

SURVEY PROFESSION AND PROFESSIONAL ORGANIZATIONS IN NEPALESE CONTEXT

Rabin K. Sharma

President

Nepal Remote Sensing and Photogrammetric Society
e-mail: - sharma19434@alumni.itc.nl

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ABSTRACT:

Survey is one of the most important professions for the national development activities because it provides basic data necessary for implementation of infrastructure development and industrial development programmes. Although the technological development in this profession is rapid, the evolution of survey profession in Nepal is gradual. Accordingly, surveying had travelled its journey from the technology of using sight rule and plane table for conducting surveys to use of modern digital technology based on information / data of the satellites. A brief note on evolution of survey profession in Nepal for the last fifty years will clarify the present status of this profession. This paper also tried to explain the activities of some of the major professional organizations related with surveying and mapping in Nepal. It is believed that professional organizations play an important role to develop professional surveyors and professionalism in the discipline, so some of the important roles of professional organization are inunciated. It also identified the existing act, rules and regulations for issuing licence to the surveyors in which the provision to issuing licence is limited to a certain group of surveyors. So in order to accommodate a large group of surveyors, it is suggested to categorize the surveyors in three levels as per their qualifications. Since survey ethical principles and code of conduct are the ornaments for the surveyors so if they possess these characteristics they will be recognized as professional surveyors and it will automatically develop professionalism in this domain. Survey Department who is also responsible for issuing survey licence had prepared the code of conduct for the Nepalese surveyors. Some of the important features included in the code of conduct are also listed in this paper. Hence this paper could be very useful and interesting to acquire information to those organizations especially for the developing countries where the licence system is just applied or where it is going to apply. Furthermore, it may help to enhance the functions of the professional organizations.

1. INTRODUCTION

Spatial and attribute data are the basic fundamental data required to implement programmes for infrastructure development and industrial development which are part of the national development activities. These data are captured, processed and disseminated by the authorized organization where the human resources are from survey profession. The standard, precision and quality of the data are directly linked with the development of the survey profession and the level of professionalism. In the present context, Survey Department is responsible to publish and distribute these fundamental data. The department was established in 1957AD and during last fifty years period the technological development and human resource development have undergone tremendous development. It can be stated that the surveying and mapping technology was slowly emerged from application of method using sight rule, chain and plane table to the modern methods of using satellite data and computer based technology so the changes have been gradual and the developments have been evolutionary. Survey Department is also recognized as National Mapping Organization in national as well as in international forum.

Survey Department is also responsible to issue licence to surveyors as per the existing Survey Measurement Act and Rules and Regulations. It is believed that licensee surveyors are more responsible and take more ownership than ordinary surveyors because they are guided by the ethical principles and code of conduct. On the other hand, professional societies also play a major role to develop survey professional and consequently to establish professionalism. In Nepal, there exist a few professional organizations in survey sector, out of which some

are inactive and some are trying to participate more on the activities of survey profession.

Professional organizations are more concerned with the advancement and technological development in their corresponding fields. It can be observed that the impact from such changes in many cases, orient the concerned organizations in the production line to restructuring the organization, reengineering the traditional system and launching human resource development programmes towards effective service delivery and efficient management. In such situation, line agencies have to face unavoidable constraints such as advocacy of new system, need of capacity building, management of financial resources, etc. Professional organizations can to some extent play roles to address these issues for benchmarking the modern tools and techniques.

In essence, this paper tried to inunciate the evolution of survey profession and the role of professional organizations for improving survey profession. Finally, it also discussed about the provision of issuing licence to the surveyors for developing survey profession and professionalism.

2. Evolution of Survey Profession

Survey profession in Nepal evolves a very long history and believe to begin from *Vaidic* period. At that period, the state assumed that the land is a fixed asset and the similar version is applicable to the land owners that they also considered their land is a fixed asset. Since then the concept of cadastral surveying was developed in a very primitive way to keep the

land records. As the time rolling, improvement on survey technology was gradual and it continued for several periods such as ancient period (13th century), middle period (18th to 19th century) and modern period (19th century and onwards). However, this part of the paper tried to present the evolution of survey profession only after the establishment of Survey Department in 1957 AD when the scope of work of the department was limited to prepare land records only. In 1964 AD the then Government of Nepal imposed the revolutionary land reform programme. In order to support this programme, survey department carried out cadastral survey through newly recruited technical personnels trained by short period training course and using sight rule, chain and plane table method which is one of the classical methods of surveying. Then gradually the scope of work of survey department enhanced and consequently there is expansion of the organizational structure. Accordingly, the following changes occurred in the organizational structure and the development in the application of technology in Survey Department:

- Survey Training Centre was established in 1965 to produce Basic Surveyors (called *Amin*). After few years, the Centre started producing Junior Surveyors and Senior Surveyors. Furthermore, additional job to conduct some special courses in Geodesy, Photogrammetry, Cartography, Map Reproduction and Survey Computation was assigned. In 1999, the training centre was upgraded to the level of the department with further additional responsibility to conduct training courses for Land Administrators and Land Managers. The name of the organization has been changed to Land Management Training Centre which is now working directly under the Ministry of Land Reform and Management.
- In 1967 Geodetic Survey Branch was established with the objective to provide ground control points for cadastral surveying. Now its objective has been enhanced to establish precise geodetic network of control points, to carryout gravity survey works, to establish levelling network along the major roads of the country and to promote the research works in Geodesy and Astronomy. Global Positioning System (GPS) was first introduced in 1990 to provide control points for topographical mapping. Some of the achievements of the branch are as follows:
 1. Establishment of 7 Laplace stations and 14 Azimuth stations with assistance from United Nations Development Programme.
 2. Establishment of 14 Dopplar stations and 68 first order Geodetic control points by a team of British Army Survey.
 3. Establishment of 9 Global Positioning System (GPS) points with the assistance from the University of Colorado and Massachusetts Institute of Technology, USA
 4. Establishment of different control networks including different orders of planimetric control points, levelling network and gravity points network.
- In 1970 Topographical Survey Branch was established to prepare new series of topographical base maps, administrative maps and thematic maps. Because there exist topographical base maps of the country at the scale of one inch to a mile which were prepared by Survey of India as a co-operation mission project of Government of India. The achievements of the branch are as follows:
 1. Capacity building in the context of infrastructure and human resources development through United Nation Development Programme.
 2. Production of administrative maps compiled from the existing one inch to a mile enlarged to 1:50 000 scale.
 3. Preparation of Land Resources Maps which include Land Utilization, Land System, Land Capability, Geological and Climatological Maps under the cooperation from Government of Canada.
 4. Publication of new series of topographical basic maps at the scale of 1:25 000 for Southern area and 1:50 000 for Northern area through the cooperation from Government of Japan and Government of Finland.
- In the growing perspective of organizational structure, Cadastral Survey Branch was established in 1982 to take over the charge of cadastral survey. The cadastral mapping of the country was completed in 1994 leaving some village block areas and some governmental lands. Out of 75 districts, 38 districts were surveyed in local control system and the remaining 37 districts by tying up with national network control points. After that, the government took decision to resurvey in the districts where the maps are not tied with national network of control points as well as for the areas where the land values are relatively higher. Accordingly, the resurvey in one of the districts was completed and is in progress in 9 other such districts.
- In 2005 AD, the digital technology has been introduced to prepare cadastral data base using Total Station Theodolite for digital data acquisition of the parcels. The programme has been applied as a piloting in Banepa Municipality of Kavre district. At present, the land registration work is in progress for this municipality.
- Realizing the fact of outdated existing land resources maps of 1985, Ministry of Land Reform and Management established National Land Use Project in 2000 to update these maps. The project has updated the land resource maps for 36 districts so far and also created digital data base for these districts. Digital technology using satellite data were used for updating the maps and creating database.
- During restructuring of the organizational setup of the Ministry of Land Reform and Management, in 1999, Department of Land Information and Archive was established to archive the old land records in digital form belonging to District level offices of Land Revenue and Survey offices and to develop computer based system for updating land related data which are undergone changes due to land transaction. So, the department started scanning the existing land related records to archive in digital form and at the same time, it is developing a system to keep records for the newly developed records due to land transaction. The ultimate aim is to perform land transaction and updating records using computer based technology and the system will be applied gradually to replace the classical methods.
- In 2000 European Union supported Survey Department to create census maps and data for conducting population census of 2001 of Central Bureau of Statistics. So, the National Geographic Information Infrastructure was initiated with an overall objective of developing National Geographic Information Infrastructure in the country to strengthen the planning and resource management. The

programme initially aimed to develop a platform to facilitate data sharing among the Central Bureau of Statistics, Survey Department and four other participating ministries. A prototype metadata system was developed and it is now in an operational stage. It is also conceptualized that in course of time this system will accommodate entire data production community in the country encompassing several other types of spatial and spatially related data.

- In order to provide exposure and to establish professional relationship with international community, Survey Department has taken membership with the following International organizations:
 1. SAARC Networking Arrangement on Cartography (SNAC)
 2. Permanent Committee on Geographical Information for Asia and the Pacific (PCGIAP)
 3. International Steering Committee for Global Mapping (ISCGM)
 4. Asian Association on Remote Sensing (AARS)
 5. International Federation of Surveyors (FIG)
 6. Asia Pacific Regional Space Agency Forum (APRSAP)
 7. Group on Earth Observations (GEO)
 8. Global Spatial Data Infrastructure Association (GSDIA)
 9. Sentinal Asia Joint Project Team (SA JPT)

This type of development can be considered as a key to a sustainable development of Survey Department and surveying profession. The department is also now capable to provide necessary maps and geo-spatial data for planning and implementation of different development projects. Therefore, the department has been recognized as a National Mapping Agency (NMA) in national as well as in international forum.

3. EXISTING LAW RELATED TO SURVEY PROFESSION

The surveying profession is governed by the prevailing Survey and Measurement Act 2019 (B.S.). When the existing Land Measurement Act 1963 Eight amendment at 2000 was drafted, it was realized that the private surveyors also should hold a licence to conduct surveying and mapping activities, like medical practitioners, lawyers and auditors who hold the licence awarded by the concerned organization. The main ideas behind to award licence to the surveyors are to recognize them as professional surveyors, to encourage to feel ownership and to make more responsible of the job they are doing.

Provisions in the Act in regard to the issuing licence are as follows:

- Surveyors having specified qualification can apply in Survey Department for the licence
- The licence can be applied for the following categories of surveying activities:
 - a) Cadastral Surveying and updating
 - b) Engineering Surveys
 - c) Topographical surveys except National Topographic Base Maps
 - d) Thematic Mapping
- Survey Department shall award licence after fulfilling the formalities mentioned in the regulation.

The provision to issue the licence in the Act is limited to the surveyors having qualification with survey graduate or Bachelor

of Science with Mathematics or Master of Arts in Geography with at least one year of training in Surveying. So the existing provision in the Act does not fulfill the present demand of the surveyors as there are surveyors with different academic qualifications. Like in the Law sector, there are three classes of licence holder lawyers, namely Pleader, Advocate and Senior Advocate; so, it is urging to adopt similar provision to categorize the level of licence holder surveyors in surveying domain. Hence, in order to accommodate a large group of surveyors, the following three categories are recommended:

- a) Category A, General Surveyor: Surveyor should have basic survey course in surveying and the work should be limited to carry out Cadastral Survey and related works under the supervision of category B.
- b) Category B, Survey Practitioner: Survey should have survey graduate or at least graduate with Senior Survey course to carryout all types of surveying and mapping using traditional and/or modern technologies under the supervision of category C.
- c) Category C, Survey Manager: Surveyor should have M.Sc. in Survey or related subject. The scope of work for this category could be to prepare terms of reference of the project, to prepare tender documents, to prepare project document, to evaluate and validate the work performed by category A and B, etc.

4. PROFESSIONAL ORGANIZATION

After the political movement in 1990-91, quite a number of professional organizations have been established mainly to secure and promote the surveying and mapping profession, to facilitate in time to time to disseminate new ideas and technology and to play an advisory role in formulating policies and programmes in their corresponding domain. Each organization has their own ways and means for promoting activities. However, the common approaches are conducting seminars/workshops, publication of journals, etc.

The major professional organizations related to surveying and mapping sector are as follows:

- Nepal Surveyor Society
- Nepal Surveyor's Association
- Nepal Remote Sensing and Photogrammetric Society
- Nepal Geographic Information System Society

Nepal Surveyor Society (NSS)

It is unfortunate to say that NSS has remained inactive for a long period. However in its initial period of time, it conducts seminars and talk programmes on the then burning issues and also publish quarterly news bulletin and an annual journal. This society was also affiliated with FIG.

Nepal Surveyor's Association (NESA)

NESA performs activities to preserve the integrity and enhance dignity of surveyors. The association has declared 18th day of the month of Bhadra as per the Nepalese calendar which lies in the first week of September as a Surveyor's Day and each year it celebrate this day with varieties of programs.

Nepal Remote Sensing and Photogrammetric Society (NRSPS)

NRSPS aims to promote the remote sensing and photogrammetry technology in all aspects of national development. The Society was also in a state of inactiveness for a long period in the past but it has been awoken since few years back. NRSPS is one of the members of International Society for

Photogrammetry and Remote Sensing, (ISPRS) and Asia Pacific Regional Space Agency Forum (APRSAP).

Nepal Geographical Information System Society (NEGISS)

NEGISS is more focussed on the GIS technologies which can contribute towards developing framework for state restructuring and realigning development priorities in the Nepalese context. The society regularly conducts training program on GIS and also organize various programmes to commemorate International GIS Day on November 16th of each year.

5. ROLE OF PROFESSIONAL ORGANIZATIONS

Attachment between the professional organizations and the professional surveyors are inevitable because the professional organization could evaluate as a good organization only when the officials of the organization are active and more professional. So in order to maintain this relationship, the contribution of professional organization could be as follows:

- Conducting awareness programme on the recent development of the technology so that the maximum number of organizations working under production line could apply for their corresponding activities.
- Supporting the government to overcome the duplication of investment in the creation of framework data and encouraging to concentrate more on the creation of value added data for respective use.
- Suggesting appropriate policies, laws and regulations for effective implementation of the technology.
- Pressurizing the government to establish and adopt appropriate policies, acts, rules and regulations to ease to adopt the suitable technologies and to sustain the system.
- Participating to develop norms, standards, etc. of the system to ensure interoperability and also to facilitate the sharing of information at local, national and global levels.
- Conducting training programmes and refresher courses to develop appropriate human resource required for the organization.

6. SUSTAINABILITY OF PROFESSIONAL ORGANIZATION

Once the professional organization is registered, one of the major problems is to sustain the organization, which is governed by several factors. Some could be listed as follows:

- Less participation from the members
- Difficult in managing financial resources
- Communication gap between the professional organization and government organizations
- Lack of administrative auditing from the concerned organization

The executive body of the professional organization has overall responsibilities for identifying appropriate programmes, managing financial resources, encouraging members for participation in the activities of the organization and communicating with the governmental organizations. Therefore the executive body should take the following initiations for sustainability:

- Prepare annual work plan viewing the users requirement and need assessment
- Communicate regularly with the concerned organizations for reporting the achievements and their feed back

- Implement programmes as scheduled for regularizing the participation of the members
- Develop appropriate strategies and implement for fund raising
- Publicize the programmes, results, achievements, etc. through appropriate media for attracting the concerned organizations

7. PROFESSIONAL ETHICS AND CODE OF CONDUCT

In General, to become a professional surveyor, it is a very difficult task because it is necessary to possess certain ethical values and at the same time it is compulsory to obey the code of conduct laid down by the authorized organization. Ethical values have following two basic principles:

- a) As a surveyor, he/she should obey the directives given by the employer and should serve to the client and beneficiaries.
- b) As a professional, he/she should display honesty to the public and should theoretically and practically competitive with his/her fellow professionals.

Basically, the list of code of conduct is derived on the basis for supporting above ethical principles. If a surveyor practice against even partially the list, it will assume to be an unprofessional and such action is against the dignity of a professional surveyor. On the contrary, a list could be prepared which should not practice by a professional surveyor. Pennsylvania Society of Land Surveyors has adopted this option. In Nepal, the code of conduct was focussed on the features like qualification, responsibility, vision, moral character etc. Realizing these features the licence surveyor must have the following characteristics:

1. Hold appropriate academic qualification
2. Feel greater responsibility and ownership to serve beneficiary, client, employer and the society
3. Visualize wide vision on the subject
4. Posses high level of moral character
5. Capable to apply appropriate technology
6. Play role to honor existing act, rules and regulations.

8. CONCLUSION

Over the period of fifty years of technological developments in the sector of surveying profession, it can be noted that the changes have been gradual and the development have been evolutionary. Survey Department initiated survey profession solely for the production of Cadastral information. Within the stated period of fifty years, it has gradually applied new technologies such as Photogrammetry, Global Positioning System (GPS), Remote Sensing and Digital Technology. Digital technology has been extensively used for development of National spatial data and recently it has been introduced in the field of cadastral domain to create cadastral data in digital form. With these developments, Survey Department has been recongnized as National Mapping Agency.

There are few professional organizations related to surveying and mapping working to create environment to provide ownership in the development of the technology and also could play important role to sustain the survey profession. In order to recognize the surveyors as a professional, he/she should hold a licence and follow the ethical values and obey the code of conduct laid down by the authorized organization. There is a

high demand and pressure through professional organizations to issue survey licence as early as possible for different categories of the surveyors. So the concerned organization should take immediate actions to finalize the system for issuing licence.

REFERENCES

Buddhi Narayan Shrestha, 2002. Need of Licensing in Surveying Profession in Nepal: *Nepalese Journal on Geoinformatics*, Number 1, pp. 15-18.

Land Measurement ACT 1963, 8th Amendment 2000.

Naba Raj Subedi, 2007. Surveying Profession and Professionalism: *Nepalese Journal on Geoinformatics*, Number 6, pp. 111-116.

Rabin K. Sharma, 2004. Participation of Survey Department in the Forum of International Activities: An Overview, *Nepalese Journal on Geoinformatics*, Number 3, pp.31-36.

Rabin K. Sharma; Professional Organizations of Geoinformatics in Nepal : 2008 (Unpublished)

Toya Nath Baral, 2007. Surveying, Survey Department and the Future Mission, *Nepalese Journal on Geoinformatics*, Number 6, pp. 124-125.

