Less Means More – NTDB At Scale 1:100 000

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Since the very beginning of our childhood we always wished for more and more of many things. We wished more happiness, success, money, satisfaction and so on. Most of the times, we are satisfied if we have more of the things we are looking for. A child is much happy if he has more and more toys to play with. A student waiting for the examination result is wishing more and more marks in each and every subject. An employee naturally wishes for more and more salary from his job. Well, this can be continued for more and more cases. There are things which we always want less and less if not nil. A child naturally wants less and less comments from his guardians, a student wishes for less and less homeworks and so on. Working in the field of mapping and geospatial data, let us think, are there anything, which we want less but at the same time we get much more?

While making maps or creating geospatial data, we always tend to include more and more information as far as possible. But how much of this "more information" is sufficient to meet our desire? Practically, a map or a data storing mechanism has a certain limit to the volume of information it can hold. The first of such limits is imposed by us, by defining the use of a map or a data set. We tend to include that information, which play role in fulfilling our requirements. We can see this clearly in case of most of the thematic maps. Another limiting factor is the space available for showing the information. In case of hard copy maps, the space available is controlled by the map scale and in case of digital data, it is controlled by the space available in the data storage devices. Similarly, the ability of human eyes to discern two or more objects lying side by side also controls the possible volume of information shown in a map.

The information content of base maps is very much critical. By the very definition, a base map should offer as much details as possible. But at the same time we should not forget about the information noise in a map or data. In case of digital data, the volume of information plays a vital role in further processing of the data. Most of the softwares available in market, working with digital data, have their limit in processing the data. Huge volume of data can't be, at least very much time consuming, processed due to limitations of hardwares and softwares.

The question "How much information should be shown in a map or data?" is still unanswered. Traditionally, in different countries different volumes of information are shown in maps of different scales. The information content of maps often reveals the economic and technological achievements of a country.

In Nepal, after a gap of about 50 years, a new series of base maps have been produced during 1990s. Before the publication of these maps, the map users were compelled to use "one inch to a mile" topographical maps published by the Survey of India. The development in the field of digital mapping and geographical information system created a huge demand of digital geospatial data. Being the national mapping agency, Survey Department took the responsibility of fulfilling this growing demand of the map users. The will power of Survey Department of Nepal made it possible to convert all those base maps into the digital form and the digital data are made available to the users.

The feedback from the users revealed some inconveniences in using the data. The data file, a set of individual layers like boundaries, buildings, hydrographic features, landcover features etc., has been managed in the basis of a map sheet creating problems of edge matching between the data files. The projection and coordinate system of data file is same as that of the corresponding map sheet creating problem in displaying the data for most of the data users. This is because of the projection and coordinate system used in the preparation of those maps. For the mapping purpose modified Universal Transverse Mercator Projection (MUTM) is used in Nepal. To keep the deformations within certain limit, the whole area of Nepal has been divided into three 3° zones. For each zone, the intersection of the central meridian and the equator has been considered as the origin for the coordinates with false

northing of 0 m. and false easting of 500 000 m. assigned to it. So, for the proper viewing of the data in computer screen, all data should first be converted into single coordinate system.

The data files often contain error prone features in them. During the editing of the data, some features were intentionally introduced to make the processing of the data possible. This is because of the limitation of the software (PC ARCINFO Ver. 3.4.2) used for the creation of the data file.

Survey Department has always done it's best to serve the map users and solve their problems in the field of mapping. Continuing this culture, Survey Department is working on creating data files at smaller scales. It has plan to create data files at scales 1:250 000, 1:500 000 and 1:1000 000. The data files at scale 1:100 000 are already available for the users.

Creating data files at smaller scales means generalizing the data content of larger scale data files. In essence, this means to reduce the number of features in the data files and cover larger ground area in the data file i e. getting more from the less. According to the map sheet layout in practice in Nepal, a data file at scale 1:100 000 covers the ground area covered by 16 data files at scale 1:25 000 or 4 data files at scale 1:50 000. This greatly reduces the problems of edge matching.

Due to technological and manpower constrains, not all aspects of cartographic generalization have been implemented in the data files. Most frequently applied aspect of generalization in creating data files at smaller scales is the selection of features. For example, several building clusters within a specified area defined by a circle of specific radius are represented by a single point. Different types of points present in the data file of buildings viz. residential buildings, religious buildings and other types of buildings are processed separately. Rivers of order 1 are removed if their lengths are less than specific length. Landcover polygons with area less than a specific area are dissolved into neighboring polygon of same category with largest area. Selected category of transportation lines is shown. Other aspects of cartographic generalization can be applied in future as new softwares, capable of performing cartographic generalization, become available. For example, line smoothing, making interrelated features consistent, displace transportation lines in accordance to the contour lines, rearrange administrative boundaries as per the generalized river lines and so on. Similarly, availability of additional attribute information of the features present in the data file can assist in generalizing them in more scientific way. For example, population by settlements may help us in ranking the settlements which may be the input for generalization of settlements.

The data files at scale 1:100 000 are stored in geographical coordinate system. This will solve the problem of displaying the data for most of the data users. Advanced users can display / convert the data file into a projection satisfying their needs. The Everest 1830 Spheroid is used in Nepal for mapping purposes. The major, a and minor, b semi axes radii are 6 377 276.345 m. and 6 356 075.413 m. respectively. The data files at scale 1:100 000 are in ArcView shape file format, which most users are familiar with. This format can be converted into most of the other spatial data formats.

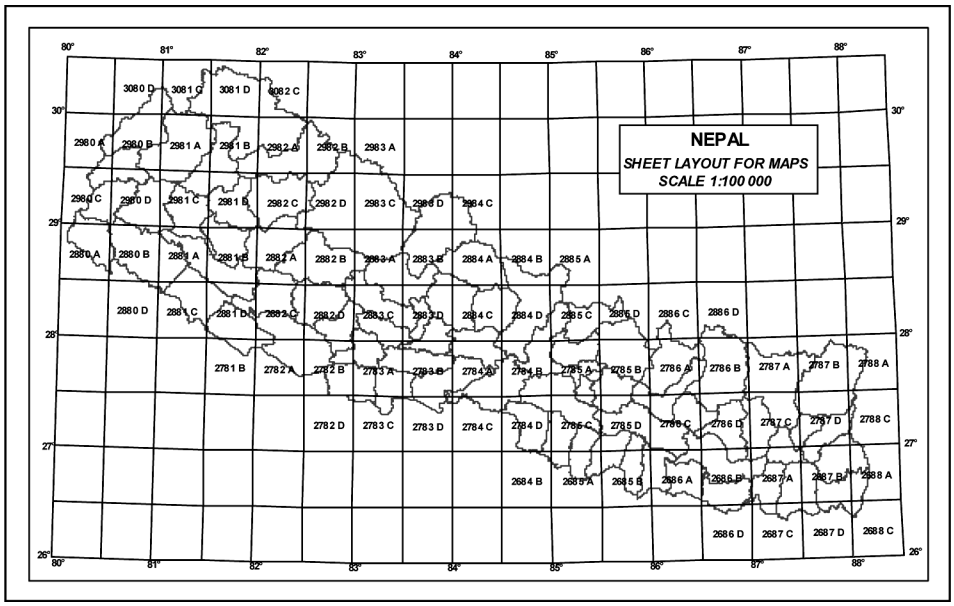
Honoring the requests from the data user side, Survey Department has decided to avail the data of each sheet (1:100 000) according to following pricing system (Table 1).

SN	DATA LAYER	DATA FILE NAME	USER CATEGORY / PRICE		
			A / NRS.	B / NRS.	C / USD
1	Administrative Boundary	ADMIN_AR	500	1000	30
2	Transportation	TRANS_LN	1000	2000	60
3	Building	BUILD_PT	300	600	20
4	Landcover	LANDC_AR	1500	3000	100
5	Hydrography	HYDRO_LN	1200	2400	80
6	Contour	ELEVA_LN	1200	2400	80
7	Designated Area	DESIG_AR	100	200	10
8	Utility Line	UTILI_LN	100	200	10
	DATA FILE		5000	10000	300

Table 1: Pricing System

Category A: Nepalese researchers, Government organizations, NGOs, Government affiliated;
Category B: Nepalese private companies(consultants, contractors) and
Category C: Foreign organizations, consultants, contractors.

The following map shows the sheet layout for data files at scale 1:100 000:



The users interested to acquire the data should write an official letter explaining purpose of data, required sheet numbers, required layers, name and official position of the person who will receive the data and sign the agreement.

The letter should be addressed to The Section Chief, Digital Mapping Unit, NGIIP, Survey Department, Minbhawan, Kathmandu.