

Ups and Down of Nepalese Cadastre

Punya Prasad OLI, Nepal

Key words: Cadastre, Land Registration, Adjudication, Cadastral Resurvey

SUMMARY

Nepal is famous for its biodiversities and natural beauty. Its future lies on the proper and wise exploitation of natural resources.

Land administration was carried out on the basis of land records "Lagat" which were prepared by land lords on the basis of survey of land without map since 1380 till 1964. These records, located at the centre and local land revenue offices and updated annually. Although cadastral survey started in 1930s and systematic survey was completed of Kathmandu valley and some terai districts by 1938. The lack of confidence on adjudication of these surveys, the field books were destroyed and fresh survey started.

Various legal measures including land reform, provision of land to landless and protection of right of tenants and land ownership initiated in 1964. Systematic cadastral survey of cultivated land of the country commenced in 1964 and completed in 1998. Existing records were replaced as and when cadastral survey completed of the area. Land owners were provided with land certificate which will assist to receive all the facilities that a citizen entitled to receive.

It also has least per capita agricultural land. Sustainable development and conservation of environment and natural resources necessitated the complete cadastral survey and record of the forest, pasture, mountains and improvement of cadastral survey system.

In this article, it is briefly described the initiation of cadastral resurvey, digitization of existing maps and digital cadastral mapping programmes of Nepal despite political agitation and corruption, and inadequately educated staffs.

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1. DEFINITION OF TERMS

European Union and UNECE, Meetings of Land Administration (MOLA) accepted the term Cadastre and Land Administration as synonymous term.

The UNECE MOLA defines the Land Administration / Cadastre as ". the process of determining, recording and disseminating information about the tenure, value and use of land when implementing land management policies" (UNECE, 1996). In this context, land administration is considered to include land registration, cadastral surveying and mapping, the fiscal, legal and multi-purpose cadastres and parcel based land information systems, and in many systems, information supporting land use planning and valuation/land taxation systems." And its objectives are as the " the Bogor Declaration proposed the development of "... modern cadastral infrastructures that facilitate efficient land and property markets, protect the land rights of all, and support long term sustainable development and land management". It also established principles for re-engineering cadastral systems. Further it stated that "...The success of a cadastral system is not dependent on its legal or technical sophistication, but whether it protects land rights adequately and permits those rights to be traded (where appropriate) efficiently, simply, quickly, securely and at low cost. However if the resources are not available to keep the cadastral system up-to-date then there is little justification for its establishment." (UN-FIG, 1996)

In Nepal, cadastral survey is understood as mapping , land registration , classification and updating maps and land administration as recording transaction, right and restriction on land and other matters related to land. Various terms are defined mainly on three acts, Land (Survey) Act 2019, Land Reform Act 2021 and Guthi Cooperation Act 2033, Land Revenue Act 2034.

Land Registration is the process interring the name of owner / Tenant of a parcel of land in the field book including, the area , land class and land use.

Adjudication is process of conforming the boundary ownership and use of a parcel in presence of owners of adjoining parcels and local representative and concurrence of the owner and previous records. Mutation (updating of records) - is the process updating maps and records. The plot register (the register which records mutation of the parcels), which may be sub division, consolidation or land pooling process. The land ceiling is maximum and minimum size of as land that the land owner allowed to own and subdivides at the location / region. Parcel is the piece of land having unique owner/tenant, land class and use, and bounded by wall, fence, bond or boudary markers.

2. INTRODUCTION

2.1 Situation in 1960

Prior to 1960s, there was abundant land for agriculture in Terai , the Gangetic basin and Chure region. Resettlement programmes initiated with Malaria eradication. There were attempts to produce cadastral maps of Kathmandu Valley and Terai regions, since 1930s, the cadastral survey was not implemented due to irregularity on adjudication . However land ownership records of all private land was available of the whole country and managed or updated annually by land lords, trust or other private person or organisations. There were problems of exploitation of tenants / farmers by land lords, and economy at the country relied on agriculture. Hence, Land Reform initiated in 1964, protecting right of tenants /farmers, cadastral survey with Land (Survey) Act 2019 in 1962, fixing highest land ceiling , lowering bank interests by less than 10% and cooperative development programmes. The systematic cadastral survey started with plane table and chain survey on flat land producing isle land type cadastral maps and later on telescopic alidade and EDM instruments are used and Geodetic survey Branch established 8 years after the commencement of cadastral survey. The cadastral survey of the whole country completed in 34 years in 1998, 4 years after initial plan.

2.2 Present Situation

By 2000, the situation changed and Nepal is least development country with least per capita agricultural land. The forest land of the countries dwindled , the urban population increased to about 20% and its economy is based on tourism rather than agriculture. After multiparty system 1992, will and wishes of people, party biases, bank interests rate, population, privatization and exploitation of poor and weaker sections increased rapidly. Lack of conservation of natural resources and environment, equitable access and distribution of land and natural resources to all citizens, employment, equal opportunity and good governance resulted Maoist Arm struggle in the country. The land and cadastral records are also the target of political agitations.

The systematic cadastral survey of the whole country completed of agricultural and other land near agricultural area producing cadastral maps 1" = 100' to 1" = 400' or 1:500 to 1:2500 scale as isle land type maps or sheets of maps on the basis of trigonometrical control points . It covered 6.1 millions ha or 41.3% of territory and remaining areas are government forest, pasture and mountain areas which need to survey, register and allow to manage locally or privately. The densely populated areas, areas with dispute of boundary and trust or private ownership which were left during the first survey are also required to resolve, survey and distribute the land ownership certificates.

The urbanisation and development of rural area, necessitated precise survey of parcels with dimensions, determination of area, class and land use of all parcels. Infrastructures and urban development, changes of the ground situation and long usage of maps and records are became less accurate and in same cases fragile. The development of land, planning and security necessitated establishment of LIS of both spatial and attribute data . The land records of

ownership and restrictions are kept and managed by Land Revenue offices, which are also part of attribute data.

This necessitated cadastral resurvey programme and started in 1996. So far, survey one of the district out of 75 districts completed and survey of 9 districts is progressing very slowly.

3. HISTORICAL SITUATION

3.1 Malla Period

The stone inscription of 478 (Sambat 399 Ashad Shukla 10) King Mandev shows the area as "Bhumi" and King Jayasthiti Malla of Kathmandu reformed land administration, defined measurement units and assigned Kshetakar of Dongol caste to carry out survey works in 1378. It was continued till the establishment of civilian Survey Goswara in 1934, where they were converted to chainman. A photo of copper plate of land transferred and its translation attached as Appendix 1.

3.2 Early Shah Period

The King Ram Shah (1536) described in the 9th para, of Rule that land records should record the area in Ropani, Muri etc with four corner posts on the ground of a parcel.

The civil code of 1853, Chapter Land, Para. 38-41, also mentioned the units of area and records keeping of land. During the time various "Sawals " (the manuals) such as Mal Sawal, Napi Sawals were prepared and circulated among the staffs. The land survey were carried out and records(Lagats) were prepared by land lords and up dated annually at the land revenue office located at the district headquarters, and the centre, Kathmandu. A copy of one page of 1913 Land Record of hill area is attached as Appendix 2.

3.3 Cadastral Mapping:-

Cadastre plans were made similar to past cadastral plans using plane table and chains, during 1930 and 1940s A sample cadastral map is attached herewith as Appendix 3.

It is known that maps of valleys and terai region were completed however, these maps and records were rejected due to irregularities of adjudication and, therefore, records were destroyed.

The cadastral mapping was started in 1964 after implementation of the Land (Survey) Act 2019. It produced new cadastral maps and records from 1964 which replaced the existing land records and land administration system district by district and completed the whole country in 1998. During the period of cadastral survey , it produced 82, 528 maps of 6.1 millions hectare (41.3% of the country) of 18.8 millions parcels of 2.9 millions land owners and government and common land. This provided the basis for land reform and freed the farmers from the tyranny of land lords. The farmer as a free person, may sale or mortgage his land, if he wishes and gets all the facilities like other citizen of Nepal.

4. EXISTING CADASTRAL SURVEY (The first cadastral survey and mapping of Nepal)

The systematic cadastral survey of a district carried out after gazette notification, establishment of trigonometrical control points, plotting the control points and mapping, measurement of area of each parcel, classification and registration of land and distribution of land ownership certificates which are summaries as following :-

4.1 Establishment of Control Points

Before 1972, base line (s) established at the middle of area on level ground on each sheet by accurate measurement of tape / chains and other control points extended over the area by plane table intersection/ resection.

The 4th order trig. control points were established at the interval of 250- 1250 m and mainly by resection from the third order trig. points in hill area. The 3rd order points were established on the basis of 2nd order trig. points, which were remonumented and re-observed points and established by Survey of India during 1946- 59 for topographical mapping . The provisional coordinates of all these points were computed for Modified UTM System in Everest 1830 Spheroid. The trig. control points were established by EDM traverses in urban and flat areas.

These points were plotted (pricked) manually at 0.4mm thick polyester drafting film and sent to Cadastral Survey Goswara (Party) with the list of coordinates. The plotted positions were checked by surveyors at office and in the field. Additional points were extended by plane table intersection/ resection methods. The first, second, third and 4th order major points are RCC pre-caste pillars and 4th order pillars are earthen pyramids or GI pipes, buried underground.

The scale of mapping is decided after studying the area by the Trig. Team and Cadastral Party and control points were established so as that at least 3-4 points felt in each sheet. Trig. Team moved to another district leaving few surveyors there to extend control points, if required during cadastral survey.

A triangle of base lines established in the east side of Kathmandu Valley, which was compared to base lines at Dehra Dun, India and Negombo, Colombo, Sri Lanka in 1974.

4.2 Survey of Parcel

The survey-team sent to the Panchayat/VDC or municipality and started their works setting office/camp on the VDC and survey-team provided appropriate allowances and facilities.

The boundary of ward, Panchayat/now Village Development Committee - VDC, and government and common land surveyed in presence of local authorities and adjoining land owners. The boundary of parcel surveyed on presence of land owner, tenant or their

representatives and owners/tenants of the adjoining parcels. In case of dispute, boundary survey carried out also in presence of local representatives and other persons in the site.

After survey, a notice is published and land owners allowed to lodge complaints in 7 days. The land owner /tenants are requested to submit, the copy of existing ownership record and receipt of land tax of current year.

4.3 Land Classification:-

The land classes, which were defined by Land (Survey) Byelaw 2032, define quality of land parcel. It is used to evaluate of land parcel for fixing land taxes, price, rent and valuation of land and other purposes.

The classification was decided on the basis of sample classes of land chosen at district head quarter in presence of district authorities and representatives.

The field team leader (surveyor) classified the land and published notice. The unsatisfied land owner / tenant might lodge complaint and the committee composed of officer of Survey Gosawara (party), local representative and district office would give final decision after hearing opinions of both sides.

4.4 Registration of Unregistered Homestead

The homestead, unregistered and traditionally used for long time also registered to present owner of the homestead as decided by committee of chaired by chief district officer and other members composed of the local and districts authorities and representatives.

4.5 Registration of Floor and Flat

The registration of floor/ flat of building owned by different persons would also be registered as land property. The dimension flood area was recorded. The records were different than other. The tenant of trust land, multiple owners of a parcel and other were also registered in the field book and provided land ownership certificates.

4.6 Field Book and Plot Register

The field book is the register which recorded description of parcels on the basis of parcel numbers, which contains references of previous record, name, address, names of father and grand father, signature of owner / tenant, adjoining parcels, area, land class and use and remarks of tenant and surveyor / changes took place on original parcel. The plot register is the register, which records the changes, the mutation of parcel.

4.7 Updating of Changes

After distributions land ownership certificate and before hand over the records to Land Revenue Office and Survey Section , the changes on parcel is recorded on the plot register kept at the Survey Unit of the party.

4.8 Hand over of Records

The land administration implemented and older land lords, traditional tenancy rights ceded after the 120days of distribution land ownership certifications and handing over records to Land Revenue Office and established Survey Section by transferring the Survey Unit described on Para 5.7 as Survey Section. It was generally transferred during off season in July / August or after completion of a VDC or wards of municipality. The copy of land ownership certificates, called Moth and records of unregistered land / government land handed over to Land Revenue Office and the maps,and Field Books and Plot Registers to Survey Section along with required instruments and furniture.

4.9 Institutional Arrangement

The Departments of Land Reform, Survey, Land Revenue and Cooperatives were under Min. of Land Reform. Cadastral Survey Goswaras were under Survey Department and carried out work as a development programme and each Goswara composed of eight field teams located in VDCs/ Wards of municipality.

The government provided field allowances, modern instruments and facilities to surveyors. The survey team worked as camps. There was a political commitment at all levels and local assistance was sufficient to carry out the works as per schedule. The other main supporting offices were Office of Chief District Officer, Land Reform and Land Revenue.

Land Revenue Office: It carried out land registration work after mutations and land transactions. It also registered the unregistered land and carried out all the land administration works.

Land Reform Office: It carried out the work related to tenancy right and land reform works.

5. RESURVEY

The infrastructures developments, growth of urban centres subdivision to smaller size of parcels, degradation quality of plans and records, plans without control points, lack of updating / present situation of development on maps and rise of prices land necessitated the cadastral resurvey of the country. It was started in 1996 on the basis of national control networks of higher precision and better records to guarantee the ownership with greater precision. There were eight amendments on Land (Survey) Act 2019, and Land (Survey) Byelaw 2058 was reformulated. The following changes made on cadastral resurvey works.

5.1 Trig Control Points

The control points were adjusted to fit to national network system. The precision of control points is also improved to standard which are mainly carried out by EDM traverses and GPS observations. However, proper observation procedure of GPS observations is yet to be prepared. The establishment of control points for cadastral survey of 46 districts are completed and progressing in 5 districts.

5.2 Map Scales

The scale of map is larger and 1:500 at densely populated areas and 1:1250 and 1: 2500 rest of the areas. Experiential digital mapping with total station / EDM measurement and corner national markers is in progress.

5.3 Field Survey

All survey worked based on national control networks using telescopic alidade and staff, and telescopic alidade and tapes in urban areas. They are also preparing parcel plan / sketch map with dimension of four sides of each parcel. However, they are not made by all Survey Goswaras and survey sections. Experiential digital mapping with total station / EDM measurement with corner markers is in progress.

There are only two types of tenancy i.e. land owner and tenant of trust land.

5.4 Correction of the Weakness of First Survey

The field survey process is same as first survey. However, chief survey officer of survey party will rectify the low precision of areas of parcel of previous survey, location changes of infrastructures and may straightened / simplified the boundary of parcels . The land pooling and land consolidation could also be carried out. Some time surveyors have to planned the area for infrastructures and distribute land and land ownership certificates for resettlement or land pooling.

5.5 Survey Section

Apart from the normal works of district survey office, it has to provide information for map updating, preparation of parcel plans/ sketch maps, assists on establishment of LIS in the district. Survey Department is assisting for upgrading the technical situation of the section.

5.6 Institutional Arrangement

All the Departments of Land Reform and Management , Survey, Land Information and Archive, and Guthi Corporation who are related to land administration are under Min. of Land Reform and Management. Cadastral Survey Goswaras are under the cadastral Survey Branch and Survey Sections of districts under Survey Department. Survey Goswaras carry

out work as a development programme and each Gosswara composes of eight field teams located in VDCs/ Wards of municipality.

The cadastral survey was initially driven from the centre with political commitment . There is no political assistance at the centre except transferring staffs and leading to corruption.

The Goswaras are under the Cadastral Survey Branch, Survey Department. There are practically no funds for field allowances, furniture, office and camping facilities and field expenditures. Some municipalities are supporting them for survey of small areas and local authorities are providing office space for the field team. The survey teams working in remote villages, are some time become targets of political agitations. The survey records, staffs and instruments are in vulnerable situation. They were over exploited. The survey Department may need advice and assistance to protect staff and records and continue their development works and fulfilment of cadastre 2014.

5.7 Public Opinion on Present Cadastre

The questionnaires were distributed to the experts on cadastral survey and land administration in Nepal on May 2004. Majority of responders had the opinion on cadastre are that the mangement is getting weaker, technology needs to improved after research, need upgrading the unskilled manpower, instruments are old type, legislation is good however, needs to amend, communication system to public is weak, good cadastral system is its strength and polical interference and corrupt practice are the weaknesses, education / training and technological development are the suggestions for improvement and the future activities suggested as digital mapping/ numerical cadastre.

5.8 Digitisation of Existing Maps

The Department of Land Information and Archive collected 71,766 maps of 67 districts and scanned 45,392 maps by June 2004 and its expected that it will collect all the maps within a year time. In three districts, where LIS programme is under progress, the 119 map sheets produced with national control networks, are vectorized. The study were also conducted to control the isle land type maps. the Survey Department is also producing digital maps/ information combining cadastral, topograhical and infrastructural information of Kathamndu City with the assistance of EU. It also experimented digital mapping with Total Station. It is not yet operational due to lack of suficient instruments.

6. FUTURE VISION

Future vision of cadastral resurvey will be secured land tenure, developments oriented information, protection of land records , complete the cadastral resurvey of the whole country with better precision, e- commerce for the distribution of survey data and expedite education of surveyors and the development works using private initiatives.

6.1 Protection of Cadastral Data

The protection of existing maps and records, instruments, staffs scattered all over the country is possible by explaining importance of records to public and copying / computerisation maps and records and storing in another safe places. The survey staffs be trained to be more service oriented and be provided sufficient field allowances and facilities.

6.2. Completion of cadastral Resurvey Programme

The developing areas of Nepal have poor cadastral maps without control networks and densely populated village blocks left unsurveyed. Therefore, it is required to expedite resurvey works with due care of proper adjudication. The uncultivated areas ,where forestry, pasture, tourism , water resources and other developments are taking place rapidly, also required to have cadastral and topographical survey of these area by photogrammetric or remote sensing technique as per the regulations and urban area by digital technique . The cooperation of central departments will also be used to complete there tasks

6.3 E-commerce for Communication

The information sharing, distribution and updating could be efficiently done using e-commerce. The cooperation of Department of Land Information and Archive and local agencies will be helpful in this tasks. The updating of development actives also be collected via internet or other nodes of National Geographic Information Infrastructures(NGII).

6.4 Use of Private Sector

The private sector would be used for project mapping, digitization of records and maps and other temporary nature of survey works. Establishment and maintenance NGII of and LIS will be the responsibility of Survey Dept. The private sector may also be used to educate survey manpower where HMG Nepal would assist the private sector undertaking of education and training programmes. The posts of district survey section and field team leaders be upgraded to cope the need of the time. The situation analysis table is attached as Appendix 4.

7. CONCLUSION

The surveyors of Nepal at present time are facing serious crisis of insecurity, exploitation, lack of resources, modern knowledge and technology, encouragement by the government and pressure of modernisation, national development and security tenure of common man and weaker sector of society. It is the time the surveyors should speak, protect the data and continue to develop their profession in Nepal as in the past and act to complete cadastral resurvey of the whole country within a time frame..

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BIOGRAPHICAL NOTES

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Appendix 1



Copper Plate

Translation - Copper Plate of Land Purchased in 1749

"Om Swasti. Shri.(Decoration Title).Jaya Prakash Malla Dev . (Title).graced on the name of brother Shri Ratna Mani Jaisi (Oli), the resident of Dumkwatha.

The land name Dumkwatha Khel bounded by East of Government land , West of plough land, South of Government land and North of river, the paddy field of 103 Karsha quantity, Bhumi paddy land 15 Ropanis, housing plot 31 Karsha, out side Rohakil Karsha 20, paddy field 10 Ropanis was sold on the prevailing price of 1230 Jaya Prakash Malli gold coins. In the presence of knowlegible of this plate, Shri Shri Raj Prakash Malla (Crown Prince). Sambat 869 Aswin Badi 13 shubha.(N.B.- 1 Karsha = 1/4Ropani, 1Ropani = 508.7sq m)

Appendix 3

Sample Cadatral Maps



Present Cadastral Map Scale 1:500



Cadastral map of 1944(Scale 1"to 100')



Cadastral plan of 1964 (Scale 1"to 100')

The Free hold (Nambari) of Year 1970 of Bulung Mauje, Dolakha

(Sample record of Land Revenue Office, Dolakha District Page No. 405)

1. Mauje Bulung.....

The following Records of Bulung Village under the Jimwal Shib Naran Wali is correct.

Signed by Dhananjaya Wali, the Present Jimwal, Bulunggau

Original					Present				
Lower Column	Paddy Field	Rice	Contract	Ghee	Lower Column	Paddy Field	Rice	Contract	Ghee
Free hold of 70					Free hold of 70				
Present Income Registered in Land Revenue in 1908					Present Income Registered in Land Revenue in 1908				
1. Land terraced by Barkhebhikhe Wali, the present tennant , the reportor, Naran Wali	/./10	-	-/14	-./2	1.Land terraced by Barkhebhikhe Wali, reportor, Naran Wali, the present tennant Bhaskar Wali	/./10	-	-/14	-./2
2. Do . do. Darkhi Wali do. do.	/2/12/4	-	-/68	-/2/3	2. Do . do. Darkhi Wali do. do. , the present tennant Bhaskar Wali	/2/12/4	-	-/68	-/2/3
3. Do . do. Raghunath Wali do. do.	/1/15	-	-/47	-/1/3	3. Do. do.Raghunath Wali dodo.	/1/15	-	-/47	-/1/3
4. Do . do. Dataram Wali do. do.	/7/4	-	-/10	-./2	4. Do . do. Dataram Wali do. do. present tennant Bhaskar Wali	/7/4	-	-/10	-./2
12. Do . do. Swastik Wali do. do.	/./5	-	-/7	-./1	12. Do . do. Swastik Wali do. do. present tennant Jagat Bahadur Wali	/./5	-	-/7	-./1
13. Do . do. Lachhimi Wali do. do.	/./7/4	-	-/11	-/6/6	13. Do . do. Lachhimi Wali do. do. present tennant Lachimi Wali	/./7/4	-	-/11	-/6/6
Total	/8/13/4	-	2/32/1	-/9/1	Total	/8/13/4	-	2/32/1	-/9/1

List

Total Cash 7/99/1

Paddy @ 1/13/6/ 3/75

Contract	2/32/1
House	-/97
Chardam	-/95

Signed by

Dhananjaya, Durga Bahadur, Singh....., Hari Lal

- Note:-
1. Units are recorded in Ropani, Muri, Pathi, Mana, Muthi and cash in Rupaiya, Paisa and Dam,
 2. Paddy Field recorded in area, rice in volume, ghee in wieght and contract in Rupaiya.
 3. 10 Muthi = 1 Mana, 8 Manas= 1 Pathi, 20 Pathis = 1 Muri, 4 Muris = 1 Ropani,
and 4 Dam = 1Paisa, 100 Paisa = 1 Rupaiya

Appendix 4.

Situation Annalysis Table

Users' Requirements	Annalysis of existing System	Redesign of System
1.Precise data of parcels	1. Maps are without dimentional data of parcels.	1. Cadastral resurvey by digital maps or graphical maps with pacel plans
2. Complete Cadastral Mapping of District	2. Urgent need of survey of village blocks and forest areas	2. Large scale maps of village blocks and digital orthophoto and cadastral maps of the whole districts.
3. Maps and spatial data based on national control networks	3. Cadastral maps of 38 districts are without national control networks.	3. The cadastral resurveys be based on national control network
4. Rectification of weaknesses of previous survey.	4. Maps were at small scale, chain survey with lower precesion and new developments were not incorporated on the maps.	4. It is hoped that the resurvey will remove these defficiencies.
5. Updated map with infrastructures as well	5. New development are not incorporated on the maps as per the Land (Survey) Act 2019.	5. Survey Dept. should persue the updating of the areas where the resurvey commpleted.
6. Efficient and better quality services	6. Poor Quality of maps and survey data are available at district Survey Section.	6. Maps and records be computerised,meta data prepared and go maps amd records available via internet /at office.
7. Possibility of use of data in Development planning	7. Isleland type maps difficult to use even after digitisation.	7. The areas with isle land type mapping should have priority of resurvey and topo. data also be icorporated as another layer
8. Improve the quality of surveyors	8. Lack of graduate level education/ training to surveyors.	8. Upgrade the some of the posts, establish the college to provide educations to surveyors.
9. Lower the cost of surveying to the users	9. Insufficient allowances and other facilities provided to survey staff.	9. Surveyors be paid allownces and other facilities and allowed to seak cooperation from other agencies/ persons.
10. Security of the land records, field teams and surveyors.	10. Field office lacks security, safe building and safe storage.	10. Surveyors be service oriented, generate public supports and keep safe storage of copy of completed maps and records.