



SUMMIT PROCEEDINGS

“Rejuvenating Resilient Habitats”

VIRTUAL SUMMIT

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12th GRIHA Summit

Green Rating for Integrated Habitat Assessment (GRIHA) Council, is an autonomous, not for profit society jointly set up by **The Energy and Resources Institute (TERI)** and **Ministry of New and Renewable Energy (MNRE)**, Government of India to promote and administer the development of sustainable buildings and habitats in India through GRIHA, the indigenous rating system developed by TERI, which was adopted as the National Rating System of India by MNRE. GRIHA has been acknowledged as India's own green building rating system. The tool evaluates reductions in emission intensity through habitats. GRIHA is a part of mitigation strategy for combating climate change in INDIA's "Nationally Determined Contributions" submitted to UNFCCC by the Ministry of Environment, Forests & Climate Change.

Over the years, GRIHA Council has been hosting its Annual Summits to deliberate on issues which are of national discourse in association with entities of national and international repute such as Ministry of Housing & Urban Affairs; Ministry of Power; Ministry of New and Renewable Energy; UNSW Sydney, Australia; Royal Danish Embassy; GIZ; Bureau of Energy Efficiency. The past Summits had been designed on the themes such as "Approach to Integrated Sustainability", "Fostering Partnerships for Sustainable Habitats", "Transforming Habitats", "Sustainable is Affordable" and "Transforming Habitats".

Considering the COVID-19 pandemic, the theme for this year's Summit had been thought of as "**Rejuvenating Resilient Habitats**" since the focus is to design our buildings and cities in such a way that they are more resilient in terms of climate, health related issues, natural calamities, biodiversity, etc. Resilient Habitat is therefore an approach in disaster risk reduction and climate change adaptation which targets the most vulnerable communities. By restoring the traditional practices of building and cities construction, we wish to gear up the building construction sector for a vibrant and much fresher approach to the built environment, living symbiotically with all the components of the natural environment.

The **12th GRIHA Summit** scheduled on **December 15th -16th, 2020** was conducted as a **virtual event** and had been themed around "**Rejuvenating Resilient Habitats**". It aimed to serve as a platform to deliberate on innovative technologies and solutions which would help in creating robust mechanisms for developing sustainable and resilient solutions for the benefit of the entire community.

The year 2020 which was initially thought to be a year to track the progress of Sustainable Development Goals and gear up to make the next decade count has taken a big turn and the entire focus of the world shifted to a pandemic which demonstrated how we have been taking the nature for granted, testing its patience and perseverance and how powerful or impactful it is to make us realize that we are mere players in the hands of the nature.

The world has witnessed a number of natural calamities like floods, bushfires, droughts, and cyclones. All these calamities question the way we design our habitats which currently demonstrate rampant usage of resources and hold a complete disregard of nature unlike the buildings that used to be designed in the past. Thus, nature has been giving us signals time and again to change the ways of our operation so as to maintain harmony with the environment or else we would be witnessing some irreversible consequences that would not only affect us but our future generations as well.

THE GRIHA Council

Construction activities in India have been pursued without giving much attention on environmental issues. This has resulted in pressure on its finite natural resources, besides creating impacts on human health and wellbeing. Unplanned and unsustainable urban development has led to severe environmental pressures. Modern buildings built in our cities have high levels of energy consumption because of requirements of air-conditioning and lighting. Such buildings consume copious quantities of water for building use and landscaping and generate substantial waste during construction and operation. Green buildings on the other hand, can reduce energy demand by as much as 40% and water demand by more than 30%. They let in more natural light, recycle wastewater, integrate natural cooling systems with conventional air conditioning systems, use renewable sources of energy to reduce dependence on conventional sources and contribute towards sustainable development. GRIHA Council facilitates the promotion and development of green buildings and habitats in India through the GRIHA rating variants.

The Ministry of New and Renewable Energy (MNRE), Government of India and TERI have jointly developed GRIHA (Green Rating for Integrated Habitat Assessment), which has been endorsed as the national rating system for green buildings in India. With support from the Government of India and active participation of the private sector, over 43 million square metres of built up space is registered to be GRIHA compliant. GRIHA Council, is mandated to promote development of buildings and habitats in India through GRIHA. It ensures implementation of GRIHA benchmarks in full compliance with various relevant national codes and standards (such as the Energy Conservation Building Code, the National Building Code, guidelines issued by the Central Pollution Control Board) and contributes to meeting objectives set forth in the National Mission on Sustainable Habitat and the Jawaharlal Nehru National Solar Mission. The demonstrated impact of GRIHA projects includes quantification of resource use optimization, implementation of environmental commitments and enhanced transparency through a web based portal. In addition to all Government of India and Public Sector Undertaking buildings that have to be minimum 3 Star GRIHA compliant, the Central Public Works Department (CPWD) has also notified that all their construction shall be minimum 3 Star GRIHA rated.

Day 1: **December 15, 2020** (Tuesday)

Inaugural Session

1000 - 1030 hrs

Welcome Speech by Dr. Ajay Mathur, President, GRIHA Council

Speech by Shri Hardeep Singh Puri, Hon'ble Minister of State (I/C) for Housing & Urban Affairs & Civil Aviation; Hon'ble Minister of State for Commerce & Industry

Launch of E-Versions of GRIHA Publications: by the Hon'ble Vice President of India

1. 30 Stories Beyond Buildings
2. Shashwat Magazine
3. Version 2019 Manual, Online Portal and E-Learning Modules

Address by the Chief Guest Shri M. Venkaiah Naidu, Hon'ble Vice President of India

Words of thanks by Mr. Sanjay Seth, Chief Executive Officer, GRIHA Council

Session Switch Over

1030 – 1035 hrs

Setting the Theme Session

1035 - 1110 hrs

Introductory Remarks: Dr. Ajay Mathur, President, GRIHA Council

Special Address: H.E The Hon. Barry O'Farrell AO, High Commissioner to India, Australian High Commission in India

Special Address: H. E. Mr. Freddy Svane, Ambassador, Royal Danish Embassy in India

Special Address: Mr. Amit Dasgupta, Strategic Advisor, UNSW India

Vote of Thanks: Mr. Sanjay Seth, Chief Executive Officer, GRIHA Council

Session Switch Over

1110 - 1115 hrs

Technical Session I : Sustainable Buildings for Atmanirbhar Bharat

1115 - 1240 hrs

Self-reliance in the building and construction industry is the need of the hour. Now more than ever we are realizing the devastating impacts of unsustainable practices in the construction industry. While the various financial schemes under Atma Nirbhar Bharat Abhiyan offer more liquidity to building owners and developers, the onus is on the members of the building fraternity to facilitate context driven responses that are locally viable and beneficial to all stakeholders. By looking inwards we can harness the immense knowledge that has traditionally existed in our nation be it in the way we construct or what 'material' we use to construct with.

Moreover, the COVID 19 pandemic has shown us the fragility of our systems and the importance of embracing sustainability in construction. Sustainability here not only refers to environmental preservation but also the protection of the disenfranchised workers and support staff. The realty industry being the second largest employer in the nation, offers over 2.5 crore jobs, carries the responsibility of uplifting and protecting their basic human needs and rights. While MoHUA has announced several sub- schemes under PMAY to provide dignified affordable rental housing to migrant workers close to their workplace, the various stakeholders must address this issue at an individual level to truly bring about reform.

This session deliberated on the need for development of self-reliant buildings in the present scenario and how making the buildings sustainable would contribute in the achievement of the government's vision of Atmanirbhar Bharat.

THEMATIC SPEAKER & MODERATOR: Shri Saurabh Kumar, Executive Vice Chairperson, Energy Efficiency Services Limited (EESL) Group

SPEAKERS: Ar. Parul Zaveri, Principal Architect, Abhikram, Ahmedabad

Mr. Fredrick Royan, Vice President - Sustainability and Circular Economy, Frost and Sullivan

Mr. Ben Huskisson, Managing Director, Gleeds Consulting (India) Pvt. Ltd.

Q & A

Vote of Thanks: Ms. Shabnam Bassi, Secretary GRIHA Council

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| A walk through GRIHA'S journey in the year 2019-2020 |
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| 1240 to 1300 hrs |
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Presentation on GRIHA Updates 2019-2020: Ms. Shabnam Bassi, Secretary GRIHA Council

Q & A

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| Lunch |
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| 1300 - 1400 hrs |
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| Technical Session II: Building Smart using Artificial Intelligence (AI) |
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| 1400 - 1600 hrs |
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Construction industry has evolved tremendously in the last few decades and technological advancements have been big contributors in the growth. Adoption of artificial intelligence (AI) in the construction sector has added another dimension to the planning, designing, construction and monitoring of not just building projects but in the development of smart cities as well.

At a time when the world is facing drastic weather phenomena due to climate change, adoption of AI comes as a boon in risk mitigation. The pool of information generated by AI systems such as Building Information Modelling (BIM) provides opportunity to building professionals in deriving solutions to the various challenges posed by artificial systems as well as our ecosystem.

This session was designed to give an overview of the BIM systems that offer intelligent solutions to create smart buildings and cities.

Speakers:

BIM for Progressing Buildings and Cities:

Dr. Amarnath Chegu Badrinath, Head-BIM Strategy, Larsen & Toubro Construction and Founder & President, India BIM Association

Digital Solutions with Algorithms contributing to Bhubaneswar as Smart City:

Dr. Teresa Kerber, Head of Program, Global Program "ICT-based Adaptation to Climate Change in Cities" (ICT-A); Advisory Program "International Smart Cities Network" (ISCN); GloBe - Global Policy, Governance, Cities; Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Q & A

Vote of Thanks: Mr. Akash Deep, Senior Manager, GRIHA Council

Hands on Activity

GRIHA REACT Web Application

A limited edition web-application was launched for the participants to engage in a hands on activity and compete with each other with optimize the resource demand for a virtual apartment.

Session on 'Mindfulness'

1600 - 1700 hrs

Major Deepshikha Gupta (Retd.), Senior Counsellor, 1to1help

Q & A

Vote of Thanks

End of Day 1

Day 2: **December 16, 2020** (Wednesday)

Awards Ceremony & Valedictory Session

1030 - 1230 hrs

Welcome Remarks: Dr. Ajay Mathur, President, GRIHA Council

Special Address: Ar. Shri Habeeb Khan, President, Council of Architecture (COA)

Valedictory Address: Shri Kamran Rizvi (IAS), Additional Secretary, Ministry of Housing and Urban Affairs (MoHUA), Government of India

GRIHA Rating Awards

GRIHA Exemplary Performance Awards

Signing of Memorandum of Understandings (MoUs between:

1. GRIHA Council & Energy Management Centre (EMC), Kerala
2. GRIHA Council & Confederation of Indian Micro, Small and Medium Enterprises (CIMSME)
3. GRIHA Council & International Institute for Energy Conservation (IIEC)

Vote of Thanks: Shri Sanjay Seth, Chief Executive Officer, GRIHA Council

Conclusion of 12th GRIHA Summit

Inaugural **Session**



*Embracing the new normal, the GRIHA Council conducted the 12th GRIHA Summit on a virtual platform. **Dr. Ajay Mathur** began his welcome address by extending a warm welcome to the Honourable Vice President of India, Shri M. Venkaiah Naidu, and the Honourable Minister for Housing and Urban Affairs and Civil Aviation, Shri Hardeep Singh Puri.*

He stated that the COVID-19 pandemic has caused widespread disruption and severe repercussions in terms of both human health and the economy. It is imperative that all stakeholders work together for a resilient tomorrow. Therefore, continued efforts and corporation are the need of the hour to build a secure and sustainable future, he added. Dr. Mathur announced that this year's Summit – 'Rejuvenating Resilient Habitats' explores the themes of preparedness, resilience, and possibilities for building systems that are better equipped to deal with unprecedented scenarios. He informed the attendees about 'Building Fitness Index', a platform developed by the GRIHA Council to aid buildings to access their preparedness and fitness for occupancy post the pandemic. He added that GRIHA has been a catalyst for widespread adoption of green development, particularly green buildings in India. GRIHA has built up resource efficiency in the design, construction, and operation of buildings, and aims to cater to both new and existing buildings.

Dr. Mathur highlighted that the Government of India has acknowledged GRIHA's intervention in evaluating reduction in emissions intensity through habitats as part of their strategy to combat climate change in the Nationally Determined Contributions (NDCs) submitted to UNFCCC before COP21. The GRIHA Council has also taken up other initiatives, such as PRAYAAS – a cleanliness drive and Paryavaran Rakshak – an awareness programme for RWA as a commitment to sustainability. Keeping with the times, he added that a virtual exhibition was organized was organized from 21st July to 25th July, 2020 by the GRIHA Council, which provided opportunity to manufacturers to disseminate information about their products to various stakeholders. Dr. Mathur thanked all the partners for their unending support and the confidence the international collaborators have in GRIHA. He hoped that this year's Summit would be an enriching experience for all and take *green development* ahead from GRIHA to a larger audience of the country.



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It is of utmost importance that new infrastructure is built green and resilient and platforms such as this Summit are essential in promoting discourse and encouraging collaborations towards this common goal

–Shri Hardeep Singh Puri

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In his address, Shri Hardeep Singh Puri appreciated the Green Rating for Integrated Habitat Assessment (GRIHA) Council for organizing the Summit on a virtual platform to engage with relevant stakeholders. He said that deliberations held during the Summit would enable knowledge sharing and encourage the development of green and sustainable habitats across the country.

He added that the Government of India recognizes the imperative of and accords the highest priority to environmental preservation and countering climate change as essential areas of focus for our nation and the planet.

As people continue to move to urban areas, it must be ensured that appropriate systems and infrastructure are in place. Sustainable development by leveraging the latest technologies and innovation are vital tools to tackle environmental degradation and climate change risks. The minister stressed that cities bear a huge

responsibility towards balancing the needs of the present with the requirements of future generations to maintain a sustainable equilibrium and limit the adverse effects of growing urbanization on the environment. “This period of pandemic has proven how world-class smart infrastructure in our cities can help us respond to unpredictable externalities,” the minister said.

Speaking on resource availability in India, Shri Puri said that India has no shortage of coastline and rivers but our country needs a comprehensive strategy to recycle, reuse, and treat water. He added that green buildings would ensure we don’t overuse our resources to the point of crippling shortage in the years ahead. Green buildings can address 9 out of the 17 Sustainable Development Goals (SDGs). Further, he congratulated GRIHA on the launch of GRIHA v.2019, the upgraded version of the GRIHA Council’s rating system, which strives to align its efforts more closely with the SDGs.



Shri M. Venkaiah Naidu launched three e-publications of the GRIHA Council, namely – *30 Stories | Beyond Buildings*, *Shashwat Magazine*, and *GRIHA Version 2019 Manual*.

In his address, Shri Venkaiah Naidu stated that the Government of India is making tremendous effort to transform our country into a holistically sustainable nation. 'Atmanirbhar Bharat Abhiyan' is the vision of 'new' India to make its citizens independent and self-reliant. Buildings are one of the major contributors of greenhouse gas (GHG) emissions, and Shri Naidu said that there is a need for concerted and coordinated efforts from all stakeholders to ensure that these buildings are environment-friendly and energy and resource-efficient. "The construction material we use today should be sustainable—it should not in any way jeopardize the ability of future generations to meet their needs," Shri Naidu asserted.

He expressed happiness over several government and private bodies committing to construct greener buildings for a secure future. The Vice President expressed his desire for every future building to go green mandatorily and said that this should apply to all kinds

of buildings. Not only new buildings, the existing buildings too must be retrofitted to make them environment-friendly, he said. Observing that our ancient civilizational values teach us to live in harmony with nature, the Vice President called for revisiting our traditional and nature-friendly house designs refined over thousands of years by our ancestors. Climate change is real and impacting us and hence, a balance should be maintained between economic development and environmental protection. Economy and ecology can coexist if one respects nature, he added.

The current year has been tumultuous due to the COVID-19 pandemic and a number of natural calamities in the form of floods, droughts, and other extreme weather events. Thus, there is an urgent need to reorient our approach to development as the decisions we make today will have repercussions far beyond our own lifetimes, he warned.



*Economy and ecology can
coexist if one respects nature*

-Shri M. Venkaiah Naidu



Noting that at least half of the country's population will live in towns and cities by 2050, the Vice President said that this will create a lot of pressure on the housing sector and therefore, green solutions must be developed to meet the emerging needs.

Emphasizing the need to utilize light and air that are naturally available to us, Shri Naidu said that the pandemic has taught us the importance of good air circulation in buildings that can contribute in reducing the infection rate. There is a need for capacity building at the local level through customized training programmes for the architects, engineers, government officials, and builders in energy-efficient buildings, he suggested. Praising the work

done by GRIHA, Shri Naidu said that ever since its inception, it has been a catalyst in the widespread adoption of green development in India and congratulated the GRIHA Council on the launch of the upgraded version of its rating system, the GRIHA Version 2019 Manual. He also expressed happiness over the fact that despite the pandemic, the GRIHA Council has continued in its endeavours to promote the sustainability agenda and has developed the Building Fitness Indicator (BFI) tool – a free-to-use self-assessment tool – that allows organizations to measure the preparedness of workplaces to prevent exposure to the outbreak of COVID-19. Shri Naidu concluded his address by wishing the GRIHA Council the best for the Summit and all its future endeavours.



*The vote of thanks was delivered by **Mr. Sanjay Seth**, CEO, GRIHA Council. He said, "COVID-19 has drastically affected the global economy and completely altered the nature of business as usual. In the days to come, India will require the ability to develop an economy that is more resilient to disruption than ever before." Mr. Seth stated that the GRIHA Council has embraced the new normal of remote presence through virtual connectivity. The GRIHA Council has also committed to 'decarbonization of the building sector'.*

Mr. Sanjay Seth thanked Shri M. Venkaiah Naidu, the Honourable Vice President of India, for reminding the attendees about the ancient practices of construction and reiterating the fact that 'economy and ecology can coexist'.

On behalf of the GRIHA Council, Mr. Seth expressed his gratitude to the Honourable Minister, Shri Hardeep Singh Puri for gracing the event and encouraging everyone to prepare to build better under the new normal regime.

He acknowledged the undying support and encouragement provided to GRIHA by several ministries and government departments, such as the Ministry of Housing and Urban Affairs, Ministry of Power and Renewable Energy, Ministry of Road Transport and Highways, Bureau of Energy Efficiency, Airport Authority of India, Central Public Works Department, Energy Efficiency Services Limited, and Council of Architecture. He extended his gratitude to the national and international academic organizations who have partnered with GRIHA for all their events and endeavours.

Setting the Theme



In the welcome address, **Dr. Ajay Mathur** highlighted the importance of sustainability and resilience in a world, which is recovering from a pandemic that had lasting effects on both human health and the global economy. Reiterating the statements made by the honourable Vice President of India Shri M. Venkaiah Naidu, Dr. Mathur said that by 2050, at least half of the country's population will live in towns and cities. This, he said, will give us the opportunity to make necessary preparation in making buildings green and resilient. He concluded by stating that the document *30 Stories | Beyond Buildings*, developed by GRIHA in association with Public Works Department, Government of Maharashtra, aims to present possible ways to achieve sustainability and resilience.

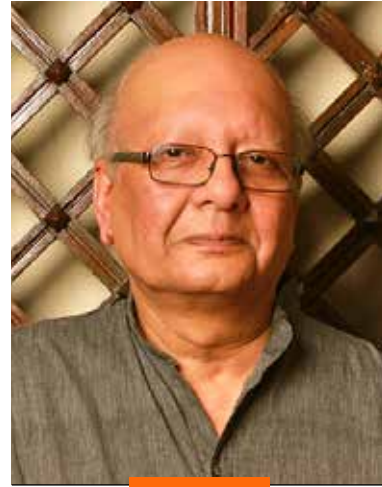


H.E. Barry O'Farrell began his address by congratulating India on achieving 7.17 billion ft² of green building footprint in 2020. He said, the theme for the Summit – 'Rejuvenating Resilient Habitats' provided an opportunity to share some of the actions Australia has taken over the years to reduce emissions and increase the resilience of communities to combat the risks and challenges of climate change. Australia is on the front line of achieving climate change mitigation goals and is committed to the Paris Agreement. The focus, H.E. Barry O'Farrell added, is on taking practical actions to reduce emissions both in Australia and the world. As Australia is trying to achieve net zero emissions, the same also focuses to drive the cost of key low emission technologies. This year, new actions and measures have been taken to advance this goal. He emphasized that Australia's technology and road map will guard around 18 million dollar of investment and leverage at least 50 billion dollar from the private sector, state government, research institutions, and other public-funded bodies.

Climate is already changing and some of its implications will be unavoidable. Australia is experiencing more heatwaves, extreme weather events, changing rainfall patterns, and intensified and longer bushfire seasons. He concluded by stating that envisioning a climate-resilient world is critical and we must secure the health and prosperity of all communities.



In his address, **H.E. Freddy Svane** stated that Denmark and India have embarked on an important new partnership. He recollected that Prime Minister Narendra Modi had called this collaboration the beginning of a 'new partnership of new age'. He added that since urbanization cannot be wished away, it is important to adopt greener and smarter ways of living. Last year, the Danish Government adopted a climate law, which reduced 70% of the emissions from 1990. An energy building code is also in place, which focuses on creating sustainable and energy-efficient new buildings while improving the condition of existing buildings, suggested H.E. Freddy Svane. He further added that taking inspiration from this, a catalogue can be formed where the focus could be on skill development. The aim should be to develop green technologies and materials as all this could account for sustainability, remarked H.E. Freddy Svane.



Mr. Amit Dasgupta congratulated GRIHA for conducting the 12th edition of the Summit on an online platform despite the challenges posed by the pandemic. He recognized the GRIHA Council's efforts as a true reflection of its commitment towards achieving the Sustainable Development Goals (SDGs). Over the years, the GRIHA Council's collaboration with the University of New South Wales has continued to reap positive, effective actions. Mr. Dasgupta stated that in a post-pandemic world, there are two areas – capacity building through training programmes and applied research – that must be considered. In his concluding remarks, he said that developmental aspirations can only be achieved if these are collectively driven.

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We cannot escape from urbanization; we can only work towards it in a smarter way to achieve sustainability
–H.E. Freddy Svane
”

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The pandemic has created a collective responsibility to work towards sustainability and hence, we need to co-create a better post-pandemic world.
–H.E. Freddy Svane
”

Technical Session I



In his thematic address, **Shri Saurabh Kumar** stated that 60–70% of the total buildings that are expected to exist by 2030 are yet to be built. Policymakers have a responsibility to shoulder by ensuring the timely implementation of constructing energy-efficient, resilient, and sustainable buildings. This also echoes the very ethos of the Government of India's 'Atmanirbhar Bharat' initiative. On the role of digitization, he emphasized that as the percentage of renewable energy increases in the grid, the variability of the grid becomes very high, leading to deviations from the frequency in which it has been set. In the last two years, there has been a rise in the share of renewable energy. Consequently, the frequency of such deviations has gone up considerably. Such situations require handling as a combination of policy and technical instruments to stabilize the grid. This also accentuates the need for convergence between different sectors, such as renewable energy, transportation, i.e., electric mobility, grid stability, construction industry, etc. Such a confluence can be significantly enhanced by digitization. The new habitats should be made part of a digitized grid with decentralized energy solutions such as battery storage, Shri Kumar concluded.



Ms. Parul Zaveri shared the principles of design practices followed by 'Abhikram', which holds the core belief that the path of modern architecture should not be blindly followed. The traditional concepts are contextual and sustainable. These have evolved after centuries of research to respond to local conditions, she averred. She briefly spoke about how the modern construction techniques and materials are unsustainable and have led to potential health hazards of sick building syndrome, which was earlier common only in the Western society. Showcasing some eminent restoration projects, which promoted traditional ideas of design, recycling and reusing of construction materials, retaining existing site features, and creating livelihoods for local craftsmen among others, she asserted that it is about time that architects and engineers accepted that traditional knowledge, wisdom, skill sets, and materials are more sustainable and that we must return to these practices and learn to sustain in the present world. Based on the lessons from the restoration projects, traditional skills, materials, technologies, and craftspeople must be used in the newer constructions. "*Design responsibly – make, sell, use, reuse, recycle, reduce consumption responsibly and replenish the environment and Earth,*" concluded Ms. Zaveri.



Mr. Fredrick Royan carried forward the session by stating that India might be experiencing a watershed moment in the movement of sustainability, since risks have been identified and related bodies are currently working on the climate agenda. India is focused on driving a change with alliances and commitments to become more sustainable. This, he said, can also be related to the policy announcements which can influence change, especially in the building sector. A key change right now is the emergence of the new business model of circular economy. The leadership in organizations is looking at sustainability as a strategic focus, which in itself is a significant shift in momentum within the paradigm of sustainable development. He emphasized the role of awareness in ensuring widespread acceptance of digital sustainability. He said, digital transformation can enhance infrastructure to be more flexible, intelligent, connected, and responsive. Mr. Royan concluded by stating that digital elements in governance in the form of artificial intelligence (AI), robotics, life cycle management, track and trace, to monitor materials could drive the circular economy.



Mr. Ben Huskisson shed light on the benefits of digital construction technology, in particular, for the Smart Cities agenda, which is important to strengthen sustainable communities in the forthcoming years. Gleeds, a leading global property and construction consultancy, is promoting small changes, such as reducing cars, enhancing public transport, limiting facilities footprint, etc., along with trying to bring behavioural cultural changes. He emphasized another aspect, based on a recent study that indicates how 64% of all clients are concerned with the environmental impact of their building, but 89% of all clients believe that the cost of sustainable construction is significant, and that it will lead to an additional cost to their capital investment. Clients have a notion that in order to incorporate sustainable features, an additional 10% is required in the capital investment. However, Gleeds demonstrates that the initial capital cost of sustainable construction could be kept under 3%. This is without considering the benefits over the entire life cycle of the project, which is more compared to the initial capital cost. He iterated that design and cost must work together, and that consultants and stakeholders should strive to promote sustainable construction practices.

An interesting round of Q&A followed the addresses. One of the questions directed to Mr. Royan was on how to address the impact that rapid urbanization and industrialization have on the global water utility services and what would be the way forward, especially in the slum and industrial sectors where the goal is to have a data-driven governance. In his response, Mr. Royan said that the nexus between water and energy has an opportunity to adopt to circular economy. Decentralization, digitalization, and modernization will play a crucial role in this shift, he concluded after which Mr. Sanjay Seth thanked the speakers for the invigorating sessions.

Technical **Session II**



Dr. Amarnath Chegu Badrinath introduced the topics of Building Information Modelling (BIM) and spoke about various global trends in BIM education. He also shared his extensive involvement in various ongoing projects which have adopted BIM. The different aspects of BIM and its applications in the construction industry were explained by Dr. Badrinath, who also emphasized how BIM helps in data management across team members and relevant stakeholders. Apart from helping the team members in understanding the Green Building Certification process, BIM also ensures better time and cost management with visual benefits, he added.

Dr. Badrinath also spoke about 'project management for industry 4.0', which encompasses BIM for data management, integrated project delivery (IPD) for people management, and LEAN for process management. He introduced the participants to the several levels of BIM and how it can be integrated from the beginning of the project till its handover. He also added how the data keep maturing as the project moves towards its completion and at the end, one gets a virtual asset for the physical asset that is developed. He concluded by explaining how BIM could be used for smart cities and the many benefits associated with it.

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BIM is a virtual asset for the physical asset that is developed.

-Dr. Amarnath Chegu Badrinath

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Dr. Teresa Kerber spoke at length about her work in digital solutions with algorithms that contribute to making Bhubaneswar a 'Smart City'. She gave a brief overview of the impact of climate change and shared details of the work her team has carried out on a pilot project in Bhubaneswar. She put forth the facts and problems that Bhubaneswar is facing due to climate change and shared the digital solutions that her team has come up with to tackle the issue.

The issue of urban flooding can be tackled efficiently by analysing drain network with critical spots based on hydrological models and vulnerability assessment. Crowd reporting, she said, could help keep an update of the current status of the drains in the city and the dashboard could locate and send alerts to carry out cleaning or maintenance operations to repair the faulty ones. Supervisors are provided with recommendations to control the critical spots of drain network. To make this digital solution user-friendly and for more people to get associated with the application, Dr. Kerber's team has come up with a gamification concept that will help in avoiding damage due to urban flooding in the city.

Dr. Kerber was delighted that this digital solution was declared the joint winner for the category 'Best Climate Smart City Project' at the 'Smart City – Empowering India Awards 2019'. She ended her presentation by mentioning that her team plans to expand the coverage from the pilot area to the entire city of Bhubaneswar.



The digital solution analysis system helps to avoid urban floods by analysing critical points.

–Dr. Teresa Kerber



GRIHA REACT **Web Application**

The GRIHA Council released a limited-edition web application called GRIHA REACT (Resource-efficient & Affordable Choice of Technologies) on Day 2 of the 12th GRIHA Summit. The application features an interactive activity where participants can compete against each other to optimize the resource demand for a virtual apartment within a fixed budget.

At the Summit, each participant started with the same 2-BHK layout having options for lights, fans, air conditioners, and other electrical fixtures with their prices and efficiencies reflected alongside as per the current market trends. Similarly, they were provided with options in plumbing fixtures and the selection was to be made on the basis of their prices and flow rates. Each participant was given a fixed budget of ₹2,00,000. The task involved minimizing the consumption of energy and water using the most efficient fixtures available, while

also keeping in mind the associated prices, given that more efficient equipment is usually also more expensive.

The winners of the game were as follows:

1st place: **Mr. Mithun Kadri**

- Expense: ₹1,99,900
- CO₂: 2760 kg

2nd place: **Mr. Vir Rajput**

- Expense: ₹1,94,700
- CO₂: 2895 kg

3rd place: **Ms. Trupti Doshi**

- Expense: ₹1,99,860
- CO₂: 2930 kg

The winners were awarded gift vouchers of ₹2,000, ₹1,500 and ₹1,000 respectively. In his concluding remarks, Mr. Akash Deep, Senior Manager, GRIHA Council thanked the speakers and the audience for their presence and participation.



Session on 'Mindfulness'



According to some studies, stated Major Gupta, nearly 50% of our waking hours are spent thinking about what isn't going on, other people or situations. She added that one tends to focus on the negatives, which in turn can cause anticipatory stress. We fail to observe and absorb the beauty in our surroundings since we are perpetually preoccupied and find ourselves absent in the moment. Recounting His Holiness the 14th Dalai Lama's words, she said, "There are only two days in a year when nothing can be done. One is called yesterday and the other is tomorrow, so, today is the best day to love, believe, and live." Thus, being mindful of the moment is important for our well-being.

Major Deepshikha Gupta began the session by introducing the concept of mindfulness and later dispelled the myths associated with it. Mindfulness has been acknowledged as a tool of relaxation. Mindfulness, if made part of people's daily routines, could be useful for a healthy living. Professionals across the spectrum, be it educators, sportspersons or employees in stressful jobs must practise mindfulness to experience an improved, healthier lifestyle. We are living in unprecedented times and situations can be daunting, compelling us to feel exhausted in the realm of physical, emotional, and mental resources. Major Gupta explained how we can replenish these resources to become functioning individuals. "Mindfulness means, paying attention in a particular way, on purpose, in the present moment, and non-judgementally," she said.

Though the origin of mindfulness is rooted in Buddhism, it is independent of any religion, culture or ethnicity

-Major Deepshikha Gupta (Retd.)

Dispelling some myths around mindfulness, Major Gupta clarified that it is not affiliated to any religion, culture or sect. Although the origins of mindfulness could be traced to Buddhism, it is not a form of practising that religion. She emphasized that one can practise it regardless of their background and it doesn't involve any form of chanting or idol worship. Elaborating on the importance of mindfulness, she said that the human brain is constantly in a state of flux and if one practises mindfulness regularly, it will come to us more naturally. She explained how there is more to mindfulness than merely relaxation and a positive attitude. Referring to Robert Sapolsky's book *Why Zebras Don't Get Ulcers*, she remarked, "The human brain is brilliant but has a tendency to overthink, while animals focus on the task at hand and do not anticipate situations."

Major Gupta explained that the physical benefits of mindfulness include assistance in the treatment of chronic illnesses, pain, cardiovascular ailments, hypertension, and so on. It also improves our sleep cycle by establishing a connect between our mind and the body, which calms us down, increases the release of dopamine, and even reduces stress and depression. Interpersonal benefits, she added, include identification of stress and anxiety indicators, which help us deal with them in a rational and logical manner instead of relying on our emotional response. She elucidated that there are psychological benefits of mindfulness

as well that include improved focus and attention, regulation of emotions, better resilience to emotional upheavals, and increased confidence and a sense of fulfilment.

Mindfulness can be practised both formally and informally. In formal meditation, one takes time out from their schedule to do it while informal meditation refers to when one does not devote a particular amount of time to it. One can practise it while doing other routine activities by being present in and aware of their situation. She stated that, often, we are in a rush to do things and are not mindful, which is why we end up enjoying less.

Sharing tips on practising mindfulness, Major Gupta explained, "First, take a pause, observe, and feel, and finally focus and accept." She briefly described Kabat Zinn's seven core attitudes to practise mindfulness – (be) non-judgemental, (have) patience, (have a) beginner's mind, (have) trust, (be) non-striving (i.e., do not expect a certain result), (practise) acceptance, and finally, let go.

This thought-provoking session was followed by a guided breathing exercise for self-awareness and experiencing external stimuli.

Major Gupta concluded with Lord Buddha's words, *"The secret to health for the mind and body is not to mourn for the past, worry about the future, or anticipate troubles, but to live in the present moment wisely and earnestly."*

Awards Ceremony **and Valedictory**



Dr. Ajay Mathur commenced his address by welcoming the participants to Day 2 of the 12th GRIHA Summit. He thanked Shri Kamran Rizvi for joining as the valedictorian of the Summit. He appreciated the initiative of the GRIHA Council for transforming the annual event to a virtual one, which has enabled the Summit to reach out to people the world over. Mentioning the pandemic and the various natural calamities experienced this year, he stated that these events have given the world a reason to question the way development has been approached. Recalling the Honourable Vice President of India, Shri M. Venkaiah Naidu's speech at the inaugural session, Dr. Mathur said that traditional and nature-friendly buildings should be constructed for a sustainable future. He also congratulated the team

on the e-publications that were released by Shri Naidu at the Summit. Dr. Mathur spoke about the 'GRIHA Exemplary Performance Awards' through which the GRIHA Council recognizes the efforts of the projects that have met the sustainability goals and acknowledges their commitment toward the cause of sustainable development. He commended all the projects that had submitted entries for these exemplary awards showcasing their commitment to sustainability. He concluded with words of appreciation for these projects that were going to be conferred their GRIHA rating during the session.

In a recorded message, **Ar. Habeeb Khan** reiterated the validity of the Summit's theme and its pertinence to today's time and context. He went on to congratulate the GRIHA Council on hosting its first virtual Summit. Stressing on the importance to introspect during the ongoing global pandemic, Ar. Khan urged everyone to think of better ways of development. Calling architecture unnatural and manmade, he stated that as humans, we have only added to the chaos. He reinstated that platforms like the GRIHA Summit can help stakeholders come up with resolutions to limit the negative impact of urbanization and industrialization. He noted that the last few months should have propelled everyone to look and work in a direction that is sympathetic and in sync with nature and the environment. Ar. Khan lauded the efforts put in by GRIHA for enabling the same. He expressed confidence that the deliberations carried out at the Summit would pave a new way for the development and growth of India. He concluded his address with the hope that architects will be more sensitive in their future work.





In his valedictory address, **Shri Kamran Rizvi** was proud to be part of this year's GRIHA Summit and congratulated the GRIHA Council for being a champion of the environment by organizing a virtual event in these pressing times. He questioned the choices available to individuals and their role in making the world more sustainable. In introspection, he spoke of the need to buy things that are environment-friendly, such as books in whose production, trees are not felled. He stated that one need not always be an activist to save the environment. Buildings are the result of human

endeavours. Considering that we spend 90% of our time indoors, he congratulated GRIHA for working toward making the buildings more sustainable and healthier. He reiterated the power of choice and encouraged people to live in GRIHA-rated cities and opt to work in GRIHA buildings. Applauding GRIHA for extending their rating to include buildings under the Pradhan Mantri Awas Yojana, he also shared information about the 'ASHA (Accredited Social Health Activist)' scheme of the Government of India, which had set up incubation centres to identify new technologies and materials. Multiple government projects were awarded their ratings during the event and that pleased Shri Rizvi. He added that the government was an active partner in boosting environmental sustainability. In his concluding remarks, he commended the GRIHA Council on the release of the 'Building Fitness Indicator (BFI)' tool and once again appreciated the efforts of planning and holding a virtual summit.



The full spectrum of society, no matter rich or poor can now choose to be sustainable via GRIHA. It has empowered the people to have a choice to be more environment-friendly

-Shri Kamran Rizvi



The government is an active partner in boosting environmental sustainability

-Shri Kamran Rizvi



The speeches were followed by the awards ceremony. A total of 33 GRIHA-rated projects received certified plaques under the GRIHA, GRIHA provisional, GRIHA for Large Developments, and SVAGRIHA rating systems. Seven outstanding projects received the GRIHA for Exemplary Performance Award in the categories of Passive Architecture Design, Energy Management, Sustainable Building Materials and Technologies, Integrated Water Management, Renewable Energy Utilization, Site Management, and Construction Workers' Health and Safety. Two projects with exemplary performances in the ratings – GRIHA for Existing Buildings and GRIHA for Day Schools – were also awarded. Representatives of the awarded project teams shared their experience of working with the GRIHA Council for sustainable development.

During the session, three Memorandum of Understandings (MoUs) were signed between the GRIHA Council and the Energy Management Centre (EMC) Kerala, Confederation of Indian Micro, Small and Medium Enterprises (CIMSME), and International Institute for Energy Conservation (IIEC), respectively.



Mr. Sanjay Seth, CEO, GRIHA Council brought the Summit to a close with his vote of thanks. He expressed his delight in having the Honourable Vice President of India, Shri M. Venkaiah Naidu as the Summit's Chief Guest and thanked all the invited guests and delegates for gracing the occasion with their presence. He was thankful for the signing of the three MoUs and looked forward to a successful collaboration with each organization. He acknowledged all partners – government, real estate, conceptual, knowledge, associate, and the media – and reiterated that it was only through forming partnerships and collaborations that the agenda of sustainability could be fulfilled.

Glimpses from **the summit**



List of Rated **Projects (2019-20)**

| Category | Name of the Project | Star Rating |
|---------------------------------|---|-------------|
| SVA GRIHA | Additional Library Block, NITK Surathkal | 3 |
| | Bogaram Booster Station VVSPL Capacity Expansion Project | 3 |
| | J K Gudem Booster Station VVSPL Capacity Expansion Project | 3 |
| | M B Patnam Booster Station VVSPL Capacity Expansion Project | 3 |
| | MDPL Capacity Expansion & PVPL Extension Project, Control room Building | 4 |
| | MDPL Capacity Expansion & PVPL Extension Project, Control room Building | 4 |
| | MDPL Capacity Expansion & PVPL Extension Project, Control Room Building | 4 |
| | MDPL Capacity Expansion & PVPL Extension Project, Administrative Building | 4 |
| | Six Bungalows for Hon. Judges at Nayaymurtinagar High Court Campus | 4 |
| GRIHA Provisional Rating | CGHS Dispensary and Administrative Building | 3 |
| | Indian Aviation Academy- Academic Block | 3 |
| | IOLPL LNG TERMINAL ADMINISTRATIVE OFFICE ENNORE | 3 |
| | Indian Railways Institute of Financial Management (IRIFM) | 3 |
| | Ladies Hostel, NITK Surathkal | 3 |
| | M3M Tee Point Developed by Marconi Infratech Pvt. Ltd. | 3 |
| | National Cancer Institute Residential Complex | 3 |
| | RAHEJA VISTAS PREMIERE - T12 & T13 | 3 |
| | Safdarjung Superspeciality Block | 3 |
| | Super Specialty Block at Govt. Medical College | 3 |
| | Center of Innovative and Applied Bioprocessing (CIAB) | 4 |
| | Construction of Academic Complex and Canteen Building at IIT Madras | 4 |
| | Astra Microwave Products Limited | 5 |
| | Manipal Hostels - Phase-1 & Phase-2 | 5 |
| | Manipal University Jaipur - Academic Block 2 | 5 |
| GRIHA Final Rating | Western Side Teaching Block Complex, National Institute of Technology | 4 |
| | Headquarter Building for Unique Identification Authority of India | 5 |
| | ITC Kohenur | 5 |
| | ITC Mudfort | 5 |
| | The British School | 5 |
| GRIHA LD | Titan Corporate Office - "Integrity" Campus | 5 |
| | Nalanda University Campus | 5 |
| | Indian Institute of Management Visakhapatnam (Phase - I) | 5 |

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