




Article

Stakeholder Role for Developing a Conceptual Framework of Sustainability in Organization

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Abstract: The purpose of this research is to frame the hierarchical pathway treating the sustainability factors from driving to dependent elements. Hence, this study starts with a brief literature review of the sustainable organization which enables the expansion of sustainability into essential factors. Experts further verified these identified factors and used for framing the hierarchical framework of sustainability in organizations. Total Interpretive Structural Modeling (TISM) has been applied for identifying the driving factor of sustainability and delivering the crucial links among the sustainability factors in organizations. While most of the organizations focus on sustainability by considering the Triple Bottom Line (TBL) framework, this paper has presented the fourth dimension of sustainability which drives sustainability in organizations. The hierarchical relationship is vital to identify the vitality and significance of factors. This in turn provides an efficient approach to achieve sustainability in organizations. The expert's review has been calculated statistically to validate the factors and conceptual hierarchical framework. Hence, the policymakers make use of sustainability hierarchy to frame a correct and efficient policy for maintaining sustainable practices that help managers to shift their priorities of an organization at the managerial level from economic growth to sustainable development. Finally, the future research direction and the limitation of the study are discussed.

Keywords: conceptual framework; organizations; sustainability; sustainability hierarchy; Total Interpretive Structural Modeling (TISM)

1. Introduction

The sustainability concept has been evolved as an environmental need and gradually moved to the need of dynamic business environment. The turbulent nature of economy, environment, and human will force a business to adopt sustainability measures [1]. Applied to the business perspective, sustainability is defined as capturing the turbulence of business without affecting economic growth of the organization [2]. For instance, in India sustainability plays a vital role in the holistic growth of the nation as it provides a basic framework for the development of organizations. Most organizations deal with the dynamics of business through TBL; it aids the organization to deal with multidimensional view of sustainability [3]. John Elkington introduced the TBL framework in mid-1990s. Before the TBL framework, the primary concern of organizations was economic growth, but it induced environmental and social aspects as two most important aspects along with economic aspects to measure sustainable growth in organizations. It can also be termed the 3P aspect as it covers people, profit, and planet [4]. Sustainability has been observed as challenge to accomplish this goal [5–7]. Thus, sustainability seems simple to understand but difficult to conceive by organizations because it requires the collaboration

of stakeholders to achieve the comprehensive coverage of its 3P aspect [8–10]. This sustainable view generates need for an underlying conceptual framework which sharply defines the hierarchy of sustainability in the organization so that returns to the shareholder can be maximized [11,12]. The objective of this paper is to find the hierarchical relationship between sustainability drivers to show how sustainability factors are related to each other. Drivers of sustainability have been studied in the past but in this research, the theory of relationship among these drivers have been studied by using the TISM methodology. This study also highlights the locus of stakeholders among other environmental, economic and societal factors of sustainability. TISM is the best-suited methodology for finding the hierarchical relationship among sustainability factors because in TISM the hierarchy has been plotted in the form of diagraph by involving experts, and connections in each level also stated in the hierarchy. Hence, total ten factors have been identified as essential factors which define sustainability in organizations.

2. Sustainability in the Organization

Sustainability regarding the environmental system can be defined as maintaining constant equilibrium with the outer environment [13,14]. The trajectory of sustainability has been initiated by sustainable societies which were reported in a Brundtland report in 1974 [15]. This basic definition of sustainability can be easily linked to the well-recognized definition of sustainability as per WCED (1987) as “Sustainability is about meeting the needs of the present without compromising the ability of future generations to meet their needs” [16]. In spite of an explicit definition of sustainability, it is difficult for the organization to understand and adapt it. Most organizations develop their strategy for adopting sustainability in their organizations, or they utilize the developed frameworks and tools for working sustainably. The interrelation of three dimensions of sustainability (namely people, planet, and profit) will provide the basis for sustainability in the organization [17,18]. Thus, sustainability in the organization has been viewed as promoting their business and gaining profit without ignoring society and the environment. Sustainable organizations provide solutions for fulfilling elementary needs to improve the lives of people, now and in the future with least possible environmental impacts and the highest possible economic and social yield [19].

A sustainable organization has a holistic concept of development that is understood as having three top pillars, namely economic vitality, social equity, and a healthy natural environment form basis of its development, which was also proposed in the TBL. These three essential pillars contribute directly or indirectly to the progress of the firm [20,21]. The sustainability of the organizations has been studied through the various models proposed by various authors. Some of the literature about the models has been summarized in Table 1.

Table 1. Models for Sustainable Organizations.

S. No.	Model	The Conclusion of Sustainability Models	References
1	Theory of the Firm Model	This model explains the conjunction of two industries for maintaining social attribute of product and CSR activity of organizations.	[22]
2	Society versus Firm Model	Sustainability implies sustainable competitive advantage not sustainable development firms.	[23]
3	Shareholder value creation model	How the business organizations maintain the dynamic, sustainable development without compromising shareholder value.	[24]
4	Triple Value Triangle Model	Sustainable development through the axes of the triangle where each axis represents the social, environmental and economic values.	[25]
5	Sustainable value creating a model	Essential actions were taken by different level of stakeholders for maintaining sustainability in organization.	[26]
6	Sustainability Sweet Spot Model	This model represents sustainability as a sweet spot.	[27]
7	Organizational Sustainability Model	This model presents the definition of a stakeholder which satisfies the demands of each level of stakeholders in the organization.	[28]
8	Integrated Management of Quality and Sustainability Model	Corporate sustainability has been discussed in this model. It has been abstracted as economic, social and environmental bottom lines.	[29]
9	Star Model	Government and customer (as a driver) are also an essential part of sustainability, along with the environment, society and economy.	[21]
10	Sustainable enterprise model innovation	A conceptual framework which helps to learn development processes, densities faced during trade-off for sustainable enterprises.	[30]
11	NINR Logic Model for Center Sustainability	Center Sustainability includes strategies to control resources for providing the long-term sustainability while planning a center.	[31]
12	The SOSTARE model	Stepwise assimilated farm sustainability valuations about technical efficiency, and its impact on environmental and economic sustainability.	[32]

It is understood from the study of the models that sustainability in the organization is associated with TBL. It is evident from the literature that profit motivates an organization, but its performance grows when it takes care of people and the planet. Along with this view, other views about sustainability have been summarized in Table 2.

Table 2. Explanation of Sustainability in Organizations.

S. No.	Authors	Sustainability Intent of the Organization
1	Byerlee [33]	The organization promotes sustainable practices at the time of crisis.
2	Shrivastava [34]	Linking the effect of populations on ecosystems.
3	Ulhoi et al. [19]	Solutions for fulfilling simple needs with minimum environmental impact and the maximum economic and social return.
4	Philips and Reichart [35]	Stakeholder status in the non-human environment.
5	Kefalas [36]	Environmentally Sustainable Organization (ESO) as a system approach.
6	Hart and Milstein [24]	Sustainable-value framework for designing shareholder value of the organization.
7	Swart et al. [37]	Sustainability science and scenario analysis are the problems of the future.
8	Figge and Hahn [38]	This research article discusses corporate contributions to sustainability.
9	Du Pisani [39]	Demand for natural resources and their effect on the environment was an endless concern all through human history.
10	Darby and Jenkins [40]	Measure social accounting procedures and tools to quantify social enterprise (SE) contribution to retaining sustainability.
11	Sen and Swierczek [41]	Societal, environmental and stakeholder dimensions for active organizational functions through case analysis of US and Asian international firms.
12	Parrish [42]	What creates a sustainable enterprise through exploration of its principle and purpose.
13	Nguyen and Slater [43]	Discussed hitting the sustainability sweet spot in the sweet spot model.
14	Kocmanova et al. [44]	Business sustainability has been studied in term of environmental, social and corporate governance performance small and medium enterprises in the Czech Republic.
15	Kiron et al. [45]	Sustainability terminology, to cover environmental, economic and societal topics.
16	Barth and Michelsen [46]	Long-term perspective has been studied in term of sustainability factors.
17	Munoz et al. [47]	Education is contributing to sustainability.
18	Jain [48]	The ontological framework has been developed to ease the environmental performance of an organization.
19	Rambaud and Richard [49]	The Concept of Triple Bottom Line Reporting in India's Perspective.
		Sustainability as "Triple Depreciation Line" instead of "Triple Bottom Line".

The sustainable organization study reveals that sustainability in organizations has been broadly categorized into three main factors. The categorization includes environmental factors, economic factors, and social factors and along with these three factors, stakeholders have also emerged as an essential factor for defining sustainability in the organization as shown in Figure 1 (the rhombus model below). These factors have been further fragmented for a thorough explanation.

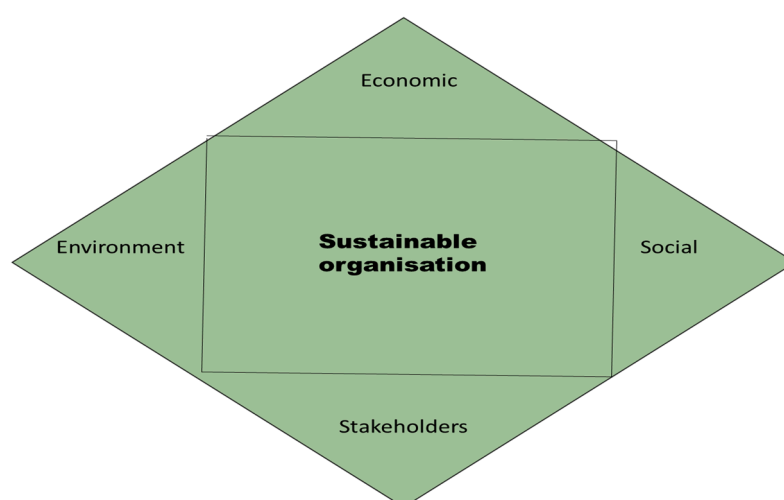


Figure 1. Factors for Defining the Sustainable Organization (rhombus model).

3. Research Methodology

The literature review can be defined as “a systematic, explicit, and reproducible design for identifying, evaluating, and interpreting the existing body of recorded documents”. The literature has been analyzed to systematically summarize the existing research and to identify the essential factors which define sustainability in an organization.

The mixed method research has been used for the verifying and identifying of crucial sustainability factors from the literature [50–54]. Directed content analysis has been used for defining sustainability and identifying the sustainability factors in an organization.

The steps of methods have been explained as:

Step I: Identify and verification of factors in the organizational context through content analysis.

Step II: Develop the hierarchical relationship between the sustainability factors in the organization using TISM.

Step III: Validating the hierarchical model of sustainability in the organizational context through expert opinions.

3.1. Content Analysis for Factor Identification

Content analysis is defined as “Any technique for making inferences by objectively and systematically identifying specified characteristics of messages” [55]. Content analysis is used for both scientific and managerial research where the research problem has been explored systematically and quantitatively [56,57].

3.2. TISM Development for the Conceptualization of Sustainability in the Organization

TISM is an interpretive extension of ISM methodology [58,59]. It interprets the relationships among the factors by determining “what,” “how” and “why”. The hierarchical relationships have then been developed between verified sustainability factors in organizations. “What” is used to define the concept answering what types of element are present. “How” provides hierarchy between the elements and “Why” explains why the relationship is there between the elements. Thus, these three aspects of theory building provide a conceptual relationship between the sustainability factors for developing the conceptual model of sustainability in an organization [21,60].

3.3. *t*-Test for Data Verification

The *t*-test is a hypothesis testing technique where the identified factors have been analyzed through hypothesis. In this study, it is used for factor verification and validating TISM links, by developing hypothesis according to these links.

4. Step I: Identify and Verification of Factors in the Organizational Context through Content Analysis

4.1. Descriptive Analysis

A publication from 1993–2016 has been reviewed for analysis of the sustainability concept. The wide range of publication and models has been studied to find the sustainability factors in an organization. However, the literature on sustainability started from the Brundtland report. The year wise distribution of studies has been shown in Figure 2. The research articles from sustainability, management, environmental, organizational, business ethics, science, and technology journals have been considered in this study. This includes literature reviews, modeling, and conceptual and sustainability research articles.

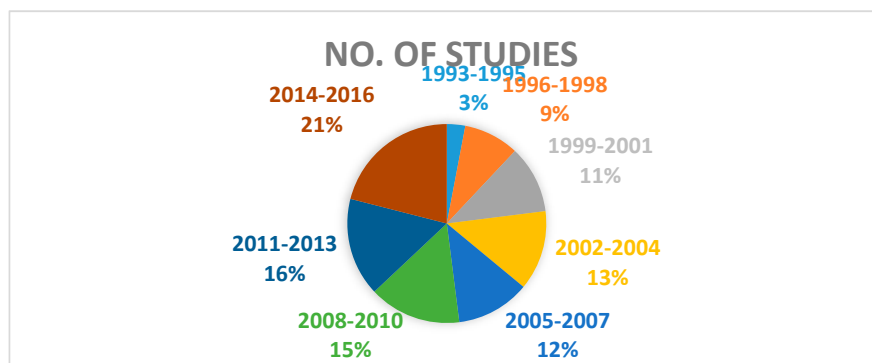


Figure 2. The Year Wise Distribution of Studies.

The sustainability research articles are divided into factors and the study has been carried out by the occurrence of factors present in the research articles, as mentioned in Figures 3 and 4. The frequency of the occurrence of factors is shown in Figure 5. The content analysis continued with the coding of identified articles. The relevant articles have been coded from the literature related to sustainability and stakeholder's involvement in an organization. The combination of directed and summative content analysis has been used manually to analyze the literature. The keyword and literature coding methodology has been used for coding the literature. During the coding of the literature, ten categorizations have occurred, which are taken as essential factors for defining sustainability aspects in the organization.

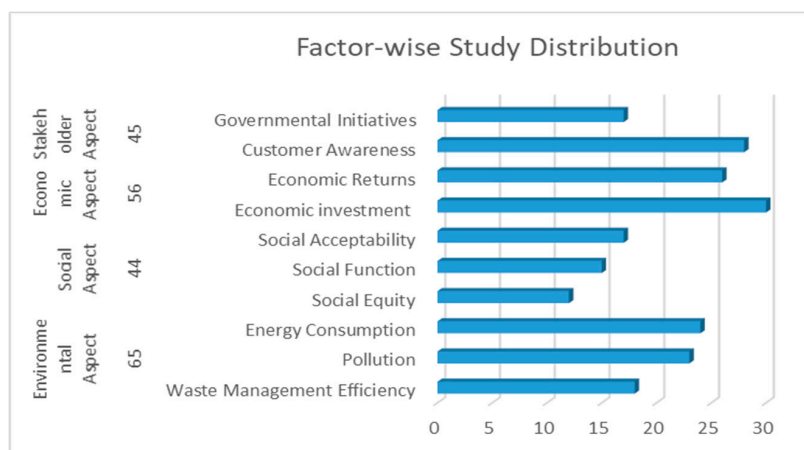


Figure 3. The Factor Wise Sustainability Research Articles Distribution.

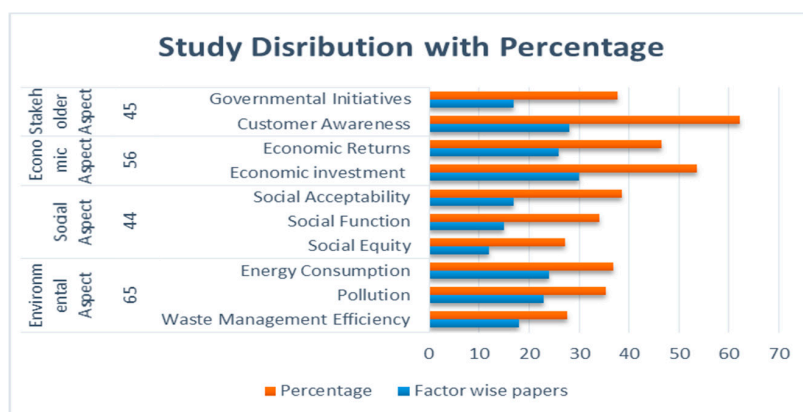


Figure 4. The Percentage-wise Study Distribution.

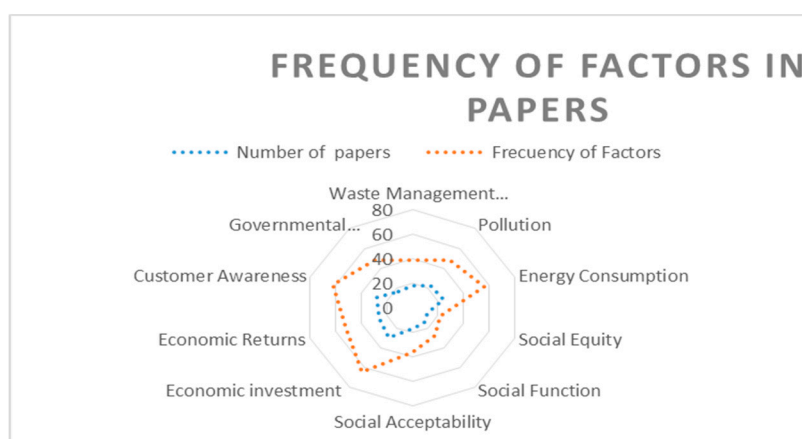


Figure 5. The Frequency of Occurrence of Factors.

From the content analysis, ten sustainability factors have been identified from the literature. These factors are present in literature, and keyword coding and a literature coding system have been used for identifying the factors. The factors with their coding and specifications are shown in Table 3.

Table 3. Factors with their Coding and Specifications.

Factor	Coding
Environmental Aspect	
Waste Management efficiency (SENF1)	Waste Management efficiency, waste management, waste management used for creating sustainability in the organization, eco-efficiency of the organization, eco-efficiency was used to co-relate the environment with economic growth, organization waste minimization, organizational waste, recycling, organizational waste reduction.
Pollution (SENF2)	Environmental Kuznets curve, environmental pollution, sustainable organizations are majorly concerned about pollution, environmental degradation.
Energy consumption (SENF3)	Energy consumption affects energy requirements, green energy, substitution of traditional energy sources, payback from green energy, solar energy, environmental load, greenhouse gas emission.
The social aspect of sustainability	
Social Function (SSCF4)	The functional aspect of the organization toward society, social approaches, the economic benefit to the society, employment creation, providing training and vocational education.
Social Equity (SSCF5)	Employment equity among the organization. Stakeholder participation rate, employees wage fairness, positioning and promotion of organization staffs.
Social acceptability (SSCF6)	Perception and participation of employees in the organization, societal perception, opinion of society, societies' view about the organization, understanding the needs of people and stakeholders, organizational development.
Economic Aspect	
Economic Returns (SECF7)	Profit maximization. Organizational earning, organization profit, financial returns environmental and social welfare maximization, economic capital, natural resource capital, long-term returns by making more profit as well as fulfilling responsibilities towards nature.
Economic Investment (SECF8)	Organizations utilize their core capabilities for absorbing sustainable changes without affecting growth, dynamic capability of gaining, the competitive advantages, investment over sustainability, investment over green energy, investment over social acceptability, social function, and investment over innovation.
Stakeholders Aspect	
Customer Awareness (SSHF9)	Customers demand green products, customer preference, critical selection of products, customer awareness of choosing sustainable products and organization, mindful consumption pull the organization towards responsible, social and societal marketing which promotes sustainability.
Governmental Initiatives (SSHF10)	Government policies, direct regulations, direct and indirect governmental initiatives, government forms a political ecology for nurturing sustainability, governmental incentives, rules for avoiding exploitation of human rights and empowers the society.

4.2. Verification of Identified Sustainability Factors in the Organization

Verification further strengthens these factors from experts. The groups of experts have been identified by using judgmental sampling. The expert's opinion has been captured by applying hypothesis testing through a *t*-test. The *t*-test is further verified by using a reliability test over the data. The hypothesis was developed for identified sustainability factors which were statistically calculated

for verifying sustainability factors by using SPSS 20 software [61]. Here, the null hypothesis and alternate hypothesis have been developed to examine expert reviews through a *t*-test for testing these hypotheses. The developed hypotheses are:

H(0): Null Hypothesis: There is no significant difference between the observed mean and specified mean for factor Fn.

H(A): Alternate Hypothesis: There is a definite significant difference between observed mean and specified mean for factor Fn (where, $N = 10$).

The questionnaire has been designed using a five-point Likert scale which used for verification of sustainability factors. This exercise included Forty-Seven experts from sustainability backgrounds. Participant experts include senior managers, CEOs, and educational experts who have extensive knowledge about sustainability. In this hypothesis testing, the test value 3.5 was used for factors verification. The *t*-test statistic for hypothesis testing results is shown in Table 4.

Table 4. The *t*-Test Analysis of Sustainability Factors ($N = 47$).

S. No.	Factors	Test Value = 3.5				
		Mean	Std. Deviation	Sig.(2tailed) Mean Difference	<i>t</i> Value	Result
1	Waste Management Efficiency	4.26	0.846	0.000	6.120	Significant
2	Pollution	3.94	0.791	0.000	3.779	Significant
3	Energy Consumption	3.94	0.870	0.001	3.437	Significant
4	Social Equity	4.11	0.729	0.000	5.700	Significant
5	Social Function	4.09	0.830	0.000	4.835	Significant
6	Social Acceptability	4.15	0.932	0.000	4.773	Significant
7	Economic investment	4.34	0.788	0.000	7.313	Significant
8	Economic Returns	4.11	0.429	0.00	9.68	Significant
9	Customer Awareness	3.96	.806	0.000	3.889	Significant
10	Governmental Initiatives	4.26	0.736	0.000	7.033	Significant

Note: N = number of respondents. * Significant, if significance value 2-tailed < 0.05 .

4.3. Reliability Analysis

According to Weber (1990), “To make valid inferences from the text, it is important that the classification procedure be reliable in the sense of being consistent: Different people should code the same text in the same way” [62]. It uses to reduce the error and to correct the factors identified through codes. The Scott (1995) pi formula has been used for checking the correctness of identified factors [63].

The formula is

$$Pi = (Po - Pe) / (1 - Pe)$$

where Po = Observed percentage of agreement; Pe = Percentage of agreement expected by chance.

t-test calculates the expert’s opinion used for verification of factors, and the Cronbach’s Alpha of reliability is 0.783, which indicates the intercoder agreement is 78%. This shows considerable strength of agreement with the data, as shown in Table 5.

Table 5. Reliability Analysis of *t*-Test Data ($N = 47$).

Reliability Statistics	
Cronbach’s Alpha	Number of Items
0.786	10

5. Step II: Develop the Hierarchical Relationship between the Sustainability Factors in the Organization Using TISM

Total Interpretive Structural Modeling (TISM)

The verified sustainability factors have been used to model the conceptual framework for sustainability in the organization. The TISM model of sustainability has been carried out using the following steps:

Step I. Identifying and defining elements

The factors used to define sustainability in the organization that has been defined above in the study are summarized in Table 3.

Step II. Define Contextual Relationship and Interpretation of Relationship

In this step, the contextual relationship has been identified as “Factor A influences Factor B.” This contextual relationship helped to draw the relationship between the sustainability factors.

Step III. Interpretive Logic of Pairwise Comparison

The ‘Interpretive Logic Knowledge Base’ developed by using a footprint in the numeric form of 0 and 1 to prepare a reachability matrix of expert opinions. The pairwise comparison of identified and verified sustainability factors have been plotted regarding the reachability matrix.

Step IV: Transitivity Check

This step is an extension of the previous one. Here the transitivity of reachability has been checked for finding the transitive links among the sustainability factors in the organization. Transitivity can be explained as “the property in which if factor A is influencing factor B, and factor B are influencing factor C then, factor A should influence factor C.” The outcome is known as a transitive reachability matrix (TRM) is shown in the appendix (Table A1).

Step V: Level Partition on Reachability Matrix

The interaction of antecedent and reachability set has been plotted in the level partitioning. The factor which has the same reachability sets and intersection set come at the first level in the hierarchy. The first level factor has been removed, and the same process is repeated for further leveling in the matrix. The level partitioning of sustainability factors exhibited in the appendix (Table A2).

Step VI: Digraph Development and Total Interpretive Structural Model formation

The pictographic representation of factors on the basis level partitioning is known as a digraph. The links obtained between the two nodes in the digraph are further interpreted. The complete interpretation of links forms the TISM model. In Figure 6, the interpretation links are shown in the form of a link number. The TISM model is subjected to different checks as suggested by Sushil (2016) [59].

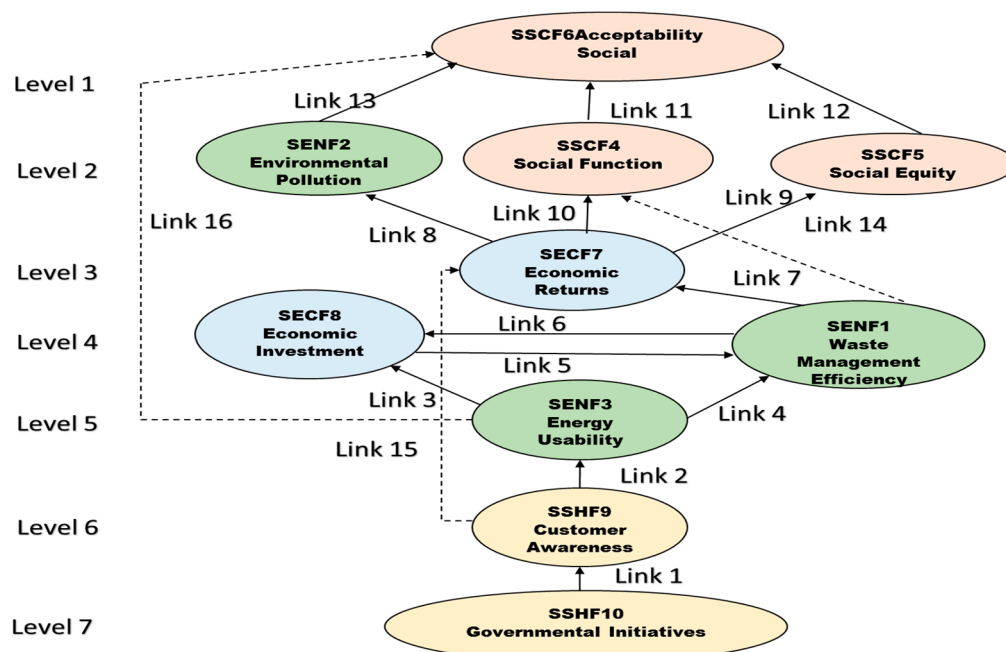


Figure 6. Initial TISM for Sustainability in the organization without Interpretation.

6. Step III: Validating the Hierarchical Model of Sustainability in the Organizational Context through Experts Opinion

Validation of TISM

Quantitative and qualitative analysis have been used together for strong validation of a concept. Here, the hypothesis testing has been used for validation of each TISM linkage through a *t*-test. There were 16 linkages, and each link was verified for validation of a complete TISM model. The survey has been conducted over thirty-five respondents; all respondents from sustainability backgrounds (having more than ten years' experience) were chosen for validation of each link developed in the TISM model. Sixteen questions were developed one for each linkage, and a questionnaire was prepared over the five-point Likert scale from strongly disagree to agree strongly.

Common null and the alternate hypotheses have been developed for analyzing 16 linkages of the TISM model. The developed hypotheses are:

Null Hypothesis: H_0 : There is no significant difference between the observed mean and specified mean in respective factor linkages.

Alternate Hypothesis: H_1 (A): There is a significant difference between the observed mean and specified mean in respective factor linkages.

The SPSS 20 software has been used for conducting a one-tailed *t*-test with 3.5 test value as shown in Table 6.

Table 6. Result of Hypothesis Testing ($N = 35$).

S. No.	Factors Link	Mean	Std. Deviation	Sig.(2tailed) Mean Difference	t-Value	Accept/Reject *
1	Link1	4.24	0.831	0.000	4.454	Accept
2	Link2	4.32	0.802	0.000	5.112	Accept
3	Link4	4.40	0.577	0.000	7.794	Accept
4	Link3	4.40	0.707	0.000	6.364	Accept
5	Link6	4.28	0.891	0.000	4.379	Accept
6	Link5	4.20	0.764	0.000	4.583	Accept
7	Link7	4.04	0.978	0.011	2.760	Accept
8	Link8	4.04	0.978	0.011	2.760	Accept
9	Link9	4.20	0.957	0.001	3.656	Accept
10	Link10	4.08	0.862	0.003	3.364	Accept
11	Link11	4.36	0.757	0.000	5.679	Accept
12	Link12	4.20	0.913	0.001	3.834	Accept
13	Link13	4.08	0.759	0.001	3.819	Accept
14	Link 14	3.92	1.213	0.106	1.683	Reject
15	Link15	4.20	0.866	0.000	4.041	Accept
16	Link16	3.96	0.676	0.002	3.404	Accept

Note: * Accept, if significance value two-tailed <0.05 . N = number of respondents.

Based on the analysis, the links with a significance level less than five percent were accepted and the links above five percent were rejected. All links except link 14 are accepted in the final TISM model. The validated TISM model with accepted links is shown in Figure 7.

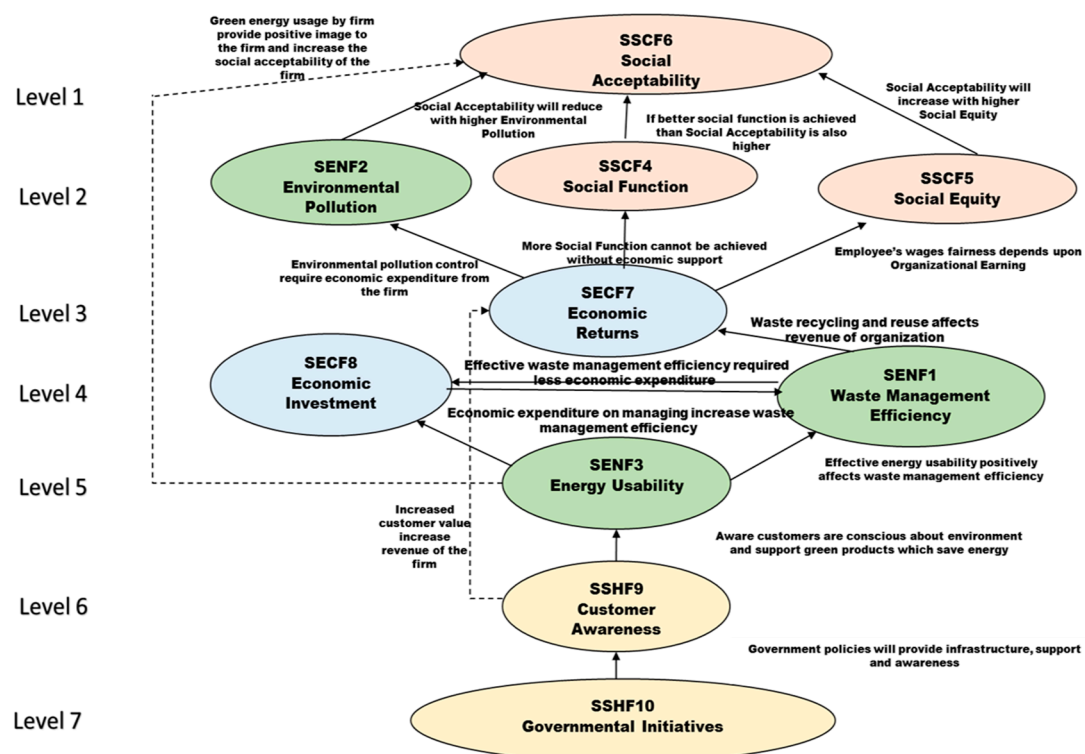


Figure 7. Final TISM model for Sustainability in the organization.

7. Results and Discussion

The final TISM model represents the path of creating sustainability in the organization with its dependent and driver factors. The final TISM model shows that social aspect is the depending aspect of sustainability and social acceptability is the dependent factor of sustainability. Meanwhile, the stakeholder aspect is the driving aspect of sustainability and government initiatives are the primary driving factor for maintaining sustainability in an organization [64]. The TISM approach has been used for framing the conceptual framework; it is differentiated from previous literature by forming the hierarchical conceptual framework of sustainability which supplements the TBL with the fourth dimension, i.e., the stakeholder. The driving factor government initiative helps in creating awareness about sustainability in the organization through its policies and actions. The driving nature of factor government initiative is easy to understand in mining industries where the role of government can be understood in term of global mining initiatives through ISO certification (ISO 14001) which helps in sustainable mining; this generates an awareness in global customers of sustainable mining [65–67]. After government, the customer plays a vital role in awakening the organization. The customer's view is the primary cause of sustainability developments in business and marketing [68]. Customer opinion is best supported as sustainably aware customers choose sustainable products and force organizations to create sustainable products or to operate sustainably [69,70]. The environmental aspect for generating sustainability in the organization is highlighted by Shrivastava (1995) in his article "Environmental technologies and competitive advantage" [71]. Thus, in an organization, energy consumption and waste management efficiency depend on economic investment for running organizations sustainably and this provides the economic returns to organizations. The economic returns act as a morale booster for organizations and motivate them to control pollution. All these aspects of social function and social equity will improve the social acceptability of an organization [72]. The final TISM model also indicates that a sustainable organization should focus on social issues by providing good social equity among their employees through wages fairness, flexibility among job for female employees, and by involving employees in social functions. The final sustainability hierarchy shows that mediating factor, i.e., economic investment has an indirect effect over sustainability, meaning the economic investment in sustainability will require some payback period. A sustainable organization needs to manage its waste through a reducing, recycling, reuse, and recovery process for improving waste management efficiency and economic returns [73–75].

7.1. Implications

This study indicates the hierarchical relationship among the sustainability factors which can be used by an authority to decide priorities and develop policies for proper implementation of sustainability in an organization.

This study also indicates that increased shareholder value will heighten shifts towards sustainability. It also shows that sustainability enhancing policies aggravate awareness which results in higher sustainable economic growth for organizations.

The study indicates that environmental factors act as an intermediary which promotes the positive social acceptance and relationship of a sustainable organization. Hence, sustainable organization should focus on environmental aspects by developing pollution control, waste management equipment, and effective energy utilization. These measures would improve the social acceptability of an organization. A positive image of a sustainable organization helps in creating new customers which in turn improves the economic gains of the organization. This study shows that CSR expenditure is not forfeited but pointedly contributes to turnover and providing a positive image to shareholder funds.

7.2. Limitations

This study tries to evaluate the hierarchy of relationships between the sustainability factors where stakeholder perspectives act as a driver for sustainability in the organization. The data is limited to customers and the government only. The actual meaning of shareholder is not limited as it can be extended to initiators of sustainability, this can also entail shareholder involvement from all aspects of the organization. It seems to be a challenging process but adds a new paradigm to achieve sustainability in organizations. A corporation can be established as an example by its accountable assurances to stakeholders.

8. Conclusions and Future Research Directions

Sustainability is the need for a dynamic business environment. It is defined as sustaining natural resources for future consumption which exposes a new arena of responsible utilization of natural resources. This explanation leads organizations to consume the natural resources responsibly in order to protect them from reaching a tipping point. This study provides a pathway which helps in achieving sustainable economic growth by increasing the social acceptability of the organization through the contribution of stakeholders. This study shows that instead of fragmenting the sustainability into drivers, there is a need for a responsible integrated path for achieving sustainability in an organization. It is also found that investing in energy efficiency, waste management, pollution control equipment and plans would provide returns directly through savings and indirectly by increasing the social value of a participating organization. This study provides a holistic approach and drivers which promote sustainability in an organization. Future research is required in standardization and developing the role of social entities to promote. The relationship can be further studied in terms of a cause-effect relationship to find the cause elements and effect elements for achieving sustainability in an organization. The polarity of relationships can be studied in future to provide positive and negative relationships among the sustainability hierarchy.

Author Contributions: The individual contribution and responsibilities of the authors were as follows: A.S. finds the factors, validate them, collect and analyzed the data, form model, and validate it for the development of paper. S., S.K. and D.P. provided good advice throughout the research, by giving suggestions on model design, methodology, inferences and refined the manuscript. All the authors have read and approved the final manuscript.

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Appendix A

Table A1. Transitive Reachability Matrix.

Sustainability Factors	SENF1	SENF2	SENF3	SSCF4	SSCF5	SSCF6	SECF7	SECF8	SSHF9	SSHF10
SENF1	1	1	0	1 *	1 *	1	1	1	0	0
SENF2	0	1	0	0	0	1	0	0	0	0
SENF3	1	1	1	1*	1*	1*	1	1	0	0
SSCF4	0	0	0	1	0	1	0	0	0	0
SSCF5	0	0	0	0	1	1	0	0	0	0
SSCF6	0	0	0	0	0	1	0	0	0	0
SECF7	0	1	0	1	1	1	1	0	0	0
SECF8	1	1	0	1	1	1	1 *	1	0	0
SSHF9	1	1	1	1 **	1 **	1	1 *	1*	1	0
SSHF10	1	1	1	1	1	1	1	1	1	1

Note: * Transitive Relationship, ** Second Order Transitive Link.

Table A2. Partitioning the Reachability Matrix into Different Levels.

Sustainability Factors	Reachability Set	Antecedent Set	Intersection Set	Level
SENF1	1,2,4,5,6,7,8	1,3,8,9,10	1,8	1
SENF2	2,6	1,2,3,7,8,9,10	2	
SENF3	1,2,3,4,5,6,7,8	3,9,10	3	
SSCF4	4,6	1,3,4,7,8,9,10	4	
SSCF5	5,6	1,3,5,7,8,9,10	5	
SSCF6	6	1,2,3,4,5,6,7,8,9,10	6	
SECF7	2,4,5,6,7	1,3,7,8,9,10	7	
SECF8	1,2,4,5,6,7,8	1,3,8,9,10	1,8	
SSHF9	1,2,3,4,5,6,7,8,9	9,10	9	
SSHF10	1,2,3,4,5,6,7,8,9,10	10	10	
Sustainability Factors	Reachability set	Antecedent set	Intersection set	Level
SENF1	1,2,4,5,6,7,8	1,3,8,9,10	1,8	2
SENF2	2	1,2,3,7,8,9,10	2	
SENF3	1,2,3,4,5,6,7,8	3,9,10	3	
SSCF4	4	1,3,4,7,8,9,10	4	
SSCF5	5	1,3,5,7,8,9,10	5	
SECF7	2,4,5,6,7	1,3,7,8,9,10	7	
SECF8	1,2,4,5,6,7,8	1,3,8,9,10	1,8	
SSHF9	1,2,3,4,5,6,7,8,9	9,10	9	
SSHF10	1,2,3,4,5,6,7,8,9,10	10	10	
Sustainability Factors	Reachability set	Antecedent set	Intersection set	Level
SENF1	1,7,8	1,3,8,9,10	1,8	3
SENF3	1,3, 7,8	3,9,10	3	
SECF7	7	1,3,7,8,9,10	7	
SECF8	1,7,8	1,3,8,9,10	1,8	
SSHF9	1,3,7,8,9	9,10	9	
SSHF10	1,3,7,8,9,10	10	10	
Sustainability Factors	Reachability set	Antecedent set	Intersection set	Level
SENF1	1,8	1,3,8,9,10	1,8	4
SENF3	1,3,8	3,9,10	3	
SECF8	1,8	1,3,8,9,10	1,8	
SSHF9	1,3,8,9	9,10	9	
SSHF10	1,3,8,9,10	10	10	
Sustainability Factors	Reachability set	Antecedent set	Intersection set	Level
SENF1	3	3,9,10	3	5
SSHF9	3,4,5,9	9,10	9	
SSHF10	3,9,10	10	10	
Sustainability Factors	Reachability set	Antecedent set	Intersection set	Level
SSHF9	9	9,10	9	6
SSHF10	9,10	10	10	
Sustainability Factors	Reachability set	Antecedent set	Intersection set	Level
SSHF10	10	10	10	7

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