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Case Study:

Land Pooling Projects in Nepal: A Consolidated Documentation

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ACRONYMS

Asian Development Bank	ADB
Central Bureau of Statistics	CBS
Delhi Development Authority	DDA
Department of Urban Development and Building Construction	DUDBC
Floor area ratio	FAR
Knowledge Hub	K-Hub
Kathmandu Valley Town Development Committee	KVTDC
Land Pooling	LP
Land Pooling/Readjustment	LP/R
Land Pooling Projects/Programs	LPP
Land Management Steering Committee	LSMC
Project Coordination Office	PCO
Town Development Committee	TDC
Town Development Committee Act	TDCA
Users Committee	UC
Village Development Committee	VDC

Chapter 1. INTRODUCTION

1.1 Background

The April/May 2015 Earthquakes in Nepal¹ caused huge loss of lives and properties in the country – about 9,000 casualties; 22,300 injuries, 8 million directly affected people (1/3rd of the national population), over half a million collapsed houses, and a drop by over 1.5 percentage points in gross domestic product (NPC, 2015). The most affected regions were rural areas located outside the Kathmandu Valley. However, the latter also witnessed about 1700 casualties, 13,000 injuries, and 724,000 collapsed houses.² In light of the recent disasters, the Urban Knowledge Hub (K-Hub) initiative in Nepal is supporting the Government of Nepal's plans and strategies towards risk-resilient urban development.

Urban resilience is a city's ability to withstand and recover from unexpected shocks associated with natural hazards (ADB, 2013). Densely populated urban core areas are understandably at greater risks to hazards such as earthquakes and fire. However, even the newly developed urban areas are falling prey to disorganized spatial pattern because of the fragmentation of land parcels into irregular shapes and sizes. As a result, efficiency in terms of mobility is being compromised. Functional open spaces are becoming rarer with each new building constructed with little or no harmony with the existing buildings or infrastructure in the neighborhood. To correct this, the National Urban Development Strategy 2015 (draft) has aimed to get half of the new residential area developed through land readjustment (land pooling) process by 2031. Land readjustment is a land assembly process that is used for developing and redeveloping real estate. The process is also known as land pooling or land consolidation.

In Nepal, the concept of land readjustment (better known as land pooling in Nepal) was first adopted to build a road in Bokhara in 1976 A.D. After this experience, land pooling was implemented in Kathmandu to develop a residential area in the then urban periphery. Some provision of land pooling was added in the Town Development Act, 1988. In late 1980s, JICA supported Housing and Urban Development Department (now Department of Urban Development and Building Construction) with two volunteers and provided short-term trainings for a dozen of engineers on land readjustment. This helped to implement Land pooling more systematically in an expanded way. In December 2003, the Department published a manual on land pooling.³

Risk-resilient urban land development through land readjustment (commonly known as land pooling)⁴ is the focus of the K-Hub second objective (Objective 2) and the associated knowledge product (KP) defined as follows: ***Promote risk-resilient urban land development by engaging decision makers with recommendations based on critical review of existing land readjustment practices.***

Several land pooling projects have been completed or are underway in and outside the Kathmandu Valley. The project details, however, are not readily available. To fill the

¹The April/May 2015 Earthquakes refers collectively to the 7.8 M_W Gorkha Earthquake of April 25, 2015 and 7.3 M_W earthquake of May 12, 2015.

² Preliminary report prepared by the Ministry of Home Affairs (MOHA), available at <http://drportal.gov.np/uploads/document/175.pdf>.

³ Sangachhen et al. (2003).

⁴ In this document, "land readjustment" and "land pooling" are used interchangeably.

information gap, this Case Study presents a consolidated documentation of completed and on-going land pooling projects in Nepal with the expectation that such information would be useful for urban policymakers and planners to take informed decision for planning better land pooling projects. This Case Study serves as a background material for the associated KP which will analyze location, design, and accessibility of the land pooling projects, among others, from the perspective of risk-resilience.

1.2 Brief History of Land Readjustment

Land readjustment was first conceived in 1791 when George Washington (a former land speculator) and his associates used it to finance and build the new capital in Washington, DC. In the process of land pooling, farm owners transferred their land titles to Washington in trust. He planned the city, outlining street layout, public sites, and private urban lots, among others. Federal government paid landowners for sites of public buildings. Half of the remaining lots were returned to original owners; half were retained by the federal government.

The legislative origins of land readjustment were established in 1902 by Franz Adickes, mayor of Frankfurt-am-Main, Germany with the goal of improving the efficiency of farmland. Historically it had been used as a means to capture land value increments to cover urban development costs and adjust outmoded property boundaries.

The first major urban uses of land readjustment were done in Japan after the Great Kanto Earthquake of 1923. A modified form of land readjustment was used to rebuild large areas of downtown Tokyo and Yokohama. Again, in the aftermath of World War Two, land readjustment projects were extensively used in the post-war urban reconstruction projects. The method has been widely used and in an extraordinary variety of circumstances: for urban expansion into agricultural areas primarily, and also for downtown redevelopment, new town building, public housing projects, and railway and mass transit development, among others (Nishiyama, 1986 cited in Sorenson, 2000).

Besides Germany and Japan, land readjustment is practiced in many other countries and territories of the world including France, Finland, the Netherlands, Sweden, India, Indonesia, Israel, Palestine, Nepal, Bhutan, Taiwan, and Thailand to name a few. It has been recognized as an effective tool to facilitate land acquisition for urban development, promote housing development, and avoid gentrification.

1.3 Land Pooling Process

The land pooling scheme is regarded as one of the best land development techniques for planned provision of urban infrastructure and supply of urban land without external investment. The landpooling process consists of acquiring large number of small land parcels belonging to many land owners; consolidating the parcels into a single large plot; planning and providing all necessary infrastructure (such as road, water supply, drainage, electricity and telephone, open spaces, community service area); re-plotting the parcels; and giving back to the owners as per agreed terms of land contribution. The cost of planning and providing infrastructure is covered from the land itself, which is partly contributed by each landowner. The owners get back about 12-30% smaller piece of land but with all necessary infrastructure including parks and open spaces. Moreover, the original irregular shapes of plots are converted into regular geometric shapes. Thus, land-pooling can be defined as a land management technique for carrying out unified design, servicing and sub-division of a group of separate land parcels for planned urban development with the sharing of the project costs and benefits between the land owners and recovery of the project costs by the sale of some of the developed plots. A typical flow-chart of the land pooling process is given in Figure

1.

The concept of land pooling can, therefore, be explained with the help of two key words – 'unification' and 'partnership'. Unification implies consolidation of separate land parcels, the unified design, infrastructure provision and subdivision of these parcels and a unified preparation and implementation of the scheme under a single management. 'Partnership' indicates the partnership between government, private and community for urban land development.

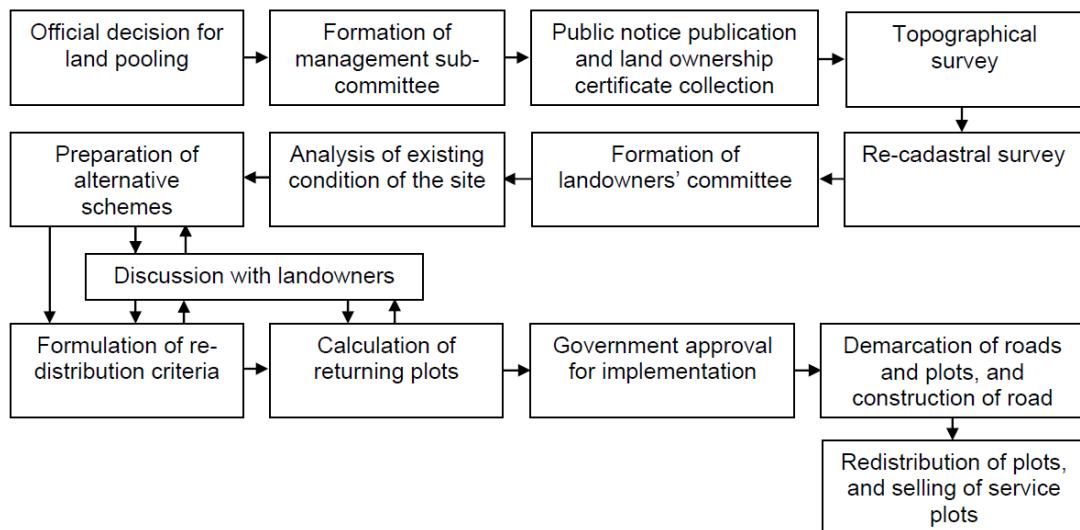


Figure 1: Flow Chart of Land Pooling Procedure

(Source: After Joshi, 1997)

In short, a land pooling project is characterized by the following features:

- Self-financing mode
- Fair and transparent procedure
- Participatory approach
- Open space and community space
- Effective use of land parcels
- No displacement of land owners
- Parallel provision of infrastructure

1.4 Advantages of Land Pooling

In most developing countries, urban development occurs as the gradual conversion of agricultural land to urban uses. As much of the land is privately owned, the process of urban development is difficult. Land pooling helps alleviate common problems associated with spontaneous growth including:

- Improvised construction, often along existing roads, leading to urban congestion.
- Incremental construction, as people build gradually according to their available resources,
- Narrow, winding roads that follow the pattern of field boundaries
- Absence of proper drainage
- Incomplete or poorly designed infrastructure

- Insufficient open space and absence of public facilities
- Creation of land locked areas that remain undeveloped due to lack of access
- Conflicting uses, in close proximity to one another
- Eventual over-development of the area due to absence of building and planning bye-laws.

Land pooling technique makes it possible to provide service even in the difficult and dispersed areas. However, it is important to note that land pooling is a tool that should be implemented consistent with the city plan and to achieve city's strategic development objectives. That means land pooling should not be promoted everywhere including urban fringe. In fact, urban sprawl can take a form of planned setting as much as it may take a form of unplanned spontaneous setting. With this consideration in mind, carefully designed land pooling can help:

- To increase supply of urban land for the development in systematic way.
- To improve urban environment by (a) conserving environmental resources, (b) minimizing resource use in the provisions of infrastructure and services and (c) controlling and designing the living environment within the project area.
- To increase the access of people (including the poor) to land for housing ensuring social justice and equity
- To capture the unearned income by different level of government and use the income for social and economic project
- To better cope with urbanization

In financial term, the land pooling projects are feasible, with the provision of adequate open space, good circulation and community facilities and with plots of different sizes to cater to different income group. There is high level of participation of the beneficiaries in decision-making. LR has several advantages including road access, cost recovery, and partnership building. The main advantage of this technique is that the designated area becomes well laid out, easily serviced and ready for urban use. The cost of infrastructure is borne by selling some of the plots and without external funds. Enforcement of land use and building bye-laws is also relatively easier in a land pooling site.

1.5 Steps of Land Pooling Process in Nepal⁵

1.5.1 Preliminary Assessment

Land in the following types of areas are considered for land pooling:

- Areas with urban expansion
- Areas designated for settlement development by physical development plan
- Areas deprived of development due to the lack of physical infrastructures like road, drainage etc.
- Areas where land owners and tenants can be identified
- Areas with high possibility of community partnership and engagement.

1.5.2 Feasibility Study

Feasibility study is carried out for the areas approved in the preliminary assessment stage, and includes the following steps:

1. Identify private and public lands in the planning area by collecting cadastral maps
2. Draw preliminary sketch of physical infrastructure development in the cadastral map

⁵ Based on DUDBC (2072 BS).

3. Specify areas required for roads, drainage and open spaces as per the preliminary maps(Usually 15 to 25% of land is necessary for providing roads to all the plots and 5% of land should be allocated for the open spaces)
4. Prepare preliminary cost estimate for road, surface drains and open spaces
5. Estimate the project management cost which will be around 10% of the development cost
6. Estimate the cost per developed plot after the completion of the project through the analysis of the land prices of the plots before and after the project
7. Calculate the area of developed land necessary to cover the total cost of the project (Usually in the urban areas, 7 to 10% of the developed land should be allocated for this purpose)
8. Specify the percentage of land necessary to be allocated for project implementation after allocating the land required for the cost of development of road, drainage and open spaces (usually 25 to 35% of land is required for the implementation of the project)
9. Calculate the land contribution to be done by land owners and tenants by deducting the area of public lands in the total land area required for the project
10. Estimate the area of developed plots to be returned by deducting the land to be contributed by the land owners
11. Calculate the cost per plot after the completion of the project
12. Calculate the cost of developed plot to be returned by deducting the land to be contributed in the existing plot and multiplying it by the cost of developed plot after the project completion
13. Compare the current cost of land with the cost of developed land returned (If the cost of returned developed land is higher than the current cost of land, then only it will be easier to convince the land owners and conduct the project).

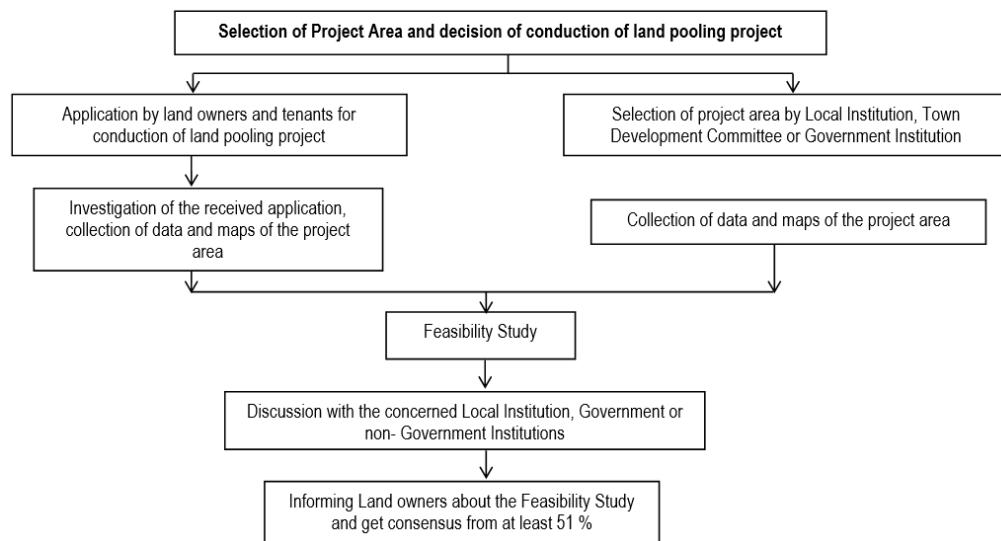
1.5.3 Preliminary Plan Preparation and Implementation

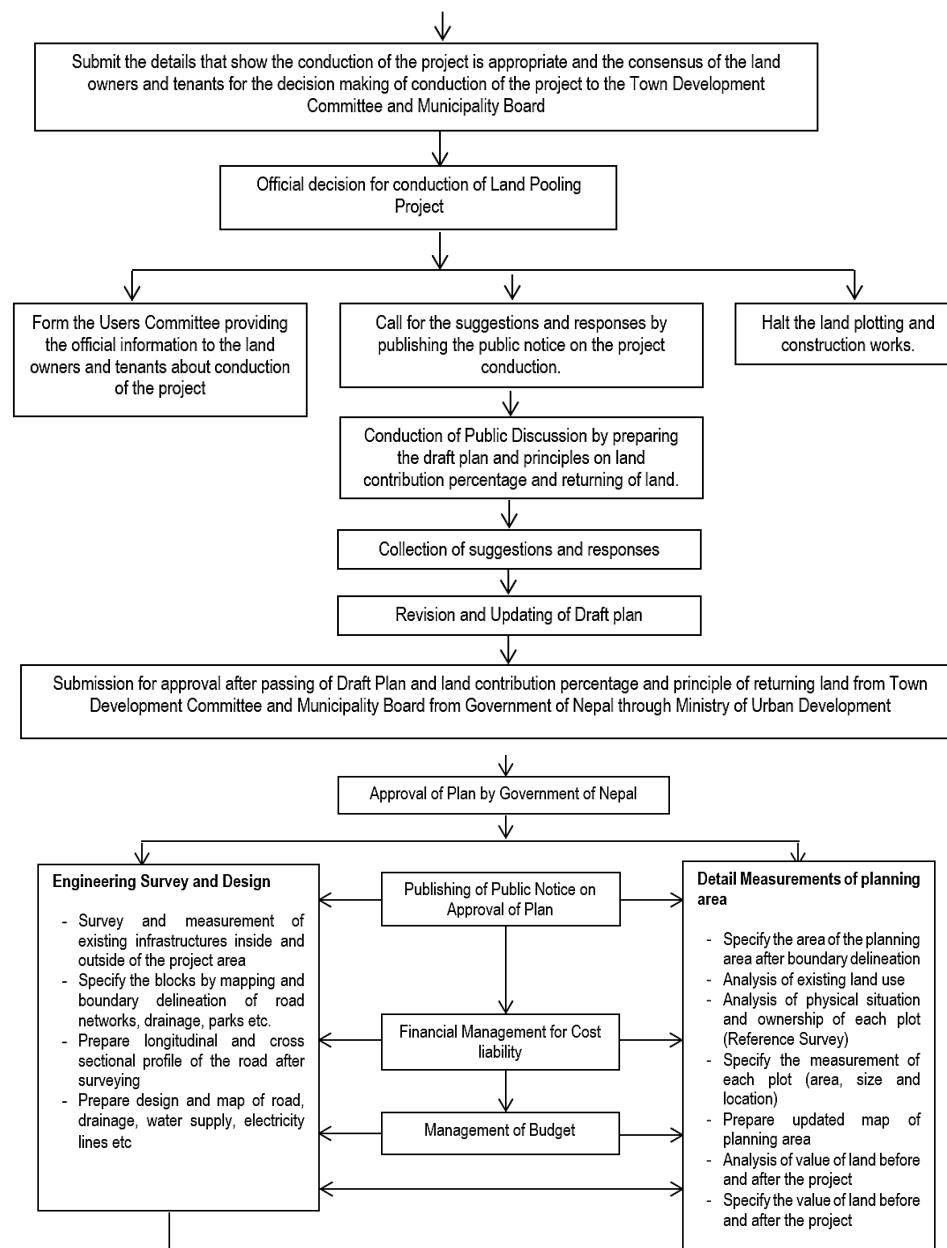
Preparation and decision of land pooling project is done through following processes:

1. Town Development Committee or Municipality decides to conduct land pooling project by specifying the four corners of the probable project area. Comments, suggestions and responses on conduction of the project are collected by publishing public notice.
2. After official publication of the notice about conduction of the project, land owners and tenants are called in a meeting, and a user's committee is formed comprising of 7 to 15 members by selecting the representatives among the land owners and tenants under the chairmanship of the ward secretary. The so formed users committee prepares projects, assists by making necessary participations for implementation, works as a mediator for interaction between project teams and land owners, and contributes to the completion of the plans within the specified time. The committee also selects representatives from the users group in the project management subcommittee.
3. The general public is informed about the decision of halting the plotting and construction works within the project area under Town Development Act, 2045 public notice. Respective local institutions, Land Revenue Department and Survey Department are requested to implement the decision.
4. Draft plan of land pooling is prepared in the base map prepared by joining the updated cadastral maps. It addresses the contributions by land owners and the policies for returning the land.
5. Comments, suggestions and responses are collected by presenting the draft plans to the officials of the users committee and other stakeholders.

6. The draft plan is revised after studying and analyzing the comments and responses from the stakeholders.
7. The updated draft report is submitted for approval to the Government of Nepal through Ministry of Urban Development after it has been passed by Town Development Committee or Municipality Board.
8. General public is informed about the approval of the plan by publishing a public notice.
9. The necessary budget for preparing the work plans and engineering design of physical infrastructure implementing the plan is managed.
10. Design maps are prepared for the roads, sewer lines, water supply and electricity lines of the project area by performing detail engineering survey and design.
11. Existing land use, physical situation of each plots and ownership details are prepared along with engineering survey and design through detail measurements and survey of the project area. The area of each plot, shape location and available facilities are identified. Updated cadastral maps are prepared.
12. Specification, cost estimate and tender document are prepared for the construction works. Bids are called, and a contractor is selected. Construction work is then started.
13. The value of land prior to the project and value of land after completion of the project is determined as per the available urban facilities and location. Policy for returning the developable lands is prepared by determining the percentage of land to be contributed by each landowner through analysis of value of land based upon the position of land before and after the project.
14. Presentations are given to the stakeholders, landowners, tenants and users group on land area required for contribution. The percentage of land to be deducted from the land owners' existing land area is determined by analyzing the comments and suggestions from the land owners, tenants and users committee.
15. A long sheet table which includes calculation of the percentage of land to be deducted from each plot for the development of road, drainage, open spaces etc. and location of returnable plot and area is prepared. Preliminary land readjustment map is prepared based on the long sheet.
16. The preliminary land readjustment map is presented in front of the land owners, tenants and users committee. Comments and suggestions are collected based on which land readjustment plan is finalized and submitted to the Town Development Committee for approval.
17. After the land readjustment plan is approved by the Town Development Committee or Municipal Board, land is leveled and plotted. Preparation is done for returning the land. Land is returned by providing temporary land ownership certificate to the respective land owners.
18. The reserved service plot is sold through auction along with the returning of land to the land owners.
19. The approved land readjustment plan consists of new cadastral plot numbers. Field book, plot register, and record book are prepared accordingly with the assistance of District Survey Branch Office and Land Revenue office. Then the permanent land ownership certificate is distributed to the holders of temporary land ownership and auction winners.
20. The land owners with plot area lesser than the minimum lot size of the project area is charged for the additional area of land to maintain the minimum lot size requirements. The land owner who will be short of land after the land readjustment project is paid for the inadequate land as compensation.
21. The fund collected by selling the reserved plot and the fund from additional plot is utilized for the payment of loans taken for initial budget management.
22. Almost all of the land owners will have been distributed the permanent land owner certificate by the time the construction of all the roads, drainage, and open spaces

- are completed. The administrative management is carried out to return the land to the land owners by that time and the announcement is made for the completion of the project. Also, authority is handed over to the local institution or the users committee or the institution responsible for the management of infrastructure for the proper utilization, preservation and maintenance of the project achievements.
23. Department of Urban Development and Building Construction (DUDBC) and or Division office of DUDBC monitors and evaluates the project after the completed project has been handed over. It is expected that the monitoring and evaluation of the project will identify the shortcomings and positive aspects of the project which will be beneficial to conduct other new land pooling projects more effectively.





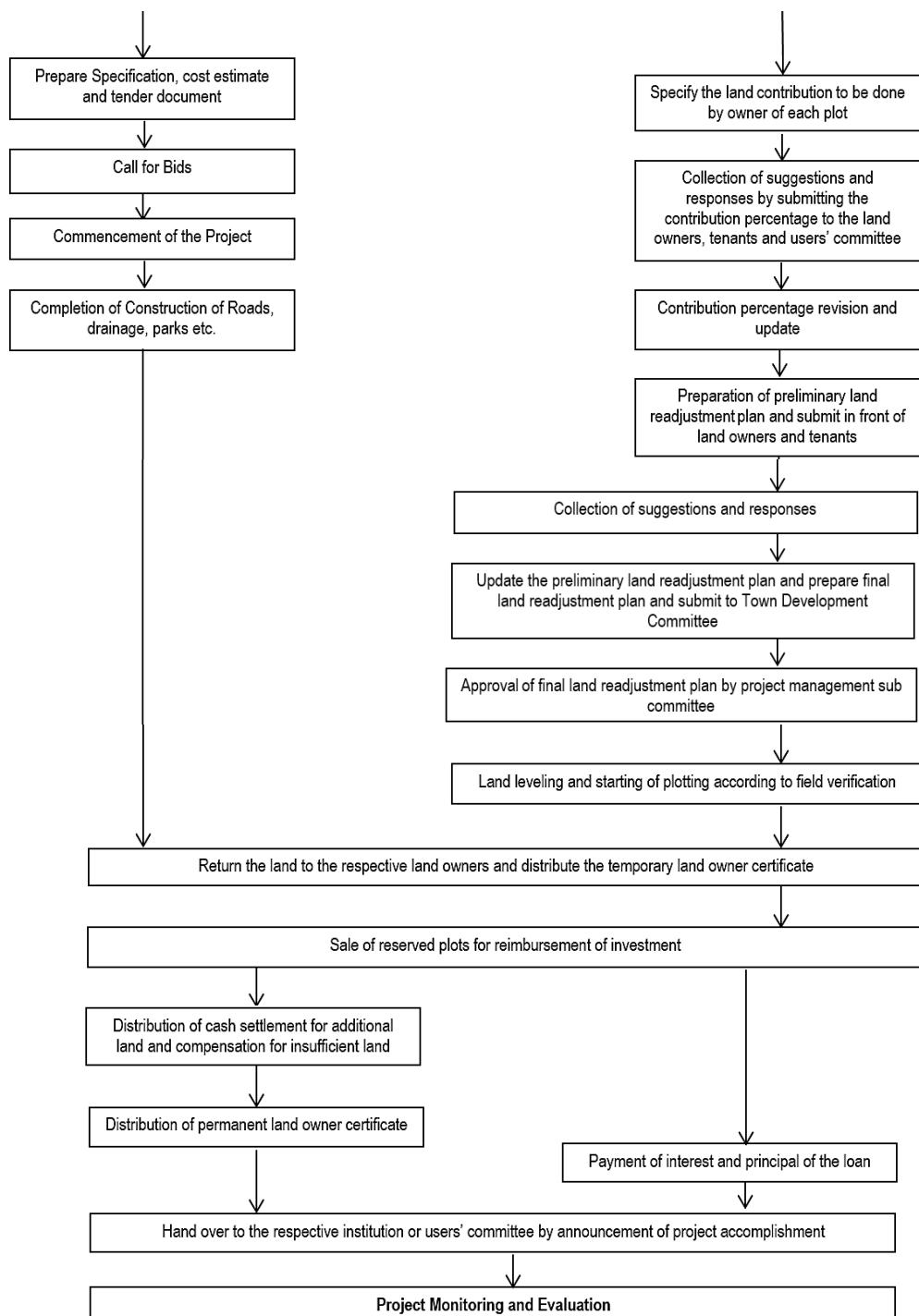


Figure 2: Land pooling plan preparation and implementation process

(Source: DUDBC, 2072 BS)

1.5.4 Formation of Administrative Management Sub-Committee

The Project Management Sub-Committees formed under the chairmanship of chief of local institution as per Town Development Committee 2045 BS, section 7, and includes participation of local administrative body, land administration, division offices under DUDBC/Ministry of Urban Development, institutions involved in providing urban services, local land owners and tenants and along with the chairmanship of mayor in case of Municipality and chief of district development committee (DDC) in the case of village development committee (VDC). Note that with the recent restructuring of the country, DDC has been replaced by District Coordination Council and instead of VDCs, Gaunpalika have come into existence.

The Project Management Sub-Committee forms the working team with the project chief and other manpower as per the work load. The budget necessary for the plan preparation before the formation of working team should be managed through the own source of Town Development Committee or Municipality. The budget should be managed by the loan assistance from Town Development Fund or other financial Institutions if could not be managed by the own source.

Chapter 2. LAND POLING IN GLOBAL CONTEXT

2.1 Land Readjustment in Japan

Land readjustment started from mid of 19th century for the purpose of redistribution of farm land, and initially followed a German model (Ishida, 1986; Ishida and Hatano, 1987 cited in Sorensen, 2000). In the early stages, only individuals were legally authorized to start projects. However, after the Great Kanto Earthquake of 1923, a modified form of land readjustment was used to rebuild large areas of downtown Tokyo and Yokohama. A special government agency was set up to carry out



these works. During the 1930s, land readjustment was widely used by the central government to establish military facilities (Ishida, 1987 cited in Sorensen, 2000). Again, in the aftermath of World War Two, land readjustment projects were extensively used in the post-war urban reconstruction projects.

Land readjustment in Japan is carried out by forming Association. An Association is a corporation including all owners and lessees of land in the project area. Agreement of at least two thirds of all owners and lessees of land (with two thirds of the land) is necessary before the Association can be incorporated. The goal of organizers is 100% consent, although projects are commonly started after 80% agreement is achieved. Because it is possible legally to carry out an Association LR project over the objections of up to one third of the landowners in the project area, various legal safeguards are built into the process. To establish the Association, seven or more individuals must prepare the project program and articles of association. The project program will generally include a plan of the project area indicating road layout, public facilities etc., and a rough schedule. When consent of two thirds of the landowners in the project area is secured they can apply for the approval of the prefectural governor. The governor is responsible for exhibiting the program publicly for two weeks. People affected by the project can submit written complaints within two weeks of the public exhibition. After review the governor can either order changes to the program to satisfy the complaints or allow the program to proceed as is. In either case the complainants are informed. Approval is then given and the Association is legally established (Miyazawa, 1982 cited in Sorenson, 1999).

In Japan, the demands of project initiation and management have been a severe constraint on the ability of local government planning departments to carry out planned projects. Japanese land readjustment is often described as a consensual, bottom-up style of planning and city building, and emphasis on the co-operative and consensual aspect of land readjustment projects is quite pervasive in Japan. In Japan, the main reason for the widespread use of land readjustment is the fact that in urban fringe areas most farmland is extremely fragmented into small, irregularly shaped plots, and it is almost impossible for a prospective developer to assemble such farm plots into larger blocks for development (Miyazawa, 1982). Japan's extremely high land prices, has meant that government has found it difficult and expensive to build space intensive public goods such as roads and parks. Planned networks of expressways and arterial roads are far from complete, and in suburban

areas sewers, parks and improved local roads are primarily found in land readjustment areas. Land readjustment is thus widely and justifiably considered to have been an essential planning tool in Japan.

2.2 Land Readjustment in Germany

In Germany land readjustment has a very long tradition and really many projects have been completed with thousands of hectares of new building land for residential, commercial, and industrial and other use as well as public infrastructure (see Müller-Jökel, n.d.). With land readjustment implementations in redevelopment areas lots of urban deficits have been alleviated by an increase of living standard, of infrastructure and the improvement of the traffic situation.

The competence to decide on a land readjustment project (project-area, redistribution criteria, land value, payments etc.) is delegated to an independent commission. This commission is called Land Readjustment Board, usually existing out of jurist, a land surveyor, a land evaluator and two members of the local parliament.

2.3 Land Readjustment in Seoul

Land readjustment has played a significant and very successful role in coping with the problems created by rapid urbanization in Korea, and particularly in Seoul (see Lee, 2002). It is recognized that Seoul's attempts to accommodate the increase in population, which used to exceed half a million per annum, and to deliver basic urban services for them would have been impossible without the help of the land readjustment programs.

Entering the 1980s, however, the land readjustment programs were assessed from a different viewpoint and the government policy preferred the purchase method. This tendency has run parallel with the central government's involvement in urban land development under the provision of the Residential Land Development Promotion Act of 1980. From 1934 until 1984 in Korea there were 397 land readjustment projects with total area of 43,580 ha. The Gaepo land readjustment project is located in the southern periphery of Seoul's existing built-up areas with an area of 9 km² to be developed for residential purposes. It had been realized within three different districts organized by different bodies. The biggest one was realized by land readjustment (6.5 km²) the others had been realized by purchase. The land readjustment area had to be developed for a population of 170,000.

The switch towards the direct purchase method or the frequently discussed idea of building satellite towns likewise appears as a worthy proposition. Particularly in the development of smaller plots of vacant high-priced land, land readjustment appears to be the most suitable method to use. Also, considering the financial difficulties prevalent within the municipal governments of the regional urban centers outside Seoul, the land readjustment method had played a major role in land development and town planning schemes.

2.4 Land Readjustment in India

In India, the land pooling policy was first used under the Bombay Town Planning Act, 1915 in the erstwhile Bombay Presidency. Few decades later, it became the basis of the Town Planning Act in Gujarat — The Gujarat Town Planning and Urban Development Act, 1976. The Town Planning Scheme was extensively used in Maharashtra in the first half of 20th Century. It is now an accepted fact that cities across the globe cannot prosper without making private players an integral part of development. Public authorities are increasingly accepting this fact and relying more on the private sector.

In Delhi, until recently, only Delhi Development Authority (DDA) had a stronghold over urban infrastructure. However, opening the domain to the private sector is a significant step toward changing the way it is managed. In the future, DDA expect private sector participation to increase significantly in the development of Indian cities. Land acquisition is among the most important issue being faced by Delhi to develop urban infrastructure. We believe that the recent land pooling policy is a welcome step toward addressing this issue and expediting the development of urban infrastructure. In addition to allowing private participation, the land pooling policy also includes promising features such as tradable floor area ratio (FAR) and single window clearance mechanism.

Chapter 3. BRIEF OVERVIEW OF LAND POOLING PROJECTS

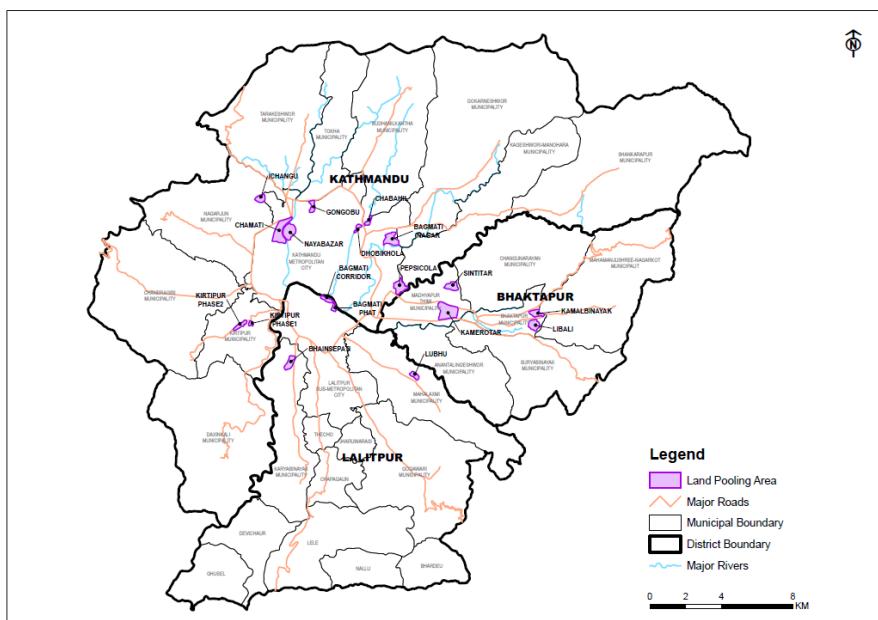
3.1 Land Pooling Projects in Kathmandu Valley

The land pooling technique has been in use in Kathmandu Valley since 1988. The initial phase included Gongabu LPP in Kathmandu, Lubhu LPP in Lalitpur and Kamal Binayak LPP in Bhaktapur. The successful implementation of these projects and lessons learnt from them, became very useful to complete other projects. Till date, 11 projects have been completed or nearly completed (Table 1) whereas 14 other projects are under implementation phase after the feasibility studies.

Table 1: Status of Land Pooling Projects in Kathmandu Valley

Status	Road Length (km)	No. of Developed Plots	Total Area (ropani)	Project Area	S. No
Completed	10.25	1,120	396	Dallu	1
Completed	12.40	2,320	840	Naya Bazaar	2
Completed	5.94	700	282	Gongabu	3
Completed	4.15	259	200	Chabahil Gopikrisna	4
Completed	11.72	1,970	901	Sinamangal	5
On-going	8.85	1,400	525	Sintitar	6
Completed	32.00	400	145	Kamalbinayak 1	7
Completed	35.00	1,800	670	Liwali	8
Completed	2.74	720	269	Lubhu	9
Completed	8.72	611	552	Sanibu Bhinsepati	10
Completed	4.20	560	197	Bagmati Phant	11
On-going	2.20	300	107	Kirtipur	12
On-going	-	3000	1,600	Kamero Tar	13
	138.17	15,160	6,684	Total	

Source: KVDA

**Figure 4: Land pooling projects in Kathmandu Valley****Table 2: List of on-going land pooling projects in Kathmandu Valley**

No. of plots	Area in ropani/hectare	Implementing agency	Land pooling projects	S. No.
2,800	1,246/63.40	KVTDC	Bagamati Nagar	1.
2,520	1,486	KVTDC	Kamerotar	2.
3,170	1,440/73.28	KMC	Chamati	3.
N/A	1,774/90.27	KMC	Manohara Phant	4.
1500	600/30.53	Bhaktapur Municipality	Tumucho Dugure Chokha	5.

Note: KVTDC: Kathmandu Valley Town Development Committee; KMC: Kathmandu Metropolitan City.

Source: DUDBC

Using the data of eleven land pooling projects of Kathmandu valley, as given in Table 3, a brief analysis was carried out in order to make a general assessment of the basic features, provided in those projects.

Table 3: Land use in 11 completed land pooling projects of Kathmandu Valley

Area a (Ha)	Landuse %					Project Area	S.N
	Land Contribution	Sales Plot	Road	Open Space	Developed Area		
20.2	40.0	8.0	25.0	7.0	60.0	Dallu	1
42.8	30.0	4.0	22.0	4.0	70.0	Naya Bazaar	2

14.4	29.6	6.9	17.5	5.2	70.4	Gongabu	3
10.2	33.6	7.0	22.7	3.8	66.4	Chabahil Gopikrisna	4
45.9	32.6	7.0	20.3	5.3	67.4	Sinamangal	5
26.7	32.2	10.0	18.8	3.4	67.8	Sintitar	6
7.4	32.5	6.8	21.5	4.2	67.5	Kamalbinayak 1	7
34.1	33.5	7.1	23.6	2.8	66.5	Liwali	8
13.7	31.3	9.0	17.9	4.4	68.7	Lubhu	9
28.1	56.0	20.3	22.8	12.9	44.0	SainbuBhaisepati	10
10.0	21.7	2.7	19.0	3.2	78.3	Bagmati Phant	11
253						Total:	

Source: DUDBC

About 253 ha (4977 ropani) of land has been developed in 11 land pooling projects as given in Table 3. The average developed plot is about 66% followed by 21% for road, 8.1 % for sales plots, and 4.8 % for open space (Figure 6). Developed area is the least in Sainbu Bhaisepati with only 44% but more area is allocated for open space (12.9%) and sales plot (20.3%). Highest developed area is in Bagmati Phant (78.3%)that allowed comparatively less space for other uses.

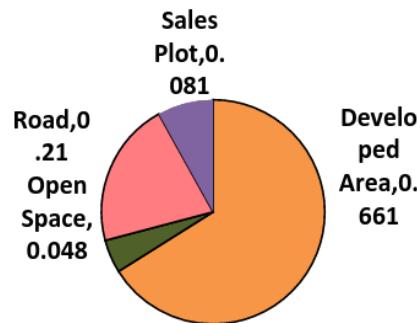
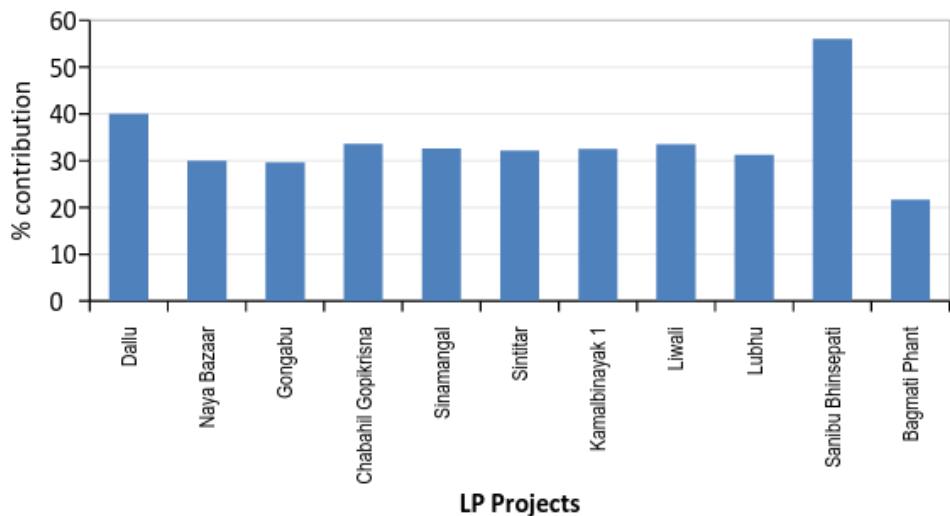


Figure 5:Average percentage in land use in 11 completed land pooling projects

Figure 7 shows the land contribution ratio of eleven LPP. The highest ratio is in Sainbu Bhaisepati with over 50 % and the least is observed in Bagmati Phant with about 20 %. For others, it varies between 30 and 40 %.

**Figure 6: Land contribution comparison chart in 11 land pooling projects**

3.2 Land Pooling outside Kathmandu Valley

Land Pooling technique has been widely used all over Nepal as well. The first land pooling project was done in Chipledhunga, Pokhara. Number of land pooling projects have been successfully completed and many in pipelines, outside Kathmandu valley as well.

Table 4: Completed and Ongoing Land Pooling Projects in Nepal, outside Kathmandu Valley

Total Area (ha)	District	Project Area	S. No
60.29	Dang	Ambapur	1
36.56	Chitwan	Krishnapur	2
97.52	Siraha	Lahan	3
15.57	Banke	Sadarline	4
44.02	Banke	Water Park	5
19.97	Morang	Bairbana Model LP	6
N/A	Sindhuli	Kamalamai	7

Source: DUDBC

Further land pooling technique has been adopted in many new urban development projects like New Towns, corridor developments and road/ outer ring road developments for planned developments of settlements and housings.

Table 5:Proposed Land Pooling Projects in New Towns

Total Area (Ha)	District	Name of New Town	S. No.
24.00	Terhathum	Basantapur	1.
34.53	Sindhuli	Khurkot	2.
27.65	Dhading	Baireni Galchi	3.
32.74	Tanahu	Dumre Bhansar	4.
21.67	Panchthar	Phidim	5.
30.64	Rukum	Chaurjahari	6.
38.50	Dailekh	Rakam Karnali	7.
21.97	Achham	Sanphebagar	8.
20.09	Baitadi	Patan	9.

Source: DUDBC

A summary of completed, on-going and under-study projects is given in Table 6.

Table 6: List of Land pooling Projects in Nepal

STATUS	DISTRICT	PROJECT NAME
Completed	Kathmandu	Dallu
Completed	Kathmandu	Gongabu
Completed	Kathmandu	Nayabazar
Completed	Kathmandu	Gopikrishna
Ongoing	Kathmandu	Sinamangal
Completed	Lalitpur	Sainbu
Completed	Lalitpur	Lubhu
Completed	Lalitpur	Bagmati Corridor
Completed	Bhaktapur	Kamal Vinayak
Completed	Bhaktapur	Kamal Vinayak-2
Completed	Bhaktapur	Liwali
Completed	Bhaktapur	Sintitar
Completed	Kaski	Naya Sadak
Completed	Baglung	Baglung Bus Park
Completed	Banke	Sadarline Bazaar Extension
Completed	Lalitpur	Bagmati Phant Jwagal
Completed	Kathmandu	Kirtipur
Completed	Kathmandu	Bagmati Nagar
Ongoing	Bhaktapur	Kamerotar
Ongoing	Kathmandu	Chamati
Ongoing	Kathmandu	Manohara Phant
Ongoing		Tumucho Dugure Chokha
NA	Kathmandu	Dibyeswari
Completed	Bhaktapur	Ichangu Narayan (Raniban) II
Completed	Lalitpur	Sainbu Nakkhu dol
NA	Lalitpur	Bhelpa- Hattiban
NA	Kavre	Tulti Phant
NA	Kavre	Dhulikhel
NA	Sindhuli	Kamalamai
NA	Chitwan	Bharatpur
NA	Banke	Water Park

NA	Morang	Biratnagar Ringroad
NA	Taplejung	Fungling Bazaar
NA	Dang	Dodhare
NA	Chitwan	Krishnapur
NA	Dang	Ambapur
Pending approval	Parsa	Pokhariya Landpooling Project
Pending approval	Banke	Rajhena Landpooling Project
Feasibility Study	Kathmandu	Dhumbarahi South (Ward No. 4, 5, 7)
Feasibility Study	Lalitpur	Harisiddhi Upanagar
Feasibility Study	Kathmandu	Gothatar
Feasibility Study	Kathmandu	Nayapati
Feasibility Study	Kathmandu	Nepaltar
Feasibility Study	Kathmandu	Kapantar
Feasibility Study	Kathmandu	Tusal
Feasibility Study	Kathmandu	Taudaha, Chovar
Detail Project Report	Rupandehi	Hattibangain
Detail Project Report	Kaski	Lekhnath
Detail Project Report	Rupandehi	Kandeldanda
Detail Project Report	Kathmandu	Mulpani

3.3 Land Pooling Projects: Brief Overview

3.3.1 Gongabu Land Pooling

Project Description. The Gongabu landpooling project is the first project implemented in Kathmandu valley. It is an example of effective implementation of byelaws for planned residential subzone.

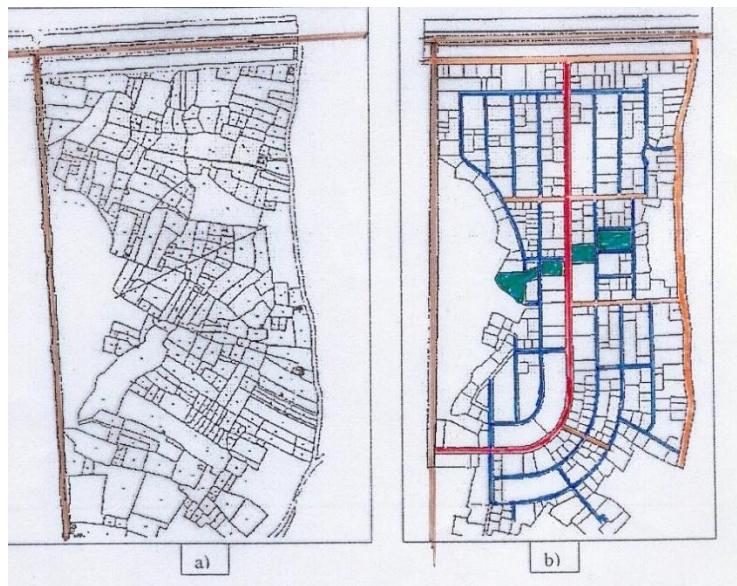


Figure 7: Master Plan of Gongabu Land Pooling Area: Before (left) and after (right)



Gongabu land pooling area

Table 7: Gongabu Land Pooling Project information I

KVTDC, Kathmandu	Executing agency
East:Samakhushi – Tokha road	Project Boundary

South:Samakhushi river	
West: Galkopakha- Ring Road	
North:Ring road (Balaju-Maharajgunj stretch)	
14.33 ha (281-7-2-1 ropani)	Project Area
376	No. of Land owners
406, among them 346 plots to be redistributed	
45 plots for sale as service plots	No.of developed plots
13 plots for open spaces and public spaces	
5.94 km	Road length
Min 14% and max 46%	Land Contribution
2044-2052 BS	Project Period
Completed	Present Status

Source: DUDBC

Table 8: Gongabu Land Pooling Project information II

Percent	Area
4.90%	Open space area allocation
16.75 %	Area occupied by Street
5.92%	ServicePlot
66.51 %	Residential Plot

Source: DUDBC

Observation

- No provision of footpath on other roads besides the main road proves to be inconvenient to pedestrians
- Lack of parking spaces: motorbikes parked in the side paths along the roads lead to more hassle.
- Haphazard intersections provided at right angles make it prone to accidents as well as make driving difficult.
- Unaffordable housing and high rental value, out of reach to poor
- Tendency of holding vacant land for future land speculation
- The open spaces are provided under high tension lines,which makes them unsafe.

3.3.2 Sintitar Landpooling

Project Description. The project site lies in the north-east part of Madhyapur Thimi Municipality (ward no. 1 and 3). The land pooling project was initiated in 1997(2054/55 BS) by KVTDC, Bhaktapur with the involvement of the local people. It was completed in 2005 (2061/62).

Table 9: Sintitar Land Pooling Project Information I

KVTDC, Kathmandu	Executing agency
East: Araniko Highway	
South: Kamerotar	Project Boundary
West: Bode-Saraswati Road	
North: NilBarahi	
27.5 ha (527-1-1-0 ropani)	Project Area
271	No. of Land owners
871, among them 271 plots to be redistributed	
51 plots for sale as service plots	No. of developed plots
5 plots for open spaces and public spaces	
8.88 km	Road length
Min 12.5% and max 38%	Land Contribution
2055-2062	Project Period
Completed	Present Status

Source: DUDBC

Table 10: Sintitar Land Pooling Project Information II

Percent	Area
3.40%	Open space area allocation
18.80%	Area occupied by Street
10.00%	ServicePlot
67.80%	Residential Plot

Source: DUDBC



Figure 8: Master Plan of Sintitar land pooling site



Sintitar land pooling area

Observation:

- Some of the minor site works remain till date (like water supply lines, black topping in the roads construction in one or more areas)
- Slower construction rate – Most of 871 residential plots allotted are vacant
- Less percentage of open space (2.38%)
- Plot depth ratio exceeded 1:4 ratio (only suitable for row houses)
- Insufficient infrastructure facility, particularly related to sewerage system
- Previously an important source area for pottery clay (the traditional pottery craft is vanishing despite the municipal vision to protect local crafts)

3.3.3 Dallu Landpooling

Project Description. The site lies in Kathmandu Municipality ward no. 15.

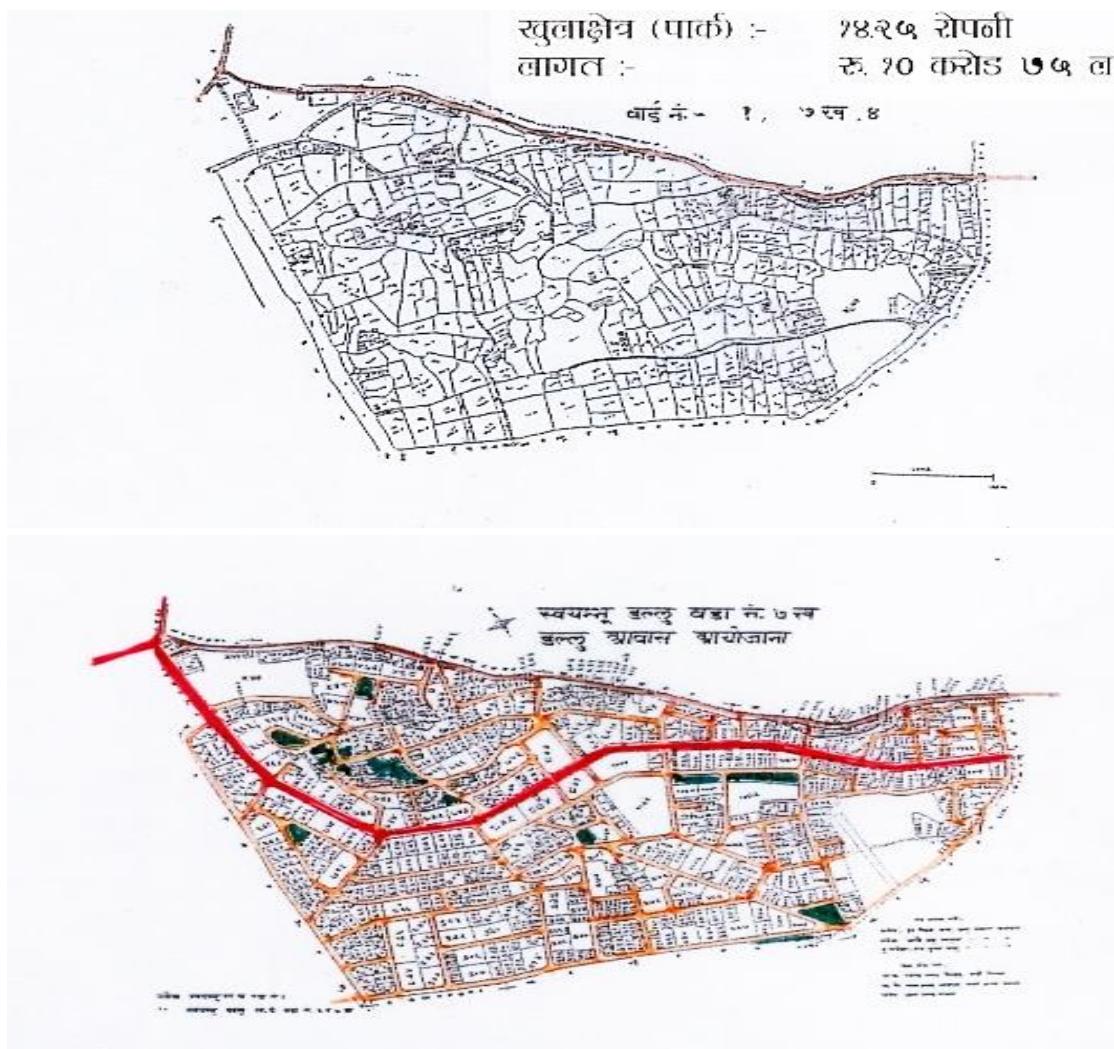


Figure 9: Master Plan of Dalluland pooling area

**Dallu Land Pooling Area****Table 11: Dallu Land Pooling Project Information I**

KVTDC, Kathmandu	Executing agency
20 ha	Project Area
455	No. of Land owners
750 plots	No.of developed plots
8.417 km	Road length
Min 40% and max 40%	Land Contribution
2047-2058	Project Period
Completed	Present Status

Source: DUDBC

Table 12: Dallu Land Pooling Project Information II

Percent	Area
7%	Open space area allocation
25%	Area occupied by Street
8%	ServicePlot
60%	Residential Plot

Source: DUDBC

Observation:

- Insufficient infrastructure facilityleading to slower rate of construction
- Poor maintenance of infrastructures

3.3.4 Saibu Bhaisepati Landpooling

Project Description. The site lies in Lalitpur Municipality

सैंबु भायेपाटी आवास आयोजना

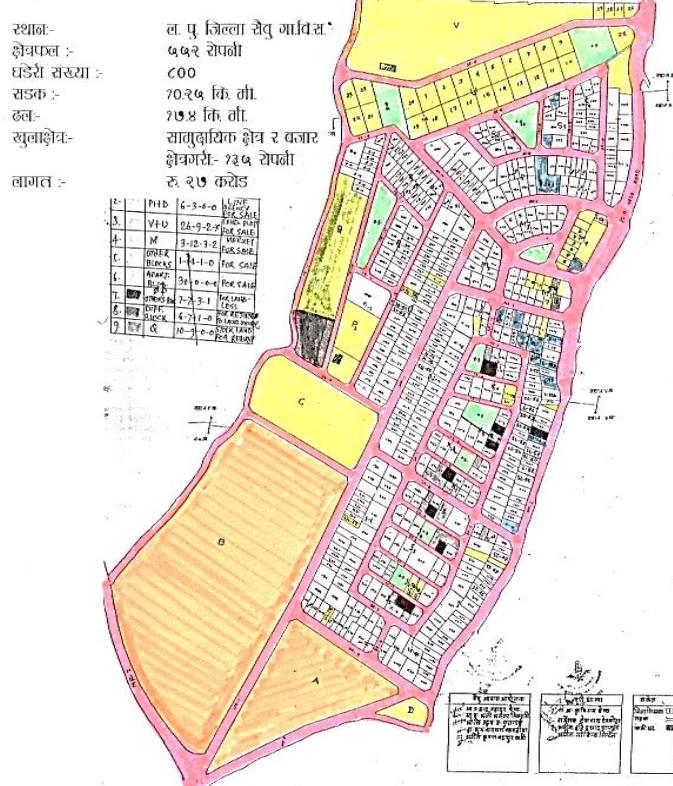


Figure 10:Sainbu-Bhaisepati land pooling area



Sainbu-Bhaisepati land pooling area

Table 13: Sainbu-Bhaisepati land pooling project information I

KVTDC, Kathmandu	Executing agency
East:Kusunti	
South: Bungamati	
West: Khokana	Project Boundary
North: Ringroad (Ekantakuna)	

24.6ha	Project Area
536	No. of Land owners
540 plots	No.of developed plots
9 km	Road length
Min 56% and max 56%	Land Contribution
2047-2058	Project Period
Completed	Present Status

Source: DUDBC

Table 14: Sainbu-Bhaisepati land pooling project information II

Percent	Area
12.9%	Open space area allocation
22.8 %	Area occupied by Street
20.3%	ServicePlot
44.0%	Residential Plot

Source: DUDBC

Observation:

- Vacant land still exists

3.3.5 Nayabazar Landpooling

Project Description:

- Located in the two different wards of Kathmandu Metropolitan City: 25 hectares (487 ropani) in Ward no. 16 and about 17 hectares (332 ropani) in Ward no. 17.
- The area was totally raw land having only one existing road of 3 m width going from east to west through the center and a circular road of average width of 3.5 m with the radius about 100 to 150 m.

नयाँ बजार जम्मा एकीकरण आयोगला

The Land pooling projects before and after the project implementation.





Figure 11: Nayabazaar Land Pooling Readjustment Plan



*Nayabazaar Land Pooling Area***Table 15: Nayabazaar Land Pooling Project Information I**

Municipality, Kathmandu	Executing agency
East: Kusunti	
South: Bungamati	Project Boundary
West: Khokana	
North: Ringroad (Ekantakuna)	
24.6ha	Project Area
536	No. of Land owners
540 plots	No. of developed plots
9 km	Road length
Min 56% and max 56%	Land Contribution
2047-2058	Project Period
Completed	Present Status

Source: DUDBC

Table 16: Nayabazaar land pooling project information II

Percent	Area
12.9%	Open space area allocation
22.8 %	Area occupied by Street
20.3%	ServicePlot
44.0%	Residential Plot

Source: DUDBC

Observation:

- Existing roads are in poor condition- maintenance has not been done after construction
- Buildings have been constructed disobeying the bye-laws.
- The land pooling area has been highly commercialized.

- The cross junctions are prone to frequent accidents.
- Entry of heavy vehicles have resulted in insecurity and disturbances in the neighborhood.
- Open spaces are not maintained as well.

3.3.6 Sinamangal Land Pooling

Project Description

- Located in Kathmandu Municipality, ward no.35
- Sinamangal Land Pooling Project 7 Ka, Kha, Ga and 7 Gha

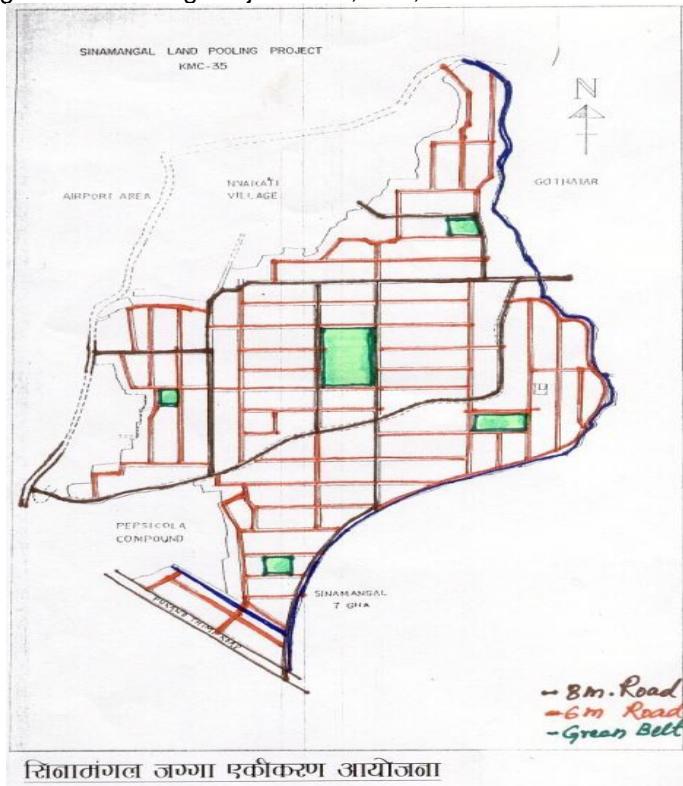


Figure 12:Master Plan of Sinamangal land pooling project-I

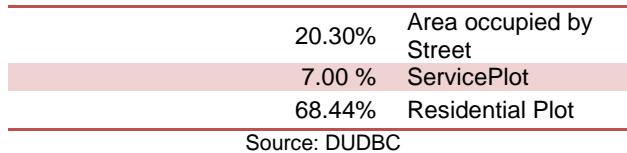
Table 17: Sinamangal land pooling project information I

TDC, Kathmandu	Executing agency
East:Gothatar	
South: Pepiscola	Project Boundary
West: Airport Area	
North:	
35.97 ha	Project Area
964	No. of Land owners
1074 plots	No.of developed plots
12 km	Road length
Min 12.5% and max 37%	Land Contribution
2051-2058	Project Period
Completed	Present Status

Source: DUDBC

Table 18: Sinamangal Land Pooling Project Information II

Percent	Area
5.30%	Open space area allocation



Sinamangal Land Pooling Area (Source: L Bajracharya)

Observation:

- One large central open space with four other small spaces. These open spaces have good linkage but not at equal distance from all part
- Most of the corner plots are left vacant
- Poor maintenance of roads, difficulty during rainy season



Figure 13: Master Plan of Sinamangal Land Pooling Project-II

3.3.7 Chabahil Landpooling

Project Description. The site is located in Kathmandu Municipality, ward no. 7.

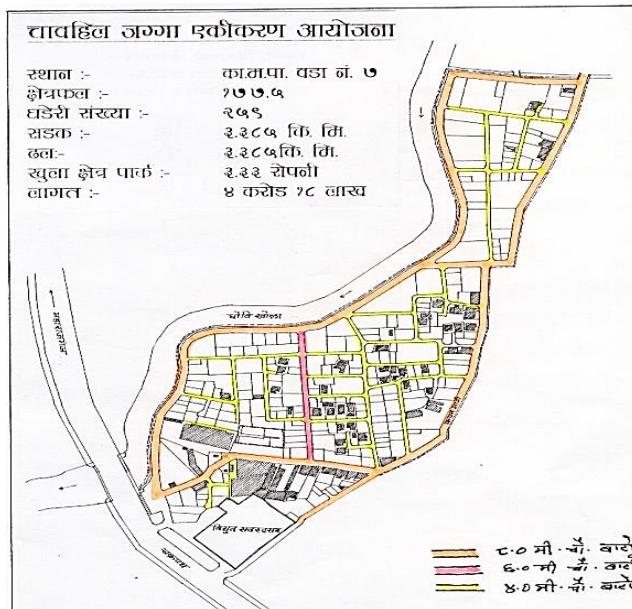
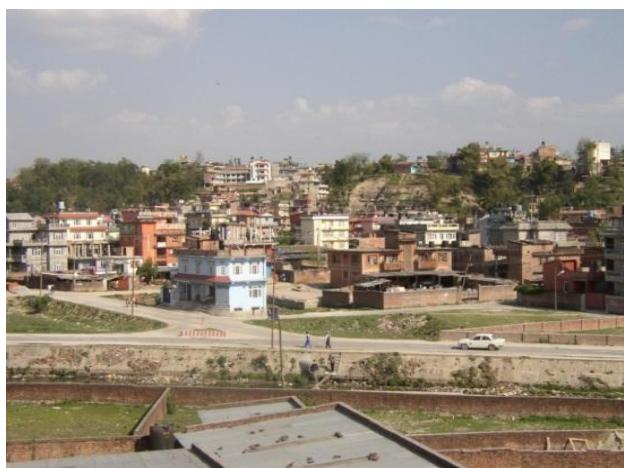


Figure 14:Master Plan of Chabahil land pooling area



Chabahil land pooling area

Table 19: Chabahil Land Pooling Project Information I

TDC, Kathmandu	Executing agency
East:Baoudha	
South: Ring Road(Chabahil Stretch)	Project Boundary
West: Dholikhola	
North:Kapan	
10.88 ha	Project Area
242	No. of Land owners
292plots	No.of developed plots
4.15 km	Road length
Min 12.5% and max 54%	Land Contribution

2051-2058	Project Period
Completed	Present Status

Source: DUDBC

Table 20: Chabahil Land Pooling Project Information II

Percent	Area
3.80%	Open space area allocation
22.70 %	Area occupied by Street
7.00 %	ServicePlot
66.45%	Residential Plot

Source: DUDBC

3.3.8 Ichchang Land Pooling

Project Description

- Located in Ichchangunarayan VDC of Kathmandu district.
- Project area: about 607 ropani.
- Located in 7, 8'ka' and 8'kha' of Ichchangunarayan VDC.



Figure 15: Master Plan of Ichchang Land Pooling Area

Table 21: Ichchang Land Pooling Project Information I

KVTDC, Kathmandu	Executing agency
33 ha	Project Area
N/A	No. of Land owners
1625 plots	No.of developed plots
8.3 km	Road length
Min 12.5% and max 54%	Land Contribution
2051-2058	Project Period
Completed	Present Status

Source: DUDBC

Table 22: Ichchang land pooling project information II

Percent	Area
3.0%	Open space area allocation
19.5%	Area occupied by Street
6.4%	ServicePlot
71.1%	Residential Plot

Source: DUDBC

Observation

- There is high tension line passing through Banasthali and Shova Bhagawati.
- The issue of contribution is pertaining despite public property like that of Balaju Industrial Estate and different Guthis.
- Rapid unequal increase of land price.
- Delay on implementation of projects
- Lack of cooperation from landowners in each step
- Commercialization
- Bureaucratic delays
- Equity problem in the allocation of plots and the provision of financial compensation
- Excess and shortfall of areas during re-cadastral survey

3.3.9 Bagmati Corridor Landpooling



Figure 16: Master Plan of Bagmati Phat land pooling area



Bagmati Phat land pooling area (source: N Shrestha)

Table 23: Bagmati Corridor Land Pooling Project Information I

KVTDC, Kathmandu	Executing agency
10.02 ha	Project Area
N/A	No. of Land owners
258 plots	No.of developed plots
3.4 km	Road length
Min 12.5% and max 54%	Land Contribution
2051-2058	Project Period
Completed	Present Status

Source: DUDBC

3.3.10 Kirtipur Landpooling

Project Description

- Located in Kirtipur
- Project area: about 107 ropani.



Figure 17: Master Plan of Kirtipurland pooling area

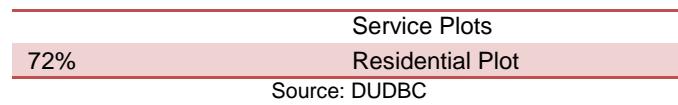
*Kirtipur land pooling area***Table 24: Kirtipur land pooling project information I**

Executing agency	
East:Chovar South: Panga old settlement West: Nagau North:Kirtipur Nayabazar, TU	Project Boundary
5.44 ha N/A N/A	Project Area No. of Land owners
2.2 km Minand max	No.of developed plots Road length Land Contribution Project Period
Completed	Present Status

Source: DUDBC

Table 25: Kirtipur land pooling project information II

Percent	Area
5%	Open space area allocation
23 %	Area occupied by Street AND



3.3.11 Kamal Binayak Landpooling

Project Description

- Located in Bhaktapur Municipality ward no.4
- Project area: about 146 ropani.

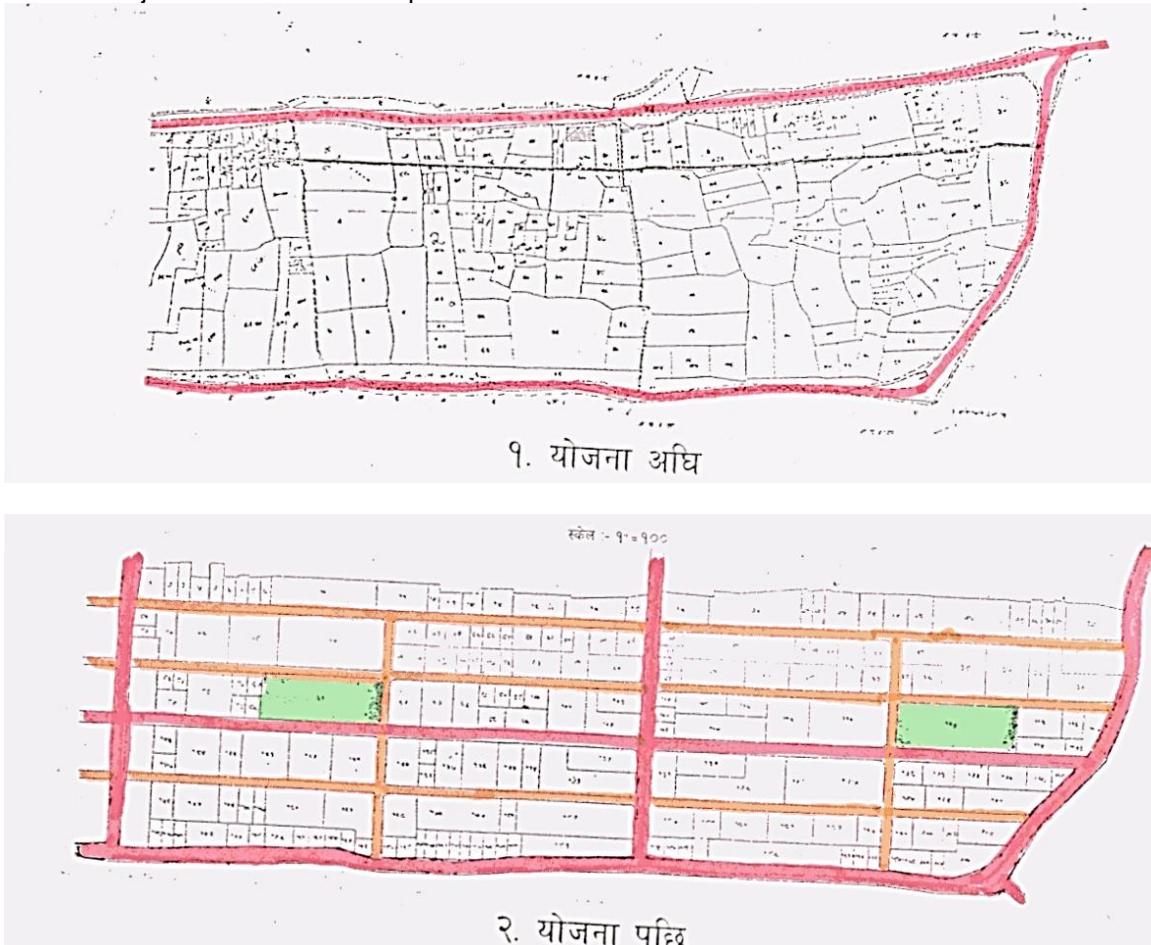


Figure 18:Kamalbinayakland pooling area (before and after)



*Kamalbinayak Land Pooling Area (source: L Bajracharya)***Table 26: Kamalbinayak land pooling project information I**

TDC	Executing agency
7.32 ha	Project Area
N/A	No. of Land owners
205 plots	No.of developed plots
3.2 km	Road length
Min 28% and max 28%	Land Contribution
2047-52	Project Period
Completed	Present Status

Source: DUDBC

Table 27: Kamalbinayak land pooling project information II

Percent	Area
4.20%	Open space area allocation
21.50 %	Area occupied by Street
6.80 %	ServicePlot
67.50%	Residential Plot

Source: DUDBC

3.3.12 Liwali Landpooling

Project Description

- Located in Bhaktapur Municipality ward no.4
- Project area: about 679 ropani.

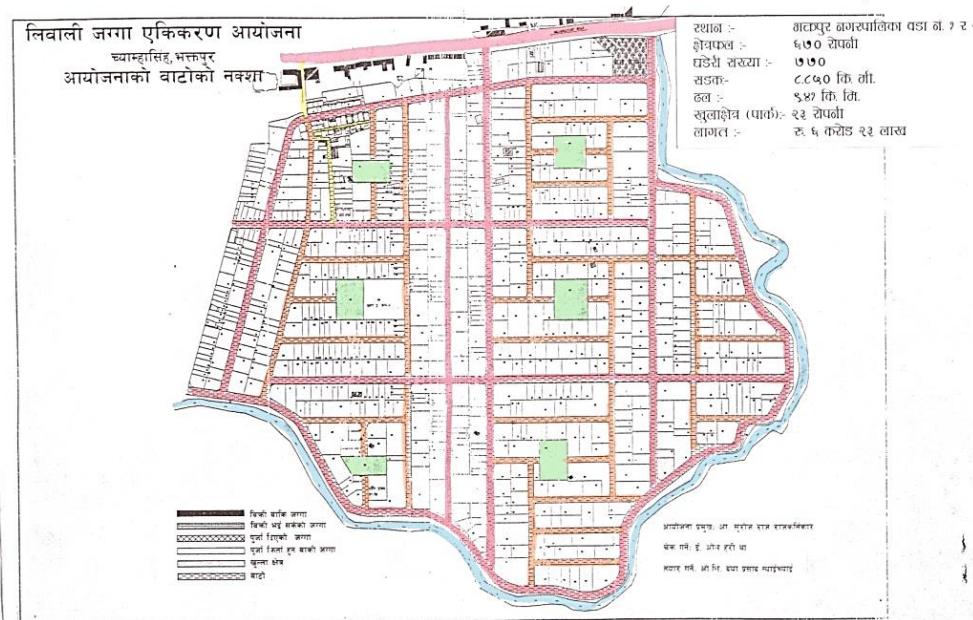


Figure 19: Master Plan of Liwaliland pooling area



*Liwali land pooling area***Table 28: Liwali Land Pooling Project Information I**

Municipality	Executing agency
34.54 ha	Project Area
N/A	No. of Land owners
770 plots	No.of developed plots
3.5 km	Road length
Min 12.5% and max	Land Contribution
38%	Project Period
2041-54	
Completed	Present Status

Source: DUDBC

Table 29: Liwali Land Pooling Project Information II

Percent	Area
2.80%	Open space area allocation
23.60 %	Area occupied by Street
7.10 %	ServicePlot
66.50%	Residential Plot

Source: DUDBC

Observation

- Few vacant lands are still remaining – used for agriculture purpose
- Most of the building with mixed land use
- Roads are poorly maintained ,most of them are only graveled

3.3.13 Lubhoo Landpooling

Project Description

- Located in Bhaktapur Municipality ward no.4
- Project area: about 679 ropani

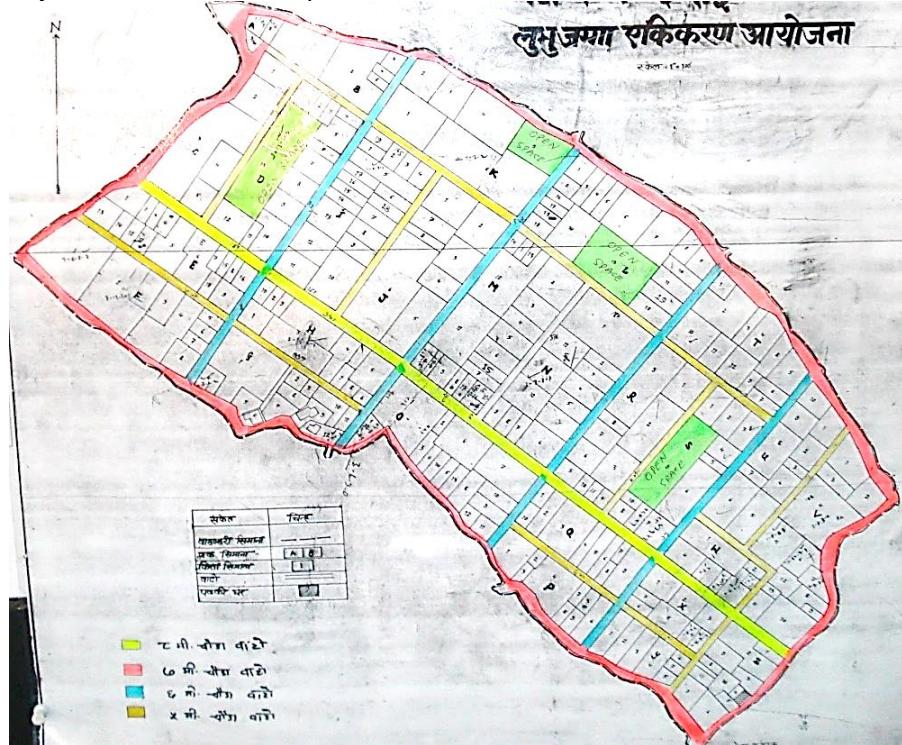


Figure 20: Master Plan of Lubhooland pooling area



Lubhoo land pooling area

Table 30: Lubhoo land pooling project information I

TDC	Executing agency
13.5 ha	Project Area
N/A	No. of Land owners
243 plots	No.of developed plots

3 km Min 18% and max 32% 2049-52	Road length Land Contribution Project Period
Completed	Present Status

Source: DUDBC

Table 31: Lubhoo land pooling project information II

Percent	Area
4.40%	Open space area allocation
17.90 %	Area occupied by Street
9.00 %	ServicePlot
68.70%	Residential Plot

Source: DUDBC

Observation

- Roads are poorly maintained, only graveled
- Vacant lands are still remaining – used for agriculture purpose
- Lack of cooperation from landowners

3.3.14 Bagmati Nagar Land Pooling

Project Description

- Located in Kathmandu Municipality
- Project area: about 1246 ropani.



Figure 21: Master Plan of Bagmati Nagar land pooling area

Table 32: Bagmati Nagar land pooling project information I

KVTDC	Executing agency
63.38 ha	Project Area
N/A	No. of Land owners
2800 plots	No. of developed plots
N/A	Road length
Min and max 2049-52	Land Contribution Project Period
Completed	Present Status

Source: DUDBC

3.3.15 Kamerotar Landpooling

Project Description

- Located in Madhyapur Thimi Municipality
- Project area: about 900 ropani.



Figure 22: Master Plan of Kamerotar land pooling area

Table 33: Kamerotar land pooling project information I

KVTDC, Bhaktapur	Executing agency
45.78 ha N/A	Project Area No. of Land owners
2500 plots	No.of developed plots
km Min and max 2049-52	Road length Land Contribution Project Period
Ongoing	Present Status

Source: DUDBC



Kamerotar land pooling area (source: L Bajracharya)

Observation:

- The project was initiated but yet not completed
- Due to the conflicts in the area, plotting has not been finished yet
- The lands are still used as agriculture field

3.3.16 Chamati Landpooling

Project Description

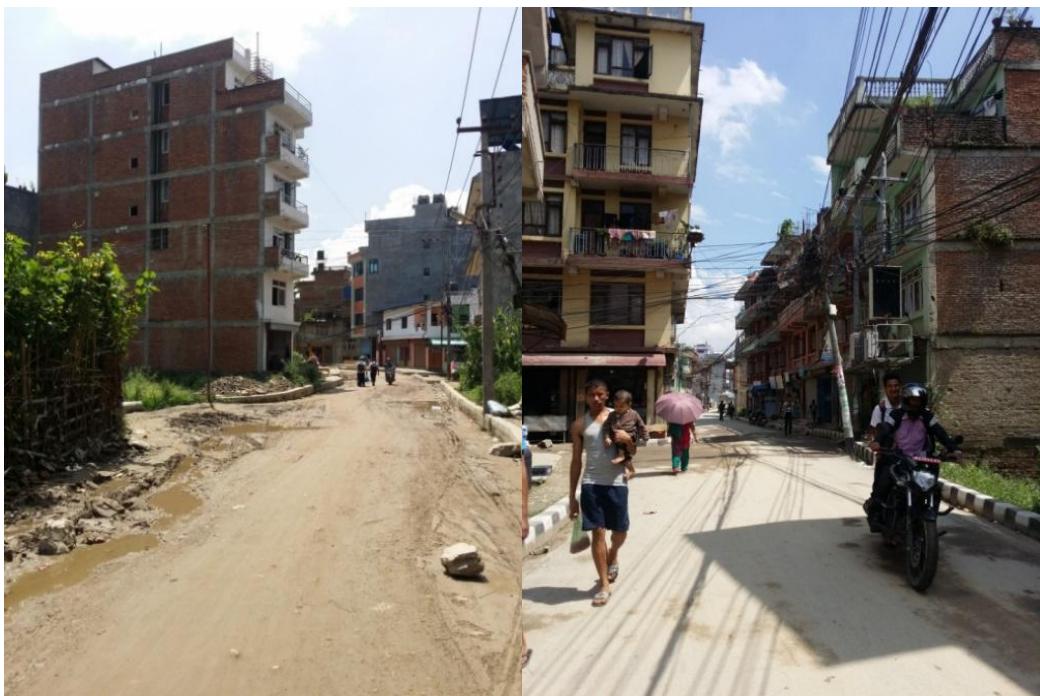
- Located in KathmanduMunicipality
- Project area: about 1440 ropani

Table 34: Chamati Land Pooling Project Information I

KMC	Executing agency
73.25 ha	Project Area
N/A	No. of Land owners
3170 plots	No.of developed plots
km	Road length
Min and max	Land Contribution
N/A	Project Period
Completed(problematic)	Present Status

Source: DUDBC



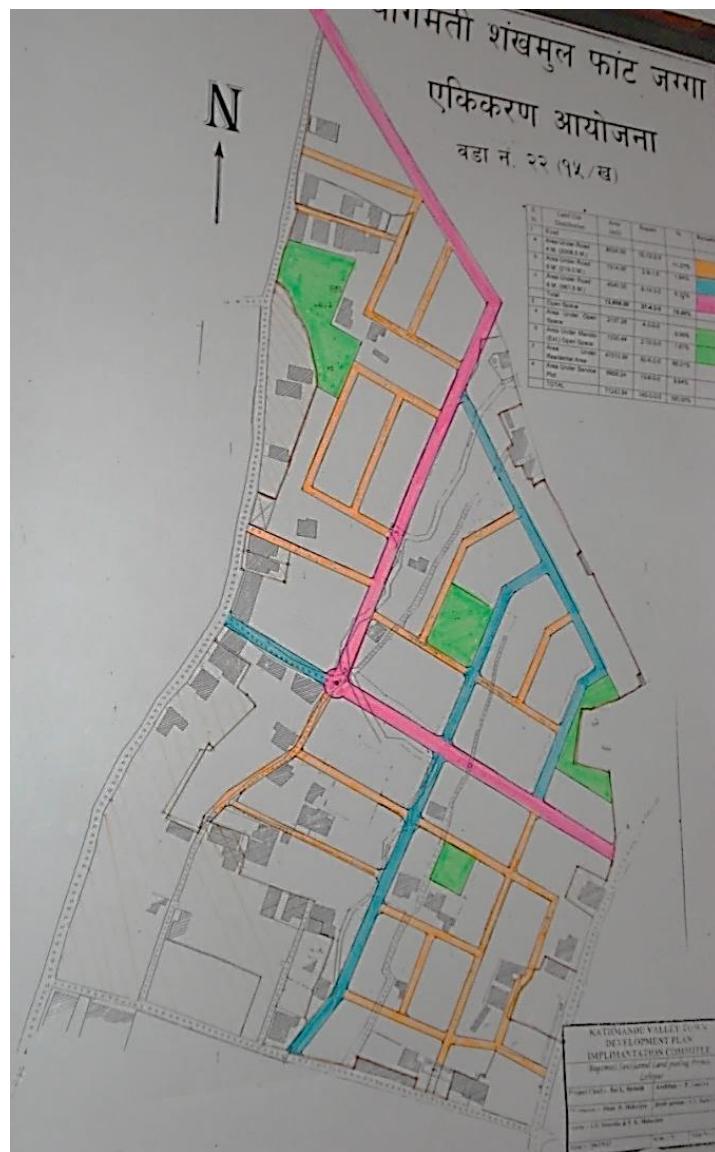


Chamati land pooling area (source: L Bajracharya)

3.3.17 Bagmati Phat Landpooling

Project Description

- Located in Jwagal area
- Project area: about 197 ropani.

**Figure 23: Bagmati Phat land pooling area****Table 35: Bagmati Phat land pooling project information I**

KVTDC, Ktm	Executing agency
10.00ha	Project Area
N/A	No. of Land owners
plots	No.of developed plots
4.2 km	Road length
N/A	Land Contribution
N/A	Project Period
Completed	Present Status

Source: DUDBC

Table 36: Bagmati Phat Land Pooling Project Information II

Percent	Area
3.20%	Open space area allocation
21.60%	Area occupied by Street +Service plot
75.20%	Residential Plot

Source: DUDBC

3.3.18 Dibyashwori Landpooling

Project Description

- Located in KMC
- Project area: about 553 ropani.

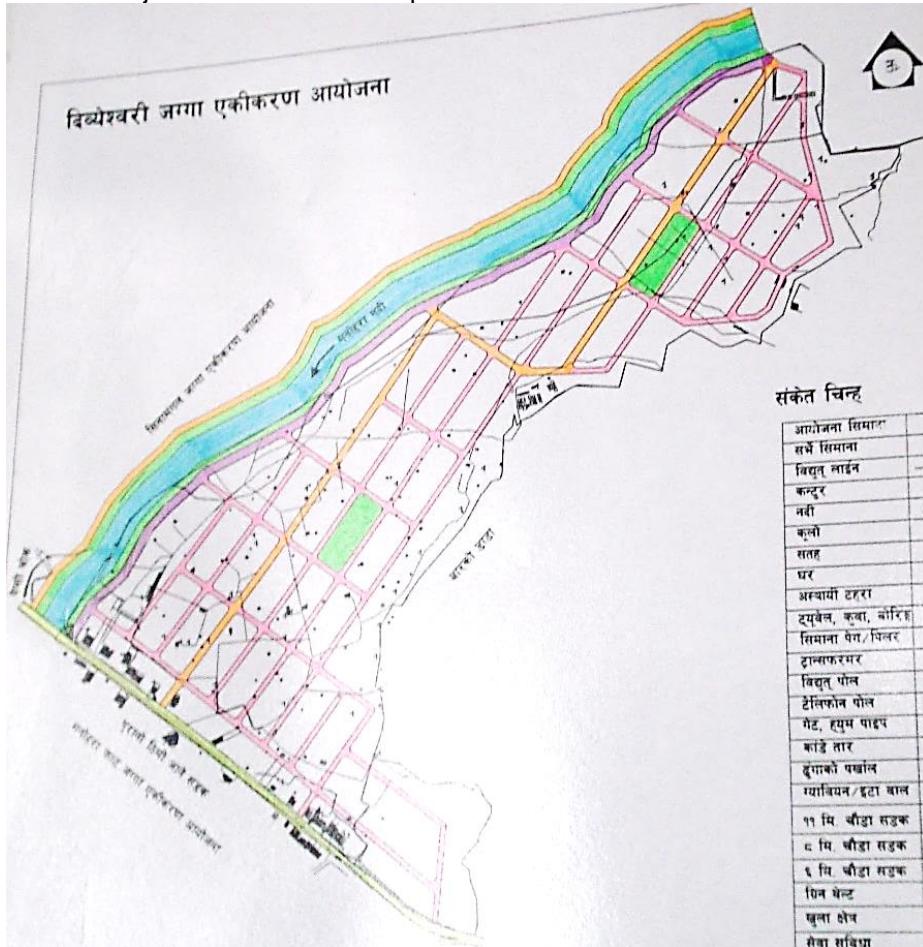


Figure 24: Master Plan of Dibyashwori land pooling area

Table 37: Dibyashwori land pooling project information I

KVTDC, Ktm	Executing agency
28.1ha	Project Area
N/A	No. of Land owners
N/A	No. of developed plots
N/A	Road length
N/A	Land Contribution
N/A	Project Period
Completed	Present Status

Source: DUDBC

3.3.19 Ambapur Land pooling, Dang

Project Description

- Located in Ghorahi, Dang
- Project area: about 89 bigha



Figure 25:Master Plan of Ambapur land pooling area

Table 38: Ambapur land pooling project information I

TDC, Dang	Executing agency
60.29ha	Project Area
N/A	No. of Land owners
N/A	No.of developed plots
km	Road length
40% for all	Land Contribution
2065 to till date	Project Period
Ongoing	Present Status

Source: DUDBC

Observation (Issues):

- Difficulties in return of land due to the some lands blocked by banks and financial institutions.
- Objection in some plot and infrastructure development by some land owners (due to their personal interest)
- Very less interest and support from Users' Committee.
- Lack of technical human resource

3.3.20 Krishnapur Land Pooling, Bharatpur

Project Description

- Located in Krishnapur 7, Bharatpur Municipality
- Project area: 36.56 Ha



Figure 26: Satellite images of Krishnapur land pooling area: before project, after project, and

after some development (top to bottom)

Table 39: Bagmati Phat Land Pooling Project Information I

DUDBC Division office Chitwan, Bharatpur Municipality, UEIP, PIU Project Management Committee	Executing agency
36.56ha 174	Project Area No. of Land owners
N/A	No.of developed plots
N/A 17% Min and 41% max 2007 to till date	Road length Land Contribution Project Period
Ongoing (95% completed)	Present Status

Source: DUDBC

Observation (Issues):

- Issues raised from land owners about partiality in land distribution and plot allotment
- Issues were raised to allot the plot in the same place where the land was originally located which could not be adjusted to all.
- Land contribution percentage at 42% is perceived to be very high.

3.3.21 Lahan Land pooling, Lahan

Project Description

- Located in Lahan Municipality of Siraha District
- Project area: 144 bigha (97.52 ha)



Figure 27: Master Plan of Lahan land pooling area

Table 40: Lahan Land Pooling Project Information I

Lahan TDC, DUDBC Saptari	Executing agency
97.52 ha	Project Area
265	No. of Land owners
N/A	No.of developed plots
N/A 6% Min and 32% max 2037 to till date	Road length Land Contribution Project Period
Ongoing (plan approved on 2073, under implementation)	Present Status

Source: DUDBC

Observation (Issues):

- Many land owners are still not willing to participate in the project, although about 53% have agreed.
- The project was started about thirty years ago and not completed yet; many people are suspecting about the successful completion of the project
- Land price in and around the project area is increasing rapidly, disturbing the project.
- The owners of the built structures in the area are refusing to dismantle the structures.
- Land owners in the area are not willing to contribute their land for the project.

- A dedicated institutional setup with dedicated human resource is required for the successful completion of the project.

3.3.22 Sadarline Land pooling, Banke

Project Description

- Located in Nepalganj Municipality of Banke District
- Project area: 23 bigha (15.57 ha)

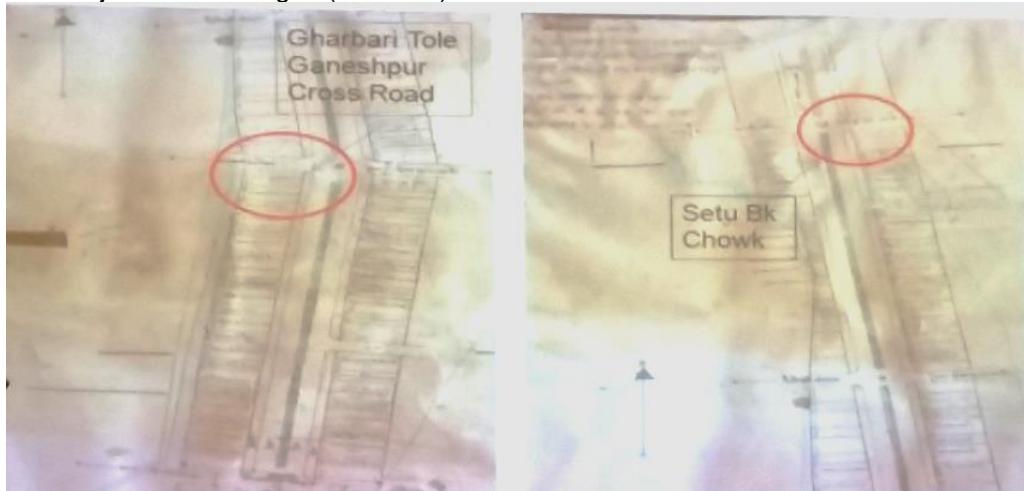


Figure 28: Sadarline land pooling area

Table 41: Sadarline Land Pooling Project Information I

Nepalganj TDC, DUDBC Banke	Executing agency
15.57 ha	Project Area
176	No. of Land owners
N/A	No.of developed plots
N/A 25% and 53% in phase I and II respectively 2047-57 and 2060-62	Road length Land Contribution
N/A	Project Period
Completed	Present Status

Source: DUDBC

Observation (Issues):

- Difficulty in land acquisition and consolidation
- Faced challenges in determining in land contribution policy
- Weakness of cadastral maps and documents
- Management of small parcels
- Disagreement in location of parcels
- Financial problems

3.3.23 Water Park Land pooling, Banke

Project Description

- Located in Nepalganj Municipality of Banke District
- **Project area:** 65 Bigha (44.02 Ha)

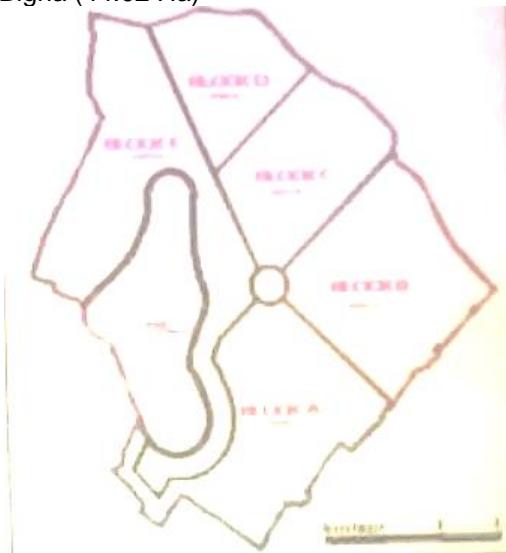


Figure 29: Layout plan of Water Park land pooling area

Table 42: Water Park Land Pooling Project Information I

Nepalganj TDC, DUDBC Banke	Executing agency
44.02 ha	Project Area
280	No. of Land owners
N/A	No.of developed plots
N/A 18% min and 61% max	Road length
2067-	Land Contribution
Completed	Project Period
	Present Status

Source: DUDBC

Observation (Issues):

- Difficulty in land acquisition and consolidation
- Faced challenges in determining in Land contribution policy
- Weakness in cadastral maps and documents
- Difficulty in management of small parcels
- Disagreement in location of land parcels
- Financial problems

3.3.24 Bairbana Model Land pooling, Biratnagar Ringroad

Project Description

- Located in Bairbana VDC of Morang District
- Project area: 29.51 Bigha (19.97 Ha)

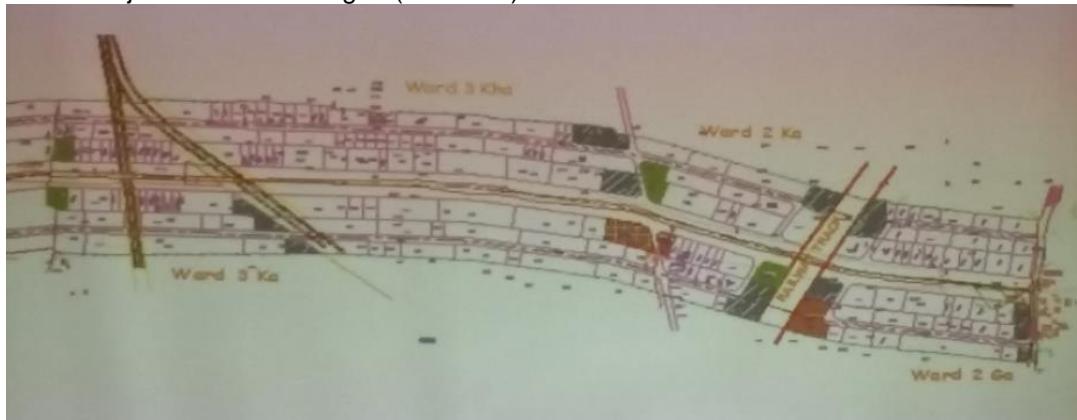


Figure 30: Master Plan of Bairbana land pooling area

Table 43: Bairbana Land Pooling Project Information I

DUDBC Morang	Executing agency
19.97 ha	Project Area
N/A	No. of Land owners
N/A	No. of developed plots
N/A	Road length
N/A	Land Contribution
2069- till date	Project Period
Ongoing (Land contribution and land return policy approved and the detail project report submitted to the MoUD and waiting for approval.)	Present Status

Source: DUDBC

Observation (Issues):

- Delay in approval of land pooling project from MoUD
- Lack of policy for compensation of buildings and other structures
- Absence of TDC authorities in Biratnagar
- Lack of separate land pooling expert staff in the project.

3.3.24 Mulpani Land pooling, Kathmandu

Project Description

- Located in Mulpani VDC of Kathmandu District
- Project area: 605 ropani (30.77 ha)

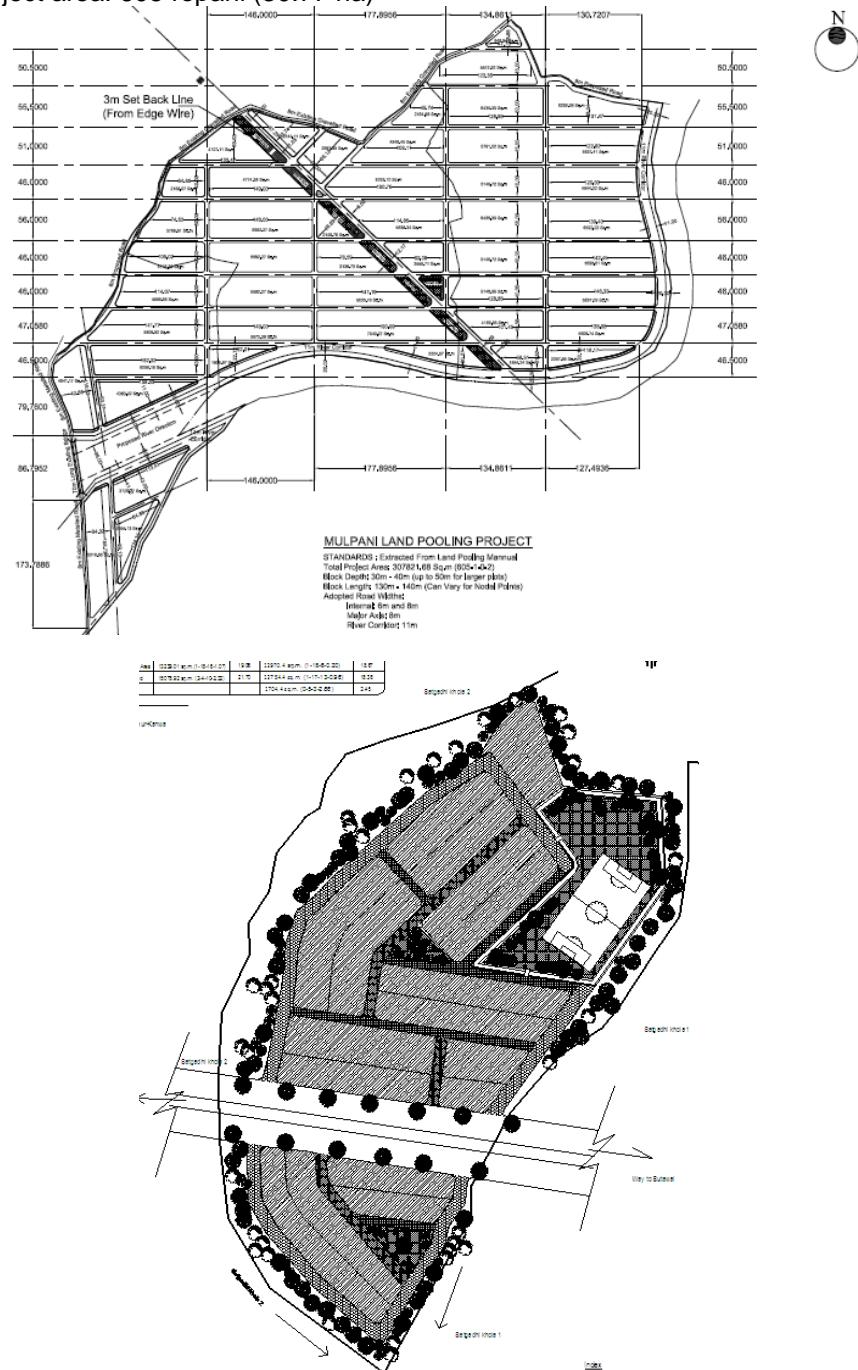


Figure 31: Master Plan of Mulpani Land Pooling Area

Table 44: Mulpani Land Pooling Project Information I

KVDA, Kathmandu	Executing agency
30.77 ha	Project Area
400	No. of Land owners
N/A	No.of developed plots
N/A	Road length
16% min and 36% max	Land Contribution
2069-	Project Period
DPR study completed	Present Status

Source: DUDBC

3.3.25 Kandeldanda Land Pooling, Butwal

Project Description

- Located in Kandeldanda of Butwal Municipality
- Project area: 173 Ropani (8.80 Ha)

Table 45: Kandeldanda Land Pooling Project Information I

DUDBC, Kathmandu	Executing agency
8.80 ha	Project Area
18	No. of Land owners
N/A	No.of developed plots
15% avg	Road length
N/A	Land Contribution
2069-	Project Period
DPR study completed	Present Status

Source: DUDBC

3.3.26 Proposed Land Pooling Projects in New Towns

Table 46: Proposed Land Pooling Projects in New Towns

Current Status	No. and Percent of Consensus	No. of Land Owners	No. of Land Parcel	Actual Area in Ha	Proposed area at least in Ha	Name of New Town	S. No.
LP in approval stage	54 (62.00%)	87	133	24.00	20	Basantapur	1.
	110(61.45%)	179	357	34.53	20	Khurkot	2.
	118 (72.94%)	239	302	27.65	20	Baireni Galchi	3.
	81 (52.60%)	154	257	32.74	25	Dumre Bhansar	4.
	56 (17.89%)	313	449	21.67	20	Phidim	5.
	161 (52.44%)	307	970	30.64	20	Chaurjahari	6.
	31 (56.36%)	55	649	38.50	20	Rakam Karnali	7.
	93 (63.39%)	138	379	21.97	20	Sanphebagar	8.
	17 (12.98%)	131	333	20.09	20	Patan	9.

Source: NTPCO, DUDBC

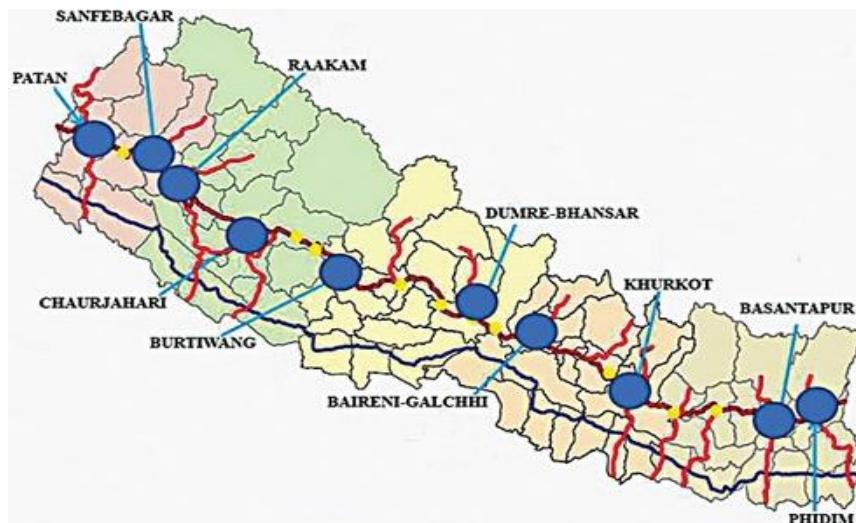


Figure 32: Location of New Town Projects

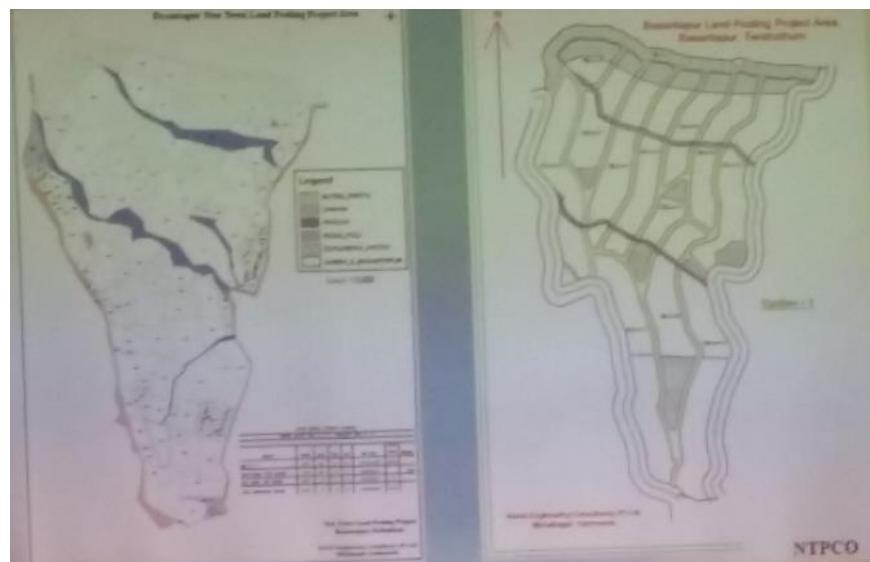


Figure 33: Existing and Proposed LP plan in Basantapur

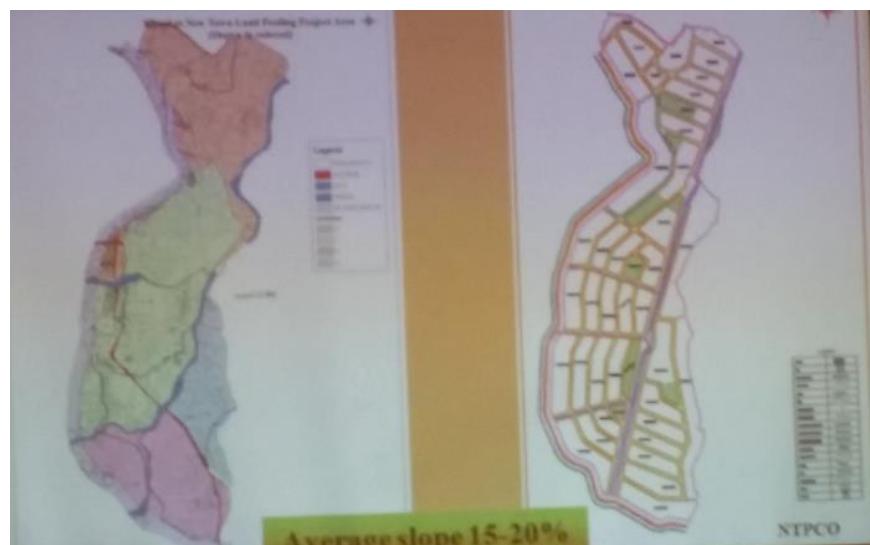


Figure 34: Existing and Proposed LP plan in Khurkot



Figure 35: Existing and Proposed LP plan in Dumre

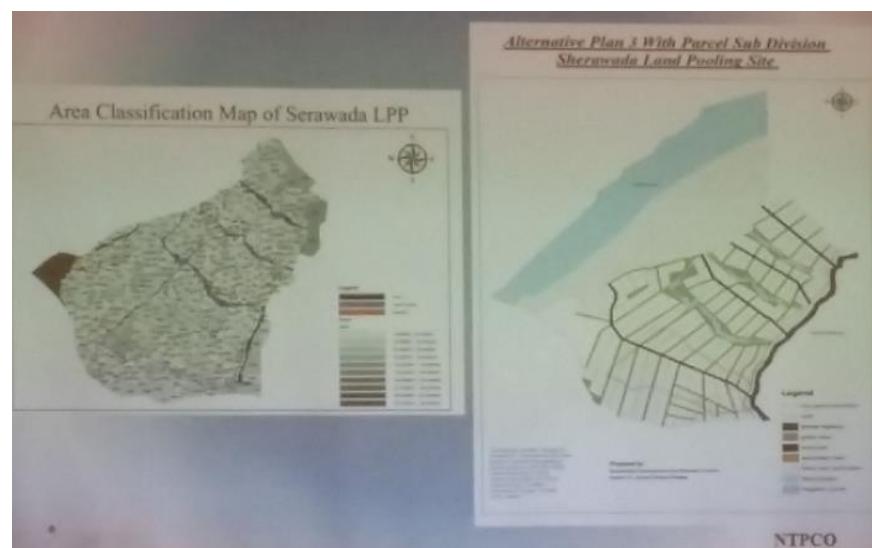


Figure 36: Existing and Proposed LP plan in Rakam Karnali



Figure 37: Existing and Proposed LP plan in Sanphebagar

Source: NTPCO, DUDBC

Observation (Issues):

- Feasibility studies for land pooling sites were conducted without adequately informing land owners.
- Allotted time for planning phase was in lump-sum basis.
- Approval stage is more complex than planning and implementation.
- Standard has not been fixed for the minimum infrastructure to be provided in the project.
- Time frame has not been set for taking consensus from the land owners (51% of land owners).

Chapter 4. OPPORTUNITIES AND SHORTCOMINGS OF LAND POOLING PROJECTS

4.1 Opportunities of Land Pooling Projects

This study has documented different land pooling projects in Nepal. Despite mixed success with land pooling projects, the technique is gaining ground. The Government has adopted land pooling technique in the planning of New Towns, which implies that the scale of land pooling projects will increase.

Land pooling projects provide many opportunities. The projects provide infrastructure like road, water supply, sewerage and drainage facilities. The projects also provide open spaces for breathing, relaxation and recreation such as for playgrounds and children parks. In addition to that, the land pooling technique leads to an arrangement of irregular plots into regular plots which are suitable for housing and for accessibility. Because land pooling projects are designed as self-financing projects, the burden on government or local governments to provide infrastructure and services is lessened to a significant degree. Although landowners lose some portion of their lands, they get serviced plots in return which are more valuable than before. In short, a land pooling project is a win-win scheme for both people and government.

4.2 Some shortcomings of Land Pooling Projects

There are, however, some barriers for the implementation of land pooling projects which may adversely affect project outcomes. Some shortcomings are listed below:

- Land pooling is a tedious process. It is difficult to get consent from land owners. The contribution percentage to be agreed by land owners is a challenging job for planners. Earlier land pooling project could be initiated only if 75% of the landowners agreed. The percentage was later dropped to 51%. In many cases, even acquiring consent from a simple majority from the landowners has proven difficult.
- Land pooling projects in Nepal are small in size, and are implemented in bit and piece manner, and often in isolation with regards to overall plan of a city.
- In general, there is misconception among land owners about the idea of re-plotting and redistribution.
- Landowners with larger plots in the development areas are often not willing to participate because they think they will be losing more lands.
- Landowners with corner plots or plots at the entry of land pooling project sites often feel that they are better off without land pooling projects as they already enjoy locational advantage.
- Boundary delineation is difficult due to the lack of coordination between Department of Land Revenue and Survey Department.

- Land administration and cadastral mapping system are often not compatible with each other; so land plotting activity is very difficult.
- In most of land pooling projects, after completion of the project, landowners keep their developed land plots vacant due to price speculation. This is against the basic objective of a land pooling project, which is to provide plots for residential development.
- Land pooling projects implemented without feasibility study are less likely to succeed. One such example is Hattibangai in Bhairahawa.
- In case of land pooling projects implemented by Town Development Committee, the success depends on the attitude and enthusiasm of the TDC members. In Pokhariya land pooling project, expected success could not be obtained because the terms of TDC members, who were active and positive, expired, and another TDC team took time to frame their opinion regarding the fate of the project.
- There are duplications of authority between TDC and municipalities(local bodies), leading to confusion regarding institutional role.

4.3 Some Key Observations

- Leaving aside few exceptions, the average contribution ratio varied between 30% and 35% which could be taken as a general framework for contribution calculation (this may vary in rural areas).
- Almost all projects had their project period overrun (spanning between any times from 5 to 10 years) owing to various managerial and technical problems, among which, the lack of financial resources being one major problem.
- The lack of proper cadastral maps and difficulty in accessing them also significantly posed limitation to the timely completion of projects.
- One of the prominent issues that needed to be addressed is co-ordination between line agencies, over or understated land area in the cadastral maps, land encroachment issues and equity issues (for landowners owning small parcel of lands less than 2.5 aana).
- Lack of updated data related to urban land use, infrastructure and market indicators resulted into the wrong location choice of the LP project sites.
- The significant delays in the project period attracted landowner's opposition to the project. The utilization of urban land in the context of Nepal by the private or public entity is done by either one or several following ways *a) construction of building for residential, commercial or industrial use b) mortgaging the land to the financial institution for loan c) splitting of land parcel for sale or transfer d) selling of entire parcel of land*. If such arrangement is made where the land owners' right for undertaking all above activities is ensured, then the opposition from the landowners would probably be mitigated to a large extent.

Chapter 5. CONCLUSION

5.1 Conclusion

Land pooling is a tool that can support sustainable urban development by allowing for planned and managed urban extension and densification. For land readjustment to be successful, it is necessary to have favorable economic conditions, along with procedural and regulatory rules in place to guide the process. Land readjustment requires intensive voluntary participation and cooperation by the property owners. It must be obvious to the property owners that the final profits will be greater than they would receive otherwise, without land readjustment and is worth, negotiating time that will be devoted to the project implementation.

Enabling legislation can strengthen these processes. The project must depend on reliable ownership records, title definitions and trained and credible assessors. From a regulatory standpoint, there must be impartial, transparent and efficient processes established by the implementing agency to manage the land readjustment project and resolve potential disputes between property owners and the agency, as well as between the property owners themselves who may have competing development plans.

This Case Study presents a consolidated documentation of land pooling projects in Nepal with a purpose of serving background for an associated knowledge product on risk-resilient urban development through land readjustment.

5.2 Recommendations

- The scale and extent of land pooling projects should be increased.
- Public awareness programs should be launched before the initiation of a land pooling project to educate the public about the merits of a land pooling project.
- Municipalities should provide subsidies for infrastructure development in a land pooling area.
- Minimum level of investment on infrastructure from the government sector should be ensured.
- Approval process should be simplified.
- Land pooling techniques should be linked with environment and climate change concerns (such as provision of green infrastructure, rainwater harvesting, sustainable designs, and energy efficiency, to name a few).
- Open space in land pooling areas should be increased so that all and majority of plots have access to open spaces.
- Before selecting the land pooling projects and its area needs to study the growth trends so that developed plots will be filled by houses in very short period of time.

REFERENCES

- Asian Development Bank, 2013. **Moving from risk to resilience: sustainable urban development in the Pacific.** Mandaluyong City, Philippines: Asian Development Bank.
- DUDBC (2072 BS). **Land Pooling Reference Manual.** Kathmandu: Department of Urban Development and Building Construction
- Gorkhali, G. P., Sangachhen, S. B., and Shakya, K. (2072 BS).**Land Pooling Reference Manual.**
- Ishida, Y. (1986).**A short history of Japanese land readjustment 1870-1980,** Comprehensive Urban Studies, No. 28, pp. 45-88, Tokyo: Tokyo Metropolitan University Centre for Urban Studies.
- Ishida, Y. (1987). **The Last 100 Years of Japanese Urban Planning**, Jichitai Kenkyusha, Tokyo.
- Ishida, Y., Hatano, H., et al., 1987. **Influences of Lex Adickes upon Legislations of Japanese Land Readjustment System.** Collected Papers of the Japanese City Planning Association 22, 121-126.
- Joshi, Jibgar, 1997. **Planning for Sustainable Development**, Kathmandu: Lajmina Joshi.
- Lee, T. (2002).**Land Readjustment in Korea**, Lincoln Institute of Land Policy Conference Paper
- Miyazawa, M. (1982) **Land readjustment in Japan**, in: W. Doebele (Ed.) Land Readjustment, a Different Approach to Financing Urbanization, pp. 91-106. Lexington, MA: Lexington Books.
- Müller-Jökel, R. (n.d.). **German land readjustment – ecological, economic and social land management.** Available at https://www.fig.net/resources/proceedings/fig_proceedings/korea/full-papers/pdf/session20/mullerjokel.pdf
- Nishiyama, Y. (1986). **Western influence on urban planning administration in Japan: focus on land management.** In: Nagamine, H. (Ed.), Urban Development Policies and Programmes, Focus on LandManagement. Japan: United Nations Centre for Regional Development, Nagoya, Japan, pp. 315-355.
- NPC, 2015. **Nepal Earthquake 2015 – Post Disaster Needs Assessment. Vol. A: Key Findings.** Kathmandu: Government of Nepal, National Planning Commission.
- Pradhan, T. (n.d.). **Land Readjustment in Kathmandu The Naya Bazar Project.** Available at <https://www.lth.se/fileadmin/hdm/alumni/papers/ad2000/ad2000-11.pdf>.
- Sangachhen, S. B., Gorkhaly, G. P., and Miyazaki N. (2003).**Land Pooling Reference Manual.** Kathmandu, Nepal: Department of Urban Development and Building Construction, Ministry of Physical Planning and Works.
- Sorensen, A. (1999). **Land Readjustment, Urban Planning and Urban Sprawl in the Tokyo Metropolitan Area**, Urban Studies, Vol 36, Issue 13.
- Sorensen, A. (2000). **Land readjustment and metropolitan growth: an examination of suburban land development and urban sprawl in the Tokyo metropolitan area**, Progress in Planning 53, pp. 217-330.

