



**GRASSROOTS**

**Vernacular habitats  
to combat climate change**

**CONTEXT**

The world of architecture and design plays a massive role in determining the state of not only the natural environment but sustainable development as a whole. The buildings are one of the major contributors to Greenhouse gas emissions requiring concerted and coordinated efforts from all stakeholders to ensure the use of construction material that is environment-friendly and mitigates the effect of climate change. With India making a 'Net Zero' commitment, setting 2070 as its target year, there lies an opportunity for the architecture industry to seek greener practices to reduce its carbon footprint. As regards housing in India, to meet the housing deficit mainly concentrated in the economically weaker section of society, there have been advancements in terms of alternative design and building practices along with refreshed ways of thinking that are better at nurturing the natural environment. With the growing demand for shelter and related infrastructure for economically weaker sections (EWS) and lower-income groups (LIG), the Government of India (GOI) has been making resolute efforts to ensure 'Affordable Housing for All' through the 'Pradhan Mantri Awas Yojna' (PMAY). The GOI policy frameworks and the technological advancements in the construction industry consider/adopt green measures that are innovative, technologically advanced and have profound impacts in conserving the environment. Various EWS and LIG, residential projects of the GOI have adopted such advancements, but despite several important steps towards a

greener future, the approach adopted has been 'selective', as only the built housing through government agencies /developers suitably integrates the greener practices, new green technologies, advancements in building materials and techniques.

Challenges remain:

1) Around the adoption of these practices and advancements, by people and communities of the economically weaker sections of society, at remote scattered locations on account of either low awareness or/and constraints as regards availability and access to advanced tools and resources, maintenance and cost efficiency issues, and desired built quality.

2) Vernacular habitats, in the phase of the rapid globalization process, are seen to be changing with ever-changing practices and new cultures which may not cope with the ambient environment and reflect the uniqueness of each city/region and its people. An approach integrating successful vernacular approaches with modern design concepts (both material and techniques) is, therefore, required as part of renewed thinking to address the affordable housing issue while also combating Climate Change, thereby creating novel, sustainable, and resource-conscious solutions. The poorer segment of the society at the individual level is unable to afford these advancements to make the construction process greener. Designs based on sustainable principles using adaptive vernacular solutions promoting local identities and cost-effective housing are needed to address/tackle both new and unsolved challenges in a way that generates mutual benefits and shared value for the poor people and nature combined, thus forming the basis of the theme for the HUDCO NASA Design Trophy 2022.

### DESIGN BRIEF

In the wake of the climate change crisis, the Conference of Parties (COP) an apex decision-making body of the United Nations Framework Convention on Climate Change (UNFCCC), has recognized the need to strengthen knowledge, technologies, practices and efforts of local communities and indigenous peoples related to addressing and responding to climate change (<https://unfccc.int/process-and-meetings/conferences/glasgow-climate->

change-conference-october-november-2021/outcomes of the glasgow climate-change-conference). India, a diverse country both culturally and climatologically, has houses of indigenous people / local communities designed and constructed, influenced by a wide range of environmental, social, and economic issues at the local level. The approach required is to ensure a high degree of sustainability with no / meagre additional cost to the individuals in the lower-income segment, prioritize actions to make them compatible with available resources (local and/or new green materials) and capacity; recognise the important role of indigenous peoples and local communities, to address and respond to climate change. Housing built using vernacular practices present a climate responsive approach to dwelling and are natural and resource-conscious solutions to a regional housing need. The relevance of vernacular architecture with the use of traditional and local construction methods and materials today, as also identified by the COP, becomes even more relevant for housing types having to deal with effective budget mechanisms, having limited resources and financial constraints. Under PMAY India has set a target of "Housing for All" by 2022. Through the Beneficiary-Led Construction (BLC) which is one of the four verticals under Pradhan Mantri Awas Yojana- Urban (PMAY-U), the central government aims to address the housing shortage in urban areas of the country. The BLC focused projects, both for new constructions and enhancements, addressing the right to adequate housing for all urban poor, through self-help or otherwise, in the wake of inherent challenges, require structural changes / suitable response options to Climate Change. "One size" solutions will not fit all, and solutions will have to be found and implemented suited to taking into account the priorities of the locals, the requirements specific to the geo-climatic region, including enhancing the adaptive capacity of indigenous solutions and strengthening resilience. The design options, so generated by the Trophy participants, would serve as a repository of designs promoting local identities, cost-effective housing using adaptive vernacular solutions; which are simple, requiring indigenous skill sets, are easy to understand and can easily integrate with nature enabling optimum utility of space and flexibility

## AIM

The competition is looking to showcase new vernacular designs that are mutable, inventive and capable of self-renewal. The aim is to generate innovative housing design solutions for varied geo-climatic zones that address the sustenance of vernacular resources and design practices for affordable settlements in the contemporary context. Advocate vernacular architecture based on the geographical location, climatological and resources in the proximity, conducive to local communities and create an identity to the habitat remaining rooted to the soil.

## OBJECTIVE

Against the tide of a global trend in urbanization, the turnaround of a settlement towards traditional habitats is possible through a systematic intervention.

The objective, therefore, is to:

- Integrate successful vernacular approaches with modern design concepts to create novel, sustainable, and resource-conscious solutions.
- Arrive at proposals based on sustainable principles using adaptive vernacular solutions, beneficiary participation, using materials in the vicinity and indigenous techniques offering rational solutions to the climate and human needs

## DESIGN PARAMETERS

1. Identification of geo-climatic region, state and city
2. Identification of alternatives for house design based on climate, drought conditions and also seismic zones and establishing a decision matrix with parameters such as:
  - a) Technical feasibility
  - b) Financial feasibility
  - c) Environmental feasibility
  - d) Social acceptability

3. Design options (2 NOs) for a house of total carpet area of 30sqm (spread at single / two levels ie both single and double-storeyed construction as at times the available area of land with individuals of EWS may not permit the building of such minimum size of the house as per NBC at one level) suitable for the specific geo-climatic zone using and environmentally friendly, new green materials and technologies. The design should promote/provide an architectural, social and cost-effective solution to the shelter needs suitable for the geo-climatic zone.

4. Apply vernacular strategies to modern architectural design to adhere to basic green principles of energy efficiency and materials utilization such that the output includes natural ventilation, cooling and heating, daylight and shading devices, and functional facade, making it a useful reference for all stakeholders in the built environment.

5. Prioritise a zero-waste approach through

- Innovation, using local / new green materials and adaptive vernacular solutions
- Use of low-carbon alternatives to minimize cost and environmental impacts.
- Flexibility and modularity in design
- Use of reused and reusable materials
- Ecological practices/options built in the design scheme, viz. - Wastewater harvesting - Low cost /Green/Renewable energy option

### JUDGING CRITERIA

The merit of the competition entries will be primarily evaluated based on:

- a) Documentation of project requirements based on detailed case analysis as outlined above under the head 'Design Parameters'.
- b) How well the vernacular architecture of that particular area is incorporated in the design proposal.
- c) Innovation/creativity and detailing that suits the needs of the project.
- d) Integration of successful vernacular approaches with modern/conventional design concepts
- e) Energy and cost efficiency, environmental impact etc.
- f) Ease of construction/reconfiguring of interior spaces.
- g) Suitability to the specific geo-climatic requirements.
- h) Selection of appropriate materials and processes for minimizing embodied energy

## SUBMISSION REQUIREMENTS

1. Thorough research and survey of existing vernacular housing typologies, disaster resistance requirements concerning geospatial and climatic conditions of the city.
2. Identification of drawbacks in existing practices with respect to current climatic condition of the city and outlining of the Adaptive Vernacular Approach
3. Analysis of existing building norms and standards in the local context.
4. Preparation of housing design for EWS with a carpet area of 30 sqm, using adaptive vernacular solutions.
5. A report in PDF with relevant project details explaining the concept, context, constraints, innovations, construction technology etc.

Note:

- The scale of the drawings is left to the discretion of the participants
- Participants may use views, perspectives and any other means felt suitable and relevant to explain the design proposal.
- The number of presentation slides/panels should not exceed 20 of A2 size
- The presentation should be supported by a report (Maximum of 15 A4 size pages).
- All entries must be prepared using metric units of measurements
- The data quoted in the presentation/report must mention the source. If based on the primary survey, the same should be mentioned

## IMPORTANT DATES

The release of brief – **23<sup>rd</sup> January 2022, Sunday**

Registration deadline- **23<sup>rd</sup> February 2022, 18 hours Wednesday**

Queries till – **14<sup>th</sup> February 2022, 18 hours Monday**

Submission deadline- **8<sup>th</sup> March 2022, 18hours Sunday**

## GENERAL TROPHY GUIDELINES

- All text should be in English.
- The file name should strictly be the registration code itself.
- The format of the sheet should contain a square box of 25mm\*25mm at the bottom right-hand corner, next to the NASA INDIA logo which should have the unique registration number allotted to the participants after registrations.
- Manually rendered entry should be scanned at least in 300\*300dpi (dots per Inch) resolution.
- The soft copy (non-editable format) of the sheets, and if any, report/video link, along with authentication letter, declaration letter and any other required documents prescribed in the submission requirements should be uploaded on the website by the submission deadline.
- The soft copy file of the sheets should not be corrupted or incomplete or in low resolution.
- It is mandatory to produce the original copy of the Authentication Letter for each entry (entry code should be mentioned if allotted) with the name of participant(s) and stating the unit will abide by whatever may be the final results and also agree that this entry is a property of both the institute and NASA India.
- The Authentication Letter should be signed by the HOD/Principal/Director.
- It is mandatory for the colleges to produce the original copy of the Declaration Letter for each entry (entry code should be mentioned if allotted) signed by the participants stating the work submitted is genuine and they have endorsed copy- rights for the same and to adhere by all the rules and regulations, jury process and the results.
- The Prize Money Authenticating Letter signed by the Director/ Principal / HOD in the college letter-head specifying the account details (Account Name, Account Number, Bank Name,IFSC Code, PAN attached to the account) in which the money is to be credited for each entry (entry code should be mentioned if allotted) shall be collected at a later stage.
- 30% of the prize money shall be deposited as TDS to the Income Tax Dept. of India and can be taken as rebate in ITRs.
- The working files in editable formats of the Shortlisted Entries should be submitted to the Council, failing which, the submission requirements would be deemed incomplete leading to the prize money being withheld.



- Shortlisted Entries with manual hand-done sheets should submit the content in a word document, failing which, the submission requirements would be deemed incomplete leading to the prize money being withheld.
- Any misconduct such as exposing identity through college name/ stamp participant(s) name or college code on the sheets will be disqualified.
- Registration, queries, and submission shall be through the website only - <https://nasaindia.co/Trophy/Index>
- The Participants shall be registered through the website prior to the submission and the list should concur with the Authentication and Declaration.

### **SHEETS & NASA INDIA LOGO GUIDELINES**

Failing to comply with any of the guidelines may lead to disqualification at the discretion of the executive council.

- The sheet template to be followed is available at:  
<https://drive.google.com/drive/folders/15eHYV7LM16n4kEYLNCiLvi3Htj9t3P5n?usp=sharing>
- NASA India Internal Logo shall always be placed on the right-hand bottom corner of the sheet.
- NASA India logo should not be merged, overlapped with any sort of text, graphic, image, etc.
- NASA India logo should be in true black with a perfectly white background.