWC model show that this model did not perform very strongly. It can be said that the predictors account for only for 54.45% of the variance in water consumption. The very low value of adjusted R^2 suggests that some predictors are not explanatory. Also, higher values of MSE and RMSE (1898.48 and 43.57, respectively) call for further improvement of the model. With $R = 0.9576$ and $R^2 = 0.9111$, the YWG model produces findings that are like those of the YEC model. The model shows outstanding predictive performance and is perfect for forecasting waste generation trends in tourism settings, as the MSE and RMSE values (1.0406 and 1.0201, respectively) show a good match with minimal error. The predictors collectively make a significant contribution to the models, as indicated by the p-value (<0.001).

Comparison between the results of the three models YEC, YWC, and YWG with the decision tree regression and random forest regression models (Table 6) shows that the generated YEC, YWC, and YWG models are more accurate than these two models. The increased MSE and RMSE values (164.94 and 12.84, respectively) also show high predictive power of YEC, YWC, and YWG models as compared to decision tree and random forest regression models.

Formula (10) is used to generate the coefficients table as shown in Table 7 to address the critique about whether regression coefficients are standardized. From Table 5 and Table 6, the significant F change statistics = 0.000 for all models indicate that at least one predictor significantly contributes to the explanatory power of each model. The unstandardized coefficients for the age group are significantly high (24.22 for energy consumption, 33.81 for water consumption, and 2.42 for waste generation), indicating that an increase in age group corresponds strongly with increased environmental impact. It emerges as the most significant factor influencing the irresponsible behavior of tourists. Therefore, tourism policies should adopt an age-targeted approach to sustainability.

Table 7. Coefficients table.

Dependent variable	Predictor	Unstd B	SE	Std Beta	t-Statistics	Sig
Energy Consumption	Const.	26.3190	2.1564	77.6450	12.2052	8.00E-26
	Age Group	24.2252	0.5236	33.8874	46.2652	4.34E-107
	Gender	0.8634	1.4694	0.4315	0.5876	5.57E-01
	Visit intent	0.2986	0.7341	0.3385	0.4068	6.85E-01
	Stay duration	-0.4999	0.7246	-0.5735	-0.6900	4.91E-01

Dependent variable	Predictor	Unstd B	SE	Std Beta	t-Statistics	Sig
Water Consumption	Const.	33.7679	9.2107	110.4800	3.6662	3.17E-04
	Age Group	33.8059	2.2366	47.2893	15.1151	1.13E-34
	Gender	5.9984	6.2763	2.9979	0.9557	3.40E-01
	Visit intent	2.4710	3.1356	2.8012	0.7880	4.32E-01
	Stay duration	-0.8781	3.0949	-1.0072	-0.2837	7.77E-01
Waste Generation	Const.	2.6319	0.2156	7.7645	12.2052	8.00E-26
	Age Group	2.4225	0.0524	3.3887	46.2652	4.34E-107
	Gender	0.0863	0.1469	0.0432	0.5876	5.57E-01
	Visit intent	0.0299	0.0734	0.0339	0.4068	6.85E-01
	Stay duration	-0.0500	0.0725	-0.0573	-0.6900	4.91E-01

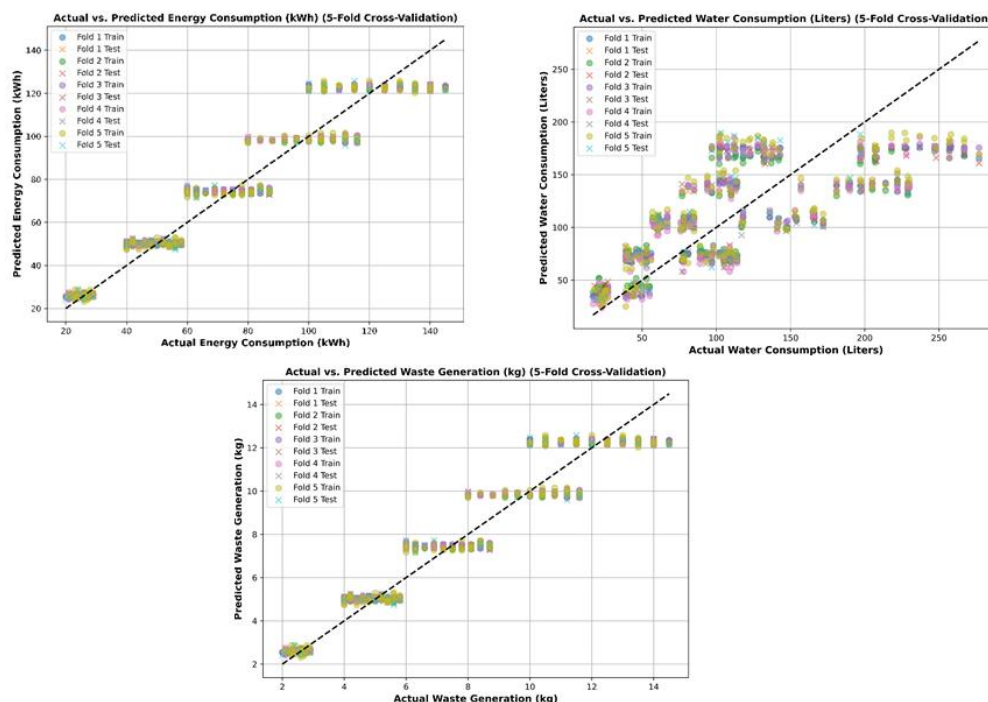
Source: Own

The p-values (<0.05), shown in Table 7, also demonstrate that age group is the strongest predictor for WEW. On the other hand, gender, visit intent, and stay duration are statistically insignificant ($p>0.05$) across all three dependent variables. The negative coefficient of stay duration points to a possible decrease in per-day resource consumption for longer stays, but the effect is statistically weak. Similarly, the visit intent and gender exhibit slight differences that have little bearing on WEW.

Model validation

The 5-fold cross-validation scatter plots for validating the models are shown in Figure 6. The YEC and YWG models show strong predictive accuracy, with minimal error (1.1216 for YEC, 0.1122 for YWG) and consistent performance. This suggests that these models generalize well and capture underlying consumption patterns effectively. In contrast, the YWC model displays greater scatter and underprediction at higher values, indicating moderate accuracy and possible limitations in feature representation or model fit.

Figure 6. Comparison of Actual vs. Predicted values using 5-Fold Cross-Validation.



Source: Own

The Variance Inflation Factor (VIF) analysis is done to detect multicollinearity in regression analysis. From Table 8 and Figures 7-9, VIF values for all the independent variables in YEC are below 2, confirming the absence of multicollinearity among independent variables. The Durbin-Watson statistics of 2.0134, close to the ideal value of 2, suggests no significant autocorrelation in residuals. The Shapiro-Wilk test ($W = 0.9876$, $p = 0.0490$) is borderline significant, implying that residuals are approximately normally distributed, although with slight deviation at the tails. Overall, the model is statistically significant and reliable for explaining variations in energy consumption. For YWC, the VIF values remain well below 2, confirming there is no multicollinearity among predictors. The Durbin-Watson statistics of 1.9616, close to 2, indicate no significant autocorrelation in residuals. However, the Shapiro-Wilk test result ($W = 0.9605$, $p = 0.0000$) strongly rejects the null hypothesis of normality, indicating that residuals are not normally distributed, which may affect the reliability of statistical inferences.

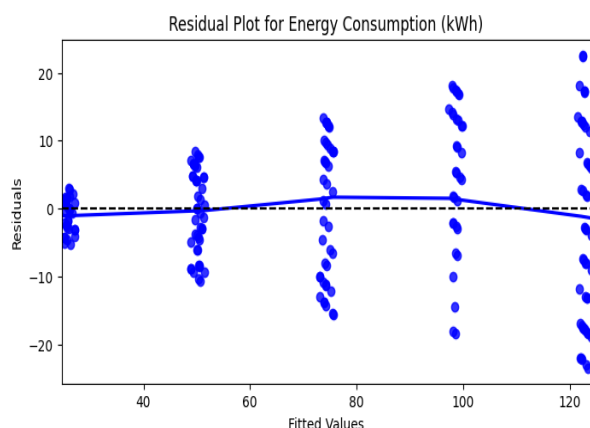
Table 8. Model validation results

Dependent variable	Feature	VIF	Durbin-Watson Statistic	Shapiro-Wilk Test	
				W	P
Energy Consumption	Age Group	0.945610	2.0134	0.9876	0.0490
	Gender	1.744086			
	Visit intent	0.889520			
	Stay duration	0.945401			
Water Consumption	Age Group	0.045691	1.9616	0.9605	0.0000
	Gender	1.744086			
	Visit intent	0.088952			
	Stay duration	0.835409			
Waste Generation	Age Group	0.945691	1.9569	0.9819	0.0110
	Gender	1.044086			
	Visit intent	0.788952			
	Stay duration	0.841427			

Source: Own

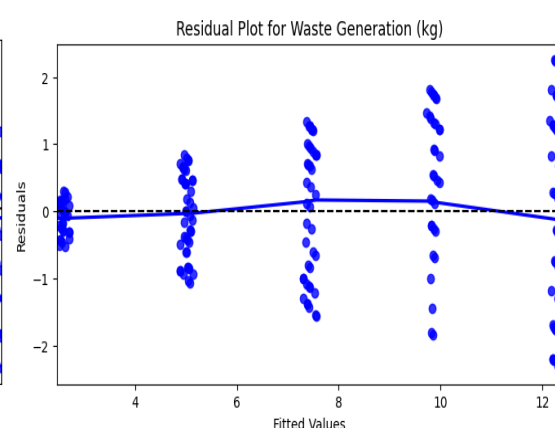
The VIF values of YWG for all predictors are below 2, confirming no multicollinearity issues. The Durbin-Watson statistic of 1.9569, which is close to the ideal value of 2, indicates that residuals are not autocorrelated. However, the Shapiro-Wilk test for normality ($W = 0.9819$, $p = 0.0110$) shows a statistically significant deviation from normality, suggesting a slight violation of the normality assumption of residuals. Despite this, given the high explanatory power and overall diagnostics, the waste generation model is statistically strong and reliable, with only minor concerns regarding the normality of residuals.

Figure 7. Residual Plot for energy consumption.



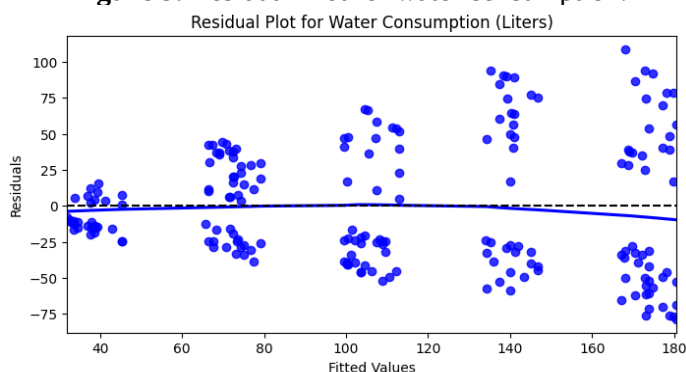
Source:

Figure 8. Residual Plot for waste generation.



Source:

Figure 9. Residual Plot for water consumption.



Source: Own

Based on the above analysis, it can be concluded that the developed WEW models demonstrate excellent fit and strong predictive performance as shown by the large effect size and R^2 values, low standard errors, and 5-fold cross-validation. The models performed well in predicting water and energy consumption and waste generation and can serve as efficient tools for sustainability planning.

The results of regression analysis showed that the age group is a strong predictor of water and energy consumption and waste generation. The rest of the predictors (gender, visit intent, and stay duration) also affect water and energy consumption and waste generation. Overall, the impact of the visitors' demographics and behavior on environmental metrics is very high, resulting in resource depletion that, in turn, affects the sustainability of the destination.

The results are in line with the findings of various researchers. For example, Rodríguez, Jacob & Florido (2020) showed that senior tourists had a higher pro-environmental attitude in hotel establishments than younger ones. Forleo & Bredice (2025) showed that the environmental behavior of Gen Z tourists was mainly related with the litter and single-use plastics issues. Torres-Bagur, Ribas & Vila-Subirós (2020) analyzed water-saving practices among guests at various destinations and demonstrated that differences in practices were impacted by the type of accommodation, reason for stay, and geographic origin. Gabarda-Mallorquí, Garcia, Fraguell & Ribas (2021) showed that stay duration significantly and positively influenced water conservation habits. Torabi, Hall, Azarniou & Borzu (2025) showed that environmental concerns, and situational responsibility positively impact water conservation behaviors.

d. Analyzing the attitude of tourists

The ESA questionnaire is analyzed to assess the sustainable awareness of tourists visiting Agra. The KMO measure ($=0.827$) exceeds the acceptable threshold (Kaiser, 1974). This supports the

appropriateness of exploratory factor analysis for assessing data reliability. Computed Cronbach's alpha value (Table 9) for the questionnaire items reveals a high degree of reliability in all the constructs (as α values > 0.7).

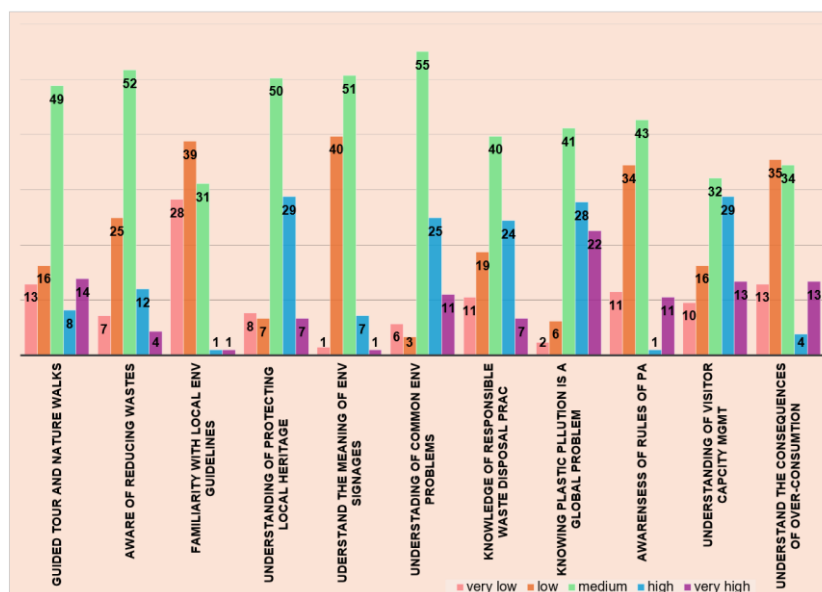
Table 9. Reliability analysis of ESA questionnaire.

Questionnaire Item	Cronbach's Alpha
Environmental sustainability knowledge	0.7332
Environmental sustainability behavior	0.8035

Source: Own

As observed from Figure 10, 35.40 % of the tourist respondents understood protecting the local heritage, 35.88% of the respondents had an understanding of common environmental problems, 50.23% respondents knew that plastic waste is a global problem, and 42.10% of the respondents understood visitor capacity management. For the rest of the factors, the knowledge level of the tourist respondent was poor. Therefore, only 44.97% of the respondents avoided visiting during peak season, 48.80% of respondents participated in sustainability tourism programs, and 59.33% of respondents adhered to the rules of the protected areas (Figure 10).

Figure 10. Environmental sustainability knowledge distribution among tourists.



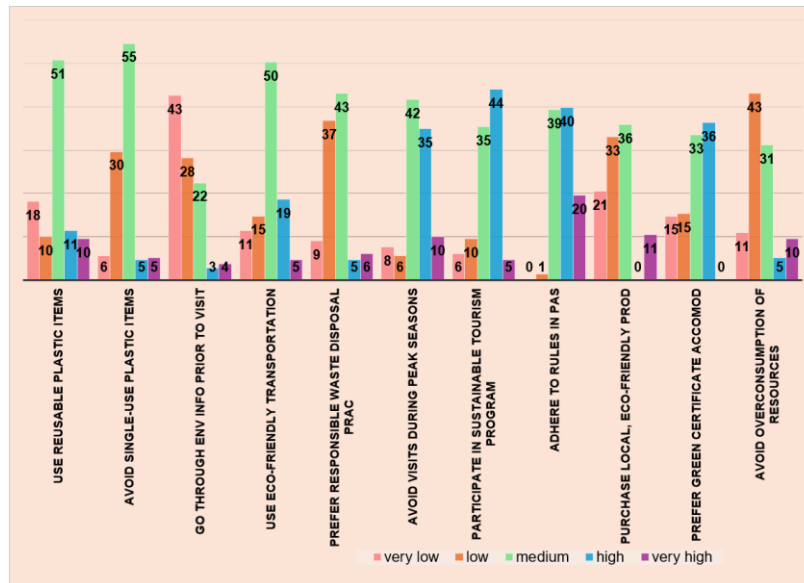
Source: Own

Overall, 74.60% of tourist respondents rated their sustainability awareness as medium to low. This demonstrates that 73.90% and 75.29% of tourist respondents, respectively, had medium to low levels of sustainability behavior and sustainability knowledge, which have a substantial impact on WEW, all of which have an impact on environmental sustainability. It was observed that from the arrived tourist respondents, only 24.71% had sustainable knowledge, and therefore, the behavior of 73.90% was medium to low. These results suggest a clear alignment between sustainable knowledge and sustainable behavior: lower levels of knowledge directly impact the behavior of arrival of tourists, resulting in lower levels of environmental sustainability awareness.

The results of correlation analysis are shown in Tables 10-12. The correlation between demographic features (age-group, gender, and education level) and knowledge-related variables (QK1, ..., QK11) indicated very ineffective correlations (correlation coefficients mostly < 0.1). Out of the 33 combinations, only 10 (gender-QK1, gender-QK6, gender-QK7, gender-QK8,

gender-QK9, gender-QK11, ageGp-QK2, ageGp-QK10, ageGp-QK11, and educ-QK10) were only marginally favorable. This suggests that tourist respondents' understanding of environmental sustainability is mostly unaffected by demographic features.

Figure 11. Environmental sustainability behavior distribution of tourists.



Source: Own

Table 10. Correlation between demographics and tourist knowledge

	Q _{K1}	Q _{K2}	Q _{K3}	Q _{K4}	Q _{K5}	Q _{K6}	Q _{K7}	Q _{K8}	Q _{K9}	Q _{K10}	Q _{K11}
GEN	0.0394	-0.0306	-0.0598	-0.0071	-0.0118	0.0455	0.0097	0.0720	0.1658	-0.0058	0.0335
AGEGP	-0.0668	0.0055	-0.0499	-0.0762	-0.0578	-0.0086	-0.0698	-0.1831	-0.0188	0.0035	0.1034
EDUC	-0.0119	-0.0757	-0.0799	-0.0613	-0.1193	-0.1027	-0.1592	-0.0435	-0.0015	0.0877	-0.1097

Source: Own

Similarly, correlation between demographic features (age-group, gender, and education level) and behavior-related variables (QB1, ..., QB11) showed very weak connections (correlation coefficients mostly < 0.1). 18 out of 33 combinations (gender-QB1, gender-QB5, gender-QB6, gender-QB7, gender-QB9, gender-QB11, ageGp-QB1, ageGp-QB2, ageGp-QB5, educ-QB1, educ-QB2, educ-QB3, educ-QB5, educ-QB6, educ-QB7, educ-QB8, educ-QB9, and educ-QB10) were only marginally positive. This suggests that tourist respondents' behavioral elements related to environmental sustainability are not significantly influenced by demographic factors.

Table 11. Correlation between demographics and tourist knowledge

	Q _{B1}	Q _{B2}	Q _{B3}	Q _{B4}	Q _{B5}	Q _{B6}	Q _{B7}	Q _{B8}	Q _{B9}	Q _{B10}	Q _{B11}
GEN	0.0004	-0.0689	-0.0082	-0.0064	0.0898	0.0221	0.0705	-0.0213	0.0030	-0.0428	0.0262
AGEGP	0.0592	0.0467	-0.0529	-0.0287	0.0182	-0.0443	-0.0963	-0.0647	-0.0473	-0.0968	-0.0845
EDUC	0.0542	0.0341	0.0366	0.0138	0.0230	0.0209	0.0566	0.1736	0.0600	0.1352	-0.0345

Source: Own

Table 12. Correlation between tourist behavior and tourist knowledge level

	Q_{K1}	Q_{K2}	Q_{K3}	Q_{K4}	Q_{K5}	Q_{K6}	Q_{K7}	Q_{K8}	Q_{K9}	Q_{K10}	Q_{K11}
Q_{B1}	0.0181	0.1076	-0.0372	-0.0105	-0.0627	0.1028	-0.0104	0.0918	-0.0027	0.1152	-0.0581
Q_{B2}	-0.1102	-0.0322	-0.1129	-0.0968	-0.0763	-0.1697	0.0212	-0.0559	-0.1240	-0.0595	-0.0512
Q_{B3}	-0.0530	0.0300	0.0832	-0.0424	0.0202	-0.0792	-0.0091	-0.1409	0.0383	0.0008	-0.0697
Q_{B4}	0.0370	-0.0203	0.0030	-0.0564	0.0454	-0.0504	-0.0063	-0.0280	0.0502	-0.0167	-0.0880
Q_{B5}	0.0093	0.1385	-0.0901	-0.0169	-0.0791	0.0239	-0.0217	0.0456	0.0194	0.0524	-0.0664
Q_{B6}	-0.0275	0.0443	0.0089	-0.0064	0.0554	-0.0091	-0.0300	0.1087	-0.0266	0.0944	-0.0999
Q_{B7}	-0.0218	0.0879	-0.0124	-0.0611	-0.0372	0.0047	0.0109	0.1270	0.0406	0.0831	-0.1530
Q_{B8}	0.0979	-0.0611	0.0705	0.0029	0.0946	0.0005	0.0885	0.0318	0.1375	0.0347	-0.0234
Q_{B9}	0.0261	-0.0317	0.0374	-0.0478	-0.0887	0.0209	-0.0522	0.1401	0.0707	0.1618	-0.1376
Q_{B10}	0.0194	0.0493	0.0614	-0.0212	0.1285	-0.0160	0.0933	0.0052	0.0633	0.0538	-0.0765
Q_{B11}	-0.0246	-0.0345	0.0239	-0.0376	0.0368	-0.0037	0.0397	0.1260	0.0336	0.0936	-0.0926

Source: Own

No significant association was found between the behavior and knowledge level of tourists, indicating that tourist respondents' attitudes towards environmental sustainability awareness are poor, because of the large gap between the demographic characteristics and behavioral factors, and knowledge level. This analysis also shows a knowledge-behavior gap, suggesting that tourist respondents possess environmental knowledge but do not act accordingly.

ANOVA results are illustrated in Table 13, showing that all predictors significantly influence WEW. With the p-value (< 0.05) and the F-value (= 182.07), it is confirmed that these factors contribute meaningfully to WEW. The RH4 hypothesis reveals that tourists with low environmental awareness show higher waste generation.

Thus, the need is to design awareness-raising targeted strategies to encourage more responsible tourist behavior.

Table 13. Model summary

Source of Variation	SS	Df	MS	F	P-value	F crit
Between Groups	5637.21	22	256.23	182.07	0.00	1.54
Within Groups	6732.75	4784.00	1.40			
Total	12369.97	4806.00				

Source: Own

e. Designing strategies

The computed weights of the SWOT groups and their factors are shown in Table 14. The strengths group had the highest priority, followed by opportunities, weaknesses, and threats.

Table 14. Priority weights of S, W, O, T.

Strengths ($g_1:0.4191$)	Weights	Weaknesses ($g_2:0.1894$)	Weights
Age	0.0968	Overconsumption of resources	0.0665
Curiosity	0.0629	Infrastructure vandalism	0.0481
Tech-savvy	0.0679	Overtourism behaviors	0.0333
Experience-driven tourism	0.0256	Generational gaps in technology	0.0106
Adaptability	0.0226	Demand variability	0.0121
Education	0.1438	Waste generation	0.0170
Opportunities ($g_3:0.2731$)	Weights	Threats ($g_4:0.1181$)	Weights
Travel education	0.1161	Cultural insensitivity	0.0557
Personalization	0.0806	Overtourism impacts	0.0281
Informative activity-based travel	0.0576	Resource depletion	0.0228
Motivation-driven trips	0.0188	Vandalism	0.0115

Source: Own

The weights of SWOT factors (Table 14) indicate that the factors f_6 , f_1 , f_3 , and f_2 of the Strength group and f_7 , f_8 , and f_9 of the Opportunity group are more important than factors in other groups. The involvement of these higher-weighted factors in the Strength and Opportunity groups testifies to the rank of SO as ‘maxi-maxi’ strategy turned out to be the best one, hence the consistency of the proposed approach.

TWOS Analysis is performed to design strategies to increase awareness among tourists. In this method, strategies are designed for using strengths to capitalize on opportunities (SO) and minimize threats (ST), while overcoming weaknesses through opportunities (WO) or avoiding threats (WT). The TOWS matrix is shown in Table 15.

The following measures must be taken to successfully execute the strategies:

- *A₁. Grow ethical awareness of responsible tourism:* Awareness campaigns should be launched at tourist accommodations to educate tourists about how to avoid wildlife exploitation, reduce waste, and buy locally.
- *A₂. Encourage to focus on slow travel:* Booklets or pamphlets should be prepared containing information about all the tourist spots and cultural heritage, so that tourists are encouraged to stay longer in one location.
- *A₃. Educate tourists to respectfully engage with locals:* While making online bookings, tourists must be shown short films to perform pre-trip research on cultural norms, promoting local language basics (hello, thank you), and encouraging respectful photography by asking permission.
- *A₄. Implement signboards for minimizing energy and water consumption:* Tourist accommodation should place signboards designed attractively to show the consequences of overconsumption of energy and water. Signs must be placed in prominent and well-lit locations where individuals can read them clearly.

Table 15. TOWS Matrix

	Opportunities	Threats
	f_7 . Travel education	f_{17} . Cultural insensitivity
	f_8 . Personalized travel experience	f_{18} . Overtourism impacts
	f_9 . Informative activity-based travel	f_{19} . Resource depletion
	f_{10} . Motivation-driven trips.	f_{20} . Vandalism
Strengths	SO	ST
f_1 . Age	A ₁ : Grow ethical awareness of responsible tourism (f_1, f_2, f_7)	A ₃ : Educate tourists to respectfully engage with locals (f_1, f_6, f_{17})
f_2 . Curiosity	A ₂ : Focus on slow travel (f_2, f_3, f_8, f_{10})	A ₄ : Implementing signboards for minimizing energy and water consumption (f_6, f_{19})
f_3 . Tech-savvy	A ₅ : Encourage informative travel (f_3, f_6, f_7)	A ₆ : Encourage tourists to visit lesser-known destinations (f_2, f_4, f_{18}, f_{19})
f_4 . Experience-driven tourism	A ₇ : Develop age-group based strategies (f_1, f_2, f_3, f_7, f_8)	A ₁₂ : Encourage eco-friendly alternatives (f_1, f_5, f_{18}, f_{19})
f_5 . Adaptability	A ₁₁ : Organize pre-visit education campaigns at tourist accommodations (f_3, f_5, f_6, f_7, f_9)	

f_6. Education	A ₁₃ : Use social media for conservation awareness (f_1, f_3, f_6, f_7)	
Weaknesses	WO	WT
f_{11}. Overconsumption of resources	A ₈ : Create new tourist attractions (f_{15}, f_8, f_9, f_{10})	A ₁₀ : Avoid overcrowding at the tourist hotspots (f_{13}, f_{18})
f_{12}. Infrastructure vandalism	A ₉ : Encourage to follow <i>leave no trace</i> principles ($f_{11}, f_{12}, f_{16}, f_8, f_9$)	A ₁₄ : Balance immediate needs with long-term scarcity through technology (f_{14}, f_{15}, f_{19})
f_{13}. Overtourism behaviors		A ₁₅ : Implement visitor dispersion model to reduce overtourism impact (f_{13}, f_{16}, f_{19})
f_{14}. Generational gaps in technology		
f_{15}. Demand variability		
f_{16}. Waste generation		

Source: Own

- A5. Encourage informative travel: Tourists must be guided by displaying the relevant information through digital signage, interactive kiosks, and large-screen displays at every tourist spot and tourist accommodation. They must be informed about the government initiatives, and rules must be made to ensure these are followed strictly.
- A6. Encourage tourists to visit lesser-known destinations: Tourists must be informed about off-beat locations via blogs and local forums, and must be encouraged to travel during the off-season. Focus should be placed on visiting smaller towns, national parks, and regions overshadowed by popular spots. Promoting slow travel can also reveal unique, non-touristy experiences.
- A7. Develop age-group-based strategies: Develop an online campaign to raise awareness about responsible tourism practices. Integrating age-specific sustainability materials into tourist welcome kits, digital guides, and hotel messaging. For Gen Z, suggest eco-friendly Instagrammable hotspots. For Gen Y and X, suggest eco-labelled responsible travel options combining leisure with ethical consumerism. For senior tourists, provide sustainable behavior training to promote eco-friendly habits such as minimizing energy and water consumption and reducing waste, provide social tourism packages that offer cultural engagement catering to comfort needs, and promote slow travel options.
- A8. Create new tourist attractions: Tourists should be encouraged to develop unique, authentic, and sustainable experiences, such as focusing on local culture, nature-based activities (cycling, trekking).
- A9. Encourage to follow leave no trace principles: Prepare a brief documentary to give them the knowledge of the regulations and special concerns for the area they will visit, prepare them for extreme weather and emergencies before tourists reach the destination. The accommodation destination manager may suggest another schedule for the trip to avoid times of high use. The manager should impose strict rules to reduce vandalism and preserve the past, should be told about disposing of waste properly, and should respect wildlife.
- A10. Avoid overcrowding at the tourist hotspots: To avoid overcrowding, tourist accommodations must provide facilities for advance online bookings of the tourist spots. The destination manager should restrict the number of tickets sold at a particular time. Virtual tours of the tourist spots can also be provided.

- A11. Organize pre-visit education campaigns at tourist accommodations: Tourists must be provided with early, accurate information, documentation, and application timelines via hotel digital platforms.
- A12. Encourage eco-friendly alternatives: Tourists should be given knowledge of biodegradable materials to minimize single-use plastics at tourist spots/accommodations, choose energy efficient accommodation, use environmentally friendly transportation modes, visit destinations that prioritize sustainability, and provide resources to educate visitors about eco-conscious choices, and should be encouraged to use the same.
- A13. Use social media for conservation awareness: Engaging educational content (videos/ infographics) must be created, collaborate with influencers, live streaming must be used for Q&As, and hashtag-driven activism to drive tangible action may be launched.
- A14: Balance immediate needs with long-term scarcity through technology: The destination manager should use AI and IoT based real-time resource tracking to implement the circular economy and invest in renewable, decentralized infrastructure.
- A15. Implement visitor dispersion model to reduce overtourism impact: Destination managers should use IoT devices to track visitor density in real-time, and implement apps to suggest less-crowded areas. Alternative sites, hidden gems or rural tourism can be suggested to relieve pressure on central hotspots.

This targeted approach can help bridge the sustainability gap across age demographics and support more responsible tourism practices.

CONCLUSION

The goal of this study was to analyze the environmental impact of tourist influxes at Agra and to generate strategies for increasing environmental sustainability awareness among tourists to minimize the consequences of tourist influxes. 8 years of data were collected, and explanatory analysis was performed to achieve the research study goal and answer the research questions. Three regression models, YWC, YEC, and YWG, were developed to find the dominant pattern of resource consumption and waste generation. Descriptive analysis and the regression models helped in relating these patterns to the demographics and behavior of tourists. This answers RQ1. A tourist environmental sustainability awareness questionnaire was developed and analyzed to assess the environmental awareness of tourists and it was found that very few tourists arriving in Agra had environmental awareness. This answers RQ2. Finally, strategies are designed using TWOS analysis to increase awareness among tourists and make them environmentally friendly. This answers RQ3.

This study has certain limitations. An in-depth analysis of different dimensions of sustainable metrics (carbon footprint, water pollution, and soil erosion) is not discussed, as the intensity and enforcement of tourist arrival factors may also have a significant impact on these metrics. Another limitation is not considering qualitative elements which could offer more profound insights. Future studies can include analyzing the impact of tourist influxes on sustainability metrics. Generating insight from the perspective of stakeholders could bring in understanding of which shortfalls are likely in the perceptions regarding sustainability and strategies for improvement. Including socio-economic factors for such analysis and used of ensemble methods can enhance accuracy of the analysis.

The purpose is added at page 2, paragraph 1; and page 3, paragraph 2.

Literature review and results already reflect the intended design, scope, and theoretical framework of the study. Therefore, these sections are not revised.

DATA AVAILABILITY

The data presented in this study are available on request from the corresponding author.

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HOTEL ATTRIBUTES AND GUESTS RE-VISIT INTENTION IN STAR- RATED HOTELS

ABSTRACT

The hospitality industry in Delta State, Nigeria, has grown rapidly in recent times, and rapid growth has intensified competition among practitioners. Therefore, this study is conceived to investigate the influence of hotel attributes on customer revisit intention in star-rated hotels. Primary data were collected from a cross-section of 395 guests of star-rated hotels, while regression and descriptive statistics were used to analyze the data. The findings show that patrons' attitude, subjective norm, desk office services, employees' appearance and attitude to guests, housekeeping and room outlook, and the quality of food and beverage services, exert positive and significant ($p < 0.01$) influence on customers' re-visit intention. The dominant impact of staff attitude to guests underscores the need for hotel managers to train employees to cultivate a service-oriented culture that will motivate them to render excellent services that will exceed guests' expectations, to foster customer loyalty and repeat visit.

KEYWORDS: hotel attributes; food and beverage services; service quality; employees' attitude to patrons; revisit intention

JEL: D12, M30, M31

INTRODUCTION

Owing to the rapid globalization of businesses across the world and the intense competition amongst brands, multinational companies are expanding their market share through new products, and increasing their distribution to wider and differentiated groups through the adoption of aggressive and innovative marketing strategies. The hospitality industry in Nigeria has been in existence for several decades, yet development in this sector has been relatively slow. A combination of factors such as erratic power supply and high energy costs, poor road networks, weak transport and communication systems, high interest rates and operating costs, crime and insecurity, taxation, licensing, compliance with safety and operational standards, inadequate managerial and professional skills, and difficulty in retaining skilled staff are amongst the critical challenges that hoteliers are grappling with in Delta State, and Nigeria at large. Comparatively, the hospitality industry is less developed in Delta State than Lagos and Cross River States in spite of the enormous tourism resources at its disposal to sustain a thriving travel and hospitality industry, due to these

daunting constraints. Moreover, the financial crisis within the last decade, high inflationary rates, the naira exchange rate volatility coupled with the slow rate of economic growth and underdevelopment of marketing activities are implicated for the poor performance of the industry (Bello, Aina & Oluwole, 2021). Thus, sufficient marketing efforts need to be applied in order to induce the much desired growth and expansion in this industry. The role of marketing in this sense could be viewed from the perspective of establishing and maintaining mutually beneficial relationships with customers by consistently meeting or surpassing customers' expectations.

The hotel sub-sector has gone through several developmental stages in Nigeria, and innovation has played a pivotal role in the level of development that has so far been attained. Such development could partly be attributed to technological breakthroughs in ICT, product innovations as well as innovative marketing in this sector (Ogunnaike et al., 2022). Years back, little or nothing more was done to meet the desire of hotel customers as rooms were just provided to accommodate sojourners. However, Innovative marketing since the last two decades has ensured that the comfort of patrons and their satisfaction has become the major concern of hoteliers in order to win their loyalty and continued patronage. This implies that service delivery has become paramount, ensuring that the needs of hotel customers are met, and customer satisfaction has become the focal point of successful operators in the industry. The quest to meet and exceed customers' expectations has been one of the key reasons why there has been an upsurge in customer-centered operational strategy. It is therefore important that hotels must continue to strive to meet the ever changing needs of the customers if they must remain relevant in the industry. And the only way to actualize this goal is to continue to be innovative; exploring new ways of satisfying the ever growing customers' needs, through proactive and innovative marketing strategies. Apart from the hotel sub-sector, restaurants, bars, nightclubs, and resorts are other areas of hospitality industry that have experienced a tremendous leap in recent years in terms of adoption of innovative marketing as operational strategy.

Knowing the expectations, perceptions, and demands of visitors as well as the quality of services the hotel offers can have a significant influence on guests' re-visit intention (RI), and a hotel's long-term performance in today's hyper-competitive industry. Attributes such as service quality, amenities and technology, cleanliness and hygiene, safety and security, staff professionalism and empathy, location and accessibility, price fairness and value are benchmarks that have set apart industry leaders from rivals in the hotel sub-sector. Although the outlined attributes impinge on overall guest satisfaction, customer satisfaction is not static but dynamic, because as competition and customer expectations continue to escalate, products and services once considered very satisfactory by a particular client today are sure to become unsatisfactory in no distant time. Because of the constant increase in client expectations, businesses today face intense pressures and are constantly looking for ways to win over customers due to market rivalry. Therefore, in order to satisfy their clients and meet their primary need for profit, hoteliers must now go above and beyond their expectations in order to win their customers' loyalty. In order to satisfy this progressive influence in consumer expectations, organizations must develop strategies to fulfill future customer wants rather than focusing only on increasing customer happiness in the short term. These goals can be accomplished by implementing a continuous process of quality improvement that will raise services to higher performance levels, which should satisfy clients by providing better and more exceptional value than they had anticipated.

Although previous studies have thoroughly researched the effects of hotel service quality (SQ) factors on customer satisfaction, customer loyalty and guests' re-visit intention, nevertheless, adequate research attention has not been focused to empirically investigate the self-perceived direct effects of factors influencing intention to repeat visit to hotels in the study location. Thus,

the main objective of the study is to ascertain the effects of hotel attributes on guest re-visit intention. Specifically, the influence of frontline office services, employees' appearance and attitude to guests, housekeeping and room condition, quality of food and beverage services, guest attitude and subjective norm on guests' intention for repeat visit are determined. In order to realize the overall goal of the research, the study addressed the following questions; to what extent do self-perceived attributes of hotels affect guests' intention to re-visit? What are the effects food/beverage, frontline office services, attitude to guests and housekeeping/room condition on repeat visitation? Do guest attitude and subjective norm affect intention to revisit a hotel?

1. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

Fishbein and Ajzen (1975) Theory of Reasoned Action (TRA) is a highly recognized theory of behavioral intention in psychology, and applied widely in marketing literature, in the field

of consumer behavior. The TRA has given an in-depth understanding of the relationship between consumers' attitudes, their behavior and ultimate actions. The theory assumes that intentions are the precursors of behavior which are determined by beliefs that performing a particular behavior will lead to a specified outcome (Madden, Ellen & Ajzen, 1992; Ajzen & Fishbein, 1998; Nissoon & Earl 2020). The components of the TRA are; attitude (ATT), subjective norm (SN) and behavioral intention (BI). Attitude is a person's judgment of how favourable or unfavorable his/her conduct is in a particular situation. Subjective norm refers to an individual's sense of social or societal pressure regarding the acceptability or non-acceptability of certain behaviors. Moreover, intention refers to an individual's inclination to participate in a specific behavior; and the intent to behave in a particular manner is a very decisive variable in determining specific behavior (Hosany et al., 2020)

2. EMPIRICAL REVIEW

The relationships between co-creation, technological innovation, guest satisfaction, and intention to return at high-end hotels in Jammu and Kashmir were examined by Sharma and Ab Rouf Bhat (2022) in their study. Information was gathered for the study via a convenience sampling survey from 34 customers. The results of structural equation modelling indicated that co-creation and technological innovation have a positive effect on visitor satisfaction and return intention. The patron's intention to revisit was seen to be influenced by guest satisfaction. Although the study only examines high-end hotels in Jammu and Kashmir, it offers recommendations for future research that would cover more ground and examine more causes and outcomes.

Anietie-Benson and Uboegbulam (2023) examined the relationship between hotel accommodation attributes and guest loyalty in Port Harcourt, Nigeria. In order to realize the objectives of the study, descriptive and quantitative research design was adopted to ascertain the effects of critical attributes such as hospitality, ambience, and security on customer retention in the hospitality industry. Data were generated with the aid of a structured questionnaire that was administered to a sample of 246 hotel guests. The results indicate that all three attributes had a positive and significant influence on patrons' retention. Arising from the findings, the authors recommended that hoteliers should focus attention on factors that enhance hospitality business by continually improving ambience through cultural experiences and improved guests' entertainment by promoting local and regional cuisines. Also, security challenges should be addressed by implementing comprehensive security measures to foster customers' trust and confidence, as well as satisfaction and loyalty.

Mohamed and Shaymaa (2023) investigated how atmospheric variables and perceived quality trigger hotel customer satisfaction (CS) and in return affect their revisit intention using the S-O-R model. The research instrument is a structured questionnaire that was self-administered to 134 customers that patronized star-rated hotels in Riyadh, Saudi Arabia. AMOS SEM model was used to test stated hypotheses. The results indicated that hotel patrons' satisfaction was impacted by assurance, word-of mouth and quality service which exerted positive and significant influence on guests' intentions to repeat visit to hotels. The authors recommended that hotel managers should continuously train their employees, so that they are knowledgeable and able to make informed decisions promptly in handling guests' concerns or complaints in the future.

Nazariana et al. (2024) studied how service quality influences hotel revisit intention through factors such as emotion, satisfaction, eWOM, and loyalty, using a cross-cultural lens. Data were extracted from 1,418 guests across 122 hotels in the US, UK, India, and Iran, the outcome indicated cultural differences in the formation of revisit intentions. For Iranians and Indians, positive emotions drive satisfaction, which along with eWOM predicts revisit intention. For US and UK guests, satisfaction stems from service quality, and loyalty drives their intention to return. The study highlights cultural variations in hospitality behavior and expands knowledge on revisit antecedents within the GLOBE Project framework.

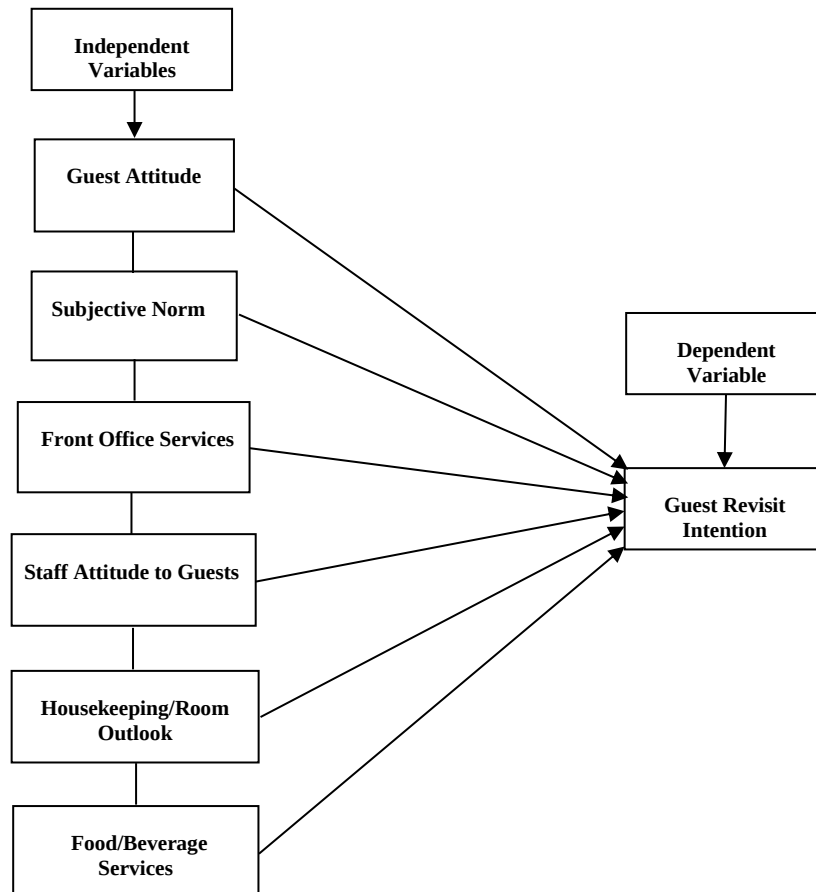
Sornsaruht (2024) studied influencing factors of patrons' intention to repeat visit in luxury hotels in Thailand, using 18 observable factors and nine hypotheses. Data were collected from 317 guests across ten 5-star hotels in Thailand, and analyzed using SEM with LISREL 9.10. The findings showed that all variables directly affected revisit intention with an adjusted R^2 value of 0.81. The significant predictors were Hotel image (HI), service quality (SQ), guest loyalty (GL), and guest experience (GE). Strong associations were also found between GE and SQ, as well as HI and SQ. The findings highlighted the crucial role of hotel staff and brand values in shaping guest perceptions and stimulating repeat visits in the hotel industry after COVID-19.

3. METHODOLOGY

3.1 Conceptual Model

The conceptual model for the study is hinged on a modified version of the TRA which incorporated hotel attributes as determinants of guests re-visit intention (RI) in hotels in Delta State, Nigeria. The model thus hypothesized that guest re-visit intention is influenced by hotel attributes such as frontline office services, staff appearance and attitude to guests, housekeeping and room condition, quality of food and beverage services as well as consumers' attitudes and subjective norm (Figure 1).

Figure 1. Conceptual Framework for the Study



Source: Modified from Theory of Reasoned Action (Fishbein & Ajzen, 1975)

3.2 Research Hypotheses

The following hypotheses were tested in the study;

H1: Guest attitude exerts positive influence on RI

H2: Subjective norm exhibits positive effect on RI

H3: The impact of Frontline office services on RI is positive

H4: Employees appearance and attitude to guests exert positive effects on RI

H5: Housekeeping and room outlook positively impacts on RI

H6: The quality of food and beverage services show direct effects on RI

3.3 Sampling Method and Data Collection

Data for the study were obtained with the aid of a structured questionnaire, from a cross-section of hotel patrons in three (3) most populous cities in the three senatorial districts in Delta State, Nigeria; Warri (536,023), Sapele (161,686) and Asaba (73,374), with a combined population of 771,083 (World Population Review, 2024). The instrument is made up of two parts; Part A sought information on guests demographic characteristics, while Part B obtained responses on guests perception of frontline office services, employees' appearance and attitude to guests, housekeeping and room condition, quality of food and beverage services, and guests' intention to revisit same hotel. The constructs and statements were adapted from relevant literature, and

the items measured on a 5-point Likert scale; where 1 implies that the hotel patrons strongly disagree; 2, disagree; 3, neutral; 4, agree, and 5 indicates they strongly agree. Descriptive statistics of constructs and statements applied in the study are shown in Table 1.

Due to lack of a sampling frame showing the population of patrons to the hotels, the Krejcie and Morgan (1970) formula for infinite population was used to determine the sample size;

$$n = \frac{Z^2 p(1-p)}{M^2} \quad (1)$$

Where;

n = sample size for infinite population;

Z = Z-value (e.g. 1.96 for 95% confidence level);

P = Population proportion, expressed as decimal, assumed to be 0.5 (50%);

M = margin of error at 5% (0.05)

$$n = \frac{(1.96)^2 \times 0.5 (1-0.5)}{(0.05)^2} = \frac{3.8416 \times 0.25}{0.0025} = \frac{0.9604}{0.0025} \quad n = 384.16 \approx 385 \quad (2)$$

Four hundred and fifty (450) copies of the questionnaire were administered to customers in fifteen (15) star-rated hotels that were randomly drawn from a list of hotels compiled from the Delta State Tourism Board, Asaba, Delta State, Nigeria (Table 2), in the three cities mentioned earlier. The respondents sampled filled the research instrument voluntarily. However, only 395 copies that were appropriately filled were used for further analysis, as the remaining 55 were discarded due to inadequate information and non-response. Eight, five and two rated hotels were selected based on online ratings, room and service qualities, restaurant services, recreation and conference facilities and brand affiliation, respectively from Warri, Asaba and Sapele. The survey was conducted between 15th January and 30th April, 2025. Regression analysis was used to determine the influence of the explanatory variables on guests' intention to repeat visit to hotels, using IBM SPSS Statistics 27.0.

Table 1. Constructs and Statements

Construct	No. of Items	Statement	Code	N	Mean	Std. Deviation
Attitude	5	I believe staying in the hotel is always an enjoyable experience	ATT1	395	3.0582	1.39766
		Staying in the hotel is a good place to rest	ATT2	395	3.2861	1.29493
		My social standing is enhanced by staying in the hotel.	ATT3	395	3.0759	1.32117
		The hotel is very appealing to me	ATT4	395	3.2785	1.28182
		I have strong liking for my choice of hotel	ATT5	395	3.1013	1.23809
Subjective Norm	5	I often choose a hotel that people expect me to lodge.	SBN1	395	4.0152	0.99479
		I like to lodge in the hotel most people I know would like to stay	SBN2	395	3.8152	0.87479
		I often identify with my friends by lodging in the hotel they choose	SBN3	395	3.9215	1.05504
		It is important that my family like the hotel I stay whenever I am visiting	SBN4	395	3.9747	0.99968
		I feel a sense of belonging by staying in the same hotel as my colleagues.	SBN5	395	4.0785	0.98281
Frontline office services	5	Staff appear very smart at all times	FOS1	395	3.76	1.0040
		Guests are cordially welcome and provided with relevant information	FOS2	395	3.73	1.0410
		Staff ensure speedy check-in and check-out services	FOS3	395	3.71	0.9990

Construct	No. of Items	Statement	Code	N	Mean	Std. Deviation
		Individual attention and respect is paid to guests at all times	FOS4	395	3.83	0.5530
		Rooms are provided according to customers' request	FOS5	395	4.18	0.4530
Employees appearance and attitude to guests	7	The staff are clean and well dressed	ETG1	395	3.7899	0.98150
		Employees are kind and respectful	ETG2	395	3.7291	1.01513
		Staff care and are concerned about guests' comfort	ETG3	395	3.6861	1.07943
		Hotel staff provide services as promised	ETG4	395	3.8076	.88038
		The staff give a prompt response to guest needs	ETG5	395	3.6759	1.08113
		Employees are reassuring in their interaction with guests	ETG6	395	3.7620	.99953
		Employees have a better command of English or pidgin	ETG7	395	3.7949	1.01310
		Housekeeping/ Room outlook	5	Hotel rooms are very clean and attractive	HRO1	395
The hotel offers very comfortable rooms	HRO2			395	3.0987	1.37891
Furniture in the rooms are of very high quality	HRO3			395	3.2987	1.36745
The hotel provides excellent laundry services	HRO4			395	3.2759	1.28928
Hotel's premises is always kept clean	HRO5			395	3.0127	1.36762
Food/Beverage services	5	Cleanliness is top notch in the hotel restaurant and bar	FBS1	395	3.7595	0.98485
		Service employees exhibit very good attitude to guests	FBS2	395	3.6785	1.01282
		Variety of food and beverages are available in the hotel	FBS3	395	3.7975	0.88959
		Food and beverages are always well presented	FBS4	395	3.64	0.642
		Diet food and beverages served are sufficient for me	FBS5	395	3.66	0.636
Revisit Intention	8	When it comes to hotels, I think this one is my top choice.	RNT1	395	3.6532	1.09624
		I am planning on returning to the hotel.	RNT2	395	3.6177	1.03403
		The hotel is my first option if I have to stay there.	RNT3	395	3.6354	1.01699
		When I travel again, I plan to stay at the hotel.	RNT4	395	3.7899	0.98150
		It would be difficult for me to stay at another hotel anytime I visit the area.	RNT5	395	3.7291	1.01513
		I had a great feeling of inclusion at the hotel	RNT6	395	3.6861	1.07943
		I plan to go to the hotel sometime in the future.	RNT7	395	3.8076	0.88038
		My feeling about the hotel is that I am connected to it	RNT8	395	3.6759	1.08113
Valid N (listwise)			395			

Source: Authors' computation (2025)

Table 2. List of Star-Rated Hotels in Delta State, Nigeria

Location	5-Star	4-Star	3-Star
Warri	Protea Hotel Delta	Lascurt Hotel	Kayriott Hotel and Suites
	BON Hotel Hyatti	Warri Wetland Hotel	Peemos Hotel
	Wellington Hotel	Bedouin Hotel and Suites	Pretelia Hotel
		Royal Nibo Presidential Hotel	TM Palace Hotel
	Ivy Lush Hotel	The Mulberry Hotel	Fonseca's Place
Asaba	Best Western Plus Elomaz Hotel	Brookview Hotel and Resorts	Maxin Lotus Motel
	Hampton Towers and Spa	Grand Hotel Asaba	Ermakel Hotel and Night Club
	Vinnilian Hotel and Resort	Villa Toscana Hotel	Fullbliss Hotel and Suites
		Nelrose Hotel	Le Millionth-Hub Hotel and Suites
		Niger View Hotel	Asabana Hotel and Suites
Sapele	N.A	Topview Hotel Asaba	
	N.A	Orion Hotel	Alacarte Residence Inn and Resort
	N.A	Richards Continental Hotel and Resort	Jomaph Hotel and Suites
			Oslar-Ben Hotel

Source: Authors' compilation from Delta State Tourism Board, Delta State, Nigeria, 2026.

4. Results

4.1 Demographic Profile of Hotel Patrons

The demographic profile of guests indicates that the sample comprised more males (73.2%) than females (26.8%). Majority (79.8%) of hotel patrons are in the most productive age bracket, while the mean age is 42 years (Table 3).

Table 3. Socio-economic Characteristics of Hotel Patrons (n=395)

Parameter	Frequency	Percentage(%)	Mean (Mode)
Gender			
Male	289	73.2	(Male)
Female	106	26.8	
Total	395	100.0	
Age			
19-28	40	10.1	
29-37	104	26.6	
38-47	119	29.9	42 years
48-57	102	25.8	
58-67	30	7.6	
Total	395	100.0	
Marital status			
Married	259	65.6	(Married)
Unmarried	136	34.4	
Total	395	100.0	
Level of Education			
Elementary school	15	3.8	
Secondary school	38	9.6	
ND/NCE	136	34.4	
HND/First Degree	154	39.0	(HND/First Degree)
Masters/Ph.D.	52	13.2	
Total	395	100.0	
Occupation status			
Student	53	13.4	
Trader	62	15.7	
Public sector employee	114	28.9	(Public sector employee)
Self-employed	73	18.5	
Private sector employee	78	19.7	
Retiree	15	3.8	
Total	395	100.0	
Mean Monthly Income(N,= †)			
50,000.00–250,000.00	267	67.6	
251,000.00–451,000.00	72	18.2	₦250,536.48
452,000.00–652,000.00	38	9.6	
653,000.00–853,000.00	13	3.3	
854,000.00–1,054,000.00	5	1.3	
Total	395	100.0	
Number of re-visit to the hotel, last 12 months			
Once	171	43.3	(Once)
Twice	131	33.2	
Three times	93	23.5	
Total	395	100.0	

†N= 1600 =1 US Dollar in September, 2025

Source: Authors' computation (2025)

Married persons constitute 65.6%, and unmarried 34.4%. Furthermore, 86.6% of them have obtained tertiary education, while the modal educational level is HND/First degree. The occupational status of the respondents includes retirees (3.8%) to private sector workers (19.7%), but the modal occupational status is private sector employee accounting for 28.9% of the patrons to hotels. The distribution of income ranged from ₦50,000.00 – ₦250,000.00 to ₦854,000.00–₦1,054,000.00 with a mean monthly income of ₦250,536.48. Moreover, of all respondents sampled, majority (67.6%) are in the least income group, 1.3 % in the highest income strata, while 18.2 % are within the ₦251,000.00–₦451,000.00 income range. On number of repeat visit to a rated hotel the last 12 months, 43.3% of them re-visited a chosen hotel once, 33.2% twice and 23.5% thrice. Table 4 shows the descriptive statistics of model variables and they are normally distributed as kurtosis ranged from -0.771 to -0.165, while skewness is -0.612 to -0.099. The values are within the acceptable range of -1 to +1 (Hair, et al., 2018). Cronbach's coefficient alpha was used to determine reliability and internal consistency of the constructs (Table 5), and all values conform to the threshold of ≥ 0.7 (Nunnally & Bernstein, 1994; Hair et al., 2018).

Table 4. Descriptive Statistics of Model Variables

Variables	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis		
						Statistic	Std. Error	Statistic	Std. Error
Revisitintention	395	2.60	4.95	3.8337	0.48432	-0.107	0.123	-0.543	0.245
Attitude	395	1.63	4.63	3.2547	0.60634	-0.054	0.123	-0.544	0.245
Subjectivenorm	395	1.20	4.60	3.1822	0.79632	-0.612	0.123	-0.459	0.245
Houskeeproomoutlook	395	1.40	5.00	3.6573	0.77082	-0.158	0.123	-0.165	0.245
Frontofficeservices	395	2.13	5.00	3.6459	0.65184	-0.099	0.123	-0.755	0.245
Emplyeguestattitude	395	2.11	5.00	3.6669	0.62945	-0.027	0.123	-0.771	0.245
Foodbeverageservice	395	1.86	4.86	3.6500	0.62014	-0.213	0.123	-0.682	0.245
Valid N (listwise)	395								

Source: Authors' computation (2025)

Table 5. Reliability Statistics of Constructs

Construct	No. of Items	Cronbach's alpha
Revisitintention	8	0.787
Attitude	5	0.850
Subjectivenorm	5	0.860
Houskeeproomoutlook	5	0.843
Frontofficeservices	5	0.801
Emplyeguestattitude	7	0.791
Foodbeverageservice	5	0.798
Research Instrument	40	0.841

Source: Authors' computation (2025)

4.2 Regression Results

The outcome of the regression model of determinants of customer re-visit intention to hotels are presented in Table 6. The Durbin-Watson statistic of 1.80 indicates absence of serial correlation of errors with an adjusted R² of 0.869, indicating the model has a good fit, which revealed that patrons' attitude, subjective norm, housekeeping/room outlook, front office services, staff attitude to guest, and food and beverage services, jointly explained 86.9% of the variation in revisit intention. The ANOVA result indicates that the model is statistically significant ($F(6, 388) = 437.840, p < 0.01$). The insignificance of multicollinearity among the variables is also revealed, as tolerance values were ≥ 0.235 , while the variance inflation factor (VIF) were < 4.5 (Hair et al., 2018; Sekaran & Bougie, 2019). As indicated in Table 6, guests'

attitude ($\beta = 0.113$, $p < 0.01$), subjective norms ($\beta = 0.051$, $p < 0.01$), frontline office services ($\beta = 0.230$, $p < 0.01$), employees' appearance and attitude to guests ($\beta = 0.40$, $p < 0.01$), housekeeping and room condition ($\beta = 0.343$, $p < 0.01$), as well as quality of food and beverage services ($\beta = 0.093$, $p < 0.01$), all exert significant impact on guests' intention to re-visit hotel. Nevertheless, employees' attitude to guests and subjective norms are the predominant and least predictors respectively.

5. Discussion

Guest's attitude exerted a positive and significant ($\beta = 0.113$, $p < 0.01$) effect on re-visit intention, though it is the fourth most impactful predictor. The implication of this finding is that a unit increase in patron attitude will cause a 0.113 rise in RI. Therefore, hypothesis one

Table 6. Regression Results of Determinants of Guests Repeat Visit

A. Model Summary ^a										
Model	R	R ²	Adjusted R ²	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R ² Change	F Change	df 1	df 2	Sig. F Change	
1	0.933 ^a	0.871	0.869	0.17508	0.871	437.840	6	388	0.000	1.80
B. ANOVA ^a										
Model			Sum of Squares	df	Mean Square	F				Sig.
1		Regression	80.525	6	13.421	437.840				0.000 ^b
		Residual	11.893	388	0.031					
		Total	92.418	394						
C. Coefficients ^b										
Model 1	Unstandardized Coefficients		Standardized Coefficient	t	Sig.	Collinearity Statistics		Tolerance	VIF	
	B	Std. Error								
(Constant)	0.636	0.067		9.427	0.000*					
Attitude	0.090	0.016	0.113	5.634	0.000*	0.828		0.828	1.208	
Subjectivenorm	0.031	0.012	0.051	2.540	0.011*	0.812		0.812	1.232	
Houskeeprooomoutlook	0.215	0.013	0.343	16.666	0.000*	0.784		0.784	1.276	
Frontofficeservices	0.171	0.025	0.230	6.947	0.000*	0.303		0.303	3.305	
Emplyeguestattitude	0.308	0.029	0.400	10.647	0.000*	0.235		0.235	4.260	
Foodbeverageservice	0.073	0.025	0.093	2.856	0.005*	0.313		0.313	3.192	

a. Dependent Variable: Revisitintetion

b. Predictors: (Constant), food and beverage services, subjective norms, attitude, housekeeping and room conditions, front-office services, employee attitudes toward guests; ** ($p < 0.01$); * ($p < 0.05$)

(H₁) is supported. A guest's favorable attitude toward a hotel, that is formed through positive experiences, satisfaction, a sense of value and loyalty, is known to strongly predict their revisit intention (Sharma and Ab Rouf Bhat, 2022; Maulana, 2024). Patrons' positive attitudes

influence their choice of hotel where their satisfaction stems from service quality, and loyalty which drives their intention to return (Nazariana et al., 2024). Thus, the significant effect of attitude on repeat visit found in the study could be attributed to this situation. Comparable findings were also reported by Dhewi et al. (2023) in their study of guests' intention to repeat visit to hotel in Indonesia.

The social pressure from people who are important to patrons influence their choice of hotel as well as their likelihood to repeat visit (Belanche et al., 2019; Abbasi et. al., 2021). Thus, subjective norm showed a direct and significant ($\beta = 0.051, p < 0.01$) influence on re-visit intention of guests in star-rated hotels. Although, it is the least predictor in the model, a 10% increase in societal pressure, will lead to 0.51% impact on intention to revisit. Arising from the foregoing, hypothesis two (H_2) is confirmed. This finding is consistent with the report of Zhang, Wong & Wang (2025) where subjective norm positively influences intentions to visit green hotels by university students in China. Influence of close friends, family, colleagues and contemporaries can exert social pressure that ultimately can affect the decision to patronize a hotel, as well as the decision to repeat visit (Wang, et al., 2023).

Rooms are the principal offerings of many hotels, and thus, the quality of the rooms have a great influence on the extent of satisfaction of customers and their behavioral intentions (Nazariana et al., 2024). House-keeping and room outlook depicts the level of cleanliness, ambience and comfort the rooms exude. The effects of housekeeping on repeat visit is positive and significant ($\beta = 0.343, p < 0.01$), and it is the second most dominant predictor of RI. The result implies that a unit rise in housekeeping and room outlook will instigate a 0.343 increase in intention to revisit hotels by guests. H_3 is therefore, confirmed. A clean and comfortable environment elicits positive emotions of happiness and contentment that would make patrons long for the service with the intent to repeat purchase or visit (Inoni & Okorie, 2022). Guests' contentment with hotel services is likely to foster their attachment to, and loyalty to a brand and consequently, repeat visit. As the level of feelings of fulfilment and joy of consumers is stimulated by their satisfaction, brand preference will increase as well as their decision for repeat purchase of the brand or visit in the future (Inoni & Ogundare, 2024; Nazariana et al., 2024). The result is in consonance with the report of Simarmata et al., (2022) in Indonesia where physical quality in terms of rooms' coziness, beds and linen, bathroom condition, provided amenities, room odor, functionality of the air conditioner had significant effects on hotel RI. Similar findings have earlier been reported by Uboegbulam and Ezurume (2020) among hotel patrons in Port Harcourt, Nigeria.

Front office services also directly and significantly ($\beta = 0.230, p < 0.01$) affect revisit intention amongst hotel patrons. A unit increase in the quality of services rendered by front office staff, has the propensity of increasing RI by 0.23. This is so because service quality is a critical prerequisite for competitiveness and for establishing and sustaining satisfying relationships with customers, particularly in service-oriented organizations (Inoni, 2021). Furthermore, the quality and value of the services provided is one of the critical elements that can be leveraged upon to influence customer satisfaction thereby stimulating behavioral intentions. In order to promote guests loyalty and repeat visit, hotel managers need to implement a marketing strategy that entails continual enhancements to the quality of services offered and employees conduct, through professional and ethical training and incentives (Inoni, 2025). The significant effects of service quality have been reported by Asgeirsson, Gudlaugsson & Jóhannesson (2024) in their study of the influence of SQ and reputation on hotel performance in Reykjavík, Iceland. Comparable results were also reported by Olorunsola et al. (2024) on the influence of front desk service quality on intention to revisit ecocentric hotels. The foregoing discussion thus confirmed H_4 .

Employees' attitude to guests is another explanatory variable that exerted significant ($\beta = 0.40$, $p < 0.01$) impact on customers' revisit intention; as a percentage improvement in staff attitude to patrons would result in a 0.4 likelihood for guests repeat visit. This result aligns with that of Wampande and Osunsan (2020) which found the attitude of employees as a significant predictor of guests' satisfaction and intention to repeat visit. The attitude and behavior of staff who are involved in delivering service to customers directly have a great influence on the behavioral intentions of guests. A good client-employee service interaction promotes positive word-of-mouth that leads to recommendations to family, colleagues and friends that could ultimately lead to patrons' loyalty and re-purchase decision. Furthermore, employees with positive attitudes create welcoming environments, provide empathetic and courteous service, thereby enhancing the overall guest experience, and increasing the likelihood for guests' to re-visit. When staff are friendly, helpful, attentive and efficient in rendering services to customers, it builds clients' trust in the service provider, and makes them feel assured of consistent quality service in the future. Other studies supporting our findings are those of Bichler, Pikkemaat & Peters (2021) in Austria and Sornsaruht (2024) in Thailand. H_5 is therefore supported.

Food and beverage (F&B) services also have positive and significant ($\beta = 0.093$, $p < 0.01$) effect on intention to repeat visit. Although its impact is low compared to other predictors, a 10 percentage increase in the quality of food and beverage services will cause a 0.93 propensity of guests to re-visit the hotel of choice. Therefore, the result supports H_6 . F&B services are an integral part of guests total hotel experience, and high-quality food and attentive service are essential for hotels to stand out from the competition. Therefore, maintaining consistent high standards in food preparation, ingredients and beverage selection to meet and exceed guest expectations is a veritable marketing strategy for customer satisfaction, retention and loyalty. Bichler, Pikkemaat and Peters (2021) found food quality and excellent service as predictors of revisit intention in their study in Austria. The reports of Inoni, Olannye and Gladson-Nwokah (2016), Inoni, 2024 and Shariff et al. (2023) amongst the general population and university residents respectively, in Nigeria and Malaysia, are also consistent with the findings.

CONCLUSION

Owing to intense competition in the hotel sub-sector of the hospitality industry in Delta State, Nigeria, many hoteliers are facing serious challenges to provide both superior services and exceptional food and beverage experiences that can foster customer loyalty and repeat patronage. The study examined the effects of guests' attitude, subjective norms, frontline office services, and employees' attitude to guests, housekeeping and room conditions, as well as quality of food and beverage services on guests' intention for repeat visit. The results revealed that all the independent variables exerted positive and significant influence on RI in the study area, with employees' attitude to guests as the predominant predictor of RI. Because the quality of services and room conditions are very critical to the comfort of guests, hotels must ensure that the totality of their offerings matches or surpasses the expectations of the clients, in order to engender customer retention and repeat patronage.

Employees with positive attitudes create welcoming environments, provide empathetic and courteous service, and enhance the overall guest experience, thereby making guests more likely to return and recommend the hotel. Therefore, the authors recommend that management should invest in employee training and development to build their skills and confidence in rendering personalized services to clients.

In view of the overwhelming challenges operators face in the travel and hospitality industry, stable electricity supply or reliable alternative energy system should be provided to reduce energy and operating costs, as well as improvement in overall infrastructure development.

Furthermore, access to affordable financing options and capacity building for hotel management needed to be put in place to stimulate investment in the industry. Although impediments to rapid and sustainable development of the tourism sector in Nigeria are common in several respects, the difficult terrain and flood-prone areas in most parts of the Niger Delta region presents very peculiar obstacle for infrastructure development for coastal States. Thus, government intervention is required urgently to address the infrastructural deficits of poor road networks and weak transport and communication systems, as these will provide the enabling environment that would stimulate private sector investment in the industry.

The study's practical implication is that hoteliers need to implement a marketing strategy that involves continuous improvement to the quality of services provided, and their operational environment. To do this, employees conduct has to be enhanced through professional and ethical training to provide courteous, reliable and personalized services to win patrons' loyalty. The originality value of the study stems from the application of the modified TRA model which posits that behavioral intention is shaped by attitude and subjective norm; as positive attitudes toward a hotel's services and social recommendations from peers impact greatly on guests' intention to revisit.

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REMOTE WORK, DIGITAL SURVEILLANCE, AND EMPLOYEE AUTONOMY: EXAMINING THE MODERATING ROLE OF TRUST IN LEADERSHIP IN SOUTHWEST NIGERIAN SERVICE ORGANIZATIONS

ABSTRACT

This study investigates the interplay between remote work, digital surveillance, and employee autonomy, with a focus on the moderating role of trust in leadership within service organizations in Osun State, Nigeria. Drawing upon Social Exchange Theory and Self-Determination Theory, the research explores how digital surveillance practices influence employees' perceived autonomy and how trust in leadership mitigates potential negative effects. The study employed a quantitative research design, with data collected through a structured questionnaire administered to 120 employees from selected Financial Technology (FinTech) organizations in Southwest Nigeria. Findings indicate that digital surveillance negatively affects employee autonomy, while trust in leadership significantly moderates this relationship. The study contributes to leadership and human resource management literature by highlighting the importance of trust in fostering employee well-being and performance in digitally monitored remote environments.

KEYWORDS: remote work; digital surveillance; employee autonomy; service organizations

JEL: M54, O32, M12

INTRODUCTION

Traditional workplace interactions have changed as a result of the COVID-19 pandemic's acceleration of the transition toward remote labor. To keep an eye on output and guarantee accountability, organizations are depending more and more on digital surveillance techniques (Ball, 2021). Employers are using digital surveillance technologies more frequently to keep an

eye on remote workers as remote labor has become the most common form of employment, especially since the COVID-19 outbreak, Keerthana & Law, (2025). However, employees' demand for psychological independence and autonomy is frequently at odds with this surveillance. The effects of digital surveillance on employee autonomy should be empirically investigated in Nigeria's service industry, where trust in organizational culture and leadership varies greatly (Adeniji & Osibanjo, 2023). According to Sethi (2025), employee monitoring has evolved from an occasional managerial tool to a pervasive, technology-driven aspect of contemporary employment due to the rapid move to remote and hybrid work. As stated by Keerthana et al. (2025), the flexibility that remote work offers is one of its main benefits. Without having to commute or dress in formal attire, employees are free to set up their workweek as they see fit. This flexibility may lead to higher job satisfaction and productivity. Additionally, remote work can enhance work-life balance since it makes it easier for employees to reconcile their personal and professional obligations. However, working remotely has disadvantages as well. One of the key issues is the blending of work and home life, which can make it difficult to maintain a good work-life balance. Remote workers may also experience a sense of alienation from their colleagues and the company culture. Finally, people who work remotely may experience higher levels of stress because they may believe that they must always be reachable, Keerthana et.al., (2025). Abaikpa, (2025) explained that the shift to remote work often impacts the level of engagement due to factors like reduced communication, lack of social interaction, and difficulties in maintaining organizational culture. Abaikpa (2025) went on to say that, especially in light of the changing digital workplace, digital leadership has emerged as a key concept in contemporary organizational management. Even while digital leadership is becoming more and more important and has the ability to improve remote work management, businesses still have a long way to go before they can fully take advantage of these prospects. Olowookere & Olatunji (2024) explained that gaps in leadership practices have been revealed by the shift to remote work, especially in issues pertaining to employee monitoring, digital literacy, and preserving a unified organizational culture. Even though digital leadership is known to improve teamwork and communication, many leaders still find it difficult to adjust to the digital tools needed for effective remote work management (Okeke & Nwosu, 2024).

Statement of the Problem

Remote work refers to flexible arrangements that allow employees to perform tasks outside conventional offices using digital technologies (Bloom et al., 2015). Digital surveillance refers to electronic monitoring systems used to track work performance (Ball, 2021). While such tools enhance productivity control, they may threaten employees' sense of autonomy (Ravid et al., 2020). Employee autonomy, defined as perceived control over one's work, is a key factor in motivation and creativity (Deci & Ryan, 2000; Gagné & Deci, 2019). While remote work enhances flexibility and work-life balance, it also introduces managerial concerns regarding control and performance monitoring. Excessive digital surveillance can erode employee trust and perceived autonomy, resulting in decreased motivation and engagement (Bennett et al., 2020). Few studies have examined how remote work and digital surveillance related to employee autonomy in Nigeria, where digital transformation and organizational hierarchies coexist. This study aims to fill this gap by examining the relationship between remote work, digital surveillance, and employee autonomy in Osun State Nigerian Service Organizations.

Objectives of the Study

The specific objectives were to:

- i. investigate the combine influence of remote work and digital surveillance on employee autonomy
- ii. determine the relationship between remote work and employee autonomy

- i. ascertain the relationship between digital surveillance and employee autonomy.

Research Hypotheses

Ho1: There is no significant combine influence of remote work and digital surveillance on employee autonomy

Ho2: There is no significant relationship between remote work, and employee autonomy.

Ho3: There is no significant relationship between digital surveillance and employee autonomy.

1. LITERATURE REVIEW

1.1 Conceptual Review

Remote Work

The advent of remote work has significantly altered traditional employment relationships. While remote work existed prior to the COVID-19 pandemic, the global health crisis accelerated its adoption across industries and regions, transforming how work is structured, supervised, and experienced (Kniffin, Narayanan, Anseel, 2021). According to coursera (2026) remote work became popular during the COVID-19 pandemic, with over a third of US businesses increasing teleworking across various sectors. Hybrid work environment i.e., as returning to the office following the pandemic became an option, many companies offered staff a hybrid work model. This gives employees the combined benefits of working from home for part of the week and having the benefits of the office environment for the other part, Coursera (2026). Remote work can be done in a co-working space, at home, at a cafe the list goes on. As long as your work can be performed without the need for in-person collaboration, remote work is usually an option whether that's in-house at a company, or as an independent freelancer, Jaye Hannah (2023) According to Indeed Editorial Team (2025) remote work is work done outside of a traditional office environment, also referred to as working from home or telecommuting i.e., fully remote, flexible job and freelance. Remote work also referred to as telework, virtual work, or flexible work arrangements has evolved from a marginal employment practice into a central component of contemporary organizational systems. Conceptual research is particularly valuable in this area because remote work is not merely a technological shift but a socio-organizational phenomenon involving changes in power relations, communication patterns, autonomy, trust, and work-life boundaries (Wang, Liu, Qian & Parker 2021). Remote work is commonly defined as a work arrangement in which employees perform job tasks outside traditional office settings, using digital technologies to remain connected to the organization (Allen, Merlo, Lawrence, Slutsky, & Gray, (2021). However, recent scholarship emphasizes that remote work is not a binary concept (office vs. home) but exists along a continuum that includes fully remote, hybrid, and flexible arrangements (Messenger & Gschwind, 2022). Remote work comprises three core elements work performed outside the central workplace (spatial flexibility), discretion over work hours (temporal flexibility) and reliance on digital communication and monitoring tools (technological mediation). These elements interact to shape employee experiences and organizational outcomes (Eurofound, 2022). Employee Autonomy, digital surveillance and monitoring, work-life boundary management are the dimensions of remote work. Remote work significantly increases decision latitude over how, when, and where work is performed. Autonomy has been consistently linked to job satisfaction, engagement, and innovative behavior in remote settings (Gajendran, Harrison, & Delaney-Klinger 2022). However, excessive autonomy without guidance may lead to role ambiguity and stress. Post-pandemic remote work has been accompanied by increased use of digital monitoring tools. Conceptual studies argue that surveillance may undermine trust and psychological safety, potentially negating the positive effects of autonomy (Ball, 2022; Parent-

Rocheleau & Parker, 2022). Remote work blurs the boundaries between professional and personal life. Boundary theory suggests that employees differ in their preferences for segmentation or integration, which moderates the impact of remote work on well-being (Allen et al., 2021). Without effective boundary control, remote work may lead to burnout and emotional exhaustion (Eurofound, 2022). Remote Work outcomes includes employee well-being, job performance and productivity and organizational commitment and engagement. Empirical evidence since 2021 presents mixed findings. While remote work reduces commuting stress and increases flexibility, it can also increase loneliness, anxiety, and technostress if not properly managed (Oakman, Kinsman, Stuckey, Graham, & Weale, (2022).). Remote work has been positively associated with task performance and productivity, particularly for knowledge workers, when supported by clear goals and trust-based leadership (Choudhury, Foroughi, & Larson (2021). However, performance gains are contingent on job type and organization support structures. Hybrid and remote work arrangements have been linked to higher organizational commitment when employees perceive fairness, inclusion, and career continuity (Beauregard, Basile, & Canónico (2022).

Digital Surveillance

According to Sebastian, Ehinger, & Miller, (2025) workplace surveillance entails organizations closely observing and evaluating employees' performance, behaviors, actions, and personality qualities. The COVID-19 pandemic significantly accelerated the adoption of digital surveillance technologies, particularly in remote and hybrid work contexts (Leonardi, 2021). Digital surveillance has become a defining feature of contemporary organization, accelerated by advances in information and communication technologies, artificial intelligence (AI), big data analytics, and the widespread adoption of remote and hybrid work arrangements. From algorithmic monitoring of employee productivity to biometric data collection and AI-driven performance analytics, digital surveillance increasingly shapes how work is organized, controlled, and evaluated (Ajunwa, 2022; Kellogg, Valentine, & Christin, 2023). While organization justify digital surveillance as a tool for efficiency, security, compliance, and performance optimization, scholars have raised growing concerns about its implications for employee autonomy, privacy, trust, psychological well-being, and ethical governance (Ball, 2022; Moore, Akhtar & Upchurch (2023). Digital surveillance is broadly conceptualized as the use of digital technologies to monitor individuals' activities, behaviors, communications, and outputs in real time or retrospectively (Zuboff, 2019; Ball, 2022). Consequently, digital surveillance has emerged as a critical construct within human resource management (HRM), organizational behavior, employment relations, and legal studies. Digital surveillance refers to the systematic collection, processing, and analysis of digital data to monitor, evaluate, predict, or influence individual behavior, particularly within organizational contexts (Ball, 2022). Unlike traditional supervision, digital surveillance relies on automated, continuous, and data-driven technologies, often operating invisibly in the background. Ajunwa (2022) defines workplace digital surveillance as the use of algorithmic and data-intensive tools to observe employees' activities, communications, physiological states, and performance outcomes. Similarly, Moore et al. (2023) emphasize that digital surveillance extends beyond observation to include behavioral prediction and decision-making, making it more intrusive and consequential than earlier monitoring practices. Digital surveillance has evolved through several stages: early tools such as CCTV and keystroke tracking (Electronic Monitoring); integration of enterprise software, productivity dashboards, and email monitoring (Data-Driven Surveillance); AI-enabled systems that evaluate performance, flag risks, and automate managerial decisions (Algorithmic Surveillance); and use of facial recognition, emotion detection, wearable sensors, and health-tracking technologies (Biometric and Affective Surveillance), (Kellogg et al., 2023; Ajunwa, 2022). The post-COVID-19 workplace has intensified this evolution, particularly with remote work surveillance tools such as screen

recording, webcam monitoring, and productivity scoring systems (Ravid, Tomczak, White & Behrend, 2024). Digital surveillance as a multidimensional construct rather than a single practice. Transparent surveillance systems disclose monitoring practices, while opaque systems operate covertly, often heightening perceptions of injustice and mistrust (Ball, 2022). Surveillance intensity reflects the frequency, granularity, and breadth of data collected, ranging from task-based monitoring to continuous behavioral and biometric tracking (Moore et al., 2023). Algorithmic control occurs when digital systems not only monitor but also evaluate, rank, reward, or discipline employees automatically, reducing managerial discretion (Kellogg et al., 2023). Digital surveillance increasingly relies on datafication, where human behavior is translated into quantifiable metrics used for prediction and optimization (Ravid et al., 2024). Organizational Implications of Digital Surveillance includes employee autonomy, control, psychological wellbeing, trust in leadership, and performance and productivity. Digital surveillance often constrains employee discretion, fostering perceptions of micromanagement and reduced decision latitude (Ajunwa, 2022). Intensive surveillance could be linked to stress, emotional exhaustion, anxiety, and technostress, particularly in remote work contexts (Ravid et al., 2024). When surveillance is perceived as punitive or excessive, it undermines trust in leadership and weakens organizational commitment (Stahl, Timmermans & Mittelstadt, 2022). While proponents argue surveillance improves performance, evidence suggests gains are often short-term and may be offset by disengagement, resistance, and counterproductive work behaviors (Kellogg et al., 2023). This includes keystroke logging, screen capture, time-tracking software, and productivity dashboards. Such tools aim to quantify employee effort and output, particularly in remote work settings (Möhlmann & Zalmanson, 2021). Algorithmic management systems evaluate performance, allocate tasks, and discipline workers automatically, commonly seen in gig and platform work (Wood et al., 2021). Digital surveillance raises significant ethical and legal concerns related to privacy, consent, data protection, fairness, and algorithmic bias. Wearable devices and biometric systems track heart rate, movement, facial expressions, and stress indicators, raising significant ethical and privacy concerns (Parent-Rocheleau & Parker, 2022). Scholars argue for governance frameworks grounded in transparency, proportionality, employee voice, and compliance with data protection laws such as GDPR-inspired regulations (Ajunwa, 2022; Stahl et al., 2022). Organizations are therefore challenged to balance managerial control with employee rights. Organizational positive Outcomes of Digital Surveillance involves Improve coordination and performance transparency, Reduce shirking and misconduct. Support data-driven decision-making. However, these benefits are often conditional and short-term (Ball, 2022). Organizational negative Outcomes of Digital Surveillance involves reduced employee autonomy and job satisfaction, heightened stress, anxiety & emotional exhaustion and Erosion of trust in leadership, (Möhlmann et al., 2023, Kellogg et al., 2022, Parent-Rocheleau & Parker, 2022. This leading to Increased resistance, workarounds, and disengagement. Digital surveillance represents a fundamental transformation in how work is organized and controlled. While it offers potential efficiency gains, its unchecked use risks undermining employee autonomy, trust, and well-being. Conceptually, digital surveillance should be understood not merely as a technological tool but as a socio-legal system embedded in power relations, ethical norms, and regulatory frameworks. When digital surveillance is perceived as excessive or opaque, employees interpret it as a signal of distrust, undermining psychological safety and organizational commitment (Parent-Rocheleau & Parker, 2022). Conversely, transparent, participatory, and ethically governed surveillance systems are more likely to be accepted by employees (Ball, 2022).

Employee Autonomy

Employee autonomy has emerged as a central construct in contemporary organizational research, particularly in the context of digital transformation, remote work arrangements, and

evolving leadership practices. Autonomy refers to the degree to which employees have discretion, independence, and freedom in scheduling their work, determining work procedures, and making job-related decisions (Morgeson & Humphrey, 2021). In knowledge-based and service-driven economies, autonomy is increasingly viewed as a strategic resource that enhances employee well-being, motivation, innovation, and sustainable organizational performance. Recent organizational disruptions such as the COVID-19 pandemic, widespread remote work adoption, and increased digital surveillance have intensified scholarly interest in employee autonomy, especially regarding its interaction with leadership trust, control mechanisms, and psycho social risk management (Kniffin et al., 2021; Wang et al., 2024). Consequently, understanding employee autonomy from a conceptual and theoretical standpoint is essential for modern human resource management (HRM) scholarship and practice. Employee autonomy is commonly defined as the extent to which a job provides employees with freedom, independence, and discretion in carrying out work activities (Ryan & Deci, 2023). From a job design perspective, autonomy encompasses control over work methods, scheduling, decision-making, and goal prioritization (Parker, Morgeson, & Johns, 2021). More recent scholarship conceptualizes employee autonomy as a multidimensional construct embedded within organizational systems, leadership styles, and technological infrastructures (Kellner, McDonald, & Townsend, (2022). Autonomy is no longer seen as absolute independence but rather as “structured freedom” shaped by organizational norms, digital tools, and managerial trust (Sewell & Taskin, 2024). Work Scheduling Autonomy, Method Autonomy, Decision-Making Autonomy and Digital Autonomy are the dimensions of Employee Autonomy. Work Scheduling Autonomy refers to employees’ discretion over when and how long they work. Flexible scheduling autonomy has been linked to improved work life balance and reduced work family conflict (Allen et al., 2021). Method autonomy involves control over how tasks are performed. Studies show that method autonomy enhances creativity and problem-solving, particularly in professional and knowledge-intensive roles (Parker et al., 2021). Decision autonomy reflects the degree to which employees can make independent job-related decisions. High decision autonomy fosters psychological empowerment and organizational citizenship behavior (OCB) (Zhang, Waldman, Han, & Li, 2022). An emerging dimension, digital autonomy refers to employees’ control over digital tools, monitoring systems, and data use. Reduced digital autonomy has been associated with increased stress, perceptions of injustice, and resistance behavior (Sewell & Taskin, 2024). Employee Autonomy and Work Outcomes involves: Autonomy and Employee Well-being i.e., reduced burnout, anxiety, and emotional exhaustion. Autonomy allows employees to self-regulate effort and recover from work demands (Bakker & Demerouti, 2023; Wang et al., 2024). Autonomy and performance: autonomy enhances both task and contextual performance by fostering intrinsic motivation and ownership of work outcomes (Van den Broeck, Howard, Van Vaerenbergh, Leroy, & Gagné, (2022). Meta-analytic evidence confirms a robust positive relationship between autonomy and performance across sectors (Parker et al., 2021). Autonomy and Innovation: Employee autonomy encourages experimentation and learning, which are essential for innovation. Autonomy-supportive climates are particularly important for knowledge sharing and continuous improvement (Zhang et al., 2022). Leadership, Trust, and Employee Autonomy: Leadership style plays a critical role in shaping perceived autonomy. Transformational, ethical, and health-promoting leadership styles have been shown to enhance autonomy through trust-based management (Slemp, Kern, Patrick & Ryan, 2021; Inceoglu, Thomas, Chu, Plans & Gerbasi, 2023). Conversely, authoritarian leadership and excessive monitoring reduce autonomy perceptions, even in flexible work arrangements (Kellner et al., 2022). Trust in leadership has been identified as a key moderating variable that strengthens the positive effects of autonomy on employee outcomes (Wang et al., 2024).

1.2. Theoretical Review

This study draws from three key theories: Social Exchange Theory (Blau, 1964), which posits that trust and reciprocity shape workplace behaviors; Self-Determination Theory (Deci & Ryan, 2000), which emphasizes autonomy as a basic psychological need; Job Demands Resources (JD-R) Theory which posits that job outcomes result from the balance between job demands.

Social Exchange Theory

Social Exchange Theory (Blau, 1964) posits that relationships in organizations are reciprocal; trust encourages positive employee behaviors (Cropanzano & Mitchell, 2005). Social Exchange Theory posits that trust develops through reciprocal and fair exchanges between leaders and followers (Blau, 1964). Recent research emphasizes that when leaders provide support, transparency, and fairness, employees reciprocate with commitment, engagement, and discretionary behaviors (Cropanzano et al., 2021). Trust and Social Exchange Theory has been used to explain trust, commitment, and reciprocity in remote work relationships. When organizations provide flexibility and support, employees reciprocate through higher engagement and performance (Cropanzano et al., 2017; Beauregard et al., 2022). Surveillance practices signal organizational intentions. High-intensity or opaque surveillance may erode trust, damaging social exchange relationships between employees and employers (Stahl et al., 2022).

Self-Determination Theory

Self-Determination Theory (Deci & Ryan, 2000) emphasizes that autonomy, competence, and relatedness are essential for intrinsic motivation. When digital surveillance threatens autonomy, motivation declines unless balanced by supportive leadership (Gagné & Deci, 2019). Self-Determination Theory explains how remote work can enhance or undermine intrinsic motivation depending on whether it satisfies employees' needs for autonomy, competence, and relatedness (Deci et al., 2017). Recent studies show that while remote work enhances autonomy, it may threaten relatedness due to reduced social interaction (Choudhury et al., 2021). From an SDT perspective, excessive surveillance undermines employees' basic psychological needs for autonomy, competence, and relatedness, leading to reduced intrinsic motivation and well-being (Ravid et al., 2024). Self-Determination Theory (SDT) remains the most influential framework for understanding employee autonomy. According to SDT, autonomy is one of three basic psychological needs alongside competence and relatedness necessary for intrinsic motivation and psychological well-being (Ryan & Deci, 2023). When organizations support autonomy, employees experience higher engagement, job satisfaction, and performance. Recent studies demonstrate that autonomy support from leaders enhances autonomous motivation, particularly in remote and hybrid work settings (Slemp et al., 2021; Van den Broeck et al., 2022).

Job Demands Resources (JD-R) Theory

JD-R theory has been widely applied to remote work research since 2021. The theory posits that job outcomes result from the balance between job demands (e.g., work intensification, isolation) and job resources (e.g., autonomy, flexibility, supervisor support) (Bakker & Demerouti, 2017). In remote work contexts, autonomy and flexibility are often conceptualized as resources, while digital overload and blurred work-life boundaries function as demands (Wang et al., 2021). Within the JD-R framework, employee autonomy is conceptualized as a key job resource that buffers the negative effects of job demands such as workload, role ambiguity, and emotional labor (Bakker & Demerouti, 2023). Autonomy enables employees to manage demands more effectively, thereby reducing burnout and enhancing resilience. Recent empirical extensions of the JD-R model highlight autonomy as a critical resource for managing techno-stress and digital overload (Molino, Ingusci, Signore, Manuti, Giancaspro, Russo, & Cortese 2023).

1.3. Empirical Review

Remote work and Employee Autonomy

Remote work has emerged as a prominent organizational arrangement, particularly in response to technological innovations and the increasing demand for flexible work conditions. One critical area of investigation is how remote work impacts employee autonomy, as remote work inherently provides employees with greater discretion over how, when, and where they complete tasks. Empirical studies indicate a generally positive relationship between remote work and employee autonomy, albeit with contextual variations. In Lagos State, Adeyemi and Fadare (2022) conducted a study on Remote Work, Employee Autonomy, and Productivity in Lagos Service Organizations. The research explored how telecommuting affected employees' decision-making capacity and control over their work schedules. Findings revealed that remote work arrangements significantly enhanced employees' perceived autonomy, allowing them to self-organize tasks and optimize personal productivity. However, the study also noted that autonomy could be undermined if remote work was paired with excessive monitoring. It was concluded that remote work can promote autonomy and job satisfaction when supported by flexible management practices. Also, Bloom, Liang, Roberts, and Ying (2015) conducted a study on does working from home work? Evidence from a Chinese Experiment in China (specifically in a large travel agency in Beijing). This experimental study examined the effects of remote work on productivity and employee performance. The researchers found that employees working from home showed a 13% performance increase compared to their office-based counterparts, largely due to reduced distractions and increased autonomy. The study concluded that remote work can improve productivity and autonomy when appropriately structured, highlighting the importance of trust and clear performance metrics.

Digital Surveillance and Employee Autonomy

Digital surveillance has become a prevalent practice in modern organizations, particularly with the expansion of remote work and technology-mediated tasks. Its relationship with employee autonomy has drawn considerable attention, as surveillance can simultaneously enhance organizational control while potentially constraining employee discretion and self-management. In Abuja, Ogunleye (2023) examined digital surveillance and work autonomy: Insights from Federal Service Agencies. The research found that continuous monitoring often created a perception of distrust among employees, which negatively affected their ability to make independent work decisions. However, the study noted that when leadership provided clear communication and trust-building measures, employees reported higher autonomy even under surveillance. The authors concluded that trust in leadership serves as a critical buffer, moderating the negative relationship between digital surveillance and autonomy. Also, Uche and Nwosu (2022) studied Trust, Surveillance Stress, and Employee Outcomes in Nigerian Service Organizations in Port Harcourt, Nigeria. The research investigated how lack of trust interacts with digital surveillance to affect employees' stress and performance. Findings showed that low trust intensifies surveillance-related stress, negatively affecting autonomy, engagement, and performance. The study concluded that trust in leadership mitigates the negative effects of monitoring and surveillance on employee well-being and performance.

1.4. Gaps in the Literature

Despite the growing body of research on remote work, digital surveillance, and employee autonomy, several empirical and conceptual gaps remain, particularly in Global South contexts. Most existing studies have focused on developed economies such as the United States, Europe, and parts of Asia (Bloom, Liang, Roberts, & Ying, 2015; Adăscăliței & Riso, 2024; Sewell & Taskin, 2015), leaving limited empirical evidence from developing countries, including African (Adeyemi & Fadare, 2022; Ogunleye, 2023). This under-representation restricts the

generalizability of findings, especially given that organizational culture, regulatory environments, and technological adoption differ substantially between the Global North and Global South. Moreover, most research has focused on individual-level outcomes, with less attention to multi-level frameworks that link surveillance, leadership, trust, and employee well-being to broader organizational systems. There is a need for conceptual models that connect individual perceptions of monitoring and autonomy to team- and organizational-level processes, including the moderating role of trust in leadership (Adeyemi & Fadare, 2022; Ogunleye, 2023). In summary, the literature demonstrates the relevance of remote work, digital surveillance in shaping autonomy and performance. However, research gaps persist, particularly regarding longitudinal studies autonomy. Addressing these gaps is critical for understanding how leadership, monitoring, and trust interact in African service organizations, including the case of POS machine vendors in Osun State

2. METHODOLOGY

2.1. Research Design

A descriptive survey research design was employed for the study. The population comprised the POS Vendors in Owode Ede and Osogbo, Southwest Nigeria. A stratified random sampling method was used to select 120 respondents. Data were collected using a structured questionnaire adapted from validated scales: digital surveillance scale (Ravid et al., 2020), employee autonomy scale (Deci & Ryan, 2000), and trust in leadership scale (Dirks & Ferrin, 2002). Data were analyzed using SPSS 27, employing Pearson correlation, ANOVA, and multiple regression analyses.

2.2. Population of the Study

The population for this study comprises employees of Financial Technology (FinTech) organizations in Southwest Nigeria who are engaged in POS machine services, specifically in Osogbo and Owode-Ede towns in Osun State. The study focuses on this population because these service organizations represent a rapidly growing sector in the economy, characterized by the adoption of remote work practices and the use of digital surveillance technologies. A total of 120 respondents were selected from these two towns. This sample includes employees at different organizational levels who are directly involved in daily POS operations and are exposed to digital monitoring systems and remote work arrangements. By focusing on this population, the study seeks to capture first-hand insights into the interplay between remote work, digital surveillance, and employee autonomy, as well as the moderating influence of trust in leadership within the local service sector context. The selected population is appropriate for the study as it ensures a representative mix of employees, enabling a reliable assessment of the research variables while reflecting the unique organizational and cultural dynamics present in Osun State.

2.3. Sample Size and Sampling Techniques

The sample size for this study consists of all 120 users of POS machine services within Osogbo and Owode-Ede in Osun State. A total 120 respondents were selected using the proportionate stratified sampling method. This approach is particularly appropriate given the manageable size of the population and the study's objective of obtaining comprehensive insights into the relationships between remote work, digital surveillance, employee autonomy, and the moderating role of trust in leadership. Employing a proportionate stratified sampling method ensures that the results accurately reflect the experiences and perceptions of employees in these two towns, thereby enhancing the validity and generalizability of the findings within the context of POS service organizations in Osun State. The Researcher administered the questionnaires

and retrieved the questionnaires and subjected it to statistical analysis using Cronbach Alpha formula.

2.4. Research Instrument

The primary research instrument used in this study was a structured questionnaire. The questionnaire was designed to collect data on the key variables of the study, namely remote work, digital surveillance, employee autonomy, and trust in leadership. It was chosen as the research instrument because it is efficient, standardized, and suitable for obtaining quantitative data from a relatively large population, allowing for systematic comparison and statistical analysis. The questionnaire was divided into four main sections: Section A – Demographic Information: This section gathered data on respondents' age, gender, educational qualification, job position, and years of experience, to provide context for the analysis. Section B – Remote Work: Items in this section measured the extent to which employees engaged in remote work, including flexibility in location, work schedule, and task management. Section C – Digital Surveillance and Employee Autonomy: This section assessed the degree of monitoring employees experienced through digital tools and the impact of such monitoring on their perceived autonomy. The questionnaire items were primarily structured using a five-point Likert scale, ranging from “Strongly Disagree” (1) to “Strongly Agree” (5), to capture the intensity of respondents' perceptions and experiences. The instrument was adapted from validated scales in existing literature to ensure reliability and validity, including works by Adeola and Adebayo (2021), Uche and Nwosu (2022), and Sewell and Taskin (2015).

2.5. Methods of Data Analysis

The data was collected through structured questionnaire and was analyzed using descriptive and inferential statistics. The descriptive statistics was used to summarize respondents' demographic characteristics and their responses on remote work, digital surveillance, employee autonomy, and trust in leadership. This provided a clear overview of the general trends and distribution of responses in the study. To test the hypothesized relationships and the moderating effect of trust in leadership, inferential statistical methods were employed. Pearson's correlation coefficient was used to examine the strength and direction of the relationships between remote work, digital surveillance, and employee autonomy. Multiple regression analysis was used to assess the predictive impact of remote work and digital surveillance on employee autonomy. The moderating effect of trust in leadership was tested using hierarchical regression analysis. In this analysis, the independent variables (remote work and digital surveillance) were entered first, followed by the moderating variable (trust in leadership), and finally, the interaction terms (Remote Work $\times$ Trust; Digital Surveillance $\times$ Trust) to determine whether trust significantly changes the strength or direction of the relationships. All hypotheses were tested at a 5% level of significance ($\alpha = 0.05$).

3. RESULTS

MULTIPLE REGRESSION

Table 1. Model Summary of the Regression Analysis for Employee Autonomy
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.861 ^a	.741	.737	2.64793

a. Predictors: (Constant), remote work, digital surveillance

Source: Researchers' Computation using SPSS 24.0, (2025)

The regression analysis examined the relationship between the predictors' remote work and digital surveillance on employee autonomy. The model produced a strong positive relationship, with an R value of 0.861, indicating a high degree of association between the predictors and the dependent variable. The R² value of 0.741 suggests that 74.1% of the variance in the dependent variable is explained by the model. While the Adjusted R Square of 0.737 accounts for the number of predictors, indicating minimal shrinkage and confirming the model's robustness.

Table 2. ANOVA Results for the Regression Model on Employee Autonomy

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	2369.597	2	1184.799	168.978	.000 ^b
Residual	827.362	118	7.012		
Total	3196.959	120			

a. Dependent Variable: employee autonomy

b. Predictors: (Constant), remote work, digital surveillance

Source: Researchers' Computation using SPSS 24.0, (2025)

The ANOVA Table above indicate that the regression model significantly predicts employee autonomy, $F(2, 118) = 168.978$, $p < .001$. The model explains a substantial portion of the variance in employee autonomy, with a regression sum of squares of 2369.597 and a residual sum of squares of 827.362, leading to a total sum of squares of 3196.959. The predictors in the model are remote work and digital surveillance, and their combined influence on employee autonomy is statistically significant, suggesting that variations in these factors meaningfully account for differences in autonomy.

Table 3 Regression Coefficients for Predictors of Employee Autonomy

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	23.368	2.194		10.652	.000
remote work	-.809	.058	-.771	-13.963	.000
digital_surv	1.404	.080	.969	17.541	.000

a. Dependent Variable: employee autonomy

Source: Researchers' Computation using SPSS 24.0, (2025)

The table 3 above revealed that both predictors significantly influence employee autonomy. The constant (intercept) is 23.368 ($SE = 2.194$, $p < .001$), representing the expected level of autonomy when both remote work and digital surveillance are zero. Remote work has a significant negative effect on autonomy ($B = -0.809$, $\beta = -0.771$, $t = -13.963$, $p < .001$), indicating that higher levels of remote work are associated with lower employee autonomy. Conversely, digital surveillance has a significant positive effect ($B = 1.404$, $SE = 0.080$, $\beta = 0.969$, $t = 17.541$, $p < .001$), suggesting that increased digital surveillance is associated with

higher autonomy in this study. Both predictors are strong and statistically significant contributors to the model.

To determine the relationship between remote work and employee autonomy

Table 4 Pearson Correlation Matrix Between Remote Work and Employee Autonomy

Correlations		remote work	employee autonomy
remote work	Pearson Correlation	1	.556**
	Sig. (2-tailed)		.000
	N	120	120
employee autonomy	Pearson Correlation	.556**	1
	Sig. (2-tailed)	.000	
	N	120	120

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

Source: Researchers' Computation using SPSS 24.0, (2025)

The findings in the Table 4 above showed a statistically significant strong relationship between remote work and employee autonomy. $\{r(118) = .556^{**} p < .01\}$. As a result, the null hypothesis was rejected and the alternative hypothesis was accepted. Therefore, there was a significant relationship between remote work and employee autonomy.

Digital surveillance will not significantly relate to employee autonomy

Table 5. Pearson Correlation Matrix Between Digital Surveillance and Employee Autonomy

Correlations		digital surveillance	employee autonomy
digital surveillance	Pearson Correlation	1	.332**
	Sig. (2-tailed)		.000
	N	120	120
employee autonomy	Pearson Correlation	.332**	1
	Sig. (2-tailed)	.000	
	N	120	120

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

Source: Researchers' Computation using SPSS 24.0, (2025)

The findings in the Table 5 above showed a statistically significant moderate strong correlation between digital surveillance and employee autonomy. $\{r(118) = .332^{**} p < .01\}$. As a result, the null hypothesis was rejected and the alternative hypothesis was accepted. Therefore, there was a significant relationship between remote work and employee autonomy

4. DISCUSSION

These results suggest that trust in leadership serves as a protective factor, enhancing autonomy in flexible work arrangements and mitigating the stress or restrictive perception caused by monitoring. This finding aligns with the work of Adeola and Adebayo (2021), Uche and Nwosu (2022). The study examined the relationships between remote work, digital surveillance, and employee autonomy, with a focus on the moderating role of trust in leadership among POS service employees in Osogbo and Owode-Ede, Osun State. Analysis of data from 120 respondents revealed several important findings. Firstly, remote work was found to have a

significant positive effect on employee autonomy. Employees who had the flexibility to manage their work location, schedule, and tasks reported higher levels of control over their responsibilities, supporting previous studies that emphasize the empowering nature of flexible work arrangements (Bloom, Liang, Roberts, & Ying, 2015; Adeyemi & Fadare, 2022).

Secondly, digital surveillance moderately related to employee autonomy. Respondents who experienced higher levels of monitoring reported a moderated perceived autonomy, highlighting the restrictive effect of monitoring technologies when perceived as intrusive or overly controlling. This aligns with prior research demonstrating that excessive surveillance can moderate motivation and self-management among employees (Ball, 2021; Adăscăliței & Riso, 2024; Uche & Nwosu, 2022).

CONCLUSION

This study examined the relationships between remote work, digital surveillance, and employee autonomy in Osogbo and Owode-Ede, Osun State, Nigeria. The findings indicate that remote work significantly enhances employee autonomy, enabling employees to have greater control over their tasks, schedules, and work locations. Conversely, digital surveillance was found to have a moderate relationship to autonomy. The study further emphasizes that contemporary challenges to autonomy, including technological monitoring, algorithmic management, blurred work-life boundaries, and organizational culture, can be mitigated when employees trust their leaders and are given supportive frameworks to exercise discretion in their work. These findings provide empirical support for organizations in Southwest Nigeria and similar contexts to invest in trust-building, fair monitoring practices, and flexible work arrangements to enhance employee autonomy and performance.

This study concluded that while digital surveillance is necessary for remote accountability, it must be balanced with strategies that sustain employee autonomy and trust. The study recommends that Nigerian service organizations adopt transparent communication, ethical digital monitoring practices, and participatory decision-making to enhance employee engagement. Policy implications include developing national workplace digital ethics frameworks and leadership training programs focused on trust-based management. Future research should explore longitudinal designs and sector-specific dynamics to deepen understanding of these interactions.

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AN INVESTIGATION INTO THE IMPACT OF OCCUPATIONAL HEALTH AND SAFETY PRACTICES ON ORGANISATIONAL COMMITMENT AMONG SELECTED AVIATION WORKERS IN LAGOS STATE, NIGERIA

ABSTRACT

The study investigated the Influence of Occupational Health and Safety (OHS) practices on Organizational Commitment among Aviation Workers in Lagos State, Nigeria. The objectives were to determine the impact of Occupational Hazard Prevention (OHP); Safety Procedure and Risk Management (SP &RM); Occupational Safety Support (OSS); First-Aid Support and Training (FAS&T); and Safety and Health Rules (S&HR) on Organizational Commitment (OC) among Aviation workers. This study adopted a descriptive survey design. The population for the study comprised all the staff of the four public agencies in the aviation industry operating in Murtala Mohammed International Airport, Ikeja, Lagos State, Nigeria, which was 2,560 as at the time of the study. Ten per cent of the population were selected as sample through proportionate sampling techniques. Linear Regression Analysis, tested at 0.05 alpha levels, were used to test the five hypotheses postulated to achieve the objectives. The results of the study showed the contribution of the indicators. Occupational Hazard Prevention (OHP) contributed with Beta value = .779 $p < .05$ (sig = .000) and t-value = 28.945; SP&RM contributed with Beta value = .812 $p < .05$ (sig = .000) and t-value = 22.626. OSS contributed with Beta value = .889 $p < .05$ (sig = .000) and t-value = 31.620. FAS&T contributed with Beta value = .857 $p < .05$ (sig = .000) and t-value = 31.620. S&HR contributed with Beta value = .857 $p < .05$ (sig = .000) and t-value = 31.620. Thus they all have significant influence on Organizational Commitment. The study then concluded that occupational health and safety practices have influence on Organizational commitment among Aviation workers in Murtala Mohammed International Airport, Lagos State Nigeria in particular and other Airports in general. The study therefore recommended that

Aviation related organizations should allocate adequate resources towards robust OHS Practices which include regular risk assessments, hazard identification and preventive measures. They should also prioritize the development and implementation of comprehensive Safety Procedure and Risk Management strategies.

KEYWORDS: occupational hazard prevention; safety procedure and risk management support; first-aid support and training; safety and health rules

INTRODUCTION

Organizational commitment is one of the pillars of a successful and productive workplace. It refers to the degree to which employees are dedicated, engaged, and loyal to their organization. When employees are committed, they are more likely to go above and beyond, strive for excellence, and work towards achieving the organization's goals. This, in turn, leads to increased job satisfaction, reduced turnover rates, and improved overall performance. Moreover, committed employees are more likely to be resilient, adapt to change, and promote a positive work culture. By fostering a culture of commitment, organizations can build a competitive advantage, drive innovation, and achieve long-term success. Ultimately, organizational commitment is essential for creating a motivated, efficient, and effective workforce that is dedicated to achieving excellence.

To achieve this desired commitment however, the work environment has to be conducive and appealing. One of the factors that will ensure this is the safety of employees. The occupational health and safety policy and practices of every organization therefore need to be adequate. As organizational health and safety policy and practices improve, the accident rate, personnel injuries, and material damage decrease, and working conditions improve, resulting in increased employee motivation and organizational commitment (Fernández-Muniz et al. 2019).

The commitment of management to safety therefore is related to organizational commitment, job satisfaction, and job-related performance. Furthermore, commitment to safety is associated with employee withdrawal behaviors (Michaels et al., 2015). In addition to improving the safety climate, such positive impressions may influence other work attitudes such as affective commitment.

Perceived occupational health and safety risks can lead to low organizational commitment, which will in turn negatively affects employees' job satisfaction and performance. This also means that the presence of perceived occupational health and safety risks may be detrimental to employees' job commitment. This is an assertion that need to be empirically proven, especially in the aviation industry in Nigeria. This study therefore focused on the influence of occupational health and safety practices can have on organizational commitment among the Aviation industry workers in Murtala Muhammed International Airport, Lagos State, Nigeria. This is to ascertain the contribution of occupational health and safety to employees' organizational commitment in Nigeria's Aviation industry.

OBJECTIVES OF THE STUDY

The broad objective of the study was to determine the impact of Occupational Health and Safety Practices on Organizational Commitment among Aviation workers in Murtala Muhammed International Airport.

The specific objectives are to:

- i. determine the impact of Occupational Hazard Prevention on Organizational Commitment among Aviation workers;
- ii. examine the influence of Safety Procedure and Risk Management on Organizational Commitment among Aviation workers;
- iii. investigate the contribution of Organizational Safety Support on Organizational Commitment among Aviation workers;

- iv. analyze the impact of First-Aid Support and Training on Organizational Commitment among Aviation workers; and
- v. evaluate the impacts of Safety and Health Rules on Organizational Commitment among Aviation workers.

RESEARCH HYPOTHESES

This paper postulated the following null hypotheses for testing.

H01: Occupational Hazard Prevention has no significantly influence on the Organizational Commitment among Aviation workers.

H02: Safety Procedure and Risk Management has no significant influence on the Organizational Commitment among Aviation workers.

H03: Organizational Safety Support has no significant influence on the Organizational Commitment among Aviation workers.

H04: First-Aid Support and Training has no significant influence on the Organizational Commitment among Aviation workers.

H05: Safety and Health Rules has no significant influence the Organizational Commitment of Aviation workers.

SCOPE OF THE STUDY

The study focuses on aviation workers at the Murtala Mohammed International Airport. The four public agencies in the airport were used for the study; viz. The Nigerian Meteorological Agency, the Federal Airports Authority of Nigeria, the Nigerian Airspace Management Agency, and the Nigerian Civil Aviation Authority.

1. LITERATURE REVIEW

Theoretical Review

Health Belief Theory: The Health Belief Theory propounded by Rosenstock et al. (1960), is a widely recognized theory that explains individuals' health-related behaviors and decision-making processes. The theory posits that people's beliefs about their susceptibility to a health threat, the severity of that threat, the benefits of taking preventive actions, and the barriers to taking those actions influence their likelihood of engaging in health-promoting behaviors. The Health Belief Theory is particularly relevant to occupational health and safety practices as it helps understand how individuals perceive and respond to risks in the workplace.

The Health Belief Theory's relevance to occupational health and safety practices lies in its ability to inform interventions and strategies aimed at promoting safe behaviors in the workplace. By understanding employees' beliefs and perceptions related to occupational hazards, organizations can tailor their safety programs to address specific barriers and promote positive health behaviors. This theory emphasizes the need to provide clear and accurate information about risks, communicate the benefits of safety practices, and address perceived barriers through practical solutions and support. Applying the principles of the Health Belief Theory can help organizations foster a safety-conscious culture and encourage employees to actively engage in behaviors that protect their health and well-being at work.

Systems Theory: This theory emphasizes the interdependence and interaction of various components within a system. It is applied to occupational health and safety to understand how different factors within a workplace interact and influence overall safety. James Reason, a prominent researcher in human factors and safety, contributed to the application of systems

theory in occupational safety. System theory, also known as systems thinking, is an interdisciplinary framework that views a system as a complex and interconnected set of components that work together to achieve a common goal. It emphasizes the interdependencies and relationships among the various elements within a system, and how changes in one component can have ripple effects throughout the entire system. System theory is highly relevant to occupational health and safety practices as it provides a holistic perspective that recognizes the interconnectedness of factors influencing safety outcomes.

In the context of occupational health and safety practices, system theory highlights that workplace safety is not solely dependent on individual behaviors or isolated factors, but rather the result of interactions among multiple components. This theory recognizes that occupational health and safety are influenced by various interconnected elements, including organizational culture, management systems, work processes, equipment, and human factors. By understanding these interdependencies, organizations can identify and address systemic issues that contribute to unsafe conditions and behaviors.

System theory's relevance to occupational health and safety practices lies in its ability to identify and address the root causes of safety issues. Instead of focusing solely on correcting individual errors or incidents, this theory encourages organizations to analyse the broader system and identify underlying systemic factors that contribute to safety risks. This approach helps organizations move beyond a reactive mind-set and adopt a proactive stance by implementing preventive measures, improving safety policies, and designing work systems that support safe practices.

Furthermore, system theory promotes a continuous improvement mind-set in occupational health and safety practices. It emphasizes the importance of feedback loops, monitoring, and learning from incidents and near misses. By adopting a learning-oriented approach, organizations can identify patterns, make adjustments, and implement changes to prevent future occurrences of similar incidents. This iterative process of learning and adaptation allows organizations to continually enhance their safety practices and mitigate potential risks.

Ultimately, system theory provides a valuable framework for organizations to understand the complex dynamics of occupational health and safety. It encourages a holistic perspective, focusing on the relationships and interdependencies among various components within a system. By considering the interconnected nature of safety factors and taking a systems thinking approach, organizations can develop comprehensive strategies, implement effective interventions, and create work environments that prioritize the well-being and safety of their employees.

Human Factors Theory. Human factor theory, also known as ergonomics or human-centered design, focuses on understanding and optimizing the interaction between humans and their work environment. It recognizes that human capabilities, limitations, and behaviors play a critical role in occupational health and safety. Human factor theory is highly relevant to occupational health and safety practices as it provides insights into how to design work systems, equipment, and processes that minimize human error, promote safety, and enhance overall well-being.

One of the key contributions of human factor theory to occupational health and safety practices is its emphasis on designing work environments that match human capabilities. This theory recognizes that humans have physical, cognitive, and psychological limitations that need to be considered when designing tasks, workstations, and equipment. By understanding and accommodating these limitations, organizations can reduce the risk of errors, injuries, and musculoskeletal disorders, leading to improved safety outcomes.

The theory provides valuable insights into the design and management of occupational health and safety practices by considering human capabilities, limitations, behavior, and the interaction between humans and their work environment, organizations can optimize safety, reduce errors, enhance user satisfaction, and improve overall well-being. Applying human factor principles can lead to safer and more efficient work systems, reduced occupational hazards, and increased employee engagement in safety practices.

Empirical Review

Adejoh and Okoye (2015) conducted a critical review of OHS practices in the aviation industry in Nigeria and found that there was a need for greater compliance with OHS regulations. The authors noted that many aviation workers in Nigeria lack basic knowledge about OHS and are not trained to identify and manage OHS risks. Oyeyemi and Adejoh (2016) examined the relationship between safety culture and compliance with OHS regulations in the Nigerian aviation industry. The authors found that while there was a general recognition of the importance of OHS among aviation workers, there was a lack of commitment to OHS at the organizational level.

Onyekwelu and Obasi (2017) conducted a study on OHS management practices in the Nigerian aviation industry and identified areas for improvement to enhance compliance with OHS regulations. The authors noted that many aviation organizations in Nigeria lack a comprehensive OHS management system and do not have effective procedures for managing OHS risks. Obimma (2018) investigated OHS practices and challenges in the Nigerian aviation industry and provided recommendations for improving compliance with OHS regulations. The author emphasized the need for effective OHS policies and procedures, regular training and education for workers, and increased engagement with workers and stakeholders to promote a culture of OHS awareness and commitment in the aviation industry.

Adejumo and Adekunle (2017) examined that OHS practices in the aviation sector of Nigeria were inadequate, leading to a high rate of workplace accidents and illnesses. The authors concluded that the lack of commitment by both the public sector and employers to implementing OHS policies and procedures was a major contributing factor to the poor state of OHS in the sector. Okogbule (2018) investigated the relationship between OHS and employee well-being in the aviation sector. The results showed that employees who perceived their workplace as safe and healthy reported higher levels of job satisfaction, lower stress levels, and better physical and mental health compared to those who did not.

Oyeyemi et al. (2020) also found that OHS practices significantly predict employee well-being in the Nigerian aviation sector. The study revealed that when organizations adopt OHS practices, employees feel more valued, motivated, and committed to their jobs, leading to higher levels of well-being. Onyia & Ezeani (2019) examined the relationship between OHS and job satisfaction in the Nigerian aviation sector. The study found that OHS significantly predicts job satisfaction among aviation employees. When employees feel safe and healthy at work, they are more likely to be satisfied with their jobs, leading to increased well-being and reduced turnover rates.

Adebayo and Ojo (2015) investigated OHS practices and commitment in the Nigerian aviation industry, finding that while workers were aware of the importance of OHS, they lacked proper training and equipment to effectively manage OHS risks. The study concluded that there is a need for the government and aviation organizations to invest in OHS education and training for workers. Oladipo and Ibitoye (2017) found that a lack of commitment to OHS by both employers and workers was a major contributor to OHS risks in the aviation sector in Nigeria. The study recommended that the government implement policies and programs to increase OHS

awareness and commitment and that those employers provide proper OHS training and equipment to their employees.

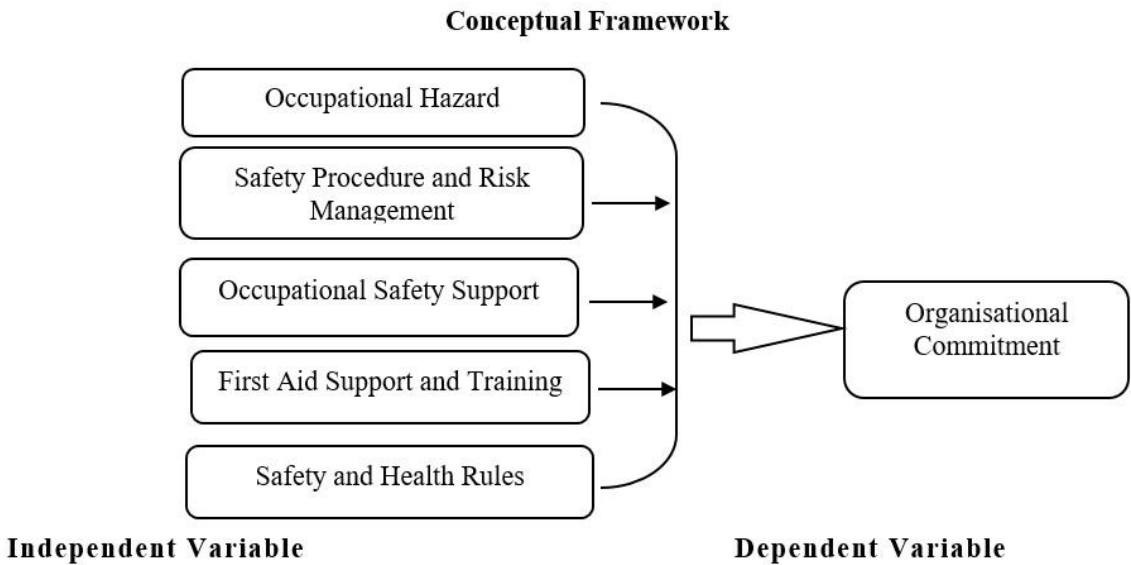
Adebayo et. al., (2016) found that while the NPOSH policy has helped to raise awareness of OHS issues in the aviation sector, there is still a need for better enforcement and compliance by employers. The study revealed that most aviation workers in Nigeria are still exposed to various hazards such as exposure to noise, toxic substances, and ergonomic risk factors, due to the lack of proper protective equipment and facilities. Ojediran (2019) highlighted the importance of involving workers in OHS decision-making processes and emphasized the need for employers to consult with workers in the implementation of OHS policies. The study also emphasized the need for the government to provide adequate resources for the enforcement of OHS regulations and for employers to provide adequate training for workers on OHS practices.

Then, the study by Onyia & Ezeani (2019) aimed to assess the current situation of occupational health and safety management systems in the Nigerian public sector and it found that the current situation of occupational health and safety management systems in the Nigerian public sector is inadequate. The study recommended that the Nigerian government should develop and implement effective occupational health and safety management systems in the public sector.

A positive safety climate can be achieved through the implementation of effective safety management practices, such as regular safety inspections, hazard identification and reporting systems, and employee training and involvement (Zohar, 2018). A positive safety climate improves production, reduces compensation and insurance costs and can also enhance employee safety knowledge and their motivation to behave safely, increase the uptake of safety-related policies and programs, improve employee perception of more support available from management, reduce the perception amongst employees of exposure to a hazardous environment, reduce the number of incidents by employees and workgroups.

In the context of aviation workers in Nigeria, a study by Ojediran et al. (2019) found that a positive safety climate was associated with better safety outcomes, including fewer workplace accidents and injuries. The authors suggest that aviation companies in Nigeria should prioritize safety climate as part of their overall safety management strategy

Figure 1. Authors' Conceptual Framework



Source: Authors' Conceptual Framework, 2024

2. METHODOLOGY

This study adopted a descriptive survey design to investigate the influence of occupational health and safety practices which served as the Independent Variable on organizational commitment, which served as Dependent variable, among Aviation workers in Murtala Mohammed International Airport, Lagos State, Nigeria. The study was carried out in the four government owned aviation related agencies operating in the airport, namely The Nigerian Meteorological Agency (NIMET), The Federal Airports Authority of Nigeria (FAAN), The Nigerian Civil Aviation Authority (NCAA), and The Nigerian Airspace Management Agency (NAMA), having a total population which stands at 2,560 (Two thousand, five hundred and sixty) at the time of this study. The choice of Murtala Mohammed International Airport (MMIA) is because it has the largest concentration of all the agencies in the Aviation Industry and it is the busiest of all the airports in Nigeria and one of the busiest in Africa, with a capacity of over 7 million passengers per year. A simple percentage of 10% was utilized to determine the sample size out of the population. The final respondents were selected proportionately according to the strata of the agencies as shown in table 1 below.

Table 1. Stratification of the Agencies Respondents by Sample Size

S/N	Name of Agency	No of Employees	Proportional Representation of the Employees (10 %)
1.	NIMET	100 /10	10
2.	FAAN	1900/10	190
3.	NAMA	500/10	50
4.	NCAA	60/10	6
	TOTAL	2,560/10	256

Source: Researchers' Survey, 2024

Primary data was sourced through the use of a structured questionnaire. The questionnaire was divided into three sections. Section A provides relevant socio-demographic data of the respondents such as gender, marital status, age, highest educational qualification, agency and length of service. Section B contain Occupational Health and Safety Practices Scale (OHSPS), which was designed by Christopher et al (2012) to determine the occupational health and safety practices (Occupational Hazards Prevention (OHP), Organizational Safety Support (OSS), First Aid Support and Training (FAS&T), Safety Procedure and Risk Management (SPRM), and Safety and Health Rules (SHR). The reliability coefficient for different segment of the scale range between 0.85 and 0.92. Section C, contain Employee Commitment Scale (ECS) developed by Mowday, Steers, and Porter (1979). It has 13 statements that describe the degree of attachment and loyalty the workers in the public sector have towards their organization. All items were scored based on 5-point Likert-modified rating scale ranging from Strongly Disagree = SD, disagree = D, Undecided = U, agree = A, Strongly Agree = SA. The reliability coefficient for the scale is 0.85. Descriptive and inferential statistics were used to analyses the data. The Regression Analysis was used to test all the hypotheses one, two, three, four and five. All the hypotheses were tested at 0.05 alpha levels.

3. RESULTS

Hypotheses Testing

Hypothesis One: Occupational Hazard Prevention (OHP) has no significant influence on Organizational Commitment among Aviation workers.

Table 2. A Summary of the Linear Regression Analysis of the relationship between Occupational Hazard Prevention and Organizational Commitment. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.779 ^a	.608	.606	1.84873

a. Predictors: (Constant), Occupational Hazard Prevention (OHP)

b. Dependent Variable: Organizational Commitment (OC)

Source: Researchers' computation using SPSS 22.0 (2024).

The model 1 summary Table 2 gives R2 value = .608. This shows that occupational hazard prevention variables have significant positive influence on organizational commitment. Thus, the models predict 60.8% commitment of the variance in occupational hazard prevention pooling all factors together enhance organizational commitment among aviation workers; meaning that 60% commitment of the variance in among the workers can be predicted from the occupational hazard prevention of the study area to the workers about hazard captured in the models from the selected area.

Table 3. Linear Regression Analysis showing Significance of Predictors

ANOVA ^a					
Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	1396.845	1	1396.845	408.698	.000 ^b
Residual	902.297	254	3.418		
Total	2299.143	255			

a. Dependent Variable: Organizational Commitment (OC)

b. Predictors: (Constant), Occupational Hazard Prevention (OHP)

Source: Researchers' computation using SPSS 22.0 (2024).

Table 3 shows that occupational hazard prevention variable significantly predicted the level of organizational commitment. $F(1, 255) = 408.698$, $p < 0.05$ F – statistical indicates that the overall regression model is highly statistically significant in terms of its goodness of fit since the value of $F_{tab} < F_{cal}$. Therefore, null hypothesis is rejected. The study concludes that occupational hazard prevention (OHP) significantly influence Organizational Commitment (OC) among Aviation workers.

Table 4 Contributions of Occupational Hazard Prevention on Organizational Commitment.

Coefficients ^a					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	4.157	.527		7.882	.000
Occupational Hazard Prevention (OHP)	.738	.037	.779	20.216	.000

a. Dependent Variable: Organizational Commitment (OC)

Source: Researchers' Computation using SPSS 22.0, (2024).

Table 4 shows the contribution of the indicators. In this case, Occupational Hazard Prevention contributes with Beta value = .779 $p < .05$ (sig = 0.000) and t-value = 7.882. The contribution is statistically significant to the level of Organizational Commitment. From the findings occupational hazard prevention have significant influence on employee commitment. As a result, the null hypothesis was rejected, and the study concluded that occupational hazard

prevention (OHP) significantly influence the Organizational Commitment among Aviation workers.

Hypothesis Two: Safety Procedure and Risk Management (SP&RM) has no significant influence on Employee Commitment among Aviation workers.

Table 5. A Summary of the Linear Regression Analysis of the relationship between Safety Procedure and Risk Management and Organizational Commitment.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.812 ^a	.660	.658	1.72133

a. Predictors: (Constant), Safety Procedure and Risk Management (SP&RM)

b. Dependent Variable: Organizational Commitment (OC)

Source: Researcher's computation using SPSS 22.0. (2024)

The model 1 summary Table 5 gives R^2 value = .660. This shows that procedure and risk management variables have positive influence on employee commitment. The model explains 66.0% of the variance in employee commitment in procedure and risk management strategy pooling all factors together enhance aviation workers' commitment; meaning that 66% commitment variance were determined among the workers of the aviation workers' predicted from the safety procedure and risk management of the study area to the commitment of the workers captured in the models from the selected area.

Table 6. Linear Regression Analysis showing Significance of Predictors on Organizational Commitment.

ANOVA ^a						
Model	Sum of Squares	Df	Mean Square	F	Sig.	
1	Regression	1516.915	1	1516.915	511.955	.000 ^b
	Residual	782.227	254	2.963		
	Total	2299.143	255			

a. Dependent Variable: Organizational Commitment (OC)

b. Predictors: (Constant), Safety Procedure and Risk Management (SP&RM)

Source: Researchers' computation using SPSS 22.0 (2024).

Table 6 shows that safety procedure and risk management variables significantly predicted the level of aviation workers' commitment. $F(1, 255) = 511.955$, $p < 0.05$ F – statistical indicates that the overall regression model is highly statistically significant in terms of its goodness of fit since the value of $F_{cal(511.955)} > F_{tab(1,255)}$. Therefore, null hypothesis is rejected. The study concludes that Safety Procedure and Risk Management (SP&RM) significantly influenced Organizational Commitment among Aviation workers.

Table 7. Contributions of Safety Procedure and Risk Management (SP&RM) on Organizational Commitment.

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.160	.472		8.811	.000
	Safety Procedure and Risk Management	.745	.033	.812	22.626	.000

a. Dependent Variable: Organizational Commitment (OC)

Source: Researchers' Computation using SPSS 22.0, (2024)

Table 7 shows the contribution of the indicators. In the case, safety procedure and risk management contribute with Beta value = .812, $p < .05$ (sig = 0.000) and t-value = 22.626. The contribution is statistically significant to the level of organizational commitment. From the finding's safety procedures and the risk management has effect on organizational commitment of the aviation workers. As a result, the null hypothesis was rejected, and the study concluded that Safety Procedure and Risk Management (SP&RM) significantly influenced Organizational Commitment among Aviation workers.

Hypothesis Three: Occupational Safety Support (OSS) has no significant influence on Organizational Commitment (OC) among Aviation workers.

Table 8. A Summary of the Linear Regression Analysis of the relationship between Organizational Safety Support and Organizational Commitment.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.889 ^a	.791	.790	1.34876

- a. Predictors: (Constant), Occupational Safety Support (OSS)
- b. Dependent Variable: Organizational Commitment (OC)

Source: Researches' computation using SPSS 22.0. (2024).

The above table 8 gives R^2 value = .791. This shows that organizational safety support variables have positive influence on organizational commitment. Thus, the models predicting 79.1% commitment of the public sector workers of the variance in occupational safety support pooling all factors together enhance the level of commitment of the workers; this implied that 79% organizational commitments of variability are explained by the occupational safety support of the Aviation workers captured in the models.

Table 9. Analysis showing Significance of Predictors on Organizational Commitment.

ANOVA ^a					
Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	1818.884	1	1818.884	999.848	.000 ^b
Residual	480.258	254	1.819		
Total	2299.143	255			

- a. Dependent Variable: Organizational Commitment (OC)
- c. Predictors: (Constant), Occupational Safety Support (OSS)

Source: Researches' computation using SPSS 22.0. (2024).

Table 9 shows that occupational safety support variables significantly predicted the level of public sector commitment. $F(1, 255) = 999.848$, $p < 0.05$ F – statistical indicates that the overall regression model is highly statistically significant in terms of its goodness of fit since the table value of F ($F - \text{cal} > F - \text{tab.}$). Therefore, null hypothesis is rejected. The study concludes that organizational safety support has positive significant influence on organizational commitment among Aviation workers.

Table 10. Contributions of Organizational Safety Support (OSS) on Organizational Commitment.

Model	Coefficients ^a			t	Sig.
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta		
(Constant)	2.256	.398		5.666	.000
1 Organizational Safety Support	.872	.028	.889	31.620	.000

a. Dependent Variable: Organizational Commitment (OC)

Source: Researchers' Computation using SPSS 22.0, (2024).

Table 10 shows the contribution of the indicators. In this case, Organizational Safety Support contributes with Beta value = .889 $p < .05$ (sig = 0.000) and t-value = 31.620. The contribution is statistically significant to the level of employee commitment. From the findings, Organizational Safety Support have influence on Organizational Commitment. This implies that the null hypothesis was rejected, and the study concluded that occupational safety support positively and significantly influences the organizational commitment among Aviation workers.

Hypothesis Four: First-Aid Support and Training (FAST) has no significant influence on Organizational Commitment among Aviation workers.

Table 11. A Summary of the Linear Regression Analysis of the relationship between First-Aid Support and Training and Organizational Commitment

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.857 ^a	.734	.733	1.52098

a. Predictors: (Constant), First-Aid Support and Training (FAS&T)

b. Dependent Variable: Organizational Commitment (OC)

Source: Researchers' computation using SPSS 22.0 (2024).

The above table gives R^2 value = .733. This shows that first-aid support and training variables have positive influence on organizational commitment. Thus, the models predicted 73.4% in the level of commitment of the variance in first-aid support and training pooling all factors together enhance commitments of the workers; this implies that 73% organizational commitment of the variance among aviation workers can be predicted from the first-aid support and training provided to the workers captured in the models.

Table 12. Linear Regression Analysis showing Significance of Predictors on Organizational Commitment.

ANOVA ^a					
Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	1688.411	1	1688.411	729.847	.000 ^b
Residual	610.732	254	2.313		
Total	2299.143	255			

a. Dependent Variable: Organizational Commitment (OC)

b. Predictors: (Constant), First-Aid Support and Training (FAS&T)

Source: Researchers' computation using SPSS 22.0 (2024).

Table 12 shows that first-aid support and training variables significantly predicted the level of employee commitment. $F(1,255) = 729.847$, $p < 0.05$ F – statistical indicates that the overall regression model is highly statistically significant in terms of its goodness of fit since the table value of F (F – cal > F-tab.). Therefore, null hypothesis is rejected. The study concludes that

first-aid support and training have significant positive influence on organizational commitment among Aviation workers.

Table 13. Contributions of First-Aid Support and Training (FAST) on Organizational Commitment.

Model		Coefficients ^a		T	Sig.
		Unstandardized Coefficients	Standardized Coefficients		
		B	Std. Error	Beta	
1	(Constant)	2.897	.442		6.552
	First-Aid Support and Training (FAST)	.827	.031	.857	27.016

a. Dependent Variable: Organizational Commitment (OC)

Source: Researchers' Computation using SPSS 22.0, (2024).

Table 13 shows the contribution of first-aid support and training with Beta value = .857 $p < .05$ (sig = .000) and t-value = 27.016. The contribution is statistically significant to the level of organizational commitment. From the findings first-aid support and training have positive significant influence on organizational commitment among the aviation workers. Hence, the null hypothesis was rejected, and the study concluded that first-aid support and training significantly influence the Employee Commitment among Aviation workers.

Hypothesis Five: Safety and Health rules has no significant influence the Organizational Commitment (OC) among Aviation workers.

Table 14. A Summary of the Linear Regression Analysis of the relationship between Safety and Health rules and Organizational Commitment.

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.674 ^a	.454	.452	4.62436

a. Predictors: (Constant), Safety and Health Rules (SHR)

b. Dependent Variable: Organizational Commitment (OC)

Source: Researchers' computation using SPSS 22.0 (2024).

The model summary Table 14 gives R^2 value = .454. This shows that Safety and Health rules variables have positive influence on public sector commitment. Thus, the models predicting 45.4% in the level of commitment of the variance in safety and health rules pooling all factors together enhance commitment of the workers; this implies that 45% organizational commitment of the variance among aviation workers can be predicted from the Safety and Health rules provided to the workers captured in the models.

Table 15. Linear Regression Analysis showing Significance of Predictors on Organizational Commitment.

ANOVA ^a					
Model		Sum of Squares	Df	Mean Square	F
1	Regression	4512.178	1	4512.178	211.000
	Residual	5431.724	254	21.385	
	Total	9943.902	255		

a. Dependent Variable: Organizational Commitment (OC)

b. Predictors: (Constant), Safety and Health Rules (SHR)

Source: Researchers' computation using SPSS 22.0 (2024).

Table 15 shows that safety and health rules variables significantly predicted the level of public sector commitment. $F(1,255) = 211.000$, $p < 0.05$. F – statistical indicates that the overall regression model is highly statistically significant in terms of its goodness of fit since the table value of F ($F - \text{cal} > F - \text{tab.}$). Therefore, null hypothesis is rejected. The study concludes that safety health rules have significant influence on organizational commitment among Aviation workers.

Table 16. Contributions of Safety and Health Rules (SHR) on Organizational Commitment.

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	10.351	.949		10.909	.000
1 Safety and Health Rules (SHR)	.589	.041	.674	14.526	.000

a. Dependent Variable: Organizational Commitment (OC)

Source: Researchers' Computation using SPSS 22.0, (2024)

Table 16 shows the contribution of safety and health rules with Beta value = .674 $p < .05$ (sig = 0.000) and t-value = 14.526. The contribution is statistically significant to the level of organizational commitment. From the findings, safety and health rules have significant influence on employees' commitment among the Aviation workers. However, the null hypothesis was rejected, and the study concluded that safety and health rules significantly influence Organizational Commitment among Aviation workers.

4. DISCUSSION

Hypothesis one was evaluated to achieve objective one using regression to show that Occupational Hazard Prevention (OHP) has no significant influence on Organizational Commitment among Aviation workers. The results showed that that occupational hazard prevention significantly influence organizational commitment among Aviation workers. This finding is in line with Okogbule (2018) who investigated the relationship between OHS and employee well-being in the aviation sector, and reported that employees who perceived their workplace as safe and healthy reported higher levels of job satisfaction, lower stress levels, and better physical and mental health compared to those who did not. Also in support of the finding, Shappell and Wiegmann (2003), discovered that effective OHP practices, positively influences job satisfaction and commitment among aviation workers. Dewa (2017) also reported that when workers perceive that their well-being is prioritized through OHP, they experience reduced stress and improved physical and psychological health, leading to better job performance. Griffin and Neal (2000), reported that organizational commitment highlights the significance of safety measures in fostering a sense of commitment among aviation personnel. Likewise, Rantanen (1999) reported that organizations prioritize OHP and its subsequent impact on organizational commitment of aviation workers and the public sector.

Hypothesis two was evaluated to achieve objective two using regression. The results revealed that Safety Procedure and Risk Management (SP&RM) has significant influence on Organizational Commitment among Aviation workers. The relationship between safety procedures, risk management, and the commitment of workers in the public sector, particularly within the aviation industry, can be influenced by various factors. It was revealed that safety procedure and risk management (SP&RM) significantly influence Organizational Commitment of Aviation workers in Murtala Muhammed International Airport. This finding corroborates the

findings of Oyeyemi et al. (2020), who also found that OHS practices significantly predict employee well-being in the Nigerian aviation sector. Also, Oladipo and Ibitoye (2017) found that a lack of commitment to OHS by both employers and workers was a major contributor to OHS risks in the aviation sector in Nigeria. A study by Griffin and Neal (2020) found that employees' perceptions of safety climate were positively associated with organizational commitment. In addition, Tims et al. (2010) found that there is relationship between safety climate, job satisfaction, and affective commitment.

The results of Hypothesis three revealed that Occupational Safety Support significantly influenced the Organizational commitment among Aviation workers. This finding is in line with Clarke (2016), who submitted that effective safety support positively impacts job satisfaction and overall commitment. Likewise, Zohar (2018), suggested that a positive safety culture enhances commitment to the organization. In addition, Hofmann and Morgeson (1999), highlighted that safety practices have impact on employee retention and commitment. It is therefore concluded that Occupational Safety Support will significantly influence Organizational Commitment among aviation workers, especially in Nigeria. By prioritizing the worker safety, cultivating a positive safety culture, demonstrating organizational values, reducing turnover, and addressing psychological contract obligations, OSS will contribute to a stronger commitment to the organization.

Finding from Hypothesis four revealed that First-Aid Support and Training significantly influence the Organizational Commitment among Aviation workers in Murtala Muhammed International Airport in particular, and Nigerian airports in general. First-Aid Support and Training (FAST) play a pivotal role in ensuring the safety and well-being of aviation workers. It was revealed that first-aid support and training significantly influence public sector commitment. This support the finding of DeJoy et al. (2021) that highlighted the link between organizational support and commitment, he ported that the provision of First-Aid Support and Training sends a clear message to aviation workers that their well-being is a priority for the organization. Also, Zohar (20018) reported that FAS&T contributes to creating a positive safety climate within the aviation workplace. A safety-conscious environment instils a sense of security and confidence among workers, leading to greater job satisfaction and commitment.

Result of hypothesis five showed that safety and health rules significantly influence the OC of aviation workers. Safety and health rules are critical aspects of any workplace, especially in industries like aviation where employee safety is paramount due to the potential risks involved. The findings corroborate the findings in a study conducted by Smith and Johnson (2017), which reported that a positive correlation exists between the perception of effective safety and health rules and a higher level of commitment among workers. In contrary however, Anderson et al. (2019) took a different approach, they explored the determinants of Organizational Commitment among aviation workers, focusing on organizational culture and job satisfaction. While they acknowledged the importance of safety and health rules, their findings suggested that factors like organizational values and opportunities for growth had a more significant impact on Employees' Commitment to their organization than safety measures alone.

CONCLUSION

Premised on the findings that showed a significantly and positively influence of Occupational Health and Safety practices on Organizational commitment of aviation workers, the study concluded that occupational health and safety practices have influence on organizational commitment among Aviation employees in Murtala Mohammed International Airport in particular, and all airports in Nigeria in general. The generalization is premised on the fact that the airport is the best, most equipped, and controls the highest traffic in Nigeria

RECOMMENDATIONS

Based on the findings of this study, it is recommended that Aviation operators should continue to invest in effective Occupational Hazard Prevention measures to ensure the safety and well-being of employees. It is recommended that organizations should implement robust Safety Procedure and Risk Management strategies. Also, provision of Organizational Safety Support (OSS) to employees should be handled with all seriousness. It is also recommended that First-Aid Support and Training (FAST) programs should be organized periodically. And there should be strict adherence to comprehensive Safety and Health Rules.

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UNDERSTANDING THE INTERPLAY BETWEEN CONSUMER EMOTIONS AND BRAND RELATIONSHIPS: A SYNTHESIS OF PREVIOUS LITERATURE

ABSTRACT

This article presents a literature review dedicated to the interplay between consumer emotions and brand relationships. For the purpose of this analysis, more than thirty-five papers have been reviewed. The earliest studies date back to 1987 and the latest to 2025.

The existing literature is organized into two main categories. The first broad group focuses on how consumer emotions influence brand performance. Among such publications, brand loyalty is the main focus. The second group examines the role of emotions in the interaction and experience consumers have with a brand.

Over the last three decades, authors have presented various perspectives on the subject. The consensus, however, is that emotions have a crucial role in shaping the consumer-brand bond. Positive emotions lead to measurable outcomes, such as brand loyalty. By contrast, negative emotions can cause negative word of mouth, brand switching and even retaliation.

KEYWORDS: consumer emotions; branding; brand relationships

JEL: M31, M37, D91

INTRODUCTION

Technology and global logistics have made it easier than ever before to build a brand, however, many brands struggle to reach the consumers' hearts. People are faced with an ever-growing number of products to choose from. It is no longer enough for companies to offer high-quality products, as thousands of rivals are likely to sell the same product at a similar price. Today brands must emotionally resonate with people in order to be successful. The real battlefield of modern marketing is the human psyche.

This study's relevance stems from the way the consumer landscape has changed, making competitive advantages like functionality and price increasingly volatile. When companies are met with a large number of "functional clones", it becomes crucial for them to establish an emotional connection with consumers. As communication becomes increasingly less personal and more digital many people seek deeper connections with brands. This makes studying the interplay between consumer emotions and branding highly timely.

Since the late 80s of the 20th century, many authors have studied the consumer-brand dyad. In more recent years, researchers have begun to focus on themes such as brand love and brand

hate and the way emotions in general shape the relationship between customers and brands. Individual consumer emotions and the effect they have on brands are well-documented, however, the literature remains fragmented when it comes to the holistic interplay between emotional drivers and brand relationships.

The article aims to explore the connection between affective drivers and brand relationships in previous literature.

The methodology is a qualitative systematic review and a theoretical synthesis. Existing literature from 1987 to 2025 was analyzed; the major themes were outlined and guidelines for future studies were suggested.

1. LITERATURE REVIEW

Emotions are the basis of every action, taken by humans. (Fornberg, 1986). In order for a consumer to carry out an action, such as making a purchase, they must first feel an emotion toward the product and/or brand.

Over the years, many researchers have delved into the connection between consumer emotions and branding. Jelev states that: “The brand lives not so much in the mind (associations are cognitive phenomena) as in the heart (feelings and emotions)” (Jelev, 2010 p.50).

Two types of emotions are typically differentiated between - positive and negative emotions. They are both significant in the sphere of branding but for vastly different reasons.

While the majority of authors differentiate between positive and negative emotions, some opt for more complex classifications. Holbrook and Batra (1987) outlined three emotional factors: pleasure, arousal and domination. Moriarty (1991) identified eleven types of emotional appeals: love, pleasure, poignancy, relief, family, nostalgia, pride, excitement, sorrow, fear and guilt.

Over the last couple of decades, a large body of literature has been accumulated concerning different aspects of the brand and its relation to human emotions. Previous studies can be divided into two main categories. The first broad group puts the emphasis on brand performance, while the second focuses more on consumer interaction and experience.

2. CONSUMER EMOTIONS AND BRAND PERFORMANCE

The first group of studies, which focuses on brand performance, reminds us that a brand must be a stable and recognizable entity. Elements like brand quality, awareness and identity can be used as guidelines to see how well the brand is performing.

Previous publications, which have been sorted into this category, aim to show how emotional resonance with the brand can lead to measurable outcomes, such as consumer satisfaction and ultimately brand loyalty.

Brand loyalty is seen by many as the holy grail of marketing – an achievement that companies across all sectors strive to reach. Its importance stems from the fact that loyalty can be a remedy against market volatility. Loyal customers are less likely to switch to another brand due to an increase in prices.

In 2014 Gallo established that attracting new customers can be as high as five to twenty-five times more costly than keeping current customers satisfied. The results of her study are an important reminder of how crucial brand loyalty is for a business.

Oliver (1999) described brand loyalty as: “a deeply held commitment to re-buy or re-patronize a preferred product or service consistently in the future, thereby causing repetitive same brand-

set purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior.” (Oliver, 1999, p. 34).

It is important to pinpoint the elements which build brand loyalty and highlight the role emotions have in this process.

Hardilawati and Ghani (2024) explored how competence, sincerity and excitement influence brand loyalty and brand love. Their research proved that competence and sincerity were essential when it came to brand loyalty, as well as brand love. Excitement, on the other hand, had no crucial role in the formation of either brand loyalty or brand love. According to Hardilawati and Ghani small and medium-sized enterprises in the traditional woven fabric industry must cultivate emotions in order to form a potent consumer-brand connection. The results of their study indicate that the combination of brand personality and brand love leads to enhanced brand loyalty.

Prasidha et al. (2024) explored the relationship between brand experience, brand image, and brand loyalty, taking into account the role of brand love. They focused on Samsung smartphone consumers as their research subjects. The data indicated that brand love has a partial role on the formation of brand loyalty through brand experience.

Over the years many scholars have investigated brand love. Bıçakcıoğlu et al. (2018) prove in their study that consumers’ love for a brand deepens when they have a positive experience with the brand.

Mostafa and Kasamani (2020) posed the question whether brand experience and brand loyalty are determined by emotions. To understand the connection between a consumer's loyalty, their study employed the stimulus–organism–response (SOR) model. According to the authors, a brand experience must first evoke a strong emotional bond before a customer can develop brand loyalty. The result of their research showed that by promoting brand passion, self-brand connection, and brand attachment, experiential brands achieve enduring brand loyalty. In terms of practical implications, Mostafa and Kasamani (2020) argued strongly in favor of experiential marketing, claiming that nowadays people prefer to make memories rather than to collect objects. Marketing specialists should focus more of their efforts on experiential marketing practices as they are shown to help build emotional connections with customers.

Tambosi et al. (2021) raised the question: what effect do non-decision emotions have on brand loyalty during a crisis? This question is especially important today, when the world is witnessing conflicts across the globe with increasing intensity, as well as an uncertain future where Artificial Intelligence will play a big role in every sphere of human life.

Tambosi et al. (2021) focused on the Covid-19 global pandemic. The authors collected data from 290 Brazilian respondents, thus showcasing how the crisis influenced one of the largest emerging markets in the world. Tambosi et al. (2021) divided emotions into two broad groups: integral and incidental, following the distinction made by Pham (2007). Tambosi et al. (2021) chose to focus on incidental, as opposed to integral emotions throughout their research. Their findings indicate that positive and negative emotions have no direct impact on brand loyalty and neither does risk perception. However, Tambosi et al. point out that consumers can become interested in products and services which help them deal with emotions they faced in times of crisis.

Huang (2017) conducted a survey about mobile phone brands, which included 237 respondents, aged between eighteen and thirty years old. He found that brand love and brand trust have a mediating role in the formation of brand loyalty, where brand experience is concerned. Attempting to answer what drives brand love, he found that it is the sensory experience that acts as the primary stimulus, leading to love and trust.

Golemecheva (2020) argued in favor of companies employing sensory marketing. She states that sensory marketing integrates consumer experiences and affective responses into the decision-making framework during brand and service evaluation.

Cleff et al. (2018) conducted a research which focused on the way consumers communicate with a brand online, how that impacts their loyalty toward it and the mediating role of emotions in the process. They differentiated between sensory, affective, relational and behavioral online brand experiences. According to the results of their study, it is affective and behavioral brand experiences that influence brand loyalty the most.

Azizah et al. (2024) decided to explore how customer emotions influence purchase intention. They found that there is a positive correlation between emotions and purchasing intention. When customers feel excitement, happiness and satisfaction, the chances of them making a purchase increase. The authors point out that product quality, brand image and perceived value affect consumer emotions and thus purchasing intentions. The researchers indicate that the retail environment plays an important role when it comes to repurchase intention. When it is visually appealing and pleasant, consumers are more likely buy the products once again. Sensory fulfillment during a shopping experience can generate positive emotions and affect the intention to make a repeat purchase.

The majority of previous studies has focused on the relationship between a brand and positive human emotions. (Khatoon and Rehman, 2021). Few studies have paid close attention to negative emotions and how they shape consumer-brand relationships. Over the last few years and especially in the aftermath of the global COVID-19 pandemic, this tendency has started to shift as more and more authors have begun to research the role of negative emotions in relation to branding.

Negative emotions can have a strong effect on consumers' decision whether to purchase or not. (Walter, et al., 2023).

According to Wu et al. (2018), if the company does not negate consumers' negative emotions towards the brand, this can result in negative word of mouth, brand boycotts and consumer avoidance.

Authors which have delved into the effects of negative emotions in relation to customer-brand relationship, have focused on several main emotions. They include fear, hate, anger and disappointment (Khatoon and Rehman, 2021).

Nasab and Abikari (2016) identified that the main negative emotions consumers experience are anger, anxiety and disconnect. Negative emotions led to negative word of mouth and reduced brand loyalty in the form of brand switching. The authors highlight the importance of corporate social irresponsibility and claim that it can raise the possibility of brand switching by a staggering 40 %. When consumers perceive a company as socially irresponsible, feelings of hostility emerge, which can induce them to replace the brand.

Shahzad et al. (2023) researched the connection between brand perception and corporate social responsibility. According to the results of the study, corporate social responsibility plays an important role in the formation of both consumer attitudes, as well as the emotions consumers feel towards a brand. The authors recommend that firms should prove their commitment to environmental causes, in order to attract customers who are becoming increasingly conscious of the impact brands have on nature.

Setiawati and Novrianto (2025) highlighted the role of authenticity in branding communication, particularly when it comes to Key Opinion Leaders. The authors view authenticity as being composed of transparency, value congruence and emotional resonance. According to their study, brand authenticity acts as a conduit that translates into positive consumer attitudes.

Positive consumer attitudes can drive brand equity and increase purchase intentions. The authors warned that when audiences suspect a lack of transparency or exaggerated promotional tactics, their trust is weakened which leads to lower brand loyalty.

Liakou-Zarda and Tzafilkou (2024) conducted a study where they linked mouse movements, consumer experience and consumer emotions with brand awareness and purchase intent. The results of their experiment indicate that when consumers move the mouse quickly, they have intention to buy the product. Conversely, moving the mouse slowly, as well as making long or frequent pauses were related to unpleasant emotions. The authors argue that mouse movements can be used to judge brand engagement as well as the emotions consumers experience.

In today's polarizing times, many authors have delved into the realm of brand hate.

Walter et al. (2023) gave the following definition for brand hate: "Brand hate can be described as a set of negative emotions on the part of consumers concerning a certain brand whose implications involve a reduction in the profitability of companies, as well as of their market shares.". (Walter et al., 2023, p.1). Walter et al. (2023) conducted a thorough literature review, analyzing in depth thirty-five articles, relating to brand hate. They concluded that the majority of the papers were focused on determining the precursors of brand hate, while fewer authors have studied the effects of brand hate on consumer behavior.

Hegner et al. (2017) demonstrated how negative emotions crystallize into brand hate and transition across the online-to-offline divide. Their study examined the anatomy brand hate in the service sector. The authors highlighted negative past experience, symbolic incongruity and ideological incompatibility as the key elements of brand hate. They in turn generate negative word of mouth, brand avoidance and even brand retaliation.

By analyzing how 265 consumers behave across both digital and physical environments, the researchers found that brand hate manifests as a multi-level attack. Brand hate can lead not only to negative word of mouth, but a serious decrease in brand loyalty as well. (Hegner et al., 2017).

According to Zhang and Laroche (2020) brand hate is caused by the following emotions: disgust, anger and fear.

One possible gap in the previous literature is the lack of focus on developing countries. The majority of authors who have studied brand hate and its consequences, have focused on developed markets. Fewer researchers have delved into the results of this phenomenon in emerging markets.

Kavaliauskė and Simanavičiūtė (2015) researched the connection between brand-related stimuli, negative emotions and brand avoidance. Among the brand-related stimuli they studied were unacceptable trade-off, symbolic incongruity, ideological incompatibility and unmet expectations. They focused on negative emotions such as anger, embarrassment, dislike and worry. Their inquiry was innovative as it explored emerging markets, rather than Western countries. The results of their study indicate that dislike is the only negative emotion which leads to brand avoidance.

Attiq et al. established that brand hate causes brand avoidance and even retaliation in the Pakistani market. (Attiq et al., 2023).

Different authors classify different types of brand hate. For example, Fetscherin (2019) lists cool hate, hot hate, simmering hate, burning hate, and boiling hate. Hegner et al. (2017) differentiates between attitudinal and behavioral brand hate.

Regardless of differentiation, however, the consensus among the majority researchers is that brand hate can translate into negative consequences for brands and it should not be underestimated or left unchecked.

While the majority of authors focus on either positive or negative emotions and their relation to branding, Kohli et al. (2021) looked at brand love and brand hate as two aspects of branding. They conducted a study which attempted to measure the influence of brand love and brand hate on the relationship between brand experience and brand loyalty. They focused on the sphere of fashion apparel in India. The authors made a distinction between attitudinal and behavioral loyalty. Their findings suggest that “brand love mediates the relationship between brand experience and attitudinal loyalty and for brand hate, ideological incompatibility and symbolic incongruity mediate the relationship between brand experience and attitudinal loyalty, as well as, behavioral loyalty.” (Kohli et al., 2021, p.1). The authors’ research has not only theoretical, but practical implications as well. Kohli et al. suggest that today people in the fashion sector should focus not only on the design of the clothing, or the promotions they offer, but on the mindset of their consumers. They stress the importance of getting to know your audience, in order to build brand experience and ultimately brand loyalty. Furthermore, brands should aim to appeal to their clients’ personalities, as well make sure no to conflict with their ideologies.

Modern consumers are no longer just looking at the price tag or a list of features. Many are interested not only in what a brand sells but what it stands for. This trend is particularly strong with Millennial buyers. Today’s buyers support brands whose values align with their own. When a company represents something meaningful, it can create positive emotional resonance with its customers, which in turn can lead to brand loyalty. However, the opposite is also true, if a brand’s actions clash with a consumer’s ethics, active rejection can arise.

The consensus among researchers is that emotions play a significant role in consumers’ relationship with a brand. Positive emotions lead to favorable results for brands. These results can be measurable, particularly in the form of brand loyalty. While positive emotions encourage retention, negative emotions serve as a catalyst for retaliatory behaviors, namely negative word of mouth and brand switching.

3. THE ROLE OF EMOTIONS IN CONSUMER INTERACTION AND EXPERIENCE

A brand comes to life through its interactions with the people who use it. The next section of this paper portrays the brand as a dynamic participant in a consumer’s life.

Fournier (1998) had a pivotal role in building a conceptual framework concerning the consumer-brand relationship (CBR). She differentiated between fifteen types of CBR, drawing inspiration from the kinds of relationships people have with one another. Among the types of CBR, she included not only best friendships, committed partnerships, but also secret affairs and rebounds. Fournier asserted that not all relationships between a brand and a consumer are built on positive emotions. She characterized enmities, as developing from negative affect.

Since Fournier’s ground-breaking work, a growing body of research has been dedicated to exploring how emotional responses and brand experiences relate to each other. (Mostafa and Kasamani, 2021; Sykora et al., 2022).

While a consumer might cognitively judge a brand based on its performance it is often emotions which anchors that judgment.

In the second half of the 1980s, researchers began to study the connection between consumer emotions the attitude towards an advertisement. The emotional response which consumers have toward an ad can have a direct effect on how they perceive the ad, their intention to make a purchase, the attitude to the advertisement and in turn the brand attitude (Edell and Burke, 1987).

Rice (1997) identified emotions and feelings as one of the three core elements that form brand attitude. Schiffman and Kanuk (2004) differentiated between three main elements which form attitude as well: intentions, emotion, and cognition.

Authors have argued that the weight that emotions carry in shaping our attitudes often depends on how much skin we have in the game. Not every purchase is equally important to a consumer. Different purchases require different levels of not only intellectual, but also emotional efforts. This was explored in detail by Batra and Stephens in 1994. They proved that “moods and emotions appear to influence brand attitudes more in low personal relevance (“low motivational involvement”) situations than under high-motivation conditions, by suppressing counterargumentation more in such low motivation situations” (Batra and Stephens, 1994, p.199).

Banytė et al. (2007) studied how emotions influence the formation of the attitude towards the brand. In their research, they focused on the world-famous alcohol-free beverage brand Pepsi. The authors examined how the five senses affect the emotions of the consumer. According to the results of their study, senses have a large role in the formation of emotions, as well as attitude towards the brand.

Anastasiei and Chios (2014) focused on how the following emotions: arousal, pleasure and domination affect the attitude a consumer has towards an advertisement or the brand itself. The pleasure dimension contains feelings, such as friendly, loving and grateful, while the arousal dimension - excited, entertained, active and interested. The domination dimension refers to emotions such as suspicious, sad and fearful.

The authors stated that “individuals are persuaded by information that appeals to their emotions” (Anastasiei and Chios, 2014, p. 44). In their research they outlined six different hypotheses. The first three hypotheses suggested that pleasure, arousal and domination have a positive effect on the attitude towards the advertisement. The remaining three hypotheses suggested that they have a positive effect on the attitude towards the brand. Their final hypothesis argued that attitude towards the ad affects attitude towards the brand. They found that pleasure and arousal significantly influence the attitude towards the brand, while domination does not. Finally, the results of their study proved that there is a positive relationship between the attitude towards the advertisement and the attitude towards the brand.

In terms of practical implications, Anastasiei and Chios (2014) advise marketers to keep in mind the pleasure and arousal emotions when creating advertising campaigns.

Rao et al. (2024) focused their research on brand storytelling and the way it shapes favorable attitudes towards brands with the help of emotions and cognition. They differentiated between two types of storytelling - brand and consumer storytelling. With the help of comparative analysis, they found that consumer storytelling was more powerful when it came to establishing a positive attitude towards the brand, cognition and emotion.

People have a particular attitude towards most of the brands they consume and even some which they do not. However, brand love is something very few brands manage to achieve.

Fournier (1998) ranked brand love at the highest place in the hierarchy of relations between the brand and the consumer. She emphasized that brand love exceeded brand preference.

In 2006 Carroll and Ahuvia gave a comprehensive definition of brand love, stating it is the “degree of passionate emotional attachment a satisfied consumer has for a particular trade name” (Carroll and Ahuvia, 2006, p. 81). The authors listed the different facets of brand love, such as attachment to the brand, declarations of love for the brand, passion for the brand and positive emotions in response to the brand.

Carroll and Ahuvia (2006) differentiated between brand love and satisfaction, stressing that the two terms signify different things. Their research revealed a fascinating paradox in consumer behavior - satisfaction does not always translate into loyalty, particularly when it comes to hedonic product categories. Another key finding was that consumers are more likely to engage in positive word of mouth, when they view the brand as self-expressive.

Ferreira et al. (2019) explored the intersection between brand love, brand loyalty and brand experience, focusing on the retail sector. They drew inspiration from Fournier's CBR Theory (1998) and through interviewing 560 customers, discovered that the way a person experiences a brand is a precursor to brand love. Physical sensations and emotional reactions were the most powerful drivers of brand love. Brand love acted as a central emotional state that translates into loyal behavior in two distinct ways. While it could trigger loyalty directly, it also worked by filtering through customer satisfaction.

According to Desmet and Hekkert (2007), two elements factor in customer's decision to make a purchase. The first factor is the functional need they feel for using a product, while the second factor is the satisfaction of the emotional needs which buying the product would lead to. In terms of practical implications, it can be said that brands should aspire to make their products and services not only useful for consumers, but also appeal to their emotions, positive or negative.

In 2024 Schivinski et al. researched brand experience in connection to sports brands which have their business operate in Australia (Schivinski et al., 2024). They found out that "Brands investing in comprehensive experiences effectively generate positive emotions among consumers, increasing consumer engagement." (Schivinski et al., 2024, p.553).

An important part of a consumers' holistic experience with a brand is the way they interact with its online presence. The vast majority of brands have their own website, as well as various social media pages. In recent years, academic researchers have begun to explore the role emotions have in consumers' interaction with brands in the digital world.

The profound shift towards influencer marketing has been well documented. Consumers tend to trust online influencers, whom they like and admire, more than companies, which are often perceived as self-congratulating or even dishonest about their products and services.

Despite the growing importance of influencer marketing, few studies have attempted to test whether or not and how much influencers' emotions affect consumer engagement.

Holiday et al. (2023) assessed the emotions displayed by influencers of different size in 402 video posts. They employed facial expression analysis and computational linguistic analysis. The results of their experiment indicate that the degree of expressed emotions affect engagement.

In 2020 Trump and Newman conducted a study which centered around emotion regulation in the marketplace and pleasant brand personalities. They established that consumers who feel a certain negative emotion are drawn to brands who embody the opposite emotion, as a means to overcome the negative emotion. For example, when consumers experience boredom, they are more attracted to a brand which they perceive as exciting. Additionally, consumers who suffer from anxiety, are more likely to engage with a brand which they identify as calm. According to their study, this phenomenon is observed only when consumers are not presented with a chance to repair the negative emotion they feel.

A particularly interesting phenomenon is the tendency people have to give human-like characteristics to brands. One example of this is when consumers associate a brand with a specific gender.

Boeuf (2020) delved into the connection between brand gender and emotions. His research demonstrated how brands, which are typically perceived as masculine, can be linked to emotional control. Consumers may disapprove of masculine brands expressing emotions, seeing this as less sincere. He stresses that this can lead to functional outcomes, affecting people's willingness to give recommendations about the brand.

While the majority of previous studies focus on the way emotions influence a brand, some explore this relationship in reverse. For example, Saini et al. (2023) established how a strong symbolic brand identity can help consumers maintain their positive emotions towards the brand. Another contribution of their study is the establishment of brand jealousy as an intermediary between brand love and brand hate.

The role of emotions is well established when it comes to buying hedonistic products. Inoni and Okorie (2022), however, demonstrated that emotions play an important part in purchasing highly functional, utilitarian items as well.

The authors found that when household appliances, such as washing machines, are bought, consumers go beyond comparing technical features. Inoni and Okorie explored the connection between brand quality, consumption emotions and purchase decisions.

Inoni and Okorie (2022) emphasize that in today's saturated markets, a consumer's mindset and internal feelings are the ultimate deciders of brand success. They placed consumers' desires above their needs.

The results of their study show how essential it is for companies which sell utilitarian products to create products that evoke positive emotions in consumers. The importance of affect is not limited to hedonistic products.

4. METHODOLOGY

For the purposes of this paper, more than thirty-five publications regarding the interplay between consumer emotions and brand relationships have been analyzed through the content analysis method.

Previous studies from various countries, including the USA, UK, China, Nigeria, Portugal and many more were analyzed. The earliest publication, which was examined can be traced back to 1987 and the latest to 2025. The main focus of the research was publications from the last decade, with the exception of foundational texts, such as the ones written by Fournier (1998).

The methodology process has the following four phases:

Identification and selection: An extensive search was conducted in academic databases such as EBSCO and Google Scholar. Search terms such as “consumer emotions”, “brand love”, “brand hate”, “consumer-brand relationship”, etc. were used.

Comparative analysis: The selected articles were further examined employing the technique of thematic analysis.

Classification of previous studies: Previous publications were classified into two major groups. The first group explores themes related to brand performance. The second revolves around consumer interaction and experience with the brand.

Theoretical integration and strategic forecasting: In the final stage of the methodology, the major themes of previous literature were synthesized and guidelines for future studies were offered.

5. RESULTS

The analysis of forty years of previous research relating to consumer emotions and brand relationships has revealed certain patterns regarding the way affective triggers influence brand relationships.

To present these findings with empirical clarity, previous literature was categorized into two core dimensions, namely studies related to brand performance and ones related to consumer interaction with the brand. The classification of the previous studies from 1987 until 2025 is provided in chronological order (see Table 1).

Table 1 Classification of Previous Studies according to Area of Study

Area of Study	Authors
Studies related to human emotions and brand performance	Kavaliauskė and Simanavičiūtė (2015), Nasab and Abikari (2016), Hegner et al. (2017), Huang (2017), Cleff et al. (2018), Wu et al. (2018), Fetscherin, M. (2019), Golemecheva (2020), Mostafa and Kasamani (2020), Zhang and Laroche (2020), Khandai et al. (2021), Khatoon and Varisha (2021), Kohli et al. (2021), Tambosi et al. (2021), Attiq et al. (2023), Shahzad et al. (2023), Walter et al. (2023), Azizah et al. (2024), Hardilawati and Ghani (2024), Liakou-Zarda and Tzafilkou (2024), Prasadha et al. (2024), Setiawati and Novrianto (2025)
Studies related to human emotions and consumer interaction with the brand	Edell and Burke (1987), Batra and Stephens (1994) Rice (1997), Fournier (1998), Carroll and Ahuvia (2006), Banytė et al. (2007), Desmet and Hekkert (2007), Anastasiei and Chios (2014), Ferreira et al. (2019), Boeuf (2020), Trump and Newman (2020), Inoni and Okorie (2022), Sykora et al., (2022), Holiday et al. (2023), Saini et al. (2023), Rao et al. (2024), Schivinski et al. (2024)

Source: Author's Research

Studies which explore the way consumer emotions influence brand performance have a slight edge over the ones which delve into consumers' interaction with the brand. This can be explained with the fact that companies are very interested in the way affective triggers translate into real world metrics, such as brand loyalty. The majority of previous research which falls into the first category of studies in fact deal with the way emotions can either amplify or decrease brand loyalty. Such studies have practical implications which can help firms learn to employ certain affective triggers to help them generate loyalty. In today's turbulent environment, this is of prime importance.

Ultimately, the two groups of research of research are not separate pillars of the consumer-brand dyad, but rather two halves of a single whole. When a brand manages to build a healthy relationship with customers, particularly one that is built upon emotional resonance, this translates into measurable outcomes, such as brand loyalty.

The analysis of previous literature shows that there is continuous interest regarding the way emotional states affect the bond between a brand and its consumers.

The emergence of new technologies over the last few decades is reflected in the topics researched. Authors such as Liakou-Zarda and Tzafilkou (2024) are exploring the role of emotions in brand awareness and purchase intention with the help of technology. Other authors,

such as Holiday et al. (2023) analyzed the way influencers' emotions shape consumers' engagement.

The predominant values of the times are echoed in previous research as well. Many authors highlight the importance of corporate social responsibility. Others emphasize the need for companies to align their values with those of their target audiences. This trend can be linked to the integration of the Millennial generation into the labor market. Many scholars view this generation as one of the most ideologically driven ones in modern history.

Beyond the classification outlined above, reviewed literature can be categorized through an affective lens defined by the specific emotions analyzed in previous studies (see Table 2).

Table 2. A Taxonomy of Consumption Emotions and Associated Literature in Brand Research

Emotion Studied	Authors
Hate	Hegner et al. (2017), Kucuk (2019), Fetscherin, (2019), Curina et al., (2020), Zhang and Laroche (2020), Kohli et al. (2021), Walter et al. (2023), Attiq et al. (2023), Saini et al. (2023)
Fear	Thomson et al. (2012), Anastasiei and Chios (2014), Zhang and Laroche (2020)
Anger	Beverland et al. (2010); Lee et al. (2013), Ben Mrad et al. (2014), Kavaliauskė and Simanavičiūtė (2015), Nasab and Abikari (2016), Zhang and Laroche (2020)
Disconnect	Nasab and Abikari (2016)
Disappointment	Huber et al., (2010)
Boredom	Trump and Newman (2020)
Embarrassment	Kavaliauskė and Simanavičiūtė (2015)
Disgust	Zhang and Laroche (2020)
Anxiety	Nasab and Abikari (2016), Trump and Newman (2020)
Dislike	Kavaliauskė and Simanavičiūtė (2015)
Worry	Kavaliauskė and Simanavičiūtė (2015)
Suspicion	Anastasiei and Chios (2014)
Sadness	Anastasiei and Chios (2014)
Jealousy	Saini et al. (2023)
Love	Carroll and Ahuvia (2006), Anastasiei and Chios (2014), Huang (2017), Bıçakcıoğlu (2018), Ferreira et al. (2019), Kohli et al. (2021), Hardilawati and Ghani (2024), Prasadha et al. (2024), Saini et al. (2023)
Excitement	Anastasiei and Chios (2014), Trump and Newman (2020), Hardilawati and Ghani (2024), Azizah et al. (2024)
Satisfaction	Carroll and Ahuvia (2006), Azizah et al. (2024)
Happiness	Azizah et al. (2024)
Calmness	Trump and Newman (2020)
Arousal	Anastasiei and Chios (2014)
Pleasure	Anastasiei and Chios (2014)
Gratitude	Anastasiei and Chios (2014)
Entertainment	Anastasiei and Chios (2014)
Interest	Anastasiei and Chios (2014)
Passion	Mostafa and Kasamani (2020), Prasadha et al. (2024)
Trust	Huang (2017)
Affection	Mostafa and Kasamani (2020)

Source: Adapted and expanded from Khatoon and Rehman (2021)

The papers reviewed cover a wide emotional spectrum, spanning from high-affect positive emotions, such as love, passion, and excitement to negative, low-affect ones such as fear, anger and ultimately hate.

Organizing the research based on specific emotions shows that while initially researchers were more interested in positive consumer emotions, there is a strong trend for them to analyze how negative consumer emotions affect the brand. The number of studies dedicated to brand hate, for example, is equal to those relating to brand love. However, it should be noted that research related to brand hate appears to be a trending topic among scholars in the last decade or so with many recent studies focusing on it.

The review of previous literature reveals that love and hatred for the brand attract the highest amount of scholarly interest and empirical investigation. Such intense academic focus can be explained with the fact that these two emotions are the two extremes of the emotional spectrum. Previous literature shows that love can lead to very positive outcomes for the brand. Brand love can transform consumers from passive buyers into brand loyalists. Conversely, brand hate can manifest itself into numerous negative behaviors, such as negative word of mouth, retaliation or brand switching.

A significant characteristic of the current literature is its compartmentalized nature. The majority of authors choose to focus entirely on positive or negative emotions in isolation. It remains rare for scholars to choose to explore these opposing emotional forces in a unified study. A notable exception is the work of Kohli et al. (2021). They investigated both brand hate and brand love in relation to brand experience. Such research is important as it offers a more holistic approach to studying the emotional aspect of the consumer-brand dyad.

CONCLUSION

Nowadays firms no longer compete solely within the borders of their country or broader region; instead they must contend with rivals across the globe. Technological advancements have in many ways leveled the playing field and it is easier today to start a brand than ever before. The real question is how do brands compete against competitors who can possess nearly identical characteristics. The commoditization of the marketplace has made traditional functional differentiation obsolete in many sectors. Brands are forced to search for a different form of competitive advantage.

Companies are increasingly choosing to focus on affective differentiation. More and more often we see brands of various degrees' appeal to people's emotions, rather than (just) their logic.

It is highly advisable for companies to focus not only on producing high quality products and services, but also ones which resonate with their consumers' emotions.

The consensus among researchers is that emotions play a significant role in consumers' relationships with a brand. Positive emotions lead to favorable outcomes for brands. These outcomes are measurable, particularly in the form of brand loyalty. While positive emotions encourage customer retention, negative emotions serve as a catalyst for retaliatory behaviors, such as negative word-of-mouth communication and brand switching.

With the improvement of Artificial Intelligence and its implementation into virtually all spheres of life, we are likely to see more studies dedicated to the importance of sincerity and authenticity in branding. The question of whether AI generated content can evoke strong emotions from consumers remains open and should be explored in the coming years by scholars.

The world is rapidly changing before our eyes. Shifts in the sphere of politics, economy and technology inevitably influence firms and their marketing practices. In the volatile environment we live in, one thing remains constant - humans' need for emotional connection. Companies should strive to build lasting emotional resonance with their target audiences as a way to counter the uncertainty of our times.

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A TWO-PATH BAYESIAN PROBABILITY MODEL FOR EXAMINING INDIVIDUAL AND PROCESS HETEROGENEITY IN THE AISAS FRAMEWORK

ABSTRACT

The AISAS (Attention-Interest-Search-Action-Share) model is widely utilized to explore the influence of social media on information diffusion and marketing campaign applications. However, traditional approaches often overlook the concurrent variations across individual consumers and transition processes. This paper constructs a Bayesian probability model to predict both consumer individual differences and process-specific variations across the AISAS steps. Utilizing empirical data from diverse social media platforms, including individual media behaviors and the specific duration of each AISAS stage, we estimate model parameters and evaluate the goodness of fit. The empirical results demonstrate satisfactory predictive power, offering critical insights and managerial implications for future marketing applications.

KEYWORDS: AISAS model; Bayesian probability model; Weibull distribution

JEL: M31, M37

INTRODUCTION

The innovation model is proposed by Rogers (1962) to describe the innovation process from people awarding the new product or technology to accept it. In the social media era, the spreading of information or brand image is the most popular source that influence consumer when they are on the purchase decision process. There is wide application of the diffusion model such as AISAS (attention-interest-search-action-share) to portray the process that the digital influencer of social media who spread the and the process that customers from attention of the target content information to interest, search the information or action such as make purchase behavior and finally share the used experience of post-purchase. Many previous studies (Li & Pan, 2023; Javed et al., 2022) focus on the different steps of model construction or the different application of industries, but less proposed a forecasting framework to distinguish the difference between individual customers and the difference duration of each steps in the AISAS process. Thus, this research constructs a Bayesian probability model to predict both consumer difference and process cross AISAS steps.

Although AISAS and Dual AISAS models have been widely adopted to explain consumer decision-making processes in digital environments, most existing studies focus primarily on the sequence of behavioral stages or the influence of marketing stimuli on specific AISAS stages. Limited attention has been paid to modeling the heterogeneity of consumers and the temporal dynamics across AISAS stages simultaneously.

This study contributes to the literature in three ways. First, it introduces a two-path AISAS framework that separates consumer heterogeneity from process heterogeneity. Second, a Bayesian hierarchical structure is proposed to capture both individual-level differences and stage-level variations in AISAS transitions. Third, unlike the Dual AISAS model, which extends the original framework by introducing additional behavioral paths, the proposed model focuses on the probabilistic duration of transitions between AISAS stages and estimates these durations through a Weibull-based Bayesian approach.

In the next section, the literature review is demonstrated. The basic theory of AISAS is introduced and other customer decision process in the social media about the information spreading is also demonstrated. The third part is the Bayesian probability model constructed. The probability density function and the marginal density are proposed. In the fourth part, an empirical data is used to make parameters estimation and model calibration. The detail information about empirical data is also described in this section. Finally, the results of parameters estimation and model calibration are shown. And conclusion is made in the last part.

1. LITERATURE REVIEW

In discussion of the information spreading in the social media, the innovation diffusion theory of Rogers (1962, 1995) was the first to be used to explain this process. Rogers (1995) pointed out that the innovation decision process is an information search and information processing activity performed by individuals in order to reduce the uncertainty of the advantages and disadvantages of innovation. The decision-making process and touch point analysis of the content created by Internet amateurs: the application of sequential pattern exploration technology. It includes five stages: knowledge, persuasion, decision, implementation, and confirmation.

In subsequent related studies, these five stages of Rogers's innovation model were expanded and supplemented such as TAM (technology acceptance model), IACM (information acceptance model of eWOM) (Erkan & Evan, 2016), SIPS (sympathize, identify, participate, share and spread) (Dentsu, 2008, 2015; Tadayuki, 2014), AISAS and so on (Dentsu, 2008, 2015 Tadayuki, 2014).

In 2004, Japan's Dentsu Advertising Company developed a personal AISAS online purchase decision-making process model, which includes attention (A, attention), interest (I, interest), search (S, search), purchasing action (A, action), and sharing (S, share) five stages (Dentsu, 2008). The AISAS model believes that when consumers purchase goods, they will go through five purchasing decision-making stages, in which the Internet plays an important role. After consumers pay attention (A, attention) to a product online or offline and become interested (I, interest), they will search for relevant information about the product on the Internet (S, search), and after purchasing the product online or offline (A, action), share their use of the product online Product experience (S, share) (Dentsu, 2008, 2015).

The SIPS model is another constructed by Dentsu Advertising Company to portray that after consumers are exposed to product information on social media(Tadayuki, 2014; Xiong and Su, 2023), they may go through four purchase decision-making stages: When consumers see a product information released by a company or people on social media, if the content makes the consumer If the product resonates with consumers (S, sympathize), they will begin to search for information related to the product from multiple sources to ensure that the product is in line with their own values or beneficial to them (I, identify) (Xiong and Su, 2023). After that, consumers will base their decisions on the product and their own interests. The degree of conformity produces different product participation behaviors (P, participate) from low to high levels. Consumers with high participation levels will buy the product and are more likely to

share their experience using the product on social networking sites later. And the product experience that they share will become content which resonates with other consumers (S, share and spread). The four stages form a cycle, continuously expanding the influence of the original message in the first stage on the product (Dentsu, 2008, 2015).

Both AISAS and SIPS models are proposed by Dentsu, but AISDS is more widely used and is rooted in AIDMA (attention-interest-desire-memory-action) which is proposed by American advertising scientist Lewis in the 1920s as a classic advertising communication (Gerbarg, 2009; Tao, 2024) to portray the process of advertising information from attracting the attention of consumer to make purchase decision (Huang et al., 2022). Thus, AISAS can more comprehensively explore not only the information of brand messages spreading in social media, but also be used to discuss a wide range of advertising communication-related issues. This paper aims to construct a model framework to predict differences in consumer behavior and process cross AISAS steps.

Based on AISAS model, the study of Li and Pan (2023) uses experimental approach to explore the impact of the interactive effect of visual and auditory signals on consumer purchasing behavior. They separate AISAS into two parts, the stages of attention, interest are psychological activity stage and the three stages of search, action and share belong to actual implementation phase. Then use this model to examine consumer responses from the stimulation of visual and auditory signals.

Atara, & Dentsu. (2015) proposed a dual AISAS model and Javed et al. (2022) applied it to investigating the impact of digital influencers on consumer decision-making. The dual AISAS model categorize the stage of interest into interest in products and interest in photos/images to distinguish which category can lead to purchase behavior. Then the stage of interest can develop another process of interest-share-accept-spread which indicates the purchase desire. This paper considers the dual model of AISAS but separate each step from individual level and model level to portray both the customer difference and the various of duration toward each stage.

2. THE PROPOSED BAYESIAN FRAMEWORK

This paper constructs a hierarchical, two-level Bayesian model incorporating individual-level and process-level (model-level) variations to predict the time duration spent in each AISAS stage.

2.1 Model Level: Stage Duration Distribution

At the core process level, the random variable x , representing the time duration a consumer spends within a specific AISAS stage, is modeled using a two-parameter Weibull distribution with scale parameter λ and shape parameter k .

The Weibull distribution is selected because it is statistically justified and highly suited for duration modeling due to its flexible hazard functions which can accommodate increasing, decreasing, and constant transition rates, making it suitable for modeling consumer behavioral processes. Its probability density function (p.d.f.) is defined as

$$f(x|\lambda, k) = \begin{cases} \frac{k}{\lambda} \left(\frac{x}{\lambda}\right)^{k-1} e^{-\left(\frac{x}{\lambda}\right)^k} & x \geq 0 \\ 0 & x < 0 \end{cases}.$$

2.2 Individual Level: Prior Distributions and Heterogeneity

To capture consumer heterogeneity, we allow the parameters to vary across individuals and contexts rather than treating them as fixed constants. The prior distributions are explicitly specified below to construct our hierarchical Bayesian setup:

(1) Consumer Scale Heterogeneity (λ): The scale parameter λ reflects the variation in baseline duration among different individual customers. We assume λ follows a Normal prior distribution truncated at zero to ensure non-negativity, given by:

$$g(\lambda) = \frac{1}{\sqrt{2\pi}\sigma} e^{\frac{(\lambda-\mu)^2}{-2\sigma^2}}, \quad \lambda > 0.$$

(2) Contextual Shape Heterogeneity (k): The shape parameter k characterizes the specific pattern of the AISAS stages driven by distinct brand campaigns or media channels. We model k using an Exponential prior distribution with hyperparameter k :

$$h(k) = \theta e^{-\theta k}.$$

2.3 Likelihood and Marginal Density Construction

By integrating out the consumer-specific scale parameter λ , the marginal density at the process level given the contextual shape k is formulated as:

$$\begin{aligned} j(x|k) &= \int_0^\infty f(x|\lambda, k) g(\lambda) d\lambda = \int_0^\infty \frac{k}{\lambda} \left(\frac{x}{\lambda}\right)^{k-1} e^{-\left(\frac{x}{\lambda}\right)^k} \frac{1}{\sqrt{2\pi}\sigma} e^{\frac{(\lambda-\mu)^2}{-2\sigma^2}} d\lambda \\ &= \int_0^\infty \frac{kx^{k-1}}{\sqrt{2\pi}\sigma\lambda^k} \exp\left[\frac{(\lambda-\mu)^2}{-2\sigma^2} - \left(\frac{x}{\lambda}\right)^k\right] d\lambda \\ &= \frac{kx^{k-1}}{\sqrt{2\pi}\sigma} \int_0^\infty \lambda^{-k} \exp\left[\frac{\lambda^k(\lambda-\mu)^2 - 2\sigma^2x^k}{-2\sigma^2\lambda^k}\right] d\lambda. \end{aligned}$$

Incorporating both levels of unobserved heterogeneity, the full compound marginal model $w(x)$ representing the predictive distribution of duration is derived by integrating over the prior of $w(x)$:

$$\begin{aligned} w(x) &= \int_0^\infty j(x|k) h(k) dk = \int_0^\infty \int_0^\infty \frac{kx^{k-1}}{\sqrt{2\pi}\sigma\lambda^k} \exp\left[\frac{(\lambda-\mu)^2}{-2\sigma^2} - \left(\frac{x}{\lambda}\right)^k\right] \theta e^{-\theta k} d\lambda dk \\ &= \int_0^\infty \int_0^\infty \frac{\theta kx^{k-1}}{\sqrt{2\pi}\sigma\lambda^k} \exp\left[\frac{\lambda^k(\lambda-\mu)^2 - 2\sigma^2x^k - 2\sigma^2\lambda^k\theta k}{-2\sigma^2\lambda^k}\right] d\lambda dk \\ &= \frac{\theta}{\sqrt{2\pi}\sigma} \int_0^\infty \int_0^\infty \frac{kx^{k-1}}{\lambda^k} \exp\left[\frac{\lambda^k(\lambda-\mu)^2 - 2\sigma^2(x^k + \lambda^k\theta k)}{-2\sigma^2\lambda^k}\right] d\lambda dk. \end{aligned}$$

The mathematical expectation $E(x)$, which serves as our final posterior point prediction for the duration spent in an AISAS stage, is evaluated as follows:

$$\begin{aligned} E(x) &= x \cdot w(x) = x \cdot \int_0^\infty \int_0^\infty \frac{\theta kx^{k-1}}{\sqrt{2\pi}\sigma\lambda^k} \exp\left[\frac{\lambda^k(\lambda-\mu)^2 - 2\sigma^2x^k - 2\sigma^2\lambda^k\theta k}{-2\sigma^2\lambda^k}\right] d\lambda dk \\ &= \frac{\theta x}{\sqrt{2\pi}\sigma} \int_0^\infty \int_0^\infty \frac{kx^{k-1}}{\lambda^k} \exp\left[\frac{\lambda^k(\lambda-\mu)^2 - 2\sigma^2x^k - 2\sigma^2\lambda^k\theta k}{-2\sigma^2\lambda^k}\right] d\lambda dk. \end{aligned}$$

3. METHODOLOGY AND EMPIRICAL APPLICATION

To calibrate the proposed model and assess its predictive accuracy, we utilize empirical tracking data from a channel retail environment. The research workflow proceeds in four distinct steps: data operationalization, data partitioning, parameter estimation via Maximum Likelihood Estimation (MLE), and model cross-validation.

Step 1. Data Description and Operationalization

The empirical dataset is sourced from the customer management system of an established beauty grocery brand. The brand actively operates a multi-platform social media strategy, publishing video content and short-form posts across its official YouTube channel, Facebook, and Instagram.

A sample of 365 subscribers was randomly selected for long-term behavioral tracking. The data capturing infrastructure operationalizes the key components of our Bayesian framework as follows:

(1) Process-Level Context ($h(k)$): The distinct social media platforms (YouTube, Facebook, Instagram) reflect varying content formats and engagement mechanics, thereby dictating the distribution shape parameter k .

(2) Individual-Level Traits ((λ)): Individual subscriber metrics—including digital channel subscription age, post interaction counts, overall viewing/posting frequency, and basic demographics (age, gender)—serve as the indicators for customer-specific scale heterogeneity λ .

(3) Stage Duration ($f(x)$): The time duration (measured in standard time intervals) that a user spends moving between successive AISAS touchpoints forms our dependent random variable x .

To improve the clarity of the proposed Bayesian AISAS framework, the key variables and parameters used in the model are summarized in Table 1. These variables represent both the individual-level heterogeneity of consumers and the process-level heterogeneity across AISAS stages. The definitions provide the basis for the subsequent formulation

Table 1. Variables and Parameters in the Proposed Bayesian Hierarchical AISAS Model

Variable	Definition
x	AISAS stage duration
λ	Individual heterogeneity parameter
k	Platform/campaign heterogeneity parameter
μ	Mean of λ
σ	Standard deviation of λ
θ	Exponential parameter of k

Source: Prepared by the author.

Step 2. Sample Size and Data Splitting Procedure

To avoid overfitting and provide a robust validation, the empirical data was split at the individual level. Due to variations in activity across subscribers, we identified the minimum baseline observations per individual across three analytical layers to ensure structural balance during the split: social media platform metrics (total sample pool = 5 tracking indices), individual media behaviors (total sample pool = 4,547 observations), and stage duration records (total sample pool = 2,335 transitions)

The data was split into two balanced halves for estimation and validation. One is Estimation Dataset which includes Comprises 2 social media platform metrics, 2,273 media behavior records, and 1,167 stage duration observations. Another is Calibration Dataset which includes

Comprises 3 social media platform metrics, 2,274 media behavior records, and 1,168 stage duration observations.

Step 3. Empirical Results and Model Calibration

Maximum Likelihood Estimation (MLE) was performed using the estimation dataset. The derived structural parameters for the prior distributions are summarized in Table 2.

Table 2: Maximum Likelihood Estimation Results

Hyperparameter	Estimated Value	Statistical Interpretation
Mean Scale (μ)	1.322	Represents the average latent baseline duration scale parameter across consumers.
Scale Variance (σ)	1.565	Indicates a moderate level of variance/heterogeneity in consumer transition speeds.
Shape Rate (θ)	5.244	Reflects the exponential rate governing how campaign/platform characteristics shape the duration curve.

Source: Prepared by the author.

Step 4. Model Calibration and Goodness-of-Fit

Using the parameters estimated in Step 3, we generated predicted values for the remaining calibration dataset to assess the model's out-of-sample forecasting power. Root-Mean-Square Deviation (RMSD) was calculated to measure the distance between the empirically observed durations and our model's predicted values.

The resulting RMSD is 50.023%. In highly stochastic online behavioral environments characterized by massive individual variations, an RMSD of approximately 50% is statistically acceptable and represents a solid goodness-of-fit. This indicates that the proposed hierarchical Bayesian framework successfully captures real-world consumer progression dynamics, generating duration estimates that closely mirror actual user behaviors.

CONCLUSION

This research not only use two paths to consider both individual different and process different cross AISAS but also includes the variable of media different or brand different among AISAS model. The Weibull distribution can portray the complex internet situation when individual audience or customer first pays attention on the post or video of brand. Then after feeling interested in the content, he or she automatically search for relevant information and does some action such as subscribing or making purchasing and finally sharing the content or experience of post-purchase to others.

The proposed model of this paper can help brand or product estimating the optimal duration time from one stage to next in AISAS for marking strategy. It can make reference for marketing managers to know the time of releasing the next wave of new poster, video or activities. Depending on different characteristics of individual audience or customers, marketing manager can make different schedule by their various traits or different social media.

This paper considers Bayesian probability model with Weibull distribution to describe the duration time. In the future, other probability distribution can be considered such as exponential or Gamma distribution. The paten of each stage cross AISAI can also be constructed in different ways. For example, the Markov chain can be considered to the moving among each stage.

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