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NATIONAL UNIVERSITY OF MANAGEMENT

NUM

STUDENT RESEARCH SERIES

Undergraduate Thesis Excellence

Phnom Penh, Cambodia

May 2026

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Acknowledgement

The editors of the *NUM Student Research Series: Undergraduate Thesis Excellence* wish to express sincere gratitude to all who contributed to the realization of this publication.

First and foremost, profound recognition is owed to the student authors whose intellectual curiosity, dedication, and scholarly commitment made this volume possible. Their willingness to engage with complex and consequential questions, which spanning artificial intelligence, food safety governance, agricultural economics, agritourism, digital commerce, constitutional law, social security, and forensic evidence reflects a standard of undergraduate inquiry that merits the widest possible audience.

The editors also extend appreciation to the faculty supervisors and academic advisors who guided these research projects with expertise and care, and to the research participants, practitioners, and institutions who generously contributed their time, insights, and data to support these efforts.

This publication stands as a testament to the value of student-driven inquiry and the enduring importance of evidence-based thinking in addressing Cambodia's most pressing development challenges.

Impact of Artificial Intelligence on Research Writing

Mr. Samol Panhaboth1

Introduction: The rapid diffusion of Artificial Intelligence (AI) tools, particularly Large Language Models (LLMs) such as ChatGPT is fundamentally reshaping how academic research is conducted, written, and disseminated. In professional and educational settings alike, AI now mediates critical tasks: literature discovery, data synthesis, hypothesis generation, drafting, and editing. While the productivity promise of these tools is considerable, so too are the risks: erosion of critical thinking, academic integrity breaches, algorithmic bias, and over-reliance that may inhibit the development of core analytical competencies. For developing-country universities such as NUM, these dynamics carry particular urgency. Unlike institutions in the Global North where AI governance frameworks are rapidly maturing, Cambodian higher education institutions are only beginning to grapple with questions of AI policy, digital literacy, and ethical use (Sarin & Kimkong, 2024). Students in this context are forming professional habits and research dispositions in a policy vacuum, using powerful tools without clear institutional guidance.

This study was conducted in the International Business program of NUM's International College, an environment that prepares the next generation of Cambodia's business leaders. It addresses three interconnected research questions:

- How does AI tool usage affect the efficiency and quality of research writing?

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- What ethical challenges arise from AI use in research writing?
- How do researchers at different experience levels perceive AI's role in shaping their writing practices?

Methodology: The study employed a mixed-methods sequential explanatory design, selected to provide both statistical breadth and interpretive depth, which enabling rigorous quantification of trends and meaningful contextualisation of participant experience.

Quantitative Phase

A structured questionnaire was administered to 220 participants drawn from the NUM academic community, including undergraduate students (77%), graduate students (12%), and other professionals (11%). The sample was calculated using Cochran's Formula (95% confidence, p=0.5, margin of error 6.6%). Participants were predominantly female (61%), aged 18–25 (88%), and concentrated in Business/Economics (56%). A critical demographic characteristic: 70% had less than one year of formal research writing experience, meaning findings reflect the perspective of novice academic writers, a population rarely foregrounded in the existing AI-in-education literature.

Four constructs were measured on 5-point Likert scales: AI Tool Usage (USE_AI, 7 items), Ethical Challenges (ETH_CH, 7 items), Research Efficiency (RES_EF, 4 items), and Research Quality (RES_QU, 4 items). All scales demonstrated excellent internal consistency (Cronbach's α: USE_AI = 0.955; ETH_CH = 0.892; RES_EF = 0.907; RES_QU = 0.900). Data were analysed using SPSS v24, including descriptive statistics, Pearson correlation, and multiple linear regression.

Qualitative Phase

Ten semi-structured interviews were conducted with purposively selected participants spanning academic levels and fields of study (International Business, Education Technology, Digital Economy). Audio-recorded interviews were transcribed verbatim and analysed thematically, generating inductively derived codes and higher-order themes. Participant anonymity was preserved through pseudonymisation (e.g., Nay, Van, Raksa). The qualitative phase was designed to explain and contextualise the quantitative results, particularly the statistical patterns that warranted deeper interpretation.

Findings

Descriptive Findings

Respondents expressed strongly positive perceptions of AI across all four constructs. The table below summarises key item-level means.

Item	Mean	Significance
AI fosters hypothesis discovery	**4.04**	Highest-rated AI usage item; underscores AI's role in ideation
AI improves study design & methodology	**4.03**	Strong endorsement of AI for methodological scaffolding
Institutions should enforce AI guidelines	**4.36**	Highest-rated item across all constructs, a governance mandate
Plagiarism / incorrect citations concern	**4.27**	Second highest ethical concern; direct academic integrity risk

AI enhances idea generation (efficiency)	**4.04**	AI seen as a creative and generative partner
Clarity of writing (quality)	**4.27**	Strongest quality gain attributed to AI
Depth of analysis (quality)	**3.76**	Lowest quality item, the core of the Quality Paradox
AI fosters team collaboration	**3.76**	Lowest USE_AI item; collaborative AI workflows underexplored

Correlation Analysis

Pearson correlation analysis confirmed statistically significant relationships among all four constructs. USE_AI and RES_EF showed a strong positive correlation ($r=.681$, $p<.01$), as did USE_AI and RES_QU ($r=.623$, $p<.01$). The strongest relationship in the entire matrix was between RES_EF and RES_QU ($r=.732$, $p<.01$), indicating that for this cohort, perceived efficiency and perceived quality are almost synonymous constructs. Ethical Challenges showed weak negative correlations with both RES_EF ($r=-.241$, $p<.01$) and RES_QU ($r=-.198$, $p<.01$), suggesting that ethical concern introduces modest but measurable friction in the workflow.

Regression and Hypothesis Testing

Hypothesis	Outcome
H1: AI Tool Usage → Research Efficiency (β=.905, p<.001; R^2=.891)	**SUPPORTED**
H2: Ethical Challenges → Research Efficiency (β=.048, p=.194)	**NOT SUPPORTED**
H3: Research Efficiency → Research Quality (β=.905, p<.001; R^2=.819)	**SUPPORTED**

H1 was strongly supported: AI tool usage accounted for 89.1% of variance in perceived research efficiency, with a standardised beta of .905, indicating that increased AI engagement drives efficiency gains overwhelmingly. H3 was equally robust: research efficiency accounted for 81.9% of variance in research quality, confirming the pathway from AI use through efficiency to quality perception. H2, however, was rejected. Despite high levels of stated ethical concern, these concerns did not measurably slow workflow, a finding of significant policy relevance.

Qualitative Themes

Thematic analysis of the ten interviews yielded three overarching themes:

Theme 1 – The Dual Nature of AI's Impact on Efficiency and Quality. All interviewees acknowledged AI as a genuine efficiency enhancer. Interviewee 7 (Sithy) described moving from "hours stuck on one section" to producing an outline "in a few seconds." However, this was consistently paired with concern about generic, robotic output. Interviewee 1 (Nay) encapsulated the paradox: "It improves my grammar and structure but sometimes makes the text too generic or too polished, I still need to edit for a personal tone."

Theme 2 – Navigating the Ethical Minefield. Plagiarism risk, cognitive atrophy, and information inaccuracy were the dominant ethical concerns. Interviewee 2 (Van) described a near-miss incident, while Interviewee 3 (Raksa) warned that over-reliance would cause students to "lose their critical thinking skills." Despite this awareness, participants continued using AI under deadline pressure, the "ineffective conscience" in practice.

Theme 3 – The Spectrum of Use. Academic experience shaped AI deployment. Undergraduates used AI for basic grammar and translation support; graduate students leveraged it for structuring, literature synthesis, and analytical scaffolding. Interviewee 9 (Sara) drew the distinction explicitly: "Graduates use AI for deeper analysis; we use it for surface-level structure." This developmental gradient has direct implications for sequenced, level-differentiated AI literacy training.

Discussion: The most substantively important finding of this study is the Quality Paradox: a measurable divergence between AI's contribution to surface-level writing quality (Clarity of writing, M=4.27) and its perceived contribution to deep analytical quality (Depth of analysis, M=3.76). The regression model confirms that for novice writers, efficiency and quality are psychologically conflated (r=.732). When AI removes friction from writing, overcoming writer's block, correcting grammar, generating outlines, which students perceive the output as qualitatively superior, even when substantive analytical depth may be absent. This has direct implications for business education. Effective business strategy requires original, critical, context-sensitive analysis, exactly the competencies that may be displaced when students outsource analytical work to AI systems trained on generic patterns. A future business leader who cannot distinguish between polished prose and rigorous analysis is inadequately prepared for high-stakes decision-making environments.

The rejection of H2 is counter-intuitive and important. Students expressed strong ethical concern, the highest mean score across all 22 survey items was the call for institutional guidelines (M=4.36, SD=.711). Yet this concern produced no statistically significant drag on efficiency. This suggests that ethical awareness, without institutional structure and behavioural reinforcement, functions as background anxiety rather than a practical constraint on behaviour. Under deadline pressure, the utilitarian pull of AI productivity overwhelms the ethical deliberation required for responsible use. This dynamic, where labelled here the "ineffective conscience", implies that voluntary codes of conduct and aspirational ethics guidelines are insufficient. What is required is structural governance: clear policies, enforced disclosure requirements, and pedagogically integrated ethical reasoning skills.

This study contributes to a largely Western-dominated literature by situating AI in the context of a developing-country university. At NUM, contextual factors, English as a second language, limited AI policy infrastructure, and a predominantly novice researcher population, which amplify both the benefits and the risks of AI adoption. The Spectrum of Use finding reveals that AI's role evolves with academic experience, suggesting that differentiated, sequenced literacy interventions are more appropriate than one-size-fits-all policies.

Implications and Recommendations

For University Leadership and Policymakers

The study's findings constitute a clear mandate for institutional action. The following recommendations are directed at NUM's senior leadership and the broader Cambodian higher education policy community.

- Establish a Nuanced, Living AI Policy. NUM should urgently formalise an institutional AI policy that differentiates between permitted uses (grammar checking, brainstorming, formatting support) and academic misconduct (submission of AI-generated content without attribution). The policy must include mandatory disclosure requirements, be reviewed annually, and be co-developed with faculty, students, and an ethics review board. The evidence from this study, particularly the consensus call for guidelines (M=4.36) confirms that students are not seeking to evade accountability; they are seeking clarity.
- Mandate Sequenced AI Literacy Training. A mandatory, level-differentiated AI literacy curriculum should be embedded across all degree programmes. For undergraduates, training should cover academic integrity, hallucination risks, fact-checking methodologies, and the dangers of cognitive over-reliance. For graduate students and researchers, training should extend to advanced prompt engineering, AI-assisted literature synthesis, and the ethical dimensions of co-authorship and intellectual property in AI-mediated research.
- Invest in Faculty Development. Academic staff are the primary interface through whom AI policies become pedagogical practice. NUM should provide targeted professional development on AI-resilient assessment design (e.g., process-based assignments, oral components, in-class writing tasks), as well as training on how to model critical AI use within disciplinary teaching.

- Engage the Cambodian Policy Ecosystem. The policy vacuum identified in this study reflects a national-level gap. NUM, as a leading national university, is positioned to convene dialogue among Cambodian higher education institutions, the Ministry of Education, Youth and Sport, and regional bodies to develop shared frameworks for ethical AI governance in academic contexts.

For Students and Academic Researchers

- Adopt a Human-in-the-Loop Mindset. AI output should be treated as a first draft or intellectual stimulus, not a final product. Every factual claim, citation, and analytical inference generated by AI must be independently verified against primary sources before inclusion in academic or professional work.
- Prioritise Analytical Depth. Students should be encouraged to use AI to accelerate mechanical tasks (formatting, grammar, initial outlines) while reserving cognitive effort for the analytical work that constitutes genuine scholarly contribution. This distinction between AI as a tool and AI as a thinker is the foundational competency of responsible AI literacy.

For the Research Community

This study opens several productive avenues for future research:

- Longitudinal designs to assess whether sustained AI use strengthens or atrophies critical thinking and writing skills over an academic career.
- Comparative studies across Cambodian and Southeast Asian institutions to test the generalisability of the Spectrum of Use and Quality Paradox constructs.

- Experimental intervention studies using blind assessment of AI-assisted versus non-AI-assisted writing to generate objective quality data beyond self-report measures.

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Empowering Cambodian Processed Food SMEs: Navigating Certification for International Market Access

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Ms. Sivey Heng[3]

Introduction: Cambodia's economy has grown at an average annual rate of approximately 6.6% between 2000 and 2024, making it one of the fastest-growing economies globally. Small and medium-sized enterprises (SMEs) are central to this trajectory: they constitute over 99.8% of registered businesses, contribute approximately 58% to national GDP, and provide around 70% of total employment. Notably, 64.9% of all Cambodian SMEs operate within the food and beverage sector, underscoring the industry's structural significance.

Cambodia's integration into international trade regimes, including World Trade Organization (WTO) membership since 2004, the ASEAN Economic Community (AEC), the Regional Comprehensive Economic Partnership (RCEP), and a bilateral Free Trade Agreement with China effective January 2022 has opened meaningful export pathways. However, these agreements impose corresponding obligations: trading partners require Cambodian food exporters to demonstrate compliance with internationally recognised safety standards. The three most prevalent frameworks are:

- Good Manufacturing Practices (GMP), governing facility hygiene, staff training, raw material handling, and documentation, valid for three years;

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- Hazard Analysis and Critical Control Points (HACCP), a preventive, science-based system identifying and controlling biological, chemical, and physical hazards throughout production, valid for one to three years;
- ISO 22000, a comprehensive Food Safety Management System (FSMS) integrating HACCP principles with general management requirements, requiring annual audits and recertification every three years.

Despite their strategic importance, the certification attainment rate among Cambodian processed food SMEs remains critically low. Only three of the ten enterprises interviewed for this study had obtained any international certification, typically with substantial external assistance. The majority faced a convergence of financial, technical, regulatory, and infrastructural constraints that made certification appear unattainable. This research examines those constraints systematically and proposes evidence-based strategies to address them.

The study is framed by two complementary theoretical perspectives: the Resource-Based View (RBV), which attributes competitive disadvantage to internal resource deficiencies; and Institutional Theory, which attributes it to the failure of external regulatory and support structures to create enabling conditions for compliance.

Methodology: This research adopted a qualitative, exploratory case study design, consistent with the study's objective of generating contextually rich insights into certification experiences that quantitative instruments would fail to capture. The approach aligns with Creswell's (2018) framework for qualitative inquiry and Yin's (2018) principles of case study methodology. Purposive sampling was employed to select ten SME owners and managers operating in Cambodia's processed food sector, supplemented by two key informants, a director from C-GLOBAL-KH Inspection and Certification Co., Ltd., and the Director of SME Development Cambodia. Participants ranged in age from 35 to 55 years and operated enterprises between 4 and 22 years old, with staff sizes of 5 to 45. Products included fruit snacks, noodles, dairy goods, sauces, spice blends, jams, and dried fruits. Semi-structured interviews were conducted between March and April 2025 via Zoom and Google Meet, each lasting 30–45 minutes. A seven-question protocol was administered in Khmer or English according to participant preference. Interviews were recorded with informed consent, transcribed verbatim, and translated where necessary. Secondary data were drawn from academic journals, government policy documents, industry reports, and international development organisation publications. Thematic analysis following the six-phase Braun and Clarke (2006) framework was applied: familiarisation, initial coding, theme identification, theme review, theme definition, and final reporting. Triangulation across interview data, secondary literature, and key informant input was used to strengthen validity and trustworthiness. All participants provided informed consent. Identities were anonymised throughout the study (respondents coded R1–R10). Interview recordings were stored securely, accessible only to the research team. Participants were free to decline any question.

Findings

Certification Status

Only three of ten SMEs had obtained international food safety certifications at the time of interview. R6 was the most advanced, having earned HACCP in 2013 and ISO 50001 in 2014. R2 and R9 held GMP and HACCP respectively, achieved with NGO assistance. The remaining seven enterprises held only domestic credentials (Cambodian Hygiene Certificate or Cambodian Standard Certificate) or were in exploratory stages. Several had initiated certification processes but abandoned them due to audit failures, cost overruns, or regulatory confusion.

Key Barriers

Challenge	Frequency	Key Evidence
Financial Constraints	60% (6/10 SMEs)	Certification costs of USD 1,000–6,000; equipment upgrades; ongoing audit fees exceed available capital
Skill & Technical Knowledge Gaps	50% (5/10 SMEs)	Owners unable to implement HACCP principles; absence of trained food safety personnel
Government & Regulatory Support	40% (4/10 SMEs)	Fragmented agency guidance; workshops too general; no dedicated SME certification desk
Infrastructure & Equipment Limitations	30% (3/10 SMEs)	Outdated facilities; lack of certified testing labs; equipment sourced from Australia/Vietnam at high cost

Financial Constraints were cited as the foremost barrier by six respondents. Certification fees alone ranged from USD 1,000 to 6,000 per cycle. Equipment upgrades, facility improvements, consultant fees, and ongoing audit costs compound the burden. Critically, SMEs in rural areas faced compounded disadvantage, as financial assistance programs were concentrated in urban centres. As one respondent stated: "If I invest a large amount on it but I don't get much profit as I spend, it would put my business at risk."

Skill and Technical Knowledge Gaps affected half of the respondents. Implementing HACCP requires specialised understanding of hazard identification, critical control point monitoring, corrective actions, and documentation, competencies largely absent in the workforce of small Cambodian processors. Structured, accessible training programs remain scarce, particularly outside Phnom Penh.

Government and Regulatory Support Deficiencies were reported by four respondents. Certification in Cambodia requires engagement with private certification bodies, as no single government agency provides integrated advisory support. Workshops organised by the Ministry of Commerce were described as general and non-prescriptive. One respondent noted: "The government holds many seminars ... but they are not very specific on certification. They don't have a specific workgroup or department that can handle the work."

Infrastructure and Equipment Limitations were flagged by three respondents, predominantly those operating in rural areas or with older facilities. Requirements for certified testing labs, cold-chain logistics, clean water, reliable electricity, and sanitary production environments exceeded what these enterprises could currently provide. Specialised machinery was often unavailable domestically and required costly import from Vietnam or Australia.

Certification and Market Access

All ten respondents acknowledged that certification is strategically important for international market entry. The three certified SMEs reported tangible benefits: invitations to international trade fairs, increased buyer trust, and access to supply chain partnerships unavailable to uncertified competitors. The seven non-certified SMEs reported missed export opportunities, rejection by foreign buyers, and reliance on product testing results in lieu of formal credentials. A near-universal sentiment was that certification would become an indispensable requirement in the near future even for markets not currently mandating it.

Alternatives to Formal Certification

In the absence of formal certification, SMEs employed internal safeguards: manual cleaning protocols, in-house hygiene checklists, informal GMP-style practices, regular staff sanitation training, and supplier quality checks. While these measures demonstrate awareness and intent, they are insufficient to satisfy the due diligence requirements of international buyers.

Discussion: Consistent with Barney's (1991) Resource-Based View, the study confirms that Cambodian food SMEs lack the internal assets, including capital, skilled labour, certified infrastructure, and systematic quality management which are necessary to build and sustain a competitive advantage through certification. These deficiencies are not incidental; they are structural features of a sector dominated by micro and family enterprises with limited access to formal financial services and professional development.

Applying Scott's (2005) Institutional Theory, the study reveals that the external environment has failed to provide adequate coercive, normative, or mimetic incentives to drive certification uptake. Regulatory frameworks are fragmented across agencies; enforcement in rural and informal markets is weak; and the absence of a dedicated SME certification support infrastructure leaves enterprises without coherent guidance. Urban SMEs experience greater mimetic pressure, they observe certified competitors gaining export contracts and respond accordingly. Rural enterprises largely lack this peer stimulus.

A brief comparative analysis with Thailand illuminates what a more enabling institutional environment looks like. The Thai Department of Skill Development offers zero-interest loans of up to 1 million baht (approximately USD 30,000) for SME workforce upskilling and certification preparation. The National Food Institute delivers specialised HACCP and ISO 22000 curricula. The Thai Food and Drug Administration has streamlined approval procedures with digital application systems. These structural supports explain, in significant part, why Thai food SMEs have achieved substantially higher certification rates than their Cambodian counterparts. Cambodia's ongoing reforms, including MISTI's digitisation of 199 services and the Cambodia Quality Seal (CQS) initiative are encouraging but require deeper institutionalisation to replicate Thailand's outcomes.

A particularly notable finding was that many respondents viewed certification not merely as costly, but as structurally incompatible with their scale of operations. Existing frameworks were perceived as designed for large enterprises. This perception whether accurate or not, functions as a psychological barrier that suppresses certification intent independent of financial or technical capacity. Addressing this perception requires both the reform of certification pathways and demonstrable case studies of small enterprises that have successfully navigated the process.

Implications and Recommendations: The following recommendations are derived from the empirical findings and their triangulation with existing literature. They are directed at three distinct actors and are designed to be actionable within Cambodia's current institutional context.

Challenge Area	Actor	Recommendation
Financial Constraints	SME owners	Form cooperatives to share certification costs and pool resources
Financial Constraints	Government	Establish targeted low-interest loans, subsidies, and matching grants for rural and female-led SMEs
Skill & Knowledge Gaps	SME owners	Appoint food safety leads; engage in peer mentoring with certified SMEs
Skill & Knowledge Gaps	Government	Deliver province-level, hands-on GMP/HACCP/ISO 22000 training in Khmer
Infrastructure Deficits	SME owners	Prioritise low-cost, high-impact improvements: sanitation, pest control, safe storage
Infrastructure Deficits	Government	Invest in shared rural water, electricity, and regional food safety testing laboratories

Challenge Area	Actor	Recommendation
Regulatory Complexity	SME owners	Partner with chambers of commerce and export agencies for guided compliance support
Regulatory Complexity	Government	Build a bilingual (Khmer/English) digital one-stop certification portal with step-by-step guidance
Awareness & Culture	All stakeholders	Run SME success-story campaigns; establish peer-learning platforms to normalise certification

Implications for Policy

The findings point to a need for policy coherence: financial incentives, training infrastructure, and regulatory simplification must be advanced in parallel rather than in isolation. Targeted interventions that have achieved traction in the Thai context, including co-financed certification schemes, provincial training hubs, and dedicated SME advisory units within the Ministry of Industry, which merit serious consideration for adaptation to the Cambodian context.

Implications for Practice

For SME operators, the study highlights that incremental improvement begin with GHP and GMP-aligned practices before progressing to HACCP and ISO

22000 that represents a feasible certification pathway. Cooperative models, where clusters of SMEs share certification and compliance costs, are underutilised in Cambodia and warrant active piloting.

Implications for Academia

This study establishes a foundation for further empirical work on SME certification readiness in emerging economies. Future research priorities include: longitudinal tracking of SMEs through the certification journey; quantitative surveys to assess barrier prevalence at scale; consumer perception studies of certified versus non-certified Cambodian products; and evaluations of the return on investment from certification for SMEs in different subsectors

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The Economic Impact of Rice Supply Chain Disruptions on Smallholder Farmers in Cambodia

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Introduction: Rice is Cambodia's most strategically important crop, central to food security, rural employment, and national export earnings. Smallholder farmers, operating plots typically under two hectares, account for the majority of the country's rice production. However, their participation in a fragmented, poorly integrated supply chain leaves them chronically vulnerable to economic shocks. Globally, smallholder farmers produce an estimated 70–80% of the world's food supply (Ricciardi et al., 2018), yet they frequently capture the least value from agricultural markets. Cambodia's rice sector generated approximately USD 1.9–2.0 billion in export revenue in 2024, with fragrant rice varieties accounting for 76% of milled exports. Despite this macroeconomic significance, the conditions experienced by individual farming households have received insufficient systematic attention in research and policy. Existing research has focused predominantly on national-level production statistics and export regulation, overlooking the granular economic realities confronting individual smallholder farmers. Supply chain disruptions caused by a confluence of environmental, infrastructural, financial, and market-related factors erode incomes, deepen household debt, and undermine long-term agricultural viability. This study addresses that gap by examining the direct impact of disruptions on farmers' incomes, production costs, and market access across four rice-growing provinces.

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Methodology: This study employed a qualitative research design, prioritising the lived experiences and economic narratives of smallholder farmers. Semi-structured interviews were conducted, providing flexibility to elicit detailed accounts while maintaining structured alignment with the three core research questions.

Sampling and Data Collection

A purposive sampling approach was used to recruit 12 smallholder farmers across four provinces selected for their geographic diversity and distinct supply chain challenges: Battambang (northwest), Kampong Thom (central), Prey Veng (southeast), and Takeo (south). Eligibility criteria required participants to actively farm rice on fewer than five hectares and to have experienced supply chain disruptions within the preceding three years. The sample included both male and female participants to capture gender-differentiated experiences.

Each interview lasted 30–45 minutes and was conducted in person or by telephone. Interview questions were organised into four thematic parts: farmer demographics, causes of disruption, economic impact, and coping strategies. Secondary data were sourced from the Ministry of Agriculture, Forestry and Fisheries (MAFF), the Food and Agriculture Organization (FAO), the International Fund for Agricultural Development (IFAD), the World Bank, and the Cambodia Development Resource Institute (CDRI).

Data Analysis

Interview transcripts and field notes were analysed using thematic analysis, grouping farmer responses into recurring themes aligned with each research question. Themes were cross-validated against secondary literature to assess convergent validity. All participants were assigned anonymised codes

(Farmer A–L) and provided informed consent prior to participation. The study was approved by the university ethics committee.

Findings

Causes of Rice Supply Chain Disruptions

Five primary categories of disruption emerged consistently across all four provinces. Table 1 presents their frequency of occurrence among the 12 interviewed farmers.

Table 1: Primary Causes of Rice Supply Chain Disruptions (n = 12)

Disruption Category	Farmers Reporting	% of Sample	Primary Consequence
Poor roads and transport infrastructure	10 of 12	83%	Delayed buyer pickup; rice spoilage; quality downgrade
Middlemen control over pricing	9 of 12	75%	Prices 20–30% below prevailing market rate
Lack of storage and drying facilities	8 of 12	67%	Forced immediate sale at depressed prices
Climate-related events (flood / drought)	7 of 12	58%	Crop loss, delayed planting, reduced yields
Late arrival of buyers	6 of 12	50%	Quality deterioration; reduced farm-gate price

Poor road infrastructure was the most pervasive challenge. During the rainy season, many rural roads become impassable, preventing transport vehicles from reaching farms. As one farmer from Takeo explained, the market road was rendered inaccessible following seasonal flooding, resulting in rice spoilage before buyer collection could be arranged. This finding is consistent with World Bank (2022) assessments that rural infrastructure remains one of the most significant impediments to market integration in Cambodia.

Middlemen exert substantial pricing power. With limited access to cooperatives, digital market platforms, or direct buyer relationships, the majority of farmers sell through intermediaries who pay prices considerably below the open market rate. The absence of drying equipment and safe storage compounds this dependency, as farmers face a binary choice between immediate discounted sale or risking post-harvest losses.

Economic Impact on Smallholder Income

All 12 interviewed farmers reported a material reduction in income attributable to supply chain disruptions. Self-reported income losses ranged from 20% to 50% of anticipated seasonal revenue, with a central estimate of 30–35%. Table 2 illustrates province-level income loss estimates for a representative subset of participants.

Table 2: Estimated Income Loss Due to Supply Chain Disruptions (Selected Farmers)

Farmer Code	Province	Estimated Loss	Primary Cause
Farmer A	Battambang	35%	Buyer delays; poor road access
Farmer B	Kampong Thom	25%	Middlemen pricing below market rate
Farmer C	Prey Veng	40%	Flooding; absence of drying facilities
Farmer D	Takeo	30%	Late selling; rice spoilage
Farmer E	Battambang	20%	Lack of storage; road degradation
Farmer G	Prey Veng	~45%	Severe weather disruption; no cooperative access
Farmer L	Takeo	35%	No storage; compounded climate risk

These losses carry cascading household consequences. Farmers reported an inability to service microfinance loans, which commonly carry interest rates of up to 2% per month. When income falls short of repayment schedules, farmers are compelled to either sell assets or take on additional high-interest debt. Several participants described being unable to purchase seeds or fertiliser for the subsequent growing season, creating a cycle of constrained investment and declining productivity. In Prey Veng and Takeo, debt-to-income ratios were reported at critical levels, with some households reporting average loan burdens exceeding USD 3,800.

Coping Strategies Employed by Farmers

Despite the severity of disruptions, farmers have developed pragmatic adaptive strategies. Table 3 summarises the most commonly reported approaches.

Table 3: Coping Strategies Reported by Smallholder Farmers (n = 12)

Coping Strategy	Farmers Using	% of Sample	Key Benefit
Group / cooperative selling	7 of 12	58%	Reduced transport costs; improved bargaining power
Crop diversification (cassava, vegetables)	6 of 12	50%	Supplementary income during rice price troughs
Delayed selling (where storage permits)	4 of 12	33%	Capture higher post-harvest prices
Family-based informal credit	5 of 12	42%	Avoidance of high-interest formal loans

Coping Strategy	Farmers Using	% of Sample	Key Benefit
Contract farming with NGOs or exporters	3 of 12	25%	Guaranteed price; access to drying / transport

Group selling through cooperatives emerged as the most widely adopted strategy and the one with the clearest income benefit. Farmers who participated in cooperative arrangements consistently reported greater confidence in price negotiations and access to shared drying and storage infrastructure. Contract farming, while least common, offered the most structured protection against price volatility, typically guaranteeing a minimum floor price alongside logistical support.

Discussion: The findings confirm that smallholder farmers occupy the most economically precarious position within Cambodia's rice value chain. Structural weaknesses—particularly inadequate rural infrastructure and the dominance of informal middlemen—systematically transfer price risk downward to individual farming households. This is compounded by the near-universal absence of on-farm or village-level storage, which eliminates any flexibility to time sales strategically. The CDRI has documented that only approximately 10.78% of rice processing companies purchase directly from individual farmers, and just 4.41% engage with farmer cooperatives. This institutional disconnect leaves the vast majority of smallholders without reliable, equitable market access, highlight a gap that middlemen fill at a significant cost to farmer margins.

Climate variability is materially worsening supply chain disruption. With only 16% of Cambodian rice fields having access to functional irrigation systems, most smallholders remain entirely dependent on increasingly unpredictable rainfall. The 2019 drought severely impacted production in Preah Vihear and Oddar Meanchey provinces. Coastal and delta regions additionally face soil salinisation driven by rising sea levels, rendering productive rice fields increasingly marginal. These environmental stresses are not transient; however, they represent a structural shift in production risk that demands long-term, systemic policy responses.

The intersection of income volatility and high-cost debt is particularly damaging. When supply chain disruptions reduce income below debt servicing thresholds, farmers are forced into distress-selling cycles that perpetuate financial fragility. The reliance on informal credit often tied to pre-arranged sales agreements with traders further entrenches dependency relationships. This dynamic is consistent with IFAD (2022) findings that external supply chain shocks are the primary driver of rural income volatility in Cambodia.

A significant gap in the existing literature is the treatment of Cambodia as a homogenous agricultural landscape. This study confirms that supply chain vulnerabilities differ materially by province. Battambang farmers face primarily infrastructure and transport constraints; Prey Veng and Takeo farmers are disproportionately affected by flooding and lack of storage. Effective policy intervention must be regionally differentiated rather than nationally uniform.

Implications and Recommendations

Implication for Government and Policymakers

- **Invest in rural road and irrigation infrastructure:** Prioritise gravel road construction and maintenance in high-vulnerability zones during the wet season. Develop small-scale, community-managed irrigation systems, particularly in drought-prone northwestern and northeastern provinces using solar-powered pump technology to reduce dependency on rainfall and enable flexible planting schedules.
- **Establish a price stabilisation mechanism:** Introduce a Minimum Support Price (MSP) programme modelled on the Indian experience, targeting flood and drought vulnerable provinces as a pilot. This would provide a guaranteed income floor during price crashes, reducing farmer exposure to market volatility.
- **Regulate middlemen and promote transparent pricing:** Mandate public disclosure of prevailing farm-gate prices through agricultural extension offices and digital platforms. This reduces information asymmetries that middlemen currently exploit.

Implication for Development Organizations and NGOs

- **Expand cooperative infrastructure:** Support the legal establishment, capacity training, and financial capitalisation of farmer cooperatives, particularly in Prey Veng and Takeo, where cooperative penetration is lowest. Well-resourced cooperatives can provide collective bargaining, shared storage, and market access.
- **Deploy weather-indexed crop insurance:** Scale pilot weather-indexed insurance schemes to cover floods and droughts. Automatic, trigger-based payouts remove the burden of complex claims processes and provide timely financial relief following climate shocks.
- **Strengthen agricultural extension services:** Deliver localised, language-appropriate training on climate-smart farming techniques,

including drought-tolerant varieties, System of Rice Intensification (SRI), and Integrated Pest Management (IPM), through village-level farmer field schools.

Implications for Private Sectors and Research Institutions

- **Develop digital market access platforms:** Invest in mobile-based price information and buyer-matching tools tailored to rural, low-literacy users. Evidence from Kenya, India, and the Philippines demonstrates that digital market platforms meaningfully reduce middlemen exploitation and improve farm-gate returns.
- **Expand post-harvest infrastructure:** Support public-private investment in village-level storage silos, mobile dryers, and milling centres. Reducing post-harvest losses through better infrastructure directly translates to higher effective income per tonne harvested.
- **Commission longitudinal field research:** The current evidence base relies heavily on cross-sectional, nationally aggregated data. Multi-year, province-level studies tracking the same farming households would provide the granular, time-sensitive insights necessary to design effective emergency response programmes.

Recommendation

High priority Recommendation

- **Rural Road Improvement and Irrigation Investment:** The government, in collaboration with the Asian Development Bank (ADB), should prioritize investment in rural road networks and smallholder-accessible irrigation systems. Physical connectivity remains a fundamental barrier to market integration and productivity, and the positive impact of such investments has been well-documented in Thailand and Vietnam.

- **Minimum Support Price (MSP) Mechanism:** The Ministry of Agriculture, Forestry and Fisheries (MAFF) should implement a formal MSP mechanism to provide smallholder farmers with a reliable price floor, reducing their exposure to volatile commodity markets. India and Thailand offer established institutional frameworks from which MAFF can draw in structuring procurement logistics and price-setting methodologies.
- **Weather-Indexed Crop Insurance:** A tripartite partnership between the government, NGOs, and the International Finance Corporation (IFC) should develop and scale weather-indexed crop insurance schemes. Unlike traditional indemnity-based insurance, weather-indexed products reduce administrative costs and offer timely, objective payouts. Precedents from India, the Philippines, and Kenya demonstrate their effectiveness in reducing smallholder vulnerability to climate-induced income shocks.
- **Farmer Cooperative Development:** NGOs, in partnership with government agencies, should lead the formation and capacity-building of farmer cooperatives at the village and district levels. Cooperatives strengthen collective bargaining power, improve access to credit, and facilitate linkages to formal markets, as demonstrated by successful models in India, the Philippines, and Bangladesh.

Medium Priority Recommendations

- **Digital Market Access Platforms:** The private sector, supported by NGOs, should invest in digital platforms that connect smallholder farmers directly to buyers, reducing dependence on exploitative intermediary chains. Platforms should accommodate low-literacy and low-connectivity users, drawing on proven models from Kenya, India, and the Philippines.

- **Village-Level Storage and Drying Facilities:** Government and private sector actors should jointly finance decentralized post-harvest infrastructure, including community storage units and mechanical drying facilities. The absence of such infrastructure compels farmers to sell at depressed post-harvest prices. Vietnam and Thailand have successfully deployed similar facilities through public-private partnership models.
- **Climate-Smart Agriculture Training:** NGOs and agricultural extension services should deliver structured training in climate-smart practices, including drought-resistant crop varieties, water-efficient irrigation, and soil conservation. As climate variability intensifies, building adaptive capacity at the farm level is increasingly urgent, with replicable models available from the Philippines, Vietnam, and Nepal.
- **Longitudinal Smallholder Research Programme:** Universities and research centres should establish a long-term research programme focused on smallholder income trajectories, technology adoption, and policy responsiveness. The current evidence base relies heavily on cross-sectional data, limiting causal inference. A longitudinal approach, consistent with regional best practice, would generate the sustained empirical foundation necessary for adaptive policymaking.

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Exploring Opportunities and Challenges of Agritourism for Farming Businesses in Cambodia

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Introduction: Cambodia's agrarian economy remains central to national development. With approximately 16.5 million people, nearly 80% residing in rural areas, agriculture and fisheries employ up to 49% of the country's labour force and contribute 22% of gross domestic product (GDP). Despite its scale, the sector faces persistent structural challenges, including limited market access, low productivity, inadequate financing, and insufficient technical capacity. In parallel, Cambodia's tourism sector has demonstrated significant growth, contributing approximately 12% of national GDP prior to the COVID-19 pandemic. The convergence of these two sectors, mainly agriculture and tourism that presents a compelling development opportunity: agritourism. Agritourism is broadly defined as any practice developed on a working farm or agricultural enterprise designed to attract visitors for purposes of education, recreation, or direct engagement with farming activities (Barbieri and Mshenga, 2008; Thol and Serey, 2023). Internationally, the sector reached a market valuation of USD 69.24 billion in 2019, projected to grow at a compound annual growth rate of 11.9%, reflecting a global surge in demand for authentic rural experiences. In Cambodia, agritourism development remains nascent and fragmented. Most initiatives are driven by individual farmers or local non-governmental organisations rather than coordinated national policy frameworks. Local

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farmers frequently lack access to adequate hospitality infrastructure, digital marketing platforms, and business training, factors that constrain the profitability and scalability of agritourism ventures (Saut and Yamada, 2013; Koh Trong Ecotourism Community). This study addresses a critical knowledge gap by examining agritourism from the perspective of farm owners actively engaged in the practice. It investigates the key opportunities that motivate farm owners to diversify into agritourism and the principal challenges they encounter in establishing and sustaining such businesses within the Cambodian context. Therefore, this study explores:

- What are the key opportunities that motivate farm owners in Cambodia to venture into agritourism?
- What are the key challenges that farmers face when integrating agritourism into their farm business?

Methodology: A qualitative, exploratory, and inductive research design was employed in this study to capture the perspectives, experiences, and decision-making processes of agritourism farm owners, dimensions not readily accessible through quantitative approaches. Following Yin (2018), a multiple case study strategy was adopted to enable cross-case comparison and a richer contextual understanding of agritourism dynamics at the farm level. Data were collected through semi-structured, in-depth interviews lasting approximately 20 to 30 minutes each, conducted simultaneously with on-site farm tours to allow for observational corroboration of participant accounts. Participants were selected through purposive and convenience non-random sampling, with eligibility criteria restricted to farm-based businesses that had integrated agritourism operations within the preceding one to two years. The final sample comprised six farm owners and managers, which designated F1, F2, F3, F4, F5 and F6 located across Phnom Penh, Kandal, Kompot, Kampong Thom and Mondulkiri Province. Initial contact was made with ten agritourism enterprises via email and Telegram, of which six consented to participate. Data collection took place during April and May 2025, with all sessions conducted on-site and audio-recorded with participant consent. Data analysis followed the thematic analysis framework outlined by Braun and Clarke (2006), proceeding through the stages of transcription, coding, theme identification, interpretation, and reporting. To ensure analytical rigor, several validity measures were implemented, including supervisor-reviewed interview questions, mock interview pre-testing, and member-checking of transcripts to verify interpretive accuracy. Ethical standards were maintained throughout the research process. All participants were anonymised using the designations F1, F2, and F3; informed consent was obtained prior to data collection; and all raw audio data were deleted upon completion of transcription.

Findings: Thematic analysis of the three interview transcripts generated eight primary themes — four pertaining to opportunities and four to challenges. These themes are presented below with supporting evidence from participant responses.

Opportunities: Key Themes

Theme	Key Findings	Farms Affected	Prevalence
Business Diversification	Transition from mono-crop farming to multi-service tourism models (farm tours, homestays, restaurants, cultural workshops)	All 6 farms	100%

Income Generation & Direct Market Access	Multiple revenue streams; elimination of intermediaries; flexible pricing from entry fees to premium villa stays	All 6 farms	100%
Local Job Creation	Employment of villagers, youth and students; on-the-job training reducing rural outmigration	All 6 farms	100%
Cultural & Environmental Value	Promotion of Khmer culinary traditions, organic/chemical-free farming, and sustainable ecological practices	F1, F2, F4, F5, F6	83%

All six farms transitioned from mono-crop production to multi-service agritourism operations. Farm 1 (F1) evolved from vegetable cultivation to include a coffee shop, restaurant, accommodation, farm tours, boating, and event bookings. Farm 2 (F2) producing Australian mangoes, coconuts, and jackfruit, expanded into a comprehensive family-oriented attraction featuring a petting zoo, art gallery, archery, villa accommodation, and an event hall. Farm 3 (F3) centred on organic vegetables and added boat rides, a children's playground, farm-to-table dining, and product sales. Farm 4 (F4) specialised in spices and peppers, differentiating through culinary tourism: guided tours, cooking classes, a spice bar, and premium villas priced at USD 150–200 per night. Farm 5 (F5) operated the most diversified model, which spanning date palms, melons, mangoes, and cashews with a dried mango processing unit, farm restaurant, mini-mart, and scenic photography areas. Farm 6 (F6) focused on coffee and organic vegetables, offering immersive eco-farm stays at USD 15 per night, targeting environmentally conscious visitors.

Income generation was cited by all participants as a foundational motivation. Farms generate revenue through entry fees (F2: USD 2.50 per person), food and beverage services (F1, F5: USD 3 per meal), premium experiences (F4: cooking classes at USD 28), and direct product sales. By serving customers directly, farms eliminate intermediary costs and achieve better margins than through conventional agricultural supply chains.

Local job creation was a consistent and socially significant benefit. Farm 1 reported that approximately 80% of its staff were local villagers. Farm 2 explicitly linked employment to reduced rural outmigration. Farm 3 offered flexible work arrangements for university students. Farm 6 provided free natural farming training to community farmers and paid consultancy packages for institutions. Across all six farms, on-the-job training was the predominant mode of workforce development.

Cultural and environmental value emerged as a compelling but less-formalised opportunity. Farm 4's cooking classes promoted Khmer culinary heritage. Farms 5 and 6 prioritised chemical-free, organic farming demonstrations as educational experiences. Farms 1 and 2 highlighted the farm-to-table model as a form of environmental stewardship. These activities aligned with the growing global demand for authentic, eco-conscious travel experiences.

Challenges: Key Themes

Theme	Key Findings	Farms Affected	Prevalence
Infrastructure & Accessibility	Poor road conditions, unstable electricity, weak internet, water shortages — particularly for remote farms	All 6 farms	100%

Human Resource Shortages	Difficulty recruiting and retaining hospitality-skilled staff in rural locations; high turnover	F2, F3, F4, F5, F6	83%
Operational Difficulties	Absence of formal business plans; challenge of managing agriculture and tourism simultaneously	F1, F2, F3, F5	67%
Growing Market Competition	Rising number of agritourism entrants; pricing pressure; need for continuous service innovation	F1, F2, F4, F5	67%

Infrastructure and accessibility constraints affected all six farms, making this the most universally experienced challenge (100% prevalence). Specific issues included difficult road access, particularly during Cambodia's rainy season, particularly unreliable electricity supply, inadequate internet connectivity, water shortages affecting both farm operations and guest services, and insufficient parking during peak periods. These deficiencies limit marketing reach, disrupt operational continuity, and reduce visitor satisfaction.

Human resource shortages were reported by five of six farms (83%). Remote locations deter qualified applicants; training hospitality-ready workers from within local communities requires significant time and investment. Staff turnover was an ongoing operational burden for several farms. The challenge was compounded by the dual skill requirement, namely, agricultural knowledge combined with tourism and customer service competencies, a pairing rarely found among available rural workers.

Operational difficulties, particularly the challenge of managing agriculture and tourism simultaneously affected four farms (67%). Most operators entered agritourism without formal business plans, relying instead on organic demand signals (e.g., visitor requests for additional services). Managing visitor flow, maintaining service standards, and coordinating logistics alongside crop cycles created significant managerial complexity, particularly in the early stages.

Growing market competition was reported by four farms (67%). As agritourism gains visibility in Cambodia, existing farms face pressure from newer entrants offering comparable services. This necessitates continuous innovation in activities, facilities, and marketing, which a resource-intensive response that strains operations already managing infrastructure and staffing deficits.

Discussion: The findings are interpreted through the lens of Schumpeter's (1934) Entrepreneurship and Innovation Theory, which frames economic progress as driven by entrepreneurs who disrupt existing systems through creative recombination of resources. Cambodian farm owners in this study exhibit clear Schumpeterian characteristics: recognising market gaps, innovating service offerings, and absorbing risk in the pursuit of new value creation.

The transition from subsistence or commercial farming to multi-service agritourism parallels Schumpeter's concept of 'creative destruction', which the deliberate dismantling of established production models in favour of more dynamic, market-responsive alternatives. Farm 1's pivot from vegetable selling to hospitality-oriented agritourism, triggered by visitor curiosity, exemplifies entrepreneurial alertness. Farm 4's construction of a premium culinary niche in a relatively underdeveloped rural market represents product and market innovation. Farm 6's provision of farmer training services adds a knowledge-sharing and social entrepreneurship dimension rarely captured in conventional agritourism frameworks.

The findings align with and extend the existing literature. The primacy of income diversification as a driver is consistent with Bannor et al. (2022), Khanal et al. (2014), and McGehee and Kim (2004), who collectively document income supplementation and livelihood resilience as core agritourism motivations across diverse national contexts. The cultural preservation function observed in the Cambodian farms echoes Chhabra et al. (2024) and Sharpley (2002), who argue that agritourism is simultaneously an economic and cultural conservation strategy.

On the challenge side, the universal prevalence of infrastructure deficits resonates with Thea and Mardy (2023), who identified transport and connectivity as primary constraints on Cambodian agricultural value chains. The human resource challenge mirrors Schmidt et al.'s (2024) finding that 54% of global agritourism businesses operate understaffed, compelling owners to extend working hours significantly. Operational difficulties, particularly the absence of formal business planning, which confirm Tew and Barbieri's (2012) observation that human capital limitations constitute critical barriers to small-scale agritourism viability.

A nuanced tension emerges from the study: the very rural authenticity that makes these farms attractive to eco-conscious and experience-seeking visitors is also the source of their greatest operational constraints. Remoteness drives visitor interest but impairs infrastructure access, labour availability, and market reach. Successful agritourism development in Cambodia will require strategies that preserve rural authenticity while systematically addressing its structural disadvantages.

Implications and Recommendations: The findings carry actionable implications for farm entrepreneurs, academic and training institutions, and policymakers. The following recommendations are grounded in both the empirical findings and relevant international literature.

Implications for Farm Entrepreneurs

- Develop formal business plans before launching agritourism activities. Business planning should encompass operational logistics, marketing strategy, staffing requirements, and financial projections for both agricultural and tourism revenue streams.
- Invest in dual competency development: farming operators entering agritourism require skills in both agricultural management and hospitality service. Structured training in customer service, complaint management, and visitor experience design is essential.
- Adopt proactive visitor segmentation strategies. Rather than responding to demand organically, farms should identify target customer groups, namely families, student groups, corporate clients, international tourists and design differentiated experiences accordingly.
- Prioritise product and service differentiation. As market competition intensifies, farms should develop unique offerings rooted in local agricultural heritage, traditional Khmer culinary experiences, or organic farming practices that competitors cannot easily replicate.
- Establish collaborative supply networks with neighbouring farms to ensure product availability, reduce costs, and create value chain efficiencies that support both agricultural and tourism operations.

Implications for Academic and Training Institutions

- Agricultural universities and vocational training centres should integrate agritourism entrepreneurship into their curricula, incorporating practical placements at working agritourism farms as experiential learning components.
- Mentorship networks should be established to connect emerging agritourism operators with experienced practitioners, accelerating knowledge transfer and reducing the learning curve for new entrants.
- Research institutions, including the NUM R&D Centre, should expand empirical investigation of Cambodian agritourism to include broader geographic regions, larger farm scales, and longitudinal studies tracking enterprise development over time.

Implications for Policy makers and Government Agencies

- The Ministry of Agriculture and the Ministry of Tourism should establish a coordinated national agritourism policy framework, replacing the current fragmented, initiative-driven approach that provides regulatory clarity, financial incentives, and structured support for qualifying enterprises.
- Targeted capacity-building programmes, accessible to rural smallholders, should be funded and delivered to address the identified gaps in hospitality skills, digital marketing competency, and business management.
- Financial instruments, including low-interest credit facilities and grant schemes should be made available to agritourism enterprises to

support infrastructure investment, particularly in locations where geographic isolation limits access to conventional financing.

- Government agencies should develop digital platforms for agritourism promotion, aggregating farm listings, visitor reviews, and booking services to reduce individual marketing burdens and improve sector visibility domestically and internationally.
- Consistent with Schumpeter's (1934) framework, policymakers should position agritourism not merely as a tourism sub-sector but as a vehicle for entrepreneurial rural transformation, aligning agritourism development with broader goals of sustainable agriculture, rural resilience, and inclusive economic growth.

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Exploring Customer Trust in the Digital Transformation of E-Commerce in Cambodia

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Introduction: Cambodia's e-commerce sector has experienced rapid expansion, reaching US$1.51 billion in revenue in 2024 and projected to grow to US$1.78 billion by 2025, representing a Compound Annual Growth Rate (CAGR) of 17.88% (Ministry of Commerce, 2024). With over 18.98 million internet users and mobile penetration exceeding 100%, the country has developed the digital infrastructure necessary for broad e-commerce participation (Xinhua News Agency, 2025). Despite this growth trajectory, customer trust remains a critical barrier to deeper market engagement. Cambodia's digital commerce environment is characterised by a prevalence of social commerce through platforms such as Facebook Marketplace and TikTok, a growing but unevenly distributed digital literacy base, and an underdeveloped regulatory and consumer protection framework. Customers frequently encounter fraudulent sellers, misleading product descriptions, delayed or failed deliveries, and inadequate post-purchase support. These experiences erode confidence and limit participation in the digital economy, particularly among first-time and less digitally literate users. This research addresses a substantive gap in the literature. While customer trust in e-commerce has been extensively studied in developed and digitally mature markets, empirical investigation within Cambodia's unique sociotechnical context characterised by informal commerce channels, nascent regulation,

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and uneven digital adoption remains limited. The study is theoretically grounded in the Technology Acceptance Model (TAM) (Davis, 1989) and Trust Theory (Mayer et al., 1995), two well-established frameworks for examining technology adoption and trust formation in digital environments. Therefore, this study explores:

- What are the key factors influencing customers' trust in e-commerce platforms in Cambodia?
- How do perceptions of platform credibility, security and privacy, perceived ease of use, and perceived usefulness affect customers' trust?

Methodology: The study employed a concurrent mixed-methods research design, combining quantitative survey analysis with qualitative open-ended responses. This approach enabled triangulation of statistical findings with experiential consumer narratives, providing both breadth and depth in understanding trust formation. A structured, bilingual (English-Khmer) questionnaire was administered to 385 e-commerce users in Phnom Penh, Cambodia's primary digital commerce hub, using convenience sampling. The minimum sample size of 384 was calculated using Cochran's formula at a 95% confidence level and 5% margin of error. Respondents were predominantly aged 18–24 (82.6%), female (66.2%), and enrolled at the Royal University of Phnom Penh or the National University of Management. The questionnaire operationalised five constructs: Customer Trust (DV), Platform Credibility, Security and Privacy, Perceived Ease of Use, and Perceived Usefulness, all measured on a five-point Likert scale. Items were adapted from validated scales in the literature, including McKnight et al. (2002), Gefen et al. (2003), and Davis (1989). A pilot test of 30 participants confirmed linguistic clarity and cultural appropriateness. An open-ended question captured qualitative narratives about e-commerce experiences. Quantitative data were analysed using SPSS, encompassing descriptive statistics, Cronbach's Alpha reliability analysis, Pearson's correlation analysis, and multiple linear regression. The normality assumption was verified using a Normal Probability-Probability (P-P) Plot. Qualitative responses were subjected to inductive thematic analysis, with emergent themes mapped against the quantitative constructs to support triangulation. All participants provided informed digital consent. The study ensured anonymity through non-collection of personally identifying information. Data were stored in password-protected files accessible only to the research team, in compliance with the institution's ethical guidelines.

Findings

Measurement Reliability

All constructs demonstrated acceptable to excellent internal consistency. Platform Credibility (α = 0.933) and Perceived Ease of Use (α = 0.917) achieved excellent reliability, while Perceived Usefulness (α = 0.828) was very good, and Customer Trust (α = 0.763) and Security and Privacy (α = 0.733) were good, all meeting or exceeding the recommended threshold of 0.70 (Nunnally & Bernstein, 1994).

Variable	Role	Cronbach's Alpha	Regression Result
Customer Trust (TRU)	Dependent Variable	0.763	—

Variable	Role	Cronbach's Alpha	Regression Result
Platform Credibility (CRE)	Independent	0.933	Not Significant (p=.771)
Security & Privacy (SEC)	Independent	0.733	Significant (β=0.636, p<.001)
Perceived Ease of Use (EOU)	Independent	0.917	Not Significant (p=.954)
Perceived Usefulness (USE)	Independent	0.828	Not Significant (p=.380)

Table 1: Summary of Construct Reliability and Regression Results

Descriptive Statistics

Respondents reported generally positive perceptions across all constructs. Perceived Usefulness attained the highest mean scores (M = 3.99–4.10), followed closely by Perceived Ease of Use (M = 3.78–4.07) and Platform Credibility (M = 3.86–4.03). Customer Trust was more variable (M = 3.25–3.78), with trust in delivery processes rated higher than trust in seller honesty and transactional transparency. Security and Privacy means ranged from 3.36 (concern about sharing personal data) to 3.88 (confidence in payment systems), indicating moderate but cautious acceptance.

Correlation Analysis

Pearson's correlation analysis revealed one strong and statistically significant relationship: Security and Privacy with Customer Trust ($r = 0.636$, $p < 0.01$). This is the dominant bivariate relationship in the dataset. A notably high correlation was also identified between Platform Credibility and Perceived Ease of Use ($r = 0.956$, $p < 0.01$), suggesting considerable construct overlap and raising the possibility of multicollinearity in the regression model. All other correlations with Customer Trust were weak and non-significant.

Regression Analysis

The multiple linear regression model achieved a satisfactory fit ($R = 0.639$, $R^2 = 0.409$, Adjusted $R^2 = 0.402$), indicating that approximately 40.9% of variance in Customer Trust is explained by the four predictors. The overall model was statistically significant ($F = 65.296$, $p < 0.001$). However, of the four independent variables, only Security and Privacy emerged as a significant predictor ($\beta = 0.636$, $p < 0.001$). Platform Credibility ($p = .771$), Perceived Ease of Use ($p = .954$), and Perceived Usefulness ($p = .380$) were all non-significant. This finding indicates that, in the Cambodian e-commerce context, consumer trust is driven primarily by the perceived safety of transactions and the protection of personal data, rather than by platform aesthetics, usability, or functional utility.

Qualitative Findings

Thematic analysis of 384 open-ended responses identified six dominant themes corresponding to consumer pain points. Delivery reliability was the most frequently cited concern (46.9% of respondents), followed by pricing transparency (36.5%), product quality and authenticity (31.2%), customer service and seller responsiveness (26.0%), honest selling practices (24.7%), and platform security and anti-fraud measures (20.8%). Positive experiences centred on efficient delivery, accurate product descriptions, and responsive communication, confirming that when platforms operate with integrity, trust is cultivated. The qualitative data strongly corroborated the quantitative primacy of Security and Privacy, with numerous respondents recounting fraud incidents, blocked communications after payment, and non-delivery of goods.

Discussion: The finding that Security and Privacy is the sole significant predictor of consumer trust aligns with established e-commerce trust literature (Gefen et al., 2003; Kim et al., 2008; Pavlou, 2003) and is contextually consistent with Cambodia's early-stage digital adoption environment. In markets where regulatory enforcement is limited and consumer protection mechanisms are nascent, users assign priority to risk mitigation over utilitarian or experiential considerations. Trust in this context functions as a threshold condition: consumers must first feel secure before they evaluate ease of use or usefulness. The descriptive statistics reveal a nuanced picture. While respondents report moderate confidence in payment system security ($M = 3.88$), they are considerably more guarded about sharing personal and financial data ($M = 3.36$). This gap suggests that technical security measures, while improving, have not yet translated into comprehensive privacy assurance. The non-significance of Platform Credibility, Perceived Ease of Use, and Perceived Usefulness as predictors of trust despite their high average ratings is a substantive finding that warrants interpretation. It does not imply these constructs are unimportant; rather, it reflects their secondary position in a trust-formation sequence where security is a prerequisite. In a digitally maturing market, these factors are likely to become increasingly relevant as consumers develop baseline confidence in platform safety. The extremely high correlation between Platform Credibility and Perceived Ease of Use (r = 0.956) also raises a methodological consideration regarding construct distinction in the Cambodian context, where consumers may perceive professional design and ease of navigation as a unified quality signal rather than separable attributes. Future research employing Confirmatory Factor Analysis could clarify this distinction.

Cambodia's e-commerce ecosystem presents specific trust challenges absent from more mature markets. The dominance of social commerce channels where formal trust signals such as credibility badges, escrow services, and institutional ratings are largely absent exposes consumers to elevated fraud risk. The concentration of purchasing activity on Facebook Marketplace and similar platforms, reported by 56.9% of respondents as their primary channel, means that trust is frequently mediated by informal peer networks and influencer endorsements rather than platform-level safeguards. This structural characteristic has significant implications for both platform design and regulatory strategy.

Implications and Recommendations: The study's findings carry actionable implications across five stakeholder groups. A strategic priority summary is provided below.

Implications For E-Commerce Platform Operators

Platforms must prioritise the implementation of end-to-end encrypted payment gateways, mandatory seller identity verification (KYC protocols), and transparent dispute resolution mechanisms. Escrow-based payment systems, where funds are held pending confirmed delivery, would directly address fraud-related trust barriers. Visible security indicators, SSL certification, trust badges, and two-factor authentication should be standard. AI-driven seller performance monitoring and tiered Verified Seller designations can provide consumers with differentiated trust signals.

Platforms should also establish and enforce clear data protection policies communicated in accessible Khmer-language formats.

Implications For Sellers and Vendors

Sellers bear direct responsibility for trust at the point of transaction. Accurate, high-quality product representations, prompt communication (within 24-hour SLAs), and fair return and refund policies are essential. Platforms should enforce these standards through systematic auditing and graduated sanctions for non-compliance. Seller training programmes on ethical marketing, customer service, and platform policy compliance should be institutionalised.

Implications For Logistics Providers

Delivery reliability, the single most cited consumer concern requires structural investment. Real-time GPS-enabled parcel tracking integrated with platform interfaces, systematic courier performance ratings, and last-mile delivery expansion into underserved areas are priority actions. Strategic partnerships between platforms and logistics providers for capacity planning and error reduction will enhance delivery consistency.

Implications For Government and Regulatory Bodies

The Ministry of Commerce and the Ministry of Posts and Telecommunications should collaborate to develop a comprehensive e-commerce regulatory framework requiring platform registration and compliance standards. A national Trusted E-Commerce Seal awarded to platforms demonstrating adherence to security, service quality, and ethical criteria would provide an institutional trust signal. Enactment of robust data protection legislation governing AI-driven marketing, consumer data use, and unsolicited communications is a priority. Nationwide digital literacy campaigns, consumer rights education, and accessible complaint resolution hotlines are essential public interest investments.

Implications For Consumers

Informed consumers are integral to a healthy digital marketplace. Consumers should be encouraged to verify seller credentials, scrutinise reviews from verified buyers, understand their data privacy rights, and report fraudulent behaviour through official channels. Government agencies and civil society organisations should develop accessible educational resources on safe online shopping practices and fraud identification.

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The Relation Between Executive (Ministry of Justice) and Judiciary

Mr. Noun Vongheng[9]

Introduction: Cambodia's legal and judicial history has been shaped by successive ruptures: French colonial administration (1863–1953), post-independence political instability, the near-total destruction of legal infrastructure during the Khmer Rouge regime (1975–1979), and the post-conflict reconstruction process overseen in part by the United Nations Transitional Authority in Cambodia (UNTAC, 1991–1993). These disruptions left a judiciary that was rebuilt from within an executive framework, establishing a pattern of structural dependence that persists to the present day.

The 1993 Constitution of the Kingdom of Cambodia formally enshrines the separation of powers and explicitly guarantees the independence of the judiciary under Article 128. The Supreme Council of Magistracy (SCM) was established to serve as the institutional guardian of judicial governance, responsible for appointments, promotions, and discipline. Yet the Ministry of Justice, an executive body retains substantial authority over judicial administration, operational guidelines, disciplinary preliminary investigations, judicial assignments, and case transfers. The result is a hybrid governance structure in which constitutional independence coexists with extensive executive oversight.

This research is motivated by the observation that formal constitutional guarantees are insufficient on their own to produce genuine judicial autonomy. The practical mechanisms through which the executive exercises

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authority over the judiciary must be examined, assessed against international standards, and reformed if Cambodia is to develop a judiciary capable of serving as an effective and credible check on executive power.

Research Questions

The thesis is organised around six primary research questions, each targeting a specific statutory provision:

- To what extent does Article 53 of the Law on the Status of Judges and Prosecutors (LSJP), read with Article 8 of the UN Basic Principles, restrict judicial freedom of expression?
- How does Article 39 of the LSJP allow executive influence over judicial promotion, and with what consequences for judicial autonomy?
- In what ways does Article 23 of the Law on the Organisation and Functioning of the Supreme Council of Magistracy (LOFSCM) enable executive gatekeeping over disciplinary proceedings?
- How does Article 11 of the Law on the Organisation of the Courts (LOC) affect administrative autonomy and practical independence?
- To what degree do Articles 16 and 17 of the LOC provide avenues for executive influence over judicial assignments and appointments?
- How do Articles 18 and 19 of the LOC allow executive discretion to shape judicial proceedings through off-site hearings and case transfers?

Methodology: The study employs a qualitative doctrinal and normative research design. This approach is appropriate because the central inquiry concerns the consistency of legal frameworks with constitutional principles and international standards, rather than the measurement of empirical outcomes or behavioural patterns.

Research Design and Method

Three primary methods are used in an integrated manner. First, doctrinal legal analysis involves close textual interpretation of statutory provisions, with attention to scope, purpose, and potential impact on judicial autonomy. Second, normative evaluation situates Cambodian law against the United Nations Basic Principles on the Independence of the Judiciary (1985) and other international instruments, using expert commentary, particularly from the International Commission of Jurists (ICJ) and the UN Office of the High Commissioner for Human Rights (OHCHR) as interpretive guides. Third, a limited comparative method references judicial governance arrangements in established democratic systems to contextualise Cambodian practice and illustrate alternative institutional designs.

Legal Instruments Analysed

The core primary sources are: the Constitution of the Kingdom of Cambodia (1993); the Law on the Status of Judges and Prosecutors (LSJP, 2014); the Law on the Organisation and Functioning of the Supreme Council of Magistracy (LOFSCM, 2014); and the Law on the Organisation of the Courts (LOC, 2014). These are evaluated against the UN Basic Principles on the Independence of the Judiciary and supplementary instruments including the Universal Declaration of Human Rights and the International Covenant on Civil and Political Rights.

The study is primarily normative and analytical. It does not incorporate empirical fieldwork, interviews, or case-based analysis of actual disciplinary proceedings, given the confidential or unpublished nature of many such records. Findings should therefore be understood as reflecting the legal framework as written and assessed against international standards, rather than as a behavioural or sociological account of judicial practice in Cambodia.

Findings: The analysis of eight statutory provisions across three laws reveals a consistent and cumulative pattern: the Ministry of Justice exercises authority over multiple dimensions of judicial governance in ways that create structural dependence, limit professional autonomy, and introduce mechanisms for potential political or administrative pressure on the judiciary.

Judicial Freedom of Expression (LSJP Article 53)

Article 53 requires judges to obtain prior authorisation from the SCM before publishing or broadcasting any commentary related to their judicial duties. Violations expose judges to disciplinary sanctions irrespective of criminal liability. When assessed against Article 8 of the UN Basic Principles, which affirms that judges enjoy freedom of expression and association subject only to the requirements of preserving judicial dignity, impartiality, and independence — Article 53 emerges as a broad prior censorship mechanism. The ICJ has consistently held that such restrictions must be narrowly tailored and must not prevent legitimate legal discourse, academic writing, or public education. The provision creates a chilling effect, discouraging judges from contributing to professional debate and reinforcing administrative control over judicial narratives. An unofficial interpretation permits court administrative units to disseminate general information, but this does not address the core problem: judges themselves are excluded from direct public engagement.

Judicial Promotion (LSJP Article 39)

Article 39 regulates the promotion of judges through a process formally anchored in the SCM. However, once the SCM reviews and approves a promotion list, the General Secretariat is required to transmit it to the Minister of Justice, who prepares the Royal Decree for submission to the King. This embeds an executive intermediary in a process that directly affects judges' careers. The ICJ identifies executive influence over promotion as among the most significant structural threats to judicial independence: even the perception that career advancement depends on executive approval is sufficient to generate self-censorship and compromise impartial adjudication. The findings confirm that Article 39 creates informal accountability to the executive at the expense of accountability to law.

Disciplinary Investigations (LOFSCM Article 23)

Article 23 authorises the Ministry of Justice to receive complaints against judges and prosecutors and to conduct preliminary examinations before referring cases to the SCM's Disciplinary Council. This arrangement places the executive at the entry point of judicial discipline, which effectively granting the Ministry gatekeeping power over which complaints proceed and which do not. International standards require disciplinary proceedings to be conducted by an independent authority free from political influence. The findings confirm that Article 23 creates a structural vulnerability: the risk of selective enforcement and the potential for retaliatory investigations generate apprehension among judges, even in the absence of overt interference, and undermine confidence in discipline as a neutral integrity mechanism.

Administrative Supervision and Court Inspection (LOC Article 11)

Article 11 empowers the Ministry of Justice, supported by the General Department of Court Administration, to supervise and review the administrative work of all courts, issue operational guidelines, and conduct inspections of courts and judicial officers. While administrative oversight is not inherently incompatible with judicial independence, the absence of clearly defined limits on ministerial inspection authority creates indirect pathways for executive influence over court operations. The findings show that Article 11 risks affecting case prioritisation, workload allocation, and judicial culture through the mechanism of continuous external scrutiny.

Judicial Assignments and Appointments (LOC Articles 16 & 17)

Article 16 provides that when a judge in a specialised court of first instance is unavailable, requests to assign a replacement judge from another court must be submitted to the Minister of Justice. Article 17 allows the Minister to designate an acting court president when the position is vacant or the incumbent is unable to perform their duties. Both provisions grant the executive a direct role in internal judicial governance. The ICJ has identified executive appointment of acting court leadership as particularly problematic, as it allows the executive to shape administrative priorities and judicial culture during potentially sensitive periods. The findings confirm that Articles 16 and 17 weaken judicial self-governance and create channels for executive influence over court composition and leadership.

Off-Site Hearings and Case Transfers (LOC Articles 18 & 19)

Article 18 requires court presidents to obtain ministerial authorisation before conducting trials outside official court premises. Article 19 authorises the Minister of Justice to transfer cases between courts when deemed necessary for public interest, social safety, or the effective functioning of justice. The absence of any appeal mechanism against jurisdictional decisions made under Article 19 further concentrates authority. The findings confirm that these provisions allow executive discretion to determine where and how cases are heard, creating a structural vulnerability that is particularly concerning in high-profile or politically sensitive matters.

Discussion: Taken individually, each statutory provision might be characterised as a reasonable administrative measure. Taken collectively, they form a coherent architecture of executive influence that permeates judicial governance from expression and career development to discipline, administration, case management, and court leadership. This cumulative effect is the central analytical finding of the thesis.

The Cambodian case illustrates a dynamic common to transitional and hybrid legal systems: the coexistence of constitutional commitments to separation of powers with statutory and administrative frameworks that preserve executive dominance. This dynamic is well-documented in the comparative literature on judicial independence. Ferejohn (2002) observes that executive control of promotion and discipline systems generates informal behavioural incentives far more powerful than formal institutional rules. Russell (2001) emphasises that genuine independence requires not only formal separation but control over internal governance and career security. Montesquieu's foundational insight that liberty cannot exist where judicial power is united with executive authority remains directly applicable.

The gap between constitutional promise and legal-institutional reality is not unique to Cambodia, but it is particularly pronounced given the country's post-conflict reconstruction context. The Ministry of Justice was created as the instrument of judicial rebuilding after the Khmer Rouge's destruction of the legal system. Its current authority is in significant part a residue of that reconstruction mandate, where appropriate in 1993, but increasingly inconsistent with a maturing constitutional order committed to the rule of law.

International assessments, including the ICJ's briefing paper on Cambodia's three judicial reform draft laws and the OHCHR's May 2014 commentary on the draft LOC, have consistently flagged these concerns. The findings of this thesis are therefore not isolated academic observations but align with a substantial body of expert analysis that has yet to produce the necessary legislative response.

From a checks-and-balances perspective, the study demonstrates that the judiciary's capacity to function as an effective counterbalance to executive power is structurally compromised. A judiciary whose members face restrictions on public expression, whose careers are subject to executive intermediation, whose discipline is controlled by an executive gatekeeper, and whose operations are subject to ministerial inspection and approval cannot credibly be described as independent in practice, regardless of the constitutional text.

Implications and Recommendations: The findings carry significant implications for constitutional governance, the rule of law, and public confidence in Cambodia's justice system. They also point toward a clear reform agenda. The following recommendations are presented in order of institutional significance.

Legislative Reform: Removing Executive Control from Judicial Governance

The most fundamental reform required is the amendment of the statutory provisions identified in this study to vest authority over judicial expression, promotion, discipline, inspection, appointment, and case management exclusively in the Supreme Council of Magistracy or other genuinely independent judicial bodies. Specifically:

- Article 53 of the LSJP should be revised to permit judges to engage in professional expression, academic writing, and public legal education, subject only to narrowly defined ethical limitations consistent with Article 8 of the UN Basic Principles.

- Article 39 of the LSJP should be amended to remove the Ministry of Justice from the promotion process. Promotions should be finalised within the SCM on the basis of transparent, merit-based criteria, with the Ministry limited to administrative facilitation of the Royal Decree process.
- Article 23 of the LOFSCM should be reformed to vest preliminary disciplinary investigation exclusively in the SCM, with clear procedural safeguards against selective enforcement and with the Ministry's role limited to receiving and forwarding complaints.
- Articles 11, 16, 17, 18, and 19 of the LOC should be amended to restrict Ministry authority to logistical and budgetary support, placing all decisions affecting court operations, judicial assignments, leadership appointments, hearing venues, and case jurisdiction within the exclusive competence of the judiciary.

Strengthening Judicial Self-Governance and Career Security

Legislative reform must be accompanied by institutional strengthening of the SCM as the principal body of judicial self-governance. This requires resourcing the SCM with an independent secretariat, a transparent disciplinary council operating under published procedures, and a promotion system governed by objective and publicly available criteria. Security of tenure, including protection against reassignment, delayed promotion, or disciplinary initiation as tools of informal pressure must be structurally guaranteed. Judges must be confident that their professional futures are governed by law and merit, not by executive favour.

Parliamentary Oversight as the Appropriate Accountability Mechanism

The study identifies a structural imbalance in accountability mechanisms: executive oversight of the judiciary is extensive, while parliamentary oversight of the executive's role in judicial affairs is weak. Strengthening the National Assembly's capacity to scrutinise judicial governance through dedicated committees, mandatory reporting requirements for the Ministry of Justice, and transparent legislative processes for judicial reform laws would provide accountability without compromising judicial independence. Parliamentary oversight is constitutionally legitimate and operationally distinct from the executive involvement that this study identifies as problematic.

Alignment with International Standards

Cambodia's judicial reform agenda should be anchored in the UN Basic Principles on the Independence of the Judiciary, the UN Guidelines on the Role of Prosecutors, and the International Covenant on Civil and Political Rights. Engagement with the ICJ, OHCHR, and regional bodies such as the Association of Asian Constitutional Courts can provide technical assistance, comparative models, and normative guidance for reform implementation. International alignment also strengthens Cambodia's credibility as a rule-of-law state in regional and global governance contexts.

Broader Significance

The reforms proposed in this study are not merely technical legal adjustments. They are foundational to Cambodia's constitutional order. A judiciary that is genuinely independent, which capable of ruling against the executive without fear of career consequences, of engaging publicly with legal issues without prior authorisation, and of managing its own discipline and administration without executive gatekeeping is essential to preventing abuse of power, protecting fundamental rights, and sustaining public confidence in the justice system. These outcomes are preconditions for democratic consolidation and long-term institutional stability.

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Enforcement Challenges in Food Safety Standards for Imported Meat and Vegetables in Cambodia: A Barrier to Consumer Rights and Domestic Competition

Mr. Srun Julian[10]

Introduction: Food safety is a fundamental dimension of public health governance and economic regulation. In Cambodia, the growing dependence on imported meat and vegetables, which driven by rapid urbanization, rising consumer demand, and deeper integration into the ASEAN Free Trade Area (AFTA) and the World Trade Organization (WTO) framework has elevated the urgency of effective food safety enforcement. Imported food products traverse complex international supply chains and are susceptible to contamination through pesticide residues, antibiotic residues, zoonotic pathogens, and microbial agents such as Salmonella, Campylobacter, and Escherichia coli. Cambodia has demonstrated legislative commitment through the enactment of three landmark instruments: the 2019 Law on Consumer Protection, the 2021 Law on Competition, and the 2022 Law on Food Safety. These laws represent a significant normative alignment with international standards, including the WTO Agreement on Sanitary and Phytosanitary Measures (SPS Agreement) and the Codex Alimentarius. However, legislation alone does not confer protection. Between 2014 and 2023, Cambodia recorded 134 foodborne disease outbreaks, over 7,000 cases of illness, and nearly 200 deaths, which a public health burden directly attributable to gaps in enforcement at the point of import and distribution. This research investigates the structural, institutional, and legal obstacles that impede the effective enforcement of food safety standards for imported meat and vegetables in Cambodia. It further examines the consequent impact on

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consumer rights and domestic market competition, and derives comparative policy lessons from Vietnam's more advanced enforcement model. The primary research questions addressed are: (i) What are the current regulatory and institutional efforts of competent authorities? (ii) What are the key enforcement challenges and their impacts on consumer protection and domestic competition? (iii) What practical legal and institutional reforms can strengthen enforcement effectiveness?

Methodology: This study employs a qualitative, doctrinal, and desk-based research design. The methodological framework integrates three complementary analytical approaches.

Doctrinal Legal Analysis

The study undertakes a systematic examination of Cambodia's primary legal instruments, including the 2022 Law on Food Safety, the 2019 Law on Consumer Protection, the 2021 Law on Competition, Inter-Ministerial Prakas No. 868 (2010) on institutional food safety arrangements, and Prakas No. 263/2019 on import inspection procedures. Analysis focuses on identifying legislative intent, institutional mandates, enforcement mechanisms, and gaps between normative prescription and operational reality.

Comparative Legal Analysis

Vietnam was selected as the primary comparative jurisdiction owing to its analogous developmental context, shared ASEAN regulatory commitments, and demonstrably more advanced food safety enforcement system. The analysis examines Vietnam's 2010 Law on Food Safety, the establishment of the Vietnam Food Administration (VFA), the implementation of risk-based inspection protocols, and the digitization of customs and food safety data through its national single window system.

Secondary Source Review

The study draws on peer-reviewed academic literature, reports from international organizations (WHO, FAO, World Bank, ADB, GIZ), government publications, publicly available enforcement data, and investigative journalism. Academic databases including HeinOnline, PubMed, JSTOR, SSRN, and Google Scholar were utilized. Although no primary field interviews were conducted, the study triangulates multiple secondary sources, including consumer surveys, donor reports, and institutional assessments to ensure validity and reliability of findings. The research scope is geographically delimited to Phnom Penh and Bavet City (Svay Rieng Province) as primary market hubs and entry points.

Findings

Legislative and Regulatory Progress

Cambodia has made notable strides in food safety governance. The 2022 Law on Food Safety consolidates previously fragmented regulations, introduces clearer definitions of food safety obligations, and formally aligns national standards with the WTO SPS Agreement and Codex Alimentarius. Enforcement responsibilities are distributed across three principal agencies: the Consumer Protection, Competition and Fraud Repression Directorate-General (CCF) under the Ministry of Commerce (MOC); the General Directorate of Agriculture (GDA) under the Ministry of Agriculture, Forestry and Fisheries (MAFF); and the Department of Drugs and Food under the Ministry of Health (MOH). Border clearance functions are performed in coordination with the General Department of Customs and Excise of Cambodia (GDCE).

The government has also pursued international cooperation through the ASEAN Food Safety Network and technical assistance programs supported by the FAO, WHO, JICA, and bilateral partners including Japan and Australia. These initiatives have included laboratory capacity workshops, inspector training, and public awareness campaigns.

Key Enforcement Challenges

<u>Institutional Fragmentation</u>

The multi-agency structure has produced overlapping mandates, duplicative inspections in some regulatory areas, and consequential enforcement voids in others. The absence of a unified national food safety coordinating body means that accountability is diffuse and coordination depends on informal inter-agency communication rather than systematized protocols. This fragmentation directly enables substandard imported products to enter the domestic market by exploiting jurisdictional gaps between agencies.

<u>Inadequate Technical and Laboratory Capacity</u>

Testing infrastructure for pesticide residues, antibiotic residues, and pathogenic contamination is critically underdeveloped and geographically concentrated in Phnom Penh. The two primary accredited facilities, the CCF laboratory and the Laboratory of Environment and Food Safety (LEFS) at Institut Pasteur du Cambodge are insufficient in throughput and geographic accessibility. Consequently, the majority of border inspections rely on documentary verification rather than physical or laboratory testing. Sample turnaround times of days or weeks mean that perishable contaminated goods may reach consumers before results are returned. The ASYCUDA customs system remains unconnected to any food safety or SPS database, further impeding real-time information sharing.

Informal Trade and Border Porosity

A significant and underestimated volume of imported meat and vegetables enters Cambodia through informal channels, bypassing official border checkpoints and evading SPS inspection altogether. In July 2025, MAFF's General Department of Animal Health and Production seized over 11 tonnes of illegally imported meat smuggled from Vietnam, an illustrative of a systemic vulnerability. Products entering through informal routes face no compliance costs, undercutting formally imported goods and incentivizing continued non-compliance. This dynamic creates a parallel, unregulated market that undermines consumer safety and distorts competition.

Transparency and Accountability Deficits

Enforcement data, which including inspection frequencies, laboratory results, rejection rates, and penalty records are not systematically disclosed by MAFF or MOC. This opacity prevents independent evaluation of enforcement effectiveness, limits informed consumer decision-making, and weakens institutional accountability. It also disincentivizes compliant producers and importers, as the regulatory playing field is insufficiently transparent to distinguish responsible actors from non-compliant ones.

Unanticipated Findings

Finding	Description
Scale of informal trade	Informal cross-border supply of meat and vegetables was substantially larger than initially anticipated, creating a parallel unregulated market that materially undermines formal enforcement mechanisms.

Enforcement data opacity	The near-total absence of publicly accessible enforcement statistics, including inspection frequency, contamination rates, and penalty outcomes represents a more severe transparency deficit than literature had indicated.
Political economy dimensions	Enforcement decisions at border crossings appear susceptible to political influence, particularly in cases involving commercially significant importers, a dimension not adequately captured by existing regulatory literature.
Low consumer awareness	Consumer knowledge of food safety rights, product labeling requirements, and available complaint mechanisms is substantially lower than secondary data had suggested, particularly among wet-market-dependent populations.

Discussion

Enforcement as a Regulatory Implementation Problem

The central theoretical contribution of this research is the reframing of Cambodia's food safety challenge as a regulatory implementation problem rather than a legislative deficit. The 2022 Law on Food Safety is substantively adequate in its normative design; it is the institutional translation of legal obligations into operational enforcement outcomes that remains critically underdeveloped. This is consistent with Baldwin, Cave, and Lodge's governance theory, which identifies coordination failure and capacity constraints as primary drivers of regulatory underperformance in multi-actor systems. Cambodia's enforcement regime is reactive in character triggered by consumer complaints or visible contamination rather than preventive and risk-based, as envisaged under the SPS framework. This inversion of regulatory logic means that the system is ill-equipped to intercept hazards before they reach end consumers, a structural deficiency that is compounded by insufficient laboratory throughput and absence of traceability systems.

Comparative Lessons from Vietnam

Vietnam provides an instructive reference point for Cambodia. Following the enactment of its 2010 Law on Food Safety and the establishment of the Vietnam Food Administration (VFA), Vietnam systematically reformed its enforcement architecture through three complementary mechanisms: (i) centralized institutional coordination under the VFA with clearly delineated agency responsibilities; (ii) the implementation of risk-based inspection protocols calibrated to product risk profiles and country-of-origin compliance records; and (iii) integration of food safety and SPS data into its national single-window customs system, enabling real-time information sharing between inspectors, laboratories, and border officials. Vietnam's annual food safety reports demonstrate measurable improvements in detection accuracy, inspection efficiency, and contamination case identification, outcomes that Cambodia has not yet achieved despite comparable legislative ambitions. The critical differentiator is not legislative quality but sustained government investment in institutional design, technical infrastructure, and data governance.

Impact on Consumer Rights and Domestic Competition

The enforcement deficiencies identified carry direct and measurable consequences for two protected legal interests. First, consumer protection is materially compromised. The right to safe food, to accurate product information, and to effective redress as enshrined in the 2019 Law on Consumer Protection cannot be exercised where inspection systems fail to detect contamination and where consumers lack the information necessary to distinguish compliant from non-compliant products. Low-income consumers, who predominantly source food from informal wet markets, bear disproportionately high exposure to food safety risks. Second, domestic competition is structurally distorted. Cambodian producers and compliant importers who adhere to CamGAP standards and food safety regulations face higher production costs and more stringent enforcement scrutiny than informal importers who bypass the system entirely. This regulatory asymmetry amounts to a compliance penalty imposed on law-abiding actors, reducing incentives for investment in safe domestic food production and creating negative competitive externalities that are not corrected by market mechanisms alone.

Implications

The findings of this study carry policy, institutional, and academic implications of broad significance. For policymakers, the research provides the first systematic post-reform assessment of the 2022 Law on Food Safety's enforcement architecture, establishing an empirical baseline for regulatory reform. It identifies specific institutional and procedural vulnerabilities that translate directly into actionable reform targets. For legal practitioners, the study reinforces the importance of bridging normative design and operational enforcement, and highlights the legal mechanisms such as risk-based inspection protocols and inter-agency coordination frameworks, through which this gap can be closed. For international development partners, the findings support the case for sustained, strategically targeted technical assistance in laboratory accreditation, inspector training, and digital infrastructure, which investments that yield compounding returns through improved enforcement outcomes. For academia, the study contributes to the comparative literature on food safety governance in low- and middle-income countries, demonstrating how enforcement failures in contexts of institutional fragmentation, hybrid formal-informal markets, and constrained resources constitute regulatory-induced market distortions with measurable social costs.

Recommendations

Based on the findings and comparative analysis, the following four-pillar reform agenda is recommended.

Pillar 1: Capacity Building and Resource Allocation

- Establish a national food inspector training program focused on risk-based inspection methodology, HACCP principles, and laboratory sampling techniques, aligned with Codex Alimentarius and WTO SPS standards.
- Allocate a dedicated, sustainable national budget line for food safety enforcement to reduce donor dependency and signal durable government commitment.
- Establish regional laboratory centers at key border provinces, including Banteay Meanchey, Svay Rieng, and Kampot to enable timely testing of imported products at the point of entry, reducing reliance on centralized Phnom Penh facilities.

- Introduce a structured risk-based inspection system that prioritizes inspection resources toward high-risk product categories, countries of origin with poor compliance records, and repeat non-compliant importers.

Pillar 2: Institutional Coordination and Digitalization

- Establish a national food safety inter-ministerial coordinating body with clearly defined institutional mandates, shared data systems, and joint accountability mechanisms to eliminate overlapping responsibilities among MAFF, MOH, and MOC.
- Urgently connect the ASYCUDA customs system to food safety and SPS databases to enable real-time information sharing between customs officers, SPS inspectors, and laboratory personnel.
- Develop a public-facing compliance portal for periodic publication of inspection results, rejected consignments, and food safety alerts, building consumer trust and institutional accountability.

Pillar 3: Consumer Awareness and Informal Trade Management

- Deploy additional border officials and enhanced inspection controls at known informal trade corridors, and introduce digital complaint and reporting hotlines for suspicious food consignments.
- Expand regulatory surveillance of informal wet markets through structured collaboration between local government authorities, food inspectors, and community health officials.
- Launch a national consumer education campaign on food labeling standards, expiry date literacy, product certification, and available

complaint mechanisms, with particular attention to wet-market-dependent communities.

- Introduce compliance incentives for informal traders such as reduced registration fees and facilitated formalization pathways to encourage transition into the regulated market.

Pillar 4: International Cooperation and Policy Learning

- Strengthen Cambodia's engagement in ASEAN food safety networks and pursue Mutual Recognition Arrangements (MRAs) to harmonize standards and reduce duplicative verification requirements.
- Pursue bilateral technical cooperation with advanced food safety jurisdictions, including Vietnam, Japan, and Australia for knowledge transfer in quality infrastructure, laboratory accreditation, and electronic inspection systems.
- Participate in regional data-sharing platforms for cross-border contamination surveillance and import compliance tracking.

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The Legal Framework for Implementing the Social Security Scheme on Unemployment in Cambodia: A Comparative Legal Analysis and Regulatory Assessment

Ms. Sok Chanmonyroth[11]

Introduction: Cambodia's social security architecture has developed progressively since the Law on Social Security for Persons Defined by the Provisions of the Labour Law (2002) established the National Social Security Fund (NSSF). Three schemes are currently operational: the Occupational Risk Scheme (launched 2008), the Health Care Scheme (2016), and the Pension Scheme (2021). The Law on Social Security Schemes (2019) added a fourth compulsory branch, mainly unemployment protection, yet more than six years after enactment, the scheme has not been operationalized. This absence is legally significant. Although Cambodia's official unemployment rate stands at 0.3% (2024), approximately 88.3% of the workforce is engaged in the informal economy. These figures mask substantial underemployment and precarious labour arrangements. The COVID-19 pandemic further exposed the vulnerability of workers lacking formal income-replacement mechanisms, compelling the government to resort to non-contributory cash transfers in lieu of insurance-based protection. Against this backdrop, the research examines why the unemployment scheme mandated by the 2019 Law has not been activated, what secondary legal instruments are required to operationalize it, and how international standards and regional comparative experience can inform the design of an enforceable regulatory framework. The study is motivated by the recognition that legal recognition alone does not produce social protection; it is the quality and completeness of

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implementing regulation that determines whether statutory rights become enforceable.

Research Objectives

- Analyse the unemployment provisions of the Law on Social Security Schemes (2019) and identify the legal gaps impeding implementation.
- Examine the regulatory models established for existing NSSF schemes as implementation precedents.
- Assess institutional and coordination barriers facing the MLVT and NSSF.
- Benchmark Cambodia's framework against ILO Convention No. 102 (1952) and Convention No. 168 (1988).
- Propose a legally grounded Sub-Decree framework and phased implementation roadmap.

Methodology: This study adopts a qualitative, doctrinal legal methodology structured around three analytical tiers. First, a doctrinal analysis of Cambodia's primary and secondary legislation, including the 2019 Law on Social Security Schemes and its subordinate regulations establishes the normative baseline and identifies regulatory gaps. Second, a comparative legal analysis of selected jurisdictions (Malaysia, Thailand, and South Korea) extracts transferable institutional and design lessons. Third, international benchmarking against ILO Convention No. 102 and Convention No. 168, as well as Recommendation No. 176 (1988), provides a normative framework for assessing Cambodia's compliance and guiding regulatory design. Primary legal sources include Cambodian national legislation, Sub-Decrees, Prakas and ministerial instruments, ILO conventions and recommendations, and the employment insurance statutes of the three comparator countries. These are supplemented by policy documents, including the National Social Protection Policy Frameworks for 2016–2025 and 2024–2035, and secondary literature from the ILO, World Bank, Asian Development Bank, and OECD. The study does not conduct actuarial analysis or economic forecasting; financial data are cited solely for contextual and descriptive purposes.

Findings

A Regulatory Vacuum, Not a Legislative Absence

The central finding is that Cambodia's unemployment scheme faces a legal vacuum rather than a policy vacuum. Articles 2, 8 and 81 of the 2019 Law establish unemployment protection as a compulsory branch of social security and assign legislative authority for implementation to the Council of Ministers via Sub-Decree. However, these provisions are non-self-executing: they cannot produce binding rights or obligations without the adoption of delegated legislation. In the absence of a Sub-Decree, the NSSF has no legal competence to collect unemployment contributions, and workers have no enforceable right to benefits.

This situation is a departure from established Cambodian administrative practice. Each of the three operational social security schemes was activated through a Sub-Decree that defined eligibility, contribution rates, benefit principles, and administrative responsibilities before the scheme commenced. The unemployment scheme has not received comparable regulatory treatment, despite six years of formal legal recognition.

Institutional Coordination as a Legal Deficit

Effective unemployment insurance requires close coordination between benefit administration (the NSSF) and employment services (the MLVT).

ILO Convention No. 168 mandates that beneficiaries must register with employment services, demonstrate active job search, and participate in re-employment programmes as conditions for continued benefit receipt. Cambodia's current legal framework does not establish binding mechanisms for inter-agency coordination, data sharing, or referral protocols between the NSSF and the MLVT's employment service infrastructure. Cambodia's public employment services administered through the National Employment Agency and the Department of Employment remain institutionally underdeveloped: staffing capacity is limited, labour market information systems are fragmented, and the primary operational focus is on overseas placement rather than domestic job-matching. This institutional gap constitutes a legal obstacle to implementation, not merely a capacity constraint, because Convention No. 168 requires the coordination link to be legally mandated rather than left to informal administrative arrangement.

Financial Governance Without Legal Foundation

A frequent justification cited for delaying the unemployment scheme is financial uncertainty, specifically, the absence of actuarial projections for a labour market in which 88% of workers are informally employed. The study finds, however, that financial uncertainty is a consequence of legal incompleteness rather than an independent barrier. Without a Sub-Decree prescribing contribution rates, a financing structure, and reserve fund requirements, there is no legal basis for actuarial assessment, no mechanism to collect contributions, and no authority to disburse benefits. The legal framework is a precondition for sound financial governance, not the other way around.

Comparative Lessons from Regional Systems

Three comparator jurisdictions offer instructive models for Cambodia:

Malaysia	Enacted the Employment Insurance System (EIS) through Act 800 (2017), effective January 2018. Administered by SOCSO, an existing institution comparable to Cambodia's NSSF with a low initial joint contribution rate of 0.4%. National coverage was introduced immediately, given SOCSO's pre-existing employer registration infrastructure. Benefits follow a declining schedule from 80% to 30% of insured wages over six months. An Early Re-employment Allowance incentivizes rapid return to work.

Thailand	Operates unemployment insurance under the Social Security Act (1990), fully activated by 2004 through a tripartite financing model: employers (0.5%), employees (0.5%), and government (0.25%). Benefits are differentiated by cause: involuntary termination attracts 60% replacement for 6 months; voluntary resignation 30% for 3 months. A 6-month qualifying period within 15 preceding months applies. Government co-financing signals state commitment and provides a fiscal buffer during economic shocks.

South Korea	Established its Employment Insurance System (EIA) in 1995 with a phased nine-year rollout, beginning with firms of 30+ workers and reaching universal coverage by 2004. Benefits (60% of daily wage) are conditioned on active participation in employment centres. The system integrates vocational training, job-placement support, and mobility

	allowances within a single legal framework, administered directly by the Ministry of Employment and Labor. Contribution rates of approximately 1.8% reflect a high-income economy and are not directly transferable to Cambodia.

Across all three systems, success depended on: a clear primary law supported by detailed delegated regulations; pre-existing or simultaneously developed employment service infrastructure; tripartite or bipartite financing at modest initial rates; phased coverage expansion; and sustained political commitment sustained beyond the enactment of primary legislation.

Discussion

The Primary Obstacle: Normative Incompleteness

The pattern that emerges from this research is consistent with a well-documented phenomenon in social security law: legal recognition is a necessary but not sufficient condition for effective protection. Cambodia's 2019 Law creates a legislative mandate; it does not create a functioning scheme. The Sub-Decree is the missing legal instrument that would transform the mandate into enforceable rights and operational administrative authority.

When measured against international standards, the current framework lacks minimum regulatory content on: eligibility conditions and qualifying periods; contribution obligations and rate-setting authority; benefit levels and duration; waiting periods; job-search conditionality; coordination mechanisms with employment services; sanctions for non-compliance; and dispute resolution procedures. Each of these elements is prescribed, which in varying degrees of specificity by ILO Convention No. 168 and reflected in the operational frameworks of the comparator jurisdictions.

Historical Pattern of Implementation Delay

Cambodia's social security history demonstrates a recurrent pattern: long intervals between statutory recognition and operational implementation. The Occupational Risk Scheme required six years from law to operation (2002–2008); the Health Care Scheme more than a decade (2002–2016); and the Pension Scheme was delayed for nearly two decades (2002–2021). Each scheme was activated only after strong political commitment, comprehensive secondary legislation, and phased institutional capacity-building converged. The unemployment scheme requires a similar convergence.

The COVID-19 pandemic, which exposed the absence of income-replacement mechanisms for workers facing sudden job loss, reinforced the urgency. The government's reliance on emergency cash transfers was an appropriate crisis response but not a sustainable substitute for contributory insurance. It demonstrated that the political and administrative infrastructure for income support exists; what is missing is the regulatory architecture to convert that capacity into rights-based unemployment protection.

ILO Standards Compliance Assessment

Cambodia's 2019 Law broadly aligns with the principles of ILO Convention No. 102, which requires formal recognition of unemployment as a social security contingency. However, it does not yet satisfy Convention No. 168's operational requirements: a replacement rate of at least 50% of previous earnings; benefit duration of at least 26 weeks per episode; coverage of at least 85% of employees; and legally mandated linkage between benefits and employment services. These standards do not require immediate full compliance; Convention No. 168 expressly permits phased implementation and progressive realization. They do, however, require that a defined regulatory pathway exists and that pathway currently does not.

Implications and Recommendations

Based on the foregoing analysis, the study advances a legally grounded framework for implementing Cambodia's unemployment scheme through the adoption of a comprehensive Sub-Decree and associated subordinate instruments. The recommendations are organized around six regulatory domains and a phased implementation structure.

Adopt a Comprehensive Sub-Decree

The immediate legislative priority is the adoption of a Sub-Decree pursuant to Article 81 of the 2019 Law. This instrument must specify:

- Scope: Initial coverage limited to employees in formal enterprises with eight or more workers, consistent with existing NSSF practice, with a defined pathway for gradual extension.
- Covered contingencies: Involuntary unemployment including redundancy, economic downturn, and enterprise closure; constructive dismissal where supported by applicable labour law principles. Voluntary resignation should be excluded in Phase 1.
- Contribution structure: Joint employer-employee contributions, with the precise rate to be determined by actuarial assessment and specified in a Prakas. A rate of 0.4–0.6% (modelled on Malaysia's EIS) is recommended as an economically viable starting point.
- Benefit design: A declining Job Search Allowance (JSA) starting at a replacement rate consistent with Convention No. 168 (at least 50% of

insured earnings), payable for up to 26 weeks, conditional on active job search and registration with employment services.

- Early Re-employment Allowance: A lump-sum incentive (equivalent to approximately 25% of remaining JSA entitlement) for beneficiaries who secure new employment before exhausting their allowance.
- Qualifying period: A minimum contribution history of six to nine months within the preceding 15–18 months.
- Administration: Assignment of benefit administration to the NSSF, with a dedicated unemployment unit, under MLVT supervision and tripartite governance oversight.
- Dispute resolution: An independent appellate mechanism based on existing NSSF grievance procedures.
- Coordination mandate: Binding inter-agency coordination provisions between the NSSF and MLVT employment services, including referral protocols and data-sharing arrangements.

Phase 2 and Phase 3 Benefit Expansion

Once core administrative systems and employment service linkages are operational, additional benefit categories should be introduced progressively:

- Training Allowance: Payable to insured persons participating in approved vocational training or re-skilling programmes, conditional on attendance and completion.
- Reduced Income Allowance: Supplementary support for beneficiaries who accept lower-paid employment than their previous position, facilitating labour market re-entry without prolonged benefit dependency.

- Mobility Allowances: Long-distance job search and relocation support to address geographical labour market mismatches, particularly relevant given Cambodia's uneven distribution of formal employment.

Strengthen Employment Service Capacity as a Legal Precondition

The study identifies employment service underdevelopment as a legal obstacle to Convention No. 168 compliance, not merely an administrative shortcoming. The Sub-Decree should designate employment service integration as a precondition for Phase 1 activation, and a parallel regulatory instrument (Prakas or Inter-Ministerial Prakas) should define binding referral obligations, job-search verification standards, and data-sharing protocols between the NSSF and the MLVT. Investment in MLVT employment service capacity, particularly staffing, IT infrastructure, and regional coverage must be treated as part of the legal implementation framework, not a subsequent administrative initiative.

Clarify the Legal Relationship Between Unemployment Benefits and Severance Pay

Under Cambodia's Labour Law, workers are entitled to severance pay upon termination linked to length of service. The Sub-Decree must establish a legally defined relationship between unemployment benefits and severance pay to prevent double compensation for the same earnings loss, consistent with Article 22 of Convention No. 168. Options include deducting severance payments from unemployment benefit entitlement, postponing benefit activation until severance is exhausted, or partial offsetting. This coordination is essential for financial safeguards and legal coherence.

Establish High-Level Political and Institutional Commitment

Comparative experience and Cambodia's own social security history demonstrates that legal activation of a new scheme requires more than regulatory drafting: it requires sustained political commitment at the Council of Ministers level, clear inter-ministerial responsibility assignment, and a defined implementation timeline. The study recommends that the government establish a dedicated Inter-Ministerial Working Group comprising the NSSF, MLVT, Ministry of Economy and Finance, and representative employer and worker organizations, to coordinate Sub-Decree drafting, actuarial assessment, and phased rollout planning. ILO technical assistance should be sought for actuarial modelling and regulatory design support.

Adopt a Hybrid Financing Model

Based on comparative analysis, a tripartite financing structure employer contributions, employee contributions, and a government co-contribution is recommended as the most appropriate model for Cambodia's developmental context. Government participation, even at a modest level (consistent with Thailand's 0.25% model), signals state commitment, provides a fiscal buffer during economic crises, and aligns with ILO principles requiring the state to act as ultimate guarantor of the scheme's financial soundness. Contribution rates should be set following actuarial assessment, with the Sub-Decree prescribing the financing principles and a Prakas specifying the applicable rates.

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Modernising Cambodia's Legal Framework For Digital Evidence Handling

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Introduction: The rapid growth of cybercrime in Cambodia has exposed a critical mismatch between the country's existing criminal legal framework and the realities of modern digital investigations. Cambodia's Digital Economy and Social Policy Framework 2021–2035 (DESPF) explicitly acknowledges that the country's legal framework for digital development remains 'incomplete and inadequate', identifying the absence of essential legislation on data protection, electronic transactions, and cybercrime as a systemic deficiency (Supreme National Economic Council, 2021, p. 13). At the core of this deficiency is the Code of Criminal Procedure (CCP, 2007), which constitutes the sole legislative instrument governing the admissibility of evidence in criminal proceedings. Its key provisions — Articles 91 and 92, governing searches and the sealing of exhibits, and Article 321, governing evidence evaluation were drafted exclusively with physical evidence in mind. They provide no guidance on collecting, preserving, or authenticating digital evidence, which is volatile, intangible, easily alterable, and requires specialised forensic procedures to ensure its integrity and admissibility. The Law on Electronic Commerce (LEC, 2019) represents Cambodia's most detailed legislative treatment of electronic evidence, offering admissibility rules (Article 35) and authentication presumptions (Articles 36–37). However, its scope is confined to commercial contexts, and its application in criminal proceedings remains legally uncertain. Furthermore, Article 43 of the LEC broadly prohibits encoding of evidence-related data, a provision that

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directly conflicts with modern encryption practices and undermines the coherence of the legal framework. In the absence of codified forensic procedures, courts rely on the subjective standard of 'intimate conviction' (Article 321, CCP), which provides no structured methodology for evaluating technically complex digital materials. This legislative gap, compounded by an underdeveloped forensic infrastructure, creates conditions in which cybercriminals may operate with relative impunity while victims lack meaningful legal protection. This manuscript presents the key findings, analysis, and recommendations of the underlying thesis, which proposes a draft Sub-Decree as a targeted, administratively efficient instrument to supplement the CCP with clear procedural rules for digital evidence handling without requiring contentious parliamentary amendment.

Methodology: The study employs a three-part analytical framework drawing exclusively on primary and authoritative secondary legal sources. No statistical or empirical data collection was undertaken; the research is doctrinal in nature.

Doctrinal Analysis

A systematic textual analysis of Cambodia's existing legal provisions was conducted, focusing on Articles 91, 92, and 321 of the CCP (2007) and Articles 35–45 of the LEC (2019). Each provision was assessed against four criteria, particularly, scope, clarity, enforceability, and adaptability and classified using a three-tier rubric: adequate (explicit guidance), partial (interpretable but lacking specificity), or inadequate (absent or unsuited to purpose).

Comparative Analysis

Singapore was selected as the primary comparative jurisdiction due to its geographic proximity to Southeast Asia, its shared trajectory from emerging to advanced digital economy, and its consistently updated cybercrime legislation. Two Singaporean instruments were examined: Sections 39 and 40 of the Criminal Procedure Code (SCPC, 2010), governing investigative access to computer systems and encrypted data; and Section 116A of the Evidence Act (1893, as amended 2012), establishing rebuttable presumptions for electronic records. Judicial application of Section 116A was analysed through two High Court decisions: Telemedia Pacific Group Ltd v Credit Agricole (Suisse) SA [2014] SGHC 235 and GIL v Public Prosecutor [2024] SGHC 287.

International Standards Benchmarking

Cambodia's framework was benchmarked holistically against three international instruments: ISO/IEC 27037:2012 (guidelines for identification, collection, acquisition, and preservation of digital evidence); the ACPO Good Practice Guide for Digital Evidence, Version 5 (2012); and the UK Forensic Science Regulator's Codes of Practice and Conduct (FSR-C107, 2020). Benchmarking assessed the transferability of each standard to Cambodia's current institutional and resource capacity, with implementation phased accordingly.

Findings

Critical Inadequacy of Cambodia's Legal Framework

The doctrinal analysis confirms that Cambodia's criminal procedural framework is critically inadequate for digital evidence handling. Three interrelated failures were identified:

- Article 91 (Searches): Physically oriented, without provision for remote digital access, encrypted systems, cross-border cloud data, or the 24-hour operational demands of volatile digital evidence. Its 6:00 a.m.–6:00 p.m. restriction is directly counterproductive to time-sensitive digital investigations.
- Article 92 (Sealing of Exhibits): Confined to tangible objects; contains no procedures for forensic imaging, cryptographic hash verification, write-blocking, or chain-of-custody documentation specific to digital artefacts.
- Article 321 (Evidence Evaluation): The 'intimate conviction' standard provides no authentication criteria, no evaluation methodology, and no technical guidance for assessing the reliability or integrity of electronic records.

The LEC, while more comprehensive, suffers from complex conditional presumptions that are difficult to apply consistently, unclear integration with criminal procedure, the absence of forensic examination standards and expert qualification criteria, and the counterproductive encoding prohibition in Article 43. The study concludes that both instruments are only partially adequate at best, and critically inadequate for the prosecution of cybercrime.

Transferable Solutions from Singapore

Comparative analysis of Singapore's framework identified several transferable legislative solutions directly responsive to Cambodia's identified gaps:

Provision	Key Feature	How It Addresses Cambodia's Gap
SCPC s. 39	Explicit authority for remote digital access; compulsory assistance obligations; evidence preservation powers; good-faith protections; tiered authorisation for sensitive data.	Eliminates legal uncertainty in Articles 91 and 92 regarding digital searches; enables lawful access to password-protected and cloud-based systems; removes inappropriate time restrictions.
SCPC s. 40	Prosecutor-authorised access to decryption information; three-tiered power structure; presumption of continued possession; enhanced penalties for serious offences.	Fills Cambodia's complete absence of decryption authority; replaces LEC Article 43's counterproductive encoding prohibition with a proportionate access mechanism.
SEA s. 116A	Rebuttable presumptions for electronic records based on ordinary operation, business context, and institutional role; excludes law enforcement from neutral third-party presumption.	Replaces reliance on LEC's complex conditional presumptions and the CCP's undifferentiated 'intimate conviction' standard with a clear, contextually

		appropriate authentication framework.

International Standards Assessment

Benchmarking against international standards confirmed Cambodia's systemic gap and provided a phased implementation roadmap:

- ISO/IEC 27037:2012: Technology-neutral principles for identification, collection, acquisition, and preservation of digital evidence. Assessed as a moderate-to-high implementation challenge given Cambodia's underdeveloped forensic infrastructure. Recommended as the basis for mandatory Standard Operating Procedures for the Judicial Police, phased over the medium term.
- ACPO Good Practice Guide (2012): Four foundational principles (non-alteration, competence, audit trail, accountability) assessed as immediately applicable as mandatory minimum conduct standards for all Judicial Police Officers (JPOs). Principles 1 (non-alteration) and 3 (audit trail) recommended for immediate priority adoption.
- FSR-C107 (2020): Requires forensic unit accreditation under ISO/IEC 17025 and ISO/IEC 17020, method validation, and contemporaneous technical records. Assessed as a high implementation challenge contingent on establishment of certified national forensic laboratories. Recommended as a long-term objective.

Unanticipated Findings

Three unanticipated findings emerged during the research. First, the depth of terminological inconsistency, which the imprecise and interchangeable use of 'digital evidence' and 'electronic evidence' across Cambodian legislation and practice was found to be more pervasive and consequential than initially anticipated, creating prosecutorial uncertainty, judicial confusion, and investigative ambiguity. Second, Cambodia's LEC Article 43 encoding prohibition was found to be not merely impractical but actively counterproductive to effective cybercrime enforcement, a structural conflict with modern investigative realities unaddressed by any existing reform proposal. Third, the multilingual drafting history of the CCP (originally French, subsequently Khmer, then English) introduces linguistic and conceptual ambiguities with direct implications for the interpretation of technologically sensitive provisions.

The Structural Nature of Cambodia's Deficit

The research demonstrates that Cambodia's digital evidence deficit is not merely a matter of legislative omission, which it is a structural failure rooted in the physical-evidence paradigm of the CCP. The absence of clear procedural rules at every stage of the evidence lifecycle from identification and seizure through preservation, examination, and authentication creates a cascading vulnerability. Judicial police officers lack guidance, prosecutors face uncertainty, and judges are left without meaningful benchmarks to evaluate the technical integrity of evidence. This systemic gap is further compounded by an underdeveloped forensic infrastructure: the absence of accredited digital forensic laboratories, undefined expert qualification standards, and limited specialist training capacity.

The Transferability Question

Legal transplantation theory cautions against wholesale adoption of foreign models without regard to institutional capacity (Watson, 1993). The study's comparative analysis therefore evaluated not only the substantive content of Singapore's provisions but also their design logic and the institutional preconditions for effective operation. The findings confirm that Singapore's core legislative techniques, which technology-neutral definitions, powers-based frameworks, role-based assistance obligations, and rebuttable evidentiary presumptions demonstrate strong transferability to Cambodia's legal context without requiring advanced forensic infrastructure. By contrast, elements dependent on Singapore's established prosecutorial independence and accreditation systems such as Public Prosecutor-level authorisation requirements and forensic laboratory accreditation require phased adaptation.

Why a Sub-Decree?

The study identifies a Sub-Decree as the most realistic and appropriate reform instrument for three reasons. First, digital evidence management is primarily technical and administrative in nature governing forensic acquisition, chain of custody, integrity verification, and storage, where making it appropriate for subordinate legislation issued under existing statutory authority rather than requiring parliamentary amendment of the CCP. Second, a Sub-Decree enables timely implementation and periodic updating as technology evolves, avoiding the structural rigidity of codified procedural rules. Third, this approach mirrors international practice in jurisdictions that regulate digital forensics through executive regulations rather than static codes, and allows Cambodia to pilot reforms that can subsequently be codified if successful. The Sub-Decree is positioned to supplement, not replace, the CCP, explicitly operationalising its general provisions without creating legal conflicts.

Implications and Recommendations:

Implications for Legal Professionals

The current framework places severe constraints on all actors within Cambodia's criminal justice system. Prosecutors face legal uncertainty that allows offenders to exploit definitional ambiguities and procedural gaps. Judges are required to apply the subjective 'intimate conviction' standard to technically complex digital materials without structured guidance, producing inconsistent and unpredictable outcomes. Judicial Police Officers lack clear statutory authority and operational protocols for digital evidence collection, creating chain-of-custody vulnerabilities that directly undermine the admissibility and probative value of the evidence they gather.

Implications for Society and Public Confidence

The legislative failure to keep pace with cybercrime has significant societal consequences. The ambiguity in the law enables cybercriminals to operate with relative impunity within Cambodian jurisdiction, while victims are denied meaningful legal protection and recourse. Comprehensive reform is essential not only for effective prosecution but for restoring public confidence in the legal system and enabling Cambodia's digital economy ambitions as articulated in the DESPF.

Draft Sub-Decree: Key Proposed Articles

The thesis proposes a Sub-Decree on the Collection, Preservation, and Presentation of Digital Evidence in Criminal Proceedings, directed to the Ministry of Justice and the Ministry of Interior's Anti-Cybercrime Department. The instrument comprises four operative chapters with seven substantive articles. The key proposed provisions are summarised below:

Article 1 — Purpose	*Establishes six objectives: ensuring integrity and authenticity of digital evidence from identification through court presentation; providing clear legal authority for JPOs, prosecutors, and courts; aligning Cambodia with international standards; strengthening capacity to prosecute cybercrime; protecting accused persons' rights; and facilitating international cooperation in cross-border investigations.*

Article 2 — Scope	*Applies to all criminal investigations and prosecutions under the CCP involving digital evidence, all criminal justice officials, and all persons required to provide assistance or expert testimony. Supplements (without replacing) Articles 91, 92, and 321 of the CCP. Excludes civil, administrative, and non-prosecution intelligence operations.*

Article 3 — Definitions	*Establishes 17 technology-neutral definitions — including 'digital evidence', 'computer system', 'data', 'authentication information', 'encrypted data', 'decryption information', 'forensic copy', 'hash value', 'write-blocking', 'chain of custody', 'metadata', and 'digital forensic specialist' ,which eliminating the terminological ambiguity identified across the CCP and LEC.*

Article 4 — Computer System Access	*Modelled on SCPC Section 39: explicitly authorises remote digital access regardless of location; eliminates time restrictions; establishes compulsory assistance obligations including password disclosure; grants authority to prevent evidence destruction; addresses cross-border data access; creates criminal penalties for obstruction with good-faith protections for cooperating parties.*

Article 5 — Decryption Access	*Modelled on SCPC Section 40: provides Royal Prosecutor-authorised powers to access encryption keys and compel decryption assistance for serious offences; introduces enhanced penalties proportional to offence gravity; establishes a rebuttable presumption of continued possession of decryption information; replaces LEC Article 43's encoding prohibition.*

Article 6 — Digital Evidence Seizure	*Operationalises ACPO Principles and ISO/IEC 27037: mandates documentation of device state before seizure; requires forensic copying over physical seizure where feasible; prescribes write-blocking and cryptographic hash verification; establishes comprehensive chain-of-custody documentation; provides flexibility for admissibility where deviations were necessary but reliability can be demonstrated.*

Article 7 — Authentication	*Modelled on SEA Section 116A: establishes specific authentication requirements; provides multiple authentication pathways (testimony, expert evidence, hash comparison, chain-of-custody documentation); creates rebuttable presumption of authenticity for evidence handled under Article 6; identifies judicial evaluation factors; clarifies the burden of proof.*

Phased Implementation of International Standards

- Immediate (Phase 1): Adopt ACPO Principles 1 (non-alteration) and 3 (audit trail) as mandatory minimum conduct standards for all JPOs. Introduce technology-neutral definitions and Article 4 computer access powers.
- Medium-term (Phase 2): Develop ISO/IEC 27037 guidelines as mandatory Standard Operating Procedures; implement Article 5 decryption powers and Article 6 seizure procedures; train JPOs as Digital Forensic First Responders (DFFRs) consistent with INTERPOL guidance.
- Long-term (Phase 3): Pursue ISO/IEC 17025 and FSR-C107 accreditation for national forensic laboratories; establish a professional accreditation system for digital forensic specialists; implement Article 7 authentication standards with full judicial training support.

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Strengthening Cambodia's Judicial System with DNA Evidence:
A Comparative Blueprint From the United Kingdom and Vietnam

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Introduction: Forensic DNA evidence has fundamentally transformed criminal justice systems worldwide since its first courtroom application in the 1980s. By enabling the identification of individuals from biological traces, including blood, saliva, semen, and skin cells, which DNA profiling offers investigative precision that few other forms of evidence can match. It serves a dual function: inculpating guilty parties and exonerating the innocent. Despite its transformative potential, Cambodia has historically operated without domestic forensic DNA infrastructure, relying on foreign laboratories in Vietnam, Thailand, and beyond for any DNA analysis required in serious criminal cases.

This structural gap began to change with the inauguration of Cambodia's first National Police DNA Laboratory in Phnom Penh in December 2024, a milestone achieved through international cooperation. The establishment of this facility marks a turning point: the technical capability now exists, but its effective deployment demands a corresponding framework of legal procedures, validated methodologies, institutional governance, and trained personnel. Without such a framework, the risk is that Cambodia possesses the technology but cannot reliably translate its outputs into courtroom-credible evidence.

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Cambodia's evidentiary architecture presents a distinctive challenge. Article 321 of the Code of Criminal Procedure adopts a "free evaluation of proof" model, all evidence is admissible in principle, and the court determines its weight. This places the entire burden of establishing reliability on the forensic system itself. Judges must be able to evaluate whether evidence was collected lawfully, preserved without contamination, analysed using validated methods, interpreted responsibly, and communicated clearly. In this regime, reliability is not filtered by categorical admissibility rules; it is constructed through documented process integrity at every stage of the scene-to-court chain.

This manuscript synthesizes the findings of an undergraduate thesis examining how Cambodia can build a standards-anchored DNA evidence system fit for its courts. The research is oriented around three guiding questions: (1) what legal, institutional, and operational gaps currently limit reliable DNA evidence in Cambodia; (2) which elements of the United Kingdom's governance model are most suitable for adaptation; and (3) what targeted lessons can be drawn from Vietnam's regional experience. The theoretical framework integrates responsive regulation, diffusion of innovations theory, socio-technical systems thinking, and international evidentiary standards to connect governance instruments with day-to-day laboratory and courtroom practice.

Methodology: The study employs a qualitative, comparative research design. Rather than laboratory experimentation, the research focuses on governance, operational practice, and judicial evaluation, which domains best interrogated through documentary analysis and comparative case study. Three methodological streams are integrated.

First, documentary analysis forms the primary evidential base. The study draws systematically on a curated corpus of authoritative international standards: the ENFSI Best Practice Manual for Human Forensic Biology and DNA Profiling (2022); the ENFSI Internal Validation Guideline (2024); SWGDAM's interpretation, reporting, and probabilistic genotyping guidance; the NIST Scientific Foundation Review on DNA Mixture Interpretation (NISTIR 8351, 2024); and the UK Forensic Science Regulator's Statutory Code of Practice (Version 2, effective October 2025). These are supplemented by Cambodia's Code of Criminal Procedure, Vietnam's personal data protection framework, and Home Office operational statistics for the UK National DNA Database.

Second, comparative case study analysis examines three jurisdictions at distinct stages of forensic maturity: Cambodia as a system under construction; Vietnam as a regional comparator scaling humanitarian and criminal casework in parallel; and the United Kingdom as a mature, regulated benchmark. Case material is selected using criterion sampling, requiring minimum coverage of secondary transfer risk, cold-case resolution, and appellate scrutiny of low-template DNA interpretation.

Third, the study optionally incorporates semi-structured interviews with stakeholders across the scene-to-court chain, particularly investigators, laboratory analysts, prosecutors, defence practitioners, and judge to triangulate normative requirements against real-world practice. Qualitative materials are analysed using Braun and Clarke's six-phase thematic analysis framework, with coding explicitly anchored to standards clauses to ensure auditability and traceability.

The temporal scope prioritises materials from approximately 2019 to 2025. The technical focus centres on autosomal STR casework, mixture interpretation, and reporting, while acknowledging, but not exhaustively examining—Y-STR, mitochondrial DNA, and investigative genetic genealogy.

Findings

Legal Gaps

Cambodia's evidentiary rules are broadly technology-neutral. Article 321 provides an open admissibility baseline and delegates evidential weight to the court. While this model is flexible, it creates a specific challenge for DNA evidence: without a dedicated DNA procedural code or forensic science statute, there is no standardised baseline for judicial expectations. This variability is itself a reliability risk, where courts cannot compare evidence quality across cases when no shared standard exists against which to calibrate reliability. The annotated commentary to the Code confirms that due process governs collection and presentation, and that probative evaluation rests entirely with the court. In practice, this means that the currency of DNA evidence is disciplined documentation and plain-language communication rather than compliance with a formal admissibility gate.

Institutional Gaps

The end-to-end DNA evidence pathway requires aligned mandates across crime-scene officers, investigators, laboratory analysts, prosecutors, and the judiciary. A central institutional gap is the absence of an externalised quality assurance loop. Where no independent oversight body sets minimum expectations, conducts audits, and requires corrective action, quality assurance becomes an internal managerial preference rather than a system-wide obligation. Comparative evidence consistently demonstrates that statutory oversight, accreditation pathways, and routine disclosure duties are the mechanisms that stabilise quality across providers.

Additionally, institutional credibility requires clear separation between investigative priorities and scientific judgement. Protection of forensic decision-making from case pressures is not merely a good practice, it is a precondition for courtroom credibility under Cambodia's reliability-centred model.

Operational Gaps: Crime Scene to Laboratory

International guidance consistently identifies the crime scene as the greatest fragility point for DNA evidence. If scene security is inadequate, if sampling decisions are undocumented, or if contamination controls are absent, the laboratory can generate a technically correct profile that is nonetheless evidentially ambiguous or misleading. These vulnerabilities are amplified in low-template samples and complex mixtures, where even trace amounts of extraneous DNA can materially alter interpretation. Continuity and documentation gaps compound this risk. Article 321's reliability emphasis requires a transparent chain of custody, a coherent narrative of how a sample moved from collection through storage, analysis, and reporting. Without standardised packaging, transport conditions, logging practices, and an auditable case file, probative value is discounted because alternative explanations cannot be excluded.

Laboratory Competence and Interpretation Gaps

A laboratory's courtroom credibility rests on its ability to demonstrate method validation and staff competence. ISO/IEC 17025 provides the international baseline for competence in testing laboratories, requiring documented methods, staff qualification records, equipment control, and quality management systems. Cambodia's new laboratory must build toward this baseline systematically. The NIST Scientific Foundation Review identifies mixture interpretation and low-template evidence as high-risk domains: results are sensitive to analytical assumptions, model choices, and human factors including confirmation bias and communication errors. For early Cambodian operations, the critical gap is not merely equipment access, but the absence of validated interpretation frameworks, including decision thresholds, replicate strategies, and a validated probabilistic genotyping software suite and a shared phrase library that communicates evidential strength cautiously and consistently.

Courtroom Communication Gaps

The fact-finding value of DNA depends critically on how experts explain it. Best-practice testimony guidance stresses the need to separate observations from evaluative conclusions, avoid source-to-activity inferential leaps, and disclose alternative explanations such as transfer, persistence, and contamination. Without these safeguards, courts may treat DNA as determinative rather than contextual, particularly in cases where DNA constitutes only part of a broader evidentiary picture.

Data Governance Gaps

Even before a national DNA database is contemplated, routine forensic practice requires decisions about case-file retention, profile storage, elimination databases, and access controls. Comparative experience demonstrates that the legitimacy of DNA use is closely tied to proportional retention rules, independent oversight, and transparent public reporting to prevent function creep beyond the original investigative purpose.

Discussion

The United Kingdom as Primary Governance Benchmark

The United Kingdom provides the most comprehensive and immediately transplantable model for Cambodia. The Forensic Science Regulator Act 2021 placed the Regulator on a statutory footing, and Version 2 of the Statutory Code of Practice (effective October 2025) sets mandatory expectations for quality management, method validation, competence assessment, proficiency testing, disclosure, and reporting. These expectations map precisely onto the questions Cambodian judges must address under Article 321: whether a result is supported by demonstrable process integrity and whether limitations have been fully disclosed. The UK's core transferable principle is that reliability is designed into routine practice through documented methods, controlled deviations, proficiency testing, and corrective action rather than argued retrospectively in court. This "reliability-by-design" philosophy is ideally suited to Cambodia's open admissibility model, where the court's weight assessment depends entirely on the quality of the forensic process. A second UK advantage is operational transparency. The Home Office's forensic information database statistics reporting that 64.8% of loaded crime-scene profiles produced a match in 2023/24 demonstrate a level of public accountability that builds judicial confidence and public trust. A Cambodian analogue, publishing metrics on turnaround time, contamination incidents, and proficiency outcomes, would be achievable at modest cost once a basic Laboratory Information Management System is in place. The UK model is further supported by proportionality jurisprudence. European Court of Human Rights decisions in S and Marper v United Kingdom (2008) and Gaughran v United Kingdom (2020) demonstrate how to avoid indiscriminate genetic data retention and how to build review and deletion rights into any DNA database framework. These rulings provide a rights-aware template for any future Cambodian database legislation.

Vietnam as Regional Comparator

Vietnam offers targeted implementation lessons rather than a comprehensive governance template. Its dual-track development, which humanitarian identification of war-era remains alongside routine criminal casework demonstrates that specialised degraded-DNA workflows and standard STR casework can progress in parallel when validation, competence, and disclosure are properly documented. Ho Chi Minh City Police inaugurated a DNA testing system for criminal investigations in December 2024, and ICMP-supported advanced capacity for degraded-sample identification was transferred to Vietnam's Institute of Biotechnology in July 2025. Vietnam's experience is particularly relevant to Cambodia's climatic and storage conditions, where sample degradation presents a practical challenge. The phased, city-level approach to capacity building also offers a scalable model that Cambodia can adapt to its own institutional pace. Vietnam's data governance trajectory carries its own lessons. The enactment of a Personal Data Protection Law effective January 2026, which treating genetic information as sensitive data subject to purpose limitation, security safeguards, and institutional accountability highlights the importance of early governance architecture. Cambodia should proactively ring-fence forensic DNA use from any civil identification database and establish explicit legal authority for cross-system access well before contemplating a national database.

A Hybrid Adaptation Model for Cambodia

The analysis points to a hybrid adoption strategy: the UK model as the core governance and quality assurance framework, supplemented by Vietnam's regional implementation lessons on phased scaling, degraded-sample protocols, and early data protection architecture. This combination is coherent because it maximises courtroom credibility under Article 321 while remaining feasible given Cambodia's current stage of institutional development. A wholesale transplant of the UK system would be inappropriate; a selective, calibrated adaptation is both achievable and defensible.

Implications and Recommendations

Adopt a National Standard Operating Procedure Suite

Cambodia should develop and formally adopt a SOP suite covering the complete scene-to-court pathway. This must include lawful collection protocols, contamination prevention measures, standardised packaging and transport conditions, chain-of-custody documentation, and laboratory reception and storage procedures. Critically, SOPs must be aligned with ENFSI Best Practice Manual requirements and written in a form suitable for disclosure to prosecutors, defence practitioners, and courts.

Build Toward ISO/IEC 17025 Accreditation

The National Police DNA Laboratory should establish a quality management system aligned with ISO/IEC 17025 as a medium-term accreditation objective. The pathway involves documented method validation, staff competence records, proficiency testing participation, equipment calibration logs, and internal audit trails. Progressive accreditation for defined DNA testing scopes, which beginning with straightforward STR casework before extending to mixture analysis provides a transparent capacity-building roadmap.

Implement Conservative Interpretation and Reporting Practices

Given the current early operational stage, Cambodia's laboratory should adopt conservative qualitative opinions with explicit disclosure of limitations, particularly for complex mixtures and low-template samples. Reporting language should follow SWGDAM's proposition-based framework and be consistent with NIST guidance on uncertainty communication. The transition from qualitative statements to evaluative likelihood-ratio reporting must be paced by local validation and paired with training and internal peer review, which it should not be accelerated by case pressure.

Establish Institutional Oversight and Transparency Mechanisms

Cambodia should designate a defined oversight body, particularly within or adjacent to the Ministry of Justice or Ministry of Interior with responsibility for setting minimum quality standards, auditing compliance, and requiring corrective action. This body should be functionally independent from investigative priorities. As a complementary measure, a transparency dashboard publishing annual metrics on laboratory performance (turnaround time, contamination incidents, proficiency outcomes) should be established. This governance infrastructure need not replicate the UK's statutory regulator in its first iteration; a graduated, proportionate model is appropriate.

Develop a Proportionate DNA Data Governance Framework

Should Cambodia consider establishing a national criminal DNA database in future, it should do so only after the casework quality and disclosure infrastructure is demonstrably in place. Any database framework must articulate: purpose limitation; proportional inclusion criteria; defined retention and deletion rules; judicial or independent oversight; audit trails; and public reporting. European jurisprudence and UK post-S and Marper governance provide concrete templates. Pre-emptive legislation or policy guidance on these parameters developed before database capacity is built, which is strongly preferable to retrospective regulation.

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