



Chapter Outline

- 11.1 Introduction
- 11.2 Conventional signs and symbols
- 11.3 Open Series Maps
- 11.4 Marginal Information
- 11.5 Interpretation of Topo sheet
- 11.6 Interpretation of selected topo sheet



Learning Objectives:

- Understand the importance of conventional signs and symbols
- Appreciate the marginal information printed on the topo sheet
- Develop map reading skills
- Identify the various physical and cultural features in a topo sheet.
- Interpret a topographic sheet

11.1 Introduction

A Map is a representation of a part or whole of the earth's surface on a two dimensional surface. A map is a good guide, but it requires some skill on the part of the map user to follow the direction

and information given by it. Map reading in actually, denotes the formation of the visual picture of the ground depicted on a map. It requires good deal of practice. The best way to familiarise once self with the topography of a region is to compare the topographic map of the region with the actually area depicted through a field visit called ground truthing. It is not possible for anyone in their life time to collect direct information about the whole earth but the student can get a large amount of information about the earth from the topographic sheet or from these maps.

Topographical map commonly known as *topo sheets*, are special maps prepared by survey department that show a three-dimensional surface on a two-dimensional sheet of paper. In India the topographic sheets for the whole country are prepared by an organisation called as the 'Survey of India' (SOI). The sheets are prepared largely on a scale of 1:50,000. Maps on scale of 1: 25,000, 1: 250,000 and 1:1,000,000 or million sheets are also prepared.

11.2 Conventional signs and symbols

Features which have to be repeatedly represented on maps are depicted by



special signs and symbols. The signs bear some pictorial resemblance to the original feature and their meaning is quite clear. Some conventional signs need to be studied closely before they can be recognised.

Point, line and area symbols are used to depict various physical and cultural features. They can be in the form of alphabets, figures, signs or colour wash.

The Survey Of India (SOI) have standardised a set of conventional signs and symbols to be used in topographical maps.

Seven colours are commonly used in the maps of Survey of India.

- **Black** - All writings on the map except grid numbers (names, abbreviation such as DB, RS, PO), river banks, broken ground, dry streams, surveyed trees, heights and their numbering, railway lines, telephone and telegraph lines, lines of latitude and longitude, all boundaries, any written amplification (such as 'open scrub', 'metalled road under construction', 'meter gauge' are given in black.
- **Brown** - Contour lines, their numbering, form lines, sand features and barren rocky areas such as hills and dunes are represented in brown.
- **Blue** - Blue colour is used to show water features or water bodies (Rivers, Lakes, ponds, tanks, wells, etc.,)
- **Green** - Wooded and forested areas shown as green wash, orchards, scattered trees and scrubs shown by green symbols.
- **Yellow** - Cultivated areas are shown as yellow wash.
- **Red** - Grid lines (East and North) and their numbering; roads, cart track and foot path, settlements, huts and buildings are shown in red.
- **White patches** - Uncultivated land and glaciated and snow covered areas in mountains. (Figure 11.1)

11.3 Open Series Maps

Survey of India (SOI) brings out two series of maps through the National Map Policy, 2005.



























































































1) Defence Series Maps (DSMs) - These topographical maps (on Everest/WGS-84 Datum and Polyconic/UTM Projection) are on various scales (with heights, contours and full content without dilution of accuracy). These maps mainly cater for defence and national security requirements. This series of maps (in analogue or digital forms) for the entire country are classified by the Ministry of Defence.

2) Open Series Maps (OSMs) - OSMs are brought out exclusively by SOI, primarily for supporting development activities in the country. OSMs bear different map sheet numbers and are in UTM Projection on WGS-84 datum. Each of these OSMs (in both hard copy and digital form) become 'Unrestricted'.

11.4 Marginal Information

Marginal information includes the topographical sheet number, its location, grid references, its extent in degrees and



Roads, metalled : according to importance; distance stone	  
Roads, unmetalled : according to importance; bridge	  
Cart-track, Pack-track and pass. Foot-path with bridge	  
Streams : with track in bed; undefined. Canal	  
Dams: masonry or rock-filled; earthwork, Weir	  
River dry with water channel; with islands and rocks. Tidal river	  
Swamp, Reeds	  
Wells : lined; unlined. Spring. Tanks : perennial: dry	  
Embankments : road or rail	  
Railway, broad gauge : double; single with station; under construction	  
Railway other gauges : double; single with distance stone; under constrn.	  
Light Railway or tramway, Telegraph line. Cutting with tunnel	  
Contours, Cliffs	  
Sand features (1) flat (2) sand hills (permanent) (3) dunes (shifting)	  
Towns or Villages : inhabited ; deserted. Fort	  
Huts : permanent; temporary. Tower Antiquities	  
Temple. Chhatri. Church. Mosque. Idgah. Tomb. Graves.	  
Lighthouse, Lightship. Buoys : lighted ; unlighted. Anchorage	  
Mine. Vine on trellis. Grass. Scrub	  
Palms : Palmyra; other. Plantain. Conifer. Bamboo. Other trees.	  
Boundary, international	  
Boundary, state : demarcated; undemarcated	  
Boundary, district : subdivision, tahsil or taluk; forest	  
Boundary, pillars : surveyed; unlocated; village trijunction	  
Heights, triangulated : station; point; approximate	  
Bench-mark : geodetic; tertiary; canal	  
Post office. Telegraph Office. Combined office. Police station.	  
Bungalows; dak or travellers; inspection. Rest-house	  
Circuit house. Camping ground.	  
Forest : reserved: protected	  

A number of methods have been used to show the relief features of the Earth's surface on maps, over the years. These methods include hachure, hill shading, layer tints, benchmarks and spot heights and contours. However, contours and spot heights are predominantly used to depict the relief of an area on all topographical maps.

Figure 11.1 Conventional Signs and Symbols

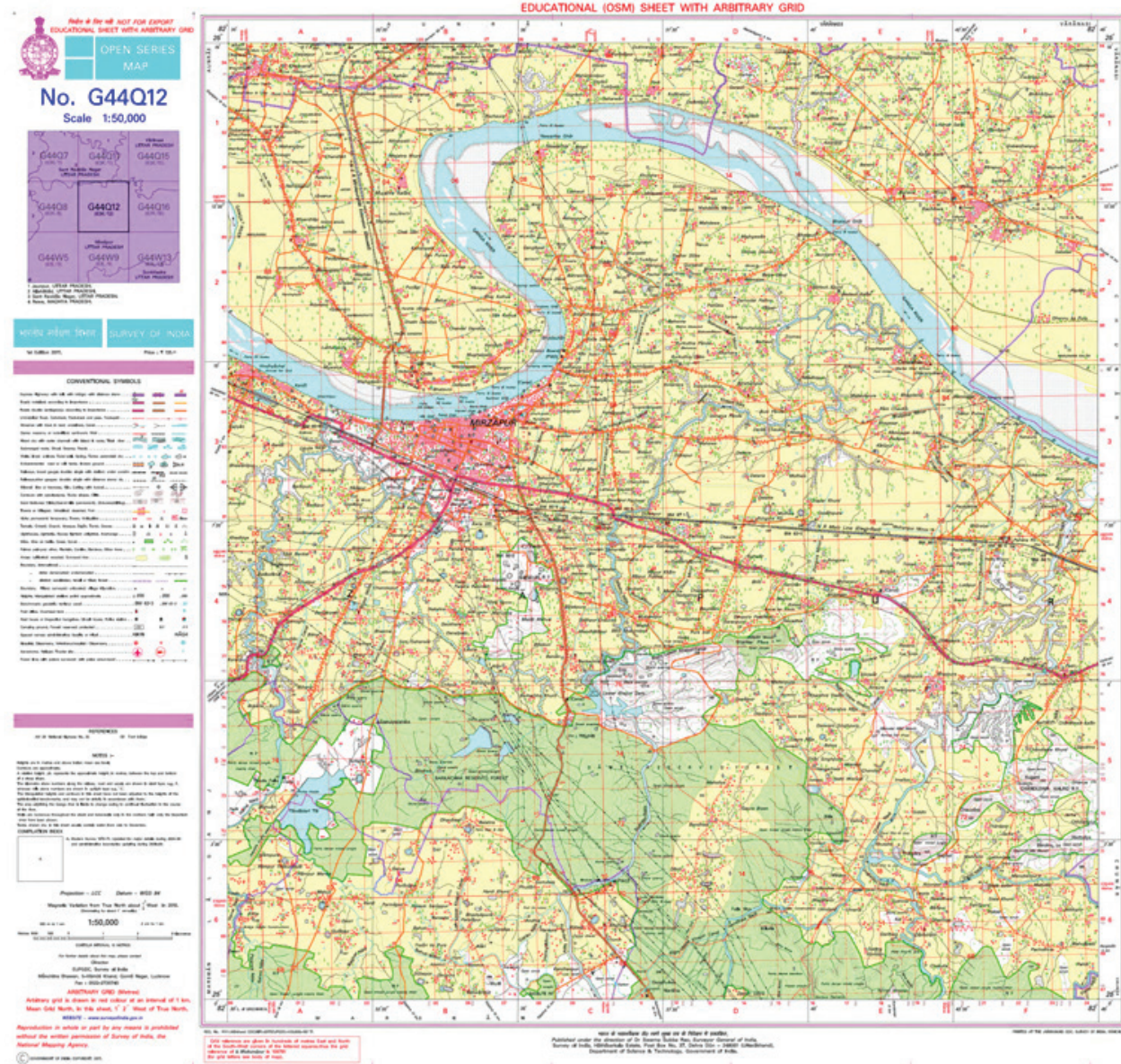


Figure 11.2 Open Series Map

minutes, scale, the districts covered, etc. Marginal information is classified in to:

- **Extra Marginal Information-** Serial Number, name of the State, District and other general information.
- **Intra Marginal Information** – Grid information, contour values, names of the next nearest places connected by transport lines and distance in Km.
- **Inter Marginal Information or Body of the Map**– depicts the topography by using various Signs and symbols

11.5 Interpretation of Topo sheet

Study of Topographical Maps

Topographic maps are general reference maps. They are also called ordnance maps. These maps are ideal for researchers, planners, administrators, defence personal, hikers, tourists and for class room purpose. They give clear details of actually surveyed natural and manmade features. These maps are drawn to scale.

Geographical knowledge and clear understanding of conventional signs and

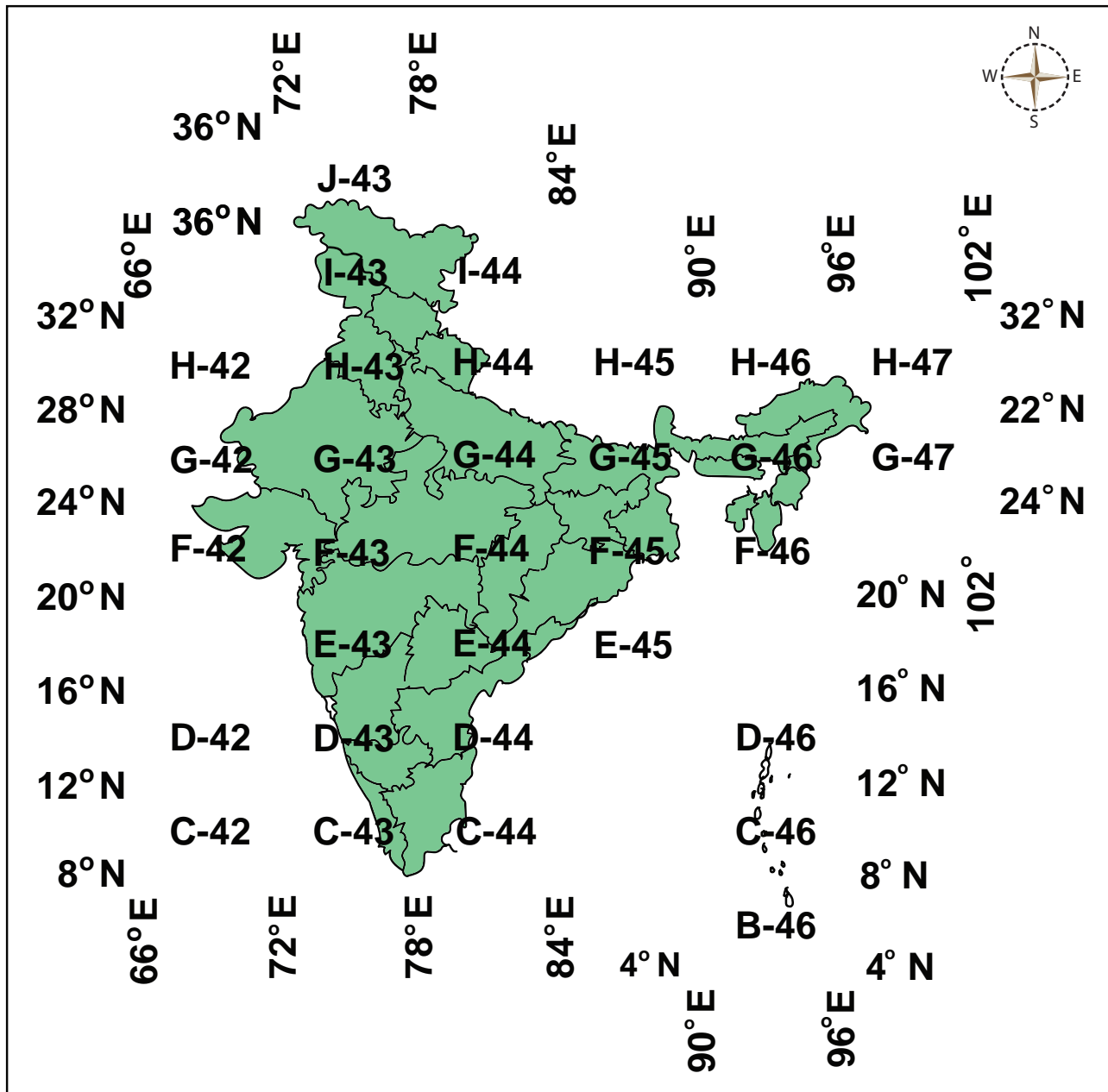


Figure 11.3 Index System

symbols is essential to understand and interpret a Survey of India Topographical sheet.

A topographic sheet is usually interpreted under the following sub headings:

- Marginal information
- Relief
- Drainage
- Natural and

- Man made
- Vegetation
- Land use
- Settlement
- Transport and communication

Marginal Information

The marginal information includes the topographical sheet number, direction, its location, grid references, latitudinal and



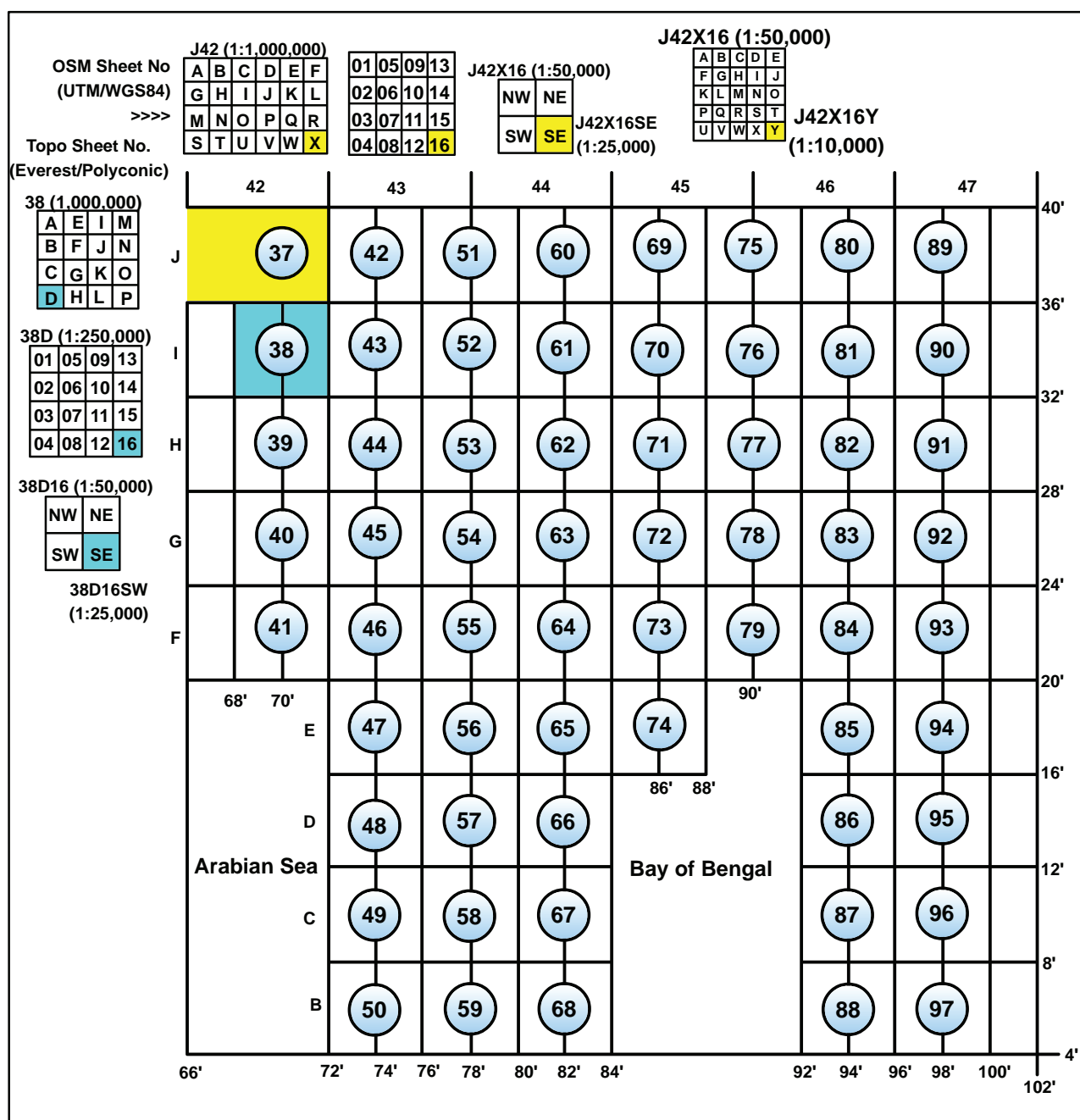


Figure 11.4 Index for conversion of Topo sheet No. to OSM sheet No.

longitudinal extent in degrees, minutes and seconds, scale, the districts, covered, contour interval etc.,

Relief

Relief refers to the general topography of the area under study. First, the landforms like mountains, hills, plateaus along with the peaks, ridges should be identified and the general direction of slope can

be determined. The contour values and patterns have to be studied. Spot heights, bench marks etc help in understanding the height of certain areas.

Drainage

Drainage of an area can be understood by observing the characteristics of the rivers, their tributaries and drainage pattern.



Vegetation

Important trees are shown by special symbols. Trees, grasses and shrubs are all shown in green colour. Agricultural land is shown in yellow colour.

Land use

Land use includes the use of land under different categories like agriculture, pasture, barren land and forest area. Other land use categories could be mining, industry, trade, tourism, fishing or cattle rearing. It also informs us about the presence (location) of airports, railway stations, schools offices, trade centres, electric substations, etc. Sometimes, land use is directly mentioned, for example, brick kiln, limestone quarry, etc. At other times it has to be inferred.

Settlements

The size, shape, pattern site, position and function of settlements should be considered while interpreting a topographical sheet because all these aspects are interdependent.

Settlements could be dispersed or scattered, compact or nucleated type. They may be radial or linear in pattern. They are also studied under the following heads, based on their size and the activities the population is engaged in.

Permanent settlements are shown by solid squares and temporary ones in outlines of squares.

- **Rural settlements:** They can be compact, semi compact, dispersed or linear, etc.
- **Urban settlements:** It is the capital city, administrative town, trade centre,

port town, religious or tourist station or a hill station.

The basic occupations that the people are probably engaged in, can be understood after the land use pattern and the type of settlement have been understood.

Transport and communication

The means of transport and communication being used can be identified from the presence of national and state highways, district and village roads, cart tracks, camel tracks, footpaths, railways, waterways, telephone and telegraph lines, post offices, etc.

Roads are not drawn true to scale. Metalled roads are shown by double lines, and unmetalled by broken double lines. Foot path shown by red dots and cart track by single broken lines. Different kinds of railways are shown by different signs.

11.6 Interpretation of selected topo sheet

Mirzapur and Varanasi District, U.P OSM Sheet No G44Q12 63K/12

Introduction

The OSM Sheet No G44Q12 63K/12 (Figure 11.2) covers major part of Mirzapur District and partly Varanasi District of Uttar Pradesh. It is based on the survey of 1970-71 and was published in 1978. It carries the scale of 1: 50,000 and covers area about 440 km² extending from 25° 0'N latitude to 25° 15'N latitude and 82°30'E longitude to 82° 45'E longitude.

Relief

It has two distinct physiographic units: 1. The Ganga Plain and 2. Vindhyan Plateau.



The Ganga Plain extends on both sides of the meandering course of the Ganga. In the south it conterminates with the Vindhyan Plateau and is crisscrossed by the Chatar Nadi, Khajuri Nadi and Ujhala Nadi and their tributaries. It is a level plain with an average elevation of about 100 m above the mean sea level. The BM 84 m lies in eastern part of Mirzapur Town. The northern bank of the Ganga is comparatively lower than its southern counterpart by about 10 m. The eastern loop of the Ganga is wider, nearly 1.5km. or more in width and is marked by wide sandy shoals.

The Vindhyan Plateau covers the southern part of Mirzapur District. It covers nearly 50% of the total area of the sheet. It is essentially a dissected plateau with an average elevation of 160m above the mean sea level. The meeting point of the Ganga Plain and the Vindhyan Plateau is marked by 120m contour line. It has an undulating slope and is depicted with residual and flat-topped hills like Deophulva followed by Murli (203 m), Rajghat (174m), Shakhar Pao (167 m). There are two ridges running parallel to each other and are separated by low saddles.

Drainage

The master stream of the area is the Ganga which has a meandering course and is fed by other tributaries and streams, the main ones being the Chatar Nadi, the Khajuri Nadi and Ujhala Nadi. They are mostly seasonal in character and rain fed. The streams of the Vindhyan Plateau are also seasonal but have formed notches on its surface. They have formed some waterfalls like the Vindhyan Fall and the Tanda Fall. The direction of the plateau streams

is by and large towards north where they ultimately join the Ganga.

Vegetation

The northern plain is mostly devoid of vegetation as the land has been cleared for purposes of agriculture. Only small patches of vegetation are found along the Chatar and the Harrai Nadi. Of course there are orchards and other plantations near the settlements. In the Vindhyan Plateau there are two main Reserved Forests, the Danti Reserve Forests and the Barkachha Reserved Forests. They are basically mixed scrub forests covering the hill slopes and tops.

Means of Irrigation: Wells and tanks are the main means of irrigation in this area. Recently tube wells and canals have also received attention in the northern Ganga Plain.

Settlements

The Ganga Plain is well settled, excepting the sandy and marshy tracts along the Ganga, particularly in the north-east sector and on both sides of the N.R. line between Khajuri and Chatar Nalas and opposite Vindhyachal. These tracts are annually visited by the floods of the river. The density of village settlements is well marked along the metalled roads.

The Vindhyan upland is sparsely populated with a few large nucleated settlements where there is cultivated land and water supply sources like tanks exist.

The most important town of the area is certainly Mirzapur located on the southern loop of the Ganga and has crescent shaped urban structure. Next to Mirzapur stands the holy town of Vindhyachal characterised

by temples, the most important being the Vindhyavasini Temple. It extends between the N.R. main line and the Ganga. North of the Ganga lay the market towns of Kachhwa, Chilh and Khamaria where bi-Weekly markets are held

Transport and communication

It is served by two railways, viz. (1) N.R. Main line (broad gauge electrified) running from Mughalsarai and passing through the main stations of Pahara, Jhingura, Mirzapur and Vindhyachal and (2) N.E. Line (broad gauge) from Mirzapur Ghat (R.S) to Madhosingh (Varanasi – Allahabad). A loop-line also exists from Pahara to a quarry about 2kms away.

The area is well connected by roads. The Allahabad-Mughal sarai metalled road runs across the region south of the N.R. Main line and passes through Mirzapur. The National Highway No. 7 (Great Deccan Road) runs from Mirzapur to Lohaghat (16km.) on its onward journey to Kanyakumari (2300 k.m) Another metalled road joins Mirzapur and southern parts of the district via Churk, Robertsganj and Pipri. Besides there are other roads like Jaunpur-Mirzapur Road, Chilh (Mirzapurghat)-Gopiganj Road and Mirzapur-Bhatauli Road. There are some unmetalled roads linking Mirzapur – Chunar and Mirzapur-Mharajganj. The Ganga Plain is, on the whole better served by roads as compared to its upland counterpart.

Exercises

Answer the following questions based on the given toposheet/ downloaded toposheet from Survey of India website - <http://www.surveyofindia.gov.in/pages/show/86-maps-data>.

1. What is the general settlement pattern of the map? Name it and draw the symbols in the settlement.
2. What is the contour interval of the map given?
3. Name any two modes of transport and communication.
4. Draw any 10 conventional symbols in the map.
5. Identify the landforms features and interpret them.
6. Identify the latitude and longitude of the toposheet.
7. Name any two types of vegetation found in the map.
8. Describe the drainage features.
9. What do the white patches of land signify?
10. What kind of economic activity is carried out in this area?



References

Practical Geography. R.L Singh
Practical Geography



Internet Resources

1. www.surveyofindia.gov.in