TITLE: Delineation of an Area: New Tehri Town, Tehri Garhwal, Uttarakhand, India

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Introduction

New Tehri, in the state of Uttarakhand is such an example, developed for the people displaced by the Tehri Dam in India. Town consist of 13 wards. Geographically, the town is located in the middle lands of Lesser Garhwal Himalaya Belt on top of mountain ridge running north-eastern to south-western and on its south-eastern and north-western slopes at 30.3739° N (30° 22'34.5036" N) latitude and 78.4325°E (78° 26'7.3644" E) longitude

Methodology

Town's physical and nonphysical characteristics including regional setting/character of the land‑ landforms, density, land uses, housing/building typologies, distribution of green space, accessibility and transport infrastructure have been mapped and analysed using open-source software i.e., QGIS 3.2.0. To measure the physical and nonphysical characteristics mentioned above, data was collected from various datasets such as the 2011 census, on-site observations and surveys, interviews and discussions with domain experts and residents on problems in selected hill town. For instance, density has been calculated by using different measurements, such as dwellings per hectare (dph), persons per hectare (pph), and the source of information was collected from census data and local authorities.

Land use and activities (such as residential, commercial and retail, recreation, public and semi-public spaces), are mapped using site survey.

To identify predominant housing types, lowest level of living accommodation and a household's access to outdoor space, site survey was conducted. Also, site survey was conducted on a street-by-street basis. GPS (global positioning system) was used during site surveys which allowed the survey data to be directly downloaded into a QGIS (geographic information system). This allowed to easily identify, locate and check various land uses; building typologies; presence of landmarks; position of bus stops and shelters; within the selected study premises.

Specific Steps

1. Manually drafted maps were obtained from local authorities (ward map and master plan).
2. Contour map of site was generated using CARTOSAT DEM from BHUVAN (contour extraction at 5m interval).
3. Using open street map and by overlaying the drafted maps (master and ward map), digitization of the area (using point, line and polygon vector layers) was completed by assigning proper land use colour coding as per URDPFI guidelines.
4. After digitization, certain attributes were linked with layers (excel saved as .csv and then drag and drop in QGIS). Population data and density was added in the attribute table of wards.
5. Population density map was prepared and viewed as graduated by clicking on properties of ward layer.
6. Certain proximity analysis was performed in QGIS to find the school proximity from dwelling units.
7. In the end, by performing weighted analysis, overall sustainability was calculated.

Complexities

Data was not easily available from the local authorities; all data was mapped by the author itself.

Application

Land use (major activities) map can be used to study the land utilization and future planning and management of land resources. Using a GIS-based proximity analysis, priority can be given to increase physical activity behaviour among youth, as the ability to walk to the play spaces, schools or even to local market areas are considered an important health benefit. Through sustainability analysis, local authorities can find out which areas need improvement in terms of infrastructure, environment, transportation category.