

MODELLING THE INTEGRITY CLIMATE OF PROCUREMENT IN PUBLIC ORGANIZATIONS

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**MODELLING THE INTEGRITY CLIMATE OF
PROCUREMENT IN PUBLIC ORGANIZATIONS**

by

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CERTIFICATE

This is to certify that the thesis entitled “Modelling the Integrity Climate of Procurement in Public Organizations,” being submitted by **Ms. Garima Bhagat (Nee Lohani)** to the Indian Institute of Technology Delhi for the award of the degree of **Doctor of Philosophy** is a bonafide record of the research work carried out by her under my supervision and guidance. The thesis work, in my opinion, has reached the requisite standard, fulfilling the requirements for the degree of Doctor of Philosophy.

The contents of this thesis, in full or in parts, have not been submitted to any other University or Institute for the award of any degree or diploma.

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ABSTRACT

Public procurement involves the acquisition of goods, services, and works by various state agencies. For a developing country like India, it is estimated to account for 20 to 30 percent of the GDP, of which works procurement constitute a large component. Procurement has evolved from being a procedural function to acquiring a strategic and professional role with extended obligations of steering economic growth and a multitude of socio-economic goals. The fundamental tenets governing public procurement require that every procuring authority be responsible and accountable for bringing efficiency, economy, transparency, and fair competition in procurement. However, with the huge financial stakes involved, corruption in works procurement is the biggest inhibitor to efficient project outcomes, involving poor project selection, cost deviations, inferior quality, time overruns, and wasteful expenditure of public money.

Integrity management in procurement leads to savings and unlocks valuable public resources for financing ambitious development projects. This is critical for a fast-developing country like India, yet there is a conspicuous paucity of research in this domain in the Indian context. This study aims to develop a systematic and holistic approach to address integrity management in construction projects with rich implications for theory and practice.

The study addresses the primary requirement for integrity risk management in public construction projects through a risk mapping methodology for risk identification, assessment, and prioritization based on the perceptions of practitioners and experts. A stage-wise analysis of integrity risks, through extensive literature survey and interactive

workshops, resulted in an inventory of 55 risks located in different stages of a construction project. Delphi survey followed by failure mode and effects analysis facilitated the prioritization of risks using risk impact as a function of its probability, severity, and detectability. The study reveals thirty top risks highly concentrated in the 'contract management' stage, followed by the 'bid design' and 'payments' stages. Top risks include poor site supervision, substitution of materials by defective or sub-standard materials, mandatory tests not done, hindrances not properly recorded, tailor-made contracts to suit a particular vendor, and non-transparent engagement of sub-contractors.

Integrity in procurement implies utilizing funds, resources, and authority transparently in alignment with the tenets of good governance. It is a characteristic not just of individuals but also of organizations, being the quality of acting in accordance with the accepted rules, values, and standards. This study explores the organizational framework of policies and practices that provide the necessary ecosystem for integrity management in a public organization. The study presents and develops the novel construct of integrity climate of procurement as a multi-dimensional interplay of organizational features promoting integrity. A multi-pronged approach synergized the extant literature with the experience of field functionaries to identify the attributes that contribute to integrity management. A Delphi survey with top anti-corruption experts in India yielded 22 critical measures that define the integrity climate of procurement. This inventory of integrity climate measures was subjected to a survey involving 193 respondents across 15 large public organizations in India to determine the criticality and implementation level of each measure. Transparency, organizational leadership, and processes designed to facilitate fair competition emerge as the top influencers in shaping the integrity climate. The implementation scores were significantly lower than the corresponding criticality scores

for all integrity climate measures in the organizations surveyed, indicating the need to strengthen the organizational integrity climate at the ground level. The underlying structure of integrity climate dissected using exploratory factor analysis yielded four factors. Step-wise multiple regression showed all four factors as critical determinants of the integrity climate: key process management, control and oversight, commitment to integrity, and engagement with stakeholders, with key process management as the most significant driver. Using the relative importance method, a basic, functional template was developed to gauge the integrity climate of procurement in a public organization.

The study explores the effectiveness of the constituent measures of the organizational integrity climate by studying the impact of the integrity climate on the project integrity risks. A questionnaire survey among practitioners was done to evaluate the integrity climate measures and the project integrity risks. The survey data with respect to the project integrity risks was subjected to exploratory factor analysis to extract their underlying factors. The five project integrity risk factors identified included violation of professional standards/ethics, lack of fairness, violation of procedural norms, lapses/irregularities by contractors, and lack of transparency. A hypothesized model was developed regarding the relationship between integrity climate and the project integrity risks, and a hypothesis (H1) was framed that the integrity climate mitigates the project integrity risks. The hypothesized model was subjected to partial least squares structural equation modelling (PLS-SEM) using the survey data. The PLS-SEM model revealed a significant path between the organization's integrity climate and project integrity risk constructs, with a negative coefficient of 0.430 which cogently supported the developed hypothesis. Amongst the four integrity climate factors, key process management emerged as the most influential in checking integrity risks in construction

projects. On the other side of the model, among the five factors of the project integrity risk construct, results show the violation of professional standards/ethics with the highest path coefficient, leading to corruption in construction projects.

In a maiden effort to identify the typical manifestations of integrity violations in Indian public organizations, the study used a Delphi survey with 11 experts to identify eight common integrity violations in public organizations. Their prevalence was evaluated through a questionnaire survey among practitioners of 15 organizations. The results show that contrary to perception, lapses such as favoritism or abuse of organizational resources are more widespread than bribery or fraud. The study used PLS-SEM technique to test the hypothesis (H2) that the integrity climate mitigates integrity violations by organizational members. The model obtained shows a strong negative path coefficient of 0.506 from the independent construct, namely, the organizational integrity climate, to the dependent integrity violation construct, clearly proving the hypothesis that the integrity climate mitigates integrity breaches by individual members.

The study contributes to the body of knowledge by introducing an integrity risk management framework through multiple-level analysis, which imparts the necessary contextuality and theoretical sensitivity. The stage-wise inventory of integrity risks with potential impact is useful for designing, monitoring, and reviewing the procurement process. The study develops the integrity climate construct as an overarching framework incorporating key organizational measures that promote integrity and, hence, improved project outcomes.

Keywords: Public procurement, construction, corruption, integrity risk, contract management, project management, integrity climate, integrity violation, integrity management, Delphi, failure mode and effects analysis, exploratory factor analysis, PLS-SEM, India.

सारांश

सार्वजनिक क्रय में विभिन्न राज्य एजेंसियों द्वारा वस्तुओं, सेवाओं और कार्यों का अधिग्रहण शामिल है। भारत जैसे विकासशील देश के लिए, सकल घरेलू उत्पाद में इसका योगदान 20 से 30 प्रतिशत अनुमानित है, जिसमें निर्माण अधिप्राप्ति एक बड़ा अंश है। आर्थिक विकास और विभिन्न सामाजिक-आर्थिक लक्ष्यों को आगे बढ़ाने के विस्तारित दायित्वों के साथ, क्रय एक प्रक्रियात्मक कार्य से एक सामरिक और पेशेवर कार्य के रूप में विकसित हुई है। सार्वजनिक क्रय को नियंत्रित करने वाले सिद्धांतों के अनुसार इसमें दक्षता, मितव्ययता, पारदर्शिता और निष्पक्ष प्रतिस्पर्धा अत्यंत आवश्यक है। निर्माण कार्यों में भ्रष्टाचार कुशल परियोजना परिणामों के लिए सबसे बड़ा अवरोधक है, जिसमें गलत परियोजना चयन, लागत विचलन, निम्न गुणवत्ता, समय की अधिकता और सार्वजनिक धन का व्यर्थ व्यय शामिल है। भ्रष्टाचार मुक्त क्रय से बचत होती है और महत्वाकांक्षी विकास परियोजनाओं के वित्तपोषण के लिए बहुमूल्य सार्वजनिक संसाधनों का द्वार खुलता है। यह भारत जैसे तेजी से विकसित हो रहे देश के लिए महत्वपूर्ण है, परन्तु भारत में इस क्षेत्र में शोध की रिक्तता है। इस अध्ययन का उद्देश्य सिद्धांत और व्यवहार के लिए समृद्ध निहितार्थ के साथ निर्माण परियोजनाओं में निष्ठा प्रबंधन (integrity management) को संबोधित करने के लिए एक व्यवस्थित और समग्र दृष्टिकोण विकसित करना है।

सार्वजनिक निर्माण परियोजनाओं में निष्ठा जोखिम प्रबंधन (integrity risk management) की प्राथमिक आवश्यकता को क्रय व्यवसायियों और विशेषज्ञों की धारणाओं के आधार पर रिस्क की पहचान, मूल्यांकन और प्राथमिकता के लिए चरण-वार मानचित्रण (stage-wise mapping) पद्धति के माध्यम से संबोधित किया जाता है। व्यापक साहित्य सर्वेक्षण और इंटरैक्टिव कार्यशालाओं के माध्यम से इंटीग्रिटी रिस्क के चरण-वार विश्लेषण के परिणामस्वरूप एक निर्माण परियोजना के विभिन्न चरणों में स्थित 55 रिस्क को समूहीकृत किया गया। डेल्फ़ी सर्वेक्षण के बाद विफलता मोड और प्रभाव विश्लेषण (failure mode and effects

analysis) के द्वारा संभावना (probability), गंभीरता (severity) और संसूचनीयता (detectability) के आधार पर रिस्क प्रभाव के अनुसार रिस्क को सूचित किया गया। अध्ययन से तीस विकट रिस्क का पता चलता है जो 'अनुबंध प्रबंधन' चरण के अलावा 'टेंडर डिजाइन' और 'भुगतान' चरण में केंद्रित हैं। शीर्ष रिस्क में खराब साइट पर्यवेक्षण, दोषपूर्ण या घटिया सामग्रियों द्वारा सामग्रियों का प्रतिस्थापन, अनिवार्य परीक्षण नहीं किया जाना, बाधाओं को ठीक से दर्ज नहीं किया जाना, किसी विशेष विक्रेता के अनुरूप तैयार किए गए अनुबंध और उप-ठेकेदारों की गैर-पारदर्शी भागीदारी शामिल हैं।

क्रय में निष्ठा का तात्पर्य सुशासन के सिद्धांतों के अनुरूप पारदर्शी तरीके से धन, संसाधनों और प्राधिकरण के उपयोग से है। स्वीकृत नियमों, मूल्यों और मानकों के अनुरूप कार्य करने का गुण न केवल व्यक्तियों की बल्कि संगठनों की भी विशेषता है। यह अध्ययन उन नीतियों और प्रथाओं के संगठनात्मक ढांचे की पड़ताल करता है जो निष्ठा प्रबंधन के लिए आवश्यक पारिस्थितिकी तंत्र प्रदान करते हैं। निष्ठा को बढ़ावा देने वाली संगठनात्मक विशेषताओं के बहुआयामी ढांचे के रूप में एक सार्वजनिक संगठन में क्रय के 'इंटीग्रिटी क्लाइमेट' की नवीन अवधारणा को प्रस्तुत और विकसित करता है। निष्ठा प्रबंधन में योगदान देने वाले मापकों की पहचान करने के लिए मौजूदा साहित्य को क्षेत्रीय अधिकारियों के अनुभव के साथ समन्वयित किया गया। भारत में वरिष्ठ भ्रष्टाचार-उन्मूलन विशेषज्ञों के साथ एक डेल्फ़ी सर्वेक्षण में 22 महत्वपूर्ण मापक सामने आए जो इंटीग्रिटी क्लाइमेट को परिभाषित करते हैं। इंटीग्रिटी क्लाइमेट मापकों की यह सूची, प्रत्येक मापक की गंभीरता और कार्यान्वयन स्तर को निर्धारित करने के लिए भारत के 15 बड़े सार्वजनिक संगठनों में 193 उत्तरदाताओं के एक सर्वेक्षण के अधीन थी। पारदर्शिता, संगठनात्मक नेतृत्व, निष्पक्ष प्रतिस्पर्धा को सुविधाजनक बनाने के लिए डिज़ाइन की गई प्रक्रियाएं, इंटीग्रिटी क्लाइमेट को आकार देने में शीर्ष प्रभावशाली कारकों के रूप में उभरते हैं। सर्वेक्षण किए गए संगठनों में सभी इंटीग्रिटी क्लाइमेट मापकों के कार्यान्वयन स्कोर, उनके महत्वपूर्णता स्कोर से काफी कम थे, जो जमीनी स्तर पर संगठनात्मक इंटीग्रिटी क्लाइमेट को मजबूत करने की आवश्यकता को दर्शाता है। खोजपूर्ण कारक विश्लेषण (exploratory factor analysis) का उपयोग करके इंटीग्रिटी क्लाइमेट की अंतर्निहित संरचना को विच्छेदित करने से चार कारक

प्राप्त हुए। चरण-वार एकाधिक प्रतिगमन (step-wise multiple regression) ने सभी चार कारकों को इंटीग्रिटी क्लाइमेट के महत्वपूर्ण निर्धारक के रूप में दिखाया: प्रमुख प्रक्रिया प्रबंधन, नियंत्रण और निरीक्षण, निष्ठा के प्रति प्रतिबद्धता, और हितधारकों के साथ संवाद। सापेक्ष महत्व पद्धति (relative importance index) का उपयोग करते हुए, एक सार्वजनिक संगठन में इंटीग्रिटी क्लाइमेट को मापने के लिए एक कार्यात्मक टेम्पलेट विकसित किया गया।

अध्ययन इंटीग्रिटी क्लाइमेट और परियोजना इंटीग्रिटी रिस्क्स के बीच संबंधों का अध्ययन करके संगठनात्मक इंटीग्रिटी क्लाइमेट के घटक उपायों की प्रभावशीलता का पता लगाता है। इंटीग्रिटी क्लाइमेट मापकों और परियोजना इंटीग्रिटी रिस्क्स का मूल्यांकन करने के लिए उत्तरदाताओं के बीच एक प्रश्नावली सर्वेक्षण किया गया। परियोजना इंटीग्रिटी रिस्क्स के संबंध में सर्वेक्षण डेटा को उनके अंतर्निहित कारकों को निकालने के लिए खोजपूर्ण कारक विश्लेषण (ईएफए) के अधीन किया गया। पहचाने गए पांच इंटीग्रिटी रिस्क्स कारकों में पेशेवर मानकों/नैतिकता का उल्लंघन, निष्पक्षता की कमी, प्रक्रियात्मक मानदंडों का उल्लंघन, ठेकेदारों द्वारा चूक/अनियमितताएं और पारदर्शिता की कमी शामिल है। महत्वपूर्ण परियोजना इंटीग्रिटी रिस्क्स और महत्वपूर्ण इंटीग्रिटी क्लाइमेट मापकों की पहचान करने के बाद एक परिकल्पित मॉडल विकसित किया गया। एक परिकल्पना (H_1) तैयार की गई, जिसके अनुसार इंटीग्रिटी क्लाइमेट परियोजना इंटीग्रिटी रिस्क्स का प्रतिकूल प्रभाव काम करता है। सर्वेक्षण डेटा का उपयोग करके इसे आंशिक न्यूनतम वर्ग संरचनात्मक समीकरण मॉडलिंग (partial least squares structural equation modelling) (पीएलएस-एसईएम) के अधीन किया गया। पीएलएस-एसईएम मॉडल से पता चला कि संगठन की इंटीग्रिटी क्लाइमेट और परियोजना इंटीग्रिटी रिस्क्स के बीच का पथ 0.430 के काफी मजबूत नकारात्मक गुणांक के साथ महत्वपूर्ण है जिसने स्पष्ट रूप से विकसित परिकल्पना का समर्थन किया। चार इंटीग्रिटी क्लाइमेट कारकों में से, प्रमुख प्रक्रिया प्रबंधन निर्माण परियोजनाओं में इंटीग्रिटी रिस्क्स की जाँच करने में सबसे प्रभावशाली के रूप में उभरा। मॉडल के दूसरी तरफ, परियोजना इंटीग्रिटी रिस्क्स के पांच कारकों में से उच्चतम पथ गुणांक 'पेशेवर मानकों/नैतिकता का उल्लंघन' का पाया गया।

भारतीय सार्वजनिक संगठनों में निष्ठा उल्लंघन (इंटीग्रिटी विओलेशन) की विशिष्ट अभिव्यक्तियों की जांच करने के पहले प्रयास में, अध्ययन ने भारत में सार्वजनिक संगठनों में आम इंटीग्रिटी विओलेशन की पहचान करने के लिए 11 विशेषज्ञों के साथ डेल्फ़ी सर्वेक्षण का उपयोग किया। उनकी व्यापकता का मूल्यांकन 15 संगठनों के अधिकारियों के बीच एक प्रश्नावली सर्वेक्षण के माध्यम से किया गया। नतीजे बताते हैं कि धारणा के विपरीत, पक्षपात या संगठनात्मक संसाधनों का दुरुपयोग जैसी खामियां, रिश्ततखोरी या धोखाधड़ी से अधिक व्यापक हैं। अध्ययन ने पीएलएस-एसईएम तकनीक का उपयोग परिकल्पना (एच2) का परीक्षण करने के लिए किया जिसके अनुसार इंटीग्रिटी क्लाइमेट, संगठनात्मक सदस्यों द्वारा इंटीग्रिटी विओलेशन को कम करता है। प्राप्त मॉडल संगठनात्मक इंटीग्रिटी क्लाइमेट से इंटीग्रिटी विओलेशन तक 0.506 का एक मजबूत नकारात्मक पथ गुणांक दिखाता है जो स्पष्ट रूप से इस परिकल्पना को साबित करता है। अध्ययन बहु-स्तरीय विश्लेषण के माध्यम से एक इंटीग्रिटी रिस्क मैनेजमेंट ढांचे को पेश करके, ज्ञान के कोष में महत्वपूर्ण योगदान देता है जो इसे आवश्यक प्रासंगिकता और सैद्धांतिक संवेदनशीलता प्रदान करता है। संभावित प्रभाव वाले इंटीग्रिटी रिस्क की चरण-वार सूची क्रय प्रक्रिया को डिजाइन करने, निगरानी करने और समीक्षा करने के लिए उपयोगी है। अध्ययन इंटीग्रिटी क्लाइमेट को एक व्यापक संगठनात्मक ढांचे के रूप में विकसित करता है जिसमें निष्ठा को बढ़ावा देने वाले प्रमुख मापकों को शामिल किया गया है और इस से परियोजना परिणामों में सम्मनति होना अपेक्षित है।

खोज शब्द: सार्वजनिक क्रय, निर्माण, भ्रष्टाचार, निष्ठा जोखिम, इंटीग्रिटी रिस्क, अनुबंध प्रबंधन, परियोजना प्रबंधन, इंटीग्रिटी क्लाइमेट, निष्ठा उल्लंघन, निष्ठा प्रबंधन, डेल्फ़ी विधि, कारक विश्लेषण, पीएलएस-एसईएम, भारत।

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LIST OF ABBREVIATIONS

ACM	Anti-corruption measures
CAG	Comptroller and Auditor General
CBI	Central Bureau of Investigation
CCI	Competition Commission of India
CEM	Construction engineering and management
CICP	Corruption in construction projects
CPPP	Central purchases procurement portal
CTEO	Chief Technical Examiner's Office
CVC	Central Vigilance Commission
DPR	Detailed project report
EFA	Exploratory factor analysis
EOT	Extension of time
FMEA	Failure mode and effects analysis
GDP	Gross domestic product
GFR	General Financial Rules
IC	Integrity climate
ICM	Integrity climate measure
ICF	Integrity climate factor
IV	Integrity violation
KMO	Kaiser–Meyer–Olkin
NOC	No objection certificate
OECD	Organization for Economic Cooperation and Development
PCP	Public construction projects
PIR	Project integrity risk
PIRF	Project integrity risk factor
PLS SEM	Partial least squares structural equation modelling
PPP	Public private partnership
RPN	Risk priority number
UNODC	United Nations Office on Drugs and Crime
UNDP	United Nations Development Programme