

The Effects of Green Economic Development (GED) Interventions on the Intention of Recycled Paper-Based Producers to Adopt Sustainable Business Practices (SBP) in the Philippines

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Abstract

A business practice that is economically viable, socially responsible and environmentally friendly is usually regarded as being sustainable. Corporations that include socially responsible and environmentally sound policies as core elements in their growth strategy very often create sustainable economic values. In the Philippines, thru the Department of Trade and Industry, the promotion of Green Economic Development (GED) aims to propel Micro, Small and Medium Enterprises (MSMEs) and government institutions to increase its sustainability initiatives with priority in environmental performance relative to economic development. Interventions to make their business more environment-friendly and climate-smart, namely: information and awareness; green service facilitation; and green framework conditions were analyzed of its significance and interrelationships to the intention Recycled Paper-Based Producers in the Philippines to adopt sustainable business practices. The Structural Equation Modeling (SEM) approach was used with a survey of the top 50% players of said industry resulting in a platform model of sustainability with GED interventions influencing many of the companies' thrust to institutionalize sustainable business practices of equipping employees with knowledge of green manufacturing, providing renewable resources and green process capability, and enhancing value through cost-efficiencies in the use and reuse of materials and energy.

Keywords

Sustainable Business Practices, Green Economic Development (GED), Recycled Paper-Based Industry, Structural Equation Modeling

1. Introduction

Recycled-based paper manufacturing can have negative effects on the environment if not appropriately managed. Though there are technologies nowadays that can moderate the negative impacts on the environment while having a positive economic effect, attaining economic growth while protecting the environment is challenging and has received wide attention in recent research programs (Cabalova, 2014). The ASEAN community is progressively becoming the leading player in Green Economic Development (GED), which promotes economic growth and development while ensuring that natural resources and environmental services critical to our societal well-being continue to be available. Additionally, it stimulates investment and innovation, thereby sustaining growth and creating new economic prospects (Gutterer, 2015). The manufacturing industry in the Philippines faces the challenge of being proactive and responsive to this global trend. In the Philippine context, the paper industry aspires to create the competence to meet the fastest emerging paper demands and to produce high-value, high-quality paper products for the long term while remaining internationally competitive and environmentally sustainable (Retrieved from GOV.PH, 2017).

Currently, the problems of the Philippines' pulp and paper industry are as follows: first, there is no sustainable local source of pulp; recovered local wastepaper has a low quality which is inefficient in operation and has a poor yield. Second is the high energy cost. Third, maintaining and an upgrade is costly since paper machines have a lot of machine breakdown. Fourth is flooding the domestic market with imported paper; Fifth, environmental regulations are becoming more stringent; mills are suffering from slow ROI funds to install anti-pollution devices, it is expensive to invest in cleaner production technologies. Lastly, skilled workforce under paper manufacturing is being pulled for overseas jobs due to more attractive compensation. Engineering graduates focusing on the paper industry are declining (PPMAI, 2017).

Researchers build corporate sustainability assessment frameworks or models that would be used to evaluate business contributions to sustainability (Grunda, 2011), however, no further study to assess whether the environmental impact is the paper industry's priority in any technological advancement to attain environmental-focus business sustainability in the Philippine setting. A program, which started in 2013, entitled Green Economic Development (GED), was developed; however, the program's implementation was vaguely defined, and precise measurement on the effectiveness of the procedures is lacking.

Given this future emphasis on environmental concern and sustainable manufacturing, this research has been conducted to assess whether green economic development (GED) program is enough to drive the company's intention to adopt and institutionalized sustainability. This problem statement is still in the context of sustainability but in contrast to the traditional business practice of putting the economic mandate ahead of the two other aspects of the business – social and environmental.

1.1 Objectives

The aim of the study is to know if green economic development (GED) program is enough to drive the company's intention to adopt and institutionalized sustainability. In order to achieve the aim of the study, the following objectives were defined.

1. To assess the green economic development (GED) initiative of recycled-based paper producers in the Philippines and how it influences their intention to adopt sustainable business practices in their operation.
2. To determine up to which extent recycled-based paper producers will institutionalized sustainability business practices in their operation.
3. To recommend a strategic industry-wide framework for sustainability institutionalization infused with green economic development (GED) program.

2. Literature Review

It is extensively acknowledged that decision making, and sustainable development planning require a unified strategy to balance the social, environmental, and economic components of sustainability. Recently, development players have begun to use more nuanced terms such as green economy, sustainable development, low carbon development and/or climate compatible development, as well as green economic development (Urban & Nordesvard, 2013). Green growth, also known as green economic development (GED), is concerned with the environmental sustainability of consumption, production, business, and markets. As a result, it emphasizes the importance of incorporating sustainable development concepts into economic development via the frame of a growth target (Urban, 2011). According to UNEP (2011), the definition of green economy is the developments in income and employment driven by investments from private and public organization that reduce pollution, and carbon emissions, resource efficiency, improve energy, and prevent loss of biodiversity and ecosystem services.

In this context, the German Federal Ministry for Economic Cooperation and Development (BMZ) commissioned ProGED to develop a value chain approach for enhancing firms' competitiveness through the adoption of climate-smart and environmentally friendly initiatives. Strategic options of this project are as follows: improving their operations' energy efficiency, optimizing business operations, meeting the international standards for production and process, adapting to innovation through collaboration between businesses and research institutions, resolving conflicts arising from excessive use of natural resources and attracting foreign investments. However, project implementation of the GED program is not easy. In fact, different issues arise in developed and developing countries concerning GED. Due to the differences in the economic and technological situation of each company engaged in the pulp and paper

industry in the Philippines and their willingness and preparedness for significant investments, only general lines for the modernization process can be defined, and no current article or supporting information on the practical implementation of ProGED specifically in the Philippine Paper Industry.

3. Methods

This study will be guided by the following conceptual framework shown in figure 1.

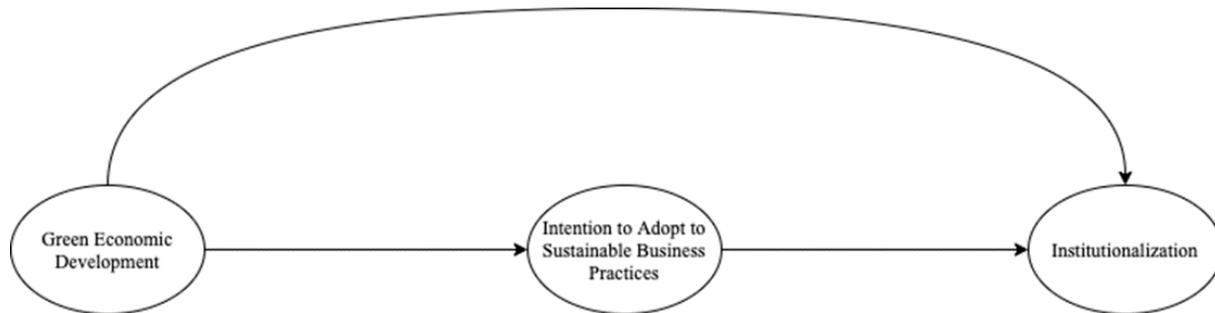


Figure 1. Conceptual Framework

This research offers a criterion for green economy opportunities that focuses on mid- to long-term development and equity, which served as the foundation for this study's GED project. The following are the modified goals, principles, and policies of GED in this study:

- Intra and Inter-Generational Equity: policies that prevent costs from being passed on to future generations and efforts that redistribute the advantages of social and economic development and environmental preservation.
- Equity and Inclusiveness: equitable wealth distribution, fair opportunity for all sectors of the population, and advancement of human rights and cohesion.
- Job Creation and Economic Diversification: fostering the development of sustainable economic sectors with a high potential for employment generation, especially for the poorest portions of the population.
- Environmental Integrity: preserving the integrity of the environment and ecosystems in order to ensure long-term sustainability and economic resilience.
- Efficiency: enhance resource efficiency in order to reduce costs, boost self-sufficiency and resilience, while also creating employment and prosperity advantages.
- Green Technological Advancement: creative technologies and practices that are environmentally friendly as drivers of sustainable and green development.

To determine the paper industry sector's willingness to adopt sustainability in their daily operations, this study integrated theory of reasoned action (TRA) which most researchers have utilized to investigate human behavior in the disciplines of social psychology (Conner et al. 2001).

Corporate commitment to sustainable development remains largely coercive (i.e., an ethical decision across most countries). Institutional authority, according to DiMaggio and Powell (1983), can be obtained by the pervasive isomorphic behaviors found in an organizational sector as a result of the following primary mechanisms or causal influences: mimetic, normative, and coercive. These isomorphic practices result from the organization's desire to emulate others (mimetic), to do the professionally correct thing (normative), or to adhere to externally imposed rules (coercive). According to DiMaggio and Powell, isomorphic practices help organizations maintain stability and survival within their organizational field (i.e., their institutional legitimacy).

As discussed above, isomorphic behavior can occur via three main mechanisms: coercive, normative, and mimetic. In turn, each of the three mechanisms can motivate a company to institutionalize sustainable business practices, hence signaling its adoption and commitment to sustainable and GED initiatives. Thus, the researcher hypothesizes the following:

- H1₀: There is no significant relationship between green economic development initiatives and intention to adopt of sustainable business practices.
 H1_a: There is a significant relationship between green economic development initiatives and intention to adopt of sustainable business practices.
 H2₀: There is no significant relationship between the intention to adopt of sustainable business practices and institutionalization in the company.
 H2_a: There is a significant relationship between the intention to adopt of sustainable business practices and institutionalization in the company.
 H3₀: There is no significant relationship between the green economic development initiatives and institutionalization of sustainable business practices in the company.
 H3_a: There is a significant relationship between the green economic development initiatives and institutionalization of sustainable business practices in the company.

Figure 2 represents a more detailed analysis infused with the determining factors that influence the intention to adapt of sustainable business practices in the paper industry sector in the Philippines. On the other hand, table 1 represents the aim and description and the latent constructs and variables of this study.



Figure 2. Operational Framework

Table 1. Latent Constructs and Variables

Construct	Description	Code	Description	Source
Green Economic Development	Aims to determine the influencing factors towards green economic development initiatives of the company.	GED1	Intra and inter-generational equity	Thorpe (2017)
		GED2	Equity and inclusiveness	
		GED3	Job creation and economic diversification	
		GED4	Environmental integrity	
		GED5	Efficiency	
		GED6	Green technological advancement	
	Aims to assess to which degree the paper	SBP1	Reduction of waste	Kneipp et al. (2019)
		SBP2	Energy efficiency	

Intention to adopt to sustainable business practice	industry is willing to adopt sustainable business practices geared with GED initiatives.	SBP3	Reduction of economic and environmental costs	
		SBP4	Valuable contribution	
		SBP5	Support usage of renewable resources and energy	
		SBP6	Influence others to support SBP	
Institutionalization	Aims to determine the paper industry's willingness to institutionalize SBP in their day-to-day operations.	INS1	Quality of yield	Zeweld et al. (2017)
		INS2	Environmental quality	
		INS3	Income of the company	
		INS4	Yield quantity	
		INS5	Success belief towards institutionalization	Baig and Straquadine (2014)
		INS6	Necessary resources	
		INS7	Adequate knowledge and competencies	
		INS8	Sustainment of future	

4. Data Collection

The primary instrument for this study will be a survey questionnaire. Considering the fact that latent constructs are unobservable, they will be derived from the operational framework's variables of interest, which will then be measured using a 5-point Likert. The survey questionnaire in Appendix 1 will be created based on the given information on table 1 and will be distributed to paper industry employees in the Philippines. The survey questionnaire will consist of four (4) sections with 25 questions: (1) Demographic profile of the employees, (2) Green Economic Development, (3) Intention to Adopt to Sustainable Business Practices, and (4) Institutionalization.

The main respondents of this study are from the top management and employees from recycle-based paper manufacturing in the Philippines in Luzon Area. The chosen company under this industry are, United Pulp and Paper Co. Inc, Bataan 2020 Inc, and Container Corporation of the Philippines and Trust International Corporations which represent the 50% of market share in the industry.

4.1 Data Analysis

In this regard, structural equation modeling (SEM) will be used to test the formulated hypotheses of this study. Figure 3 illustrates the initial SEM model to determine the significant factors influencing the intention to adopt of paper industry to sustainable business practices that is geared with green economic development. AMOS 22, a statistical software used for the evaluation of moment structures, will be used in conjunction with a maximum likelihood approach to achieve a model fit of causal relationships between observed and latent constructs.

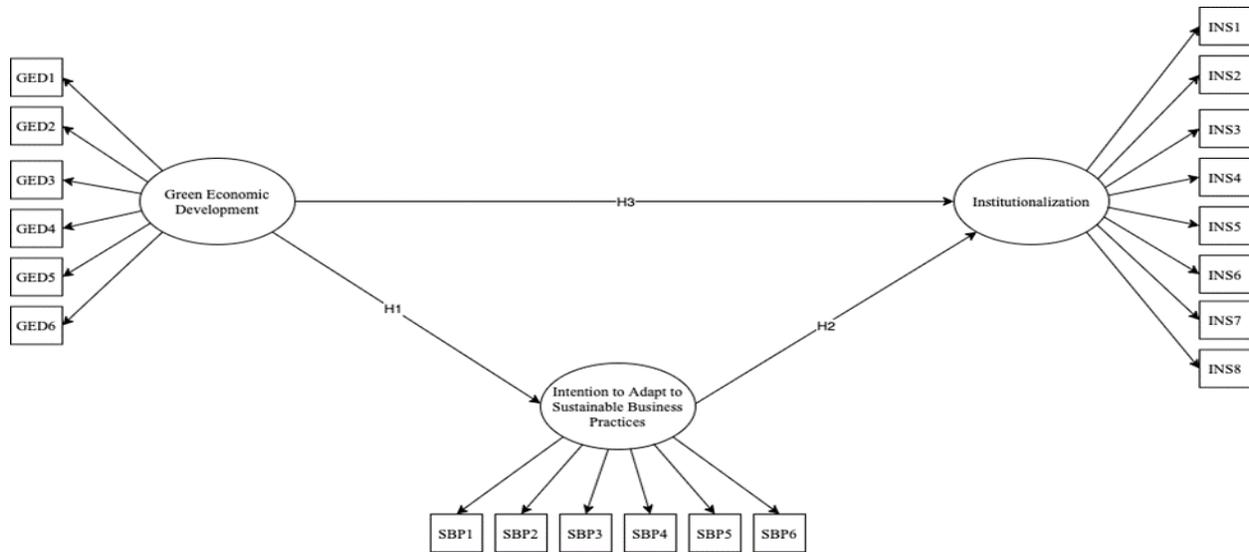


Figure 3. Initial SEM Model

In determination of the model’s fit of the SEM construct, six measurements will be taken into consideration such as the Incremental Fit Index (IFI), Tucker Lewis Index (TLI), Comparative Fit Index (CFI), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AFGI), and Root Mean Square Error of Approximation (RMSEA).

4.2 Interpretation

The result of this study will be divided into two parts subjected to interpretation. To start, a path analysis of the resulting structural model will be conducted to determine the direct and indirect effects of the significant factors and relationships identified in the hypotheses test results. After this, insights from the findings will be then used to strengthen the significant factors that affect the green economic development initiatives of the company in order to influence their intention to adopt sustainable business practices and institutionalized in their day-to-day operations.

The structural relationships and the significant factors will then become the basis for enhancing green economic development initiatives and programs that will positively influence the intention to adopt of paper industry to sustainable business practices as well as institutionalizing policies of sustainable business practices.

5. Results and Discussion

The survey questionnaire of this study includes two parts: The first part asks about the demographic information, such as age, gender, and working experience. Whereas the second part includes item measures rated based on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). A total of 150 respondents are then collected for analysis.

5.1 Numerical Results

Table 2 represents the goodness of fit model of the conducted initial SEM.

Table 2. Goodness of Model Fit

Measure	Parameter Estimates	Minimum Cut-off	Suggested By
Incremental Fit Index (IFI)	0.810	> 0.90	Hair (2010)
Tucker Lewis Index (TLI)	0.781	> 0.90	Hu and Bentler (1999)

Comparative Fit Index (CFI)	0.807	> 0.90	Hair (2010)
Goodness Fit of Index (GFI)	0.791	> 0.80	Gefen et al. (2000)
Adjusted Goodness Fit of Index (AFGI)	0.738	> 0.80	Gefen et al. (2000)
Root Mean Square Error of Approximation (RMSEA)	0.101	≤ 0.05 – 0.08	Steiger (2007)

5.2 Graphical Results

The analysis of the demographic parameters is displayed in figure 4, where it is noticed that the average age of the respondents is 33 years old, and most of them are male (61.3%). Finally, the percentages of the working experience of the respondents are 8.7%, 41.3%, 31.3%, and 18.7% for less than a year, 1 to 5 years, 6 to 10 years, and more than 11 years, respectively.

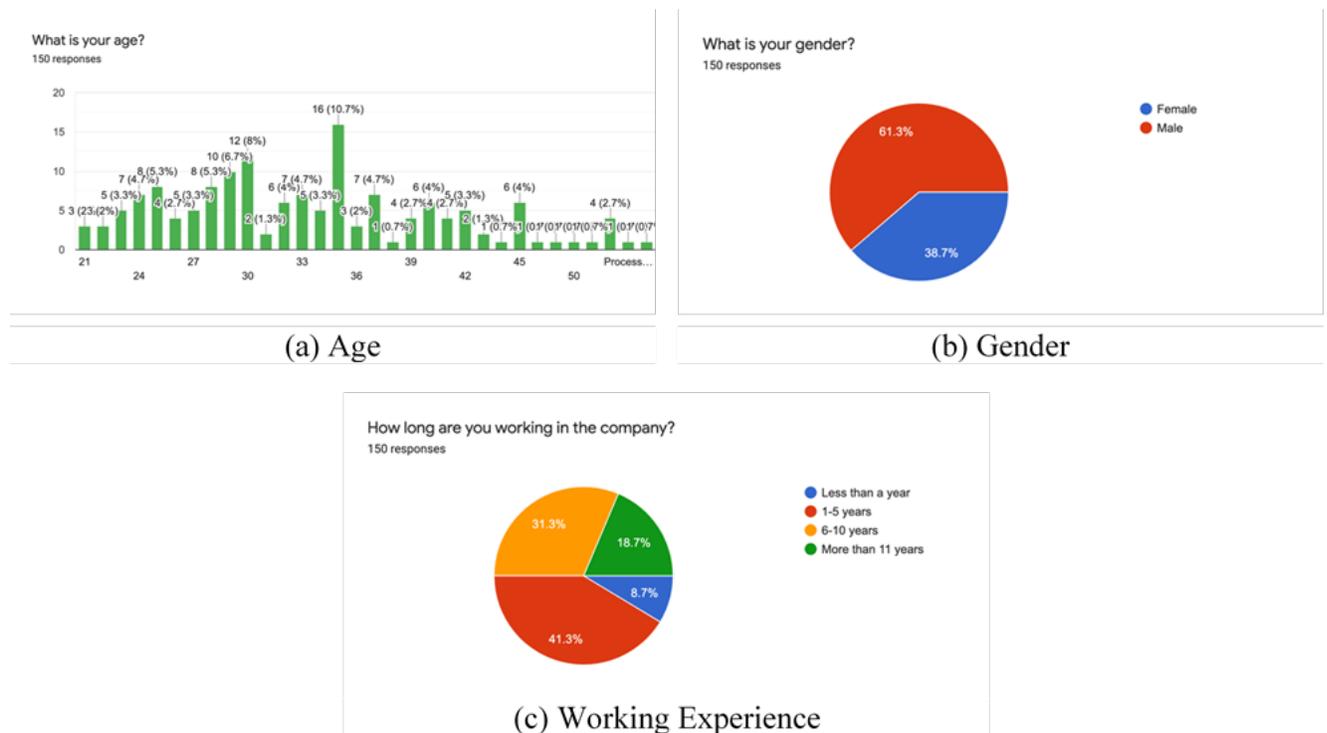


Figure 4. Analysis of the Demographic Parameters

Figure 5 demonstrates the initial SEM for evaluating the interrelationships of the following constructed latent factors of this study. According to the figure below, two variables have a factor loading value less than 0.5: INS2 and SBP2, which affects the model fit result. A revised model was derived by eliminating these two variables as Hair et al. (2010) mentioned that all standardized factor loadings should be statistically significant and has a value higher than 0.5. By omitting these two variables, we can improve the goodness model fit test result of the initial run.

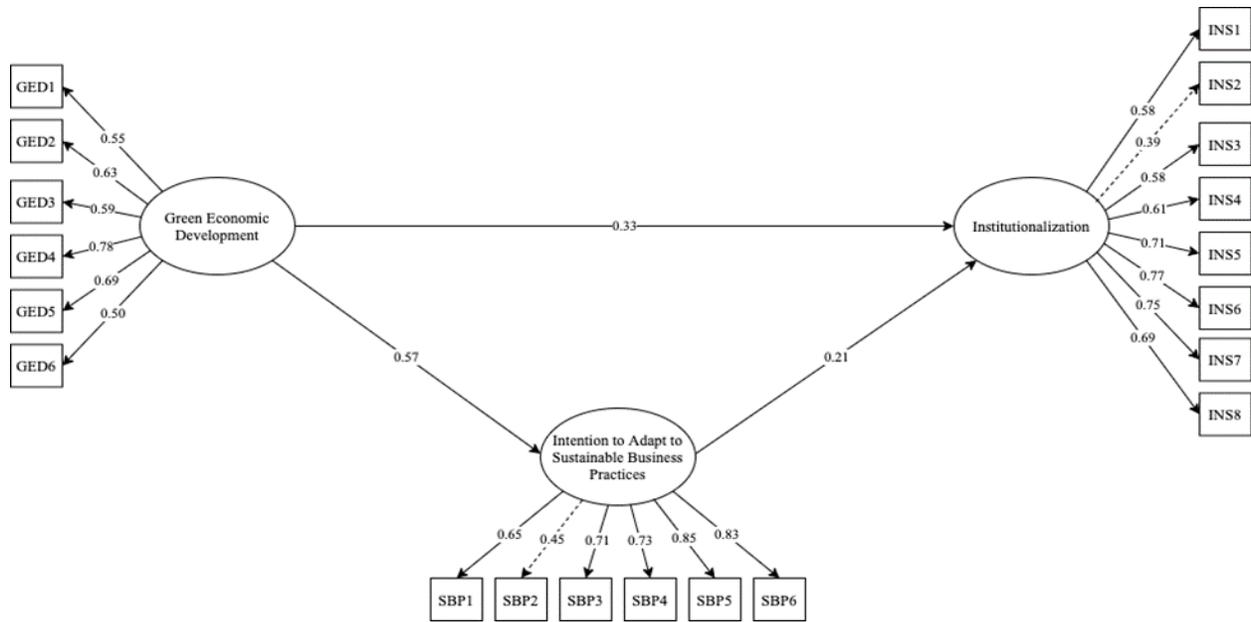


Figure 5. Initial SEM Result

5.3 Proposed Improvements

Figure 6 demonstrates the final SEM, after improving the initial SEM Result after omitting the two variables SBP2 and INS2, for evaluating the intention to adapt of the pulp and paper industry to sustainable business practices and to what extent they are going to institutionalize this motive in their company that is influenced by the green economic development.

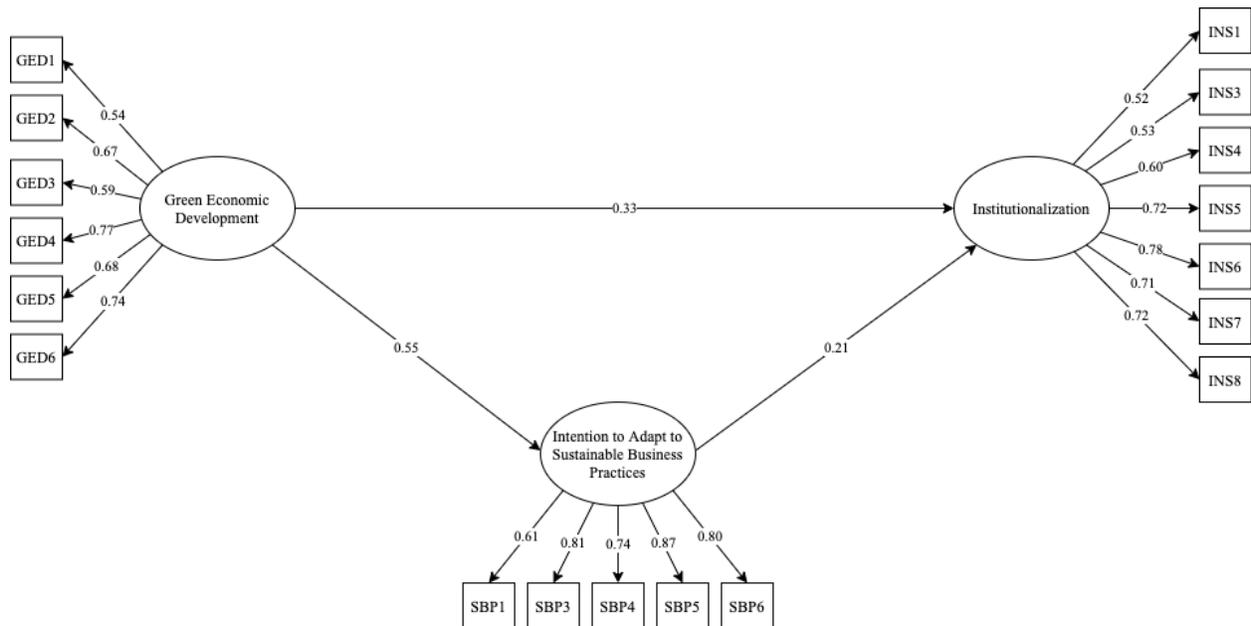


Figure 6. Final SEM Result

Table 3 represents the descriptive statistic results of each variable based on the Final SEM Result.

Table 3. Descriptive Statistic Results

Factor	Item	Standardized Weight	P-value
Green Economic Development	GED1	0.542	0.001
	GED2	0.671	0.001
	GED3	0.587	0.001
	GED4	0.766	0.001
	GED5	0.68	0.001
	GED6	0.742	0.001
Intention to Adapt to Sustainable Business Practices	SBP1	0.611	0.001
	SBP3	0.806	0.001
	SBP4	0.736	0.001
	SBP5	0.871	0.001
	SBP6	0.802	0.001
Institutionalization	INS1	0.516	0.001
	INS3	0.531	0.001
	INS4	0.597	0.001
	INS5	0.723	0.001
	INS6	0.784	0.001
	INS7	0.712	0.001
	INS8	0.716	0.001

As presented in table 4, the IFI, TLI, and CFI values were greater than the suggested cut-off of 0.90, indicating that the specified model's hypothesized construct was an excellent representation of the observed data. In addition, the GFI and AFGI values were 0.903 and 0.855, respectively, indicating that the model was also good. The RMSEA value was 0.061, which is also lower than the suggested cut-off. Finally, the direct, indirect, and total effects are presented in table 5.

Table 4. Final Result for Goodness Fit of Measures

Measure	Parameter Estimates	Minimum Cut-off	Suggested By
Incremental Fit Index (IFI)	0.948	> 0.90	Hair (2010)
Tucker Lewis Index (TLI)	0.930	> 0.90	Hu and Bentler (1999)
Comparative Fit Index (CFI)	0.947	> 0.90	Hair (2010)
Goodness Fit of Index (GFI)	0.903	> 0.80	Gefen et al. (2000)
Adjusted Goodness Fit of Index (AFGI)	0.855	> 0.80	Gefen et al. (2000)
Root Mean Square Error of Approximation (RMSEA)	0.061	≤ 0.08	Steiger (2007)

Table 5. Direct, Indirect, and Total Effects

Variables	Direct	P-value	Indirect	P-value	Total Effect	P-value
GED → SBP	0.554	0.001	-	-	0.554	0.001
GED → INS	0.328	0.003	0.115	0.003	0.443	0.003
SBP → INS	0.208	0.040	-	-	0.208	0.040

5.4 Validation

The current study utilized a Structural Equation Modeling (SEM) approach to analyze the interrelationship among green economic development (GED), intention to adapt to sustainable business practices (SBP), and institutionalization (INS).

SEM result indicated that green economic development (GED) is the highest contributor and had significant direct effects on SBP ($\beta:0.554$, $p = 0.001$). It could be interpreted that GED initiatives will greatly influence the intention of paper industry to adapt sustainable business practices, which uses renewables resources and energy to develop new sustainable solutions and reduces the economic and environmental costs through material reuse and change of waste into value. In addition, the result also indicates that companies are willing to make an effort to influence others to support the adaptation of sustainable practices in their daily operations infused with GED initiatives. These initiatives are listed based on their ranking from the SEM Result:

1. Ensuring environmental and ecosystem integrity for long-term sustainability and economic resilience.
2. Environmentally sound innovative technologies and practices as enablers of green and sustainable development.
3. Promoting the efficient use of resources, to lower costs and increase self-sufficiency and resilience while creating jobs and economic opportunities.
4. Equitable distribution of wealth, providing equal opportunities for the different segments of the population while promoting social justice and cohesion.
5. Supporting the growth of sustainable economic factors that have a high potential for job creation, particularly for the poorer segments of the population.
6. Prevent passing of costs to future generation and actions, which distribute benefits of improved economic and social development and environmental conservation.

Consequently, the result also showed that GED had a significant direct effect on institutionalizing sustainable business practices in the pulp and paper industry ($\beta:0.328$, $p = 0.003$). The result of this study implies that the company should have the necessary resources, adequate knowledge, and competencies to institutionalized sustainable business practices in their daily operations.

Lastly, it was also found out that SBP had a significant direct effect on institutionalization ($\beta:0.208$, $p = 0.040$). According to Roman (2016), meaningful sustainability actions are indeed difficult to achieve, as some external and internal organizational factors need to be aligned for an organization to truly embrace sustainable practices. Hence, for the pulp and paper industry to institutionalize the SBP, the company should exert a high level of willingness to adopt these initiatives.

Figure 7 represents the recommended strategic industry-wide framework for sustainability institutionalization infused with the green economic development (GED) program based on the result and discussion of the SEM. Institutionalization in this model impacts three outcomes, which are the quality of yield, environmental quality, and income of the company.

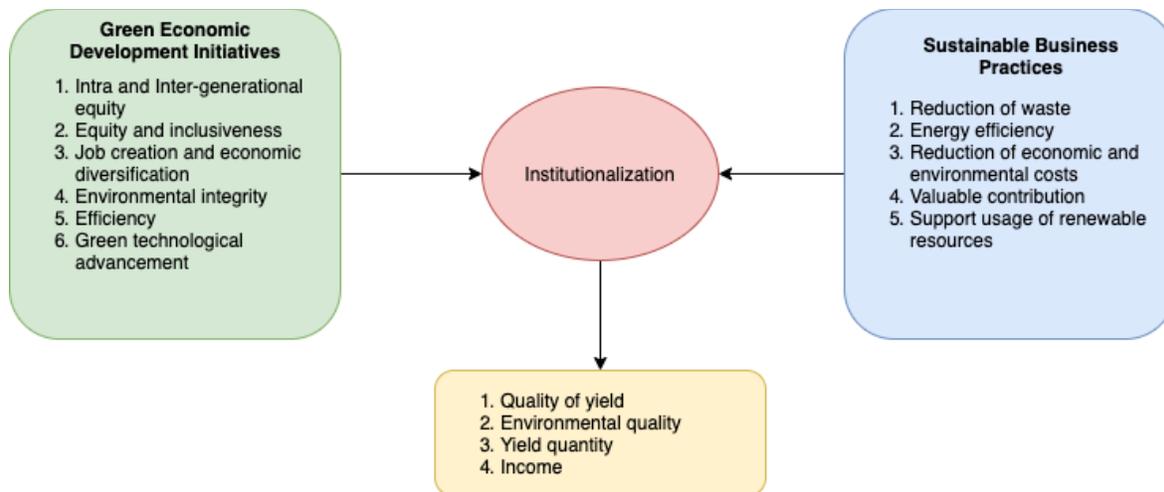


Figure 7. Institutionalization of Sustainable Business Practices infused with GED initiatives.

6. Conclusion

Today, sustainability has become an essential part of manufacturing and business strategies in the pulp and paper industry. This study has contributed to the discussion about institutionalizing sustainable business practices infused with green economic development initiatives to the pulp and paper industry. A structural model is built to display the relationships between the constructed latent factors by integrating the theory of reasoned action (TRA) to understand the intention to adopt sustainable business practices in daily operations. A total of 150 data samples are collected through the distribution of an online questionnaire, which contained 25 questions. The result showed that green economic development initiatives (GED) significantly affect intention to adapt to sustainable business practices (SBP) and sustainability institutionalization. Also, GED initiatives can influence the sustainability institutionalization of the company. Finally, the established recommended strategic industry-wide framework for sustainability institutionalization can help policymakers of the organization gain profit without taking for granted the environmental damages they may cause thru continuous innovation.

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Biographies

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