

# **RESTORATION AND UPCYCLING BUILDINGS**

**A SUSTAINABLE BUILDING PRACTICE**

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# The building industry is a major contributor to waste





## **Consumes large amounts of natural resources and energy**

- ❖ Typically, ordinary concrete contains about 12% cement, 8% mixing water, and 80% aggregate by mass. This means that, in addition to the 1.6 billion tons of cement used worldwide, the concrete industry is consuming 10 billion tons of sand and rock, and 1 billion tons of mixing water annually. In total, the concrete industry, which uses 12.6 billion tons of raw materials each year, is the largest user of natural resources in the world.

## **Produces harmful pollution**

Brick kilns in Nepal is a major source of air pollution

There are nearly 1,600 brick kilns operating in Nepal and they burn approximately 1 million tonnes of coal every year, according to a latest World Bank study





Operating kilns are considered as improved/intermediate technologies in:

Bangladesh, roughly 60%

Nepal roughly 17% and India 3%

### Barriers to improvement

- brick industry's entrenchment in the gray economy
- lack of adequate investment and bank financing;
- low levels of human capital and know-how;
- weak or absent regulation, oversight, and standards;
- evasion of taxes and regulations;
- poor working conditions and wages; and
- largely stalled transition to higher-quality products and more efficient production technologies and approaches.

## **Produces massive amounts of waste**

- ❖ In the EU, more than 450 million tonnes of construction and demolition waste is generated every year, which makes it the largest waste stream in quantitative terms, with the exception of mining and farm wastes. At present, 75% of construction and demolition waste in the EU is being landfilled, although over 80% recycling rates have been exceptionally achieved in countries such as Germany and the Netherlands.



# The process of demolition and construction new buildings produces waste

Illegal landfill of waste in one of the Belgrade suburbs



Radivojević, Ana, Miloš Nedić, and Stefan Spasojević. 2013. Treatment of construction waste in Serbia and the life cycle of buildings.

- ❖ Construction and Demolition waste in Indian cities is 165-175 million tonnes, annually
- ❖ Waste dumped illegally on vacant sites, on the sides of highways, below fly-overs, beside lakes and rivers, in other low-lying areas and open stormwater drains
- ❖ Commonly known as “fly-tipping”
- ❖ In Bengaluru, C&D waste is increasingly being used to encroach on lake-bed land for construction.



Isher Judge Ahluwalia, Almitra Patel. 2020. Ministry of Environment, Forest and Climate Change.



**C&D debris generated in city**  
**2,500-3,000**  
tonnes per day



**BBMP's Nov 29 notification**  
Generators of construction and demolition waste should discard it only through civic body's channels. Rs 134 per metric tonne will be charged.



**Response from builders, contractors**  
To date, BBMP has received only a handful of enquiries about the process.

**The processing plant**  
Rock Crystal, a privately run unit in Chikkajala, north B'loru

Capacity	1,000 metric tonnes
Current utilisation	80 metric tonnes

**BBMP's new facility**  
Project proposed on 10-acre plot in Kannur. It will have capacity to process 750 metric tonnes per day.



# Concrete evidence: Construction waste chokes Bengaluru lakebeds, roadsides

Rohith BR / TNN / Updated: Jan 6, 2020,  
08:54 IST

Read more at:

[http://timesofindia.indiatimes.com/articleshow/73115549.cms?utm\\_source=contentofinterest&utm\\_medium=text&utm\\_campaign=cppst](http://timesofindia.indiatimes.com/articleshow/73115549.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst)

**“Sustainability in architecture has to start with the restoration of existing buildings. Keeping what we have and reusing it is one of the best ways to save carbon.”**

**- Conservation architect Nicholas Groves-Raines, MBE**



Our vernacular buildings are energy efficient and sustainable

❖ uses of local materials and resources

Thick stone walls



Sherpa house, Namche Bazaar

Our vernacular buildings are energy efficient and sustainable

- ❖ uses appropriate energy technology under given geographical, climatic and cultural conditions

Bamboo-lattice with mud-plaster walls



Tharu house, Chitwan



**Pollutes less, tie up less energy,  
produce less waste, and provide  
solutions that are safer and  
healthier**



**Kotgaun, Ghandruk**



# Upgrading vernacular houses



Parajuli residence, Kawasoti, Nawalpur



❖ recycled and upcycled



Parajuli residence, Kawasoti, Nawalpur





❖ steady maintenance and careful adaptation of existing buildings are keys to sustainable consumption in the built environment



Hotel Gaunghar, Bandipur Bazaar, Bandipur



❖ transform into different uses over time



Hotel Gaunghar, Bandipur Bazaar, Bandipur



## ❖ Revitalise towns



Bandipur Bazaar, Bandipur





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Bandipur Bazaar, Bandipur



## ❖ Revitalise towns



Bandipur Bazaar, Bandipur



## ❖ Revitalise towns



Bandipur Bazaar, Bandipur



**THANK YOU.**

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