

ISM of Critical Success Factor for Sustainable Development

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Abstract:- The Brundtland Report, which warned of the negative environmental consequences of economic growth and globalisation and attempted to find possible solutions to the problems caused by industrialization and population growth, introduced the concept of sustainable development for the first time in 1987. Although we are aware of the concept of sustainable development and its pillars, we decide to do it with a perception of civil engineering students that is for green building sustainability. Well there are some factors that have an impact on sustainable development but we don't know the relation between them, however without adequate research, this is impossible to obtain. In this article, we looked at the three pillars of sustainable development: social, economic, and environmental. During the research, we discovered some variables that have an impact on Sustainable development. After analysing the variables, we realised that we couldn't do ISM on all of them, so we focused on the 10 most important ones, and the findings revealed which elements are more or less responsible for Sustainable development.

Keywords:- Sustainable Development, ISM, Critical Success Factor.

I. INTRODUCTION

Efforts to Meet the Sustainable Development Goals (SDGs) The Sustainable Development Goals (SDGs) were established as the global sustainability agenda for 2030 in September 2015 by a consensus of 193 member countries at a United Nations meeting in New York, with 17 goals and 169 targets.

However, achieving this goal will necessitate identifying the components that are entirely responsible for Sustainable Development. In this paper we will discuss the various factors, what are they? And how sustainable development's three pillars are social, economic and environment plays a major role in this.

So we have found out about the 10 critical success factors on which we will be performing the ISM.

Economic Factors:-

1. Funding and Provision: Creative finance strategies based on a ways economy that produces more with less, different provision to encourage it.

2. Government and Political Support : The degree to which a government can influence sustainable development

and can contribute towards it in different ways. Need to encourage Private firms.

3. Affordability: It is only affordable when a country's basic development, such as poverty and health challenges, is addressed. So, who can afford or by what means we will afford sustainable development.

4. Construction Technology: When it comes to new construction Technology, sustainable construction implies employing renewable and recyclable materials while also lowering energy usage and trash. The main purpose of sustainable building is to lessen the industry's environmental effect.

Environmental Factors:-

5. Appropriate Material Use : These materials are made out of recycled and industrial waste materials and byproducts, and they aim to have a lesser environmental impact. They are also thermally efficient and consume less Embodied energy.

6. Protection of Environment: Increasing the efficiency of building resources such as energy, water, and materials while lowering the impact of buildings on human health and the environment

7. Land Use and Development Plan: Land use planning is the process of allocating land among competing and often conflicting uses in order to ensure the rational and orderly development of land in an environmentally sound manner in order to create long-term human settlements.

Social Factors :

8. Security of Lives and Properties: Sustainable construction Without compromising the safety and security of the people.

9. Jobs and Skills Acquisition: Job opportunities and required skills in the labour according to the need of sustainable construction.

10. Public Awareness: People's understanding of what sustainable development is and how it can benefit humanity in the future.

We selectively focus on a few essential elements that affect sustainable development, then perform ISM on those factors, so that we can find out the relation between them. but we will not discuss how to address these concerns.

II. LITERATURE REVIEW

The study of Albert Ping Chuen Chan, Amos Darko, Ayokunle Olubunmi Olanipekun, Ernest Effah Ameyaw shows that,

- The most significant impediment to GBT adoption in Ghana is the high cost of GBTs.

- Higher GBT costs are a major impediment not only in Ghana, but also in the United States, Canada, and Australia.
- Government-related, human-related, knowledge-and-information-related, market-related, and cost-and-risk-related barriers are the fundamental grouping hurdles.

Another study of Williams and Dair(2010) identified twelve impediments to sustainable construction in England, five of which were,

- Cost
- A lack of customer demand
- A shortage of sustainable materials and products
- A lack of information and awareness
- Insufficient skills.

Inadequate building rules, as well as a lack of information and skills, Winston(2007) discovered, are hurdles to sustainable housing development in Ireland.

Meenakshi Sharma(2018) Study shows that,

- For the Indian green building situation, a conceptual ‘Green Building Sustainability Model’ has been designed.
- Stakeholders have an important role in designing a green building strategic mix for sustainable growth.

Rajesh Attri , Nikhil Dev and Vivek Sharma studies for ISM was also helpful as it explains what role it Will play in identifying the impact of various variables on the Sustainable development,

The ISM method is understandable to a wide range of users in interdisciplinary groups, provides a means of integrating the diverse perceptions of participating groups, can handle a large number of components and relationships typical of complex systems, is heuristic in terms of assessing model formulation adequacy, and leads to insights about system behaviour.

III. RESEARCH METHODOLOGY

Basically, the reviews aimed to identify the various critical success factors responsible for the sustainable development and then categories them into the three main pillars that is Social, Economic, and Environmental. But we Need to measure the impact created by the different success factors(more or less) in order to acquire sustainable development. For this we have taken 10 critical factors which impact sustainable development.

First step was the criteria of selecting the critical factors that are basically research individually in social, economic and environmental fields. Secondly by following some research paper in which there is some data that indicates the impacts of different factors.

Another step was performing the ISM .

- ii) SSIM
- iii) Reachability Matrix
- iv) Giving the levels
- v) Final table of hierarchy

IV. RESULTS

Step 2: SSIM

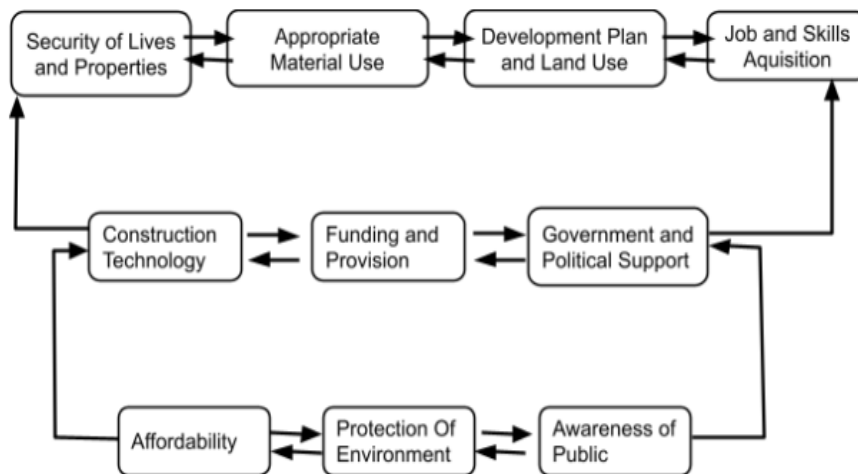
Critical Factors	(10)	(9)	(8)	(7)	(6)	(5)	(4)	(3)	(2)	(1)
(1) Construction Technology	A	V	A	V	V	V	A	A	A	O
(2) Affordability	A	V	O	V	V	V	A	A	O	
(3) Funding and Provision	V	V	V	V	V	X	A	O		
(4) Government & Political Support	X	V	V	A	V	A	O			
(5) Protection of Environment	X	V	O	A	A	O				
(6) Appropriate Material Use	A	A	V	X	O					
(7) Development Plan & Land Use	A	V	A	O						
(8) Jobs Requi. & Skills acquisition	X	V	O							
(9) Security of Lives & Properties	A	O								
(10) Awareness of Public	O									

Step 3: Final Reachability Matrix

	1	2	3	4	5	6	7	8	9	10	Driving Power
1	1	0	1	1	1	1	1	1	1	0	8
2	1	1	1	1	1	1	1	1	1	1	10
3	1	1	1	1	1	1	1	1	1	1	10
4	1	1	1	1	0	1	1	1	1	1	9
5	1	1	1	1	1	1	1	1	1	1	10
6	1	0	1	1	1	1	1	1	1	1	9
7	1	1	1	1	1	1	1	1	1	1	10
8	1	1	0	1	1	1	1	1	1	1	9
9	0	0	0	0	1	1	1	1	1	0	5
10	1	1	1	1	1	1	1	1	1	1	10
Dependence Power	9	7	8	9	9	10	10	10	10	8	

Step 4: Giving the Levels

	Reachability Set	Antecedent Set	Intersection Set	Level
1	1,3,4,5,6,7,8,9	1,2,3,4,5,6,7,8,10	1,3,4,5,6,7,8	II
2	1,2,3,4,5,6,7,8,9,10	2,3,4,5,7,8,10	2,3,4,5,7,8,10	III
3	1,2,3,4,5,6,7,8,9,10	1,2,3,4,5,6,7,8,10	1,2,3,4,5,6,7,8,10	II
4	1,2,3,4,6,7,8,9,10	1,2,3,4,5,6,7,8,10	1,2,3,4,6,7,8,10	II
5	1,2,3,4,5,6,7,8,9,10	1,2,3,5,6,7,8,9,10	1,2,3,5,6,7,8,9,10	III
6	1,3,4,5,6,10	1,2,3,4,5,6,7,8,9,10	1,3,4,5,6,10	I
7	1,2,3,4,5,6,7,8,9,10	1,2,3,4,5,6,7,8,9,10	1,2,3,4,5,6,7,8,9,10	I
8	1,2,4,5,6,7,8,9,10	1,2,3,4,5,6,7,8,9,10	1,2,4,5,6,7,8,9,10	I
9	5,6,7,8,	1,2,3,4,5,6,7,8,9,10	5,6,7,8	I
10	1,2,3,4,5,6,7,8,9,10	2,3,4,5,6,7,8,10	2,3,4,5,6,7,8,10	III

Step 4: Final order or Hierarchy**V. CONCLUSION**

While the aim of sustainable development is unquestionably important, the issues and solutions are both unique and intertwined in their own ways. Among the above mentioned 10 essential success elements, we discovered that cost, environmental protection, and public awareness are the foundations for long-term building sustainability. As a result, we must continue to focus on these three variables. Aside from that, construction technology, funding and availability, and government and political backing are the elements that have a little less but still significant influence on the face of sustainable building.

Finally, the variables whose influence is reliant on other aspects include Security of Lives, Appropriate Material Use, Development Plan and Land Use, and Job & Skills Acquisition. So, in order to work on the Core Factors of Sustainable Building, we need to have adequate information and resources for the basics of sustainable construction.

However, in some studies it is suggested that developing countries need to be more focused on this sustainable development issue as a whole, not only the sustainable construction, because contribution toward sustainable construction is only possible when there is no poverty, no health issue etc. developing countries have a long way to go for sustainable development. Also there is an issue of involving the government in this matter, Government plays a major role in this.

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