Land Management Training Centre: Journey of surveying and mapping studies in Nepal

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Abstract: Since, 1968 as the name of Survey Training Centre (STC) under Survey Department (SD) then in 2001, government reorganized it by Land Management Training Centre (LMTC) as one of the member under the umbrella of National Mapping Organization of Nepal under the Ministry of Land Reform and Management to produce the skilful surveying and mapping professionals with in the country acquiring the entire knowledge in Land Management and Land Administration, 3S technology and other relevant application digital technology to meet the global trend for participating the various development activities. With the continuous technological development on surveying and mapping activities, regular updating of knowledge on this field is very essential to achieve the goal for the correct and up to date geospatial outputs and services. Hence Centre has introduced the revised core courses for fresh candidate, similarly for refreshing the exiting professional with in country.

Keywords: LMTC, Digital technology, Surveying and Mapping, Human resource, Educational quality

1. Introduction

It was established by the government in 1968 as the name of Survey Training Centre under Survey Department to produce the surveying and mapping professionals with in the country. Now as the technology changed, the government apprehends to introduce the global trend to its development activities. The education should for uplifting the social, economical, and environment condition of the people, so these event should be perfect and up-to-date, the indicators/patterns related with geographic spaces and the information should be represented correctly and easily. Data collection, data management, and data dissemination and data sharing are very crucial and the better representation and management of the geospatial data helps the planner, policy maker, decision makers, development practitioner, and researcher. For getting these achievements, government reorganized the Survey Training Centre as Land Management Training Centre in 2001 directly under Ministry of Land Reform and Management as one of the member under the umbrella of National Mapping Organization of Nepal to produce the skilful surveying and mapping professionals with entire knowledge in Land Management and Land Administration, 3-S technologies and other relevant application digital technology to meet the global trend for participating the various scientific development activities.

LMTC has so far trained about 4000 surveying and mapping professional. These are now engaging and serving for different governmental and non-governmental organization. The government has aimed to strengthen the training and professional development capacity of this centre. To achieve this aim, LMTC needs institutional reforms and technical assistance to extend a digital geoinformation education/ services. Due to severe financial constraints, it is still difficult for the centre to achieve its own goal. Therefore, LMTC has set its policy to assets the technical experts, technological supports, financial aid and the educational expertise exchange programme from different cooperation bodies, national / international institute, and the various universities as possible as. The main objective of this
discussion is focussed to explore the information about Land Management Training Centre, its historical background, educational programmes, its importance on Nepalese surveying and mapping field, further technological development and its services, some recommendations to its development for producing the human resources of the concerning organization and other objective is to attract the national and international institutes and organizations for joint support to upgrade the infrastructural development and educational quality in the changed digital context.

2. Educational programme

The courses conducted in this training centre are unique. Since, this is one and only central governmental institute for surveying and mapping education within the country, the courses are based on the application as per the demand of the technological development. The current courses are illustrated in a tabular form as follows.

Table 1. Showing details on the different courses

<table>
<thead>
<tr>
<th>S N</th>
<th>Course</th>
<th>Duration</th>
<th>Main subjects</th>
<th>Entry level</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Senior Survey Course (SSC)</td>
<td>Sixteen months</td>
<td>• Fundamentals of surveying&lt;br&gt;• Applied sciences&lt;br&gt;• Geodesy I&lt;br&gt;• Geodesy II&lt;br&gt;• Photogrammetry and Remote sensing&lt;br&gt;• Cartography and map reproduction&lt;br&gt;• Engineering survey&lt;br&gt;• Computer with GIS application</td>
<td>B.Sc.( Math)* or M.A.(geography)* Departmental candidates</td>
<td>To produce surveying and mapping supervisor</td>
</tr>
<tr>
<td>2</td>
<td>Junior Survey Course (JSC)</td>
<td>Twelve months</td>
<td>• Fundamentals of surveying&lt;br&gt;• Control surveying&lt;br&gt;• Topographical surveying&lt;br&gt;• Cadastral survey&lt;br&gt;• Photogrammetry and Remote sensing&lt;br&gt;• Cartography and map reproduction&lt;br&gt;• Engineering survey&lt;br&gt;• Computer with GIS application</td>
<td>I.Sc.( Math)* Departmental candidates</td>
<td>To produce surveying and mapping technicians</td>
</tr>
<tr>
<td>3</td>
<td>Basic Survey Course (BSC)</td>
<td>Twelve months</td>
<td>• Fundamental of surveying&lt;br&gt;• Methods of surveying&lt;br&gt;• Control surveying&lt;br&gt;• Related land law and rule and regulations&lt;br&gt;• Computer with GIS application</td>
<td>S.L.C. (Math)</td>
<td>To produce assistance surveying and mapping technicians</td>
</tr>
<tr>
<td>4</td>
<td>Application based short term course</td>
<td>As per required</td>
<td>• Cartography&lt;br&gt;• Photogrammetry&lt;br&gt;• Survey computation</td>
<td>Departmental candidates</td>
<td>To update the knowledge</td>
</tr>
</tbody>
</table>
### 3. Resources in LMTC:

LMTC is consisting of 3 hectares of beautiful land with a pleasant working environment containing the training block, administrative block, hostel block, executive director’s quarter, director’s quarter, guard room and playground for various games such as volleyball, table tennis, basketball, etc. Other building like quarters for trainers, cafeteria and library are also planned. At this moment, there are 32 computers in internal networking. Some Surveying and mapping software are running like Arc View 3.2, ILWIS, ERDAS, and R2V. Some pairs of Stereo-trainer plotter and santony G-7 provided by ITC, the Netherlands are also being used for photogrammetric training. The financial status of the Land Management Training Centre is only based on the government fund till now. It is very essential to support it by other national and international donor agencies. In concerning with the staffs personnel, LMTC has the technical source persons trained from the International Institute for Geoinformation Science and Earth Observation (ITC) –the Netherlands, Stuttgart University -German, GSI -Japan, Indian Institute for Remote Sensing (IIRS) -India and UK. These staffs personal are now engaging on current running courses and LMTC is going to conduct some short term courses in near future with the help of these available professional. LMTC has also set the policy to train the staff personnel, who do not have any further training. LMTC requests to the national and international agencies for providing chance of further studies to gain the knowledge on new technological development in surveying and mapping concern.

### 4. LMTC product verses surveying and mapping market

The contributions of this centre are to develop the technical capacity of the technical personnel with the foundation development and knowledge in surveying and mapping field. Now in changed context, LMTC has begun to use the terms geoinformatics, geospatial, spatial activities as the national and international organization had already accepted it. This centre produces the human resources needed for surveying and mapping activities, it is obviously known that the different types of maps and the information are the basic tool for any kind of development activities; the expected outcome of the project will improve an access to basic development foundations for citizens. This issue is fundamental to the successful implementation of the good governance. The strengthening of the centre highlights the delivering capacities of the essential information. The LMTC will be identified after the success of work as the key agency for an emerging information infrastructure capable of supporting improved governance. Enhanced public access to Spatial Information resources of Nepal empowers citizens to take increasingly greater control of their own development. The establishment of a traditional and oncoming geo-information education and professional training at LMTC, an important sub-component of this preparatory assistance, will be beneficial for all surveying and mapping professionals in the country.

The basic input into the development of any discipline is the necessary manpower. The levels of skillful manpower in the organization are extremely essential. The trend of producing the various products is based on the public visual thinking concept, now it has been turning the concept based on the private visual thinking these thinking are
spreading all over the world. The developed countries have already developed such outputs. A number of other websites regarding the various themes can be found in the Internet. However, the trend in such kind of representation is rather slow in the developing countries. Taking consideration for producing the skilful Geoinformatics manpower for the concerning organisation, his majesty’s government of Nepal establish the Land Management Training Centre in 1968, till now 4000 alumni making contribution in the field of surveying and mapping throughout the country like Survey Department (SD), International Centre for Integrated Mountain Development (ICIMOD), Department of Land Information System and Archive (DoLIA), Forest Department, Nepal Electricity Authority (NEA), Royal Nepalese Army (RNA), Nepal Police Department of Mining, Department of Irrigation, National Planning Commission and other many national and international private organisations around the world. The instructor in this Training Centre are also required to train to use new global technology. Such type of training course become very important to the instructors of LMTC.

The most important part of the national mapping organization is the latest training for their human recourses to engage for better surveying and mapping activities. Today’s very rapid development in the technology makes the demands of public/private sector high. The better education help to fulfill the scientific knowledge of the professionals in this field, which in turn reflect by the user satisfaction. Nevertheless, the curriculum and the course requirement must be brought up to data by the schools and college level with responsibility in this regard.

Table 2: The total outcome from LMTC

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Subject</th>
<th>Female</th>
<th>Male</th>
<th>From open selection</th>
<th>From departmental</th>
<th>Total</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Senior survey course</td>
<td>4</td>
<td>384</td>
<td>154</td>
<td>234</td>
<td>388</td>
<td>Till June, 2004</td>
</tr>
<tr>
<td>2</td>
<td>Junior survey course</td>
<td>9</td>
<td>1449</td>
<td>101</td>
<td>1357</td>
<td>1458</td>
<td>Till March, 2005</td>
</tr>
<tr>
<td>3</td>
<td>Basic survey course</td>
<td>24</td>
<td>2418</td>
<td>2442</td>
<td>-</td>
<td>2442</td>
<td>Till Oct., 2004</td>
</tr>
<tr>
<td>4</td>
<td>Special training programme</td>
<td>a) LIS</td>
<td></td>
<td>52</td>
<td>7</td>
<td>59</td>
<td>Till March, 2005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Numerical Cadastral</td>
<td></td>
<td></td>
<td>37</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>c) Land Management</td>
<td></td>
<td></td>
<td>68</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>d) Geodesic survey</td>
<td></td>
<td></td>
<td>46</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>e) Photogrammetry</td>
<td></td>
<td></td>
<td>45</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>f) Map reproduction</td>
<td></td>
<td></td>
<td>71</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>g) Cartography</td>
<td></td>
<td></td>
<td>28</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>h) Survey computation</td>
<td></td>
<td></td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>i) GIS on land management</td>
<td></td>
<td></td>
<td>28</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>j) Refresh course on cadastral mapping for the assistance lawyers and the</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
administrative staffs of the Supreme Court

| Total | Outcome professionals in different special training courses | 368 |

5. Geospatial data and the quality human resources

The intended goals of LMTC are to train the trainers with GIS and Remote Sensing technological knowledge for their better geoinformation service, to acquire necessary educational equipment – hardware /software containing the capacity to perform research and project work. On the basis of research, LMTC has been updating the courses and redesigning the existing courses with including digital mapping techniques and affordable satellite technologies. With the advancement in the Information Technology, the application of GIS is rapidly growing. This advancement has provided opportunities of disseminating different type of information throughout the world via web. The development of web technology has changed the way of communicating tremendously. New concepts of exploiting the available technologies and possibilities are developing day by day. Availability of a number of sites based on different themes in the web is the result of this advancement. Not only the developed countries but also the developing countries in the world are influenced by this trend, same is the case of Nepal. However, the dissemination tools are hardly found, due the lack of technological development, financial constraints and highly qualified expertises.

Undoubtedly, the dissemination of geospatial information would be highly effective but the trend of developing such tools in public or private sector seems very low. The governmental agencies like Survey Department, being accountable to the general public interest, should provide such services to the public. As the Department has the spatial database of the whole country and a number of technically expert staffs produced by LMTC, assisting with other organisation and the data produced by different organizations could be used to produce such a dissemination system.

On this ground, the SDI concept has been developed. The data duplication causes the serious problem in the country like Nepal. Taking these in consideration, government has set the policy for minimising the data redundancy. Most important events related to the various aspects such as socio-economic trends, infrastructure development trends, health and environmental situation and its trends, forest management system and its trends, multipurpose cadastral information system and trends, agriculture situation etc have been incorporated in a system. On the basis of above concept and the results, the system has been designed. The government has been taken the mission for such sort of system development is “To strengthen planning and resources management in Nepal through the development of a geographic information infrastructure for the access of geographic and related data for decision–making”. Now the question arises that how LMTC can contribute to work on the SDI concept, the simple and clear answer is by producing the human ware. But only producing the large amount of human ware is useless, for this, it is indispensable that the development of proper human resource having professional, managerial, and technical skills with appropriate knowledge on the subjects is necessary to sustain the system. Due to the lack of proper human resources, it is difficult to implement the programmes efficiently and effectively.

6. Gender Issue

It is obviously that the sustainable and balanced development of the society is not possible with out men and women having the equal opportunity for their development and behaviour except for the natural differences. According to the government policy on elimination of all types of discrimination against women. First time Nepal, LMTC introduce the women participation policy in the surveying and mapping sector. Even though, surveying and mapping
techniques are based on the field survey. In the present digital environment, there are the plenty of opportunities for the women professionals in the field of surveying and mapping.

7. Some recommendations on working policy and working strategy

At the beginning, Land Management Training Centre was established to fulfil the necessary technical manpower for the Department of Survey. Now at this stage; this centre has its broad scope. The policy is definitely to be reviewed and should have been set by focusing the human resource development for the different concerning governmental and non governmental organisation under the working policy and some strategic work plans need to be developed to gain the goal. Some of the recommendations are as follows

- **The infrastructure development** for conducting the proposed educational programme within the centre. It is also better to introduce the educational project and research work approach for the self-sustainability of the centre. The joint venture concept may give the efficiency to the centre.

- **Digital mapping and GIS/RS theory and its application in the core course modules**, LMTC is currently confined the digital mode in its education system to small nodes. It is very essential to introduce and run the software like ArcGIS, ERDAS, ENVI, and ILWIS as a tool for GIS and RS application in a systematic way, that means it should be very essential to conduct the application based action oriented module. There are very few staffs, which have basic knowledge in GIS and Remote Sensing. Those in house expertises are to be further trained via the training course conducted in the international institute / universities.

- **Research and Development activities** in LMTC on the diverse aspects and the raise problem during the implementing phase by the concerning organisation should be noticed. For example, defining the suitable national coordinate system, ellipsoidal parameter, transformation of parameter from one coordinate system to another, use and usability analysis on the product and services, different types of maps, geographic information infrastructure concept and scientific land management for creating the beautiful, secured dynamic land etc. These jobs could be done integrally associating with the relevant existing university and institute.

- **National Academy of Surveying and Space technology**, to develop the centre as the national coordination body for coordinating the research in surveying, mapping and space technology activities within the country by setting the open policy on joint collaboration concept with national as well as international cooperating bodies.

8. Conclusion

The brief introduction about Land Management Training Centre and its journey on surveying and mapping studies in Nepal has unique important to develop the human resources. The education on this matter and its short/long term effect on the surveying and mapping service are highly considerable. The gender issue has also been considered. Since the scientific education is very essential for the technological development in every filed. The above discussion on the current and forthcoming activities are also vital, the essentials and some vital recommendation to be taken for surveying and mapping education has also been clearly mentioned. There is no alternative that the geospatial data are very essential for infrastructural development, social justice, and good governance of the country. Coordinating body on the context of surveying mapping education with in the country is now very clearly seems to be lack. The suitable curriculum on surveying, mapping and space technology should be developed from school level up to the campus level, which intern very important to restructure the centre as the **National Academy of Surveying and Space technology (NASST)**, to develop the centre as the national coordination body for coordinating the surveying, mapping and space technology education/activities and the human resource development with in the country

References:

[2] Proceeding of the colloquium on the role and functions of survey department in the context of broader technical development, Survey Department, 2005


