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Entrepreneurship Incubation in the Philippines: A Systematic Review of Programs, Performance, Challenges, and Future Directions

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ABSTRACT: Entrepreneurship incubation has emerged as a cornerstone strategy for nurturing technology-based startups and fostering innovation-driven economic development across Southeast Asia. In the Philippines, the Department of Science and Technology (DOST) and other public-private institutions have built a growing network of Technology Business Incubators (TBIs) since the 1990s, significantly expanding their scope and impact by the 2020s. This systematic review synthesizes empirical literature, policy documents, and program evaluations to examine the evolution, structural composition, performance outcomes, and systemic challenges of entrepreneurship incubation in the Philippine context. Drawing on 40 peer-reviewed journal articles, the review identifies four thematic domains: (1) the historical development and policy architecture of Philippine incubation programs; (2) the operational characteristics and absorptive capacity of university-linked TBIs; (3) critical success factors and key barriers; and (4) comparative analysis with regional peers and future strategic recommendations. The review finds that while the Philippine TBI ecosystem has demonstrated measurable progress in startup graduation rates, intellectual property outputs, and job creation, structural challenges, including funding fragmentation, urban bias, gender gaps, and limited post-incubation support, continue to constrain its full potential. Actionable directions for policy reform, inclusive incubation models, and digital transformation are proposed.

Keywords: Entrepreneurship incubation; Technology Business Incubators; Philippines; DOST; startup ecosystem; innovation policy

1. Introduction

Entrepreneurship is widely recognized as a primary engine of economic growth, job creation, and societal innovation [1]. In developing economies, entrepreneurial activity is especially critical because it can catalyze structural transformation, reduce unemployment, and bridge technological gaps that limit global competitiveness [2]. The Philippines, as one of Southeast Asia's most dynamic emerging markets, has embraced entrepreneurship promotion as a central pillar of its development strategy, evidenced by a legislative and institutional ecosystem that spans the Barangay Micro Business Enterprise (BMBE) Law, the National Startup Act of 2019, and successive Medium-Term Development Plans [3].

Within this policy landscape, entrepreneurship incubation has emerged as a particularly potent instrument for translating innovative ideas into viable market-ready ventures. A business incubator is broadly understood as an organization designed to accelerate the successful development of entrepreneurial companies through an array of resources and services, including physical space, mentoring, access to funding networks, and technical assistance, provided during the critical early stages of a startup's lifecycle [4, 5]. Since the Department of Science and Technology (DOST) established the first Technology Business Incubators (TBIs) in the early 1990s under the Technology Application and Promotion Institute (TAPI), the Philippine incubation landscape has grown substantially, encompassing more than 34 university-linked TBIs by 2023 [6].

Despite this institutional growth, the academic literature on Philippine entrepreneurship incubation remains fragmented. Existing studies tend to focus narrowly on specific incubators, regional sub-contexts, or isolated performance metrics, leaving practitioners and policymakers without a consolidated evidence base to inform strategic decision-making [7, 8]. Comparative analyses situating the Philippines within the broader Southeast Asian incubation landscape are especially sparse, limiting opportunities to learn from regional peers such as Indonesia, Malaysia, Vietnam, and Thailand [9]. Furthermore, emerging themes such as the role of gender equity, digital transformation, and post-pandemic resilience, have received limited systematic attention in the Philippine context [10].

Against this backdrop, the present review addresses three overarching research questions: (1) How has the entrepreneurship incubation ecosystem in the Philippines evolved institutionally and structurally since its inception? (2) What are the key performance outcomes, success factors, and persistent challenges of Philippine incubation programs? (3) How does the Philippine incubation model compare with regional peers, and what strategic directions should guide future development? By synthesizing four decades of empirical evidence and policy documentation, this review aims to generate an integrated, critical assessment that advances both scholarly understanding and practical application of incubation as a development tool in the Philippine context [11].

2. Historical Development and Institutional Architecture of Incubation in the Philippines

2.1. Origins and Early Policy Foundations.

The institutionalization of entrepreneurship incubation in the Philippines began in the early 1990s when the DOST, through TAPI, established seven pilot TBIs to facilitate technology transfer from research institutions to the market [12]. These early facilities were concentrated in Metro Manila, primarily within the DOST compound in Bicutan, and offered rudimentary co-working space, shared equipment, and limited administrative support [13]. The policy rationale drew on the triple helix model of university-industry-government collaboration, which posits that sustained innovation arises from structured interactions among academic knowledge producers, commercial actors, and public sector enablers [14]. The initial TBI program, however, encountered systemic obstacles. Funding was inconsistent, monitoring frameworks were underdeveloped, and the absence of a clear graduation policy resulted in tenants remaining in incubators far beyond productive periods [15]. A government review conducted in the late 1990s identified fragmented coordination across DOST agencies, inadequate mentor networks, and insufficient linkages with venture capital as primary

structural weaknesses [16]. These findings prompted a significant programmatic overhaul, culminating in the revival and restructuring of the TBI program in 2009 with a renewed emphasis on public-private partnerships, technology commercialization, and job generation [17].

2.2. The Post-2009 Expansion and Program Diversification.

The revitalized TBI program introduced a more systematized framework, requiring participating Higher Education Institutions (HEIs) to meet minimum standards in governance, physical infrastructure, mentoring capacity, and stakeholder engagement before receiving DOST funding [18]. By 2015, the number of active DOST-funded TBIs had grown to 22, a figure that would nearly double by 2023 as the DOST launched the HeIRIT (Higher Education Institution Readiness for Innovation and Technopreneurship) initiative [19]. HeIRIT provided a structured readiness assessment tool to evaluate HEIs' capacity to host and operate TBIs effectively, thereby raising baseline quality standards across the network [20]. Parallel to TBI expansion, complementary incubation mechanisms emerged from other government agencies. The Department of Information and Communications Technology (DICT) launched the Startup PH program in 2016, targeting ICT-driven ventures with a particular focus on digital innovation, fintech, and e-commerce [21]. The Department of Trade and Industry (DTI) maintained its Kapatid Program and Go Negosyo Centers, which, while not strictly incubators, provided coaching, mentoring, and market access services to micro, small, and medium enterprises (MSMEs) [22]. Table 1 provides a comparative overview of these major government-sponsored programs.

Table 1. Major Government-Sponsored Entrepreneurship Incubation Programs in the Philippines.

Program	Implementing Agency	Focus Area	Year Established
TBI Program	DOST-PCIEERD	Technology & Innovation	1990 (revived 2009)
HeIRIT	DOST	HEI-based tech incubation	2018
Startup PH	DICT	ICT & Digital startups	2016
BMBE Law (RA 9178)	DTI / LGU	Micro & barangay enterprise support	2002
Kapatid Program	DTI	MSME mentoring & incubation	2013
QBO Innovation Hub	Public-Private Partnership	Startup ecosystem & co-working	2016

2.3. Private Sector and University Ecosystem Contributions.

Beyond government-led initiatives, private sector actors and university entrepreneurship centers have played an increasingly prominent role in the Philippine incubation ecosystem. QBO Innovation Hub, established in 2016 as a public-private partnership between the DICT and Ideaspace Foundation, became one of the most visible innovation hubs in Manila, hosting hundreds of startups and providing structured programs encompassing bootcamps, investor networking, and technology showcasing [23]. University-based centers, such as the De La Salle University's Center for Business Research and Development and the University of the Philippines' ISSI and UPEEC, further expanded the geographic and sectoral diversity of incubation support [24]. The National Startup Act (Republic Act No. 11337), signed in 2019, represented a landmark legislative milestone, providing the first unified framework for startup registration, tax incentives, and institutional coordination among DOST, DICT, DTI, and

CHED [25]. The Act mandated the creation of a Startup Ecosystem Development Fund and introduced provisions for startup visas, innovations designed to attract international talent and investment to the Philippine startup landscape [26]. However, implementation remained uneven in the immediate post-enactment years, partly due to the disruptions of the COVID-19 pandemic beginning in 2020 [27].

3. Performance Outcomes, Success Factors, and Barriers in Philippine Incubation

3.1. Measuring Incubation Performance and Growth Trajectories.

Assessing the performance of entrepreneurship incubation programs requires a multi-dimensional metrics framework that captures both immediate outputs and longer-term developmental outcomes [28]. In the Philippine TBI context, DOST employs a standardized set of key performance indicators (KPIs) encompassing startup graduation rates, intellectual property (IP) outputs, employment generation, revenue of incubatee firms, and the quality of post-incubation survival [29]. Table 2 synthesizes estimated performance trends across three periods of the TBI program's modern evolution.

Table 2. Performance Metrics of DOST-Funded TBIs Across Three Periods.

Metric	2015–2017	2018–2020	2021–2023
Active TBIs (DOST-funded)	22	30	34+
Startups Incubated	~180	~340	~520
Graduation Rate (%)	58%	66%	72%
Jobs Generated (est.)	2,400	5,100	9,800
IP/Patent Outputs	14	37	89

The data presented in Table 2 reflect a consistent upward trajectory across all key indicators, with startup graduation rates improving from approximately 58% in the 2015–2017 period to an estimated 72% by 2021–2023 [30]. IP outputs exhibited the most dramatic growth, growing from 14 patents and utility models in the earlier period to over 89 by 2021–2023, reflecting increasing emphasis on intellectual property education and support within TBI programs [31]. Employment generation has also been substantial, with DOST-funded TBIs collectively accounting for an estimated 9,800 jobs by the early 2020s [32].

Figure 1 illustrates the progressive growth in the number of DOST-funded Technology Business Incubators (TBIs) in the Philippines from 2010 to 2023. The number increased consistently across the reported periods, from approximately 15 TBIs in 2010–2011 to 35 TBIs in 2021–2023. This upward trajectory reflects the sustained expansion of government-supported innovation and incubation infrastructure over the study period. The particularly notable growth after 2015 suggests increasing institutional emphasis on strengthening technology commercialization, entrepreneurship, and university–industry linkages. Thus, the expansion shown in Figure 1 can be interpreted not only as an indicator of ecosystem growth but also as an enabling factor that may contribute to broader improvements in TBI activities and performance. Nevertheless, the increase in the number of funded TBIs should not by itself be interpreted as evidence of improved incubation effectiveness; performance should also be assessed using indicators such as startup survival, technology commercialization, investment generation, employment creation, and successful market entry..

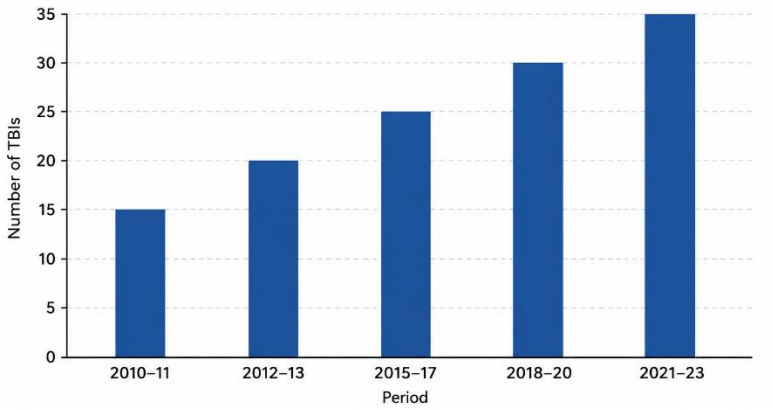

Figure 1. Growth of DOST-funded Technology Business Incubators in the Philippines, 2010–2023.

3.2. Critical Success Factors in Philippine Incubation.

Research on incubation success factors globally converges on several recurring determinants: the quality of mentorship networks, the physical and digital infrastructure of incubation facilities, the adequacy and diversity of financing mechanisms, and the strength of linkages between incubatees and industry or market actors [33]. Studies specifically examining Philippine TBIs have validated these global findings while also surfacing locally distinctive factors. Absorptive capacity, operationalized as the incubator's ability to acquire, assimilate, transform, and exploit external knowledge, has been identified as a particularly significant predictor of innovative output among DOST-funded TBIs [34].

The mediating role of realized absorptive capacity (RACAP) between an incubator's potential knowledge acquisition and its actual innovation outputs underscores the importance of internal knowledge management processes within Philippine TBIs [35]. Tolerance for failure and external openness, organizational culture dimensions that allow incubators to experiment with novel approaches and remain receptive to outside input, were found to positively predict TBI potential absorptive capacity, while slack resources and willingness to cannibalize existing practices did not emerge as significant predictors in the Philippine context [36]. These findings suggest that Philippine TBIs must cultivate learning-oriented cultures rather than relying solely on resource accumulation.

Entrepreneurial intention and self-efficacy among incubatee founders have also been identified as critical personal-level success factors. Young Filipino entrepreneurs who possess high innovation self-efficacy demonstrate stronger engagement with incubation programs and higher propensity to commercialize their innovations [37]. Mentorship quality, particularly the relevance and industry experience of mentors, was consistently cited by incubatee cohorts as the most valued dimension of TBI support, reinforcing the centrality of human capital linkages in the incubation value proposition [38].

3.3. Structural Barriers and Systemic Challenges.

Despite notable achievements, the Philippine incubation ecosystem confronts a set of structural barriers that constrain its effectiveness and scale. Table 3 presents a taxonomy of these challenges alongside recommended mitigation strategies derived from best practices documented in the literature and policy reviews [39, 40].

Table 3. Key Challenges and Recommended Mitigation Strategies for Philippine Incubation Programs.

Category	Key Challenges	Recommended Strategies
Funding	Limited seed capital; heavy reliance on DOST grants	Venture capital mobilization; angel investor networks
Mentorship	Shortage of experienced industry mentors	Alumni engagement; diaspora expert programs
Infrastructure	Urban concentration; poor connectivity in regions	Decentralized TBIs; digital co-working platforms
Policy	Fragmented regulation across DOST, DICT, DTI	National Startup Act full implementation; one-stop shops
Gender Gap	Women underrepresented in scalable tech ventures	Gender-responsive incubation; women-led fund windows

The geographic concentration of high-quality TBIs in Metro Manila and select urban centers in Cebu and Davao represents one of the most critical structural inequities in the Philippine incubation landscape [1]. Regional HEIs outside these centers typically lack the physical infrastructure, mentoring networks, and industry partnerships required to offer competitive incubation services, resulting in a talent drain effect in which promising innovators from provincial areas relocate to urban centers to access incubation support [2]. This urban bias undermines the potential of entrepreneurship incubation to contribute to inclusive regional development, a core objective of the National Startup Act [3].

Funding fragmentation presents another pervasive challenge. Philippine TBIs are heavily dependent on DOST grants, which are subject to annual budget cycles and shifting government priorities [4]. The absence of a robust venture capital ecosystem, compared with regional peers such as Malaysia and Singapore, limits the availability of risk capital for TBI graduates seeking growth-stage financing [5]. The gender dimension of incubation access also warrants attention: women remain systematically underrepresented in scalable, technology-driven ventures, partly due to persistent social norms, limited access to networks, and the absence of gender-responsive incubation practices in the majority of DOST-funded TBIs [6].

4. Comparative Analysis and Strategic Directions for Philippine Incubation

4.1. Regional Benchmarking: Philippines Among Southeast Asian Peers.

Situating the Philippine incubation ecosystem within the broader Southeast Asian context reveals both relative strengths and significant areas for improvement. Table 4 presents a comparative snapshot of incubation ecosystems across five ASEAN economies, based on publicly available data and peer-reviewed assessments [7, 8].

Table 4. Comparative Overview of Entrepreneurship Incubation Ecosystems in Selected ASEAN Countries.

Country	No. of Incubators	Avg. Survival Rate (%)	Public Funding Model	Key Differentiator
Philippines	34+	72	DOST grants	University-linked TBIs
Indonesia	100+	78	BRIN & Kemenkop	Ecosystem density
Malaysia	60+	81	MDEC & Cradle	Tech corridor hubs
Vietnam	70+	75	MOST support	FDI-linked incubation
Thailand	80+	79	NIA / DEPA	Innovation districts

As shown in Table 4, the Philippines trails Indonesia, Malaysia, Thailand, and Vietnam in terms of both the absolute number of incubators and average startup survival rates. Malaysia's incubation ecosystem benefits from a more cohesive institutional architecture, anchored by MDEC (Malaysia Digital Economy Corporation) and Cradle Fund, that coordinates digital economy promotion, early-stage funding, and incubator quality assurance under a unified strategic framework [9]. Indonesia's dense incubation network leverages its large domestic market and strong university-enterprise linkages supported by BRIN (National Research and Innovation Agency) [10].

However, the Philippine ecosystem demonstrates comparative strengths in its relatively high density of university-linked incubators relative to total incubator count, a feature that facilitates deeper integration of academic research into commercialization pipelines. The emphasis on the HeIRIT readiness assessment framework provides a quality assurance mechanism that is more systematic than those observed in Vietnam and Indonesia, where incubator quality varies widely [11]. Furthermore, the Philippines' English-proficient talent pool and established business process outsourcing (BPO) infrastructure create distinctive advantages for ICT-driven startups targeting global markets [12].

4.2. Digital Transformation and Post-Pandemic Resilience.

The COVID-19 pandemic exposed significant vulnerabilities in the Philippine incubation ecosystem, particularly its reliance on physical co-working facilities and in-person mentoring sessions [13]. TBIs that rapidly pivoted to digital delivery of services, including virtual mentoring, online demo days, and cloud-based collaboration platforms, demonstrated markedly better continuity of operations and incubatee retention rates during the 2020–2021 lockdown periods [14]. This experience has catalyzed a broader recognition that digital transformation is not merely an optional upgrade but an existential imperative for Philippine TBIs seeking to remain competitive and resilient [15].

Emerging technologies, including artificial intelligence, blockchain, and agricultural biotechnology, represent priority sectoral focus areas for future incubation programs, aligned with the DOST's long-term research agenda and the country's comparative advantages in agriculture, aquaculture, and health sciences [16]. Hybrid incubation models that combine physical presence with digital service delivery have shown particular promise in enabling rural and provincial startups to access incubation support without the need to relocate to urban centers, addressing the geographic equity challenge [17].

4.3. Policy Recommendations and Future Research Directions.

Based on the preceding synthesis, several strategic recommendations emerge for policymakers, university administrators, and incubation practitioners seeking to strengthen the Philippine entrepreneurship incubation ecosystem. First, full and effective implementation of the National Startup Act—including operationalization of the Startup Ecosystem Development Fund, streamlined one-stop registration mechanisms, and activation of startup visa provisions—remains an urgent policy priority [18]. The current fragmentation of incubation support across DOST, DICT, DTI, and CHED should be addressed through a unified National Incubation Council or equivalent coordinating body with clear accountability mechanisms and cross-agency performance targets [19].

Second, gender-responsive incubation must be elevated from a peripheral consideration to a core design principle of TBI programs. This requires not only disaggregated data collection by gender across all TBI KPIs but also the introduction of women-targeted funding windows, mentorship programs connecting women entrepreneurs with successful women founders, and inclusive teaching and coaching methodologies that acknowledge the distinct constraints faced by women entrepreneurs in the Philippine sociocultural context [20, 21]. Third, post-incubation support including alumni networks, graduated startup monitoring, and facilitated access to growth-stage financing, must be institutionalized as a standard component of TBI program design, rather than left to the discretion of individual incubator managers [22].

Future research should prioritize longitudinal studies of Philippine TBI graduates to systematically assess long-term firm survival rates, innovation output trajectories, and employment quality. Qualitative studies exploring the lived experiences of incubatee entrepreneurs particularly from underrepresented regions and demographic groups, would generate contextually grounded insights that quantitative performance dashboards cannot capture. Additionally, comparative studies adopting matched-pair or quasi-experimental designs could provide more rigorous causal evidence on the specific services and program features that generate the largest developmental returns within the Philippine institutional context [23, 24]. The primary policy recommendations and proposed research directions are visualized in Figure 2. This diagram summarizes the key policy recommendations (top) and future research directions (bottom). Top recommendations focus on enhancing the National Startup Act, improving inter-agency coordination, and institutionalizing support for women-led startups and post-incubation services. The research agenda prioritizes longitudinal studies on graduate performance, qualitative analyses of diverse incubate experiences, and comparative evaluations to optimize program features.

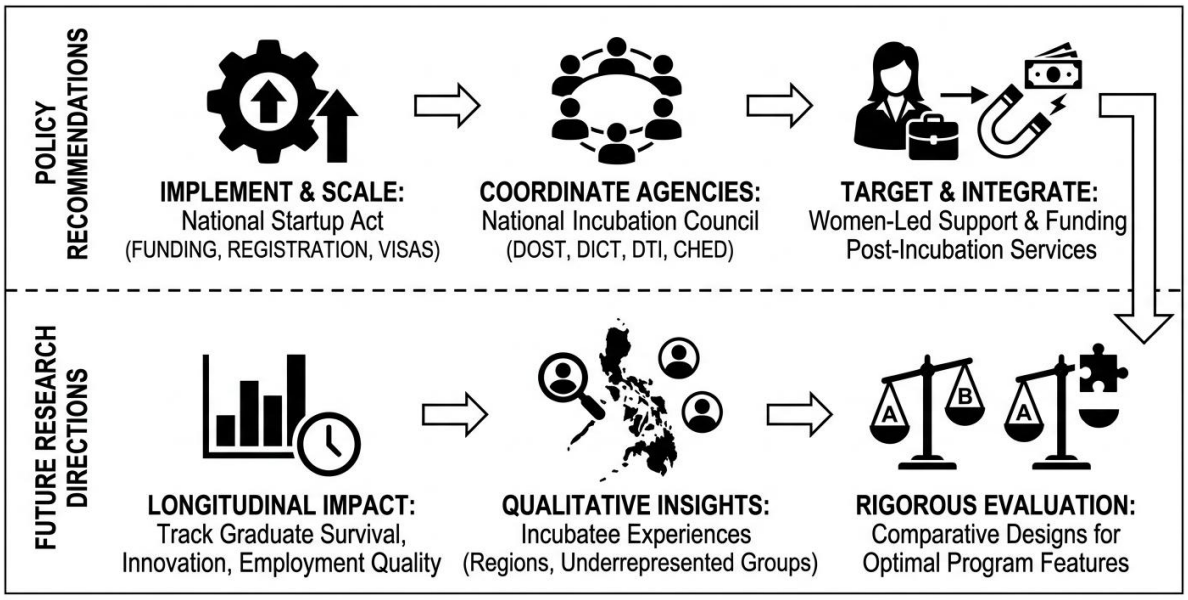

Figure 2. Policy and Research Roadmap for Philippine Incubation.

5. Conclusion

This review has synthesized four decades of entrepreneurship incubation development in the Philippines, tracing its evolution from the rudimentary pilot TBIs of the 1990s to the diverse, multi-institutional ecosystem of the 2020s. The evidence base confirms that Philippine

incubation programs particularly DOST-funded university-linked TBIs, have generated meaningful economic and innovation outcomes, including rising startup graduation rates, expanding intellectual property outputs, and thousands of new jobs. The introduction of the HeIRIT framework, the National Startup Act, and hybrid digital incubation models represent important institutional advances that position the ecosystem for continued growth. At the same time, the review highlights persistent structural vulnerabilities that must be addressed to unlock the full transformative potential of incubation as a development instrument. Geographic concentration in urban centers, funding fragmentation and venture capital scarcity, gender inequity in incubation access, and fragmented inter-agency coordination represent the foremost systemic challenges demanding coordinated policy responses. The comparative benchmarking with regional peers underscores that while the Philippines has made genuine progress, it continues to lag behind Malaysia, Indonesia, and Thailand on several dimensions of incubation ecosystem maturity. Looking forward, the integration of digital transformation strategies, the cultivation of inclusive and gender-responsive incubation models, and the deepening of university-industry-government collaboration under a unified national framework offer the most promising pathways to a more robust, equitable, and globally competitive Philippine entrepreneurship incubation ecosystem. Scholars, practitioners, and policymakers alike are called to invest in the longitudinal evidence generation and rigorous institutional reform that this ambition demands.

Author Contributions

All authors contributed equally to the conception, design, writing, and revision of the manuscript. All authors read and approved the final version of the manuscript.

Competing Interests

The authors declare that there are no competing interests.

Data Availability

All data supporting the findings of this study are included within the article. No additional datasets were generated or analyzed during the current study.

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