TOPOSHEET STUDY

MAPS

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INDIAN TOPOGRAPHICAL MAP NUMBERING ON A METRIC SCALE

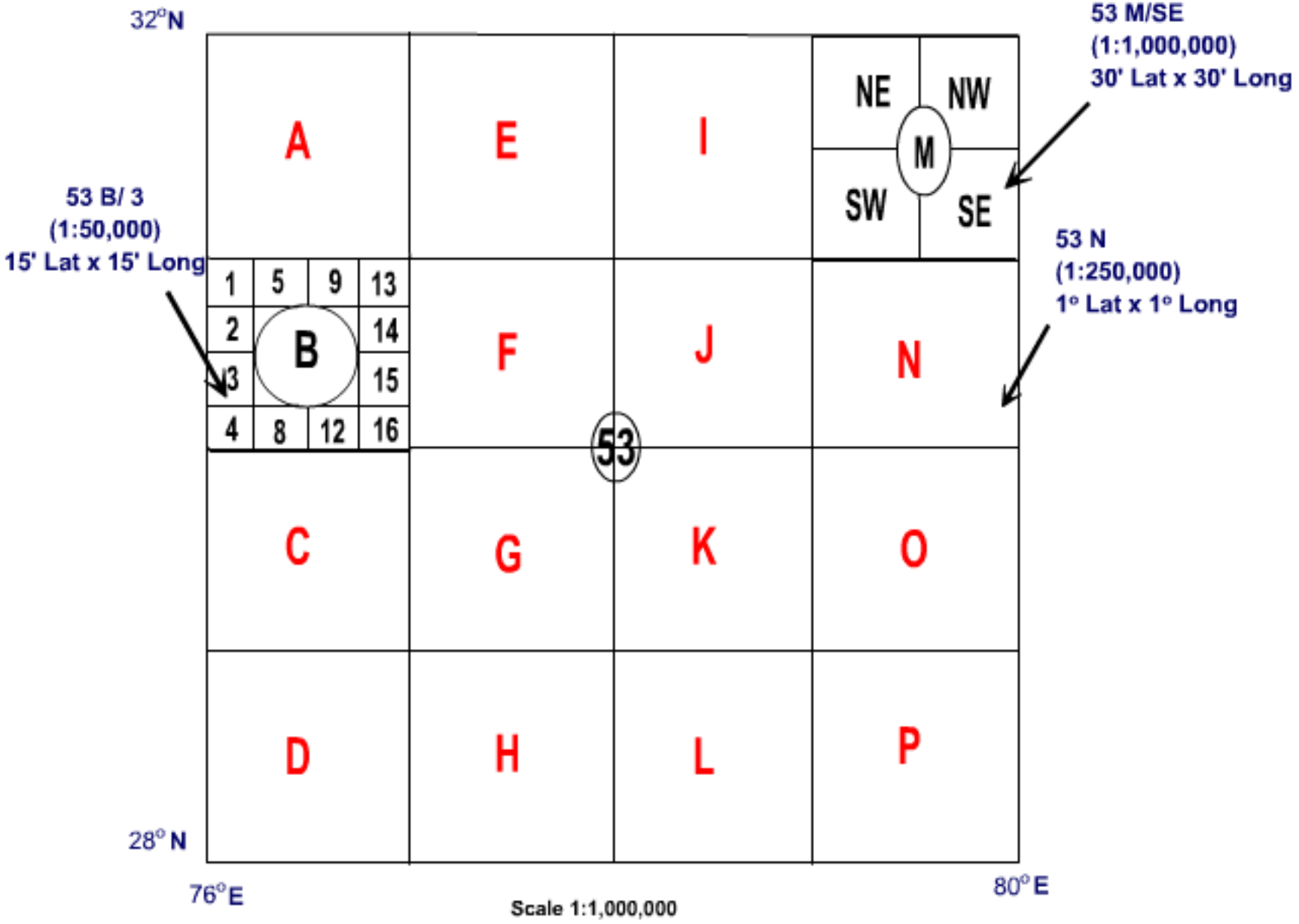
No	TYPES OF TOPO MAP	SCALE	LATITUDINAL AND LONGITUDINAL EXTENT	CONTOUR INTERVAL	EXAMPLE OF MAP SERIES
1.	Million map	1:10,00,000	4° × 4°	500m	58
2.	Degree map	1:2,50,000	1° × 1°	100 m	58A
3.	Quadrant/Half Degree/Half inch	1: 100000	30’ × 30’	50m	58 A/NE
4.	Quarter degree map	1:50,000	15' × 15'	20 m	58A/1
5.	Special map	1:25,000	7' 30" × 7' 30“ 5’ × 7’30”	10 m 10m	58A/1/SW 58 A/1/5

TOPOSHEET NUMBERING SCHEME ON OLD SCALE

Number of map (example)	Name	Number of Divisions	Scale in Degrees	Scale in Inches	Scale in Centimeters	Contour interval in ft.
53	Million Sheet	136	4° latitude × 4° longitude	1 in = 16 mile	1cm = 10 km	500
53 C	Degree or Quarter	16 (A to P)	1° latitude × 1° longitude	1 in = 4 mile	1cm = 2.5 km	250
53 C/NE	Half Inch	4 (NE, SE, NW, SW)	30'× 30'	1 in = 2 mile	1cm = 1.25 km	100
53 C/8	Inch	16 (1 to	15' × 15'	1 in =	1cm = 0.5	50

LAYOUT OF OSMs (NMP 2005, PROJECTION-UTM, Datum-WGS 84)

NAME	SCALE	EXTENSION	REFERENCE NUMBER
MILLION SHEET	1:1000000	6° × 4°	F45
DEGREE SHEET	1:250000	1° × 1°	F45 D
15’ SHEET	1: 50000	15’ × 15’	F45 D 08
QUADRANT SHEET	1:25000	7’30” × 7’30”	F45 D 08 NW
3’ SHEET	1: 10000	3’ × 3’	F45 D 08 U
LS SHEET	1: 2000	36” × 36”	F45 D 08 U 13


32°N
53 M/SE
(1:1,000,000)
30' Lat x 30' Long
NE
NW
M
SW
SE
A
E
I
53 B/ 3
(1:50,000)
15' Lat x 15' Long
1
5
9
13
2
B
14
3
15
4
8
12
16
F
J
53 N
(1:250,000)
1° Lat x 1° Long
N
53
C
G
K
O
D
H
L
P
28° N
76°E
80° E
Scale 1:1,000,000

A MAP & A DIAGRAM

- ***DIAGRAM***-is a sketch of something where the area shown on paper is not true to land area
- ***MAP-*** is the correct ground area represented on paper according to scale.
- ***TOPOGRAPHICAL MAPS***: A topographical map is that which shows both natural and manmade features. If in a physical map, latitudes and longitudes are the basis for the study of a region, than in a topographical map, Eastings and Northings are important to locate a place in a topographical map

USE OF A TOPOGRAPHICAL MAP

- Topographic maps have multiple uses in the present day: any type of geographic planning or large-scale architecture, earth science and many other geographic disciplines; mining and recreational uses such as hiking or, in particular orienteering, which uses highly detailed maps in its standard requirements.

Topographical Maps

- Topographical Maps, called Topomaps or Toposheets, are analogous or equivalent to the Ordnance Maps of Great Britain and Europe and the USGS maps in America.
- The British Surveyors prepared 106 Million Sheets in total covering the then Indian Sub-continent and the adjacent countries of Iran, Afghanistan, Tibet and parts of China and South-east Asia.
- Million Sheets (1:1,000,000) are drawn on Lambert's Conical Orthomorphic Projection with Everest Datum.
- Toposheet No. 1 on 1:1,000,000 corresponds to Tabriz in Iran.
- India is covered by 39 Million Sheets: 39–49, 51–58, 61–66, 72–74, 77–79, 82–84, 86–88, 91 and 92.
- The Inch Sheets (1:63,360) or the 15' Sheets (1:50,000) are drawn on Modified Polyconic or International Projections.
- The estimated number of Million Sheets covering the whole globe is 2222
  a) between 60°N and 60°S of (4° × 6°)
  dimension = $2 \times (60°/4°) \times (360°/6°)$
  $= 1800$
  b) between 60°N/S and 88°N/S of (4°×12°)
  dimension = $2 \times (28°/4°) \times (360°/12°)$
  $= 420$
  c) between 88°N/S and 90°N/S
  covering polar regions = $2 \times 1 \Rightarrow 2$
- With advancements in science and technology, Indian topographical sheets have been updated and redrawn with more details on larger scales of various layouts from time to time.
- The open series maps (OSM) on digital formats with a new layout are now available on various scales with fully digitised datalayers since the introduction of the new National Map Policy (NMP) on 19 May 2005.

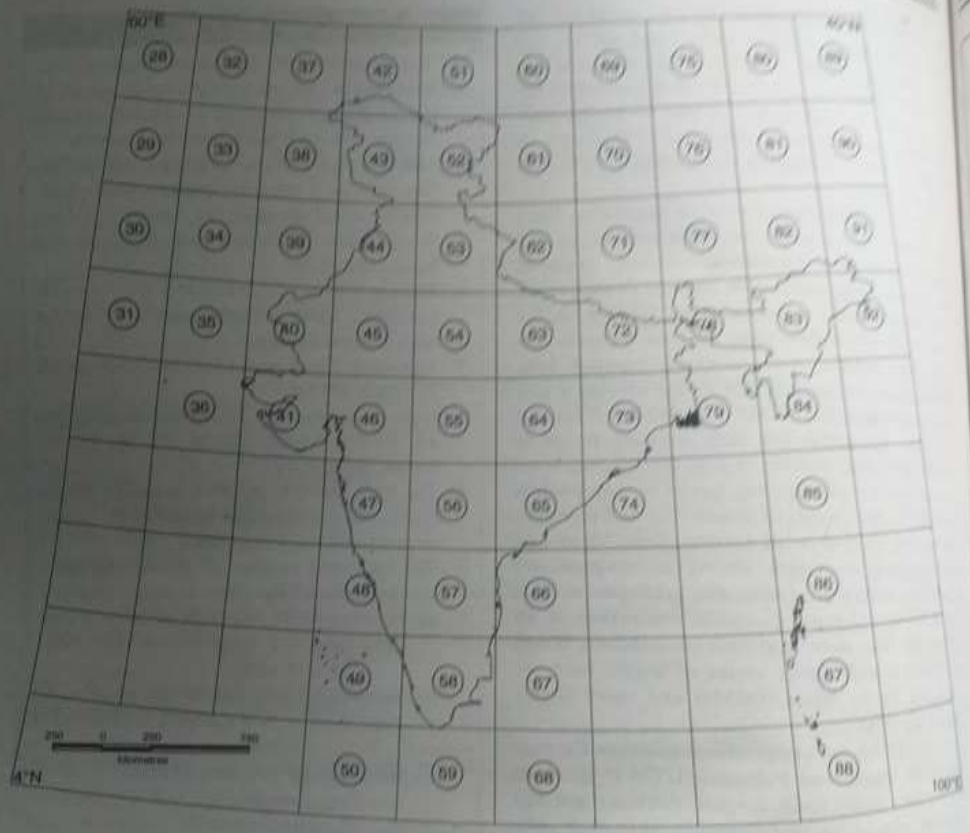
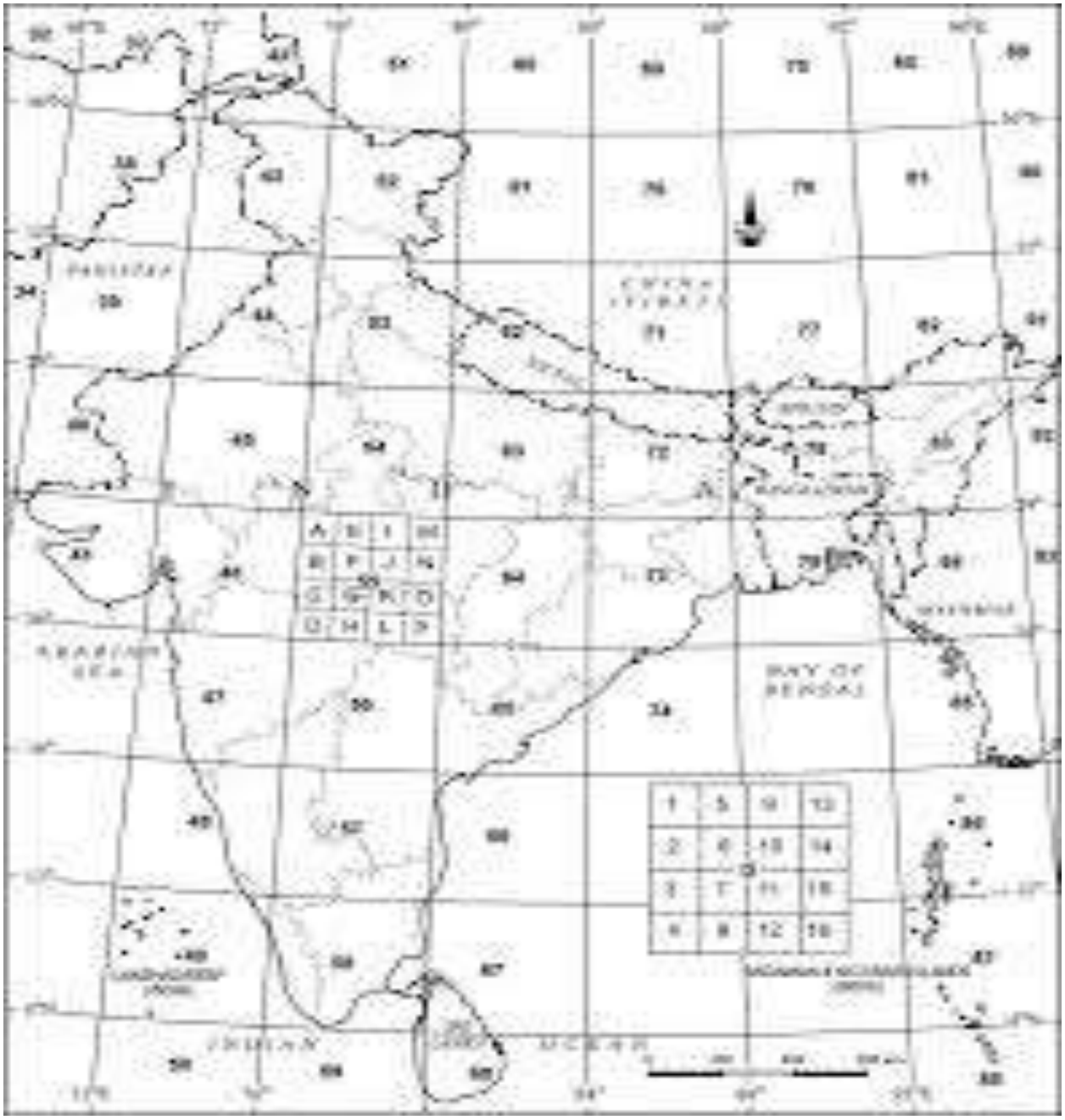


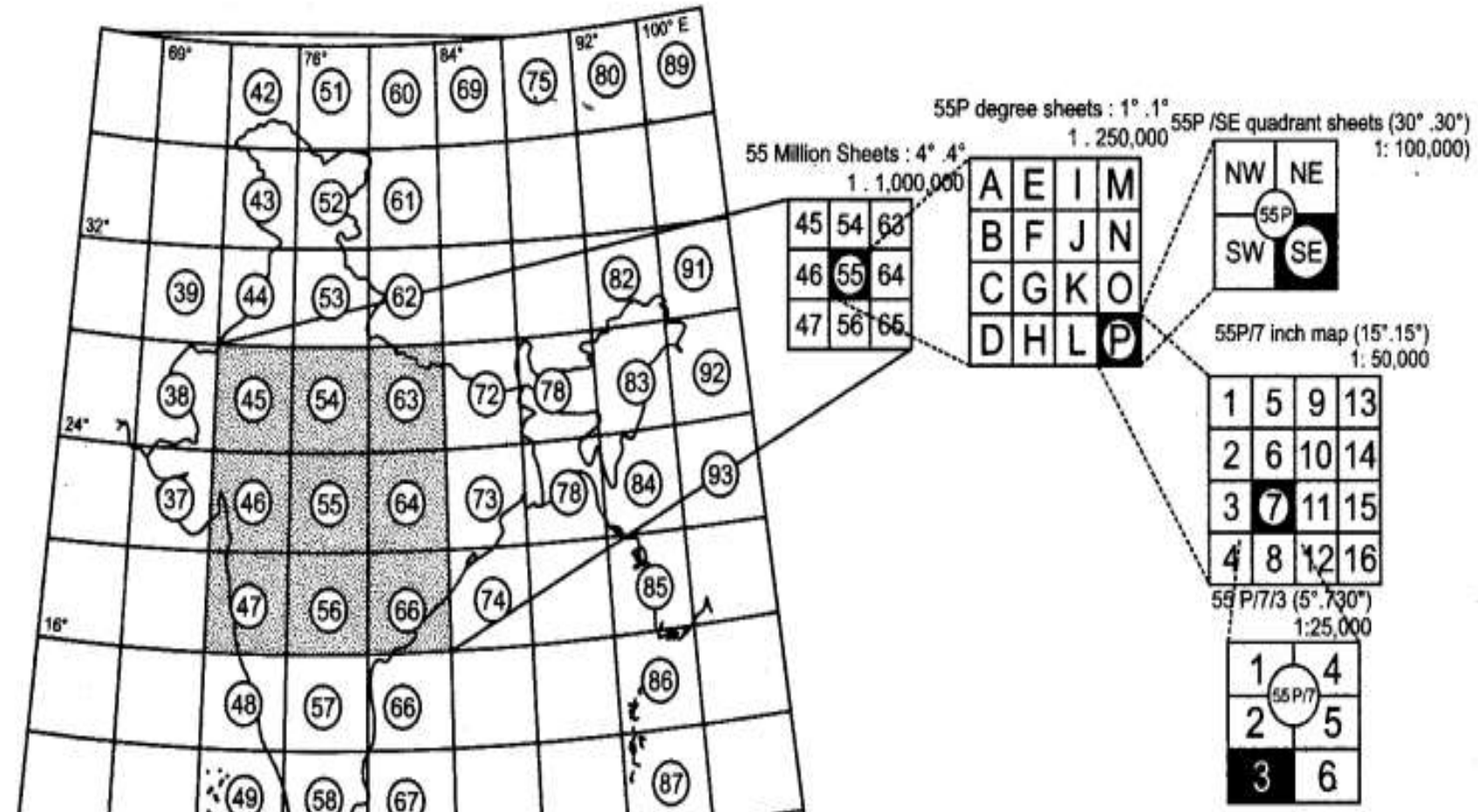
Fig. 8.3 Layout of Million Sheets covering the Indian Subcontinent

sheet contains 24 *degree sheets* on 1:250,000 scale and are designated by *alphabets*, A–X. Each degree sheet contains 16 sheets of (15' × 15') dimension 50,000 scale and are designated by *numerals* 15' sheet is then divided in *two* ways. heet contains 4 *quadrant sheets* of (7'30" × 7'30") on 1:25,000 scale and are designated as NW, NE, SE and SW. *Secondly*, each sheet contains 25 sheets of dimension (3' × designated again by numerals, 01–25. These are the largest scale maps published by the SOI (even larger than the existing cadastral maps on 1:4000) and are called LS sheets.

Methods of Interpretation

After the identity of the toposheet is established, its interpretation follows. It requires a careful study of the


PAKISTAN
CHINA
INDIA
ARABIAN SEA
BAY OF BENGAL
INDIAN OCEAN
A B I M
E F J N
G K L O
H L P
1 5 9 13
2 6 10 14
3 7 11 15
4 8 12 16


69°
76°
84°
92°
100° E
32°
24°
16°
42
51
60
69
75
80
89
43
52
61
39
44
53
62
82
91
38
45
54
63
72
78
83
92
37
46
55
64
73
78
84
93
47
56
66
74
85
48
57
66
86
49
58
67
87
50
59
88
88
55 Million Sheets : 4° .4°
1 . 1,000,000
45 54 63
46 55 64
47 56 65
55P degree sheets : 1° .1°
1 . 250,000
A E I M
B F J N
C G K O
D H L P
55P /SE quadrant sheets (30° .30°)
1: 100,000)
NW NE
55P
SW SE
55P/7 inch map (15°.15°)
1: 50,000
1 5 9 13
2 6 10 14
3 7 11 15
4 8 12 16
55 P/7/3 (5°.730°)
1:25,000
1 4
55 P/7
2 5
3 6

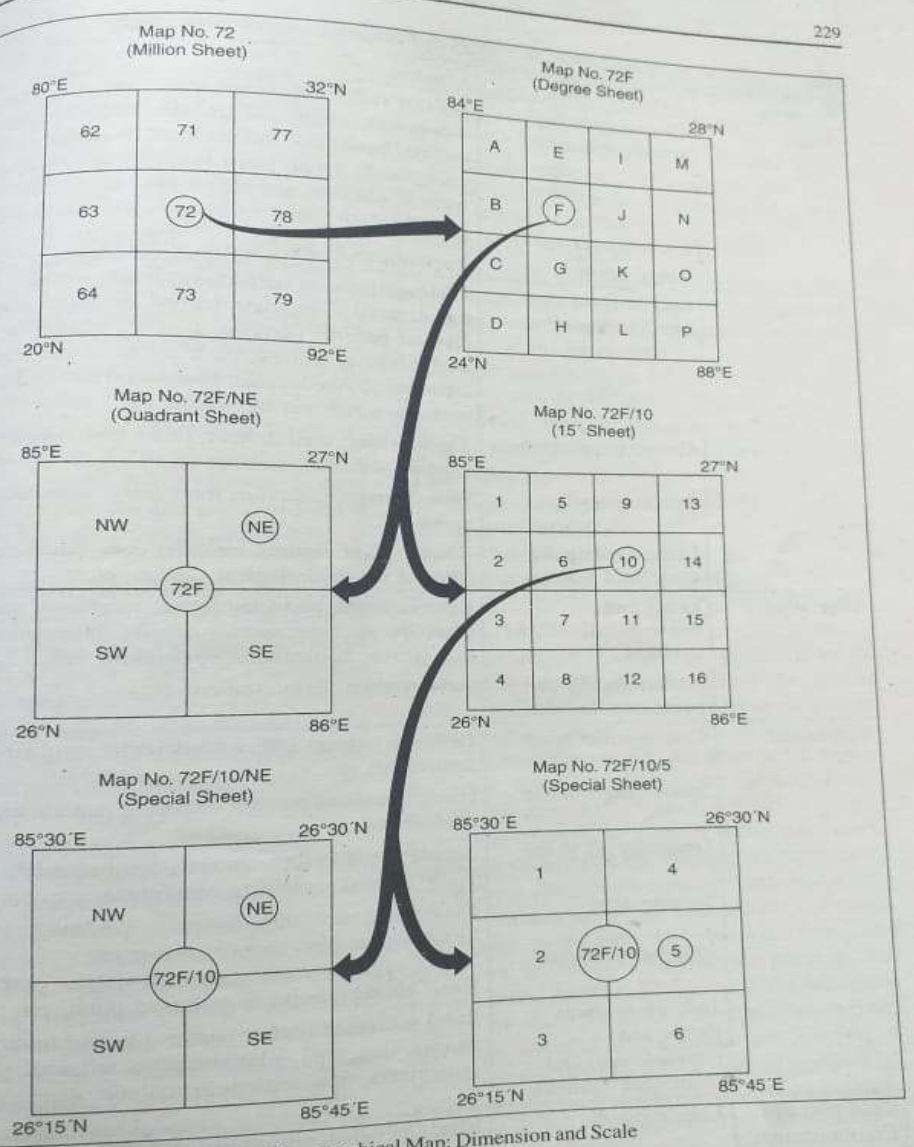
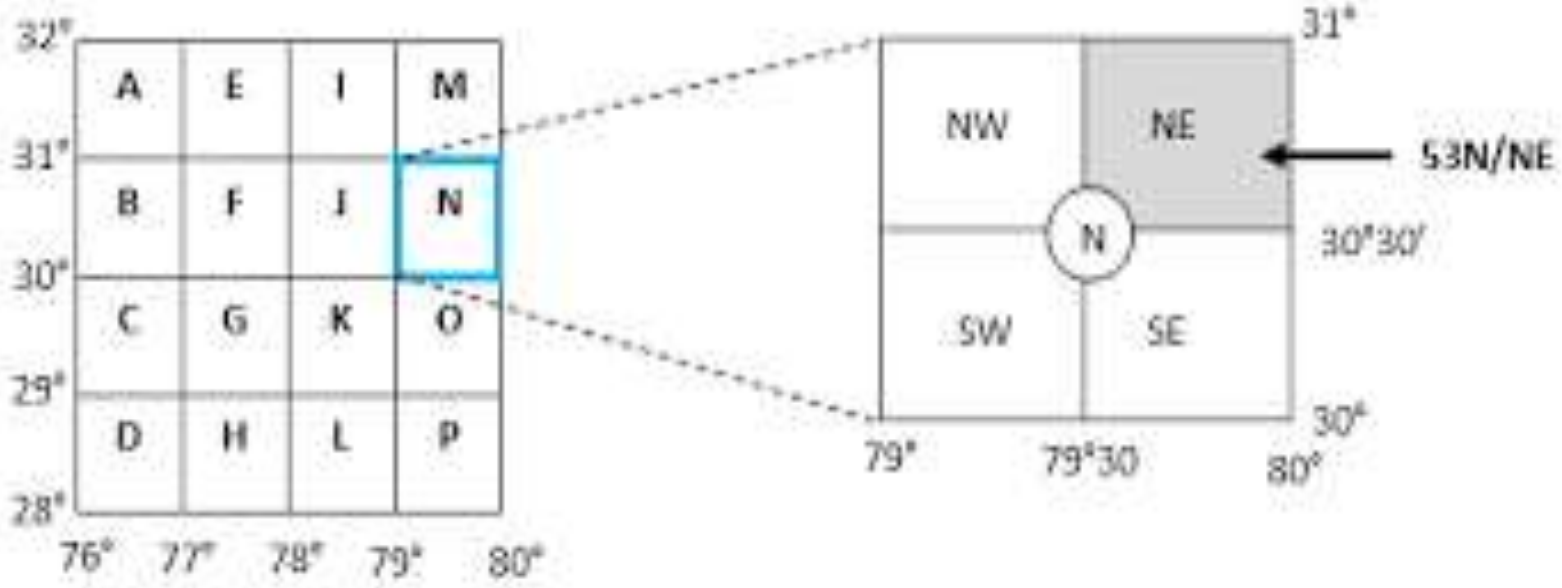


Fig. 8.4 Indian Topographical Map: Dimension and Scale

processes of the major map elements (i.e., geology, geomorphology, phytogeography, settlement geography, cultural geography, economic geography, etc.) as well as a vivid idea of the region portrayed in the map is required. Toposheet interpretation is a 3-step process by which *features*



A sheet of 4° × 4° (scale: 1: 1,000,000)

A sheet of 30′ × 30′ (scale: 1:100,000)

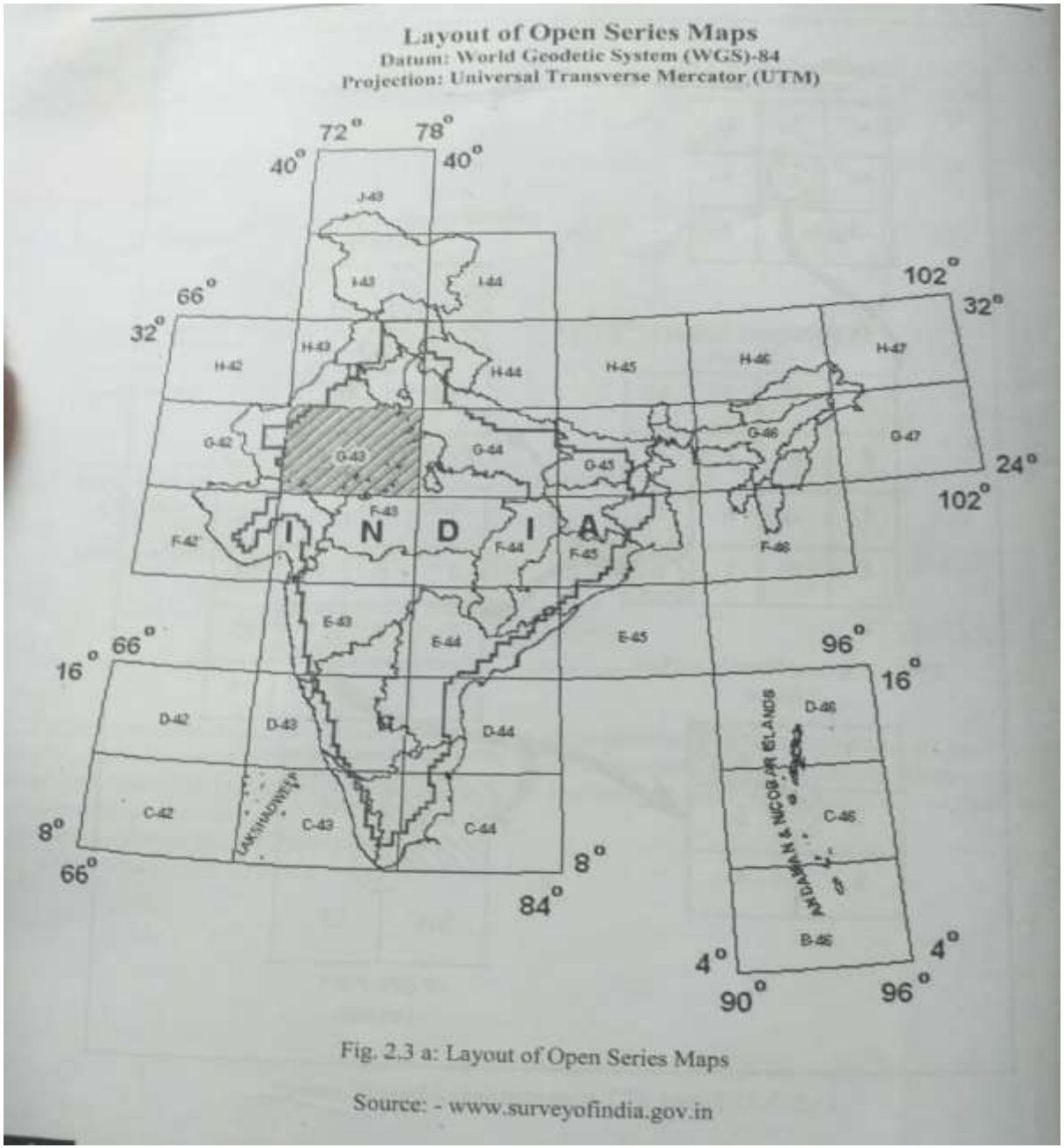


Fig. 2.3 a: Layout of Open Series Maps

Source: - www.surveyofindia.gov.in

Layout of Open Series Maps

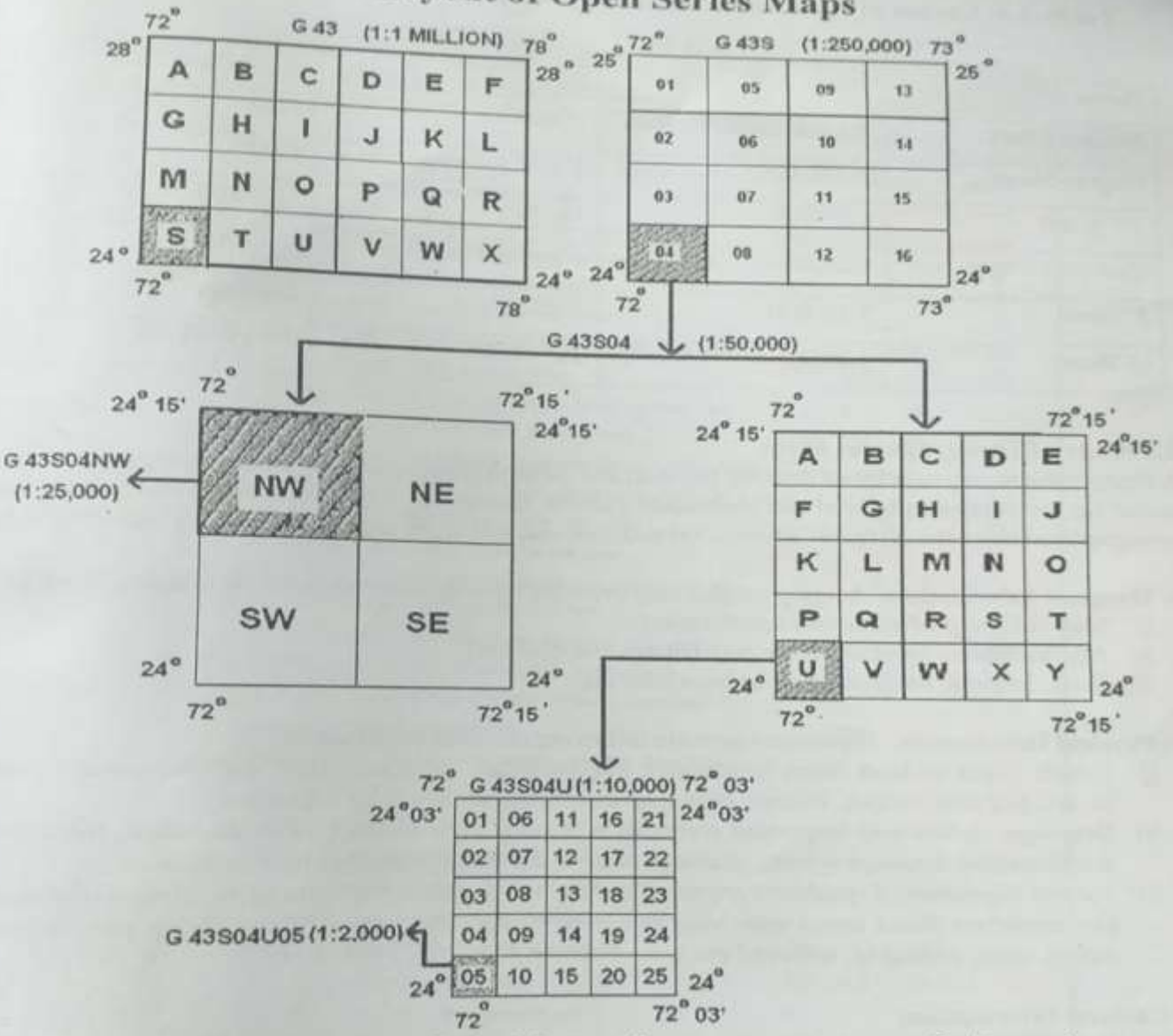


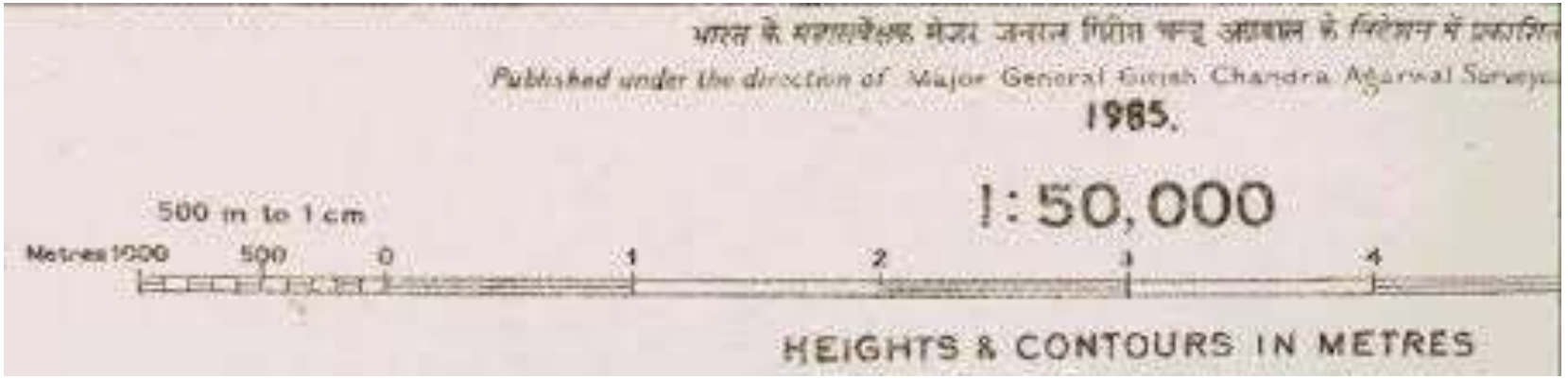
Fig. 2.3b: Layout of Open Series Maps Source: - www.surveyofindia.gov.in

HOW TO CALCULATE TOPOSHEET NUMBER

55 P/1	**55 P/5**	**55 P/9**	**55 P/13**
55 P/2	**55 P/6**	**55 P/10**	**55 P/14**
55 P/3	**55 P/7**	**55 P/11**	**55 P/15**
55 P/4	**55 P/8**	**55 P/12**	**55 P/16**

	X-1	
X-4	X	X+4
	X+1	

TOPOSHEET MAP SCALE



MAP SCALE

- **SCALE:** Scale is the ratio between the distance of any two points on the map and the actual distance of the same points on the ground. The scale of the given map extract is 2 cm: 1 km or 1:50,000.
- **REPRESENTATIVE FRACTION SCALE-** In the map, 1:50,000 is the R.F. of the map, which means that one unit on the map represents 50,000 units on the ground. For example, 1 cm on the map represents 50,000 cm on the ground. It is a universally accepted scale due to the use of local unit of measurement of distance in a place.
- **STATEMENT SCALE** :The scale may be indicated in the form of a written statement. For example 1cm on the map represents 1 km on the ground. The scale is written as 1 cm = 1 km.
- **LINEAR SCALE OR GRAPHICAL SCALE**. This scale is expressed as a horizontal or straight line. The base line is to express visual equivalents of representative fraction or verbal scale.

CONTOURS

- **CONTOURS** : A contour is a line on a map joining two points of equal height, and is the standard method of showing relief on a topographical map.
- Contours are shown at regular vertical intervals. On a 1:50,000 map the interval is 10 or 20metres.
- **CONTOUR INTERVAL**: The interval between two consecutive contours is called contour interval (*it is a constant 20 mts in your toposheets.)
- **INDEX CONTOUR**: Contour lines are thickened at regular intervals to make it easier to read contours. For example at every 100 mts the contour line is made darker. The darker lines are called Index Contours.
- **INTERPRETATION OF CONTOURS** :When contours are further apart, the slope is gentle and when contours are close together the greater the drop

CALCULATION OF AREA

- Area= Length x Breadth
- In topographical maps, each grid (square) 2cm X 2cm or 1 km to 1 km as per the scale 2 cm=1 km

CONVENTIONAL SIGNS AND SYMBOLS

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COLOURS

- **BLACK** – All names, river banks, broken ground, dry streams, surveyed trees, heights and their numbering, railway lines, telephone and telegraph lines, lines of latitude and longitude.
- **BLUE** – Water features or water bodies that contain water.
  GREEN – All wooded and forested areas, orchards, scattered trees and scrubs.
- **YELLOW** – All cultivated areas are shown with a yellow wash.
- **WHITE PATCHES** – Uncultivable land
- Prominent surveyed trees are shown in black. Surveyed trees have numbers on their trunks. They serve as landmarks and are not allowed to be cut.
- **RED** – Grid lines (Eastings and Northings) and their numbering, roads, cart tracks, settlements, huts and buildings
- **BROWN** – Contour lines, their numbering, form lines, and sand features such as sand hills and dunes.

CONTOUR RELATED HEIGHTS

- APPROXIMATE OR RELATIVE HEIGHT- It is height is not taken from sea level but with respect to the surrounding area. It may be the height of a dam, bridge, sand dune or it can be the depth of a well, tank, hill or river canal, for example , 3r, 5r, 8r, etc. EXAMPLE:3r - the relative depth of perennial lined well in 3 metres
- ● 5r – the relative height of dry tank is 5 metres
- NOTE: CHECK THE SYMBOL – if it is tank, dam, bridge, embankment, etc then write the answer this way - the relative height of ..... is .....meters.

- SPOT HEIGHTS: Spot heights are used to provide more information about land surfaces between the contours. These are represented by a number preceded by a dot. for example ●340

- TRIANGULATION POINTS : When the spot heights are accurately surveyed , the dot is enclosed within a triangle and are called the triangulation points. e.g..Δ 877
- BENCH MARKS : The marks inscribed stones or shown on buildings to indicate the exact height determined through the surveys, are called the Bench Marks. These marks are shown by letters BM along with height . e.g.. BM 590
- RELATIVE HEIGHT Relative height is the height of a feature with reference to the height of the surrounding land and NOT to sea level. It is represented by the height with a small ‘r’ e.g. –12r.