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Land Pooling as a Land Development Tool in Rural Context: A Case Study of Deukhuri Dang

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Abstract
Nepal has rapidly urbanized during the past ten years. Numerous urban areas have been designated as a result of this urban transition, and numerous land development strategies, such as Site and Services, Guided Land Development (GLD), and Land Pooling (LP), have been used. The administration wants to develop Deukhuri Valley in the Dang district as the future site of the province capital, but LP projects meet obstacles there as well. In this study, the Deukhuri Valley is used as a case study to evaluate the viability of LP as a land development technique in a rural setting. It looks into the practices now in place for LP implementation, community acceptability, and the financial viability of LP projects. The study combines secondary data sources like policy papers and geographic data with primary data gathering techniques including site observation, structured questionnaires, key informant interviews, and focus group discussions. According to preliminary studies, there is a lot of skepticism about local initiatives among the populace, which is attributed to mistrust of the government, a slow start to the project, and insufficient attempts to raise awareness. These projects' economic sustainability is also in doubt because they mainly rely on grants with no assurance of funding. The study also finds that landowners are unwilling to offer their property for LP, partly because they are unsure of the government's intentions and need to keep some of their land for farming. In conclusion, this study illuminates the difficulties and complexity involved in putting LP projects into practise in Nepal's rural areas, highlighting the significance of community acceptability, long-term economic viability, and strong governmental frameworks.

Keywords
Land Pooling. Land development, community sensitivity, financial sustainability, contribution ratio, rural context

1. Introduction

1.1 Background

Nepal is one of the ten least urbanised countries in the world. However, it is also one of the top ten fastest urbanising countries [1]. Rapid urbanization in the last decade has been observed as a result of multiple urban transitions (spatial, demographic, and economic) that are underway. It is one of the top ten fastest-urbanizing countries in the world [2]. Until 2013, only 17.1% of Nepal's population resided in 58 designated urban areas. The designation of 159 local bodies as municipalities in 2014/ 2015 led to more than 40% of Nepal's population residing in 217 designated urban areas [3]. Land development acts as an alternate solution to a needed change in lifestyle. In Nepal, three forms of land development have so far been adopted which are Site and Services, Guided Land development (GLD), and Land Pooling (LP) as an attempt to control the haphazard unplanned growth of the cities and provide a planned space with the provision of basic infrastructure and services. In Kathmandu, all three of these land development tools have been tried with mixed success. Among these three, Land pooling has been considered the most effective of all so as to achieve well planned urban land, facilitated with necessary infrastructure and services. One of the most used land development techniques in Nepal is Land Pooling. It has emerged as a de facto urban land development technique for planned urban growth [4]. It is a technique for managing the planned development of urban fringe lands, whereby a government agency consolidates a selected group of land parcels, and then designs, services and subdivides them into a layout of streets, open spaces, and serviced building plots, with the sale of some of the plots for cost recovery and the distribution of the remaining plots back to the landowners to develop or to sell for development [5]. Land Pooling as a technique for urban renewal is becoming a fast-growing technique worldwide to achieve effective, unbiased, and sustainable urban development [6].

In the case of Nepal, land pooling is one of the fields which has good potential both in terms of development of the urban areas, by providing developed land parcels and improved infrastructure and services, and also a security of return of investments by generating revenue from sales plots. In most cases, municipalities lack a reliable partner that has both the technical and financial backstopping for such projects. Following the success of such attempts inside the valley, the practices are now being initiated throughout the country, without paying attention to the prerequisites for such endeavors.

1.2 Study Area

Deukhuri valley refers to the stretch of plain lands in between Dandwa range that border India to the South and Dang subrange to the North, situated in Dang district. It covers an approximate area of 600 sq. km and is characterized by Rapti river flowing approximately E-W through the valley. This area was designated as the provincial capital of Lumbini Province on 6th of October, 2020 [7], satellite image of which is shown

in figure 1.

Figure 1: Satellite map of the study area [8]

1.3 Problem Statement

Land pooling projects are sensitive and require significant government investment and cooperation from landowners. They are based on the reimbursement of infrastructure investments through the sale of plots, often in urban areas. Most of the land pooling projects are concentrated inside the Kathmandu Valley, out of which, few projects have been completed on time. Projects are expected to be completed 5 years from approval, but only 4 of 21 projects have reached this goal. All other completed projects took between 7 and 12 years to reach completion [9]. Ongoing projects have been underway between 12 and 17 years, and some are still far from being completed [9]. The provincial government of Lumbini Province has initiated numerous land pooling projects in the Deukhuri Valley to develop the provincial capital. However, there is skepticism about the successful implementation of these projects, particularly regarding the self-sustaining nature of the tool, economic viability, and community acceptance.

1.4 Objectives

The main objective of the research is: To determine the suitability of land pooling as a tool for land development in rural context The specific objectives are:

a) To identify existing policies for the implementation of LP

b) To understand the communal sensitization and acceptance in regard to the proposed land pooling projects in Deukhuri Valley, Dang.

c) To examine the economic self-sustainability of the land pooling project

2. Literature Review

2.1 Land Pooling

In response to the pressing demand for adequate housing with well-developed urban infrastructure, the conservation of valuable agricultural land and the environment, land consolidation, and planned urban expansion, municipalities facing resource constraints have turned to the concept of land pooling (LP) as a solution. This urban development technique involves the transformation of diverse and irregular land parcels within a specific area into fully developed residential plots, complete with essential amenities such as roads, drainage systems, water supply, and communal spaces. While the compulsory acquisition of land can be cumbersome, leading to the displacement of local residents and extended timelines, adopting the land pooling/readjustment approach proves more effective in generating resources for infrastructure development in peri-urban or developing areas. Additionally, this method is gaining traction in construction projects that require the acquisition of large land areas. The concept of land pooling or readjustment holds a significant historical background, with its roots tracing back to President George Washington, who utilized this approach in 1791AD to reach an agreement with landowners for the development of the city that now bears his name [10]. The inception of a legal framework for land pooling took place with the Lex Addickes in Frankfurt-am-Main, Germany, in 1902AD [11]. Land pooling serves as a vital method for managing urban land, especially in areas prone to urban sprawl in the absence of proper planning. Its primary goal is to transform irregularly developed land parcels into suitable forms in alignment with town planning requirements [12].

2.2 Land Development in Rural Areas

2.2.1 Land Consolidation

[13] has defined the land consolidation as the formation of single or individual farms which have enough size, structure and suitable for productive use. Land consolidation means landowner gives up their scattered parcels in order to get an equivalent area or value of land in fewer or more continuous parcels [9]. Similarly, [14] pointed out that land consolidation is a strategic adjustment of ownership patterns and parcels, enhancing farm structure and infrastructure like drainage networks, irrigation systems, and roads for agricultural development.

2.2.2 Community Land Cooperatives

The fear of displacement of livelihood means in rural land conversions is a major concern. Community land cooperatives model has been effective in addressing this issue. In urban-sponsored developments, rural villages tend to cooperate more when bottom-up institutional changes are initiated in their best interest [15].

3. Methods and Procedures

3.1 Conceptual Framework

The framework designed in accordance to the objectives has been presented in Table 1. The variables need to be addressed to fulfill the objectives has been presented along with the probable data sources to acquire it.

Table 1: Conceptual Framework

Main Objective	Specific Objective	Variables or Research Questions	Data Sources
To determine the suitability of land pooling as a tool for land development in the rural context	To identify existing policies for the implementation of LP	• Types of rural land development strategies • Socio economic factors related to rural lands National and international initiatives	• Literature Review Case studies
	To understand the communal sensitization and acceptance in regard to the proposed land pooling projects.	• Community's perception • Social sustainability • Land Use of Study Area • Attitude and behavior related to the initiation of Land Pooling	• Map Study/ Satellite images • Questionnaire Survey • Literature • Stakeholder Analysis • Qualitative observational data collection
	To examine the economic self-sustainability of the land pooling project	• Land Value • National and international case studies • Existing economic policy framework in land pooling	• Key Informant Interview • Rural Municipality profile and data • Policy review • Quantitative observational data collection

3.2 Data Collection Methods

3.2.1 Primary Data Collection

1. Site Observation The selected site was ward number 4 of Rapti Rural Municipality the map to which is shown in 2. The researcher was engaged in field observations to gain firsthand insights into the current land use patterns, agricultural practices, and infrastructure conditions in the area and land value data. Observations provided valuable context and provided support the interpretation of interview data.

2. Structured Questionnaire The structured questionnaire method was used to collect the insights of the concerned stakeholders. The following are some of the questions asked in order to get insight into the communal perspective in regard to the land pooling.

   (a) Does your land have access to roads? If yes, which type?

   (b) What is your perception towards the initiated land pooling?

   Sample size was determined using sample size calculator. The total HH of Ward no 4, Rapti Rural Municipality, Dang was 1509 for 15.24 sq.km. The study area under this research was found to be 455 HH. Due to social constraints and lack of respondent's positive attitude towards Land Pooling, only 137 samples were taken for the questionnaire survey.

Figure 2: Site Area

3. Key Informant Interview Key Informant Interviews (KIIs) are a qualitative research technique commonly used in urban planning to gather in-depth insights from individuals who possess specialized knowledge or expertise about a particular topic. These individuals are often considered "key informants" due to their roles, experiences, or positions that make them well-informed about the subject being studied [16]. In this case, the researcher conducted KII with ward president Mr. Bir Bahadur Chaudhary and an undisclosed project official, who were asked questions regarding public perception and obstacles in implementation of the land pooling projects.

4. Focus Group Discussions A Focus Group Discussion is a qualitative research method that involves a small group of participants who engage in an open and interactive discussion about a specific topic [17]. In urban planning research, FGDs are often conducted to gather insights, opinions, and perspectives from diverse stakeholders such as residents, experts, policymakers, and community members. The outcomes of FGDs can provide valuable qualitative data that can complement and enhance the understanding of urban planning challenges and solutions. Figure 3 represents an instance of such discussion organized in regard to discussion about land pooling in the site area.

3.2.2 Secondary Data Collection

The researcher studied about the study area secondarily using various sources, such as:

Figure 3: FGD organized in ward no. 3, Rapti Rural Municipality

a) Policy Documents

b) Google Maps

c) Periodic Plans

d) Village profile

4. Results and Findings

4.1 Site Observation

The observation of the site provided insights into valuable data regarding the land value. A tentative plot size was selected to carry out more specific analysis on the various parameters of land pooling. A block plan was also prepared. The existing infrastructures were also recorded to tally the land price scientifically. A detailed estimate for the development of infrastructures in the area was done for the financial analysis. The cost was estimated using the latest district rates. The total cost for the development of roads, water supply, sewer network and electrification on the plot was calculated to be around **NRs. 2,469,716,446.69 (In words: Two billion Four hundred Sixty Nine Million Seven hundred and Sixteen thousand Four hundred Forty Six rupees and sixty nine paisa)** and is shown in Table 2. Table 2 was used to

Table 2: Summary of Cost

S.N.	Particulars	Amount
	INFRASTRUCTURE COSTS	
A	Road	671,222,054.06
B	Water Supply	12,820,680.73
C	Sewer Network with MH per 50m	1,075,402,424.81
D	Electrification	37,358,575.21
E	TOTAL INFRASTRUCTURE COST (A+B+C+D) :	1,796,803,734.81
E	Provisional Sum (PS)	5,909,000.00
	Grand Total with contingencies and VAT	2,469,716,446.69

determine the sales plot required to create a self-financing system within the site abiding by the guiding principles and policy. It was found that 58.45% average contribution of land was required. This was way more than what the local people had anticipated.

4.2 Key Informant Survey and FGD findings

The interviews shed light to following:

a) One of the main reasons for the dissatisfaction of the local people towards the project is the lack of trust towards it, and the subsequent unstable nature of the government itself.

b) There was the implementation of land moratorium for the past 2 years, and the initiation of the intended land development scheme was late.

c) The financing mechanism is based on the expectation of the provision of grants to the Project Infrastructure Development Authority by the provincial government through multiple sources, i.e, there is no allocation of funds for the complete application of the projects.

d) The lack of awareness and poor education status is also responsible for the opposition by the local people.

The researcher was a participant in FGDs organized by the local government, in coordination with the **Provincial Infrastructure Development Authority** with the concerned landowners and stakeholders related to the initiated land pooling schemes, who expressed their opinions as follows:

a) There is a hoax spread that the government intends to conduct forceful acquisition of the lands.

b) The sensitization programs have majorly focused on the local leaders rather than the actual land owners.

c) People are skeptical about the government's intention owing to the delay in project initiation and improper sensitization.

4.3 Questionnaire Survey Findings

4.3.1 Demographic Data

Out of the 138 respondents, 65 were female and 73 were male. Similarly, 32 of the respondents were found to have age between 20 and 30. Similarly, the number of students older than 30 and younger than 40 is 37. 34 of the respondents were over the age of 40 and less than 50, 34 of them were over 50 and 3 of them were over 60. In regard to the education status, 73% had education lesser than primary, 18% had primary upto SLC and very less numbers with higher secondary and more. Although, most of the residents of the Rural Municipality are involved in agriculture, in the case of this project area, there were same number of families based on jobs and agriculture among the respondents. Only about 14 households were involved in business. The following graph summarizes our findings. In terms of earnings, most of the families involved in agriculture earned Rs 30000-40000 monthly. The same goes for families involved in business and jobs. The data regarding the family size is presented in figure 4

4.3.2 Land Data

In regard to the knowledge about Lumbini Lumbini Capital City Master Plan and Land Development Plan, it was found

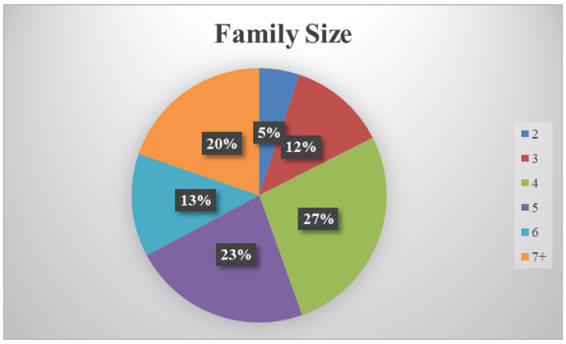

Figure 4: Family size distribution

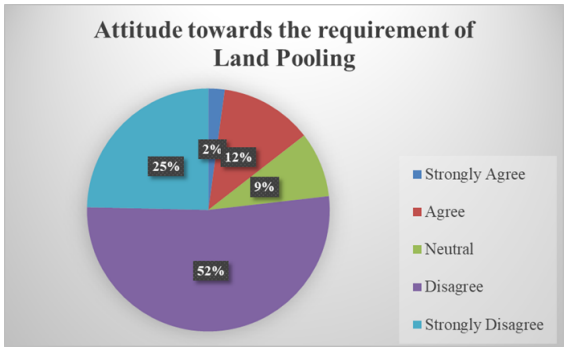

Figure 6: Attitude towards land pooling

that 96 out of 137 respondents had an idea about the prepared Master Plan of the Lumbini Capital City Master Plan along with the Land Development Plan implementation by the Provincial Government. Regarding the land frontage,the data is shown

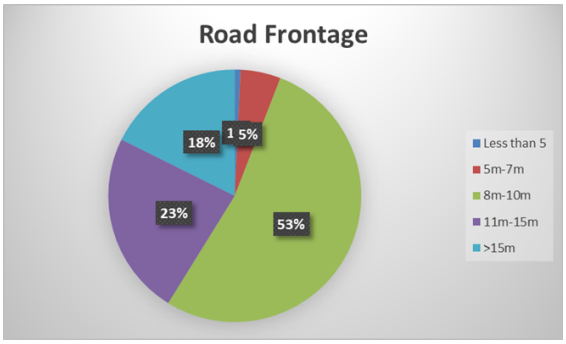

Figure 5: Road Frontage

in figure 5. The road access to the land was not satisfactory. About 5 of the respondent's land had access to black-topped roads, and about 2 of them had only walkable roads. Similarly, 53 of the respondents had access to gravel roads and 77 of them had access to earthen or RCC roads. The survey found that 55 respondents bought land, while the rest inherited it. Only 15 households had certificated house plans, and none had problems with water logging or landslide.

4.3.3 Perception Data

Most of the respondents had an idea about what type of land development tool Land Pooling was, owing to the sensitization and introduction attempts made by the concerned bodies. More than 75% of the respondents had an idea about it, while the rest had never heard about it. One of the most important questions asked during the survey was whether you are in support or oppose of the land Pooling initiation, response to which is shown in figure 6 The respondents were also asked whether or not where they willing to contribute their land for the land pooling project. Most of the respondents were not willing to contribute land for the sake of investments in infrastructure development. The reasons presented by them was skepticism towards the government, to have as much land as possible for agriculture purposes etc.

5. Conclusion

This research aimed to assess the suitability of LP as a land development tool in rural contexts, with a specific focus on the Deukhuri Valley. Regarding the policies governing land pooling in Deukhuri Valley, it was found that minimum 12 dhur of plot size was to be maintained for all the landowners. The roads also ought to be planned in accordance with the provincial capital master plan which requires several wide roads in certain intervals, which in turn will affect the land contribution more. Regarding the perception of land pooling on the local landowners, it was found that most of them showed skepticism and distrust towards the project and were opposed to the implementation. The data is based on the questionnaire survey, KII and FGDs. The major reasons for the distrust are:

1. **Trust and Government Stability:** Dissatisfaction among local residents in the Deukhuri Valley toward LP projects primarily stemmed from a lack of trust in the government and concerns about its stability. The implementation of a land moratorium and delays in project initiation exacerbated these issues.

2. **Fear of displacement:** The survey showed that the economic status of the residents was not satisfactory, and the major source of income was agriculture. The locals feared that their agricultural lands would be replaced by residential plots, casting doubts over the means of income. Similarly, lack of awareness fueled the hoax that state that the government would take the land forcefully later on.

3. **Awareness and Education:** Limited awareness and low levels of education among local residents contributed to opposition to LP initiatives. Sensitization efforts often focused on local leaders rather than landowners, contributing to misunderstandings.

4. **Land Pooling Support:** Most respondents disagreed with the concept of LP for developing their lands, citing skepticism toward the government and a desire to retain land for agricultural purposes.

6. Recommendation

Despite the challenges, LP remains a viable strategy for planned urbanization and infrastructure development in Nepal. To ensure its success, several recommendations can be made:

1. **Community Engagement:** Effective and targeted community engagement programs should be developed to inform and educate landowners about LP projects, addressing their concerns and fostering trust in the government's intentions.
2. **Financial Planning:** A more robust financial plan that includes clear allocation of funds for LP projects should be established to ensure their self-sustainability and timely completion. For that, extensive subsidies need to be provided by the government for the infrastructure development, rather than basing all the expenditure on the expected income through the sales plots.
3. **Transparent Policies:** Clear and transparent policies for LP implementation should be developed, taking into account the specific needs and circumstances of rural areas.
4. **Local Capacity Building:** Efforts to enhance local capacity in project management and implementation should be prioritized to ensure successful LP projects in rural contexts.
5. **Adaptation to Local Context:** LP projects should be adapted to the unique characteristics and needs of rural areas, considering factors such as land use patterns, agricultural practices, and community dynamics.

In conclusion, while challenges exist, LP remains a valuable tool for land development in Nepal's areas. With careful planning, transparent policies, and effective community engagement, LP can contribute to well-planned urban growth, improved infrastructure, and enhanced living standards for the residents of Deukhuri Valley and similar regions in Nepal. Similarly, the government might also need to reconsider the alternative to LP in the cases of rural areas of the country. Techniques like land consolidation and community land cooperatives can be used to convert the unplanned rural areas into well planned agricultural zones, rather than urban space abruptly.

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