



Risk-resilient urban land development

Observations from land pooling projects in the Kathmandu Valley

The devastating April/May 2015 earthquakes in Nepal not only exposed the vulnerability of buildings to seismic shocks but also revealed the severe lack of open spaces for temporary shelter in the Kathmandu Valley. For many days, people took shelter in any open space, public or private, that they could find in the immediate vicinity.

Urban growth in the Valley has been mostly spontaneous and haphazard. There are some initiatives from the government and local governments to manage urban land development. Among such state interventions, land pooling has been a popular choice among policymakers although the results have been mostly mixed.

Box 1: Two massive earthquakes hit Nepal in April and May 2015

The result was huge loss of lives and properties including 9000 casualties, 22300 injuries, and over half a million collapsed houses. About 8 million people were directly affected. The Kathmandu Valley witnessed about 1700 casualties, 13000 injuries, and over 0.7 million collapsed houses. For days, people took shelter in open spaces.



From the perspective of risk resilience, existing land pooling projects in the Kathmandu Valley leave much to be desired. For instance, land pooling projects are expected to facilitate risk-resilient land use planning and zoning including provision for open space.

This Policy Brief documents the planning gaps in the existing land pooling initiatives in the Valley from the perspectives of risk resilience, and derives policy lessons for similar future projects.

Ten Policy Recommendations

1. Perform land suitability analysis before selecting a site for land pooling, considering liquefaction potential, earthquake fault lines, sensitivity to floods, slope, and geological conditions, among others.
2. Formulate land pooling project such that it forms a part of the neighborhood and not end up as a distinct residential island (Measures for integration include provision of open space area in proportion to the level of residential development in the vicinity).
3. Analyze development potential of a site before deciding to launch land pooling scheme.
4. Plan land pooling site such that it can facilitate temporary shelter during emergencies (A catchment area of 1 km could be used for this purpose).
5. Plan location of open spaces within a land pooling site so as to ensure proper accessibility from all directions (In case of multiple open spaces within a land pooling site, link them through green corridors).
6. Adopt land pooling as a part of a holistic city

plan.

7. Opt for large-scale land pooling project for new towns or urban expansion to utilize economies of scale.

8. Design and implement small-scale, customized land pooling projects in haphazardly developing new urban areas to correct road alignments and plot shapes and sizes.

9. Develop public-private partnership model for land pooling given scale of private-sector involvement in the urban land market.

10. Review risk-sensitivity status in the existing land pooling areas, and implement corrective measures as required.

Key observations follow based on the study of ongoing and accomplished land pooling projects in the Kathmandu Valley to promote risk-resilient urban land management and support the policy recommendations.

Box2: List of land pooling projects in the Kathmandu Valley

Completed projects:

1. Dally(396 ropani)
2. Naya Bazaar (840 ropani)
3. Gongabu (282 ropani)
4. ChabahilGopikrishna (200 ropani)
5. Sinamangal (901 ropani)
6. Kamalbinayak (145 ropani)
7. Liwali (670 ropani)
8. Lubhu (269 ropani)
9. SanibuBhinsepati (552 ropani)
10. BagmatiPhant (197 ropani)

On-going projects:

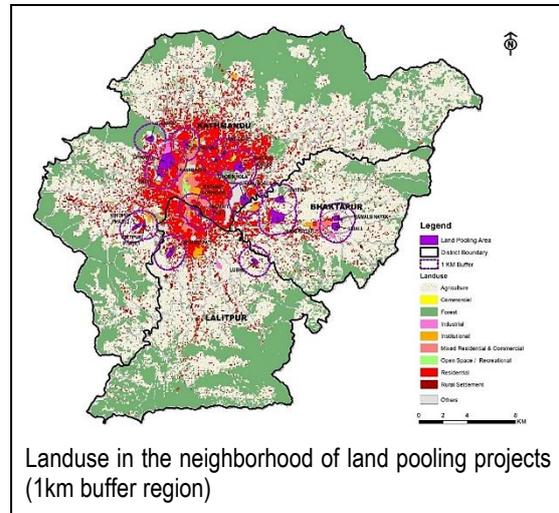
11. Sintitar (525ropani)
12. Kirtipur(107ropani)
13. Kamero Tar (1,600ropani)
14. Bagamati Nagar (1,246ropani)
15. Kamerotar (1,486ropani)
16. Chamati (1,440ropani)
17. ManoharaPhant(1,774ropani)
18. TumuchoDugureChokha (600ropani)

Note: 1 ropani = 508.72 sq. m (0.05 ha)

Observation #1: Land pooling project areas are not integrated with the surrounding development

Most of the land pooling sites are located in mixed-use residential areas. Some of

these areas might not have developed to the present density-level when land pooling projects were first launched. There are land pooling areas located away from the city center with mostly agricultural land use in the surrounding area.



Land pooling is not a magic wand; it cannot solve all urban land management issues. In fact, if not planned properly, land pooling may lead to unintended results. For instance, a land pooling in the urban fringe area with low density exemplifies urban sprawl.

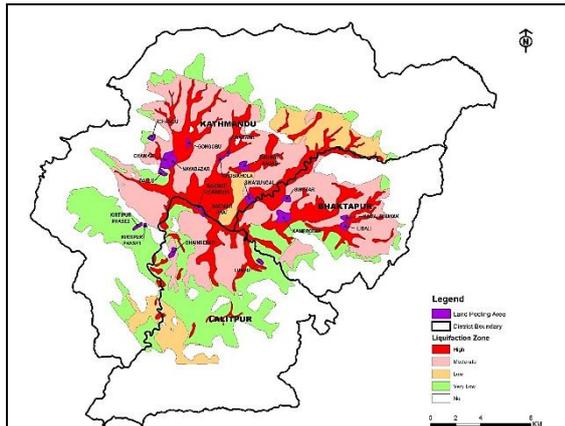
It is, therefore, necessary to understand and acknowledge the limitations of land pooling as a planning tool. Land pooling schemes should be designed such that they are integrated with the neighboring land use plan, and form a part of a holistic city level plan.

Observation #2: Many land pooling sites are located in risk-sensitive areas

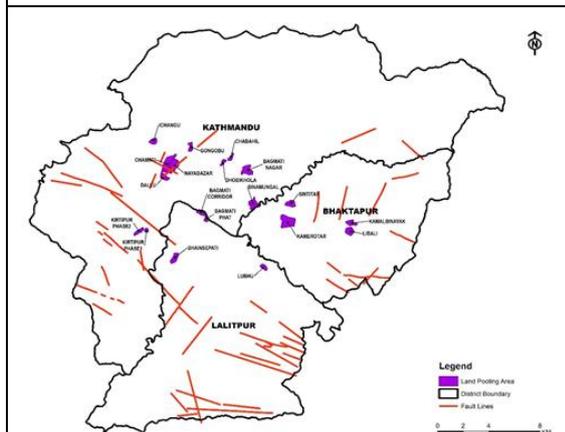
Almost all land pooling areas partly or wholly lie in liquefaction potential zone. From the perspective of liquefaction potential, Nayabazar land pooling site is most sensitive. Bagmati Nagar, Sintitar, Chamati and Kamerotar have considerable area in high liquefaction zone.

Likewise, three land pooling sites (Chamati, Dally, and Nayabazaar) are directly located on earthquake fault lines,

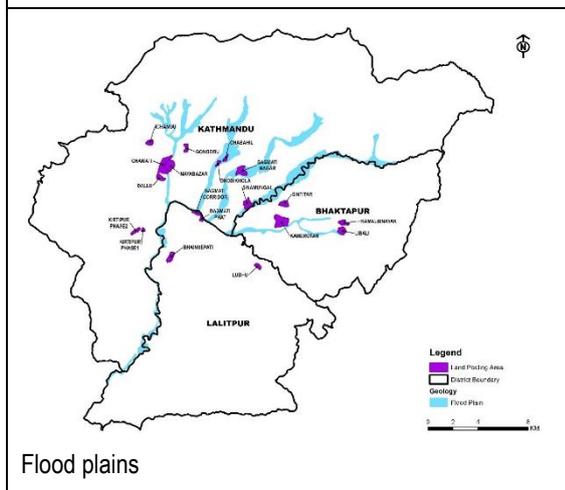
making them vulnerable in case of strong earthquakes.



Liquefaction potential areas



Fault lines



Flood plains

Safety of land pooling sites from the perspective of flood risks has also been overlooked in many cases. In particular, threesites – Bagmati Nagar, Chabahil and Dhobikhola – totally lie on flood plain.

Given that the land pooling projects are implemented by government or local

governments, it is natural to expect site selection based on careful analysis of underlying risks such as those related to earthquake vulnerability (e.g., liquefaction, and location on fault lines) and floods, among others. But observations show that most of the existing land pooling areas do not meet such expectation. This should be an eye-opener for future initiatives.

Observation #3: Provision of open space is aimed at meeting minimum criteria but still largely fails

The World Health Organization (WHO) recommends a minimum of 9 sq.m of open space per person. Nepal's Planning Norms and Standards, 2013, requires a minimum of 5% land allocated for open space in a land pooling area.

Assuming one household per plot and an average household size (4.0 to 4.6) as per census data of corresponding location (CBS, 2011), the requirement of open space versus the actual provision was compared.

Open space requiremnt analysis

Land Pooling Project	Area (ha)	Allocated open space (ha)	Allocated open space (%)	Estimated population	Allocated open space per person (sq.m)
Dallu	20	1.40	7.0	4,480	3.13
Naya Bazaar	43	1.72	4.0	9,280	1.85
Gongabu	14	0.73	5.2	2,800	2.60
Chabahil	10	0.38	3.8	1,036	3.67
Gopikrishna					
Sinamangal	46	2.44	5.3	7,880	3.09
Sintitar	27	0.92	3.4	6,482	1.42
Kamalbinayak	7	0.29	4.2	1,852	1.59
Liwali	34	0.95	2.8	8,334	1.14
Lubhu	14	0.62	4.4	2,909	2.12
Sainbu	28	3.61	12.9	2,468	14.63
Bhainsepati					
Bagmati Phant	10	0.32	3.2	2,262	1.41

ha - hectare

Results show that out of 11 land pooling areas reviewed for this purpose, only four sites satisfy the minimum criteria of 5% set by Planning Norms and Standards, 2013.

In terms of the WHO recommendation, only one site, Sainbu, meets the criteria.

Observation #4: Accessibility to open spaces within a land pooling area cannot be overlooked

Many land pooling sites have not only inadequate open space but also poorly placed ones. Two sites, Sinamangal and Gongabu, are compared.

In Singamangal land pooling site, 39% of the area is within 100m and 51% between 100 – 200m from open space. Only 10% of the area is beyond 200m. In Gongabu landpooling site, open space serves only the central part. About 30% of the area is within 100m, 36% is between 100 and 200 m and 34% is beyond 200m from the open space. This shows poor open space accessibility in Gongabuas compared to Singamangal.

Box 3: Agencies that need to take the lead to promote risk-resilient urban land management

MoUD: Ministry of Urban Development

MoFALD: Ministry of Federal Affairs and Local Development.

MoLRM: Ministry of Land Reform and Management

Local units (Municipalities and *Gaunpalika*)

KVDA: Kathmandu Valley Development Authority

DUDBC: Department of Urban Development and Building Construction

DMG: Department of Mines and Geology

Conclusions

As a planning tool, land pooling has its limitations. But its merits are also numerous. However, land pooling projects implemented in the Kathmandu Valley have left much to be desired from the perspective of risk-resilience. There are weaknesses in terms of site selection and in the provision of open spaces. For an earthquake-prone urban region like Kathmandu Valley, the importance of these concerns cannot be overstated.

The scale of land pooling projects implemented in the Kathmandu Valley or in Nepal is relatively small. The scale is expected to grow in future. Lessons learnt from the past and existing land pooling projects can lead future endeavors along the path of risk-resilience.

Further Reading including References:

South Asia Urban Knowledge Hub Nepal (2017). **Land Pooling Projects in Nepal: A Consolidated Documentation.** Kathmandu: Institute of Engineering.

South Asia Urban Knowledge Hub Nepal (2017). **Improved Land Readjustment Process and Implementing Mechanism.** Kathmandu: Institute of Engineering.

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