Comparative Review of Different Rating Systems Approach and Responses to Pandemic Situations

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Abstract

This study is going to spot the light on the shortcomings of the current sustainability and green buildings rating systems in terms of protection against pandemics especially COVID-19 pandemic. Six of the globally widely used, most developed, well-known Green buildings rating systems were carefully picked, studied and compared in scientific comparison according to certain criteria The aim is to show the common aspects of sustainable built environment and the credits/criteria which are aligned with COVID-19 protection precautions and measures. The reliable source of COVID-19 protection precautions is the official publications by the world health organisation on their Website after the crisis started. It is to be noted that only precautions with impact on architecture and urban levels were used by the researcher. The study/comparison showed gaps in the selected systems in global pandemic situations.The response of the different systems around the globe was studied and presented by the researcher. It is not intended to provide any criticism to the studied systems rather than providing an overview on different approaches of responses of different systems in a variety of geographical areas. Finally, the paper shows the recommended approaches in overcoming such gaps and shortcomings which were concluded after the study. It is expected that this study would provide practitioners in the field of architecture, Enginnering, Construction, green buildings industry and public health professionals some guidelines to help them overcome shortcomings in the current green standards and rating systems.

Keywords

Architecture • Sustainability • Pandemic • Pandemic architecture • Health and safety

1 Introduction

In 2020, the whole world was under brutal and relentless attack of new and mutated type of respiratory virus of SARS family, which is currently known as COVID-19, the spread of the virus was rapid that the world health organization declared the state of pandemic emergency, the effect of the pandemic reached almost everywhere on planet earth, several industries were severely affected and the impact is to be evaluated in post pandemic stage, but the initial readings predict that it will be catastrophic.

The sustainability experts and professionals around the globe must carry their responsibility and to be in the front line in the army fighting the current pandemic and the future potential ones. What can be done in this current historical turning point can save millions of lives in the near and far future. The war against pandemics will not end quickly and it is believed that it is time now to take further step in this war and not to stay in defensive mode but to take a proactive approach as "the best defence is a good offence".

The world Health Organization issued recommendations to all countries to fight the current pandemic COVID-19. These recommendations were in several formats including brochures, bulletins, reports and awareness campaigns (World Health Orgnisation). With hundreds of recommended precautions there are main protection measures that are reiterated by the organization and all public health professionals. These precautions include (and not limited to).

- Promotion of hygiene practices including regular hand washing and use of sanitizers. Hand hygiene stations availability.

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- Promote respiratory etiquette by all people at the workplace and the use of personal protective equipment.
- Development of regulations and policies that mandates the use of face shields/masks and other protective tools.
- Social distancing and avoidance of unnecessary gatherings and reduction of people density inside buildings.
- Minimize the need for physical meetings or events and promotion of virtual conferences and meetings.
- Adjustment of working hours to avoid people gathering (working from home).
- Travel restrictions, to and from high risk countries.
- Space and surfaces cleaning and disinfection.
- Efficient and effective waste management especially hazardous waste.
- Responsible procurement of sanitizers, disinfectants and all similar products.
- Avoid the excessive use of sprayers or disinfectants in indoor and outdoor areas. And restrict smoking in indoor areas.
- Promote awareness campaigns and provide regular trainings and guidance.

A	Meets the proposed criteria Fully.
B	Meets the proposed criteria Partially.
C	Does not meet any Criteria.
Blank	Information not available.
N/a	Not applicable.

2 Structure

This paper consists of the following sections:

Overview of rating systems, Review Criteria, Analysis and elaborations, Results and Finding and Conclusions.

3 Overview of Rating Systems

Green building rating tools—also known as certification tools—are the tools which used to evaluate the performance of buildings in terms of sustainabilility and provide recognition and publicity to it. The said rating tools, often voluntary, provide rewards to the buildings which has significant greener performance. Green Building Councils, which are members of the WorldGBC global network, develop and administer many of the world's ratings tools. By 2016, more than one billion square meters of green building space (an area as ten times as the size of the french capital) had been certified globally through member Green Building Councils (World Green Building Council).

Table 1 Studied ratinng systems and countries (Politia and Antoninib, 2016)

Rating system	Country
Leed	US/International
GSAS	Qatar
Estidama	UAE
Bream	UK/International
Green star	Australia
Greenglobes	Canada/US

Nowadays, there are hundreds of green buildings and sustainability ratings systems, standards in the global market. These tools were made to help guide, demonstrate, and document efforts to deliver green and sustainable, high-performance buildings. It is widely believed that more than six hundred 600 green product certifications around the globe with approximately one hundred in use in the united states and the numbers continue to grow.

The vital role of sustainability rating systems is currently in protecting the built environment against pandemics is being examined nowadays. In the following section (Table 1), several prominent rating systems are going to be studied and reviewed against WHO COVID-19 recommendations. The rating systems are namely LEED, GSAS, ESTIDAMA, BREAM, GREENSTAR, GREENGLOBES. These picked tools are currently the most well-known, most influential and technically developed green rating tools available (Fowler and Rauch, 2006).

4 Review Criteria

There are different approaches of evaulating the sustainability rating systems. During the literature review of this paper, the author reviewed different approaches of evaluation and concluded that there are four different sets of criteria; RSMEANS, B.K. Nguyen/H. Altan, E. Bernardi/S. Carlucci/C. Cornaro/R. Bohne and H.M. Karmany.

The first approach, which is called RSMEANS (Table 2), cited as follows "*there are four main principles that should be taken into consideration when evaluating a building rating or certification system:*

- ***Science-based****—the ability to reproduce the results,decisions by other stakeholders.*
- ***Transparent****—evaluation and award process is transparent and examinable.*
- ***Objective****—Conflict free, no corruption certification entity.*
- ***Progressive****—Tools are crafting a postive impact on the market and the industry.*"

Table 2 RSMEANS criteria

RSMEANS approach	
Science-based	*The ability to reproduce the results,decisions by other stakeholders*
Transparent	*Evaluation and award process is transparent and examinable*
Objective	*Conflict free, no corruption certification entity*
Progressive	*Tools are crafting a postive impact on the market and the industry*

The second approach was introduced by Professor and Scholar of School of Architecture at the University of Sheffield Dr. Binh K. Nguyen and Prof. Hasim Altan in 2011. The proposed criteria for assessment can be summerised as follws in Table 3.

The third approach was introduced by Researchers and Professors in the Faculty of Engineering of Norwegian University of Science and Technology and the Department of Enterprise Engineering in the University of Rome; Elena Bernardi, Salvatore Carlucci, Cristina Cornaro and Rolf Andre Bohne. Published on the web.

Table 3 Nguyen/Altan approach and criteria/sub-criteria

Binh K. Nguyen/Hasim Altan		Remarks
Popularity & influence	Well known Importance Numer of countries adopting the system Number of projects Involved Versatility	Versatility: the usability of the system as comparison basis or benchmark
Availability	1-Availability to the system itself: Accessibility System's format Information available for public System cost Certfication fees 2-Vailability of references: Vailability of on-line information vailability of non on-line information availability of case studies avilability of user's interaction System's openess	
Methodology	Methodology summary Weighting Rating levels Standardization Quantitative criteria Qualitative criteria Whole life cycle assessment Complexity Efficiency of assessment method	
Applicability	1-Stages of Building lifecycle incfluenced: Pre-design, design, construction, operation and post occupancy Demolition, second life 2-Technical Contents:	
Data collection process	Data gatherer Data collection method Documentation Measurability Convenience	Measurability: the ability to use tangible and measureable methods
Accuracy & verification	1-accuracy of data processing stage 2-Accuracy of data outputting stage 3-Verification: Assessor qualifications Level of details to check Third party Results aknowledgement	

(continued)

Table 3 (continued)

Binh K. Nguyen/Hasim Altan		Remarks
User-friendliness	1-Ease of use: 2-Product support Availability of responsive assisstance FAQ & Record inquiries Training & courses available Instructions or helps	
Development	Systems maturity Systems stability Update Development approach Future development	
Results presentation	Presentation method Clarity Comparability Result usability	

Table 4 E. Bernardi/S. Carlucci/C. Cornaro/R. Bohne approach and criteria

E. Bernardi/S. Carlucci/C. Cornaro/R. Bohne	
Focus	An inclusive focus on buildings
Scientific interest	Cited in at least 20 scientific researches and papers in reputable journals
Widespread adoption	More than 500 Certfied projects
A consolidated development state	Exceeds five years of service

The criteria can be summerized as in Table 4.

The fourth and last approach was presented by Heballah Mostafa Karmany in her research and study about green buildings rating systems for Egypt (Karmany, 2016). The approach can be summerized and presented as in Table 5.

From the above discussion, comparison and analysis study of different approaches was conducted. Using the analytical approach to merge all approaches in one approach which combines the most significant criteria and rearrange the criteria in a new set of evaluation criteria. The analysis is presented hereunder using colour mapping (Table 6). See Appendix 2 for more details.

After the analysis, the combined criteria can be categorized into 5 main groups (Table 7).

- Science base/Technical content
- Transparency/Accessibility
- Objectivity/Focus/Proactivity
- Progression/Development/Adabpatability/Diversity
- Miscellaneous asepcts (number of projects,assessment method,weighting..etc.).

Table 5 E. Hebaalla Mostafa Karmany evaluation criteria summerised

H.M. Karmany approach criteria
Technical content & sustainability aspect metrics
System accessibility
Assessment cost
Local context (regional Priority)
Assessment and weighting methodology
Registration & assessment process
Maturity
Life cycle approach
Validity
Adaptability

Table 6 Evaluation categories

Category
Science Base/Technical content
Transparency/Accessibility
Objectivity/focus/proactivity
Progression/development/Adaptability
Miscellaneous aspects (number of projects, assessment method, weighting).

Table 7 Evaluation criteria summary and points

Number	Aspect	Score
1	Science base/Technical content (Pandemic precautions inclusion)	20 Points
2	Transparency/Accessibility	20 points
3	Objectivity/Focus/Proactivity/Responsive actions	20 points
4	Progression/Development/Adaptability/Diversity	20 points
5	Miscellaneous aspects (number of projects, assessment method, weighting)	20 points
Grand total		100

Since the focus of this paper is pandemic protection measures and its inclusion in green buildings rating systems, the researcher focused his study on the criteria that relate to such topic. The above criteria adress five main aspects of the rating system response to the pandemic situation. It can be elaborated as follows:

- Protection measures included in technical contenet of the system.
- How accessible/transparent is the system in pandemic situations.
- The reaction to situation was responsive/proactive and focused.
- Is the system developing over time to absorb global challenges (especially what relates to biological threats).
- General overview of system capacity, setup and assessment methodology.

It has to be noted that the only reliable source currently for pandemic protection measures is the published WHO recommendations which are available on its website.

Table 8 shows the detailed points system for each category and subcategory.

The above criteria are going to be implemented on all studied rating systems. The following section provides more details.

5 Analysis and Elaborations

The following will be the detailed anaylsis of each rating system against the proposed criteria. The below (Table 9) is the key of sysmbols used in the anaylsis to reflect compliance or non compliance.

LEED (Leadership in Energy and Environmental Design) is the most widely used green building rating system in the world. Available for virtually all building types. It was checked versus the summarized criteria.

The studied version is LEED v4.1. Out of selected 12 WHO recommendations, 5 were found in line with LEED documentation and 1 credit contradicts with social distancing (Reduced parking footprint-option 3 car share). See Appendix 1 for detailed scores.

While the COVID-19 response is remarkably impressive due to issuance of several publications and pilot credits. The system is aligned with many other sustainability tools like WELL. However, health and safety certification are not mandatory as part of LEED certification.

BREEAM is the world's leading sustainability assessment method for master planning projects, infrastructure and buildings. It recognizes and reflects the value in higher performing assets across the built environment lifecycle, from new construction to in-use and refurbishment. The studied version is 2016 version as V.6 is yet to be available.

Table 8 Review criteria with scores (detailed)

Number	Aspect			Score
1	Science base/Technical content (Pandemic precautions inclusion)			20 pt
	1.A	Alignment with WHO recommendations		10
		1.A.1	Number of Credits/Criteria aligned	
		1.A.2	Accuracy and effectiveness of application	
		1.A.3	Applicability to certified or existing buildings	
	1.B	Credits/Criteria contradicting with WHO recommendations or Not covered		10
		1.B.1	Number of Credits/Criteria not aligned	
		1.B.2	Importance (Mandatory/optional)	
		1.B.3	Number of Credits/Criteria not covered	
		1.B.4	Importance (Mandatory/optional)	
2	Transparency/Accessibility			20 pt
		1.C.1	Easy to access/Material available	
		1.C.2	Cost of system/Certification fee	
		1.C.3	Availability of user interaction/support	
		1.C.4	Availability of case studies	
Total				40
3	Objectivity/Focus/Proactivity/Responsive actions			20 pt
	2.A	Action taken		10
	2.B	Number of Credits/Criteria added		5
	2.C	Addendums or chapters published		5
Total				20
4	Progression/Development/Adaptability/Diversity			20 pt
	3.A	Synchronization with other tools		10
	3.B	Cultural & Geographical zone adaptation		5
	3.C	different building types coverage		5
Total				20
5	Miscellaneous aspects (number of projects, assessment method, weighting)			20 pt
	4.A	Number of countries using the system		5
	4.B	Number of projects		5
		4.B.1	Registered	
		4.B.2	Certified	
	4C	Different building types of coverage		10
		4.C.1	Prescriptive based	
		4.C.2	Performance based	
		4.C.3	Solutions based	
Total				20
Grand total				100

Table 9 Analysis key

Key	Explainayion
A	Meets the proposed criteria Fully
B	Meets the proposed criteria Partially
C	Does not meet any Criteria
(Blank)	Intformation not available
N/A	Not Applicable

Out of selected WHO recommendations; 6 were in line with BREEAM documentation (Cerdit Tra05 Travel plan is in addition to 5 credits similar to LEED). None were found in contradiction with WHO recommendations (Carpooling is not an option of credit. It is generally recommended unlike LEED).

No additional credits or courses were available. The system is aligned with several tools of sustainability (e.g. CARES). The system has low adaptability to different regions despite the wide spread of certifications and projects. See Appendix 1 for detailed scores.

Global Sustainability Assessment System (GSAS) is the first performance-based system in the Middle East and North Africa (MENA) region, developed for rating green buildings and infrastructures. The studied version is GSAS V4.

Out of selected 12 WHO recommendations, 5 were found in line with GSAS documentation. no additional criteria added in response to COVID-9. However, some awareness campaigns were conducted (for example testing of local sanitizers).

The system is aligned with other local tools (like Gulf green mark and Qatar carbon trust). It covers narrow range of countries and no medium for cultural adaptation. The system combines performance and evidence-based methodologies. See Appendix 1 for detailed scores.

ESTIDAMA (PBRS), The aim of the Pearl Building Rating System (PBRS) is to promote the development of sustainable buildings and improve quality of life.. There is no available updates of the system since the first issuance in 2010. As such, the studied version is 2010.

Out of selected 12 WHO recommendations, 5 were found in line with PBRS documentation. No actions were taken as a response to COVID-19. The system is aligned with some local tools and programs (e.g. green key).

International adaptability is considered very low. (Rahim et al. 2015), The system combines performance and evidence-based methodologies. See Appendix 1 for detailed scores.

GREENGLOBES as per the official website that is is identifing opportunities and provides effective tools to achieve success. A nationally recognized green rating assessment tool, guide e and certification system, Green Globes® works with stakeholders to achieve the sustainability goals for newly constructed projects, existing buildings and interiors. The studied version is “New Construction 2019”.

Out of selected 12 WHO recommendations, 4 were found in line with GREEN GLOBES documentation. No evidence of training or awareness campaigns promotion as a response to COVID-19 Crisis.

Actions were taken as part of COVID-19 response including webinars and courses but added or amended credits. The system is aligned with other systems (e.g. ANSI). The system is a prescriptive bases evaluation tool. See Appendix 1 for detailed scores.

GREEN STAR, Launched by Green Building Council of Australia (GBCA) in 2003, Green Star is Australia's only voluntary and truly holistic sustainability rating system for buildings, fit outs and communities. No evidence of versions updates on the website.

Out of selected 12 WHO recommendations, 5 were found in line with GREEN STAR documentation. The system responded to COVID-19 crisis and issued a report addressing the changes in certification system. However, no added or amended criteria were introduced.

The system is aligned with other tools (like NABERS, BASIX, GEMS, ECS certification).The system is prescriptive and evidence-based tool. See Appendix 1 for detailed scores.

6 Results and Findings

The different rating systems were evaluated and compared based on the former discussions. More details are presented in Appendix 1.

The results are illustrated in Fig. 1.

The scores were concluded to be as follows (Tables 10 and 11).

LEED (90.3/100), BREEAM (74.0/100), GSAS (72.8/100), ESTIDAMA (PBRS) (55.8/100), GREENGLOBES (77.7/100) and GREEN STAR (73.5/100).

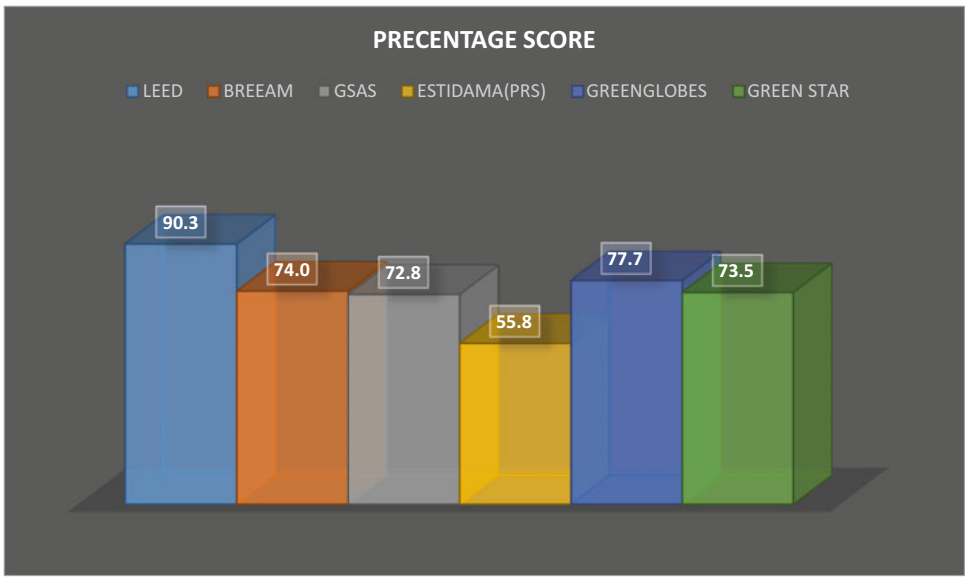

Fig. 1 Final scores/percentages

7 Conclusion

After the previous presentation and discussions, the following points could be concluded.

Firstly, all prominent sustainability rating systems responded to COVID-19 situation with different approaches and outputs. Some systems like LEED showed quicker response in changing some credits content while some other systems were stuck in providing guidance to maintain the certification process or promote the wellbeing of their employees.

Secondly, without exceptions, all systems showed deficiency in providing the required actions to protect the built environment against future pandemics. A further study is to be prepared on the feasibility of introducing a new tool dedicated for pandemics and biological threats.

As such, there are three recommended courses of actions to tackle the shortcomings of the current sustainability rating systems. These actions can be listed as follows:

1. To update the current versions of rating systems to include protective precautions of pandemics.
2. To update the policies to make health and safety tools (like WELL or Fitwell) mandatory as part of the assessment process.
3. To introduce a new tool or system which will be dedicated for pandemic situations, the tool shall combine sustainability, health and safety, resilience, wellbeing and environmental aspects in one comprehensive tool that addresses the current biological threats. The tool should be "solutions based".[1]

Acknowledgements Special thanks to Dr. Mohamed El Masry for his contribution in this paper.

[1] Further study to be made on the impact of solutions-based tools to improve the certification process.

Table 10 Summary of findings

Rating system	Country	Rsponsive	Adaptable	Additional measures taken	Additiona credits added	Methodology
Leed	US/International	Yes	Yes	Yes	Yes	Prescriptive Preformance based
Bream	UK/International	Yes	Yes	Yes	No	Prescriptive Preformance based
GSAS	Qatar	Yes	No	Yes	No	Prescriptive Preformance based
Estidama (PBRS)	UAE	No	No	No	No	Prescriptive Preformance based
Greenglobes	Canada/US	Yes	Yes	Yes	No	Prescriptive
Green star	Australia	Yes	Yes	Yes	No	Prescriptive

Table 11 Final scores

System	Version	Score (%)
Leed	Version 4.1	90.3
Breeam	2016 version	74.0
GSAS	Version 4	72.8
ESTIDAMA(PRS)	Version 1.0	55.8
Greenglobes	New construction 2019	77.7
Green star	Version 4.6	73.5

Appendix 1. Detailed Review Scoring

Number	Aspect			Score	LEED		BREEAM		GSAS		ESTIDAMA(PBRS)		GREENGLOBES		GREEN STAR	
1	**Science Base/Technical content (Pandemic Precautions inclusion)**			20 pt	Key	Score	Key	Score	Key	Score	Key	Score	Key	Score	Key	Score
	1.A	**Alignment with WHO recommendations.**		10												
		1.A.1	Number of Credits/Criteria aligned.		B	4.2	B	5.0	B	4.2	B	4.2	B	3.3	B	4.2
		1.A.2	Accuracy and effectiveness of application.		B	3.0	B	3.0	A	5.0	A	5.0	A	5.0	B	3.0
		1.A.3	Applicability to certfied or existing buildings.		A	2.5	A	5.0	A	5.0	C	0.0	A	5.0	A	5.0
	1.B	**Credits/Criteria contradicting with WHO recommendations or**		10												
		1.B.1	Number of Credits/Criteria not aligned.		B	1.5	A	2.5	A	2.5	A	2.5	A	2.5	A	2.5
		1.B.2	IMPORTANCE (Mandatory/optional)		A	2.5	A	2.5	A	2.5	A	2.5	A	2.5	A	2.5
		1.B.3	Number of Credits/Criteria not covered.		A	2.5	A	2.5	A	2.5	A	2.5	A	2.5	A	2.5
		1.B.4	IMPORTANCE (Mandatory/optional)		A	2.5	A	2.5	A	2.5	A	2.5	A	2.5	A	2.5
2	**Transparency/Accessibility**			20 pt												
		1.C.1	Easy to access/Material available		A	5.0	A	5.0	A	5.0	A	5.0	A	5.0	A	5.0
		1.C.2	Cost of system/Certification fee		A	5.0	A	5.0	B	3.0	A	5.0	A	5.0	A	5.0
		1.C.3	availability of user interaction/support		A	5.0	A	5.0	C	1.0	C	1.0	A	5.0	A	5.0
		1.C.4	Availability of case studies		A	5.0	A	5.0	B	5.0	C	1.0	A	5.0	A	5.0
	Total			40	38.7		43.0		38.2		31.2		43.3		42.2	
3	**Objectivity/focus/Proactivity/Responsive actions.**			20 pt												
	2.A	**Action Taken**		10	A	10.0	B	5.0	B	5.0	C	0.0	B	5.0	B	5.0
	2.B	**Number of Credits/Criteria added.**		5	A	5.0	C	0.0	C	0.0	C	0.0	C	0.0	C	0.0
	2.C	**Addendums or chapters published.**		5	A	5.0	C	0.0	A	5.0	C	0.0	A	5.0	A	0.0
	Total			20	20.0		5.0		10.0		0.0		10.0		5.0	
4	**Progression/development/Adaptability/diversity**			20 pt												
	3.A	**Synchronisation with other tools**		10	B	5.0	B	5.0	B	5.0	B	5.0	B	5.0	B	5.0
	3.B	**Cultural & Geographical zone adaptation**		5	A	5.0	B	3.0	C	0.0	C	0.0	B	3.0	B	3.0
	3.C	**different building types coverage**		5	A	5.0	B	3.0	A	5.0	A	5.0	A	5.0	A	5.0
	Total			20	15.0		11.0		10.0		10.0		13.0		13.0	
5	**Miscellaneous aspects (number of projects, assessment method, weighting).**			20 pt												
	4.A	**Number of countries using the system.**		5	A	5.0	A	5.0	B	3.0	B	3.0	B	3.0	A	5.0
	4.B	**number of projects.**		5	A	5.0	A	5.0	A	5.0	A	5.0	A	5.0	A	5.0
		4.B.1	Regsitered		A		A		A							
		4.B.2	Certified.		A		A		A							
	4C	**different building types coverage**		10		6.7		5.0		6.7		6.7		3.3		3.3
		4.C.1	Prescriptive based		A		A		A		A		A		A	
		4.C.2	Performance based		A		B		A		A		C		C	
		4.C.3	solutions based.		C		C		C		C		C		C	
	Total			20	16.7		15.0		14.7		14.7		11.3		13.3	
	Grand total			100	90.3		74.0		72.8		55.8		77.7		73.5	

Key	Explanation
A	Fully Meets Criteria
B	Partially Meets Criteria
C	Does not meet Criteria
(blank)	Information not availble
n/a	Not applicable

Appendix 2. Different Approaches of Evaluation with Colour Codes of Similar or Related Criteria

RSMeans		K.Nguyen/Hasim Atlan		E.Bernardi/S.Carlucci/C.Cornaro/R.Bohne		H.M.Karmany	
Science-based	Results and decisions must be reproducible by others using the same standard	***Popularity & Influence***	Well Known Importance Numer of Countries Involved Number of projects Involved Versatility	***Focus***	an inclusive focus on buildings	***Technical Content & Sustainability aspect metrics***	
Transparent	Standards and process for awarding the certification should be transparent and open for examination	***Availability***	1- Availability to the system itself: Easy to access System's format Information available for public Cost of system Certfication fees 2- vailability of References: Vailability of on-line information vailability of non on-line information availability of case studies avilability of user's interaction	***Scientific interest***	Cited in at least 20 papers reflected in the Elsevier Scopus database; the search was excuted on article titles,abstracts and keywords	***Access to Rating system***	
Objective	Certification body should be free of conflict	***Methodology***	Methodology Summary Weighting Rating Levels Standardization Quantitative Criteria Qualitative Criteria Whole Life cycle Assessment Complexity Efficiency of assessment method	**Widespread Adoption**	More than 500 Certfied projects	***Cost of assessment***	
Progressive	Standards should advance industry practices, not simply reward business as usual	***Applicability***	1-Stages of Building lifecycle incfluenced: Predesign/Planning/Site selection Design/Procurement Construction/Post construction review Existing building management/operations/Maintenance tenant fit-out/refurbishment Demolition. 2- Technical Contents:	**A Consolidated Development State**	More than 5 years of service	***Local Context (regional Priority)***	
		Data Collection Process	Data Gatherer Data collection method Documentation measurability Convenience			***Weighting method***	
		Accuracy & Verification	1-accuracy of data processing stage 2-Accuracy of data outputting stage 3-Verification: Assessor qulaifications Level of details to check thrird party results aknowledgement			***Registration & Assessment Process***	
		User-Friendliness	1-Ease of use: 2- Product support availability of responsive assisstance FAQ & Record inquiries Training & courses available instructions or helps			***Maturity***	
		Development	Systems Maturity Systems stability Update Development approach Future development			***Life cycle stage coverage***	
		Results Presentation	Presentation Method Clarity comparability Result usability			***Validity***	
						Adaptability	

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