

Young Structural Engineers' International Design Competition (YSEIDC)

2020 Competition

Design for a Changing Climate

Location – Coastal Regions of Least Developed Nations

Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level.

Fourth Assessment Report from the UN Intergovernmental Panel on Climate Change

It is estimated that by the year 2100, many millions of people around the world who inhabit low lying areas will be displaced by rising sea levels and the increased incidence of flooding. Many of these communities represent some the most impoverished members of society. While their habitats are under threat, relocation offers a challenge as access to the sea is often the main source of their livelihood.

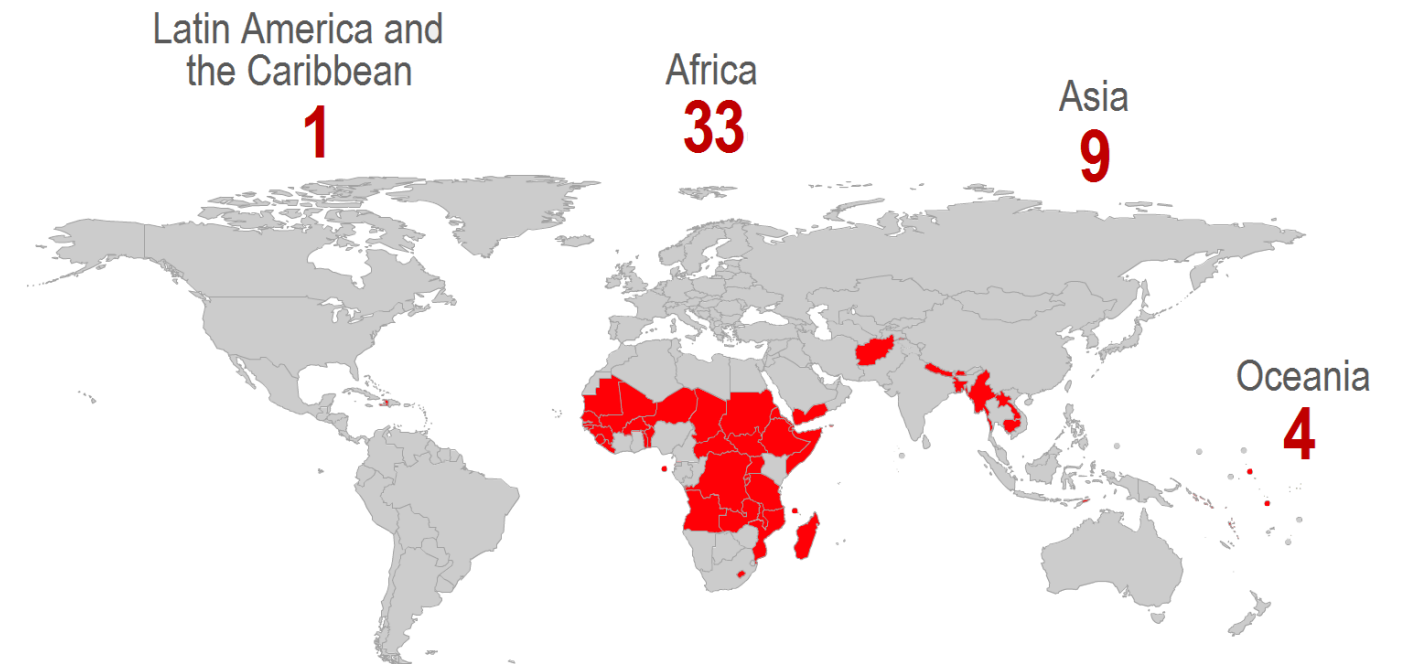


Nations categorised as Least Developed Country (LDC) by the United Nations have suffered terribly from natural disasters in the past decades, particularly in coastal regions with poor communities living at a low elevation, in coastal regions. They are at high risk from the effects of Climate Change and many of the residents are at risk of losing their homes due to rising sea levels.

Below left - images of the devastation caused by flooding due to rising sea levels

Below - contextual map, showing nations categorised as Least Developed Countries by the United Nations

THE LDC CATEGORY IN 2018



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The Brief

Prepare conceptual sketch design proposals for rebuilding a community settlement of 100 persons, that can be constructed in a coastal area of an LDC that is at risk of being lost due to rising sea levels / flooding, or in an area that may already be partly under water. Most of the inhabitants simply cannot afford to relocate to higher ground and will derive their livelihood from access to the sea. The new settlement will allow them to continue with their way of life.

The proposals should show how the settlement can be constructed using a phased approach, to allow the community to continue to function as far as possible, so that residents can gradually move back in when each phase is completed.

The settlement should comprise housing, work areas and places of assembly, as well as the means to move between these areas. The proposals should also include outline infrastructure design such as drainage and sanitation and access to / from the rest of the land mass. Some of the locations have suffered from earthquakes in the past; the buildings are also to provide protection against tropical storms.

Entrants may select a coastal or estuarine site in an LDC.

Designers may wish to consider the following approaches:

- ▶ A settlement that is raised above the water level
- ▶ An anchored, floating settlement
- ▶ A settlement with buildings designed for their ground floors to flood
- ▶ How existing buildings may be adapted, to increase the protection they provide to their residents
- ▶ The design may include a dam structure, to help to protect the areas further inland from becoming submerged

Designers might wish to consider:

- ▶ Minimising costs
- ▶ The use of materials which are freely available locally and sustainable
- ▶ The use of details which can be constructed by persons who might not be experienced builders
- ▶ Allowing for broader climate change issues, such as the increased incidence of tropical storms.

Designers are to research current literature and research papers on such structures, in order to demonstrate an appreciation of the problems involved in their design and construction. An outline strategy for sanitation should also be provided, as part of the submission.

Consider that schemes of this nature will eventually be implemented through the help of non-governmental organisations (NGOs), who will consult fully with the needs and aspirations of the local people and work in full partnerships with them to help them to deliver the schemes.

The hope is that in the construction of the settlements, the local people will learn new skills and then be able to collaborate with neighbouring communities, to share their knowledge and experience and help them to construct similar settlements of their own.

Coastal regions of LDCs represent some of the areas of the world that are at highest risk from the effects of Climate Change. The aspiration for the competition is that it will provide viable solutions which can be adapted and possibly used in the other parts of the world where people are at risk of losing their homes, due to rising sea levels and the increased incidence of extreme weather events.

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How to enter

- ▶ Check the eligibility criteria for the competition for you and any team members and the relevant prizes.
- ▶ Visit the IStructE website and register your entry to the competition as an individual or a team, to receive your competition number before the registration deadline, 12:00pm GMT on 15 June 2020
- ▶ Work on your submission and complete before the competition deadline, 12:00pm GMT on 1 September 2020.
- ▶ Winners will be announced on the IStructE website on 30 October 2020.

Entry to the competition is free of charge.

To register visit [istructe.org/training-and-development/enter-awards/young-structural-engineering-international-design/](https://www.istructe.org/training-and-development/enter-awards/young-structural-engineering-international-design/)

All queries regarding the competition should be directed to education@istructe.org.

Prizes

- ▶ The John Barrett Prize is awarded to the winner of the competition, who will receive £5,000 and a certificate.

The John Barrett Prize was established 23 years ago by Mrs Ann Barrett in memory of the life and work of her husband John Barrett. John was a Member of the Institution and keen to develop design skills in young structural engineers. John sadly died in the Clapham Rail disaster in 1988.

- ▶ The Drury Prize is awarded to the best entry submitted by an individual or team of individuals who are all under 25 years of age. The winner will receive £2,000 and a certificate.

The Drury Prize was founded by the late Mr F E Drury (President 1945-1946) and was established to encourage students and graduates of the Institution to design adventurously.

- ▶ The Undergraduate Prize is awarded to the best entry submitted by an individual or a team where all members are undergraduates studying a civil / structural course. The winner will receive £1,500 and a certificate.

All submission entries shall be entered into all prizes that they are eligible for, but candidates will only be eligible for one prize. Judges will only award the prizes to submissions from individuals and teams that fully satisfy the requirements and standards required.

Eligibility

This is an International competition and entries are welcomed from individuals or teams of up to 3 people, however candidates must be:

- ▶ Under the age of 30 years by 1 September 2020
- ▶ Students currently undertaking a course of Further or Higher Education in Civil or Structural Engineering, Graduates in these subjects and professionally qualified Structural Engineers.
- ▶ Individual entrants and at least one participant of a team must be a member of the Institution of Structural Engineers. Teams must designate a chief representative when registering, who must be a structural engineer.

Submissions

- ▶ You are required to submit two digital A1 colour posters which fully communicate your design (to include drawings and sketches to show the plans and general arrangements of the structures, connection details and the construction sequences). There should also be a separate document of up to 20 A4 pages which contain your research and brief outline calculations (these should justify the loadings and cover the major elements of the structures).
- ▶ Candidates will also submit a written report, not exceeding 1500 words, detailing the design choice with an engineering appraisal of its advantages and disadvantages. We would also like to see evidence of your 'optioneering': show the different ideas that you have explored and give reasons why you have decided to work up some of the concepts and discounted others.
- ▶ All of this information is to be submitted electronically in the Adobe pdf format.
- ▶ All parts of your entry, including the calculations, must be written in English and bear your registration number. Entrant names, membership numbers, places of study / work / origin and home countries must not be mentioned, to allow for anonymous marking.
- ▶ Any Codes of Practice can be used for the calculations, however, once selected, submissions must continue to use the same Code of Practice.
- ▶ All submissions details will appear on istructe.org.
- ▶ All prize-winning individuals or teams will be required to give a livestreamed lecture on their submission.

Judging Criteria

The judges will be looking for innovative and feasible ideas that have the potential for further development, rather than an expert knowledge of the detailed design of the structures.

The competition will be judged by a panel, including members of the Education Committee and other specialists in the field covered by the competition, as deemed necessary by the Committee.