Ayad River 1.5km model stretch Restoration:
A Design Manual

prepared by Aarhus School of Architecture and The City of Aarhus, Denmark
The Liveability Standards in Cities launched by the Government of India focuses on the qualitative issues of urbanization and states:

Cities in India can work towards achieving the targets under the UN Sustainable Development Goal 11 on making cities:

inclusive, resilient and sustainable

The Indian Minister for Housing and Urban Affairs have said:

The world will not succeed in fulfilling the UN’s Sustainable Development Goals if India falls short and; the world will not succeed in fulfilling the Sustainable Development Goal 11, if Indian cities fall short.
IN INDIA

11 Sustainable Cities and Communities

By 2030, India will have 7 megacities with populations over 10 million.

13% of urban households don’t have sanitary toilets.

62 million tonnes per annum waste generated.

17% of urban population lives in slums.

2.5 million pollution-related deaths in 2015.

Half of humanity lives in cities today, and by 2030, 6 out of 10 people will live in cities.

IN INDIA

GRIHA Summit: Thematic Track 5: Sustainable Low Impact Materials
with - Udaipur Municipality; Aarhus Municipality; The Royal Danish Embassy New Delhi

Sustainable Development Goals

Make cities and human settlements inclusive, safe, resilient, and sustainable.
Research estimates that annual waste generation in India will increase to 165 million tonnes by 2030. The design manual takes the starting point in addressing this issue and provides proposals for a sustainable design approach based upon a clear agenda of:

**UPCYCLING and DESIGN FOR DISASSEMBLY**

### MAKE CITIES AND HUMAN SETTLEMENTS INCLUSIVE, SAFE, RESILIENT, AND SUSTAINABLE

- **GLOBALLY**
  - **HALF OF HUMANITY LIVES IN CITIES TODAY**
  - **AND BY 2030, 6 OUT OF 10 PEOPLE WILL LIVE IN CITIES**

- **OVER 10 MILLION**
- **31% LIVE IN URBAN AREAS**
- **17% OF URBAN POPULATION LIVES IN SLUMS**

### POLLUTION RELATED DEATHS IN 2015

- **2.5 MILLION**
- **62 MILLION TONNES PER ANNUM WASTE GENERATED**
- **13% OF URBAN HOUSEHOLDS DON’T HAVE SANITARY TOILETS**

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*with - Udaipur Municipality; Aarhus Municipality; The Royal Danish Embassy New Delhi*
How to achieve UN Sustainable Development Goal 11 on making Udaipur - The Ayad River Model stretch:

**Inclusive, Resilient and Sustainable**

1. Recycling waste
   - Upcycling material choices: Plastics and concrete

2. Design for disassembly
   - Component design material choices: Bamboo
1: Recycling waste: *concrete*

Recycled concrete retaining walls
1: Recycling waste: *plastic*

Collecting and recycle plastic waste
Plastic waste can be shredded and remelted to form new products and building components.
With the assistance of digital fabrication technology it will be possible to design bespoke fixing components from plastic to make new and interesting constructions.
Plastic fixing components
2: Design for disassembly- Bamboo

Constructing bamboo clad retaining walls

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2: Design for disassembly—Bamboo

Constructing bamboo Shelters for different activities

Constructing sunshade canopies from bamboo

Constructing bamboo land sculptures
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ARKITEKTSKOLEN AARHU
New bamboo bridge across the river

Recycled concrete retaining walls

Bamboo clad retaining walls

New bamboo shelters

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Examples of seating using recycled bamboo and plastic
Examples of seating using recycled bamboo and plastic
Ayad River 1.5km model stretch Plan proposal

- Flooded Park
- Bridges Across Riverbed
- Riverside walk
Removable bamboo bridges

Existing large stones in riverbed

Riverside path
Flooded Park

Riverside walk

View from University Road Bridge
Removable Bridge

Small Removable Bridge

View of Bridges over Riverbed
View of Riverside path
View of Riverside path

Seating around Trees

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Recycled Plastic experiments

Removable Bamboo Bridges

Flooded Park

Map of Arad River Development proposals

Exhibition Boxes

ARKITEKTSKOLEN AARHUS

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Ayad River 1.5km model stretch Restoration: Design Manual

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