Reconstruction in Urban and Rural Areas After the Nepal Earthquake

‘Tekhacho Tole’ Housing Reconstruction Project, Bhaktapur

Final Workshop on JST: J-RAPID Nepal
June 21st and 22st, 2016
Venue, Kathmandu, Nepal

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INTRODUCTION OF THE PROJECT

RESEARCH PROJECT

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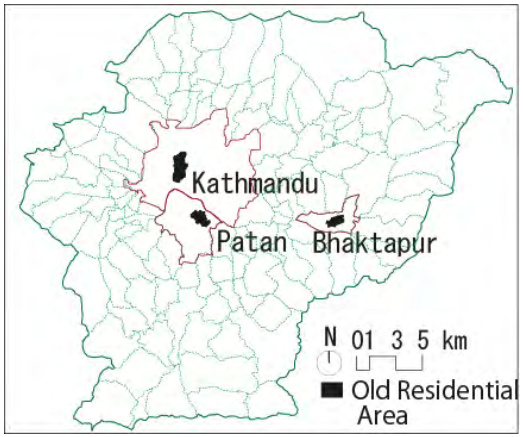
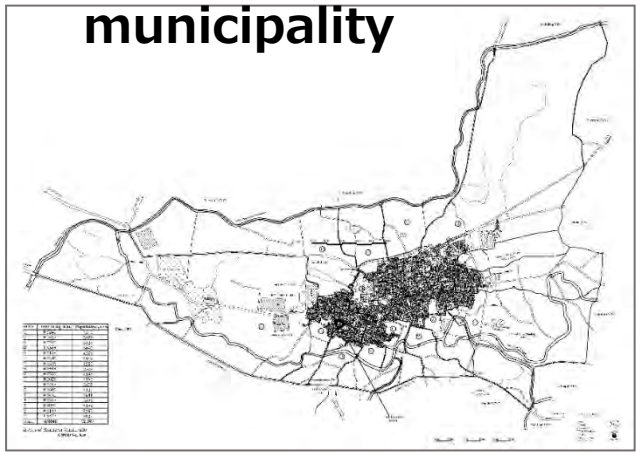
STUDY AREA

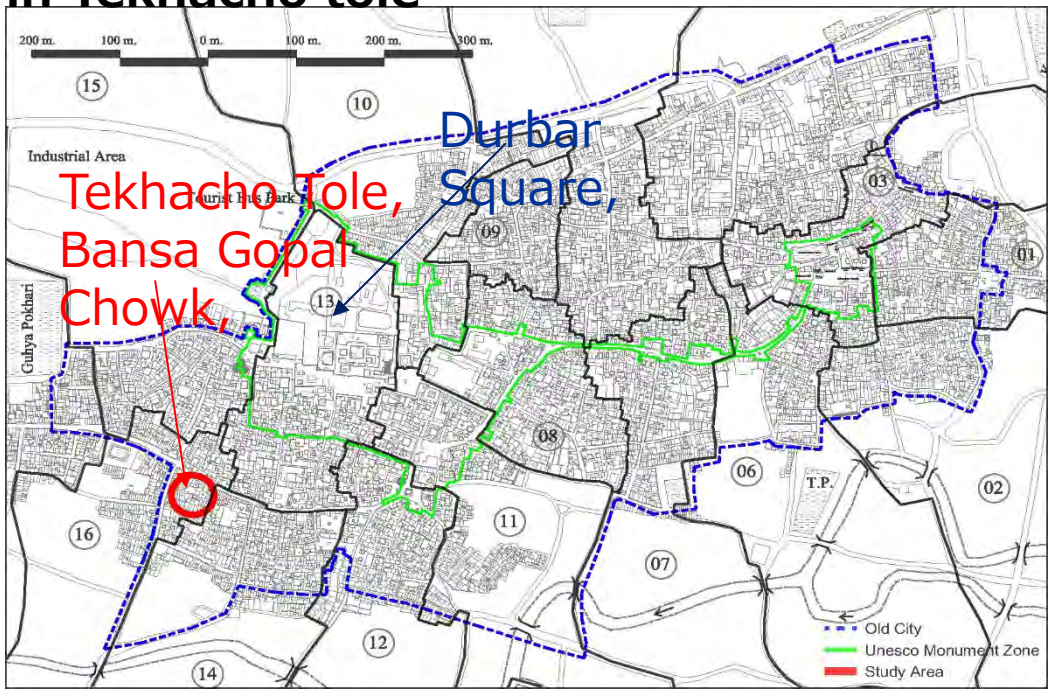
Three historic cities and old residential area (ORA) of Kathmandu Valley



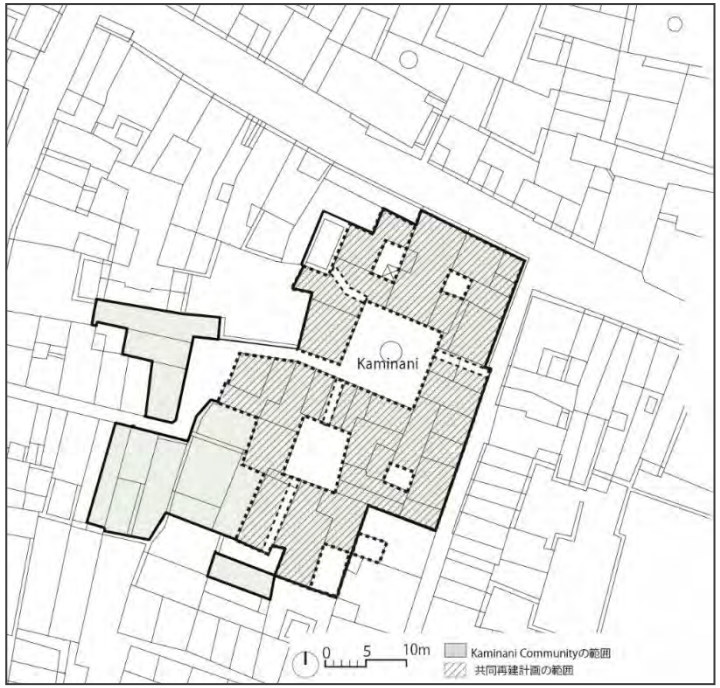
Bhaktapur municipality



ORA of Bhaktapur city and study area in Tekhacho tole



Kaminani community and Reconstruction Group



STUDY AREA: Kaminani Community

SURVEY AREA : Spatial Characteristics of Kaminani Community

- 35 plots
- Main Street & Sub Street
- Courtyards

  -Front courtyard 3

  -Back courtyard 5
- Pati 2

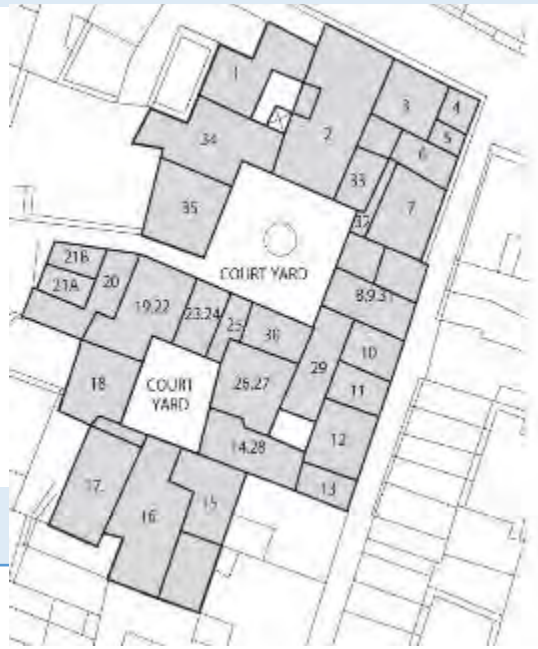
  -Guthi house with Pati 1

  -Pati in private house 1

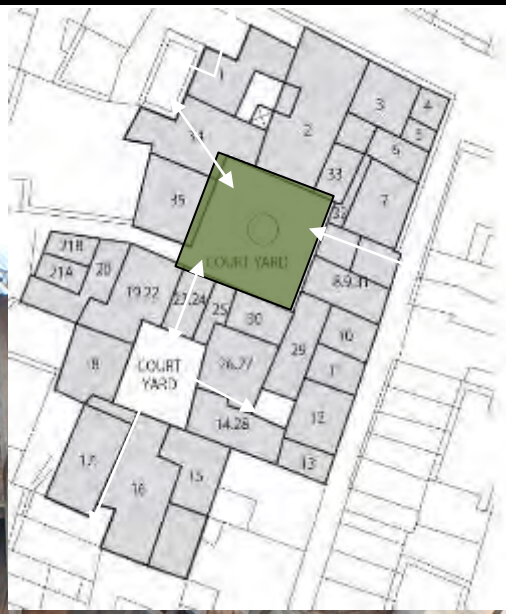
SURVEY AREA : FACADE

East elevation

North elevation

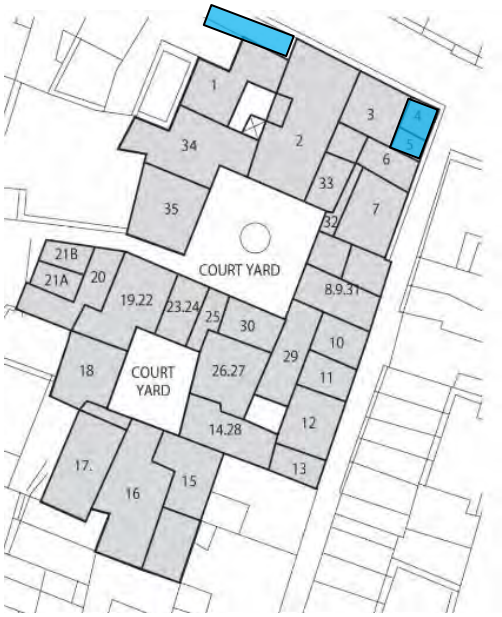


SURVEY AREA : COURT YARD



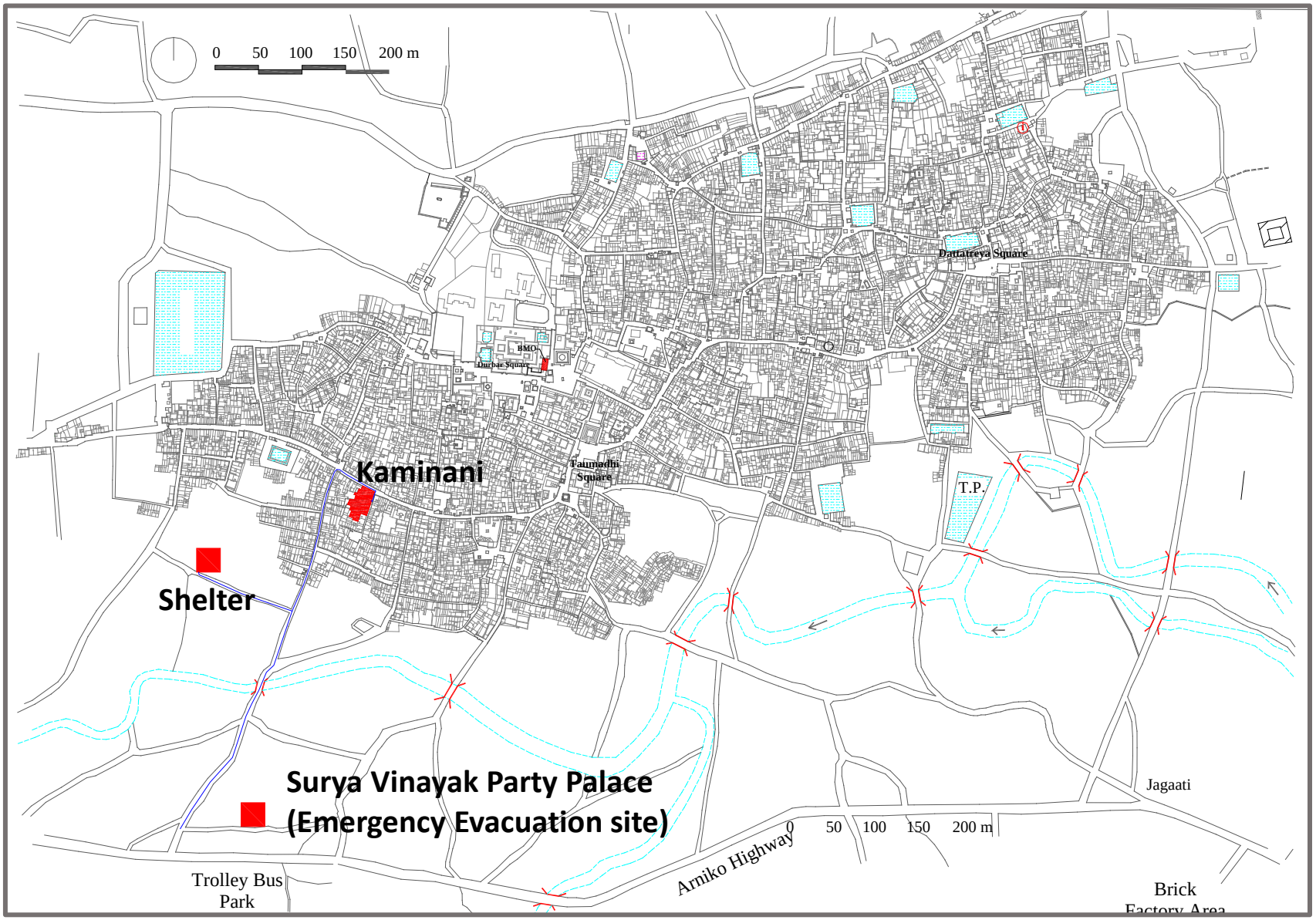
SURVEY AREA : BACK COURTYARD

SURVEY AREA : PATI

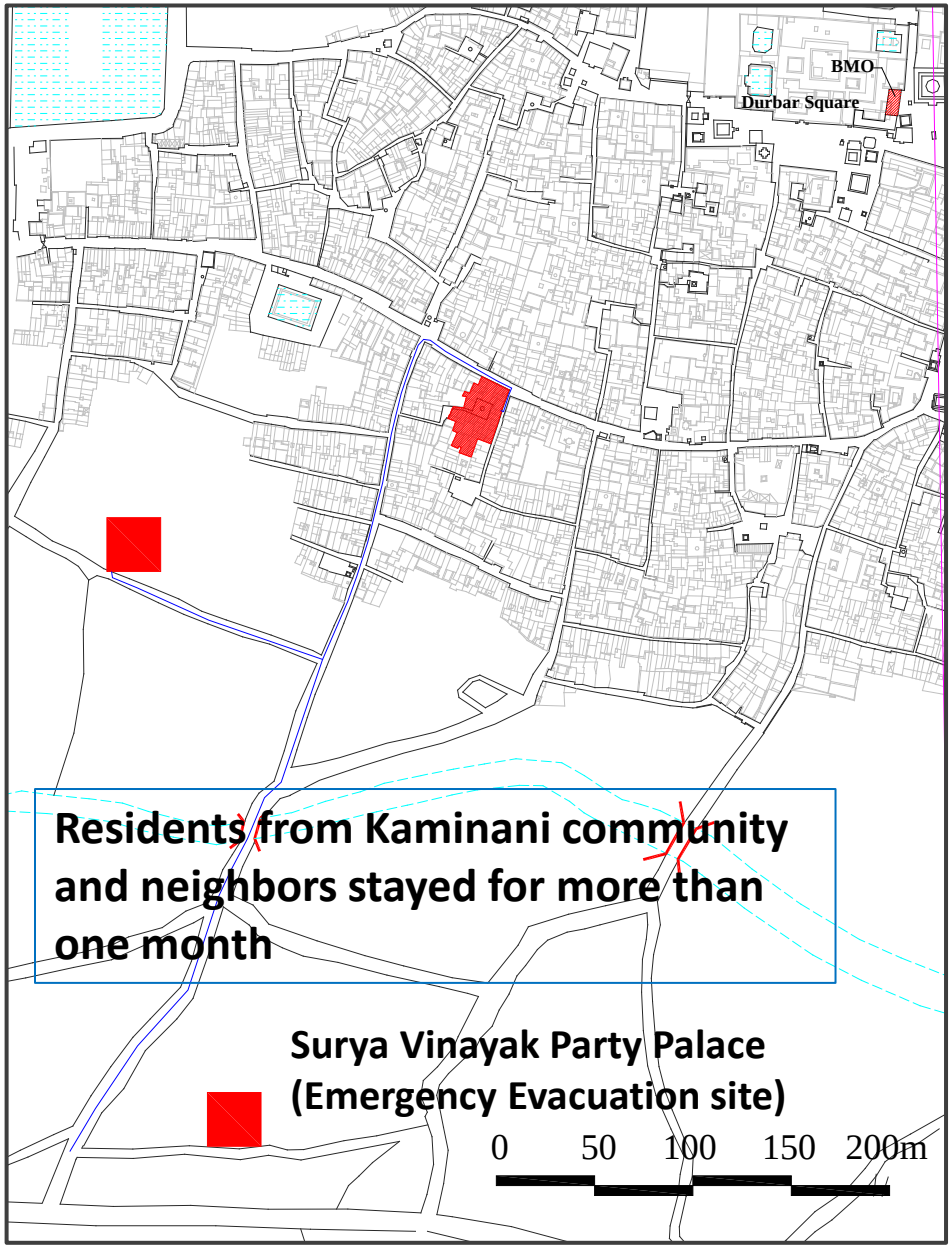


ANALYSIS : situation after the earthquake

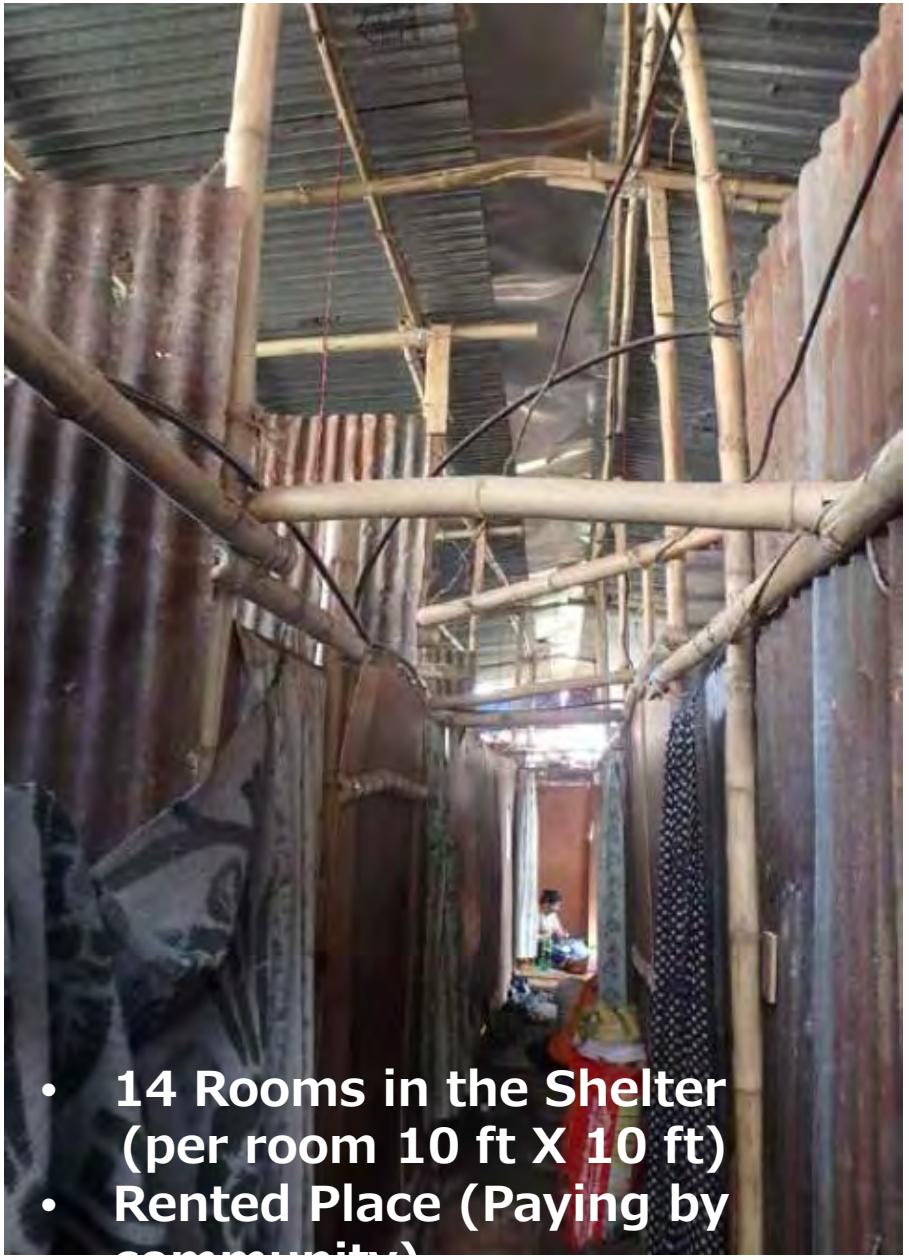
ANALYSIS: PROCESS AFTER THE DISASTER



ANALYSIS: EMERGENCY EVACUATION SITE -Surya Vinayak Party Palace



ANALYSUS: TEMPORARY SHELTER BUILT BY COMMUNITY – WASHIKA-MALACHA



- 14 Rooms in the Shelter (per room 10 ft X 10 ft)
- Rented Place (Paying by community)

ANALYSIS: RESIDENT'S PRESENT LIVING PLACE

- Cadestral map 35 plots
  -On field 33 plots (-5plots+2plots)
- Guthi house 2 plots
- Land 1 plots

- Shelter residents of 13 houses

Living place	Families	
Shelter	5	17
Rental room	1	
Same house	8	
New house	3	
Shelter + Same house	3	12
Shelter + Rental space	3	
Shelter + New house	2	
Rental + Same house	2	
Rental + New house	1	
Same house + New house	1	
Shelter + Rental house + Same house	1	

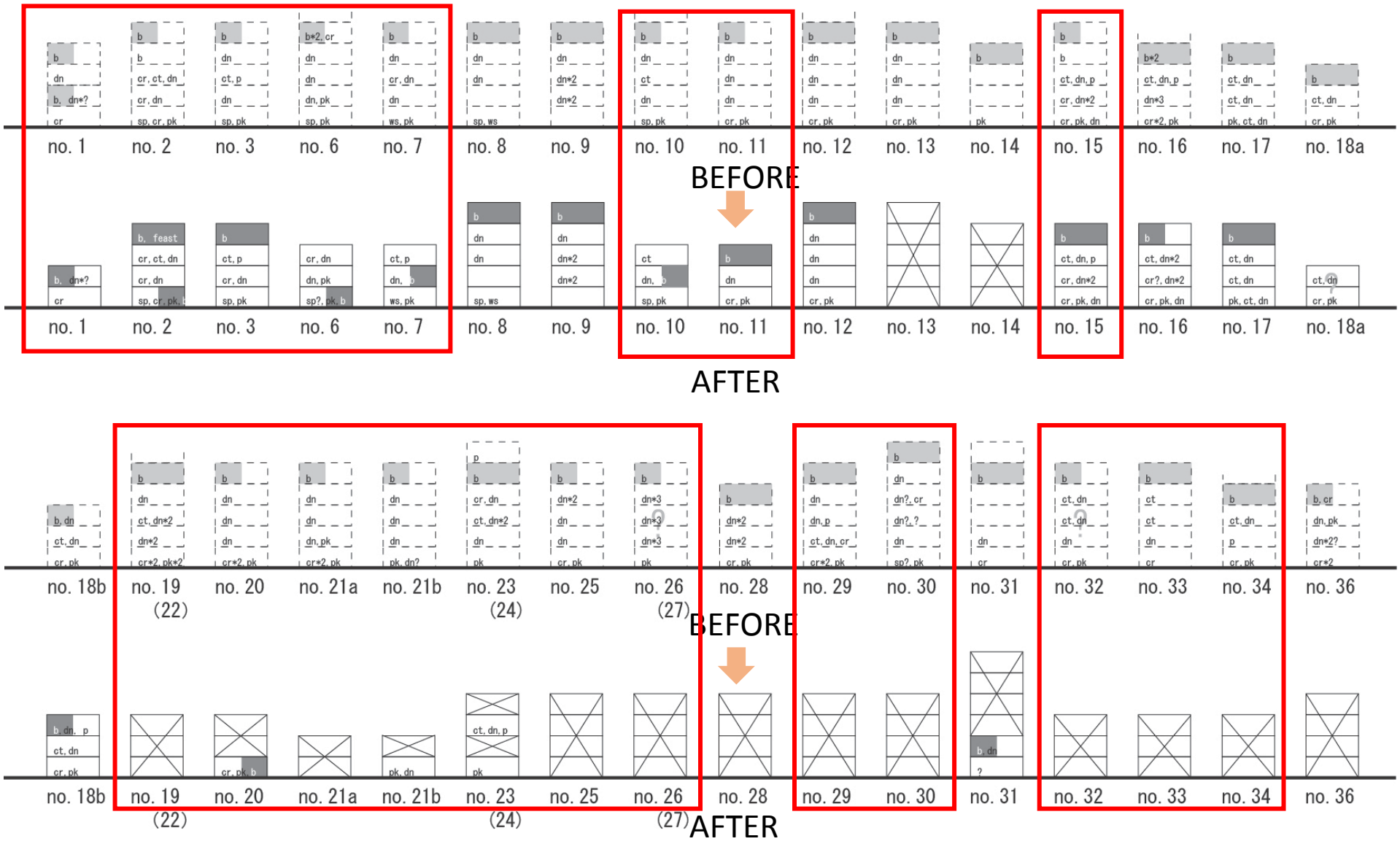
Families have to live separately

House no.	Present living place				Residents in old house		res
	Shelter	Renta room	Same old house	New house	Residents in old house before earthquake	household numbers	fan nur
H no. 1	•		•		10	2	
H no. 2			•		5	1	
H no. 3			•		4	2	
H no. 6	•		•		4	1	
H no. 7		•	•		8	1	
H no. 8			•		4	1	
H no. 9	•			•	6	1	
H no. 10			•		4	1	
H no. 11			•		3	1	
H no. 12		•	•		10	1	
H no. 13		•		•	11	1	
H no. 14/28					rental people	0	
H no. 15			•	•	10	1	
H no. 16	•		•		9	2	
H no. 17/23+24			•		9	1	
H no. 18a			•		4	1	
H no. 18b	•			•	4	1	
H no. 19+22	•				2	1	
H no. 20	•				10	1	
H no. 21a	•				6	1	
H no. 21b	•	•	•		7	7	
H no. 24				•	6	1	
H no. 25+30	•				12	1	
H no. 26							
H no. 27	•	•			11	1	
H no. 29				•	4	1	
H no. 31				•	4	1	
H no. 32	•	•			14	2	
H no. 33	•				6	1	
H no. 34					3	1	

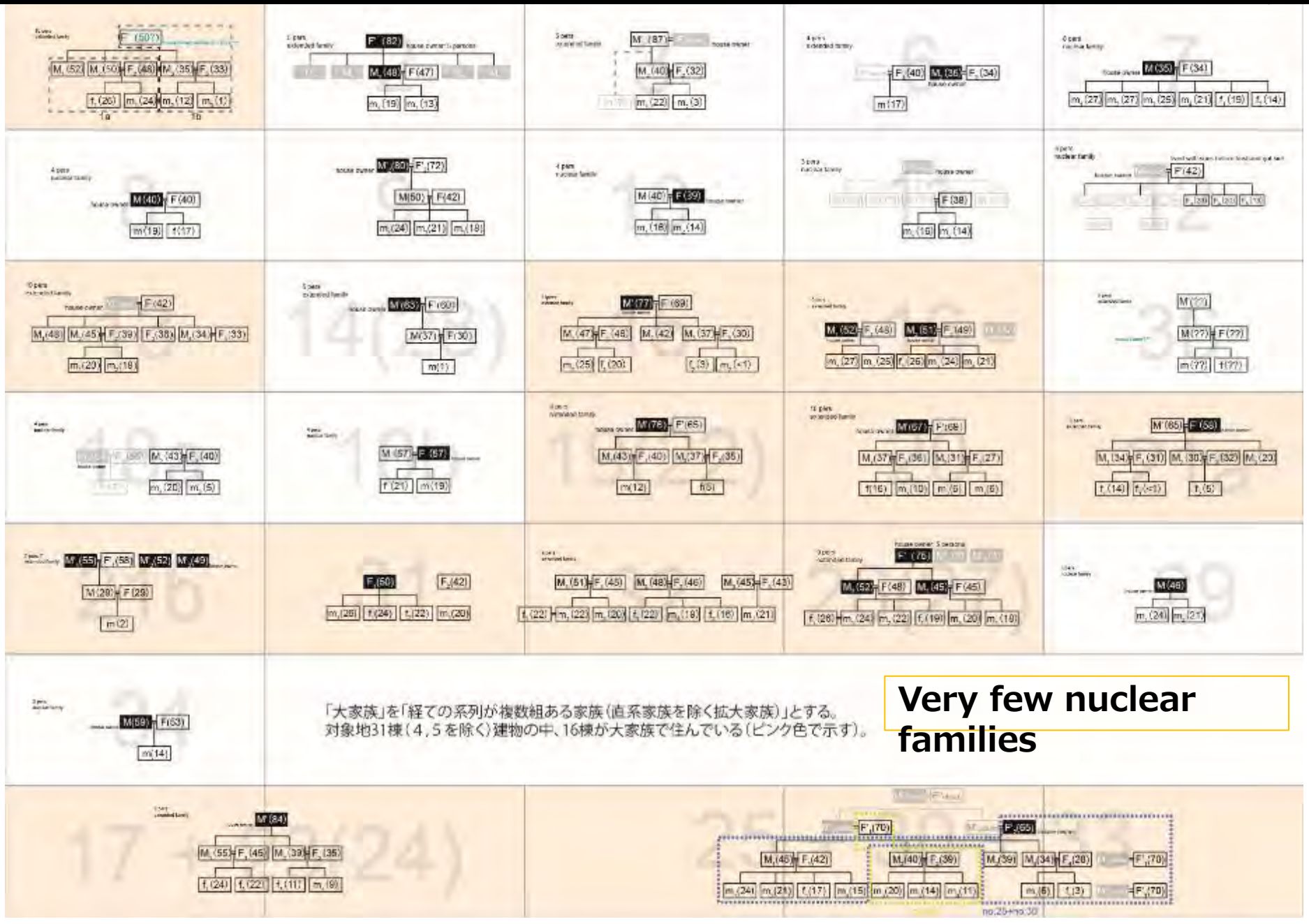
ANALYSIS: DAMAGES BY EARTHQUAKE

- All houses are listed as Red level
- Victims living in the damaged structures

ANALYSIS:
DEMOLITION OF UPPER FLOORS AND FUNCTION REPLACEMENT



ANALYSIS : FAMILY STRUCTURE



ISSUE & PROBLEMS IN REBUILDING

Heavy destruction of traditional houses

Shallow foundation, absence of DPC, poor bonding of mud mortar between sun dried and mud bricks, lack of tie at corner walls

Vertical division of houses and haphazard renovation and addition of floors irrespective of strength of old houses

Extension of rooms by creating balcony & then converting them into rooms

Haphazard creation of openings in load bearing walls after vertical property division

Issues & problems:Housing Rebuilding

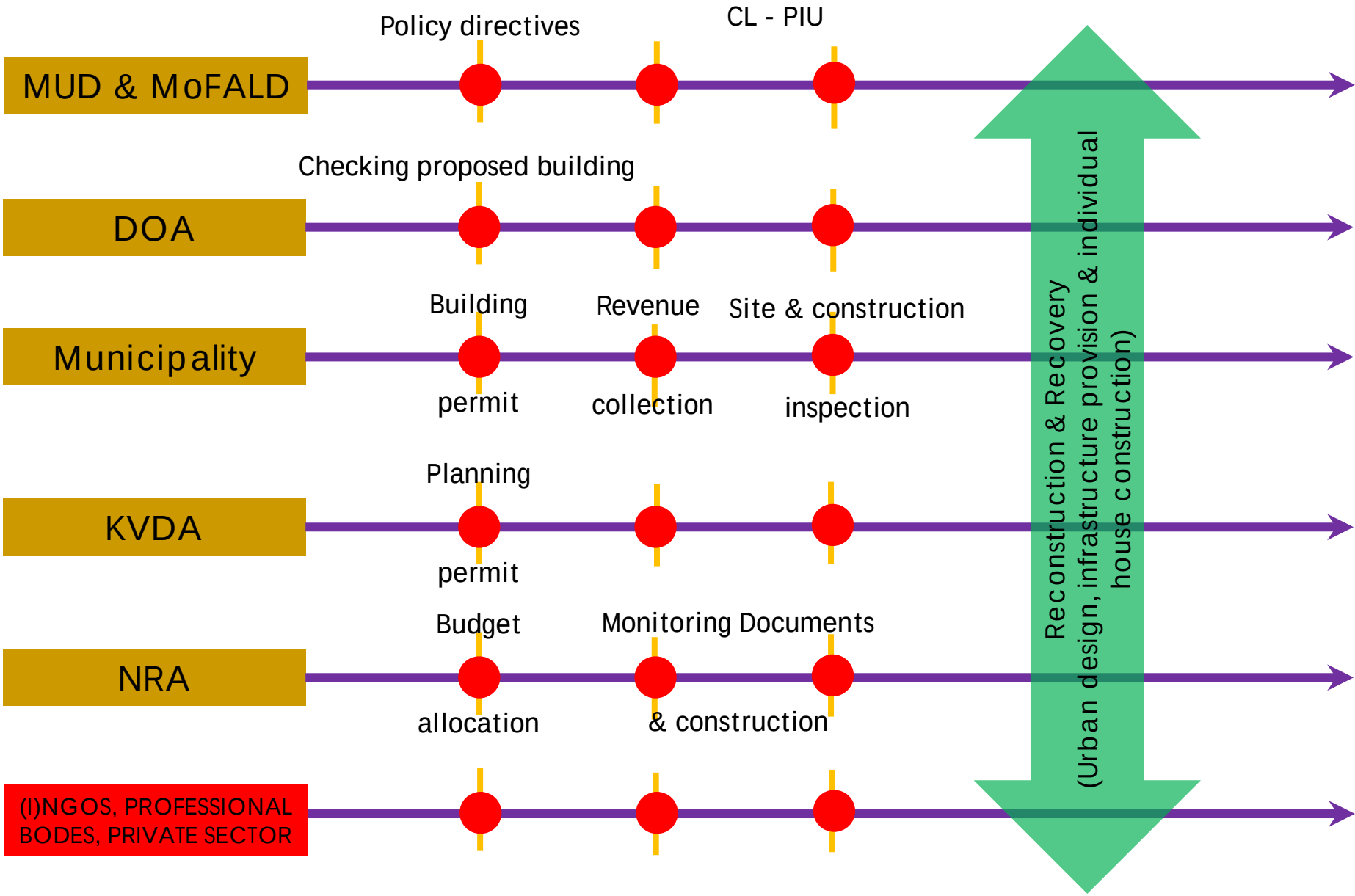
Physical problems	Roof leaking Poor light and ventilation Dampness
Building age	50-100 yr OR > 100 yrs
Renovation work	Addition of floors New D/W opening Outer plaster
Professional consultation	No – (engineers) No- (contractors)




Issues & challenges: Housing reconstruction in ORA

Protection & conservation	- What are the features/characters to be conserved?
Planning & design issue	- Tiny, elongated plot sizes - Multiple ownerships on land & houses
Financial issues	- Low affordability - NRs. 200,000 grant with concessional loan up to NRs. 300,000 OR providing a soft loan up to NRs. 250,000 for the valley
Permit issue	- No regulation for house pooling & urban regeneration; - No change in Building bylaws in HCA of Bhaktapur municipality; - Applicable Joint Apartment Act 1997 for mass reconstruction? - Need to take planning permit if no change lanes & courtyard size? - House pooling (?) & urban regeneration (?) possible
Safer neighbourhood	- How to make safe neighbourhood?
Cost effectiveness	- How to achieve cost effectiveness in reconstruction?
Opportunity	- How to incorporate the emerging issues (energy efficient components) and community's needs and aspiration

Role & Responsibility; various stakeholders

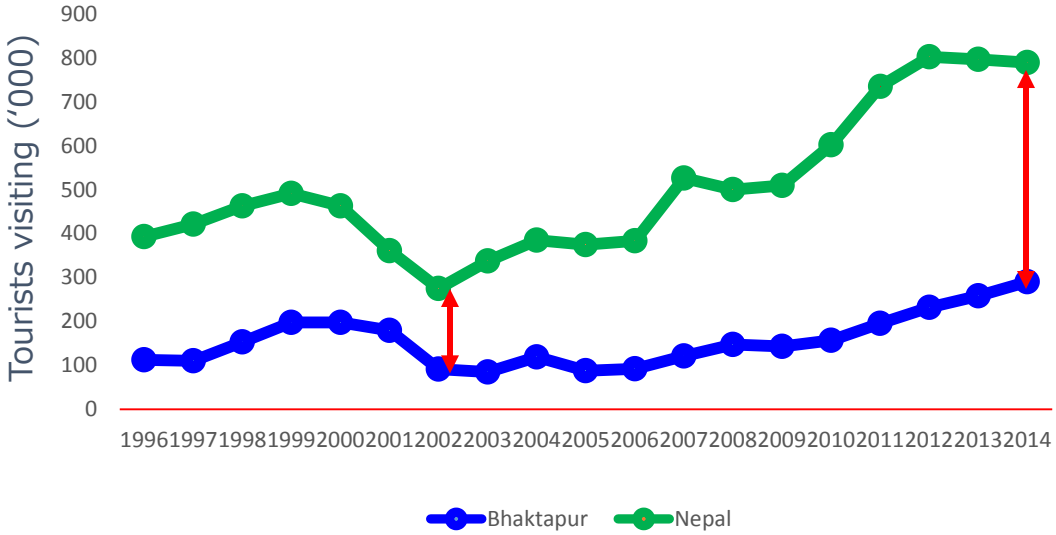


Emerging Development models : Features

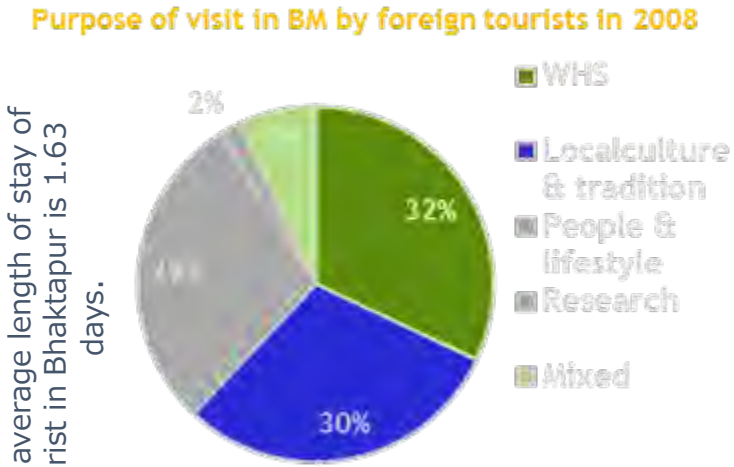
Aspects	Pilachhen, Patan	Kilagal, Kathmandu
Location	Newari core settlement	Newari core settlement
House nos.	82	80
Cast of community	Maharjan	Maharjan, Gopals & Dongol
Professions of community	Agriculture, wood & stone carving, cloth weaving	Agriculture, animal husbandry with some on trade & services
Construction system	Each individual house separately	Single monolithic structure
New use	Lower-guest house & galleries & upper floor for residents (owners)	Lower floors for commercial and upper spaces owners on flat system
Financial system	Owner cash payment = 25% Cash or kind support = 25% Volunteer support = 25% Bank financing = 25%	Rental from commercial uses on lower floors

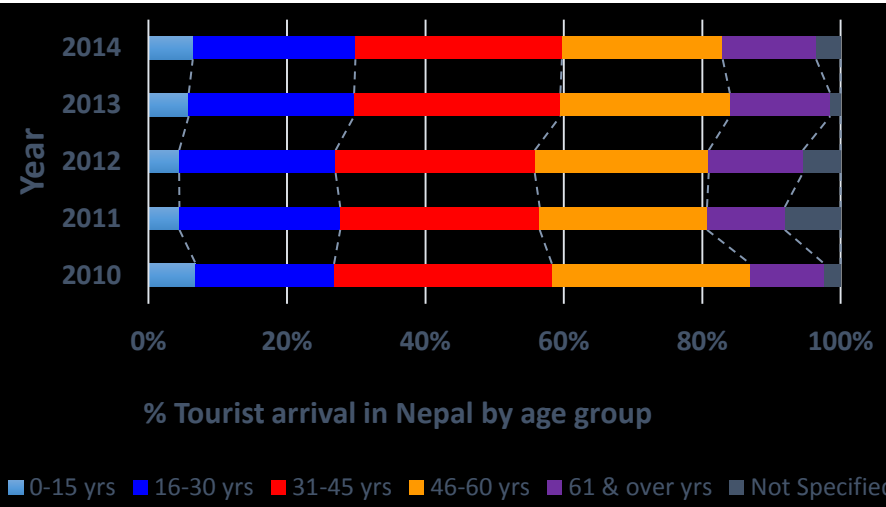
Use of the area: cultural tourism & private residence

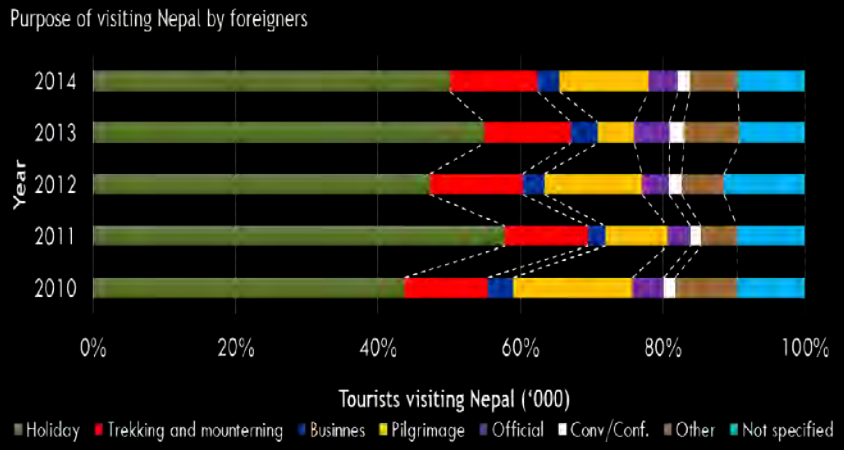
Gap between tourist arrival in Nepal and visiting Bhaktapur municipality (WHS)



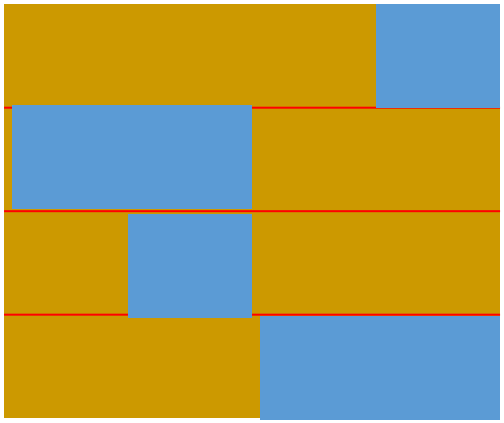
The average length of stay of tourist in Bhaktapur is 1.63 days.







Social problems



- Multiple ownership over houses without legal status
- Sharing of ‘saga’ common open spaces
- Dismantling the existing wall
- Design, style and construction technology
- Variation in use of the building in post-earthquake period

Issues & problems:Housing Rebuilding

Tiny elongated plots

Not enough light

Common wall

house no.	Plot area (m2)		house no.	Plot area (m2)
2	73.32		15	31.15
3	26.04		16	57.14
6	14.9		17	43.62
7	32.03		18	31.14
8,9,31	47.83		19(22)	28.34
10	16.63		20	28
11	15.05		21-a	10.1
12	26.95		21-b	10
13	11.93		22(19)	14.6
1	46.62		23,24	17.6
34	51.21		25	10.41
35	37.78		26,27	35.81
32	6.54		28	16.96
33	13.49		29	35.81
14	13.52		30	18.72

31.79m2= 1 anna= 342.25 ft2

7.94 m2 = 1 paisa = 85.56 ft2

Ground floor plan (measured base)

PROPOSALS - PHASE 1

BRIEF INTRODUCTION OF 3 PROPOSALS

TYPE2: along the street

TYPE3: along the street

(a) To conserve and promote socio-cultural dimension and past glory of the community;
(b) To achieve safer and cost effective reconstruction;
(c) To improve environmental condition

All these qualities will be achieved through integrated planning of all houses with detailing of each house (block) as per the prevailing guidelines and building bylaws and Nepal National Building Code, prepared by the Government of Nepal.

All the suggested three proposals have considered the above mentioned aspects with varying degree.
All the buildings will have four story (maximum 35’ high) with additional staircase coverage (not exceeding 42’ high).

The proposed construction system is RCC frame structure with exposed brick facades towards the street, lanes and courtyards. However, alternative materials can be used for inner partition walls, as per households’ need.

The proposed plan has conserved courtyards (public as well as private), pass through ways (Gallis) and adopted traditional Newari architecture details which will

BRIEF INTRODUCTION OF 3 PROPOSALS

TYPE1: INDIVIDUAL WITH FEW COMBINED

CONCEPT

(a) This type intends to combine tiny, elongated and those plots lacking adequate light and ventilation into a single plot for better space planning, design and detailing (3-5 plots will be combined into one larger plots);
(b) As staircase will be used by all those households, EQUAL SHARING on circulation and staircase is required. However, increase in area will be PROPORTINATELY distributed among the households based on the existing areas in each floor;
(c) Each household will get the developed area in their ORIGINAL LOCATION (and SIDE) as far as possible;
(d) Ground and First Floors shall be DISTRIBUTED TO THE PARTICIPATED OWNERS whereas upper two floors shall be SHARED ON FLOORWISE as per their consensus due to better light and ventilation on upper floors;
(e) Ground Floor shall be generally used for Toilet and other utilities;
(f) Those who own larger plot can have their OWN INNER STAIRCASE (narrow one) for circulation within different floors.

METHOD

STEP1:
Once the community agree on the BASIC CONCEPT, then detailed workout over room distribution with exact areas can be calculated. However, negotiation among the households in each block is further needed to adjust the allocated spaces as per calculation;

STEP2:
(b) The municipal drawings shall be prepared on block wise basis for getting permission from Bhaktapur municipality. However, it can be submitted together at municipality and the permit fee shall be shared equally for staircase and lobby area but on the proportionately basis for the remaining areas;

STEP3:
(c) The ownership on land can have as per EARLIER PLOT basis but it will have joint ownership for staircase and circulation areas (including the terrace area) with individual ownership over rooms on proportionately basis.

DATA

SITE AREA: 900 m2
Construction Area: 900 m2
Total floor Area: 900X4.1 m2=3690 m2

Construction Cost
Skeleton: Rs. 20000X3690 m2=Rs 73,800,000
Infill: Rs.1000X3690 m2=Rs. 36900000

CORRENT SITUATION s=1:200

GROUND FL. PLAN s=1:200

STREET VIEW

1st FL, 2nd FL, 3rd FL. PLAN s=1:200

Tekhacho Tole, RECONSTRUCTION PROPOSAL

Architecure Planning Lab. + Urban Redesign Studies Unit, the University of Tokyo

BRIEF INTRODUCTION OF 3 PROPOSALS

TYPE2: COMMUNAL

CONCEPT

This proposes that all the land and structures are conbined.
Blocks along the streets are designed as commercial space on Ground FL, 2nd Fl and 3rd Fl. First floor will be flat type housings for smaller houses.
Through this commercial activity, the association can earn rent from tenants and it will appropriate to construction loan. In addition, 10% of the income will be allocated to all the household (house hold along the streets will be allocated twice than others).

METHOD

STEP1: All the land willbe conbined.
STEP2: All the houses are allocated 70% of the original area as use right.
STEP3: Houses which obtain more than 12㎡ for one floor willbe allocated 4 stories residential space. Houses which obtain less than 12nf for on floor will be allocated flat residential space above rental space block along the streets.

DATA

SITE AREA: 900㎡
CONSTRUCTION AREA: 810㎡ / **BUILDING COVERAGE:** 90%
TOTAL FLOOR AREA: 3,240㎡ / **FLOOR COVERAGE** 400%
-**RENTAL SPACE AREA:** 510㎡ (15%)
G FLOOR:190㎡ / **2nd FL:** 160㎡ / **3rd FL:** 160㎡
-**RESIDENTIAL SPACE AREA:** 2,300㎡ (70%)
-**COMMON SPACE AREA:** 430㎡ (15%)

CONSTRUCTION COST: 3,240㎡×30,000Rs/㎡=97,200,000Rs
INCOME FROM TENANTS: 254,000Rs/month
-GF(SHOPS):190㎡×1,000Rs/㎡=190,000Rs
-2-3rd FL(HOUSES): 320㎡×200Rs/㎡=64,000Rs
ALLOCATION FOR HOUSE HOLDS: 25,400Rs/month(10%)
APPROPRIATION FOR CONSTRUCTION LOAN: 228,600Rs/month(90%)
* construction cost will be covered for 35years income

Tekhacho Tole, RECONSTRUCTION PROPOSAL

Architecure Planning Lab. + Urban Redesign Studies Unit, the University of Tokyo

BRIEF INTRODUCTION OF 3 PROPOSALS

TYPE3: MIXED

CONCEPT

This is a 'hybrid model' of type 1 and type 2. Residents can choose whether they retain their land (individual) or conbine the land (communal).
Ground FL of Communal space will be guesthouse which has 5 rooms and restaurant and workshop where carpenters of this community can work. Through this commercial activity, the association can earn rent from tenants and it will appropriate to construction loan.1st FL and above are residentials which allocates 70% of the original area.

METHOD

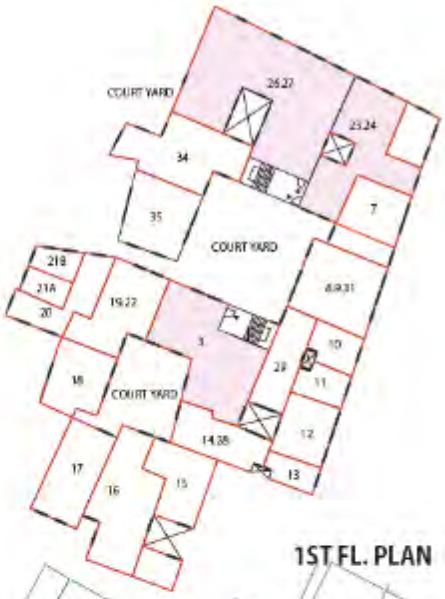
STEP1: Each household choose whether they reconstruct individually or communaly. Households which choose individual type, they remain in their land and reconstruct. Households which choose communal type, they establish reconstruction association of this community.
STEP2: Communal type households are allocated 70% of the original area as a use right. GF of the block will be guest house and workshop. The interest of this buisiness will be appropriate to construction loan.

DATA

SITE AREA: 900㎡
CONSTRUCTION AREA: 870㎡ / **BUILDING COVERAGE:** 96%
TOTAL FLOOR AREA: 3,480㎡ / **FLOOR COVERAGE** 400%
-**INDIVIDUAL AREA:** 520㎡ ×4F=2,080㎡
-**COMMUNAL AREA:** 350㎡ ×4F=1,400㎡
GUEST HOUSE: 260㎡ **WORKSHOP:** 70㎡ (25%)
RESIDENTIAL SPACE: 1,000㎡ (70%), **COMMON SPACE:** 70㎡ (5%)
CONSTRUCTION COST: 3,480㎡×30,000Rs/㎡=104,400,000Rs
-**INDIVIDUAL AREA:** 62,400,000Rs -**COMMUNAL AREA:** 42,000,000Rs
INCOME FROM TENANTS: 274,000Rs/month
-GUEST HOUSE:260㎡×1,000Rs/㎡=260,000Rs/month
-WORKSHOP: 70㎡×200Rs/㎡=14,000Rs/month
ALLOCATION FOR HOUSE HOLDS: 27,400Rs/month(10%)
APPROPRIATION FOR CONSTRUCTION LOAN: 246,600Rs/month(90%)
* construction cost of communal area will be covered by 14 years income

Tekhacho Tole, RECONSTRUCTION PROPOSAL

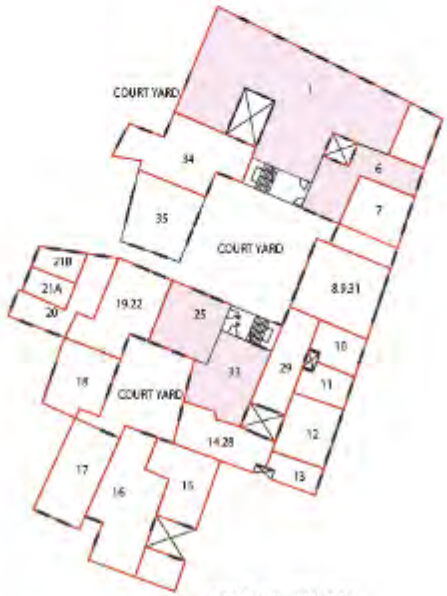
Architecure Planning Lab. + Urban Redesign Studies Unit, the University of Tokyo



1ST FL. PLAN

3RD FL. PLAN

GROUND FL. PLAN s=1:200



2ND FL. PLAN

BRIEF INTRODUCTION OF 3 PROPOSALS

COMPARISON OF 3 PROPOSALS

		TYPE 1 ; INDIVIDUAL	TYPE 2 : COMBINED	TYPE 3 ; MIXED	
				AREA 1 (combined plots)	AREA 2 (individual plots)
Ownership	Land	same as before	combined	combined	same as before
	Building(structural)	combined	combined	combined	individual
	Staircase	communal	combined	combined	individual
	Corridor	communal	combined	combined	-
	Rooftop	communal	combined	combined	individual
	Private rooms	individual	individual	individual	individual
Combining houses to be combined		2 - 3houses	all houses	4-5 houses	-
No. of stories		4	4	4	4
Uses	Ground floor	houses	rental room	rental room	houses
	First floor	houses	rental room	houses	houses
	Above 2nd floor	houses	rental room + houses	houses	houses
Design	Façade	traditional	traditional	traditional	
	Roof	-	flat	flat	
Investment	Gov. loan	○	○	○	○
	Owners'	○	○	○	○
	Income from rental spaces	-	○	○	-

DETAIL EXPLANATION OF TYPE1

First Floor and Typical Floor Plan

Increase in area

Regular size of rooms

Better light & cross ventilation

Flexibility in layout plan for individual

Flexibility in sharing rooms, floors (3 & 4 floors)

Maintaining traditional newari architecture on facade

COST CALCULATION

SITE AREA: 900 m^2

Construction Area: 900 m^2

Total floor Area: 900X4.1 m^2=3690 m^2

Construction Cost

Skeleton: NRs. 20000X3690 m^2= NRs 73,800,000 (7.4 cror)

Infill: NRs.1000X3690 m^2= NRs. 36900000 (3.7 cror)

DETAIL EXPLANATION OF TYPE1

REACTION FROM THE COMMUNITY

Workshop on PROCESS OF RECOVERY AND HOUSING RECONSTRUCTION in Kaminani, Bhaktapur after the Gorkha earthquake, Nepal

Date: 9th Feb. 2016 (Tues) (26th Magha, 2072 BS)
Venue: Surya Vinayak Parti Venue, Tekhacho, Bhaktapur
Participants: residents of 34 houses

Workshop on PROCESS OF RECOVERY AND HOUSING RECONSTRUCTION in Kaminani, Bhaktapur after the Gorkha earthquake, Nepal

The objective of this Workshop is 1) to dissemination of the study process related to recovery and housing process, 2) to present Proposal options and their strengths and weaknesses, 3) to get necessary feedbacks from participants.

Date: 10th Feb. 2016 (Wed) (27th Magha, 2072 BS)
Venue: Surya Vinayak Resort/ in Bhaktapur
Organiser: Jointly by JST Nepal Japan team for Recovery and Housing Reconstruction & Bhaktapur Municipality

Workshop Program

S. No	Timing	Activity details	Remarks
1	9:00 - 9:30	Registration	
2	9:30 - 10:00	**Informal Opening:** Opening remark and welcome by **Mr. Umesh B. Malla**, Nepal Speech by the Executive Officer, Bhaktapur municipality Speech by representative from Ministry of Urban Development Speech by representative from Ministry of Science & Technology Speech by the representative from Ward No. 15 community Speech by the representative from Reconstruction Authority (Section chaired by Bhaktapur municipality)	**Facilitator** (???????) Speech by each for 6 minutes
3	10:00 - 10:30	**Tea - coffee break**	
4	10:30 - 11:30	**Session I: Presentation and discussion on the study carried out by JST ream** (a) Presentation on project introduction and examples of reconstruction process in Japan by **Prof. (Dr). Otsuki** (b) Study methodology, survey, data collection and analysis and synthesis by **Dr. Lata Shakya**, University of Tokyo, Japan (c) Proposal options and their strengths by **Dr. Imoto**, University of Tokyo, and **Dr. Bijaya K. Shrestha**, Khwopa Engineering College, Bhaktapur, Nepal **Floor Discussion**	**Facilitator** Presenter to present maximum 20 minutes followed by floor discussion
5	11:30-13:00	**Lunch**	
6	13:00-14:30	**Session II: Presentation by panellists on their perspective on various issues on process of recovery and housing reconstruction at ward no. 15, Tekhachhe, Bhaktapur** **Prof (Dr). Otsuki**, University of Tokyo, Japan (Design team's perspective) ; **Mr. representative from Nepalese team**, (Design team's perspective) ; **Mr. Krishna Sadan Awal**, Representative from Local community(Users' perspective); **Mr.???**, DUDBC, Babarmahal, Kathmandu, Nepal (GoN's perspective);	**Facilitator (Dr. Bijaya K. Shrestha)** Views on various issues on recovery and reconstruction by experts in the panel

REACTION FROM THE COMMUNITY

Workshop on 9th Feb 2016

Not acceptable	Acceptable if could correspond the challenges
Changes in position of houses • Land value is very different between road side house and courtyard side house. So changing the position of houses is not acceptable, mainly for rode side houses. • Shop owners want their ownership and possession on the shop as before • Changing original place of owned land is problematic	**Construction Cost** • Good idea to collect the reconstruction cost from rental rooms but distribution of percentage is not clear. If it can be fix, this is also an option. • Many of residents are masonry and carpenter. So they can work together which will minimize the labor cost. **Concept of combining houses** • New concept, residents are not sure whether they are prepared for combining houses. • Worry about bylaws or guidelines regarding combining houses which are not prepared by government yet. • Need of co-operation work with municipality and Dep. of archeology. May become first model and give pressure to government. **Challenges for management of communal staircase** • Even area arises, problem for management would arise more.

REACTION FROM THE COMMUNITY

Talk Program with residents

Date: 26th March 2016

Venue: Surya Vinayak Parti Venue, Tekhacho, Bhaktapur

Participants: representatives of residents (15 persons)
3 persons from Nepal team and a Guest Rabi Tuladhar

Aim of the program:

(a) listening their views after the workshop (held on February);
(b) to share experience on Ason area redevelopment; and
(c) to find out the way to go ahead.

Discussed and resulted that

- Proposal 1, without changing of position of houses, is the best. However remains, challenges on construction cost
- Proposal 2 has concept of combining all houses with thinking of construction cost which is not bad but it might be risky in case of failing in market
- Less interest on Proposal 3 because it divides residents in two groups

REACTION FROM THE COMMUNITY

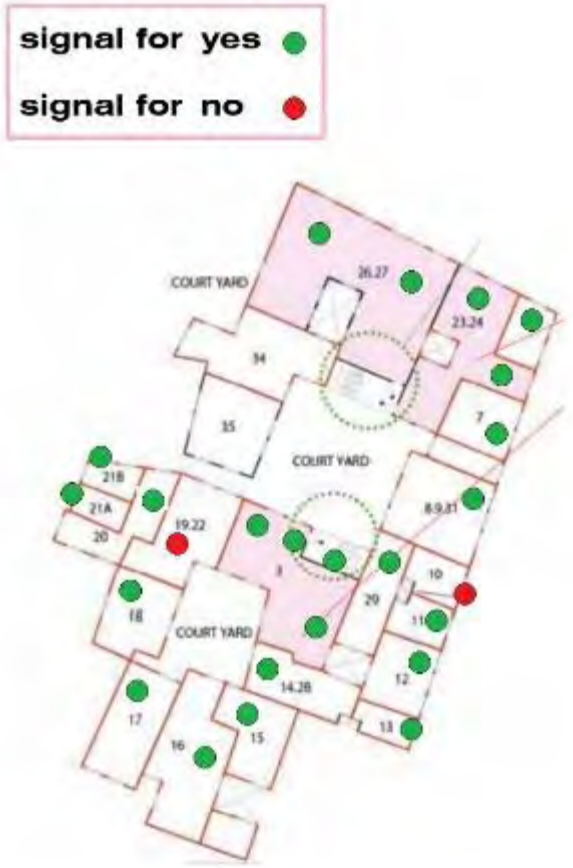
Decision from Community 2nd May 2016

Except 2 Households, all are agreed to participate in “Reconstruction with concept of Proposal 1” which includes following points

1) to combine 2-5 plots into one with sharing staircase and lobby spaces. which will solve challenge for tiny area
2) Residents right on land would be same as before

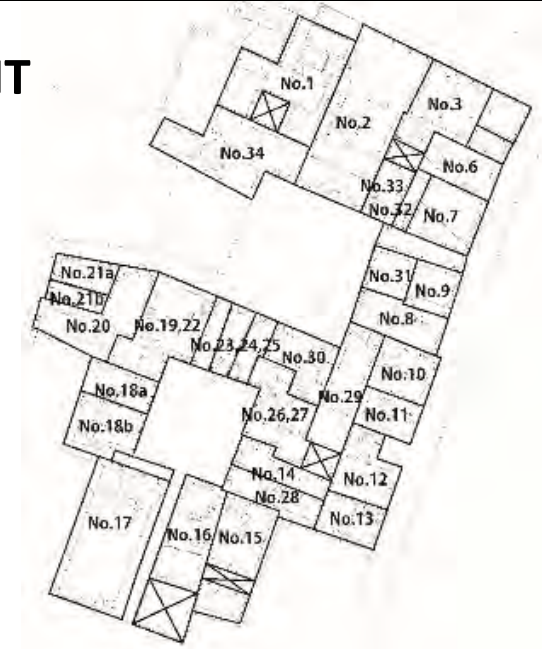
- However, residents have not decided which houses should be combined
- There also remains the same challenges of management of communal spaces and construction cost

- As a next step: Proposing 1’ plan

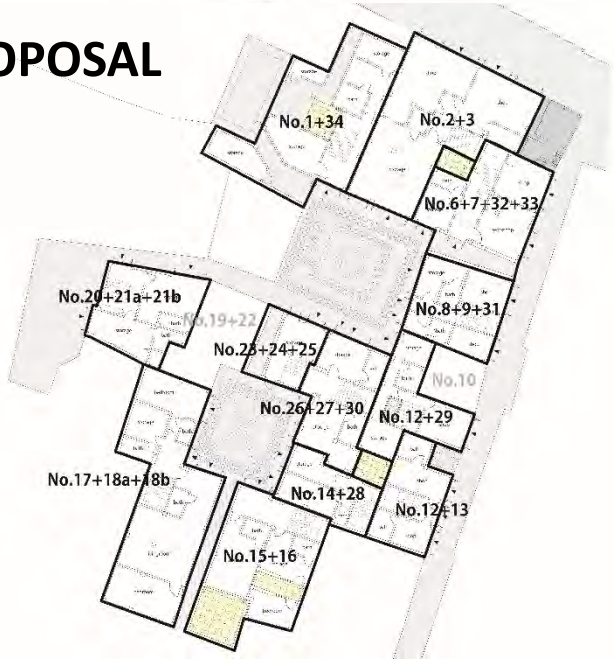


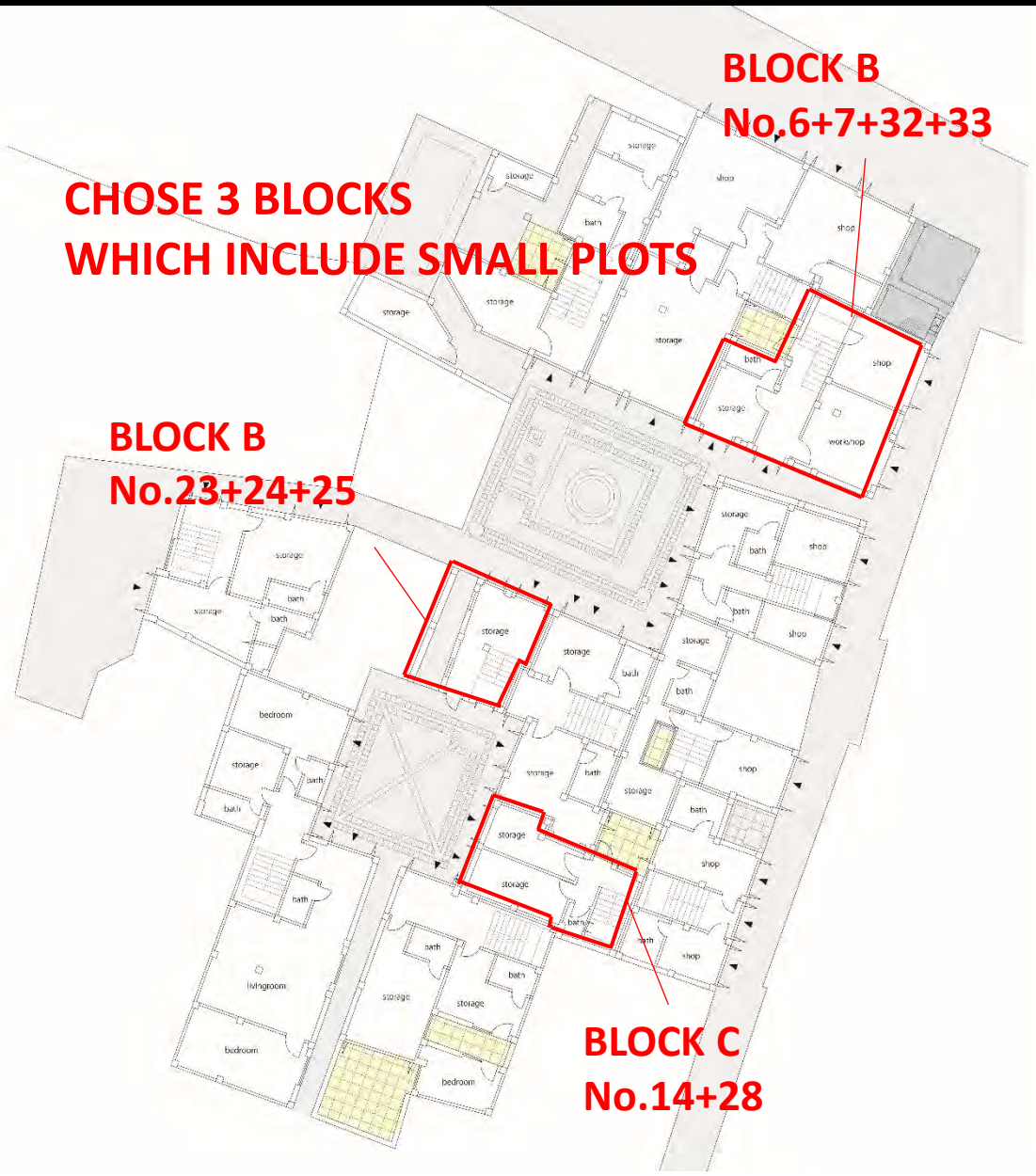
NEW PROPOSAL (Type 1')

CURRENT



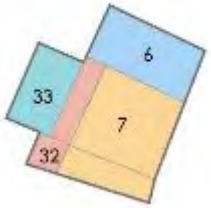
PROPOSAL





12 GROUPS WHICH COMBINE 2-4 HOUSES

NEW PROPOSAL



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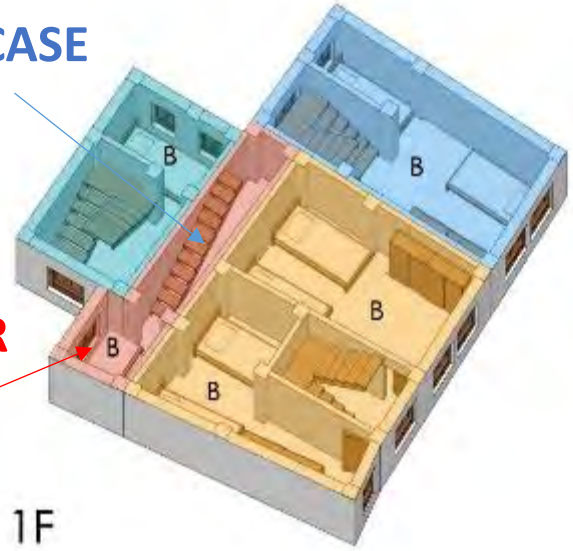
OWN STAIRCASE

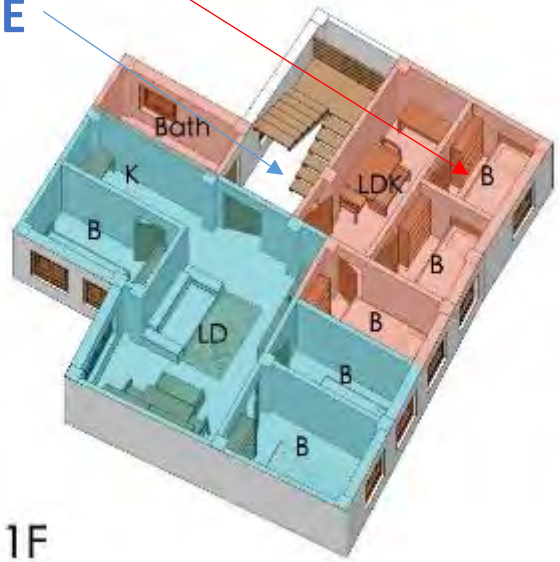
4 STOREY HOUSE WITH SMALL FLOOR AREA



INDIVIDUAL RECONSTRUCTION

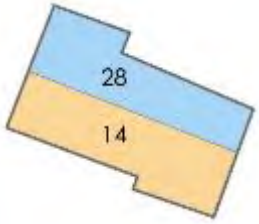
FLAT SYSTEM HOUSE WITH ENOUGH ROOM

SHARE STAIRCASE



COMBINED RECONSTRUCTION

NEW PROPOSAL



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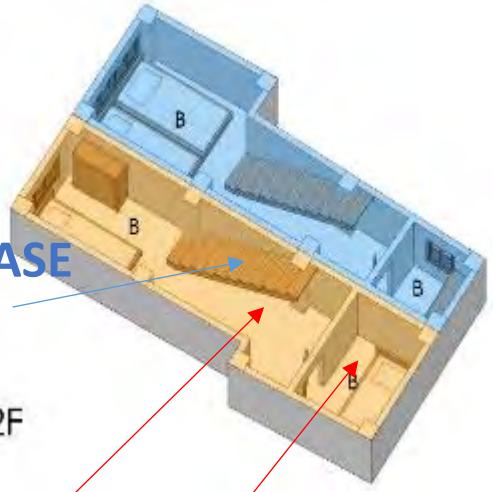
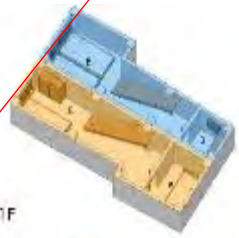
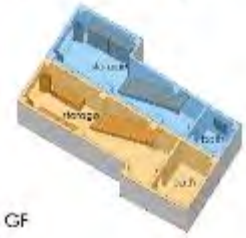


OWN STAIRCASE

4 STOREY HOUSE WITH SMALL FLOOR AREA

NO LIGHT AND VENTILATION



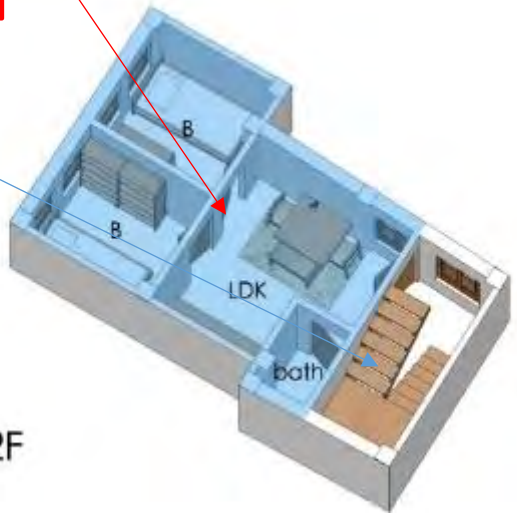


INDIVIDUAL RECONSTRUCTION

FLAT SYSTEM HOUSE WITH ENOUGH ROOM

ENOUGH LIGHT AND VENTILATION

SHARE STAIRCASE



COMBINED RECONSTRUCTION

NEW PROPOSAL : MERITS

1) FLOOR AREA INCREASE

	INDIVIDUAL								
HOUSE NO.	6		7		32		33		TOTAL
	ROOM	STAIRCASE	ROOM	STAIRCASE	ROOM	STAIRCASE	ROOM	STAIRCASE	
3F	12.4	2.8	23	3.9	4.9	1.5	12.4	3.9	64.8
2F	12.4	2.8	23	3.9	4.9	1.5	12.4	3.9	64.8
1F	12.4	2.8	23	3.9	4.9	1.5	12.4	3.9	64.8
GF	12.4	2.8	15.5	3.9	2.6	1.5	5.4	3.9	48
TOTAL	49.6	11.2	84.5	15.6	17.3	6	42.6	15.6	242.4

ROOM AREA :
INCREASE 103%～130%

	COMBINE					
HOUSE NO.	6	7	32	33	SHARE	TOTAL
	ROOM	ROOM	ROOM	ROOM	STAIRCASE	
3F	0	54.5	0	0	8	62.5
2F	38.5	16	0	0	8	62.5
1F	0	0	22.7	31.8	8	62.5
GF	12.5	15.5	0	11.7	14.4	54.1
TOTAL	51	86	22.7	43.5	38.4	241.6

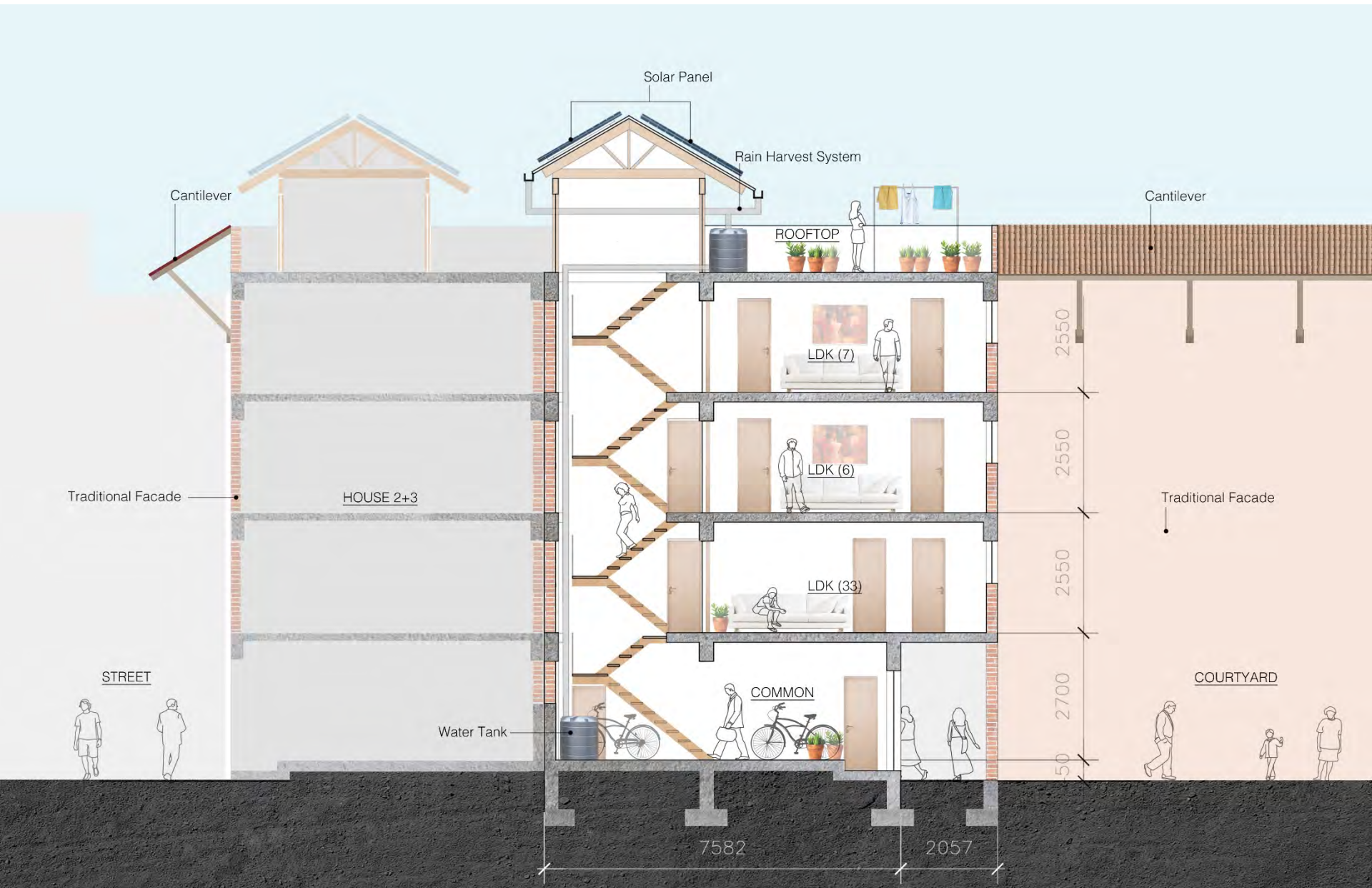
2) BUILDING CONSTRUCTION COST REDUCTION

Because of reduction of columns and walls

3) INFRASTRUCTURE COST DECREASE

Because of reduction of water pipes

NEW PROPOSAL



MODEL SECTION

NEW PROPOSAL

NEW PROPOSAL

Conclusion with Implementation Mechanisms & Ways Forward

CONCLUSION

Implementation mechanism and Proposal for effective implementation

Mid-Term Consultative Workshop on 10th Feb. 2016 outcomes

- Different options of redevelopment plans and detailing presentation.
- Social, financial, Institutional and legal issues related with reconstruction process discussed.
- Exploration of possible ways to solve the raised diverse issues and problems.

Discussed issues and roles of each sectors for implementation

Crucial Issue:

Selection of a redevelopment option that respond to the household level needs and aspirations of the earthquake affected families **through a community level collective housing plans and programs?**

CONCLUSION

Issues for architectural design in historic town

- Combining houses may be a good idea to reduce construction cost and arise individual using floor area.
- Reconstruction in smaller groups may be more affordable in terms of decision making.
- Flat system may be an option for several households living while using common staircases with privacy.

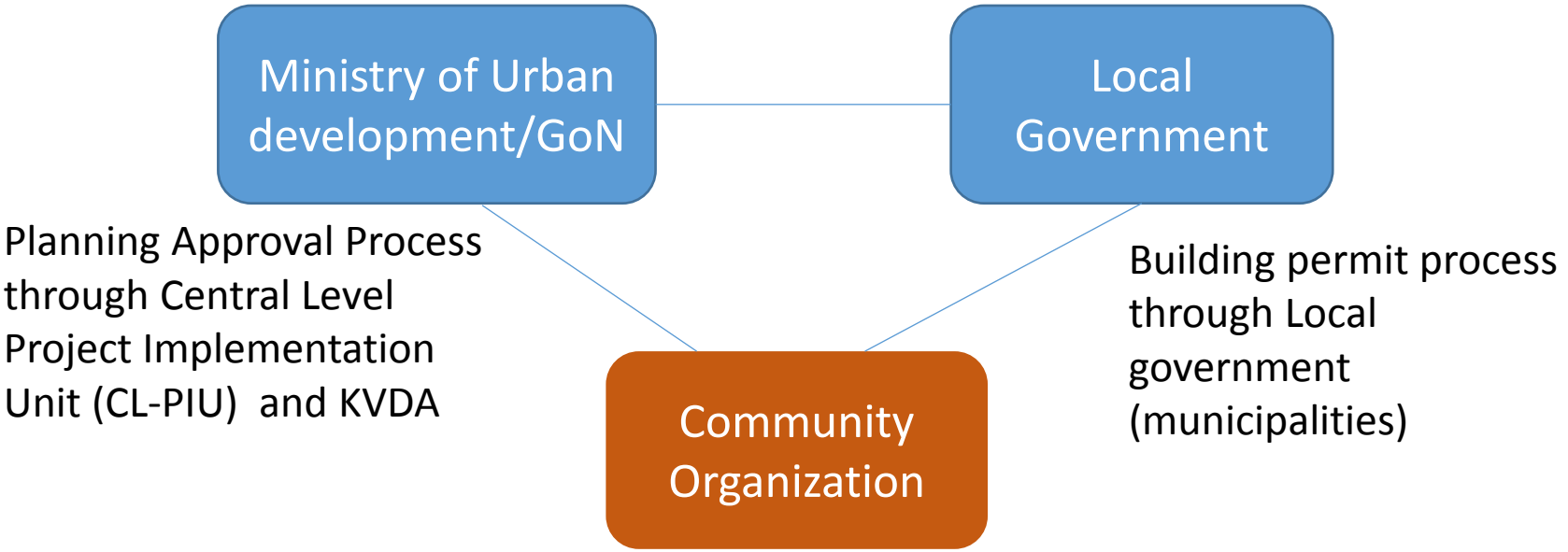
CONCLUSION

Issues for architectural design in historic town

- In the wake of exposure of the people to modern living conditions with the ever changing values, retaining the traditional architectural style of the new buildings in the historic town like Bhaktapur, is a big challenge.
- Reconciling the traditional architectural style with modern house planning could be an ideal solution.

Implementation mechanism and Proposal for effective implementation

Effective and efficient implementation mechanism



Planning Approval Process through Central Level Project Implementation Unit (CL-PIU) and KVDA

Building permit process through Local government (municipalities)

Setting up of the community organisation of the beneficiary households at the local level **(Local Residents Committee – LRC).**

Implementation mechanism and Proposal for effective implementation

Setting up the Project facilitation and Coordination Committee (PFCC)

(Government sectors with Local residence committee)

1) **Development Commissioner of Bhaktapur District, KVDA as Chairperson.**
2) **Chief Executive, Bhaktapur Municipality (or Representative)**
3) **Representative, Local Residence Committee (LRC).**
4) **Representative, National Reconstruction Authority.**
5) **Two other members from Land Administration and Survey Offices of the district.**
6) **Chief, DUDBC Bhaktapur office (District level Project Implementation Unit) as the Member Secretary**

Setting up of the Project Implementation Office (PIO) at the site consisting of the technical and administrative staff to be hired by Local Residence Committee.

-Selection of **the engineering consulting firm** to support the project design and construction supervision for the PIO with the assistance of PFCC.

Setting up of the project execution fund consisting of the government grant and loan from the banks for individual quake victim families.

-Exploiting a provision of additional grant funding **for community level** infrastructure from National Reconstruction Authority (NRA). Applicable for NRA approved housing project.

CONCLUSION

1. This pilot project with community's involvement from concept to planning and design is implementable;
2. The government agencies including Bhaktapur municipality should support this initiation;
3. DOA, infrastructure providing agencies & donors need to support the community in investing infrastructure and conservation aspects;
4. This pilot project can be replication to other HCA of the KV and peripheral satellite towns

Thank you