INTERNATIONAL JOURNAL OF PROGRESSIVE RESEARCH IN ENGINEERING MANAGEMENT AND SCIENCE (IJPREMS)

e-ISSN : 2583-1062

Impact Factor: 5.725

www.ijprems.com
editor@ijprems.com

Vol. 04, Issue 05, May 2024, pp: 2322-2326

TECHFORWARD: EMPOWERING SUSTAINABLE DEVELOPMENT THROUGH INNOVATION

Karthick Raja. S[1], Dr. G Amutha[2]

[1]Student, Department of Management Studies, Vels Institute of Science, Technology & Advanced Studies (VISTAS) Chennai, India.

[2]Associate professor, Department of Management Studies, Vels Institute of Science, Technology & Advanced Studies (VISTAS) Chennai, India.

DOI: https://www.doi.org/10.58257/IJPREMS34663

ABSTRACT

"TechForward: Empowering Sustainable Development Through Innovation" investigates the pivotal role of technology in advancing global sustainability. This study employs an exploratory research design to examine how technology business incubators (TBIs) contribute to Sustainable Development Goal (SDG) 9, emphasizing innovation, inclusive industrialization, and infrastructure development. Through an extensive literature review, the research evaluates the impact of TBIs on fostering entrepreneurship, innovation ecosystems, and sustainable economic growth. Findings indicate a lack of significant correlation between general R&D investment and government support for manufacturing and industrial R&D. However, collaborative innovation efforts show a strong positive correlation with economic and societal progress. Additionally, age groups exhibit a significant relationship with perceptions of economic equity, highlighting the necessity for targeted policies. Recommendations include balancing R&D investments, fostering collaboration, and addressing generational disparities. This study underscores the critical role of TBIs in driving innovation and sustainable development, offering actionable insights for policymakers and stakeholders to promote inclusive growth and advance the SDGs. In conclusion, embracing collaborative innovation and addressing age-related disparities are crucial steps towards achieving sustainable development goals.

Keywords: Technology business incubators, SDG 9, innovation, industrialization, infrastructure, entrepreneurship, economic growth, R&D investment, collaborative innovation, economic equity.

1. INTRODUCTION

"TechForward: Empowering Sustainable Development Through Innovation" is a platform focused on exploring how technology can drive sustainable development globally. This forum delves into the dynamic landscape of innovation, where cutting-edge technologies and forward-thinking solutions converge to address pressing global challenges. From renewable energy and eco-friendly manufacturing to smart infrastructure and digitalization, the possibilities for positive change are extensive.

TECHNOLOGY BUSINESS INCUBATOR

A technology business incubator is a tailored type of business incubator primarily focused on assisting startup companies and solo entrepreneurs who utilize modern technologies for creativity and innovation. These incubators support the development of startups by offering a range of services, including training, brokering, and financing. Typically, these organizations, known as TBIs, receive funding from the national government as a form of support.

HOW TECHNOLOGY BUSINESS INCUBATOR PLAYS AN IMPORTANT ROLE IN PROMOTING SDG 9

- **Innovation Hub:** Incubators provide a supportive environment for startups to innovate and develop new technologies, driving industrial growth and technological advancement.
- **Entrepreneurship Support:** They offer resources, mentorship, and networking opportunities, fostering entrepreneurship, creating jobs, and stimulating economic growth.
- **Resource Access:** Incubators provide startups with essential resources like funding and workspace, accelerating the development and commercialization of innovative solutions.
- **Ecosystem Building:** They build vibrant innovation ecosystems, facilitating collaboration, knowledge sharing, and partnerships among entrepreneurs, investors, and experts.
- **Sustainable Solutions:** Many focus on addressing sustainable development challenges, contributing directly to the achievement of SDG 9 and other goals.
- **Inclusive Growth**: By supporting diverse entrepreneurs, including women and minorities, incubators promote inclusive growth, ensuring that innovation benefits all segments of society.

INTERNATIONAL JOURNAL OF PROGRESSIVE RESEARCH IN ENGINEERING MANAGEMENT AND SCIENCE (IJPREMS)

e-ISSN : 2583-1062

Impact Factor: 5.725

www.ijprems.com
editor@ijprems.com

Vol. 04, Issue 05, May 2024, pp: 2322-2326

2. OBJECTIVES

- Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.
- Increase investment in research and development for innovative technologies in manufacturing and industry.
- Facilitate technology transfer and knowledge-sharing to support industrial development in developing countries.
- Support the development of innovation hubs and incubators to nurture and accelerate technological advancements.

3. REVIEW OF LITERATURE

Innovations for sustainable development: Moving toward a sustainable future (Author: Bruno S. Silvestre, Year:2019) This article reviews the literature on innovations that can lead to transformations in individuals, organizations, supply chains, and communities toward a sustainable future. Although many of the articles explored in this review report on existing urgent environmental and social issues, their findings, recommendations, and contributions are encouraging as we make progress toward a sustainable society through innovation and change. This article reviews the diversity of innovation for Sustainable Development in the literature, proposes a typology of such a phenomenon, provides an overview of key articles based on the primary subjects they address, and identifies a series of recommendations for the future development of the field.

Achieving Sustainable Development by Collaborating in Green Product Innovation (Author: Lisa Melander, Year:2017) Collaboration in green product innovation (GPI) is becoming increasingly important, and research on such innovation has grown in recent years. This study reviews Literature on external collaborations in GPI to investigate drivers, inter-organizational factors and intra-organizational factors for such collaborations. The review includes a total of 67 papers. Survey studies and case studies are the methodologies applied most in the reviewed papers. The most common collaborators are suppliers and customers. Drivers include economic factors, regulations, customer demand, competitiveness and firm performance.

Technological innovation to achieve sustainable development—Renewable energy technologies diffusion in developing countries (Author: Samira Tabrizian, Year:2019) A variety of reasons Causes the slow spread, but we would like to address the barriers from the economic theory perspective. Then, we will scrutinize the specific elements of the developing Countries market that make the diffusion move slowly. We believe that by examining the factors that result in market failure and by taking into account the specific characteristics of the renewables industry, especially in developing countries, governments can enable their national infant market to be a competitor in the worldwide marketplace.

Responsible Innovation for Sustainable Development Goals in Business: An Agenda for Cooperative Firms (Author: Oier Imaz and Andoni Eizagirre, year:2020) In this contribution, we explore the possibilities of Responsible Innovation (RI) to assess and support the engagement of businesses in the spectrum of Social and Solidarity Economy (SSE) and, in particular, cooperatives to the implementation of Sustainable Development Goals (SDGs) at the firm level. We conduct a critical review of the academic literature on sustainable development and responsible innovation, focusing on the role of business to identify how firms in the spectrum of SSE can contribute through responsible innovation to the sustainable development agenda and how firms in the spectrum of SSE can benefit from it.

A Review of Product Innovation Management Literature in the Context of Organization Sustainable Development (Author(s): **Dorin Maier, Mihaela Maftei, Andreea Maier, Gabriela Elena Bițan, year:2019)**

This paper addresses the field of product innovation in the context of current sustainability requirements in order to identify the relationship between sustainable development and product innovation. The demand for products continues to increase but in the same time, the environmental factors are more and more present in the organization policies, in these conditions, the sustainability aspects related to the product developments are becoming a competitive advantage.

4. RESEARCH METHODOLOGY

This research uses an exploratory design to examine the topics of interest. Convenience sampling is utilized to select participants who are readily accessible. Primary data is gathered through questionnaires, offering direct insights from respondents. Secondary data is obtained from various sources, including websites, journals, books, company websites, and other related records, providing additional context and background information to support the analysis.

5. DATA ANALYSIS & INTERPRETATION

TABLE

EXPLORING THE INTERPLAY BETWEEN CROSS-SECTOR R&D INVESTMENT AND GOVERNMENT SUPPORT FOR INDUSTRIAL DEVELOPMENT

INTERNATIONAL JOURNAL OF PROGRESSIVE RESEARCH IN ENGINEERING MANAGEMENT AND SCIENCE (IJPREMS)

e-ISSN : 2583-1062

Impact Factor: 5.725

www.ijprems.com
editor@ijprems.com

Vol. 04, Issue 05, May 2024, pp: 2322-2326

CORRELATION

Null Hypothesis (H0): No significant correlation exists between prioritizing research and development investment across sectors and directing government support to research and development in manufacturing and industrial sectors.

Alternative Hypothesis (H1): A significant correlation exists between prioritizing research and development investment across sectors and directing government support to research and development in manufacturing and industrial sectors.

Correlations			
		Governments should prioritize investment in research and development to spur innovation in various sectors	Government support should be directed towards fostering research and development in manufacturing and industrial sectors
Governments should prioritize investment in research and development to spur innovation in various sectors	Pearson Correlation	1	.215
	Sig. (2-tailed)		.135
	N	50	50
Government support should be directed towards fostering research and development in manufacturing and industrial sectors	Pearson Correlation	.215	1
	Sig. (2-tailed)	.135	
	N	50	50

INFERENCE

The statistical analysis reveals a p-value of 0.135, surpassing the conventional significance level of 0.05. Thus, we lack sufficient evidence to reject the null hypothesis. This indicates an absence of a significant correlation between emphasizing research and development investment across sectors and directing government support specifically to research and development in manufacturing and industrial sectors.

TABLE

THE IMPACT OF COLLABORATIVE INNOVATION ON ECONOMIC AND SOCIETAL ADVANCEMENT IN MANUFACTURING AND INDUSTRY

CORRELATION

Null Hypothesis (H0): There is no significant correlation between collaborations among the private sector, academia, and government for driving technological innovation in manufacturing and industry, and the role of innovation in economic and societal progress.

Alternative Hypothesis (H1): There is a significant correlation between collaborations among the private sector, academia, and government for driving technological innovation in manufacturing and industry, and the role of innovation in economic and societal progress.

Correlations			
		Collaborations between the private sector, academia, and government are necessary to drive technological innovation in manufacturing and industry	Innovation plays a crucial role in driving economic growth and societal progress
Collaborations between the private sector, academia, and government are necessary to drive technological innovation in manufacturing and industry	Pearson Correlation	1	.410**
	Sig. (2-tailed)		.003
	N	50	50
Innovation plays a crucial role in driving economic	Pearson Correlation	.410**	1

INTERNATIONAL JOURNAL OF PROGRESSIVE RESEARCH IN ENGINEERING MANAGEMENT AND SCIENCE (IJPREMS)

e-ISSN : 2583-1062

Impact Factor: 5.725

www.ijprems.com
editor@ijprems.com

Vol. 04, Issue 05, May 2024, pp: 2322-2326

growth and societal progress	Sig. (2-tailed)	.003	
		50	50
Correlation is significant at the 0.01 level (2-tailed).			

INFERENCE

With the p-value at 0.003, signifying significance at the 0.01 level, the null hypothesis is rejected. Consequently, the alternative hypothesis is upheld, indicating a notable positive correlation between collaborations among the private sector, academia, and government for advancing technological innovation in manufacturing and industry, and the significance of innovation in driving economic growth and societal progress**.**

TABLE

IMPACT OF AGE GROUP ON EQUITABLY DISTRIBUTUON OF ECONOMIC BENEFITS

REGRISSION

H0: There is no significant relationship between age group and the fair distribution of economic benefits throughout society**.**

H1: There is a significant relationship between age group and the fair distribution of economic benefits throughout society.

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	AgeGroup[b]	.	Enter

a. Dependent Variable: Inclusive industrialization ensures that economic benefits are distributed equitably among all segments of society.

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Es
1	.311[a]	.097	.078	.7073

a. Predictors: (Constant), AgeGroup

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	
1	Regression	2.566	1	2.566	5.129	.(
	Residual	24.014	48	.500		
	Total	26.580	49			

a. Dependent Variable: Inclusive industrialization ensures that economic benefits are distributed equitably a segments of society.

b. Predictors: (Constant), AgeGroup

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.159	.195		11.080	.000
	AgeGroup	-.210	.093	-.311	-2.265	.028

a. Dependent Variable: Inclusive industrialization ensures that economic benefits are distributed equitably among all segments of society.

INTERNATIONAL JOURNAL OF PROGRESSIVE RESEARCH IN ENGINEERING MANAGEMENT AND SCIENCE (IJPREMS)

e-ISSN : 2583-1062

Impact Factor: 5.725

www.ijprems.com
editor@ijprems.com

Vol. 04, Issue 05, May 2024, pp: 2322-2326

INFERENCE

- If we are testing the null hypothesis that there is no significant link between age group and the fair distribution of economic benefits throughout society, then the alternative hypothesis would be that there is a significant link. With a p-value of 0.028, there is evidence against the null hypothesis, supporting the alternative.
- Alternatively, if we are testing the null hypothesis that the coefficient for age group is zero, indicating no effect on perceptions of inclusive industrialization, then the alternative hypothesis would be that the coefficient for age group is not zero, indicating an effect. Again, with a p-value of 0.028, there is evidence against the null hypothesis in favours of the alternative.
- The p-value is utilized to assess evidence against the null hypothesis and support for the alternative hypothesis in both scenarios

6. FINDINGS

- R&D Investment and Government Support as No significant correlation ($r = 0.215$, $p = 0.135$). The null hypothesis is not rejected, indicating no substantial relationship.
- Collaborative Innovation and Economic/Societal Progress have Significant positive correlation ($r = 0.410$, $p = 0.003$). The null hypothesis is rejected, indicating a strong positive relationship.
- Age Group and Economic Benefit Distribution have Significant relationship ($p = 0.028$) with a negative beta coefficient (-0.210), indicating that younger groups perceive less equity. Evidence suggests age impacts perceptions of economic equity.

7. SUGGESTIONS

- Governments should allocate R&D investments both broadly and specifically to explore potential indirect benefits.
- Encourage stronger collaborations between the private sector, academia, and government to drive technological innovation and growth.
- Develop policies targeting the concerns of different age groups to ensure fair economic opportunities for all.

8. CONCLUSION

The analysis presents important insights and recommendations. Firstly, there is no significant correlation between general R&D investment and government support for manufacturing and industrial R&D, suggesting a need for a more refined approach to R&D funding. Secondly, the positive correlation between collaborative innovation efforts and economic and societal progress highlights the importance of fostering partnerships between the private sector, academia, and government. Lastly, the significant relationship between age groups and perceptions of economic equity indicates a need to address generational concerns to ensure fair distribution of economic benefits. To promote industrial development, governments should balance their R&D investments across various sectors, encourage collaborative innovation, and create policies that address the needs of different age groups. By implementing these strategies, policymakers can support a more inclusive and innovative industrial environment, leading to sustainable economic growth and societal advancement.

9. BIBLOGRAPHY

[1] Imaz, Oier and Eizagirre, Andoni (2020). Responsible Innovation for Sustainable Development Goals in Business: An Agenda for Cooperative Firms.

[2] Maier, Dorin; Maftei, Mihaela; Maier, Andreea; Bițan, Gabriela Elena (2019). A Review of Product Innovation Management Literature in the Context of Organization Sustainable Development.

[3] Melander, Lisa (2017). Achieving Sustainable Development by Collaborating in Green Product Innovation.

[4] Silvestre, Bruno S. (2019). Innovations for sustainable development: Moving toward a sustainable future.

[5] Tabrizian, Samira (2019). Technological innovation to achieve sustainable development—Renewable energy technologies diffusion in developing countries.