

Community Participation Approach for Land Adjudication; an Innovative Approach for Digital Cadastre in Nepal

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Key words: land adjudication, community participation approach, digital cadastre, institutional framework, land dispute, norms and value, land administration

SUMMARY

In Nepal due to secured life and opportunity for employment people are migrating from rural area to urban area. The population of urban area is increasing day by day. The price of land is increasing very high in urban and peri urban area of Nepal. There is importance of one inch of face length of a parcel of land which is near the road or highway. The existing cadastral maps cannot reflect the real situation of parcel boundary on the ground as they are very old (in some place island maps), have of small scale and the parcel boundary on map and field is different. Land owner are not satisfied with these cadastral documents and asking for reliable cadastral information. There is worthless to make the digital database with these erroneous documents. Hence Cadastral Survey Branch of Survey Department has started Numerical Cadastral Mapping (NCM) method for data acquisition in urban areas for the creation of digital cadastral database. During NCM, it was found that the boundary of parcel on land and map is different in most of the places. People are occupying and constructing houses without caring much on these cadastral documents. Due to the norms and value of the society people are satisfying with their occupying. In re-cadastral mapping works, if surveyor follows the existing cadastral maps it will take lots of time to adjudicate a single parcel boundary on the ground. Hence for the land adjudication, an innovative approach has followed for numerical cadastral mapping in Nepal.

This paper first starts with introduction and describes about the evolution on Nepalese cadastre starting from rudimentary cadastre to digital cadastre. It then describes about the existing institutional framework for cadastral mapping and land registration as well as cadastral processes in Nepal. It then elaborates the piloting of digital cadastre and an innovative approach for land adjudication in Nepal for numerical cadastral mapping. It also describes some typical cases of norms and values of the society which the authors have noted during field survey. Finally, this paper concludes with some conclusions and recommendations.

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1. INTRODUCTION

Land is the prime resource of livelihood for almost eighty percent of the Nepalese people. Each individual is some how or other attached with a land parcel. Therefore the administration and management of land is the main concern for Government of Nepal for economic growth and sustainable development. The Ministry of Land Reform and Management (MLRM) is responsible for the administration and management of land through its central Departments and District Offices. Survey Department is responsible for the initial land registration and cadastral surveying. Cadastral Survey Branch under Survey Department is responsible to carryout adjudication of land ownership rights, identify and survey land parcels and owners, prepare cadastral maps, classify land, prepare and issue the land ownership certificates. For cadastral mapping, the plane tabling method is used and the graphical cadastral maps are not adequate to reflect the real situation of parcels in the urban areas. Due to the high value of land in urban and peri urban areas of Nepal, land owners are not much satisfied with these cadastral products and asking for reliable cadastral information. There is importance of even one inch of face length of a parcel of land which is near the road or highway. Hence Cadastral Survey Branch of Survey Department has started Numerical Cadastral Mapping (NCM) method for data acquisition in urban area for the creation of digital cadastral database. The boundary of parcel on land and map is different in most of the places. The existing cadastral maps cannot rectify the exact position of parcel boundary on the ground. People are occupying and constructing houses without caring much on these existing cadastral documents. Due to the norms and value of society people are satisfying with their occupying. In re-cadastral mapping works, if surveyor follows the existing cadastral maps it will take a lot of time to adjudicate a single parcel boundary. Hence for the boundary adjudication, an innovative approach has followed for numerical cadastral mapping in Nepal.

1.1 Evolution on Nepalese Cadastre; From Rudimentary to Digital Cadastre

In Nepal, Land Recording and Cadastral System have evolved through a long history. There are evidences of grant lands being recorded during Lichchhabi era (400- 750 A.D.). Later, in the Malla era King Jayasthiti Malla (1323-1385 A.D.) made some efforts on land related activities like classification of lands, specification for land measurements, development of special profession for land survey and measurement (Dangol) (Paudyal, 2005). Ram Shaha (1606-1636 A.D.) introduced land adjudication and boundary description of land. The unit of measurement of land was defined as *hale, kute, kodale, mato, muri, bijak, mana* etc. Similarly Prithivi Narayan Shah (1723- 1775 A.D.) introduced land recording system for tax purpose and established tax collectors and land recorders in district level (Shah, 2000). In 1873, the

chain survey method was introduced for measurement of valuable lands in terai regions and some part of hilly areas. In 1923, the plane tabling technique was introduced in Bhaktapur District for cadastral surveying by militaries. Since 1939, civilians had been trained and attached to militaries to prepare cadastral maps (Acharya, 1992). After the introduction of the first Land (survey and measurement) Act in 1963, a systematic adjudication and cadastral mapping (graphical method using plane table) was started in 1965 with local control points to support land reform programme. There are 38 districts, out of 75 having such island maps and remaining 37 districts are based on National Geodetic Control points. The cadastral survey of the whole country was completed in 1998 and resurvey has been started in the district having island maps. The cadastral mapping on this resurvey is very slow due to the complicated procedures for mapping and budget constraints. The landowners are also not much satisfied with this resurveying. The maps prepared by Survey Goswara do not reflect the real field situation. To move towards the digital environment also there are a lot of technical problems. Due to the increase in population and great demand for land market, people are asking for updated and reliable land information. The policy makers are asking about the justification of resurvey. In the FIG and GSDI arena also the importance of reliable cadastral information is one of the important agenda. The cadastre 2014 report of FIG also has given the vision for next decade's cadastre. There is no more use of pencil and paper for cadastral mapping after 2014. Considering these facts the Survey Department has undertaken a number of initiatives/activities to modernize its cadastral activities. Recently, Cadastral Survey Branch under Survey Department has prepared a proposal for new innovative approach for cadastral mapping and the proposal has been approved by National Planning Commission. Numerical Cadastral Mapping (NPM) method has been used for piloting to prepare digital cadastral database. Though, the piloting is running on some very successful results have come out during different cadastral processes. One of the first and important cadastral processes is boundary adjudication. This paper describes about the innovative approach for boundary adjudication and its outcomes.

2. INSTITUTIONAL FRAMEWORK AND CADASTRAL PROCESS

Ministry of Land Reform and Management (MLRM) is responsible ministry for overall land administration & land management in Nepal. There are three departments (Survey Department, Department of Land Reform and Management, Department of Land Information and Archive), one Training Centre (Land Management Training Centre) and one Trust Corporation that are involved in the land administration and management in Nepal. Survey Department has three Branches (Geodetic Survey Branch, Cadastral Survey Branch and Topographical Survey Branch) and 83 Survey Offices. The Cadastral Survey Branch has nine mobile Survey parties which are called Goswara. The Goswara conducts the Cadastral Survey and after completion of Cadastral mapping work in the district it hand over the field books and maps to District Survey Office and other land records to District Revenue Office of Department of Land Reform and Management (Acharya, 2003).

In Nepal, there is complete cadastral coverage of whole country leaving some governmental/public lands and village block areas. The purpose of initial cadastral mapping

was only fiscal to collect revenue. Later legal cadastre was developed. Now the concept of multi-purpose cadastre has developed. Due to urbanization, the land value has increased and agricultural land has developed as a residential land. The quality of maps is very poor due to the continuous used of map sheets. Hence, according to the Nepalese legislation the resurvey should be done in every 20-25 years. The following are the main reasons for resurveying (SD, 2004).

- There is difference between occupying area and map area
- In Island maps the errors are kept on the margin of boundary and governmental lands
- There is mistakes on attribute information and need to be corrected
- There are gaps and overlaps in the existing cadastral maps and now the land value of those areas is very high
- The information about government land, trust land and public land is not recorded properly on the existing cadastral maps
- Due to the land value, the land dispute was occurred for one inch of land boundary and the existing cadastral maps cannot rectify it
- For the development of National Land Information System there is a need to connect island maps with National Geodetic Control network
- The maps are not updated according to the infrastructure development and natural land escape change

The followings are the main cadastral process for initial land registration (Tuladhar, 2005)

- Cabinet decision and published in the Gazettes about cadastral mapping of certain area
- Notification by means of national newspaper, radio and television
- Control Survey, Adjudication, Demarcation, Land Classification and Cadastral Mapping
- Preparation of cadastral maps and field books
- Notification to the land owners about the area and other attribute information of their lands (Allow seven days time for objection, appeal and rectification)
- Land registration
- Preparation of land registry data and other statistical data
- Land ownership certificate distribution
- Handover land registers to district land revenue office for further land transaction and levying tax
- Establishment of district survey section for maintenance of cadastral maps

3. PILOTING OF DIGITAL CADASTRE

For piloting of digital cadastre, ward no six of Banepa Municipality, Kabhrepalanchok district has been selected. The area is newly developed area near Arniko Highway having very high land value. The study area is situated 20 Km far from Kathmandu, the capital city of Nepal. The following are the main reasons to select the study area for piloting.

- The area is easily accessible from head quarter for monitoring and supervision.

- The existing cadastral maps are very old and the quality of maps is in wear and tear condition and the parcel boundaries on the maps are not clear.
- There was change in the landscape of study area which has not updated on the cadastral maps.
- The scale of existing cadastral maps is small in comparison to the land value of study area. The existing graphical cadastral maps do not reflect the real field situation.
- The ward is small (approx 30 hectares) and ward is the smallest administrative unit for cadastral mapping according to the legislation of Nepalese cadastre.
- The land owners are demanding for resurvey to improve the quality of cadastral maps.
- The Municipality was ready to cooperate for cadastral survey; they need updated cadastral maps for development activities and taxation.
- The land owners were very much enthusiastic and ready to co-operate for cadastral mapping.

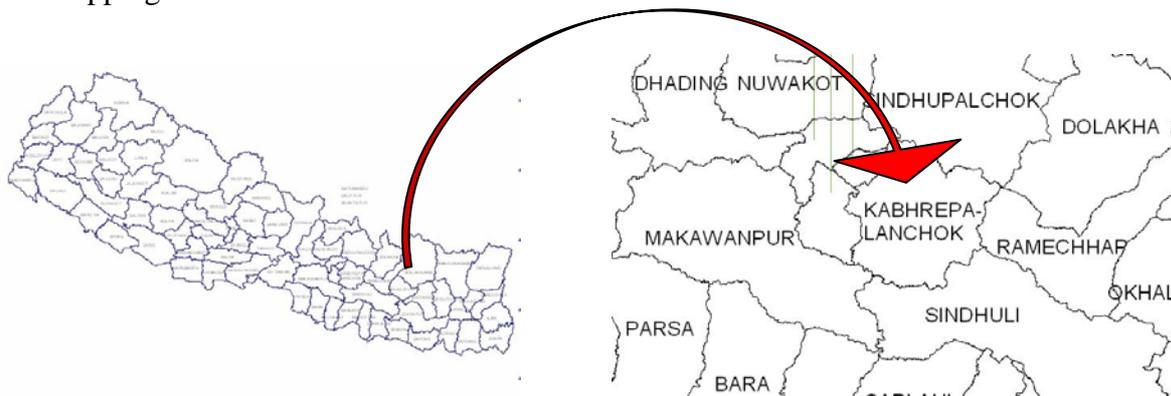


Fig 1: Location of piloting area (Banepa Municipality ward no 6, Nepal)

A field team lead by survey officer with four surveyors was deputed to carry out the numerical cadastral mapping in ward no six of Banepa Municipality. The team made a proper plan before leaving for field work. All the necessary equipment and data were collected from Cadastral Survey Branch. The Description Cards (D-Cards) and coordinates of existing geodetic control points were collected from Geodetic Survey Branch. The existing cadastral maps and land records were collected from District Survey Section, Land Revenue Office and Municipality. A round table discussion was organized with the personnel of Banepa Municipality for funding and other logistic support. A camp office was set up for carrying out the field survey. First a notice with detailed schedule was published before starting the field survey.

Basically two types of field survey were performed. First the control survey was extended starting from existing national geodetic control points situated near Banepa Municipality. All necessary control points were established and checked the accuracy. After control survey, the adjudication team delineated the boundary of each of the parcels. A coordination committee was formed to assist for adjudication. The coordination committee was composed from the land owners involving respected persons and social workers of the community. Boundary

Marks (Wooden Peg or Permanent Pillars) were placed at each of the turning point of the boundary lines of the parcel. The boundary of each of the parcel was delineated in the presence of local peoples and adjoining parcel owners. A field *muchulka* was prepared after the boundary demarcation. The parcel mapping was done with the help of total station. Other necessary details were also captured during the parcel mapping. A sketch of each of the parcel was made in the field. The attribute data about the ownership was also collected from field and varied with existing data. The data were transferred to the computer (laptop) in every day. In office the digital cadastral database was created.

4. COMMUNITY PARTICIPATION APPROACH FOR LAND ADJUDICATION

The word adjudication was first used in 1950's to describe systematic ascertainment of rights in lands (Lawrence, 1985). According to the FIG definition" Adjudication is the formalization of unwritten evidence of ownership into sworn written statements to be legally recognized as documentary proof of ownership (FIG, 1996).

Now the parcel boundary adjudication is becoming one of the main cadastral processes for land registration. The function of land adjudication is to resolve disputes and uncertainties pertaining to who owns what property, it may focus solely on problems that exist when property is first formalized but in some jurisdiction it is also involved in many problems that arise after formalization (Dale and McLaughlin, 1999). There are total sixty four acts which are directly or indirectly related to the land administration in Nepal (Sharma, 2002) and according to the Nepalese jurisdictions, adjudication is the first cadastral process to confirm the ownership of lands and delimitation of parcel boundary on the ground in resurveying. In most of the cases, the parcel subdivision was done by surveyors without visiting the field. The location and area of parcel on the maps and the same occupying on the ground do not match. In city area, the population has increased rapidly and the value of land has increased day by day. On the cadastral mapping, if surveyor follows the existing cadastral maps, not a single parcel will exactly match with the field reality. Hence, an innovative approach of public participation and their active involvement was followed for boundary adjudication and cadastral mapping. The land owners were gathered and formed a cooperation committee involving most of the respected persons of the community. The boundary disputes were solved by their mutual understanding and moderate by these community members. The field team and representative from municipality were also involved during land adjudication.



Fig 2. Community members are involving for adjudication in the field (left photo) and land owners are pegging wooden marks on boundary lines after adjudication (right photo)



Fig3. Surveyors with total station for numerical cadastral mapping (left photo) and district cadastral office surveyor is adjudicating encroached governmental land (right photo)

The following are the main activities done during land adjudication.

- Notification by letter for public campaign and discussions
- Public campaign and open discussions
- Formation of cooperation committee
- Notification about the cadastral survey site
- Collection of records/ proofs
- Adjudication of Public and Government land (In the presence of Municipality and District Cadastral Office representatives)
- Adjudication of private and other lands
- Dispute resolution by agreement
- Make agreement between adjoining parcel neighbors and record their signature on field record termed as *muchulka*
- Demarcation of parcel boundary with boundary marks
- Allow time for objections, appeals, and the rectifications on land adjudication

- Cadastral mapping and Land registration
- The procedure for boundary adjudication is shown in the Fig 4.

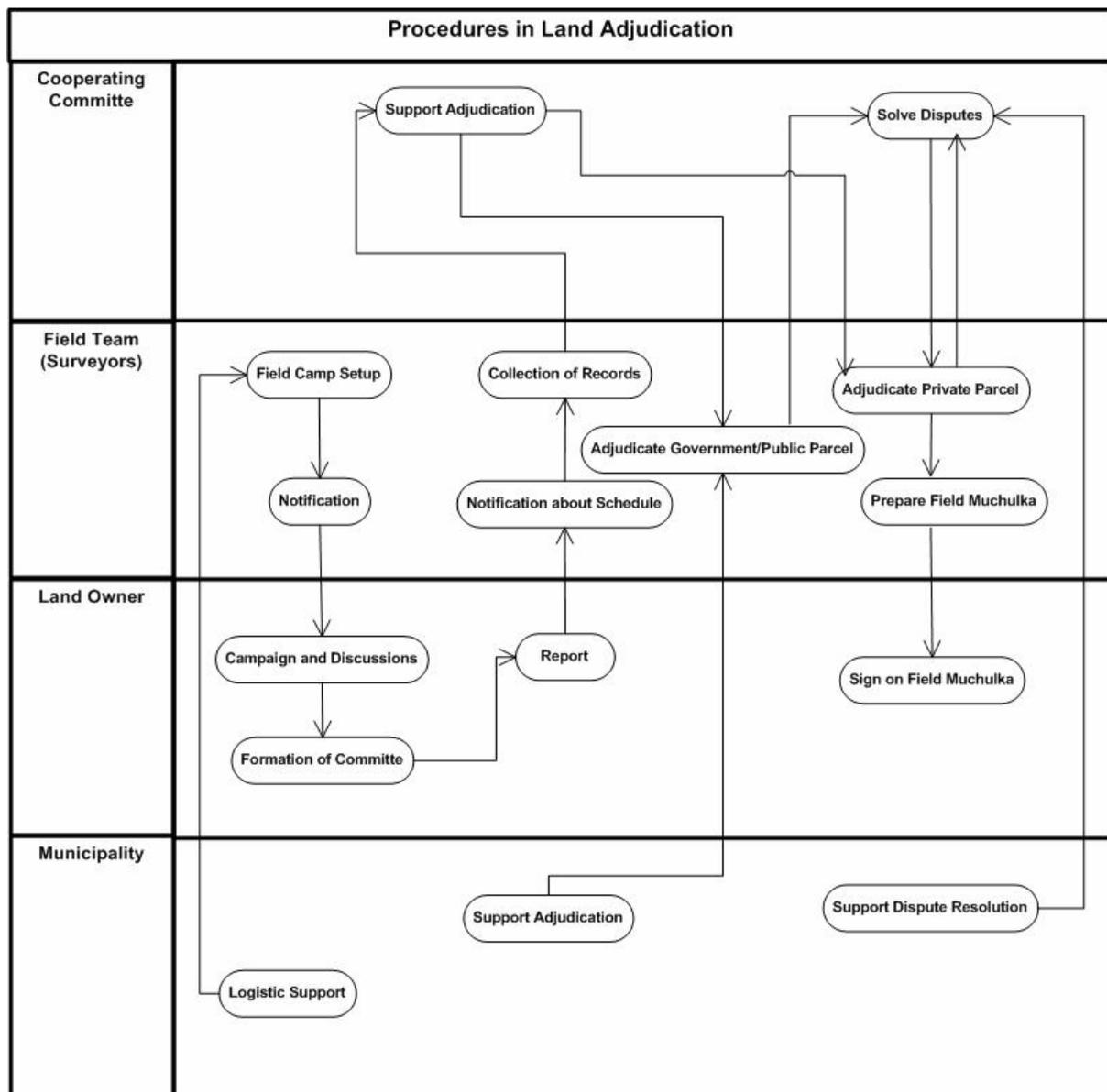


Fig 4: Procedures in Land Adjudication

5. TYPICAL CASES OF NORMS AND VALUE OF THE COMMUNITY

During adjudication process typical norms and value of the community was noted. The following are a few examples.

- The land owners' believe more to the local chief person of the community. The local chief person is very good mediator during resolution of boundary disputes.
- The rivers and stream has changed their course. Specially, in the rainy season due to the high flood all the boundary lines of the parcel have dismissed. They do not use the cadastral documents for relocate boundary. The parcel boundary is demarcated according to the mutual agreement and understanding.
- The land owners believe that if stream or river has encroached their land and some land has left on another side of stream/rivers they will not claim their land crossing the rivers. They do not use the cadastral maps for demarcation of their boundary. They assume that the river is the boundary line. If the river/stream will leave the land, then only they reoccupy their land. Hence, the concept of 4D cadastre is necessary.
- The local news papers, cable televisions and drama are found very suitable tools for notification and awareness about land adjudication and cadastral mapping to the land owners.
- The land owners' believe more to the district cadastral office surveyors rather than the surveyors from central office. During boundary adjudication, the surveyors from district cadastral office need to be deputed.
- The community driven approach is found more suitable for boundary adjudication and cadastral mapping rather than rigid administrative approach.
- The cases of boundary disputes are psychological rather than physical. Hence, most of the boundary disputes can be resolved during adjudication.
- In some cases, the respected person of the society use Dharma, religious oath, to produce the truth.
- The municipality is found more aware for the protection of government land and public land. They have developed certain rules to provide construction permit for house construction. They have developed the rules respecting the norms and value of the society.

6. CONCLUSIONS

Parcel boundary adjudication is the main cadastral process in land registration. The important of adjudication is in the first cadastral mapping as well as resurveying. Due to the high value of land in urban area, the cadastral maps are not adequate to reflect the real situation of parcel boundary on the grounds. In Nepal people are constructing houses and occupying their land much caring on the existing cadastral documents. At the time of parcel subdivision also surveyor subdivides the parcels without visiting the field. Hence, the parcel boundary on maps and fields are not exactly matched with each other. A piloting of digital cadastre has done for high accuracy cadastral mapping in urban area of Nepal for the creation of digital database. The community participation approach has followed during numerical cadastral mapping. The approach is found very suitable and successful for parcel boundary adjudication and boundary dispute resolution. From piloting, it can be concluded that the formation of coordination committee from the members of community for boundary adjudication and parcel mapping is an innovative approach for cadastral mapping in the urban areas of Nepal. The provision of preparation of field muchulka and boundary demarcation

with temporary/ permanent boundary marks makes the adjudication and cadastral mapping process more transparent and people centric.

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BIOGRAPHICAL NOTES

Dev Raj Paudyal (36) is a Survey Officer in Cadastral Survey Branch, Survey Department, Nepal and part-time Faculty Member in School of Environmental Management and Sustainable Development (SchEMS) under Pokhara University. He has Completed M. Sc. Degree in Geoinformation Management (GIM2) from ITC, the Netherlands. He had worked in Remote Sensing Section of Topographical Survey Branch and as a Team Leader in GPS survey for “Nepal - India Boundary Survey” works. Now he is working in the digital cadastre section of Cadastral Survey Branch. He has 10 years of professional experience and about 10 publications in GI domain. His research interests are Land Administration and SDI.

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