



## Still a Vision Cadastre 2014 for Nepal

Pawan THAPA\*<sup>1</sup> 

<sup>1</sup>Kathmandu University, Lecturer, Department of Geomatics Engineering, Dhulikhel, Nepal

### Keywords

Cadastre 2014  
Six Statements  
Cadastral System

### ABSTRACT

Cadastre 2014 provides six visions to improve the cadastral system globally. For Nepal, all six statements are essential, and experts assured Cadastre 2014 to enhance its cadastre system. Over the last 20 years, countries experienced legislative, technical, and political developments; however, this is unable to address six statements. The case study from Nepal will focus mainly on the present status of six visions. From this research, the respective authorities participate and commit to implementation; one ray of hope is digital cadastre in few districts that is prolonged and time-consuming. Also, these statements unaccomplished until now. To approach this particular situation, digital cadastre with public-private partnerships throughout nations underlined principle these statements.

## 1. INTRODUCTION

Cadastral surveying begins when a man produces food through crop cultivation instead of hunting or foraging food. From ancient Egypt, it all begins, and there is evidence from tombs of that era that indicate the registration of land to provide proof of ownership (Larsson, 2012; Trafton, 2004). Simultaneously, a simple method of cadastral surveying was to set up the parcel boundaries, whereas, from 1980, the multipurpose cadastre evolved with the advancement of technology.

The cadastral is continually evolving as the human relationship changes to the land, urbanization, economic reform, globalization, environmental sustainability, and technology (Williamson, 2001; Williamson et al., 2010). Modern cadastre developed for proper land administration. The public's demand for modern cadastre increases its conferences, workshops, books, journal articles, and academic courses that provide knowledge about the cadastral system and land administration (Williamson & Ting, 2001; Yomralioglu & McLaughlin, 2017).

Although Nepal's history of land recording started from the Licchavi around the 13th century, a systematic cadastral survey began in 1964, which took almost 30 years to complete using the traditional graphical method with plane tables using telescopic and plane alidades. Cadastre 2014 is a systematic method for arranging public inventory of data includes all land spatial and nonspatial objects in a particular country or district, based on a survey of their legal boundaries. It's a vision for the future of the cadaster system and proper administration, which aims to addresses the future development of cadastre and ensures integration of cadastre globally, and shaping the future of surveying occupation. It tries to measures its growth in the following twenty years (Polat et al., 2015).

The Cadastral system mainly focuses on legal and fiscal which needs to reform the multipurpose system for reliable and up-to-date information. The current cadastral system is unreliable due to the local control system mapping, each map sheet has its own system, orientation, and accuracy. It leads to a mismatch of edges of the adjacent map. Similarly, surveys perform with low accuracy instruments and less skilled persons. To improve it resurveying should perform with a national

\* Corresponding Author

(pawan.thapa@ku.edu.npl) ORCID ID 0000-0002-4331-5315

Technical Note; DOI: 10.51765/tayod.899431

Received: 18/03/2021; Accepted: 16/06/2021

Citation (APA): Thapa, P. (2021). Still a Vision Cadastre 2014 for Nepal, *Turkish Journal of Land Management*, 3(2), 53-57.

control system with accurate and precise information. It can be achieved by reform and resurveying the program under the framework of these six vision statements of Cadastre 2014. Furthermore, an integrated system that includes both cadastral map and attribute is commonplace.

## **2. MATERIAL AND METHOD**

The cadastral system of Nepal is far behind to support people's demands and proper land administration. Instead, these promote conflicts between landholders and landless people. The most common conflicts include boundaries, demarcation, tenants and landlords, encroachment of public land, control of Guthi land and its revenues, land registration and cancellation, and conflict over inheritance (Pradhan, 2012; Subedi, 2016). Its cadastral map and information are approximately two decades old with limited accuracy. A cadastral survey started using a chain in 1873 AD and a plane table survey to measure and prepare a cadastral map in 1923 AD. From 2006 AD, cadastral surveys use a total station to survey Banepa and Dhulikhel. It uses fourth-order geodetic control points established by the cadastral survey branch. Cadastral Maps prepare in three scales 1:2500 for agricultural land, 1:1250 for semi-urban, and 1:500 for urban areas.

The cadastral survey takes more than thirty years to complete one time of whole Nepal (Law Commission, 2019). There were problems with the instrument, method, control points, and skilled human resources during this survey. A modern cadaster surveying begins with the total station and preparing a map on ArcGIS software; however, the process is slow and takes longer as the land parcel changed over thirty years. Also, land valuation significantly increases that demand higher parcel boundaries lag in the previously prepared cadastral Map.

The protection of existing maps, records, and instruments scattered all over the country is possible by explaining the importance of records to the public and storing them by creating a central spatial database. The survey staff should train for service-oriented and provide sufficient field allowances and facilities. The information sharing, distribution, and updating using eCommerce. Also, updating development actives is collected via the internet or other appropriate mediums.

## **3. APPLICATION**

Nepal's cadastral system commenced collecting land revenue for the Government by identifying the landowners and its tenants. Later on, it supports the land reform program. The allocation of revenue amount depends on the area and type of the parcel. Therefore, the cadastral survey main application to identify the landowners, tenants, and land types. The initial primary purpose of the cadastral information for fiscal, as this have reform used for legal and multipurpose functions. The data contained in the cadastral system is working as

fundamental data set for many users. The computer-based land information system development will help derive a multipurpose cadastral system for various land-related activities.

The Survey Department produces digital information combining cadastral, topographical for Kathmandu City supported by European Union. However, this is in a preliminary stage, as insufficient human resources and instruments. Moreover, Nepal's migration between rural and urban areas and the hills to the plains has put further pressure on public land (IOM, 2021). It significantly increases conflict between State and the squatters. Urban areas' rapid development has poor cadastral maps without control networks, and densely populated village blocks are left unsurveyed (Tamrakar, 2012). Therefore, it is urgent and essential to conduct resurvey with proper adjudication. Furthermore, the cadastre is rapidly changing; there is a need for digital information of a cadastral and topographic map through the modern surveying method such as photogrammetric and remote sensing. Moreover, free and open-source software can alternative to proprietary software for digital land administration (Espada, 2008; Thapa & Thapa, 2021).

## **4. DISCUSSION**

The first statement is to legally recognize every restriction, responsibility, and right on the land, also ensure these rights, responsibilities, and restrictions' for land tenure security. In Nepal, complete documentation of the legal situation of land registration is incomplete until now. The several research study shows that there is still 9000 to 20000 ha of village blocks remaining of the cadastral survey (Adhikary, 2002; Dangol & Kwak, 2013). Its first cadastral survey was conducted for the whole of Nepal between 1964 and 1999, after that no other cadastral survey perform for the full country. However, a lack of systematic surveys and continuous updates during the transaction has made the database outdated. The pilot program has been launch in two municipalities (Banepa and Dhulikhel) since 2006 AD (cadastral survey finished in Banepa). Furthermore, it begins in few districts of Terai plain. Overall, this process is sporadic, steady, slow, and resulting in numerous land conflicts such as mismatch area, shape, and parcel size of previous and new. Public lands are not well managed; also, an inventory of such lands is often missing. Moreover, many societal problems depend on how these lands and other public interests address. Therefore, the first statement needs comprehensive private and public land survey data to secure their rights, restrictions, and responsibilities.

The second statement is to abolish the separation of maps and registers to date any significant initiation absence. An essential complete set of maps and registers are unavailable. During the moiast period, the two districts of Accham and Arghakhanchi documents have destroyed. Also, there are two different offices, one that holds registers (Sresta) with non-spatial information is District land revenue offices, and the other cadastral

map, tereej, field book, and plot register are in the District survey offices. Firstly, these two organizations must combine for efficient and effective work on registration, parcel subdivision, and mapping. People regularly had to face frequent visits to two organizations for the same process, making it time-consuming and costly.

The third vision is cadastral modeling than cadastral mapping. The Nepal cadastral survey department started its digital mapping in 2006 of Kavrepalanchowk district as a pilot project implemented in Banepa and Dhulikhel but not fully completed the distribution of landowner certificate (Paudyal, 2014). Since the paper maps have been digitized, later that can be modeled for any scale as user demand. For example, almost all the paper maps of 76 districts among 77 districts have been digitized (Dangol & Bhatta, 2018). However, in most of the district survey offices, parcel sub-division is not being conducted in digital data however conducted frequently on paper maps, creating the outdated digital cadastral database. Therefore, it will not be possible to employ operators with limited vocational education and are unavailable to high-tech. The widespread use of mobile technology and location devices is one example. Therefore, need high-tech, technical system design based on conceptual cadastral modeling. Cartographers will be gone with computerized drafting and technology and data modeling to facilitate data analysis, statistics, reports, and hard copy maps at various scales. Electronic administration is an extension of this concept.

The fourth vision is a paper and pencil-free cadastre. In Nepal, this vision has been unachieved to the full extent. Despite the digital cadastral data availability, since nonexistent digital transactions entirely in all the survey offices, still use paper maps and pens to update cadastral maps. Parcel Editor produces digital cadastral maps and records land registries. However, it does not fully support the parcel sub-division. SAEx conducts parcel sub-division unable to record first registration and land registry. There is also no connection between systems of district land revenue offices and district survey offices (DSO). DLRO also produces a paper print of the Land Ownership Certificate (LOC). Department of Land Information System and Archive (DoLIA) is vigorously working on modernizing land administration, approaching paper and pencil free land administration, and establishing Land Information System (LIS) in Nepal (Sapkota, 2012; Thapa & Thapa, 2021). In Nepal, this vision starts by collaboration with international, national organizations. Manual work requires time and cost for 'big data': working with 'pen and pencil' is unsustainable.

The fifth vision is the use of the private sector in the cadastral survey. In Nepal, there is an insignificant role of private surveyors in cadastral Systems such as data acquisition, and cadastral mapping. A small number of private sectors perform cadastral mapping which has to validate by public offices such as the Survey offices, Land Revenue offices. This process needs adequate time for validation and adjudication which increases the cost of work as time increases the economy. Furthermore,

repetition on validation and adjudication by private and public. This process should be performed in combination and coordination with both sectors which will save time and budget. To motivate the private sector and involve the efficiently proper distribution of work is needed with a structure and systematic approach (Milindi Rugema et al., 2021; Cadastral Template, 2021).

Government surveyors conduct all the processes from Survey offices. However, if anyone wants to know their land-like area's status, they can request any private surveyor. Nevertheless, that is only for their personal information and affirmation of their land. It cannot use for legal purposes. During the land transaction, some regular writers help in preparing deeds. It is more or less like private conveyancing. However, the help and use of legal writers are not compulsory. If any individual is capable of preparing the deeds, they can do it themselves without notary help. Besides, private sectors are fully involved in the system development of land information systems. Therefore, both public and private sectors – need to work and support for surveying and record updating of public and private land.

The sixth vision is the cost recovery cadastral survey. However, in the case of Nepal, the cadastral survey requires a high cost for registration and a cadastral survey. The government invests a large amount in cadastral survey and record management. Also, massive difference between the total sum of the cost for land tax and land administration service and the cost of cadastral data acquisition. The only get back of this investment is the land tax and revenue during the land transaction, which is very nominal compared to a total investment of cadastral data acquisition (Brasselle et al., 2002; Dangol & Kwak, 2013). However, people believe they are paying twice as registration and revenue and even more for every piece of land information. A slow cadastral survey, updating, mapping, and distributing ownership certificate are pictures of every district survey and land revenue office. Hence, this increases the cost of the work and its information. Therefore, people have to pay high, to address this, charging maintenance costs while surveying costs should manage via land tax.

## **5. CONCLUSION**

The information regarding rights, restrictions, and responsibilities on the Cadastre and its recording is outdated in Nepal. Another newly started program, such as the Digital Cadastre system, requires a more extended period than expected to provide results. Overall cadastre system unable to address the public needs and demand leads to a significant increase in land dispute cases. The following vision is impossible to address until the existence of a separate survey and registry office. At least both organizations agreed on an integrated system consisting of spatial and non-spatial information of Cadastre. For visions three and four, the digital parcel sub-division should be made compulsory for ensuring recent changes and keeping it up to date. The main one

is an integrated central database system for first registration and cadastral data updating.

Mainly private sectors are involved more or less on the backhand, instead made provision to support in fieldwork, human resources, upgrading through inspection and monitoring, that might speed up the work of a complete and updated cadastre system. Regarding vision six, this remains far away until this perception phase out, where land revenue is taken as one source to function the country. It is no question that the vision of Cadastre 2014 is relevant and achievable; however, the lack of workforce, technology could be a limitation in developing and undeveloped nation. There is significant work remaining for achieving this vision in Nepal and creating a modern cadastral system to increase land administration efficiency. Cadastral systems face a severe crisis of insecurity, exploitation, lack of resources, modern knowledge and technology, encouragement by the Government, the pressure of modernization, national development and security tenure of the ordinary person, and weaker society sectors. It is 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.

The resurvey has started with the total station and the use of a computer system to store the database with the main objective to provide accurate and reliable cadastral information. For precise survey work, a licensed surveyor or technician must be involved, which is nonexistent due to a lack of rules and regulations regarding the process, qualification of the surveyor, terms, and conditions to honor the license. A licensing surveyor can play a major role to reduce the number of disputes, increase the accuracy of mapping, and support the establishment of a parcel-based cadastral information system. Moreover, those surveyors will be responsible for any technical errors. Purposeful land information and cadastre system is a prerequisite for land tenure security and resolving conflicts. Therefore, it is an urgent need, and CADASTRE 2014 has been a guideline for every stakeholder to perform appropriately. However, while a proper cadastral system has become a top priority for the Government, policymakers, civil society, academia, and advocacy organizations, there are still many landless, informal, and marginalized farmers in the Mountain, Hill, and Terai. However, even a decade after a peace treaty was signed with Maoists, the cadastral system remains highly politicized and has not changed much. First and foremost is a cadastral survey of an entire country with a modern instrument such as the total station and computerized database system.

#### ACKNOWLEDGEMENT

I would like to acknowledge those people who directly and indirectly support this research work. I sincerely thank the reviewer of this paper for their valuable feedback and recommendations.

#### Authors contributions

The author has conducted all research activities such as critical analysis, evaluation, and results.

#### Funding

No funding was received.

#### Ethics approval and consent to participant

Not applicable.

#### Consent for publication

I agreed to submit the final manuscript for the Turkish Journal of Land Management

#### Competing interests

The author declares that they have no competing interests.

#### REFERENCES

- Adhikary, K. R. (2002). *Global Positioning System on Cadastral Survey of Nepal*. 23rd Asian Conference in Remote Sensing, Nepal.
- Brasselle, A. S., Gaspard, F. & Platteau, J. P. (2002). Land tenure security and investment incentives: Puzzling evidence from Burkina Faso. *Journal of Development Economics*, 67(2), 373–418.
- Cadastral Template, (2021). Cadastral Template 2.0, Nepal. <http://cadastraltemplate.org/nepal.php> [Access Date: 09.05.2021]
- Dangol, S. & Bhatta, G. P. (2018). Cadastre 2014: Performance of Nepal. *Nepalese Journal of Geoinformatics*, 17(1), 49–54.
- Dangol, S. & Kwak, B. Y. (2013). Improvement of Cadastral System: Scope in Nepal. *Nepalese Journal of Geoinformatics*, 12, 19–24.
- Espada, G. P. (2008). Free and Open Source Software for Land Administration Systems: A Hidden Treasure? 14.
- IOM, (2021). Microdynamics of Land Conflict and Land Conflict Resolution in Nepal, IOM Online Bookstore. <https://publications.iom.int/books/microdynamics-land-conflict-and-land-conflict-resolution-nepal> [Access Date: 09.05.2021]
- Law Commission, (2019). Land-survey-and-measurement-act. [Access Date: 09.05.2021] <https://www.lawcommission.gov.np/en/wp-content/uploads/2018/10/land-survey-and-measurement-act-2019-1963.pdf>
- Larsson, T. (2012). *Land and loyalty: Security and the development of property rights in Thailand*. Cornell University Press.
- Milindi Rugema, D., Birhanu, T. A., & Shibeshi, G. B. (2021). Spatial aspect of fit-for-purpose land administration for emerging land administration systems: A conceptual framework for evaluation approach. *Survey Review*, 1–14.
- Paudyal, D. R. (2014). Assessment of the Digital Cadastre in Nepal from the Cadastre 2014 Vision. 12.
- Polat, Z. A., Ustuner, M. & Alkan, M. (2015). *On the way to vision of cadastre 2034: Cadastre 2014 performance of Turkey*. FIG Working Week, İstanbul.

- Pradhan, K. L. (2012). *Thapa Politics in Nepal: With Special Reference to Bhim Sen Thapa, 1806-1839*. Concept Publishing Company.
- Sapkota, R. K. (2012). LIS Activities in Nepal: An Overview in prospect of DoLIA. *Nepalese Journal of Geoinformatics*, 11, 23-28.
- Subedi, G. P. (2016). Land administration and its impact on economic development, *Doctoral Thesis (PhD)*, University of Reading.
- Tamrakar, R. M. (2012). A Prospect of Digital Airborne Photogrammetry Approach for Cadastral Mapping in Nepal. *Nepalese Journal of Geoinformatics*, 11, 1-6.
- Thapa, P. & Thapa, N. (2021). Land Parcel Information System Using *Free and Open Source Platform*, 8.
- Trafton, S. (2004). *Egypt land: Race and nineteenth-century American Egyptomania*. Duke University Press.
- Williamson, I. P. (2001). The evolution of modern cadastres. FIG Working Week, Seoul.
- Williamson, I., Enemark, S., Wallace, J. & Rajabifard, A. (2010). *Land administration for sustainable development*. ESRI Academic Press.
- Williamson, I. & Ting, L. (2001). Land administration and cadastral trends—A framework for re-engineering. *Computers, Environment and Urban Systems*, 25(4-5), 339-366.
- Yomralioglu, T. & McLaughlin, J. (2017). *Cadastre: Geo-Information Innovations in Land Administration*. 2. Edition, Springer (Capital Publishing Company).



© Author(s) 2021.

This work is distributed under <https://creativecommons.org/licenses/by-sa/4.0/>