

羽ばたけ報告会

インド・ムンバイのスラム街における水害
と防災マネジメント



Mumbai, India



urbz Mumbai



About *urbz* Mumbai

Year of establishment : 2008

Location : Dharavi Mumbai

No. of core staffs: 5

Purpose :

Taking an experimental action and research collective specialized in participatory planning and design.



Organization structure

Local supports

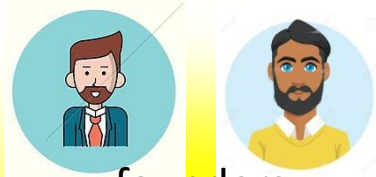


Scholars
Researchers
Social workers
Universities

International collaborations



Core members



founders



administrator

staffs

Internship participants



Geology
ITALY

Rimu

Law
NEW ZEALAND

Psychology
US

Architecture
INDIA

Design
PORTUGAL

Architecture
INDIA

研修目標・目的

①インドの都市とスラム街にインドのスラム街における近代的防災施設及び防災マネジメントのあり方を探るためにインドのスラム街における**無計画的・行政的防災マネジメントの実態を明らかにすること**

②インドのスラム街と日本の密集市街地における事例が相乗的な学びによる「国際協力」の方針の実現性を確認すること

研修活動内容

- 【ヒアリング調査】
- 【観察】
- 【意見交換】



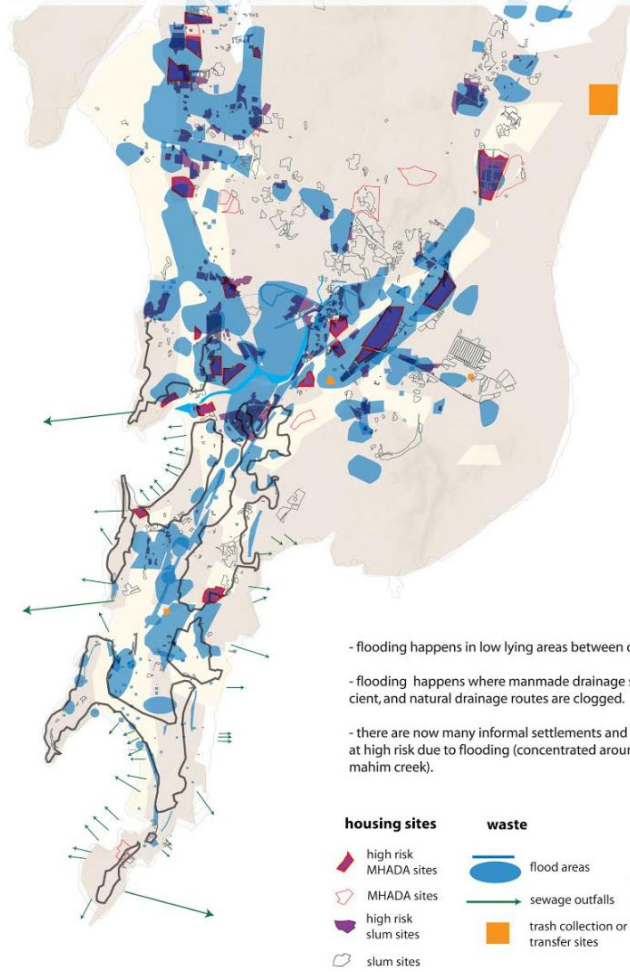
Site visit and investigation at 10 slum areas and neighborhood



研修の成果、研修で獲得したもの

- 深刻な被害を受けた地域の多くはスラム街であることを分かった

flood diagram: this mapping and analysis shows areas flooding on an annual basis due to monsoons. the sites outlined in red are government housing sites; over half of the sites shown flood annually.



flooding-
 'an overflowing of water onto land that is normally dry'
 (The American Heritage® Dictionary of the English Language, Fourth Edition)

causes of flooding

uncontrollable causes

-excessive rain
 24 hours of rain, 944 mm measured at airport, 2005

-impervious soil
 flood water terrain ground water
 mumbai is mostly rock and clay. water can only infiltrate to the ground water in the small area that is sand.

-island topography
 water collects at low, landfilled points

controllable causes

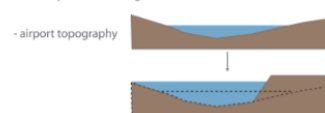
elimination of impervious surfaces



the stormwater management system was developed over 70 years ago. the system is no longer equipped to handle increased runoff from additional built area.

mithi river clogged due to:

- informal settlements (and further development)
- improper disposal of waste
- storm pipes, powerlines, railway and road bridges



- plastic bags
- insufficient pumping stations

-one quarter of the outfalls are below high tide.
 -building on sites with shallow ground water

flooding causes and regional flood mitigation solutions

plausible solutions

restore mangrove populations for better filtration of stormwater as it enters the sea

mangroves decreased by 32% between 1924 and 1994



provide (steal-proof) valves for outfalls below high tide to prevent back logging of stormwater

trash collection services need to be upgraded, amplified and offered to the 60% of the population living in slums.

organic and recyclable waste
 inorganic waste
 less than 15% of garbage produced is inorganic. better filtration will reduce waste.

Categorized informal areas

Urban village



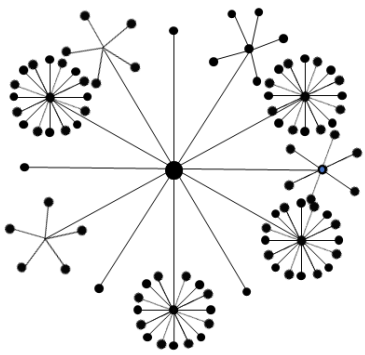
Notified slum



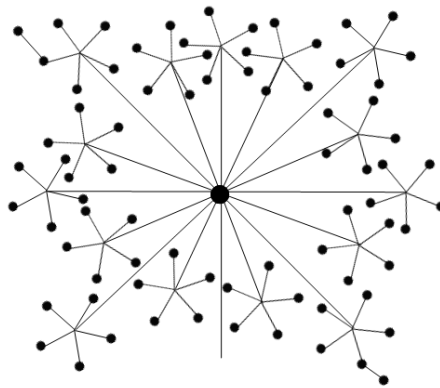
Non-notified slum



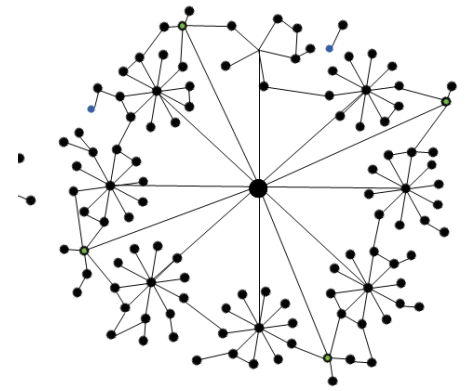
Basic infrastructure service



Decentralized system



Centralized system



Distributed system

行動目標の達成度と問題点

- 現地調査作業の達成 【95%】
- 現地学者との会議の効率 【60%】
- ファシリテーション達成度 【50%】
- 問題解決の実践 【90%】

研修で達成したこと

- より深くより幅広い都市に関する知識を習得し、インドのムンバイ市に対する研究をさらに高度にできた
- 貧困に関する様々な分野への関心も抱くことができた
- 有力な新興国であるインドで研修を行うことによって、母国のマレーシアと日本と異なる条件を持つ環境のもとで新しい経験を得ることができただけでなく、環境適応力を磨いたうえで将来国際的な場で活躍できる質を向上することができたと考える