

# Affordable Housing

Problem Based Learning (PBL)

Student Case Study

Client: Larsen and Toubro Realty Ltd.

**Members:** Rasa Apanavičienė (Mentor), Dinesh Dangol, Himanshu Patel Tuniki, Olga Mäkinen, Choten Tshering, Ramesh Shrestha, Lena Sthapit and Abhishek Singh

**Universities Participating:** Aalto University, IIT Bombay, Jigme Namgyel Engineering College, Kaunas University of Technology, Nepal Engineering College, Sagarmatha Engineering College, Asian Institute of Technology and Management

**Countries Represented:** Bhutan, Finland, India, Lithuania, and Nepal



"The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein."



Co-funded by the  
Erasmus+ Programme  
of the European Union



# Stakeholders

- Developer
  - Larsen & Toubro Realty Limited (L&T)
- Slum residents (horizontal slums)
- LOCAL\_PARTNER
  - Local partner
  - Communicates/ negotiates with the slum residents
- Slum Rehabilitation Authority (SRA)
  - Defines 300 sq. ft. floor area per family
  - Authorizes the Crescent Bay project

# Problems for L&T

- Space issues
- Delays increasing time and cost
- Need for prefabricated concrete
- Negotiate with and convince slum dwellers - our main focus



**L&T Realty**



**Local Developers**



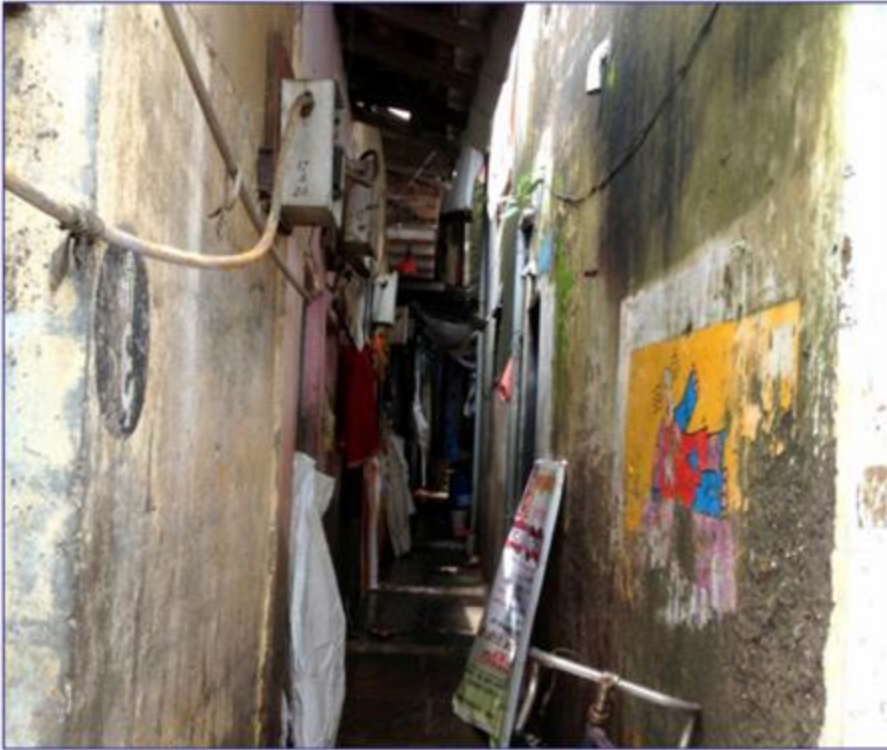
**Representative of  
slum dwellers**



THEN

NOW





THEN

NOW





THEN

NOW







THEN

NOW



# Key Problems

Recognized through research, rounds of iterations, and feedback from client

1. Financial burden of relocation
1. Building maintenance issues
1. Need for employment & skills
1. Lack of green areas  
→ stress, discomfort

## Vertical garden



- Green plants remove carbon dioxide from the atmosphere and generate oxygen
- Cooling effects
- Stress-reducing effects

## Improving Employability



### Basic training in trades:

- Welder
- Plumber
- Electrician

# Mobile application

- Communication and feedback channel
- Real-time status of maintenance and cost display
- Maintenance requests to go through application



63% of slum residents have mobile phones (Indian Government census, 2011)

## BENEFITS

### For L&T

- Quality assurance
- Feedback for continuous improvement
- Centralized communication with Pragati residents
- Knowledge for estimating maintenance costs for future projects

### For residents

- Platform for community development
- Feeling of being heard
- Helps residents estimating costs for future (after 10 years)

# Conclusion and Key Learnings

*Long term success: Slum rehabilitation projects can be sustainable **only** if the residents can afford the maintenance after 10 years and the majority will not move out*

1. Capability to work with different cultures and fields
1. Understanding of slum rehabilitation scheme, policies and the project in Mumbai
1. PBL mindset & application of selected methodologies

# REFERENCES

Hindman e al., 2015, Dow sustainability fellowship 2015: addressing slum redevelopment Issues in India

Slum rehabilitation in Mumbai, <https://www.jstor.org/stable/pdf/4404081.pdf>

Sheth et al., 2009, Slum rehabilitation in the context of urban sustainability: a case study of Mumbai, India

Restrepo, 2010, Moving in - selling out: The outcomes of slum rehabilitation in Mumbai

Subbaraman et al., 2014, The psychological toll of slum living in Mumbai, India: A mixed methods study

<https://www.thinkpragati.com/think/6104/understanding-slum-rehabilitation/>

<http://www.mca.gov.in/Ministry/pdf/CompaniesAct2013.pdf>

[http://www.indiaenvironmentportal.org.in/files/file/SLUMS\\_IN\\_INDIA\\_Slum\\_Compndium\\_2015\\_English.pdf](http://www.indiaenvironmentportal.org.in/files/file/SLUMS_IN_INDIA_Slum_Compndium_2015_English.pdf)

<https://journals.sagepub.com/doi/abs/10.1177/097542531200300112>

DHANYAVAAD

AČIŪ



KADRINCHE

KIITOS



THANK YOU